



AIA® Document G710™ – 2017

Architect's Supplemental Instructions

PROJECT: *(name and address)*
Wilma P. Mankiller Health Center
Expansion
Stilwell, OK

CONTRACT INFORMATION:
Contract For: CMAR

Date:

ASI INFORMATION:
ASI Number: Bid Package 02 - ASI 003

Date: 03-30-20

OWNER: *(name and address)*
Cherokee Nation Property Management
LLC.

ARCHITECT: *(name and address)*
James R. Childers Architect, Inc.
45 South 4th Street
Fort Smith, AR 72901

CONTRACTOR: *(name and address)*
M. Ross, Inc.

The Contractor shall carry out the Work in accordance with the following supplemental instructions without change in Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgment that there will be no change in the Contract Sum or Contract Time.

(Insert a detailed description of the Architect's supplemental instructions and, if applicable, attach or reference specific exhibits.)

See attached MEP Narrative.

ISSUED BY THE ARCHITECT:

James R. Childers Architect, Inc. _____

ARCHITECT *(Firm name)*

J. Breck Childers

SIGNATURE

J. Breck Childers, Architect _____

PRINTED NAME AND TITLE

03-30-20 _____

DATE



5214 W. Village Parkway, Suite 120, Rogers, AR 72758 | 479-899-6370

CHANGE NARRATIVE LETTER

TO: MATHEW THOMAS- CHILDERS ARCHITECTS
FROM: STEPHEN EDMONDSON, JAMISON MIRANDA, BETSY WELLS– HP ENGINEERING, INC.
DATE: 1/10/2020
PROJECT: WPMHC EXPANSION BID PACKAGE 02 ADDENDUM 01

MECHANICAL DESIGN ITEMS

1. M1.01
 - a. Item 1 Response: Outside air ductwork will only be lined if shown hatched on plans. There is not hatched outside air ductwork on plans.
 - b. Item 2 Response: Plans revised to have condensate neutralizer. Building controls sequence note for hot water temperature reset will vary the hot water temperature based on ambient outside air temperature
 - c. Item 3 Response: Plans revised to show pre-insulated piping below grade.
 - d. Item 4 Response: This is the primary heating coil and is located in the preheat position. Nomenclature will be changed on schedule.

- e. Item 5,6,7 Responses: The AHU coil size can be revised. This will change AHU1 & AHU-3 items below. This will add approx. \$4k-\$7k to each unit. This will be coordinated with the owner and design team to determine if they want to make the change.

	Old	New	Delta
Height	73.4	73.4	0
Width	100	112.5	12.5"
Length	295.6	300.6	5"
Weight	10381	10954	573 lbs
MCA	78.7	78.7	
MOP	90	90	
WPD	29.84	12.36	17.48
APD	1.325	0.869	0.456
Face Vel	522	454	68

- f. Item 8 Response: Although, not required, we were asked to design this building similar to healthcare requirements. This included the extra filtration.
- g. Item 9 Response: If power goes out or equipment goes down, there will be no freeze protection if there is no glycol in the system. We prefer to account for multiple points of failure.

2. M2.02

- a. Item 10 Response: Recirculating pump will be removed from detail. No recirculating pump will be required since we have glycol in the system.

3. M8.10

- a. Item 11 Response: Chilled water piping is not routed below the boilers.

4. M9.01

- a. Item 12 Response: Plans revised.

5. M9.02

- a. Item 13 Response: Plans revised.
- b. Item 14 Response: Coil is primary heating coil located in the preheat position.

ELECTRICAL DESIGN ITEMS

1. ELECTRICAL TYPICAL

- a. Noted on plans to coordinate mounting heights with all architect/owner.

2. ELECTRICAL TYPICAL

- a. Noted on plans to reference equipment plans.

3. ELECTRICAL TYPICAL

- a. This has been verified.

4. ELECTRICAL TYPICAL

- a. Circuit provided for automatic door.

5. E1.02

- a. Exterior receptacle circuit divided into 2 circuits.

6. E1.06

- a. Power added for automatic doors.

7. E1.07

- a. Latest Interior Logistics plans we have don't show 2 freezer. Will coordinate with ILO.

8. E1.14

- a. Power provided for VAV2.22. no changes required

9. E1.18

- a. Additional receptacles added to roof. Receptacles are provided with AHU.

10. E1.24

- a. Note added to provided smoke rated penetrations at all smoke walls.

11. E1.25

- a. Note added to provided smoke rated penetrations at all smoke walls.

12. E2.05

- a. Provided photometrics for fire lane. Site lights added to perimeter lot entrances.

13. E2.09

- a. Exit sign added in hallway.

14. E3.02

- a. Panel HE1 has 114 amps of spare capacity. We feel this will be sufficient.
- b. Circuit added for site lights.
- c. Chiller loads matches chiller MCA.

15. E3.04

- a. Future loads have been taken into account for panel L4B. no changes required

PLUMBING DESIGN ITEMS

1. P1.00:

- a. Note 7 & 8 have been added to the water heater schedule.
- b. The booster pump information was added to the schedule in Bid Package 02 – ADD 01 in January.
- c. Wall hung water closets are provided with 4” waste connection and floor mount are provided with 3” waste connection. This has been adjusted in the Rough-In Mounting Height Schedule.
- d. OHD-1 have been added to the Plumbing Equipment Schedule and the Rough-In Mounting Height Schedule.

2. P2.00:

- a. Sewer mains are sized according to code and DFU.

3. P2.11:

- a. Per table 709.1 of the 2015 IPC for water closets, note D “trap size shall be consistent with the fixture outlet size.” Floor mounted toilets are typically installed with 3” lines and wall hung toilets are typically installed with 4” lines due to the carrier. The toilets that are being used on this project are low flow type and do not exceed 1.6 GPF. Per table 709.2 of the 2015 IPC fixture drain or trap size for 4 drainage fixture units is 2-1/2” which we would never use for a toilet. Please indicate where in the 2015 IPC it specifically states that a 3” waste connection to a water closet is only allowed if it is the only fixture on the branch?

4. P2.12:

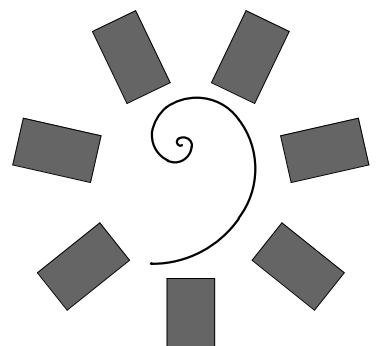
- a. Couldn’t find a 01-01-10 Storage room. Assumed that it was 01-07-10 Storage. A floor drain has been added.
- b. Note 22.39 has been added to this sheet stating, “PROVIDE OPEN HUB DRAIN WITH TRAP GUARD UNDER COUNTER FOR DRAIN FROM COUNTER MOUNTED ICE MACHINE. HUB DRAIN SHALL BE CONNECTED TO THE DRAIN LINE AT THE SINK NEAR BY.”

5. P2.14:
 - a. Per table 709.1 of the 2015 IPC for water closets, note D “trap size shall be consistent with the fixture outlet size.” Floor mounted toilets are typically installed with 3” lines and wall hung toilets are typically installed with 4” lines due to the carrier. The toilets that are being used on this project are low flow type and do not exceed 1.6 GPF. Per table 709.2 of the 2015 IPC fixture drain or trap size for 4 drainage fixture units is 2-1/2” which we would never use for a toilet. Please indicate where in the 2015 IPC it specifically states that a 3” waste connection to a water closet is only allowed if it is the only fixture on the branch?

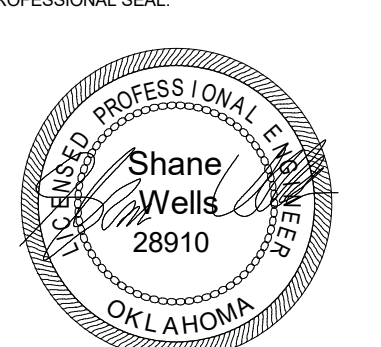
6. P3.11:
 - a. The keynotes have been added to this sheet.

7. P3.12:
 - a. TMV-1 is in the mechanical room. The TMV-2 at Group room 01-08-10 needs to stay a TMV-2. This room may be accessed by the public therefore requires no more than 110 degrees. All lavatories in restrooms and public access areas are marked with the TMV-2. Sinks (stainless steel) located in areas that are not accessed by the public do not
 - b. Equipment was shown to indicate spacing. Equipment with no connections have been hidden.
 - c. Note 22.38 has been added to the plans stating, “PROVIDE CW LINE TO LAUNDRY DETERGENT DISPENSER. PROVIDE BACKFLOW PREVENTER PRIOR TO SOAP DISPENSER CONNECTION. COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT LOCATION OF DETERGENT DISPENSER AND SIZE OF CONNECTION.”
 - d. Water line has been added at 01-07-13 Nourishment for the #3307 ice maker along with SB-1 & WHA-1.

END OF RESPONSES



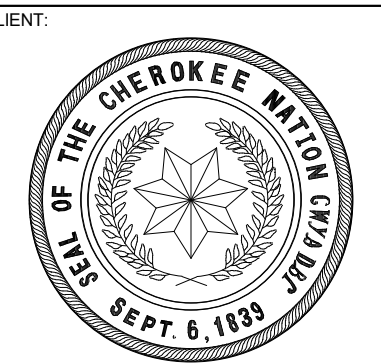
James R. Childers Architect, Inc. 45 South 4th Street Fort Smith, AR 72601 479-783-2450 www.childersarchitect.com



CONSULTANT LOGO



HP ENGINEERING PROJECT NO. 18068R 100% COMPLETE



WILMA P. MANKILLER HEALTH CENTER EXPANSION STILLWELL, OKLAHOMA

KEY PLAN

PROJECT PHASE

BID PACKAGE 02

Table with columns: #, DATE, REVISIONS, DESCRIPTION

DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:

P.100

PLUMBING LGD, NOTES & SCHS.

GAS LOAD CALCULATION

Table with columns: EQUIPMENT, MBH INPUT (EACH), QTY, TOTAL MBH INPUT

GENERAL PLUMBING SEISMIC NOTES

- 1. PROVIDE VIBRATION AND SEISMIC CONTROLS FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT FOR DEVICES FOR FIRE-SUPPRESSION SYSTEMS... 2. PROVIDE VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT... 3. COORDINATE ALL VIBRATION ISOLATION DEVICE INSTALLATION AND SEISMIC BRACING FOR PLUMBING PIPING AND EQUIPMENT WITH OTHER SYSTEMS AND EQUIPMENT IN THE VICINITY...

P-WATER HEATER SCHEDULE

Table with columns: TAG NUMBER, SERVICE, MFR, MODEL NUMBER, TYPE, GPM AT 70F RISE, POWER SUPPLY, NOTES

P-BOOSTER PUMP SCHEDULE

Table with columns: TAG NUMBER, SERVICE, MFR, MODEL, TYPE, TOTAL SYSTEM US GPM, TDH FT, HP, POWER SUPPLY, NOTES

PLUMBING PIPING INSULATION SCHEDULE

Table with columns: DESCRIPTION, INSULATION TYPE, INSULATION THICKNESS NOMINAL PIPE SIZE (<1, 1 TO <1-1/2, 1-1/2 TO <4, 4 TO <8, >8)

PIPING MATERIAL SCHEDULE

Table with columns: DESCRIPTION, MATERIAL

ROUGH-IN AND MOUNTING HEIGHT SCHEDULE

Table with columns: FIXTURE, WASTE, VENT, COLD WATER, HOT WATER, HEIGHT OF INSTALLATION

PLUMBING EQUIPMENT SCHEDULE

Table with columns: FIXTURE TAG, DESCRIPTION, MANUFACTURER, TRIM, ELECTRICAL REQUIREMENTS

PLUMBING PIPE LEGEND

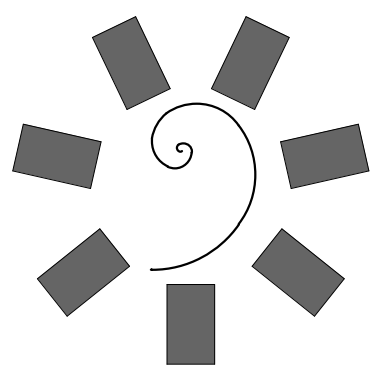
Table with columns: DESCRIPTION, TAG, LINETYPE

PLUMBING SYMBOL LEGEND

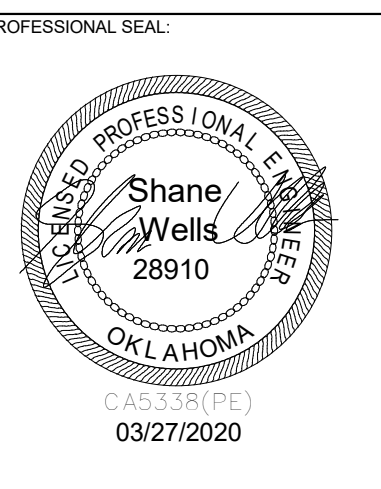
Table with columns: D.F.U., GPM, FL, M, R, PRESSURE REDUCING VALVE, BALL VALVE, MIXING VALVE

GENERAL PLUMBING NOTES

- 1. THE ENTIRE PLUMBING SYSTEM SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL PLUMBING CODE REGULATIONS AND LOCAL PLUMBING INSPECTOR... 2. THE PIPING INDICATED ON THESE PLANS ARE DIAGRAMMATICAL... 3. THE CONTRACTOR SHALL OBTAIN AND PAY ALL FEES RELATED TO PERMITTING, INSPECTIONS, TAP-ON FEES, ETC.

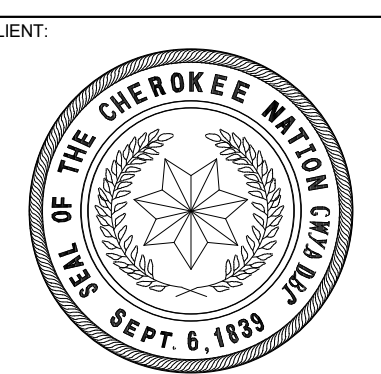


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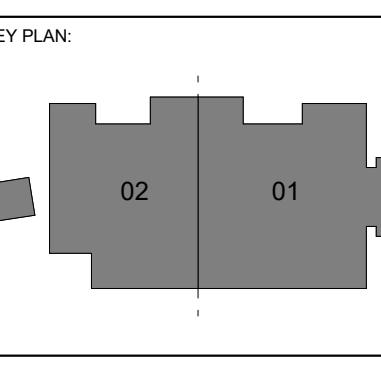


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**WILMA P. MANKILLER HEALTH CENTER
EXPANSION**
STILWELL, OKLAHOMA



PROJECT PHASE
BID PACKAGE 02

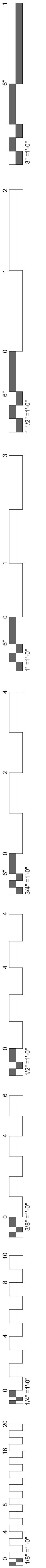
#	DATE	REVISIONS	DESCRIPTION

DATE: 12-06-19 JOB NUMBER: 18-01.01
SHEET NUMBER: P2.00

**OVERALL
LEVEL 01 DRAIN
PLAN**



OVERALL LEVEL 01 DRAIN PLAN
1/8" = 1'-0"



KEYNOTES
 22.01 NEW 6" BUILDING DRAIN LINE.
 REFER TO CIVIL PLANS FOR
 CONTINUATION. 486 D.F.U.

SEISMIC RESTRAINTS FOR MEP EQUIPMENT AND SYSTEMS
 BUILDING IS CLASSIFIED AS SEISMIC DESIGN CATEGORY C. CONTRACTOR SHALL
 PROVIDE SEISMIC BRACING FOR PIPING, DUCTWORK AND EQUIPMENT TO MEET ALL
 LOCAL AND NATIONAL CODE REQUIREMENTS.
 CONTRACTOR'S RESPONSIBILITIES INCLUDE PROVIDING ALL SUBMITTALS AND DETAILS
 WITH STRUCTURAL ENGINEER'S CERTIFICATION FOR PERMITTING.

NOTE: IT IS THE PLUMBING CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE
 SITE CONTRACTOR TO CONFIRM THAT THE INVERT AND LOCATION OF THE SANITARY
 SERVICE IS COMPATIBLE WITH THE SITE UTILITIES PRIOR TO BEGINNING WORK.

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PROFESSIONAL SEAL

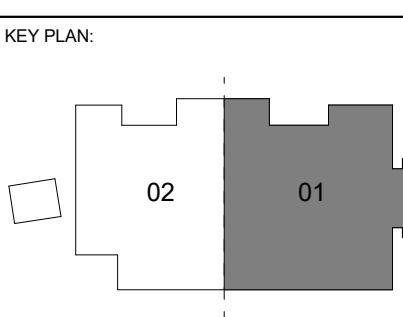
 Shane Wells
 License No. 28910
 State of Oklahoma
 03/27/2020

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CLIENT

 THE CHEROKEE NATION
 EST. SEPT. 6, 1829

**WILMA P. MANKILLER HEALTH CENTER
 EXPANSION**
 STILLWELL, OKLAHOMA

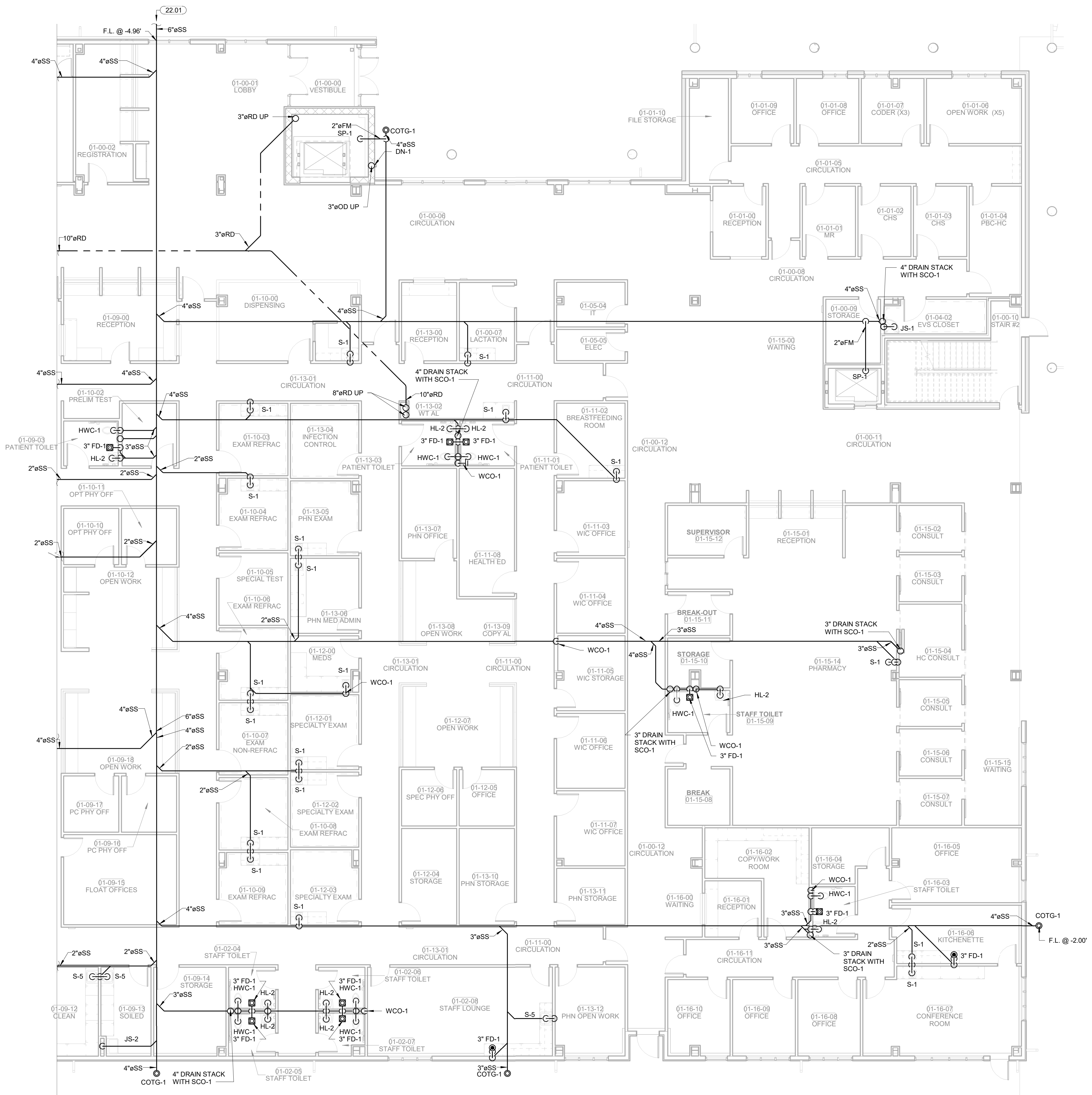


PROJECT PHASE
 BID PACKAGE 02

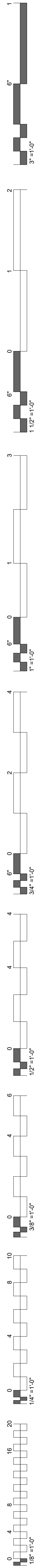
#	DATE	REVISIONS	DESCRIPTION

DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:
P2.11
DRAIN PLAN
LEVEL 01
SECTOR 01



FLOOR PLAN LEVEL 01 SECTOR 01 - DRAIN PLAN
 1/8" = 1'-0"



KEYNOTES

22.01 NEW 6" BUILDING DRAIN LINE. REFER TO CIVIL PLANS FOR CONTINUATION. 488 D.F.U.

22.02 NEW 4" DRAIN LINE. REFER TO CIVIL PLANS FOR CONTINUATION.

22.09 18" STORM DRAIN LINE. REFER TO CIVIL PLANS FOR CONTINUATION.

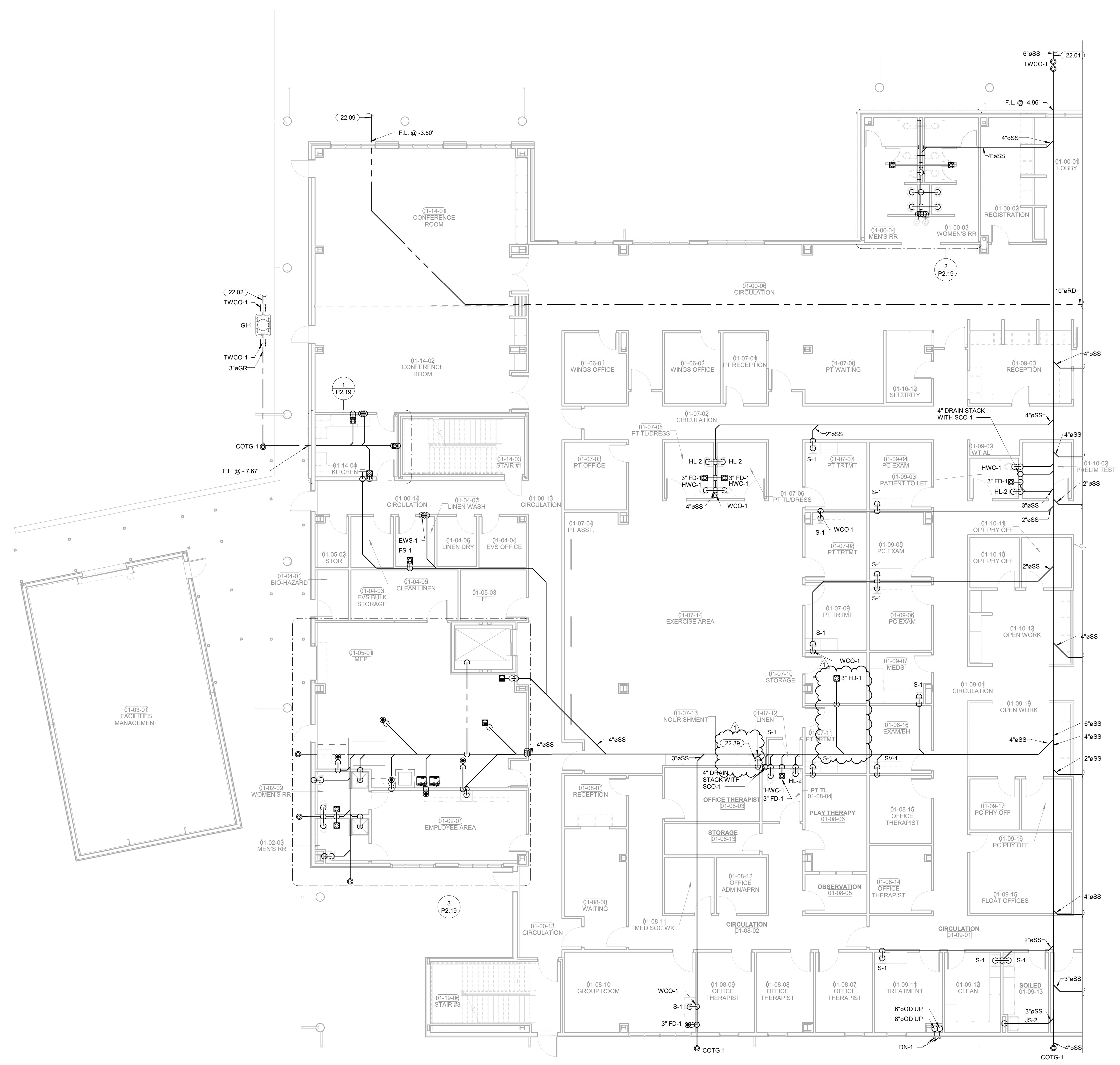
22.39 PROVIDE OPEN HUB DRAIN WITH TRAP GUARD UNDER COUNTER FOR DRAIN FROM COUNTER MOUNTED ICE MACHINE. HUB DRAIN SHALL BE CONNECTED TO THE DRAIN LINE AT THE SINK NEAR BY.

SEISMIC RESTRAINTS FOR MEP EQUIPMENT AND SYSTEMS

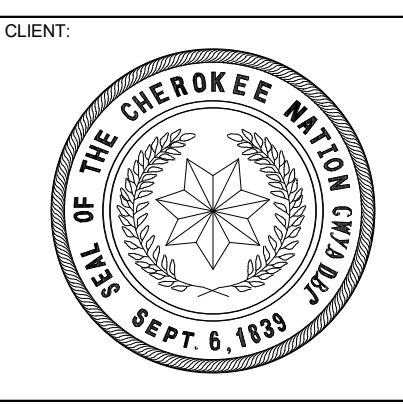
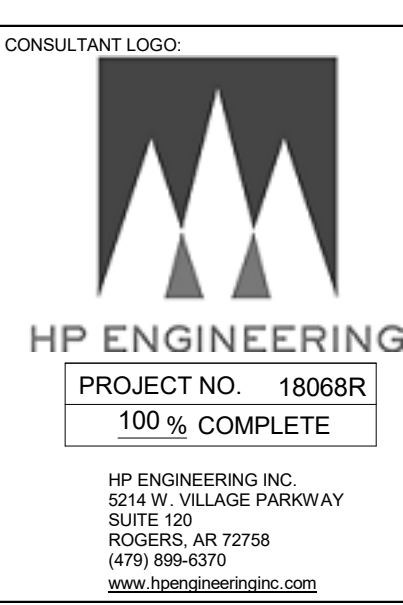
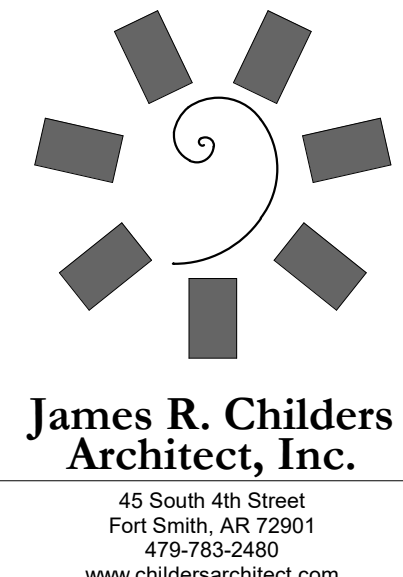
BUILDING IS CLASSIFIED AS SEISMIC DESIGN CATEGORY C. CONTRACTOR SHALL PROVIDE SEISMIC BRACING FOR PIPING, DUCTWORK AND EQUIPMENT TO MEET ALL LOCAL AND NATIONAL CODE REQUIREMENTS.

CONTRACTOR'S RESPONSIBILITIES INCLUDE PROVIDING ALL SUBMITTALS AND DETAILS WITH STRUCTURAL ENGINEER'S CERTIFICATION FOR PERMITTING.

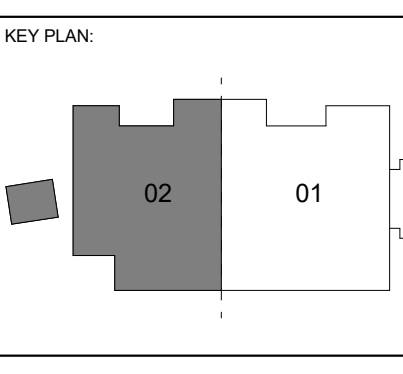
NOTE: IT IS THE PLUMBING CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH THE SITE CONTRACTOR TO CONFIRM THAT THE INVERT AND LOCATION OF THE SANITARY SERVICE IS COMPATIBLE WITH THE SITE UTILITIES PRIOR TO BEGINNING WORK.



FLOOR PLAN LEVEL 01 SECTOR 02 - DRAIN PLAN
1/8" = 1'-0"



**WILMA P. MANKILLER HEALTH CENTER
EXPANSION**
STILWELL, OKLAHOMA

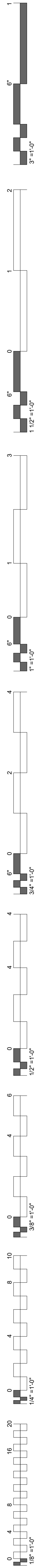


PROJECT PHASE:
BID PACKAGE 02

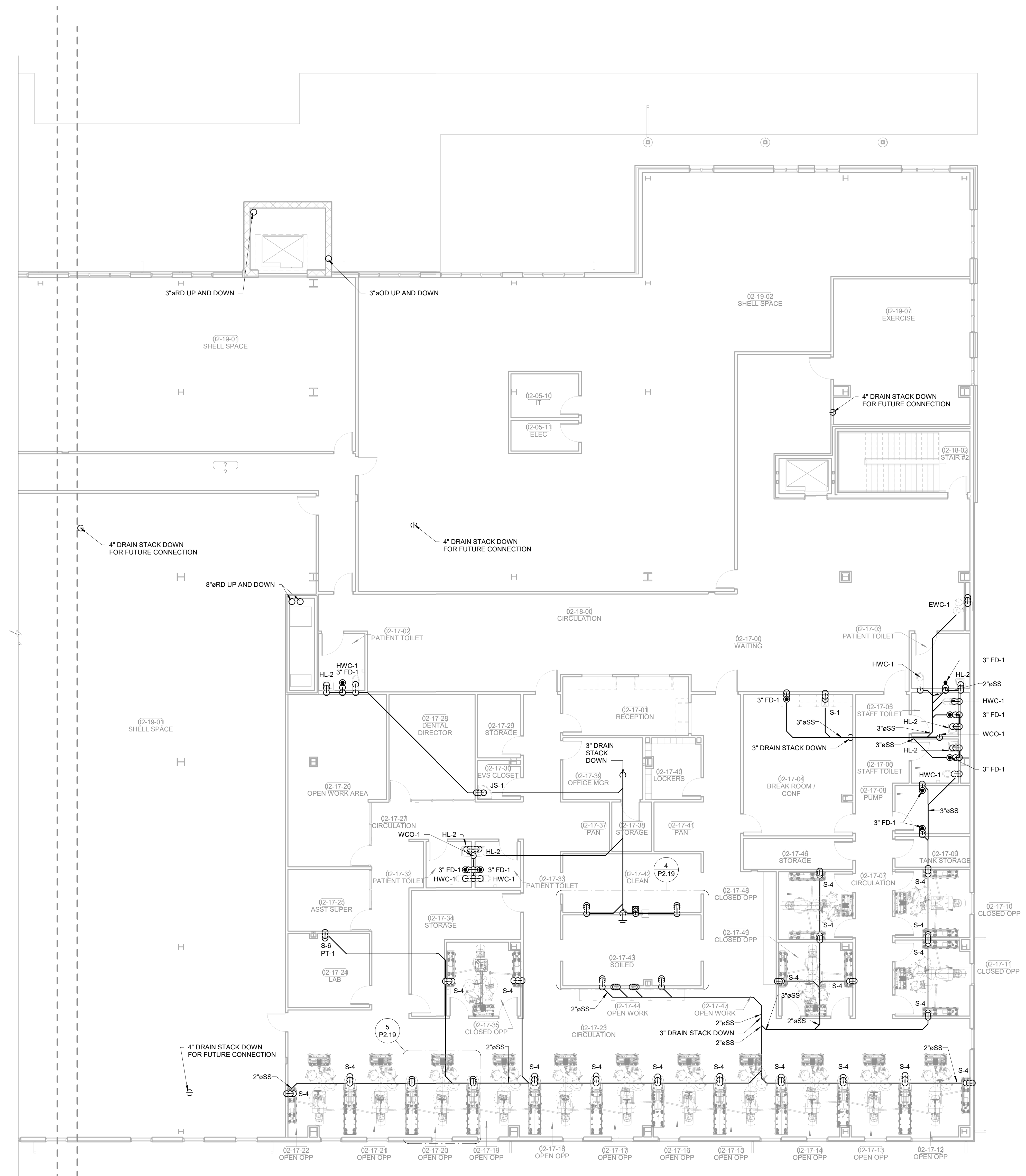
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1	3/30/20	BID PACKAGE 02 - ASI 03

DATE: 12-06-19
JOB NUMBER: 18-01.01

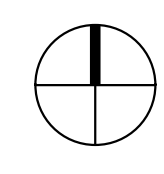
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P2.12
**DRAIN PLAN
LEVEL 01
SECTOR 02**

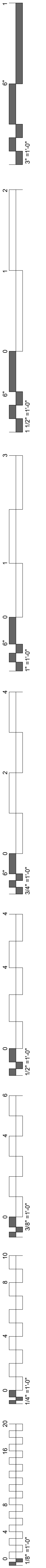


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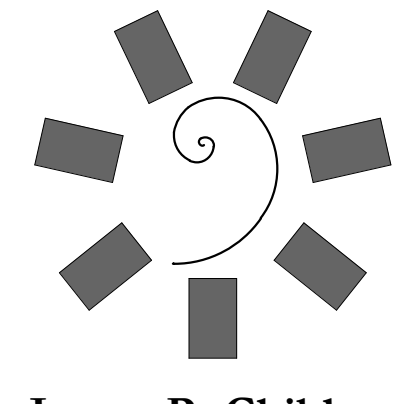


FLOOR PLAN LEVEL 02 SECTOR 01 - DRAIN PLAN
 1/8" = 1'-0"

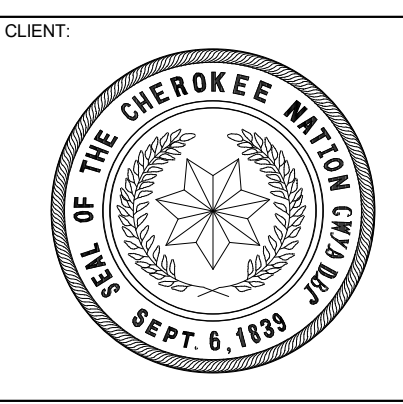
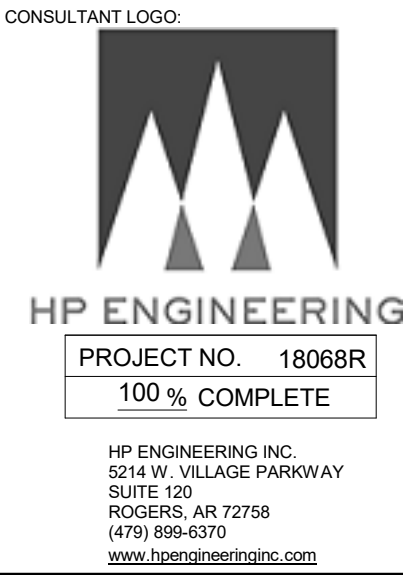
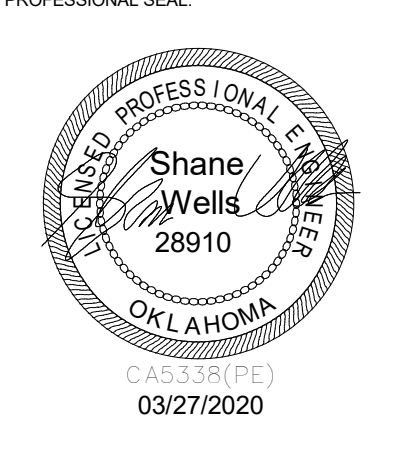




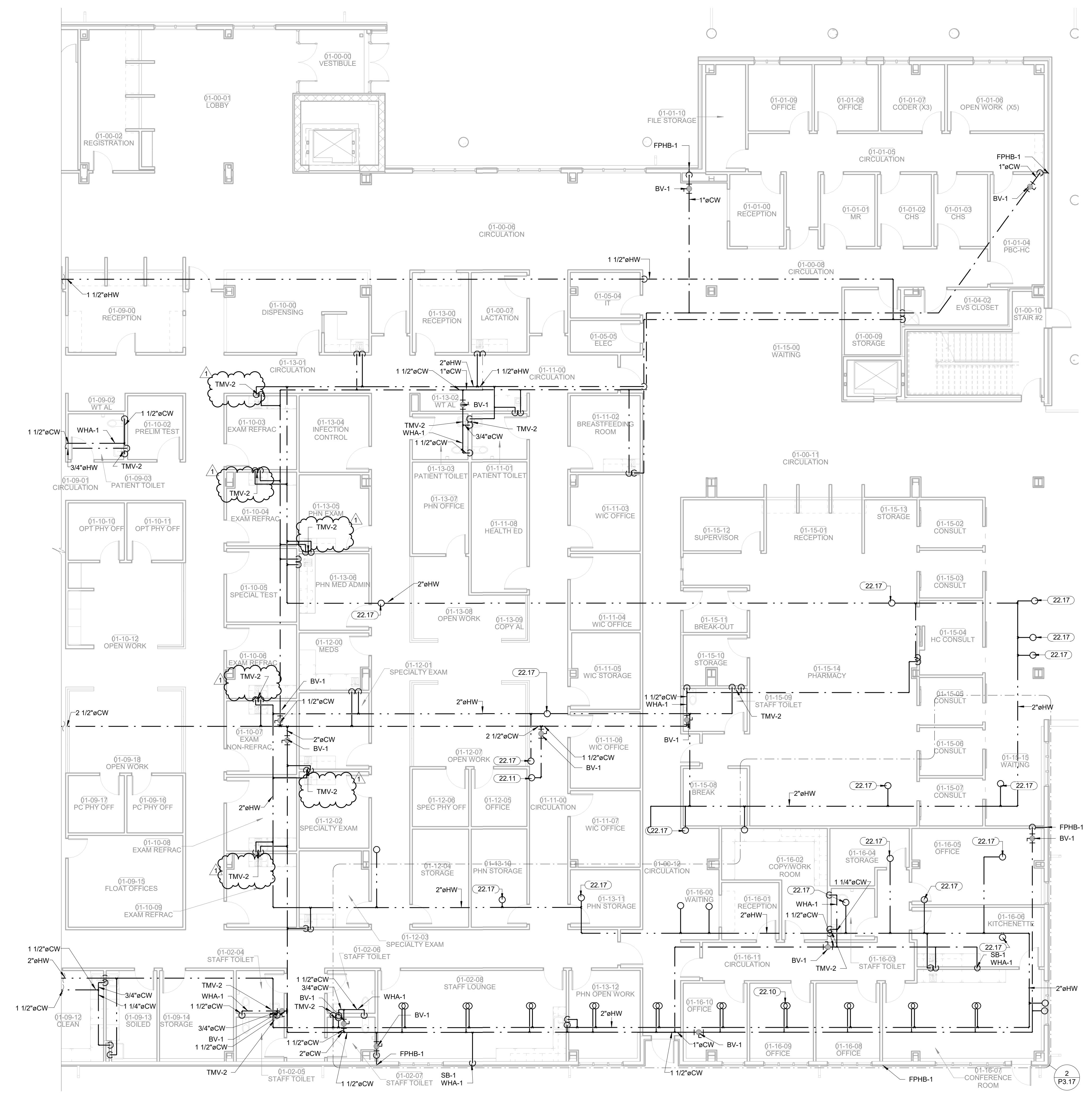
KEYNOTES	
Key Value	Keynote Text
22.10	3/4" CW & HW UP. TYPICAL 12 PLACES.
22.11	2-1/2" CW UP TO 2ND FLOOR.
22.17	3/4" HW UP.



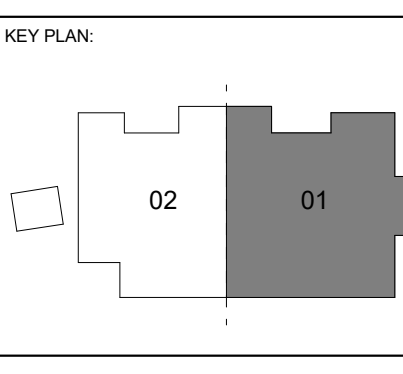
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**WILMA P. MANKILLER HEALTH CENTER
 EXPANSION
 STILLWELL, OKLAHOMA**



FLOOR PLAN LEVEL 01 SECTOR 01 - SUPPLY PLAN
 1/8" = 1'-0"

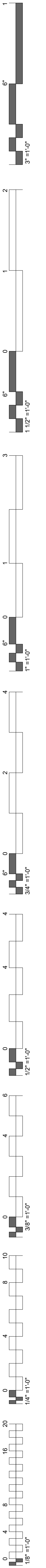


PROJECT PHASE:
BID PACKAGE 02

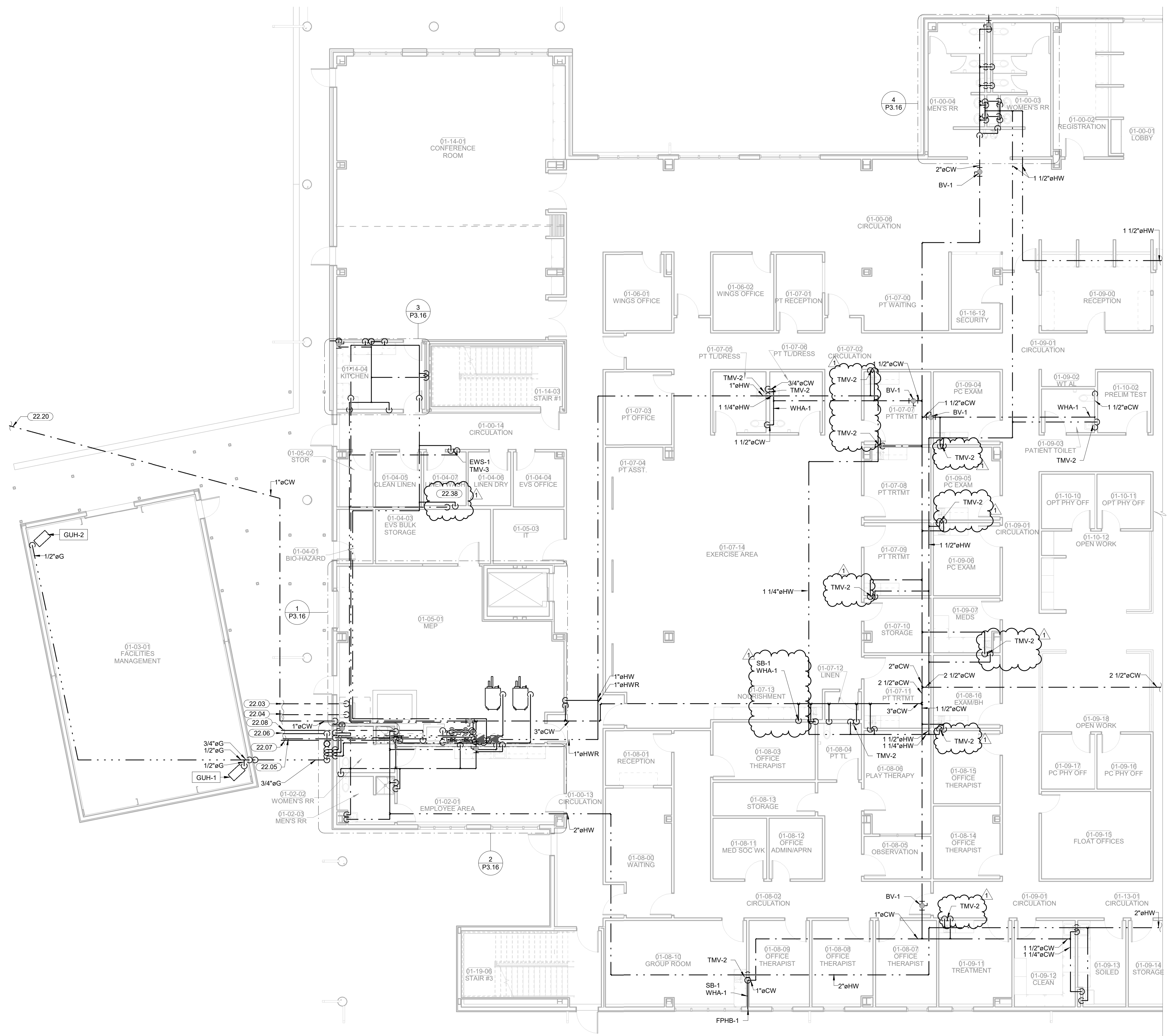
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1	3/30/20	BID PACKAGE 02	ASB 03

DATE: 12-06-19
 JOB NUMBER: 18-01.01

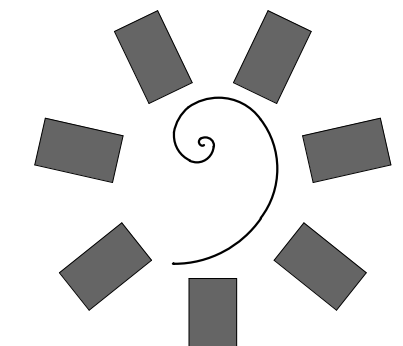
SHEET NUMBER:
P3.11
**SUPPLY PLAN
 LEVEL 01
 SECTOR 01**



- ### KEYNOTES
- 22.03 NEW 8" FIRE LINE. STUB UP INSIDE BUILDING FOR SPRINKLER CONTRACTOR CONNECTION. FIRE LINE TO BE SIZED BY SPRINKLER CONTRACTOR. REFER TO CIVIL PLANS FOR CONTINUATION.
 - 22.04 FIRE LINE TO FDC. REFER TO CIVIL PLANS FOR CONTINUATION. COORDINATE EXACT LOCATION OF FDC WITH LOCAL FIRE MARSHAL.
 - 22.05 3" DOMESTIC WATER LINE. REFER TO CIVIL PLANS FOR CONTINUATION. 143 G.P.M.
 - 22.06 2" MEDIUM PRESSURE GAS LINE (2 PSI). REFER TO CIVIL PLANS FOR CONTINUATION. 2855 & MBH
 - 22.07 IRRIGATION LINE TO RPZ-2. COORDINATE SIZE WITH IRRIGATION CONTRACTOR. REFER TO CIVIL PLANS FOR CONTINUATION.
 - 22.08 IRRIGATION LINE. COORDINATE SIZE WITH IRRIGATION CONTRACTOR. REFER TO CIVIL PLANS FOR CONTINUATION.
 - 22.20 PROVIDE 1" CW LINE TO THE MECHANICAL YARD YH-1. COORDINATE EXACT LOCATION OF THE YH-1 WITH EQUIPMENT AND OWNER/OWNER REPRESENTATIVE.
 - 22.38 PROVIDE CW LINE TO LAUNDRY DETERGENT DISPENSER. PROVIDE BACKFLOW PREVENTER PRIOR TO SOAP DISPENSER CONNECTION. COORDINATE WITH EQUIPMENT SUPPLIER FOR EXACT LOCATION OF DETERGENT DISPENSER AND SIZE OF CONNECTION.



FLOOR PLAN LEVEL 01 SECTOR 02 - SUPPLY PLAN
1/8" = 1'-0"



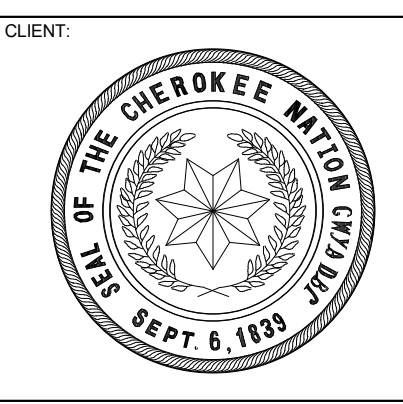
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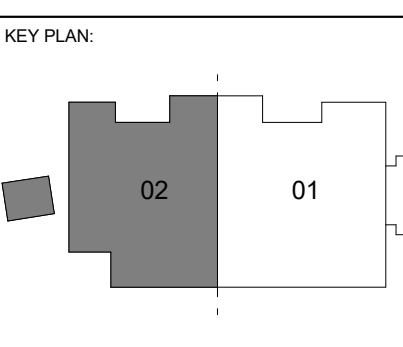
CONSULTANT LOGO

HP ENGINEERING
PROJECT NO. 18068R
100% COMPLETE

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**WILMA P. MANKILLER HEALTH CENTER
EXPANSION**
STILWELL, OKLAHOMA

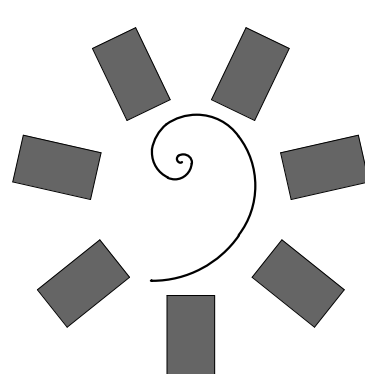


PROJECT PHASE
BID PACKAGE 02

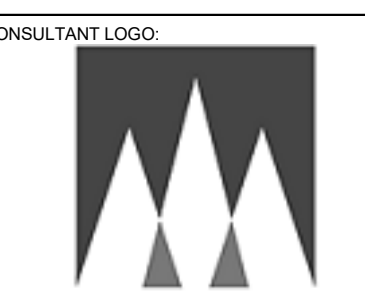
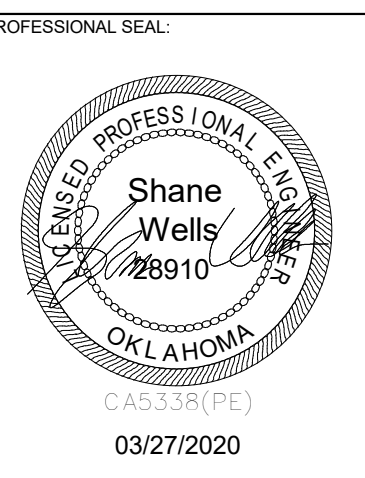
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1	3/30/20	BID PACKAGE 02 - ASI 03

DATE: 12-06-19 JOB NUMBER: 18-01.01

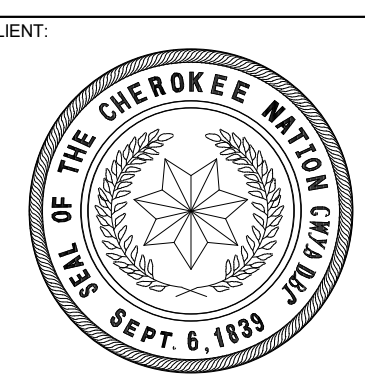
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P3.12
SUPPLY PLAN
LEVEL 01
SECTOR 02



James R. Childers Architect, Inc.



HP ENGINEERING PROJECT NO. 18068R



WILMA P. MANKILLER HEALTH CENTER EXPANSION

PROJECT PHASE BID PACKAGE 02

Table with columns: #, DATE, REVISION, DESCRIPTION

DATE: 12-06-19 JOB NUMBER: 18-01.01

M1.01

MECHANICAL NOTES AND SCHEDULES

GENERAL MECHANICAL NOTES

- 1. SUBMISSION OF PROPOSAL IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE...

GENERAL NOTE: ALL RECTANGULAR DUCT SIZES SHOWN ARE THE OUTSIDE METAL DIMENSIONS. DUCT DIMENSIONS ALREADY HAVE ALLOWANCES FOR THE INSULATION LINER...

MECHANICAL DUCTWORK & INSULATION SCHEDULE

Table with columns: SERVICE, DUCT TYPE, INSULATION TYPE, INSULATION THICKNESS. Includes entries for Fresh Air Supply Duct, Restroom Exhaust Duct, etc.

HYDRONIC ACCESSORIES SCHEDULE

Table with columns: TAG, DESCRIPTION, MFR, MODEL, TANK MIXTURE, TANK VOLUME (GALLONS), PRESSURE RANGE (PSI), MAKE-UP CAPACITY (GPM @ PSI), HP, VOLT/PH, ACCESSORIES.

AIR SEPARATOR SCHEDULE

Table with columns: MARK, SERVES, MFR, MODEL, VOLUME (GAL), WPD (FT), WEIGHT (LB), ACCESSORIES.

MECHANICAL PIPING & INSULATION SCHEDULE

Table with columns: SERVICE, PIPING TYPE, INSULATION TYPE, INSULATION THICKNESS. Includes entries for Hot Water Heating to 250°F, Condenser Water, etc.

CONDENSING BOILER SCHEDULE

Table with columns: TAG, DESCRIPT, MNFR, MODEL, FLUID, WPD (FT), FLOW RATE MAX/ MIN(GPM), TURNDOWN, EFFICIENCY @ 100% FIRE / DESIGN EWT, OPERATING WEIGHT (LBS), MBH IN, MBH OUT, BOILER VOLTAGE / PHASE / AMPS, PUMP VOLTAGE / PHASE / AMPS, NOTES.

- GENERAL NOTES APPLICABLE TO ALL UNITS: 1. REQUIRED GAS PRESSURE IS 7.0" W.C. MINIMUM TO 14" W.C. MAXIMUM. 2. INSTALL BOILERS ON EXISTING CONCRETE PAD...

CHILLER SCHEDULE

Table with columns: TAG, DESCRIPTION, MFR, MODEL, NOM TONS, NET TONS, FLUID, FLOW RATE (GPM), EVAP COIL P.D, EWT (°F), LWT (°F), FAN FLA, TOTAL POWER, VOLTS, PH, MCA, MOCF, NOTES.

- GENERAL NOTES APPLICABLE TO ALL UNITS: 1. PROVIDE WITH SINGLE POINT POWER. 2. SCOR 69K. 3. PHASE PROTECTION. 4. BACNET INTERFACE.

ROOFTOP CHILLED WATER VAV AIR HANDLING UNIT WITH HOT WATER HEAT

Table with columns: TAG, DESCRIPTION, MFR, MODEL, DRIVE TYPE, FAN HP, CFM, ESP, TSP, RPM, FAN HP, CFM, ESP, TSP, RPM, FLUID, CAPACITY (MBH), EAT / LAT AREA (SQ FT), FACE MAX FCFE VELOCITY (FPM), MAX APD (IN-WG), HEAT ROWS, FINS / FT, GPM, ENT / LVG WATER TEMP (°F), FLUID, SENS / TOT CAP (MBH), EAT DB / W.B (°F), LAT DB / W.B (°F), FACE VELOCITY APD (FPM), MAX APD (IN-WG), ROWS, GPM, MAX WPD (FT), EWT / LWT (°F), OA CFM, PRIMARY AIR FILTERS, PRE-AIR FILTER, CIRCUIT #1 - SINGLE POINT POWER, CIRCUIT #2 - UV LIGHTS, CIRCUIT #3 - LIGHTS & SWITCH, CIRCUIT #4 - RECEPTACLE, WEIGHT (LB), NOTES.

- GENERAL NOTES APPLICABLE TO ALL UNITS: 1. PROVIDE STANDARD ROOF CURB. 2. PROVIDE THROUGH THE BASE ELECTRICAL. 3. PROVIDE UNIT MOUNTED CONVENIENCE OUTLET.

EXPANSION TANK SCHEDULE

Table with columns: TAG, DESCRIPTION, MFR, MODEL, ASME CONSTRUCTION (YES/NO), CAPACITY (GALLONS), ACCEPTANCE (GALLONS), INITIAL TANK PRESSURE (PSIG), NOTES.

PUMP SCHEDULE

Table with columns: TAG, MFR, MODEL, TYPE, SERVICE, GPM, SYSTEM HEAD (FT), MAX HP, VOLTS / PHASE, NOTES.

- GENERAL NOTES APPLICABLE TO ALL UNITS: 1. PUMPS TO BE FURNISHED WITH INTEGRAL MOTOR VFD'S. 2. PUMPS TO BE VERTICAL, MULTI-STAGE WITH SPLIT COUPLING.

AIR DEVICE SCHEDULE

Table with columns: TAG, DESCRIPTION, MFR, MODEL, FACE SIZE, FRAME SIZE, NECK SIZE, MATERIAL / FINISH, MAX FLOW.

- GENERAL NOTES APPLICABLE TO ALL UNITS: 1. COORDINATE AIR DEVICE DEFLECTION ADJUSTMENTS WITH THE MECHANICAL ENGINEER DURING AIR BALANCE.

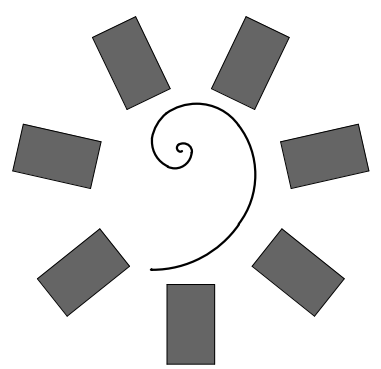
EXHAUST FAN SCHEDULE

Table with columns: TAG, DESCRIPTION, MFR, MODEL, DRIVE, FLOW, ESP, RPM, VOLTS / PH, POWER, CONTROL TYPE, ACCESSORIES.

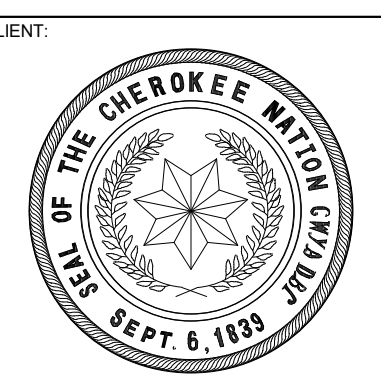
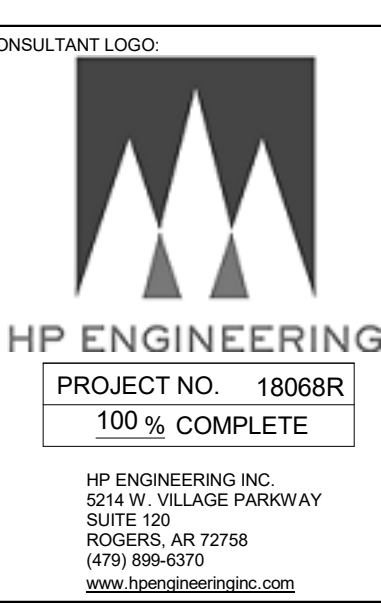
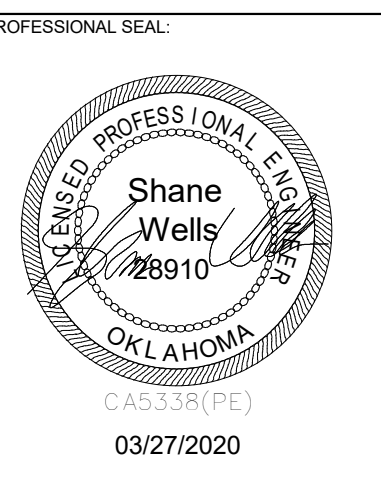
- GENERAL NOTES APPLICABLE TO ALL UNITS: 1. PROVIDE PRE-WIRED FACTORY MOUNTED INTEGRAL DISCONNECT DEVICE (NEMA 3R FOR EXTERIOR).

- NOTES: A. PROVIDE BACKDRAFT DAMPER. B. PROVIDE MOTORIZED DAMPER WITH TIME DELAY FAN START.

MECHANICAL NOTES AND SCHEDULES



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**WILMA P. MANKILLER HEALTH CENTER
EXPANSION**
STILWELL, OKLAHOMA

KEY PLAN

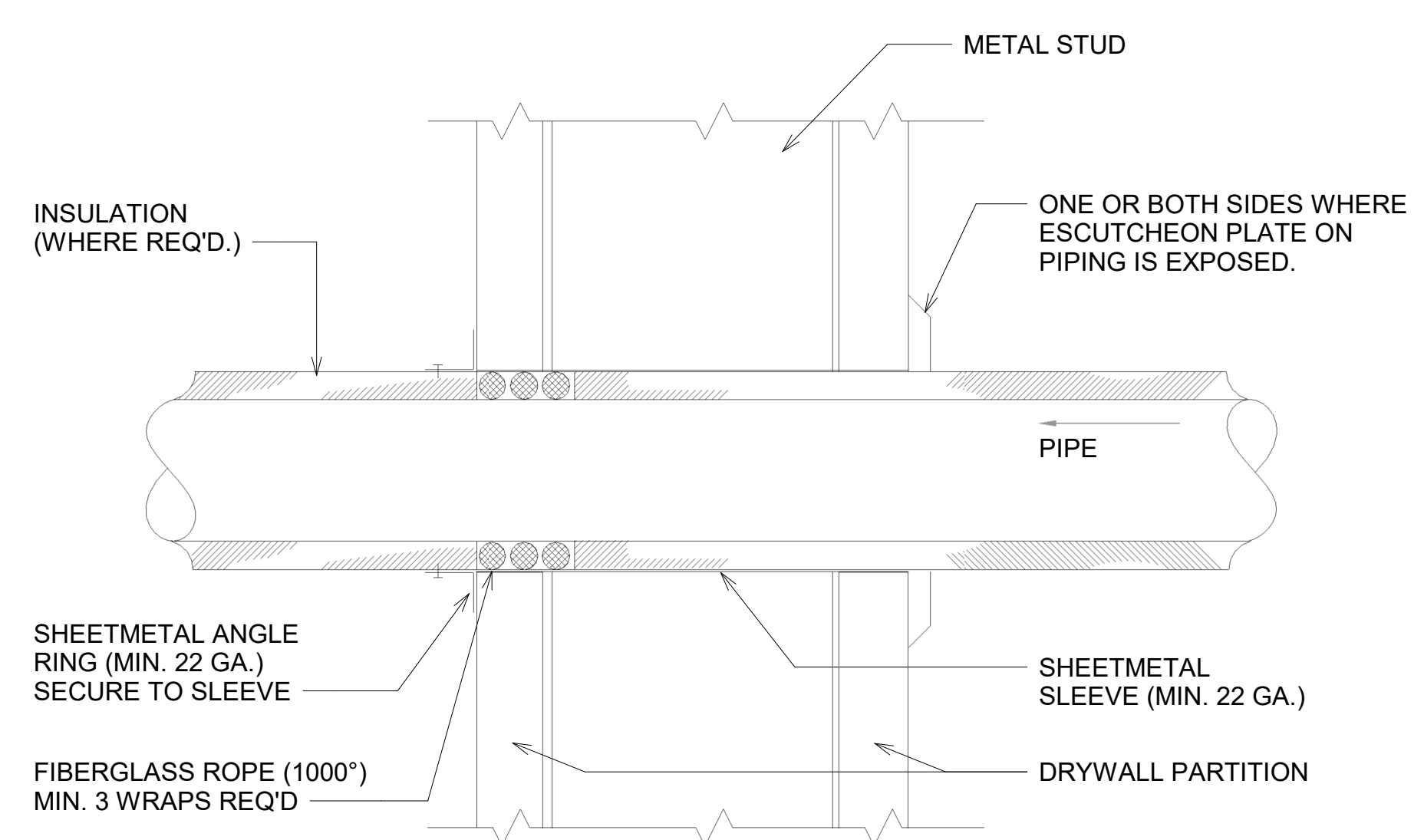
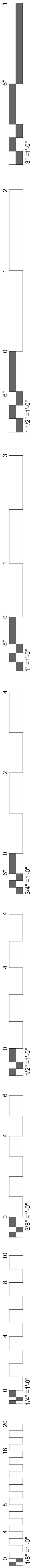
PROJECT PHASE
BID PACKAGE 02

#	DATE	REVISIONS	DESCRIPTION
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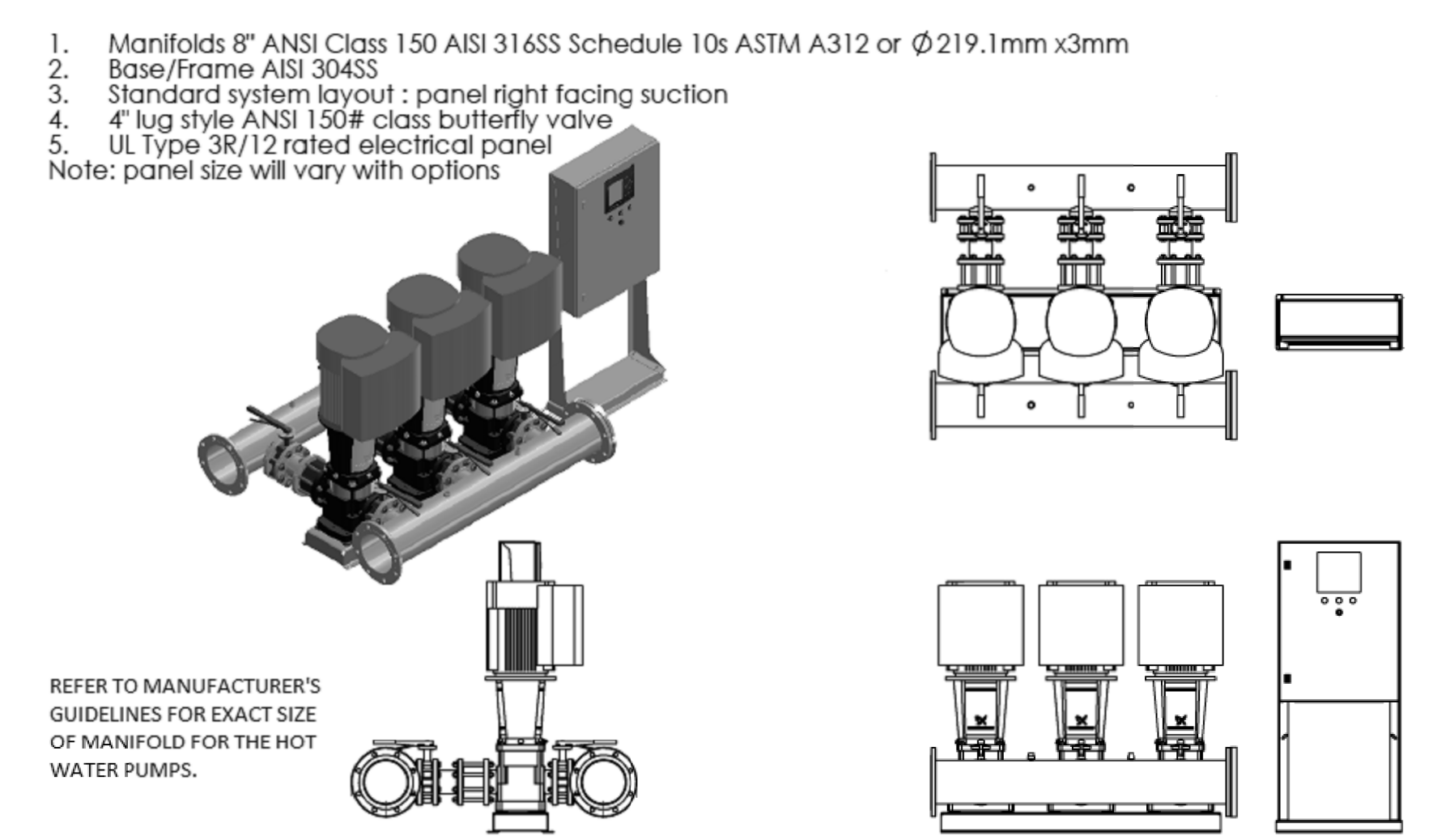
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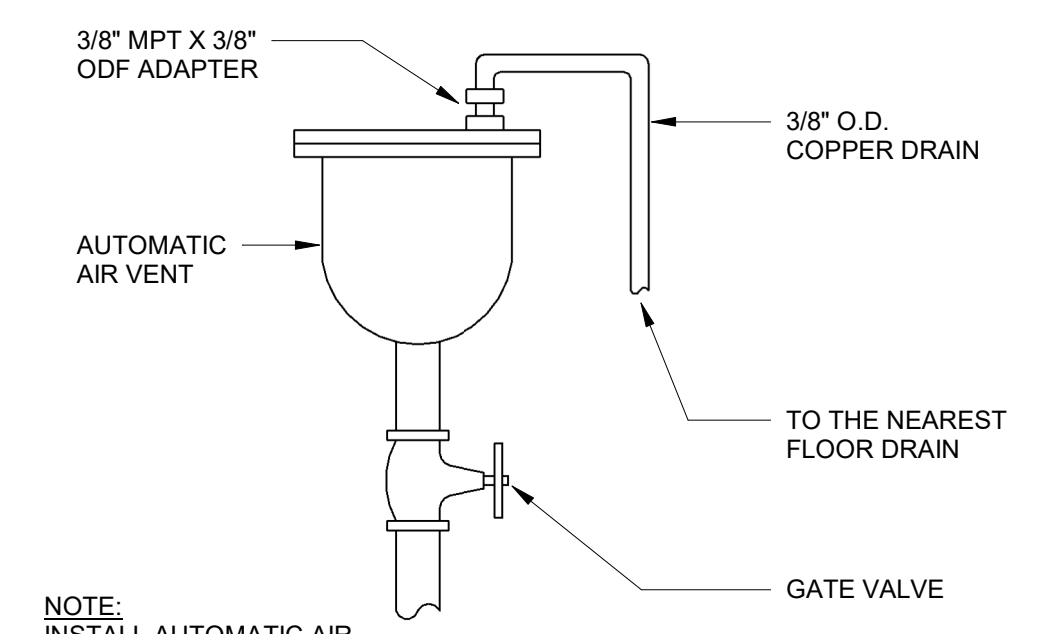
**MECHANICAL
DETAILS**



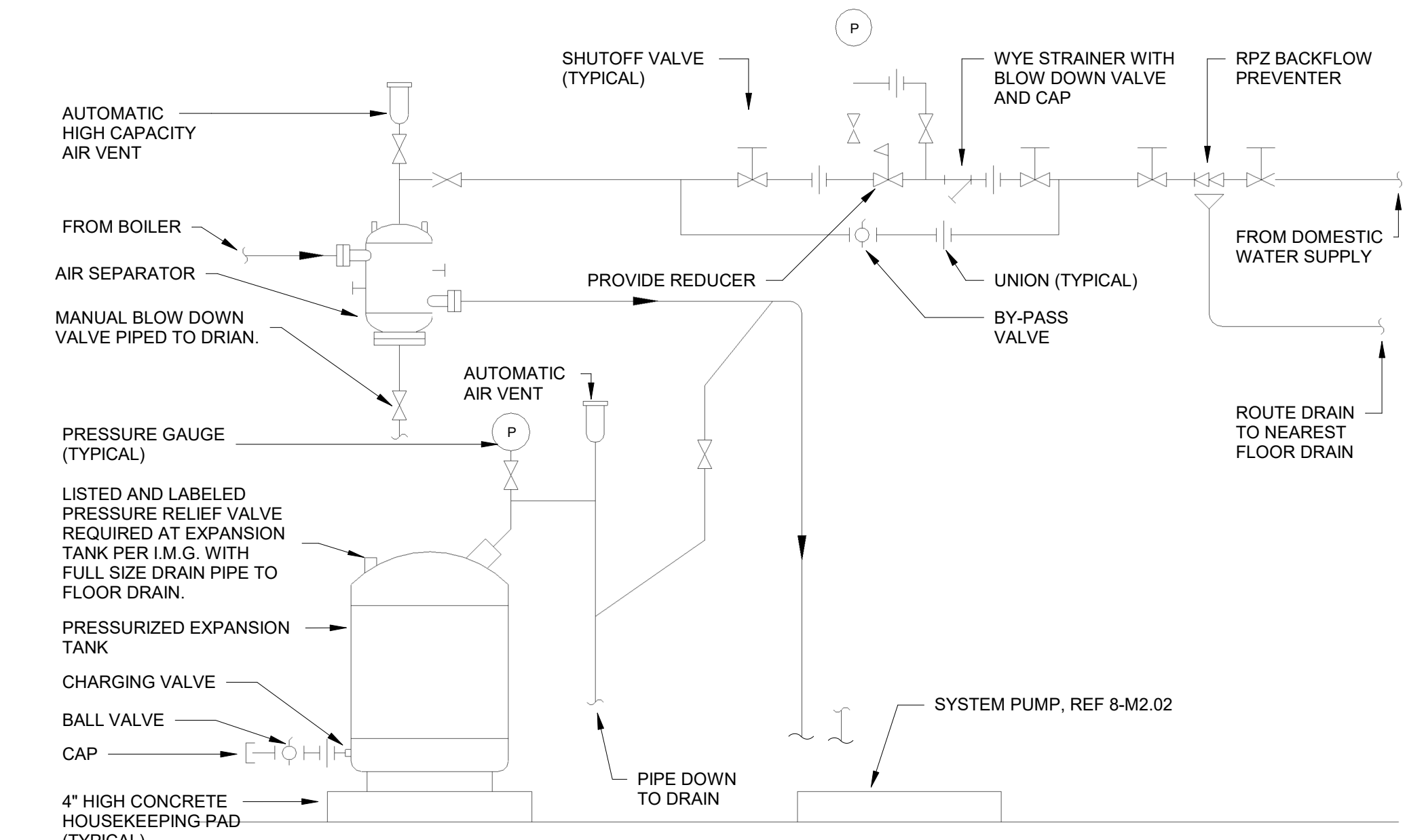
9 PIPE SLEEVE THRU WALL DETAIL
SCALE: N.T.S.



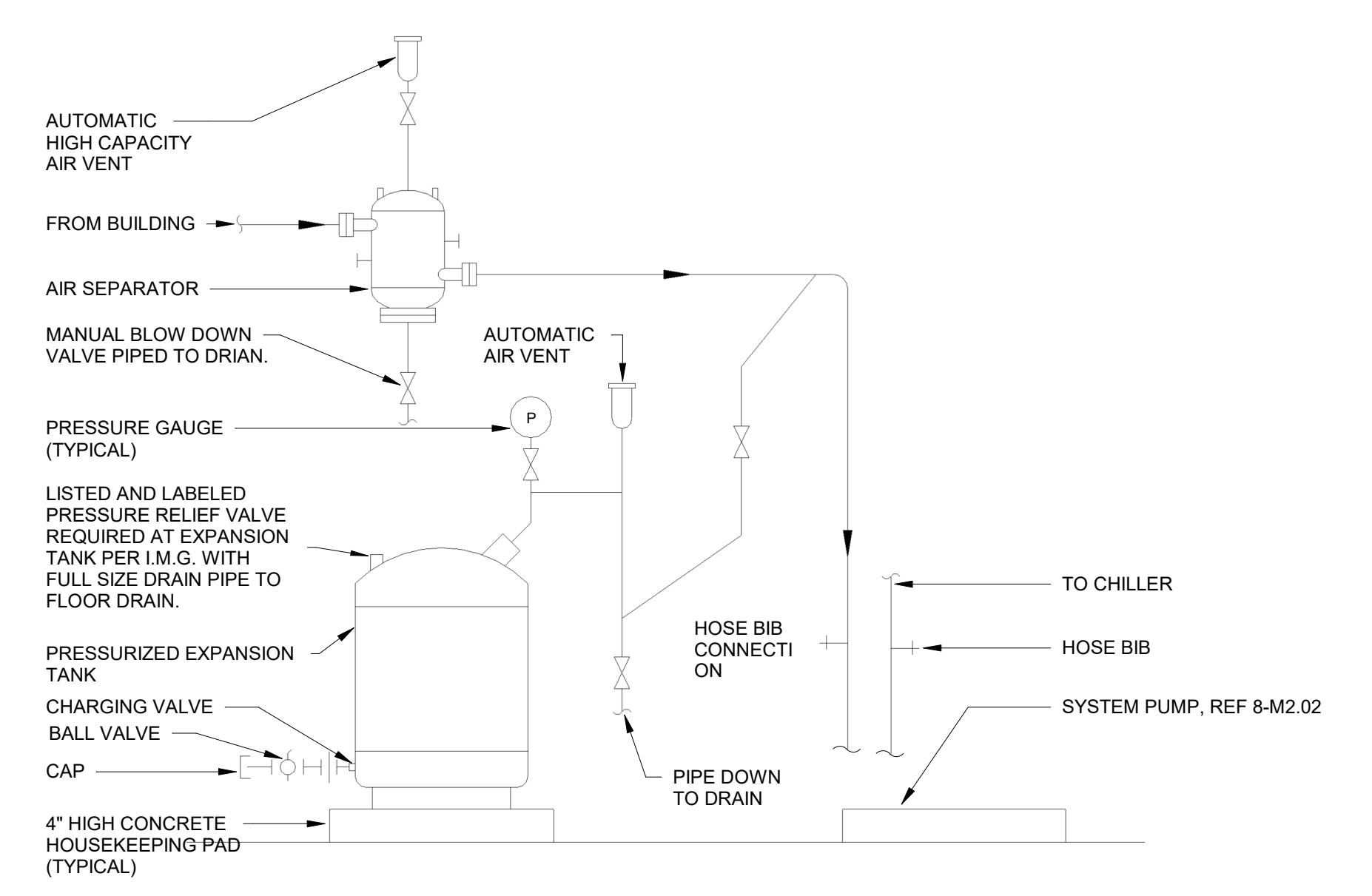
8 TRIPLEX PUMP SYSTEM DETAIL
1/4" = 1'-0"



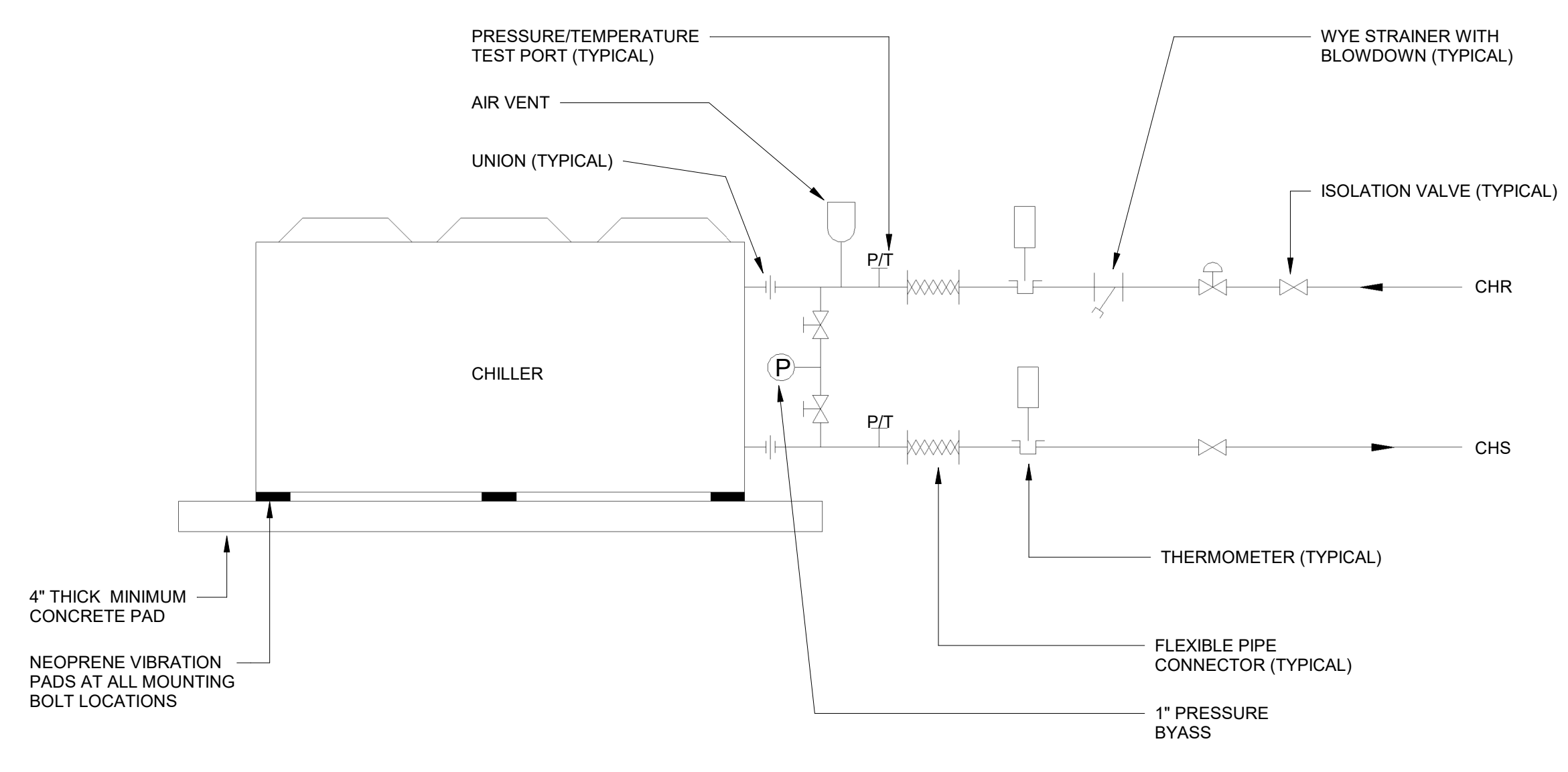
7 AIR VENT DETAIL
3/16" = 1'-0"



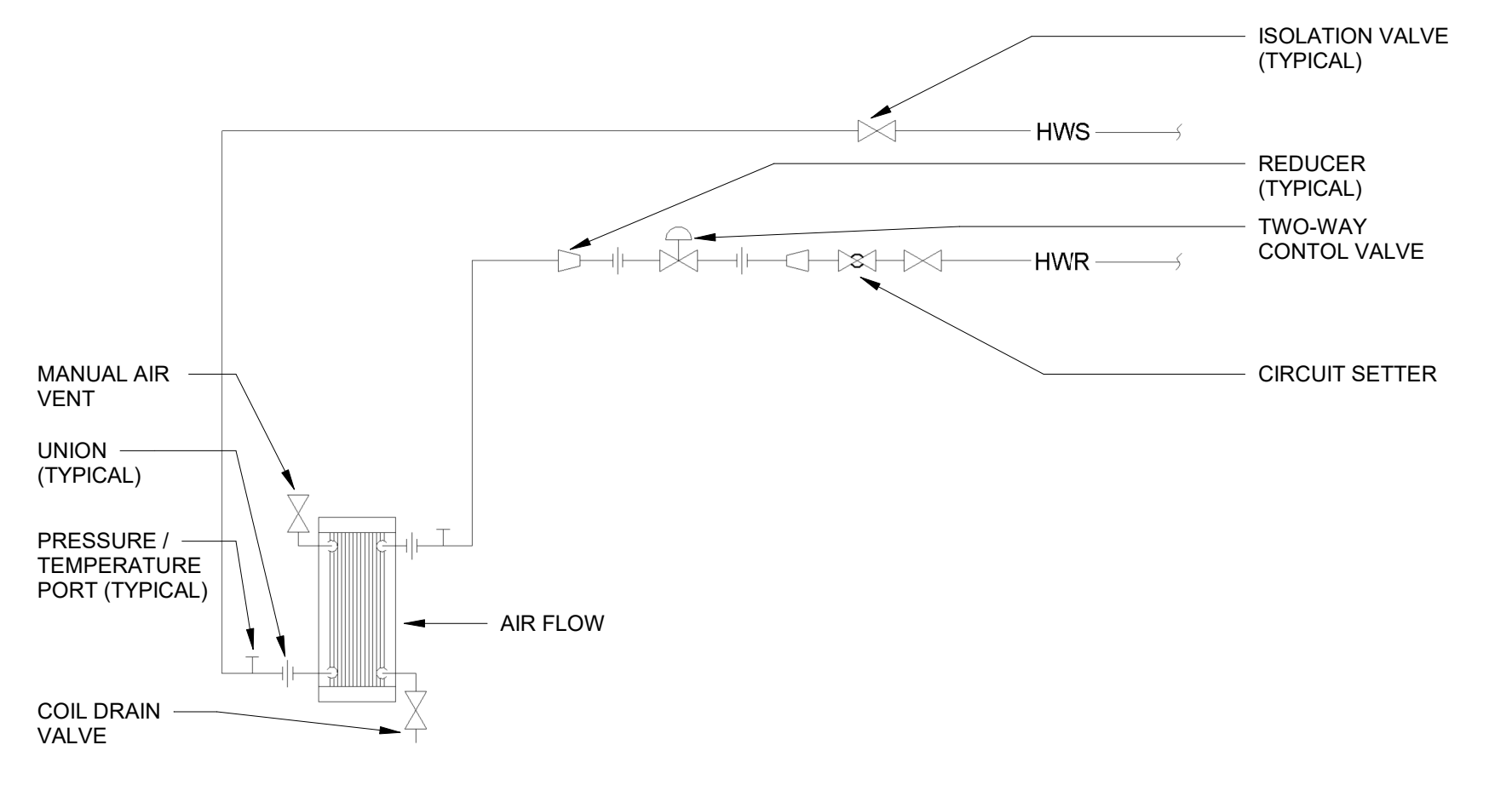
6 HEATING WATER SYSTEM MAKEUP AND EXPANSION TANK DETAIL
SCALE: N.T.S.



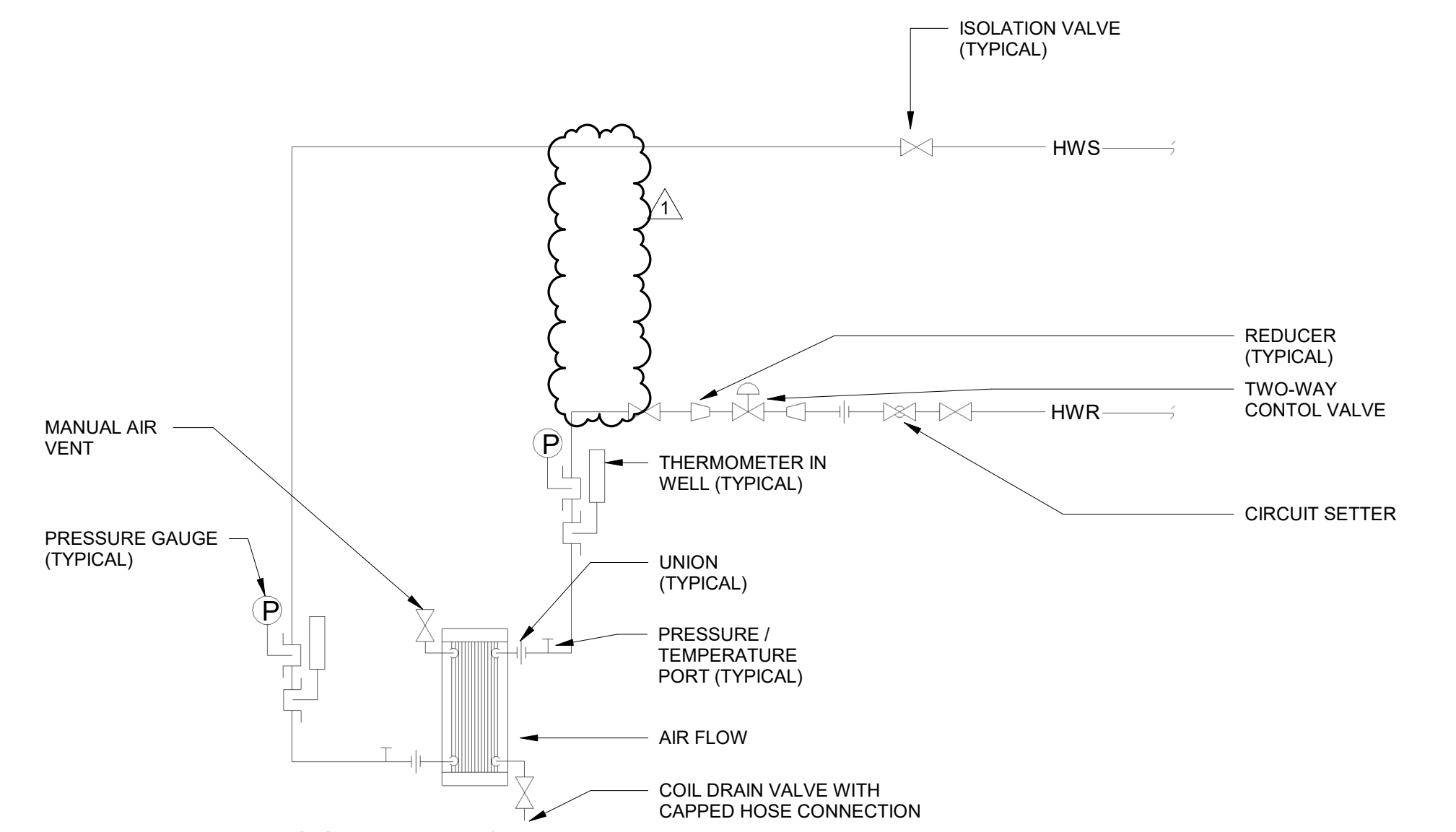
5 CHILLED WATER SYSTEM EXPANSION TANK DETAIL
SCALE: N.T.S.



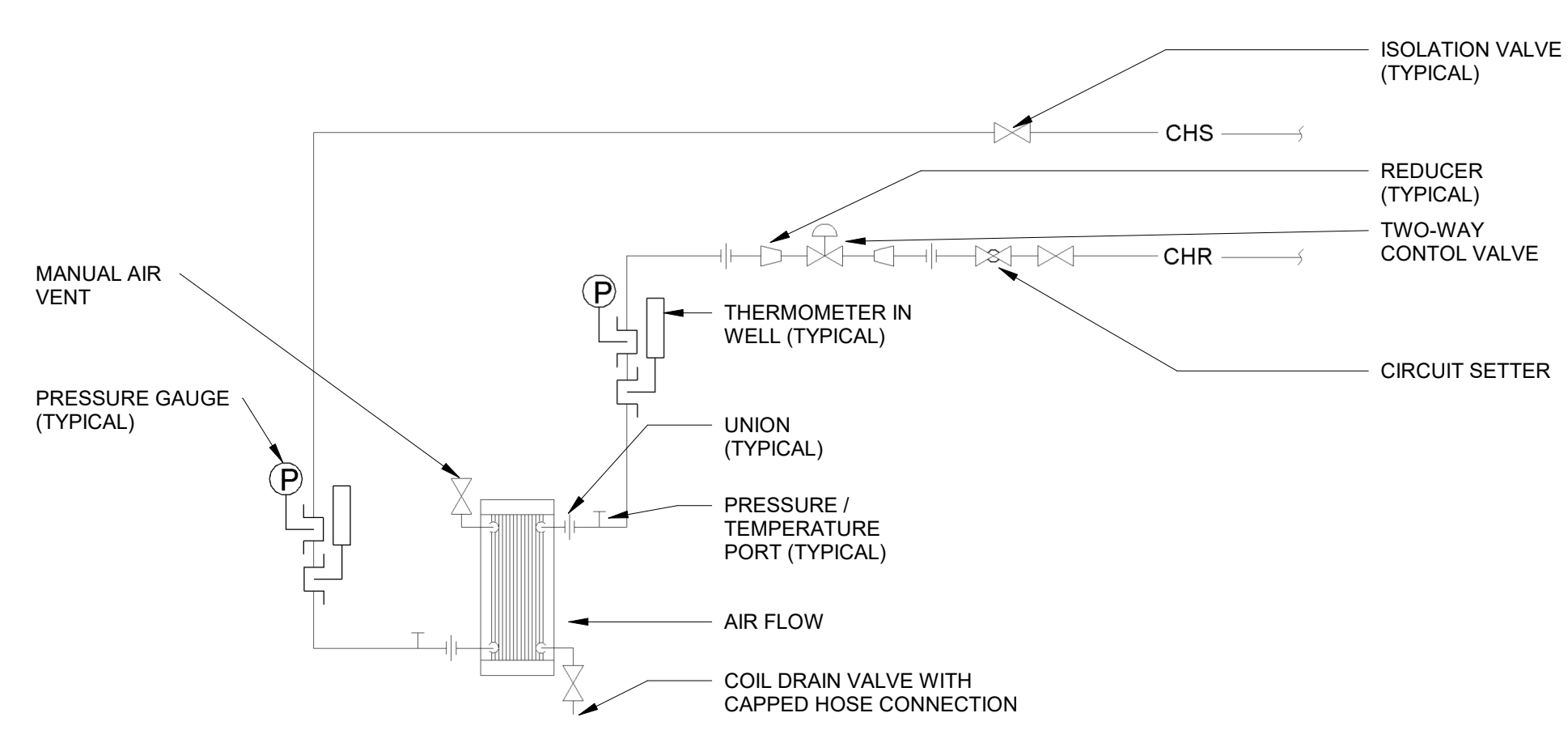
4 AIR COOLED CHILLER PIPING CONNECTION DETAIL
SCALE: N.T.S.



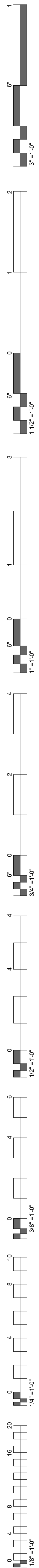
3 HOT WATER REHEAT COIL AT VAV BOX
3/16" = 1'-0"



2 AHU REHEAT COIL PIPING
3/16" = 1'-0"



1 AHU CHILLED WATER COIL
3/16" = 1'-0"



Sequence of Operation – Airside Optimization

System Operating Modes: The Building Automation System (BAS) shall include a user-adjustable time-of-day schedule to define when the various areas of the facility are expected to be occupied versus unoccupied. Then, based on current zone conditions, the BAS determines the current system operating mode.

Occupied Heat/Cool
During the Occupied Mode, each VAV terminal unit varies primary airflow, cycles a terminal fan (if equipped), and/or modulates (or stages) a local or remote heat source (if equipped) to maintain zone temperature at the occupied setpoint (cooling or heating). Meanwhile, the air-handling unit (AHU) modulates the supply fan and return fan (if equipped) to deliver the required airflow to the zones, positions the outdoor-air damper to bring in required amount of ventilation, modulates the central relief damper (or relief fan) to maintain building pressure at the desired setpoint, and modulates the chilled-water valve, modulates (or stages) the source of heat, and/or enables the airside economizer to discharge air at the desired setpoint.

Unoccupied Heat/Cool
During the Unoccupied Mode, each VAV terminal unit varies primary airflow, cycles a terminal fan (if equipped), and/or modulates (or stages) a local or remote heat source (if equipped) to maintain zone temperature at the unoccupied setpoint (cooling or heating). Meanwhile, the AHU shuts off, unless a zone requires unoccupied cooling or heating. If needed to operate, the AHU modulates the supply fan and return fan (if equipped) to deliver the required airflow to the zones, closes the outdoor-air damper, closes the central relief damper (or shuts off the central relief fan), and modulates the chilled-water valve or modulates (or stages) the source of heat to discharge air at the desired setpoint.

Morning Warm-up/Pre-cool
During the Morning Warm-up/Pre-cool Mode, each VAV terminal unit varies primary airflow, cycles a terminal fan (if equipped), and/or modulates (or stages) a local or remote heat source (if equipped) to raise/lower the zone temperature to the occupied setpoint (heating or cooling), and then closes. Meanwhile, the AHU modulates the supply fan and return fan (if equipped) to deliver the required airflow to the zones, closes the outdoor-air damper, closes the central relief damper (or shuts off the central relief fan), and modulates the chilled-water valve or modulates (or stages) the source of heat to discharge air at the desired setpoint.

For a cold air VAV system, if the return air dew point temperature is higher than 55°F (adj) during Morning Pre-cool Mode, the discharge-air temperature setpoint will be reset every 10 minutes so that it is only 2°F (adj) below the current return air dew point temperature.

Optimized System Level Control Sequences: The BAS shall perform the following optimized system-level control strategies:

Optimal Start
The BAS shall initiate Optimal Start mode such that the AHU is started and VAV boxes are enabled to allow the zone temperature to reach the occupied heating or cooling setpoint prior to scheduled occupancy. The system shall wait as long as possible before starting, so that the temperature in each zone reaches the occupied setpoint just in time for scheduled occupancy.

Optimal Stop
The BAS shall initiate Optimal Stop mode such that cooling or heating is disabled so that the zone temperature does not drift beyond the occupied standby setpoint by the end of the scheduled occupancy period. The AHU supply fan shall continue operating, and ventilation control shall continue, through the end of the scheduled occupancy period.

1 CONTROLS - RISER AND MAIN SEQUENCE OF OPERATIONS

N.T.S.

Sequence of Operations

- Chilled Water Plant

System General Description:

The chilled water system consists of the following:
Two (2) chillers, configured as: one (1) lead and one (1) lag
Three (3) chilled water pumps: one (1) lead, one (1) lag and one (1) standby
One (1) chilled water isolation valve per chiller
Chilled water bypass valve

The Building Automation System

(BAS) controller provides stand-alone control or control from a higher level BAS and provides lead/lag/standby control for the chilled water pumps and controls the chilled water bypass valve to maintain minimum flow through operating chillers.

Chilled Water Plant Enable

The chilled water plant will be enabled in response to a need for chilled water from any system load as indicated by any chilled water valve being commanded to more than 50% open for more than 5 minutes.

Startup – Soft Start

System Soft Start – The chiller plant control system will initiate a “soft start” mode whenever the system chilled water temperature exceeds the specified chilled water system setpoint by 20°F (adj) at system start-up. The chiller plant control application will add cooling capacity during soft start mode only if return water temperature is not declining at a rate of at least 0.5°F (adj) per minute. This prevents the unnecessary operation of chillers and limits system electrical demand during chilled water loop pull down.

Chiller Sequencing

When the chilled water system is enabled the chiller plant control system will send an enable signal to the lead chiller and chilled water pumping control. The chiller plant control system will initiate the start of the next chiller in the sequence whenever the chilled water load, as determined by the system supply water temperature, is not met for 20 (adj) minutes. The chiller plant control system will initiate the shutdown of the next chiller in the sequence whenever excess chilled water capacity exists, as determined by percent run load amps, for 20 (adj) minutes.

Chiller Rotation

Chiller rotation will be initiated based on an operator editable day of week/time, fixed number of days, number of run hours, or by the cycling of a binary input. Chiller cycling caused by normal system load fluctuations will cause the chillers to change rotation sequence or at the operator's option chillers may be forced into the new rotation sequence at the time of sequence change.

Chiller Setpoint Control

The chiller plant control system will control individual chiller setpoints to maintain the system supply water temperature setpoint.

Failure Recovery

Upon sensing a chiller failure the chiller plant control system will shut down the failed chiller immediately and initiate the start of the next chiller in the rotation sequence. In the event of a power loss, the chiller plant control application will compare the number of chillers running to the number of chillers running prior to the power loss. The application will add chillers one at a time, skipping normal delay timers, until the chillers running equals the number of chillers running prior to the power loss.

Chilled Water Supply Temp Reset:

The chilled water supply temperature setpoint default shall be 42 deg. F. (adj.) This setpoint shall be reset based on outside air dry bulb temperature. When the outside air dry bulb is 65 deg. F. or greater, the chilled water supply temperature shall be 42 deg. F. When the outside air dry bulb temperature shall be 55 deg. F. When the outside air dry bulb temperature is between 65 and 55 deg. F the chilled water supply temperature setpoint shall be linearly reset between 42 and 55 deg. F. If at any time any AHU chilled water valve is more than 97% open, this reset shall be disabled and the chilled water supply temperature setpoint shall revert to default. If the system global outside air temperature sensor is in fault, an alarm shall be annunciated at the BAS and the chilled water supply temperature setpoint shall revert to default.

Chilled Water Pumping System Enable/Disable:

The chilled water pumping system shall be enabled on a contact closure from any system chiller. When enabled, the BAS controller shall open the isolation valve and starts the lead chilled water pump. As additional chillers make chilled water requests, the next pump in the sequence shall be enabled and chiller isolation valves opened. When the chilled water pumping system is disabled, the chilled water pumps shall be off and the isolation valves shall be closed unless requested by one of the chillers. The isolation valve for the first chiller in the sequence shall be an exception to this. If the plant is disabled, the isolation valve for that chiller shall be opened so that the pump can start immediately when the plant is enabled.

Chilled Water Pump Control:

When enabled as described above, the BAS controller shall start the lead chilled water pump through a contact closure of the pumps Variable Frequency Drive (VFD) drive run-enable contacts. The BAS controller shall monitor the chilled water system differential pressure sensor. When the pump VFD is enabled, the BAS controller shall control the analog speed signal that is sent to the pump VFD to maintain the chilled water differential pressure setpoint which is reset as described in the Pump Optimization section of this sequence. The default setpoint shall be 15 psig (adj.). When the running pump(s)' speed is controlled to 100% (60 hz) and the system differential pressure setpoint is not maintained for 5 minutes, the next available lag pump shall start. When multiple pumps are running to maintain setpoint, their speed shall be modulated in unison. If more than 1 pump is running and their speed is over 75% **, the last pump most recently started shall be disabled, subject to a minimum on/off timer of 10 minutes (adj.). ** this speed shall be adjusted by the BAS Contractor according to the pump curves provided by the pump manufacturer. The speed shall be chosen which according to the pump curves, indicates the resulting running pump(s) would be able to maintain the current flow and pressure at 90% or less speed.

If a pump is commanded on and fails to prove status (through the VFD) for more than 30 seconds (adj.), the BAS controller shall cancel the start command to that pump, annunciate a chilled water pump failure alarm to the BAS, and start the next pump in the sequence.

Once the problem has been corrected, the operator shall be able to clear the alarm failure from the BAS controller from the BAS interface or by manually overriding the pump on momentarily. This shall re-enable the pump participation in the lead/lag sequence.

Chilled Water Pump Lead/Lag Rotation:

The chilled water pump lead/lag sequence shall be rotated on a weekly schedule. The sequence shall be based on calculated run time with the pump having the least run time as lead, the pump with the next lowest run time will be the second in the sequence and so on. An operator shall be able to manually change the lead/lag sequence from the BAS.

System Differential Setpoint Optimization:

The BAS shall continually monitor the position of all valves in the chilled water system. From the BAS interface an operator shall be able to exclude any valve for consideration in this optimization.

At chilled water system startup, the differential pressure setpoint is 100% of the maximum pressure setpoint. When all valves are less than 85% open, the differential pressure setpoint shall be lowered by 0.1 psig (adj.). This occurs every 5 minutes until at least one valve is more than 85% open, or if the setpoint is equal to the minimum differential pressure setpoint, or if the pump VFD's are at a minimum speed setting (22 Hz).

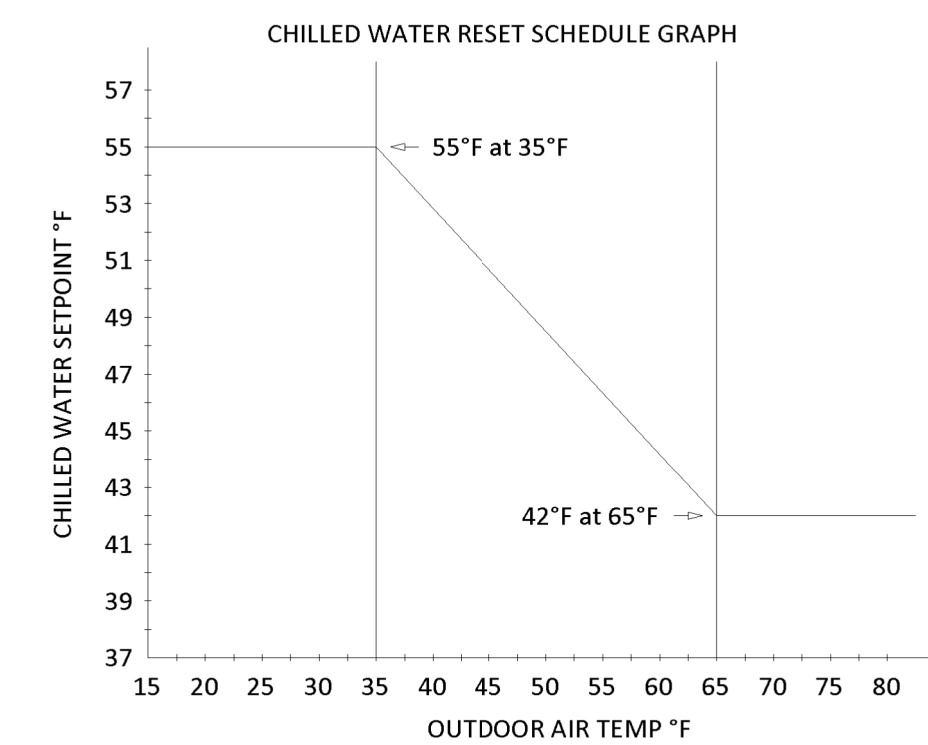
When any valve is more than 95% open, the differential pressure setpoint shall increase by 0.1 psig (adj.). This occurs every 5 minutes until no valve is more than 95% open, or if the differential pressure setpoint has risen to the system's maximum setting, or if the pump VFD's are at the maximum setting (60 Hz). If the system differential pressure sensor is in fault, an alarm shall be annunciated at the BAS and the differential setpoint shall revert to default.

Chiller Isolation Valves:

Chiller isolation valves shall prevent the flow of water through non-operating chillers. Chiller chilled water pump operation will be coordinated with the isolation valve operation.

Bypass Valve Control:

The BAS controller shall monitor the evaporator differential pressure of the chillers. When the pressure of an operating chiller indicates a low pressure (flow), the BAS controller shall control the analog signal that is sent to the bypass valve to maintain minimum pressure (flow) on all operating chillers.



Unoccupied Economizing (Night Purge)

Between 4:00 AM (adj.) and 6:00 AM (adj), the BAS shall initiate Unoccupied Economizing mode if the current zone temperature is at least 1°F warmer than the occupied cooling setpoint and the outdoor dry-bulb temperature is more than 15°F (adj) cooler than the current zone temperature. When initiated, the AHU is started (OA damper fully open, chilled-water valve closed) and VAV boxes are enabled to allow the zone temperature to cool to the occupied cooling setpoint.

Optimized Control of Supply Duct Static Pressure (Fan-Pressure Optimization)

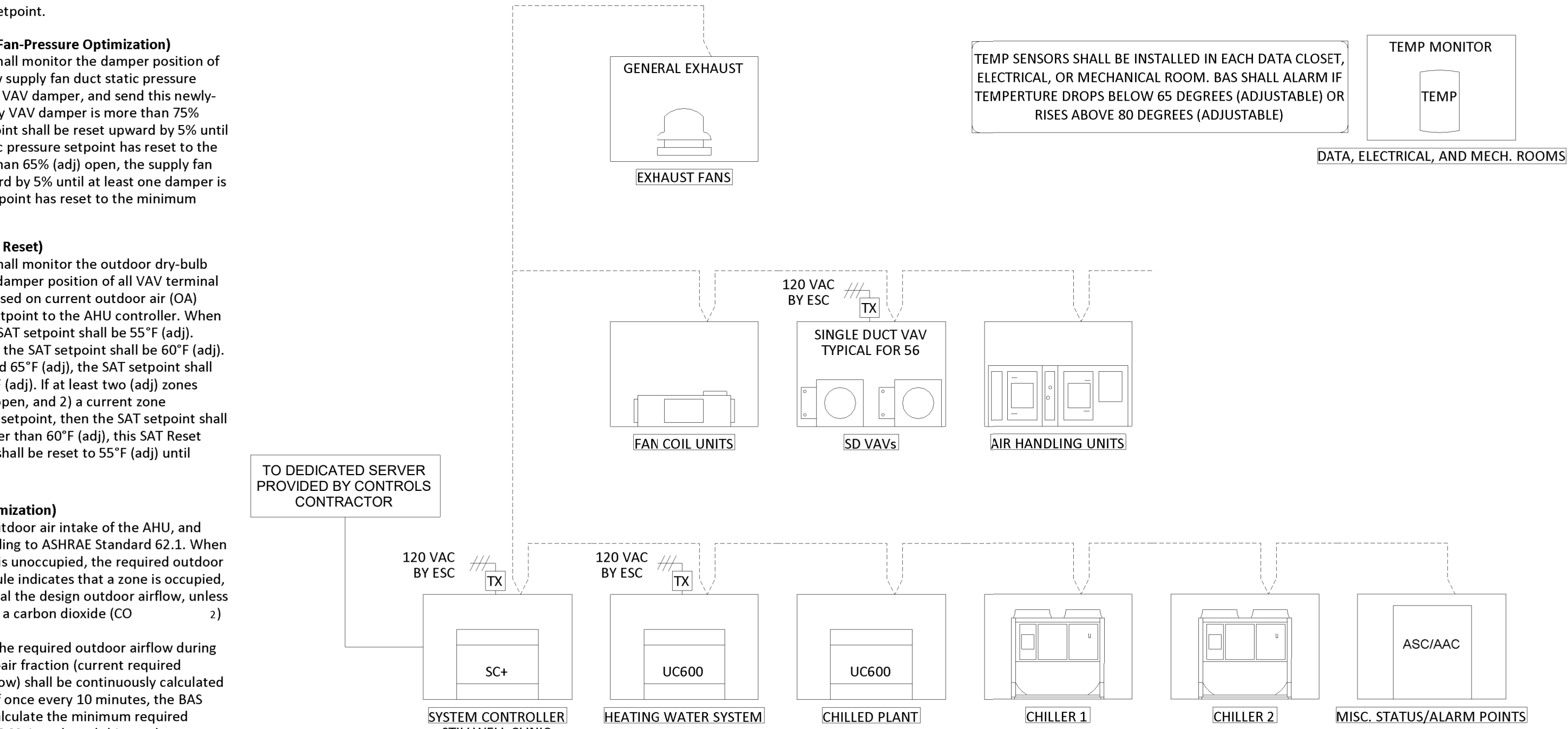
At a frequency of once every 10 minutes, the BAS shall monitor the damper position of all VAV terminal units. The BAS shall calculate a new supply fan duct static pressure setpoint based on the position of the furthest-open VAV damper, and send this newly-calculated setpoint to the AHU controller. When any VAV damper is more than 75% (adj) open, the supply fan duct static pressure setpoint shall be reset upward by 5% until no damper is more than 75% (adj) open or the static pressure setpoint has reset to the maximum setting. When all VAV dampers are less than 65% (adj) open, the supply fan duct static pressure setpoint shall be reset downward by 5% until at least one damper is more than 65% (adj) open or the static pressure setpoint has reset to the minimum setting.

Optimized Control of Supply Air Temperature (SAT Reset)

At a frequency of once every 10 minutes, the BAS shall monitor the outdoor dry-bulb temperature, as well as the zone temperature and damper position of all VAV terminal units. The BAS shall calculate a new SAT setpoint based on current outdoor air (OA) temperature, and send this newly-calculated SAT setpoint to the AHU controller. When the OA temperature is warmer than 65°F (adj), the SAT setpoint shall be 55°F (adj). When the OA temperature is colder than 55°F (adj), the SAT setpoint shall be 60°F (adj). When the OA temperature is between 55°F (adj) and 65°F (adj), the SAT setpoint shall be reset proportionally between 55°F (adj) and 60°F (adj). If at least two (adj) zones have both 1) a VAV damper that is more than 75% open, and 2) a current zone temperature that is higher than the current cooling setpoint, then the SAT setpoint shall return to 55°F (adj). If the outdoor dew point is higher than 60°F (adj), this SAT Reset sequence shall be suspended and the SAT setpoint shall be reset to 55°F (adj) until outdoor dew point drops below 57°F (adj).

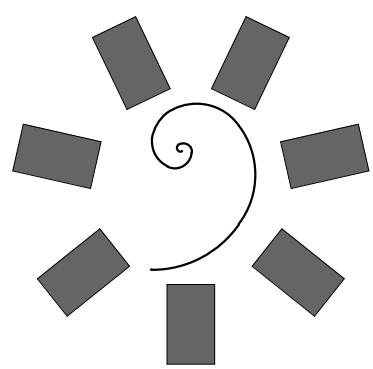
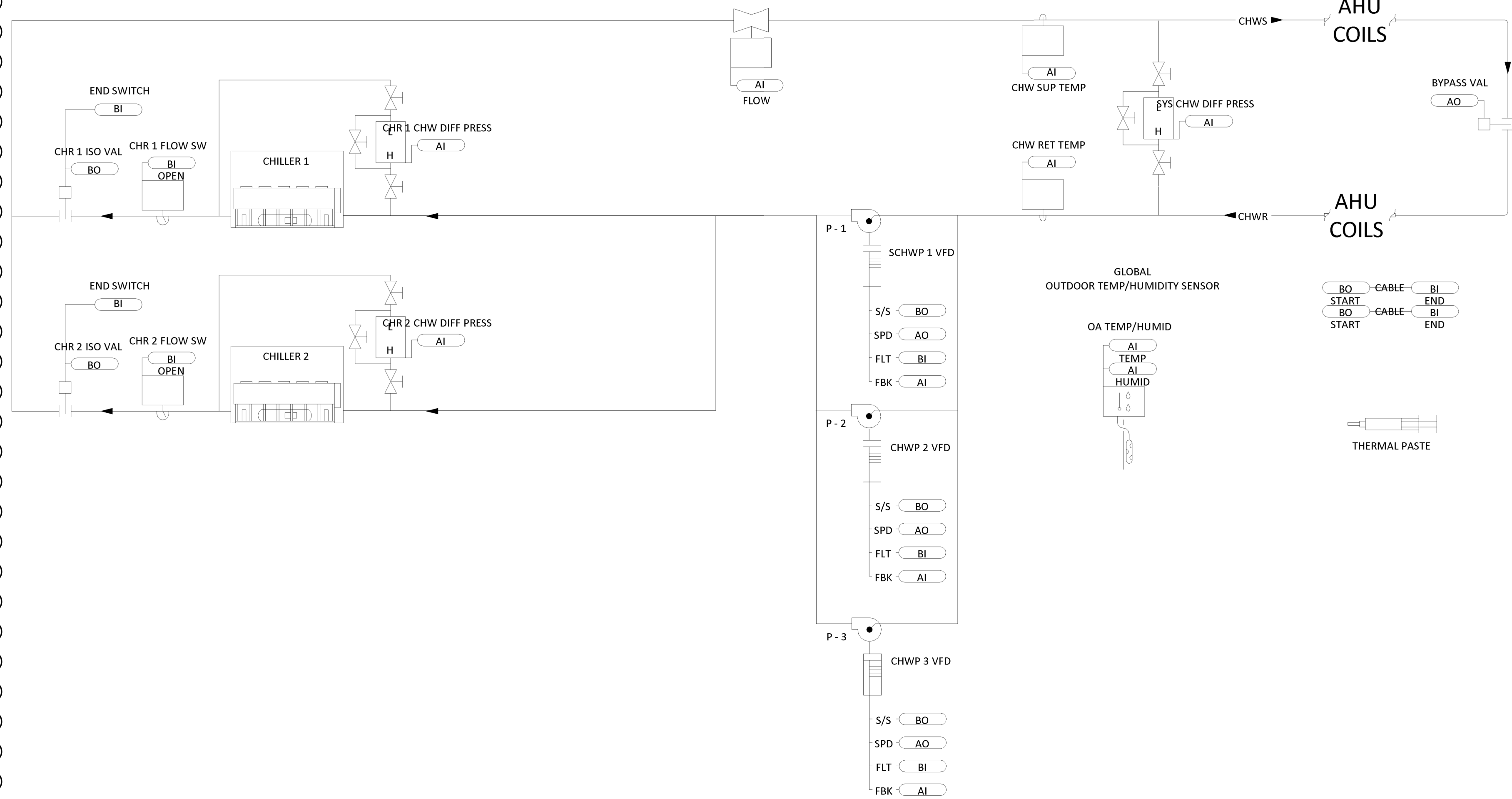
Optimized Control of Ventilation (Ventilation Optimization)

The actual outdoor airflow shall be sensed at the outdoor air intake of the AHU, and controlled to an airflow setpoint determined according to ASHRAE Standard 62.1. When the BAS time-of-day schedule indicates that a zone is unoccupied, the required outdoor airflow for that zone shall be zero. When the schedule indicates that a zone is occupied, the required outdoor airflow for that zone shall equal the design outdoor airflow, unless the zone is equipped with occupancy sensor and/or a carbon dioxide (CO₂) sensor, or uses a time-of-day ventilation schedule, to reduce the required outdoor airflow during periods of partial occupancy. The required outdoor-air fraction (current required outdoor airflow divided by the current primary airflow) shall be continuously calculated for each zone (VAV terminal unit). At a frequency of once every 10 minutes, the BAS shall gather this data from all VAV terminal units, calculate the minimum required outdoor airflow for the system according to ASHRAE 62.1, and send this newly-calculated outdoor airflow setpoint to the AHU controller.

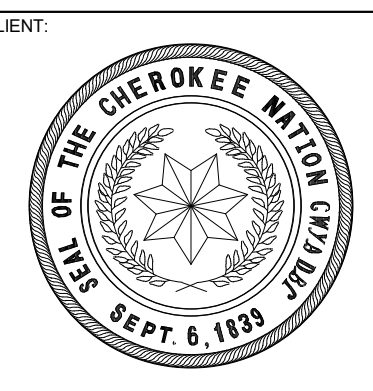


2 CONTROLS - CHILLED PLANT

N.T.S.



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WILMA P. MANKILLER HEALTH CENTER EXPANSION
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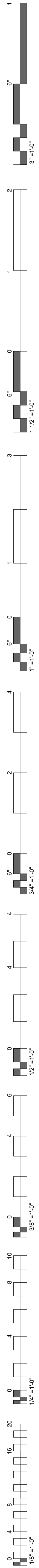
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PROJECT PHASE:
BID PACKAGE 02

#	DATE	REVISIONS	DESCRIPTION
1	3/9/20	BID PACKAGE 02 - ASI 03	

DATE: 12-06-19
JOB NUMBER: 18-01.01

SHEET NUMBER:
M9.01
MECHANICAL CONTROLS



Sequence of Operations

Heating Water System

General Description:

The hot water system consists of multiple boilers with factory BACnet interfaces, and associated pumps. The Building Automation System (BAS) controller shall control the supply of heating water at a temperature setpoint (adj.) by communicating setpoints and enable/disable commands to the boilers via their BACnet interface, and directly controlling the secondary system pumps.

Heating System Enable/Disable:
The heating system shall be enabled when the outdoor air temperature is below 60.0 deg. F (adj.) or any system AHU heating valve is commanded more than 50% open for 5 minutes, or when at least 3 VAV heating valves are commanded more than 50% open for 5 minutes. When enabled, the BAS controller shall start the lead hot water distribution pump, the lead boiler circulating pump, and enable the lead boiler. The boiler factory control shall operate the boiler to maintain its local supply setpoint. Heating shall be disabled when the outdoor air temperature is above 65.0 deg. F (adj.) and no hot water valve is commanded 50% or more open. When heating is disabled, the hot water pumps and boilers shall be commanded to OFF.

Boiler Control:
Boilers will be controlled by their factory controller including lead/lag, rotation, and firing based on enable/disable and setpoints communicated to the boiler controllers via their factory BACnet interface from the BAS.

Hot Water Reset:
The hot water supply temperature setpoint shall be linearly reset from 100.0 deg. F (adj.) to 180.0 deg. F (adj.) as the outdoor air temperature falls from 60.0 deg. F (adj.) to 20.0 deg. F (adj.) per the provided hot water reset schedule graph.

Hot Water Distribution Pump Start/Stop:
The BAS controller shall start a hot water pump through a contact closure of the pump's variable frequency drive (VFD) run-enable contacts.

Hot Water Distribution Pump Status:
The BAS controller shall detect hot water pump run status by comparing the VFD speed feedback to the commanded speed and monitoring the VFD fault contacts.

Hot Water Distribution Pump Lead/Lag:
The hot water pump lead/lag sequence shall be based on a weekly schedule. From the BAS controller's optional Tracer™ TD7 Color Touch Screen Display or a BAS workstation, an operator shall be able to manually change the lead/lag sequence. If the lead pump speed falls below 40% (adj.) for five minutes (adj.) the lag pump shall be disabled.

Hot Water Distribution Pump Failure:
If the lead start/stop relay is enabled and the current switch status is off for more than 30 seconds (adj.), the BAS controller shall annunciate a hot water pump failure alarm to the BAS workstation and starts the lag pump. When a pump failure exists, lead/lag automation shall be disabled and the currently running pump becomes the lead pump. Once the problem has been corrected, the operator shall be able to clear the alarm failure from the BAS controller or BAS workstation. This action shall re-enable the lead/lag sequence.

Hot Water Distribution Pump Speed:
The BAS controller shall monitor the heating water system differential pressure sensor. When the pump VFD is enabled, the BAS controller shall control the analog speed signal that is sent to the pump VFD to maintain the heating water differential pressure setpoint which is reset as described in the Pump Optimization section of this sequence. The default setpoint shall be 15 psig (adj.).

When the running pump(s) speed is controlled to 100% (60 Hz) and the system differential pressure setpoint is not maintained for 5 minutes, the next available lag pump shall start. When multiple pumps are running to maintain setpoint, their speed shall be modulated in unison. If more than 1 pump is running and their speed is over 75% **, the last pump most recently started shall be disabled, subject to a minimum on/off timer of 10 minutes (adj.).

** this speed shall be adjusted by the BAS Contractor according to the pump curves provided by the pump manufacturer. The speed shall be chosen which according to the pump curves, indicates the resulting running pump(s) would be able to maintain the current flow and pressure at 90% or less speed.

If a pump is commanded on and fails to prove status (through the VFD) for more than 30 seconds (adj.), the BAS controller shall cancel the start command to that pump, annunciate a chilled water pump failure alarm to the BAS, and start the next pump in the sequence. Once the problem has been corrected, the operator shall be able to clear the alarm failure from the BAS controller or BAS workstation, or by manually overriding the pump on momentarily. This shall re-enable the pumps participation in the lead/lag sequence.

Pump Optimization:
The BAS shall continually monitor the hot water control valve position of all AHUs in the hot water system.

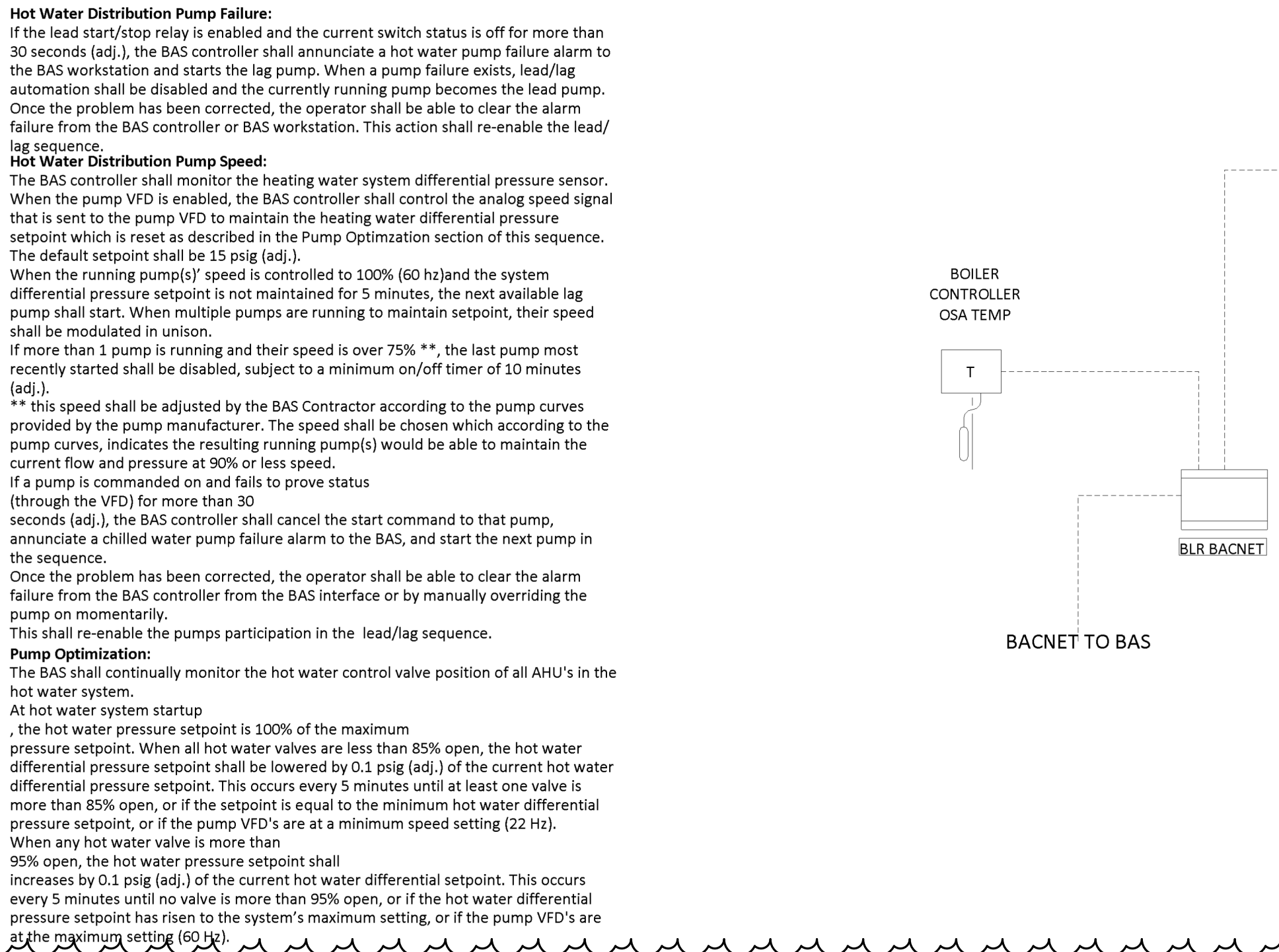
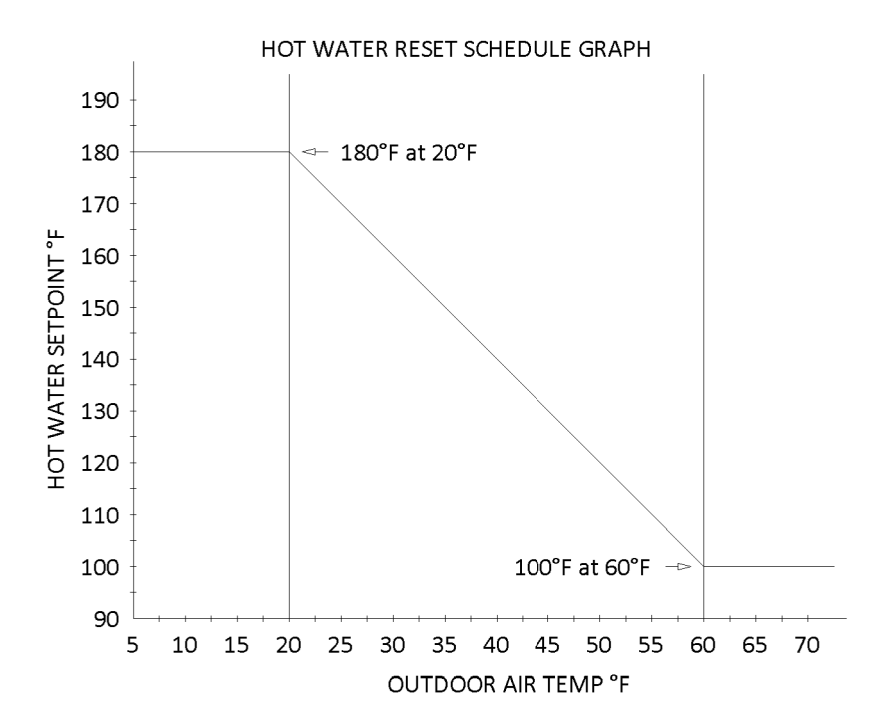
At hot water system startup, the hot water pressure setpoint is 100% of the maximum pressure setpoint. When all hot water valves are less than 85% open, the hot water differential pressure setpoint shall be lowered by 0.1 psig (adj.) of the current hot water differential pressure setpoint. This occurs every 5 minutes until at least one valve is more than 85% open, or if the setpoint is equal to the minimum hot water differential pressure setpoint, or if the pump VFD's are at a minimum speed setting (22 Hz). When any hot water valve is more than 95% open, the hot water pressure setpoint shall increase by 0.1 psig (adj.) of the current hot water differential pressure setpoint. This occurs every 5 minutes until no valve is more than 95% open, or if the hot water differential pressure setpoint has risen to the system's maximum setting, or if the pump VFD's are at the maximum setting (60 Hz).

Freeze Protection:

When the outdoor air temperature falls below 35.0 deg. F (adj.), the hot water distribution pump shall operate continuously to provide hot water circulation to all associated hot water coils. If the hot water supply temperature falls below 60.0 deg. F (adj.) during unoccupied periods, the boiler sequence shall be enabled to safeguard against low water temperature.

Make-Up Water Flow Monitoring:

If the Make-Up flow meter registers flow for more than 10 minutes (adjustable), or if the totalized flow surpasses 2 gallons (adj.) in a single month, an alarm shall be generated in the BAS.



1 CONTROLS- HEATING WATER PLANT

N.T.S.

Sequence of Operations

Air Handling Units

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Free-Cool, Occupied/Unoccupied and Heat/Cool modes. The BAS shall also send the discharge air temperature setpoint and the duct static pressure setpoint. If communication is lost with the BAS the controller shall operate using default modes and setpoints.

Occupied:
During occupied periods, the supply fan shall run continuously and the outside air damper shall open to maintain minimum ventilation requirements. The chilled water and hot water valves shall modulate to maintain the discharge air temperature setpoint. If economizing is enabled the outside air damper shall also modulate to maintain the discharge air temperature setpoint. If the discharge air temperature sensor fails the chilled water and hot water valves shall close and an alarm shall be annunciated at the BAS.

Unoccupied:
When the space temperature is below the unoccupied heating setpoint of 60.0 deg. F (adj.) the supply fan shall start, the outside air damper shall remain closed and the hot water valve shall open. When the space temperature rises above the unoccupied heating setpoint of 60.0 deg. F (adj.) plus the unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop and the hot water valve shall close.

When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start, the outside air damper shall open if economizing is enabled and remain closed if economizing is disabled and the chilled water valve shall open. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F (adj.) minus the unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop, the chilled water valve shall close and the outside air damper shall close.

Optimal Start:
The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-up Mode:
During optimal start, if the average space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:
During optimal start, if the average space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling or economizer. The outside air damper shall remain closed, unless economizing. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:
The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

Occupied Bypass:
The BAS shall monitor the status of the "on" and "cancel" buttons of the space temperature sensors. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Supply Air Temperature Reset Control:
The supply air temperature setpoint shall be reset to the optimal setpoint communicated by the BAS. The BAS shall reset the supply air temperature setpoint based on the current outside air temperature, but shall override this reset function and return the supply air temperature setpoint to 55.0 deg. F (adj.) if more than two (adj.) zones begin to overheat. Also, the BAS shall override this reset function whenever outdoor dew point is higher than 60.0 deg. F (adj.) or indoor humidity is higher than 60% RH (adj.). If the supply air temperature drops below the minimum limit, a low temperature alarm shall be annunciated and the unit shall shut down. If the supply air temperature rises above the maximum limit, a high temperature alarm shall be annunciated.

Economizer:
The discharge air temperature sensor shall measure the dry bulb temperature of the air leaving the cooling coil while economizing. When economizing is enabled and the unit is operating in the cooling mode, the economizer damper shall be modulated between its minimum position and 100% to maintain the discharge air temperature setpoint. The economizer damper shall modulate toward minimum position in the event the mixed air temperature falls below the low temperature limit setting.

Comparative Enthalpy:
Outside air (OA) enthalpy shall be compared with Return air (RA) enthalpy point. The economizer shall enable when OA enthalpy is less than RA enthalpy + 2.0 BTU/LB. The economizer shall disable when OA enthalpy is greater than RA enthalpy.

Demand Control Ventilation:
When in the occupied mode, the flow-measuring outdoor-air (Traç™) damper shall modulate to maintain the current outdoor airflow at setpoint. The BAS shall calculate and reset this outdoor airflow setpoint based on the current ventilation requirements of the VAV terminal units.

Supply Fan:

The fan shall be off in the unoccupied mode. When the unit controller is in the occupied mode, the supply fan shall operate continuously and its speed shall be modulated to maintain the duct static pressure setpoint. The duct static pressure setpoint shall be sent by the BAS and shall be reset between the minimum and maximum static pressure limits to maintain the critical zone VAV air damper in a position between 65% and 75% open.

If the supply fan fails to prove status for 30 seconds (adj.), the fan shall be commanded off, the outside air damper shall close, all valves will close and an alarm will be annunciated at the BAS. A manual reset shall be required to restart the fan. A hardwired, high static pressure cut-off switch shall be electrically interlocked with the variable speed drive. If the high static pressure cut-off switch is tripped the fan shall stop, the outside air damper shall close, all valves will close and an alarm will be annunciated at the BAS. A manual reset of the high static pressure cut-off switch shall be required to restart the fan.

Building Pressure Control:

A differential pressure transducer shall actively monitor the difference in pressure between the building (indoor) and outdoors. If the building pressure increases above the desired setpoint, the AHU controller shall turn on the exhaust fan and modulate the exhaust fan VFD to control building pressure at setpoint. If the building pressure decreases below the desired setpoint, the controller shall turn off the exhaust fan.

Building Pressure Control:
A differential pressure transducer shall actively monitor the difference in pressure between the building (indoor) and outdoors. If the building pressure increases above the desired setpoint, the AHU controller shall enable the exhaust fan, and modulate the exhaust fan VFD to control building pressure at setpoint. If the building pressure decreases below the desired setpoint, the controller shall disable the exhaust fan.

Mixed Air Low Limit:
The initial damper opening rate shall be limited to 2% per minute (adj.) until the damper has reached its minimum ventilation position. The outside air damper shall modulate to a position less than the minimum damper position if the mixed air temperature drops below 50.0 deg. F (adj.). If the mixed air temperature sensor fails an alarm shall be annunciated at the BAS and the outside air damper shall return to the minimum position.

Freeze Protection:
A hardwired, low limit temperature switch shall be electrically interlocked with the variable speed drive. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the outside air damper shall close, all valves shall open to 100% (adjust per climate) and an alarm shall be annunciated at the BAS. A manual reset of the low limit temperature switch shall be required to restart the fan.

Smoke Detector Shutdown:
The unit shall shut down in response to a signal from either smoke detector indicating the presence of smoke. The smoke detectors shall be interlocked to the unit through the dry contacts of the smoke detectors. A manual reset of the smoke detectors shall be required to restart the unit.

Supply Air Temperature Reset Control:

The supply air temperature setpoint shall be reset to the optimal setpoint communicated by the BAS. The BAS shall reset the supply air temperature setpoint based on the current outside air temperature, but shall override this reset function and return the supply air temperature setpoint to 55.0 deg. F (adj.) if more than two (adj.) zones begin to overheat. Also, the BAS shall override this reset function whenever outdoor dew point is higher than 60.0 deg. F (adj.) or indoor humidity is higher than 60% RH (adj.). If the supply air temperature drops below the minimum limit, a low temperature alarm shall be annunciated and the unit shall shut down. If the supply air temperature rises above the maximum limit, a high temperature alarm shall be annunciated.

Economizer:

The discharge air temperature sensor shall measure the dry bulb temperature of the air leaving the cooling coil while economizing. When economizing is enabled and the unit is operating in the cooling mode, the economizer damper shall be modulated between its minimum position and 100% to maintain the discharge air temperature setpoint. The economizer damper shall modulate toward minimum position in the event the mixed air temperature falls below the low temperature limit setting.

Comparative Enthalpy:

Outside air (OA) enthalpy shall be compared with Return air (RA) enthalpy point. The economizer shall enable when OA enthalpy is less than RA enthalpy + 2.0 BTU/LB. The economizer shall disable when OA enthalpy is greater than RA enthalpy.

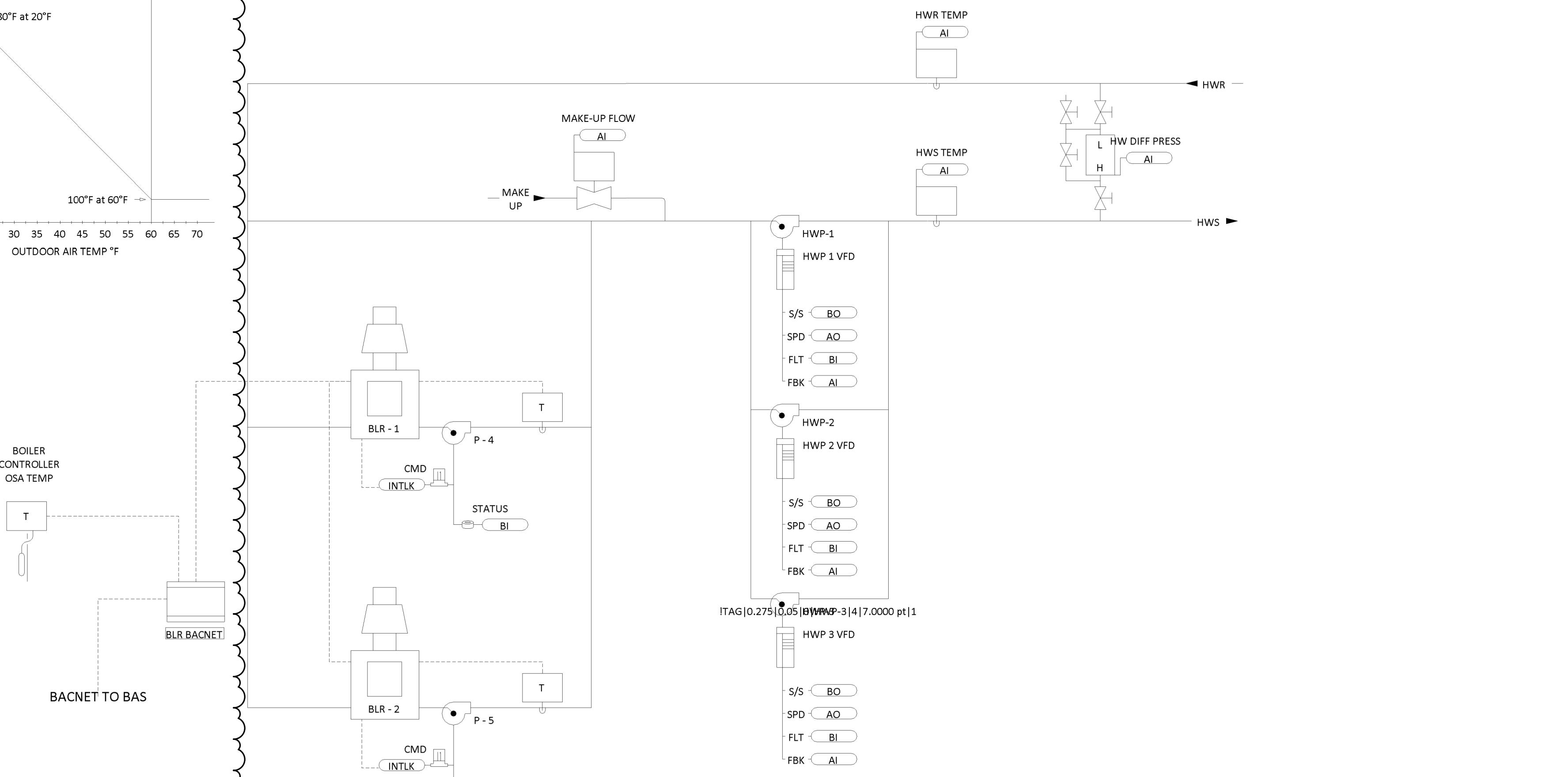
Demand Control Ventilation:

When in the occupied mode, the flow-measuring outdoor-air (Traç™) damper shall modulate to maintain the current outdoor airflow at setpoint. The BAS shall calculate and reset this outdoor airflow setpoint based on the current ventilation requirements of the VAV terminal units.

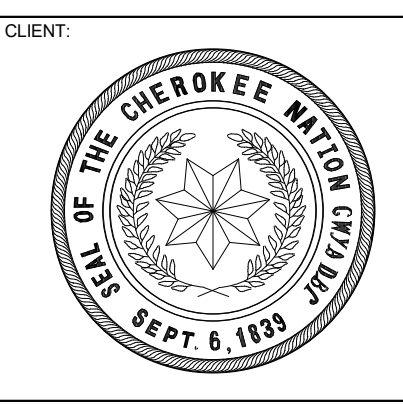
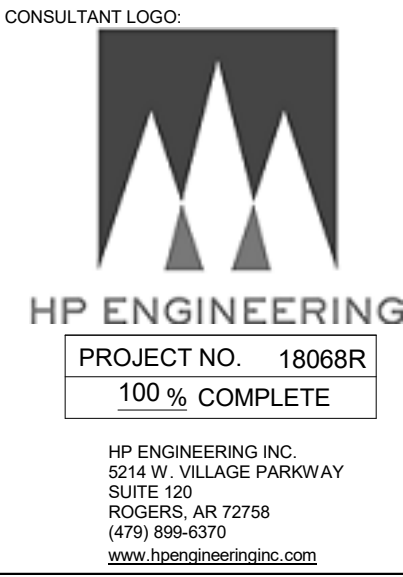
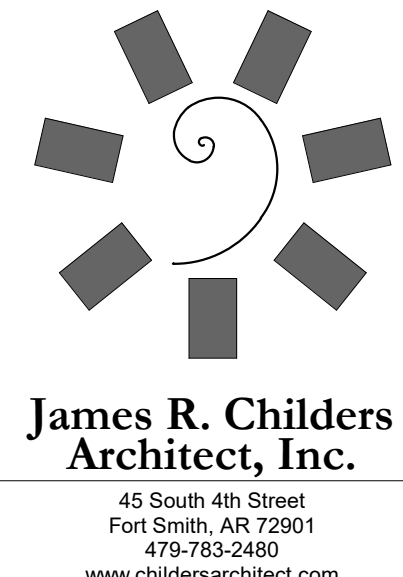
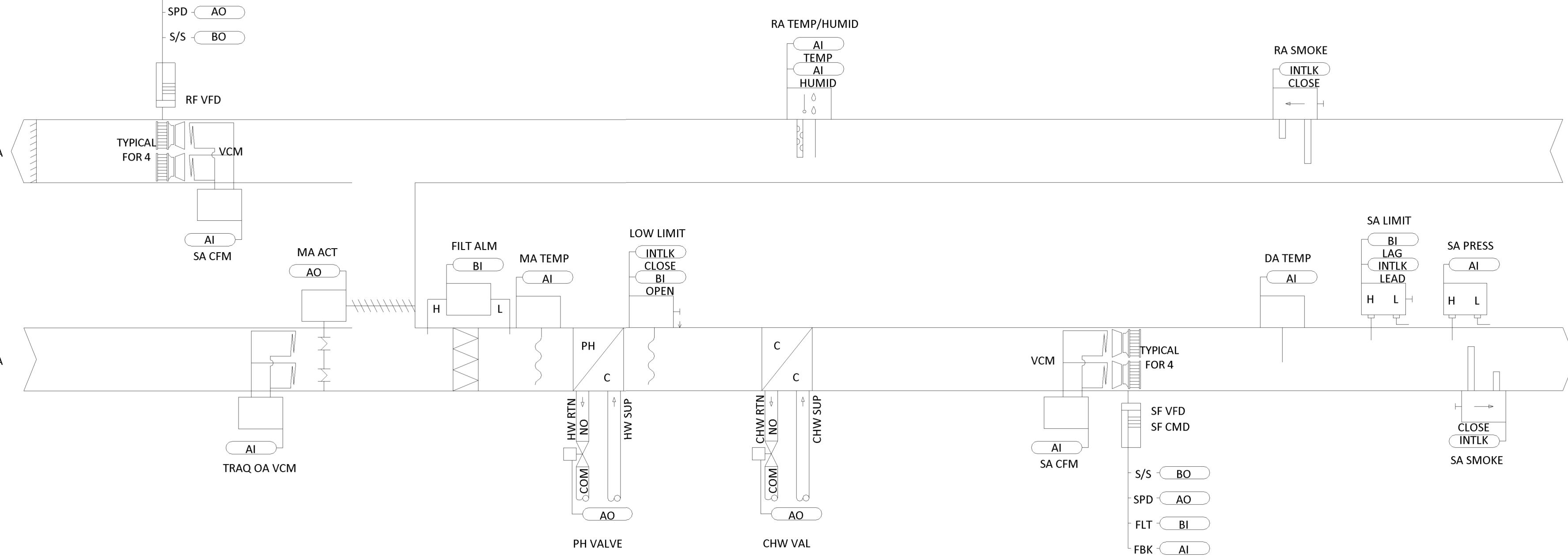
2 CONTROLS- AHU'S

N.T.S.

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AIR HANDLING UNITS



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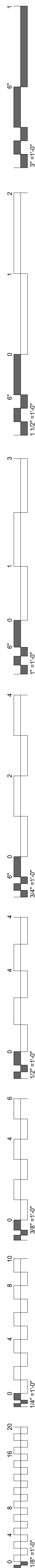
KEY PLAN

PROJECT PHASE: BID PACKAGE 02

#	DATE	REVISIONS	DESCRIPTION
1	3/30/20	BID PACKAGE 02 - ASH 03	

DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER: M9.02
MECHANICAL CONTROLS



Sequence of Operations
- VAV with Hydronic Reheat

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied and Unoccupied commands. The BAS may also send a Heat/Cool mode, priority shutdown commands, space temperature and/or space temperature setpoint. If communication is lost with the BAS, the VAV controller shall operate using its local setpoints.

Occupancy Mode:

The occupancy mode shall be communicated from the BAS. The VAV controller shall also include a spare binary input for possible future occupancy sensor connection, not included in this project.

Occupied:

Normal operating mode for occupied spaces or daytime operation. When the unit is in the occupied mode the VAV shall maintain the space temperature at the active occupied heating or cooling setpoint. Applicable ventilation and airflow setpoints shall be enforced. The occupied mode shall be the default mode of the VAV.

Unoccupied:

Normal operating mode for unoccupied spaces or nighttime operation. When the unit is in unoccupied mode the VAV controller shall maintain the space temperature at the stored unoccupied heating or cooling setpoint regardless of the presence of a hardwired or communicated setpoint. When the space temperature exceeds the active unoccupied setpoint the VAV shall modulate fully closed.

Occupied Bypass:

Mode used to temporarily place the unit into the occupied operation. Tenants shall be able to override the unoccupied mode from the space sensor. The override shall last for a maximum of 4 hours (adj.). The tenants shall be able to cancel the override from the space sensor at any time. During the override the unit shall operate in occupied mode.

Heat/Cool Mode:

The Heat/Cool mode shall be set by a communicated value or automatically by the VAV. In standalone or auto mode the VAV shall compare the primary air temperature with the configured auto changeover setpoint to determine if the air is "hot" or "cold". Heating mode implies the primary air temperature is hot. Cooling mode implies the primary air temperature is cold.

Heat/Cool Setpoint:

The space temperature setpoint shall be determined either by a local (e.g., thumbwheel) setpoint, the VAV default setpoint or a communicated value. The VAV shall use the locally stored default setpoints when neither a local setpoint nor communicated setpoint is present. If both a local setpoint and communicated setpoint exist, the VAV shall use the communicated value.

Cooling Mode:

When the unit is in cooling mode, the VAV controller shall maintain the space temperature at the active cooling setpoint by modulating the airflow between the active cooling minimum airflow setpoint to the maximum cooling airflow setpoint. Based on the VAV controller occupancy mode, the active cooling setpoint shall be one of the following:

Setpoint	Default Value
Occupied Cooling Setpoint	74.0 deg. F
Unoccupied Cooling Setpoint	85.0 deg. F
Occupied Standby Cooling Setpoint	78.0 deg. F

Occupied Min and Max Cooling Airflow Setpoint See VAV Schedule
 The VAV shall use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs will be controlled based on the unit configuration and the requested cooling capacity.

Ventilation Control:

When the unit is in unoccupied mode, the ventilation airflow setpoint will be zero. When the unit is in occupied mode, the ventilation airflow setpoint will equal the design outdoor airflow (see VAV schedule).

CO₂ Sensor (For VAV Units with CO₂ Sensors Scheduled or shown on floor plans)

When the unit is in occupied mode, the ventilation airflow setpoint is equal to the Design Minimum Ventilation setpoint. When the CO₂ concentration is at or below Design Minimum CO₂ Concentration, the ventilation airflow setpoint is equal to the Design Minimum Ventilation setpoint.

When the CO₂ concentration is at or above Design CO₂ Concentration, the Ventilation airflow setpoint is equal to the Design Minimum Ventilation setpoint.

When the CO₂ concentration is between the scheduled CO₂ concentration values, the control system will interpolate between Ventilation setpoints.

The current ventilation airflow setpoint shall be communicated to the BAS for control of the system outdoor -air intake.

Heating Mode:

When the unit is in heating mode, the VAV controller shall maintain the space temperature at the active heating setpoint by modulating the airflow between the active heating minimum airflow setpoint to the maximum heating airflow setpoint. Based on the VAV controller occupancy mode, the active heating setpoint shall be one of the following:

Setpoint	Default Value
Occupied Heating Setpoint	71.0 deg. F
Unoccupied Heating Setpoint	60.0 deg. F
Occupied Standby Heating Setpoint	67.0 deg. F

Occupied Min and Max Heating Airflow Setpoint See VAV Schedule
 The VAV controller shall use the measured space temperature and the active heating setpoint to determine the requested heating capacity of the unit. The outputs will be controlled based on the unit configuration and the requested heating capacity.

Reheat Control:

Reheat will only be allowed when the primary air temperature is 5.0 deg. F below the configured reheat enable setpoint of 70.0 deg. F (adj.). The reheat shall be enabled when the space temperature drops below the active heating setpoint and the minimum airflow requirements are met. During reheat the VAV shall operate at its minimum heating airflow setpoint and energize the heat as follows:

Proportional Hot Water Reheat:

If the space temperature is below the heating setpoint the hot water reheat valve shall modulate as required to maintain the active heating setpoint.

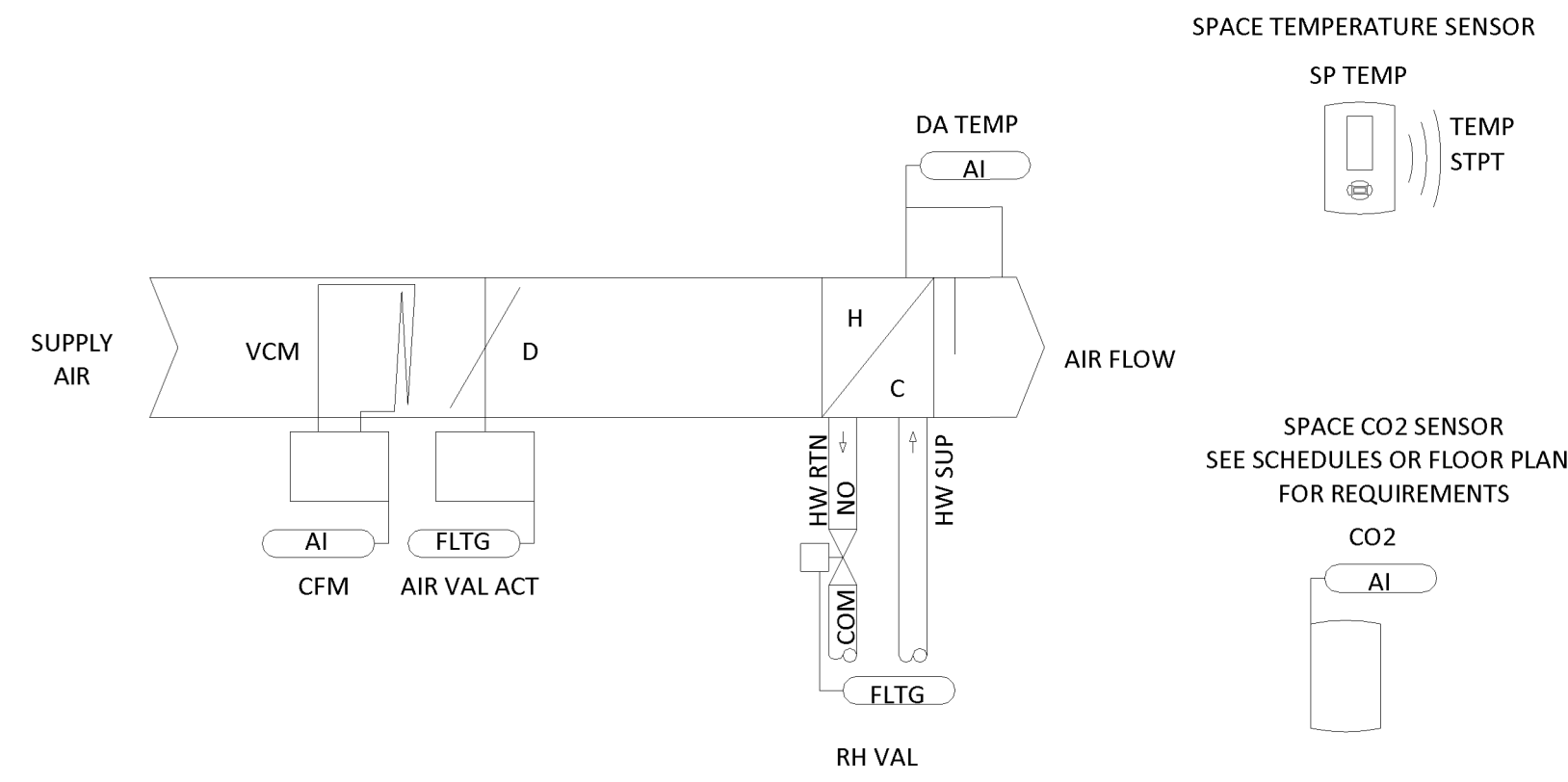
Ventilation Control (Fixed):

When the unit is in unoccupied mode, the ventilation airflow setpoint shall be zero. When the unit is in occupied mode, the ventilation airflow setpoint shall equal the design outdoor airflow (see VAV schedule).

The current ventilation airflow setpoint shall be communicated to the BAS for control of the system outdoor -air intake.

Space Sensor Failure:

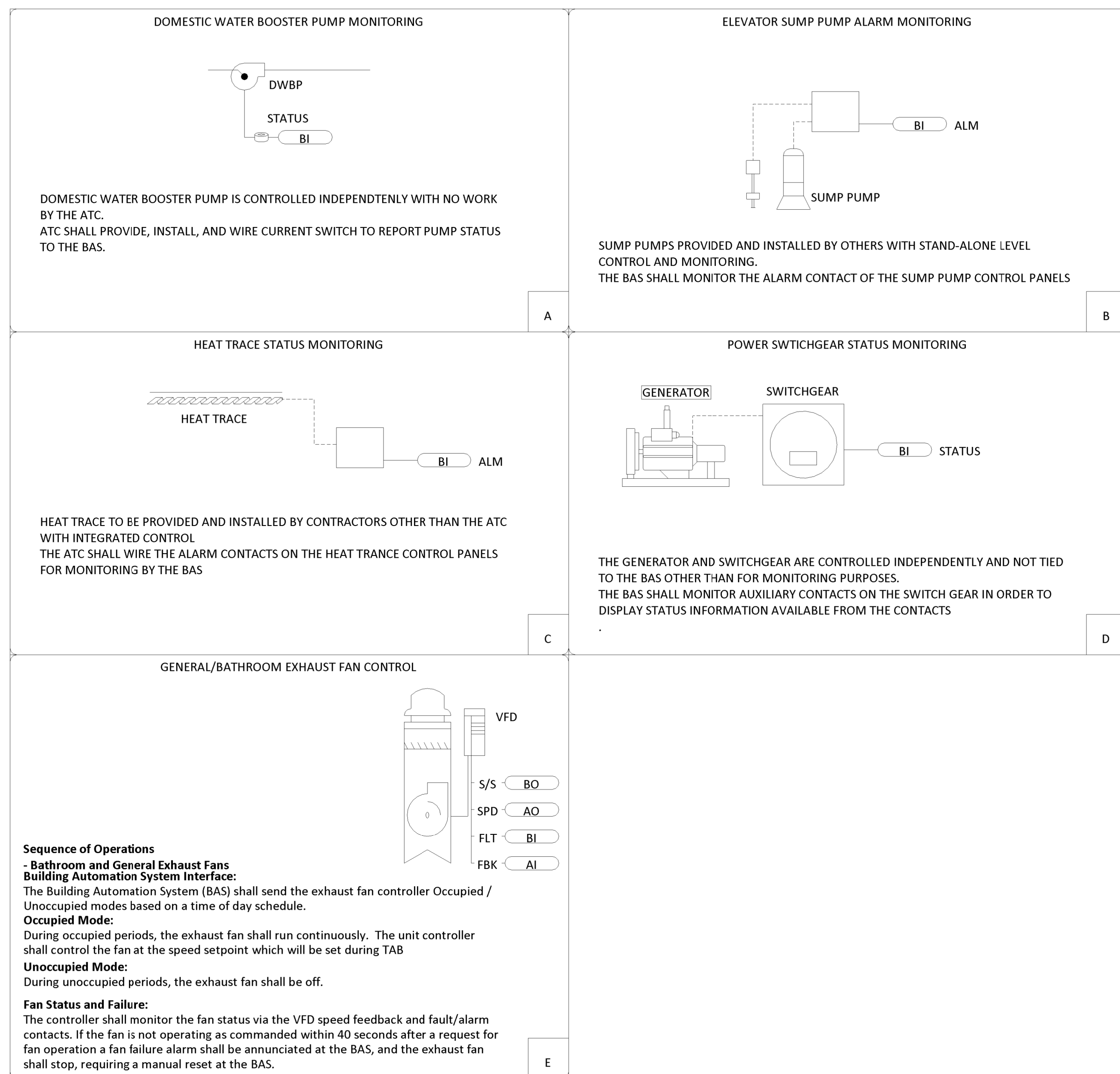
If there is a fault with the operation of the zone sensor an alarm shall be annunciated at the BAS. Space sensor failure shall cause the VAV to drive the damper to minimum air flow if the VAV is in the occupied mode, or drive it closed if the VAV is in the unoccupied mode.



1 CONTROLS- VAV'S

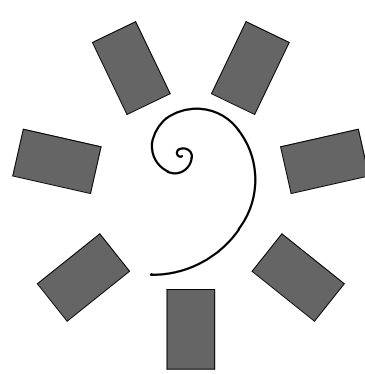
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(EXHAUST AND MISCELLANEOUS I/O)

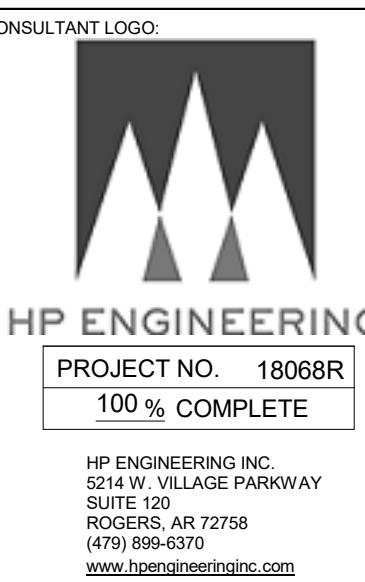
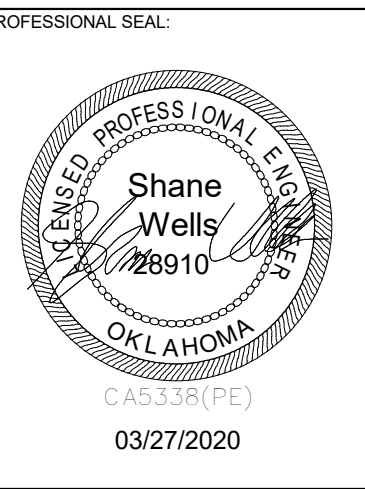


2 CONTROLS- EXHAUST AND MISCELLANEOUS I/O

N.T.S.



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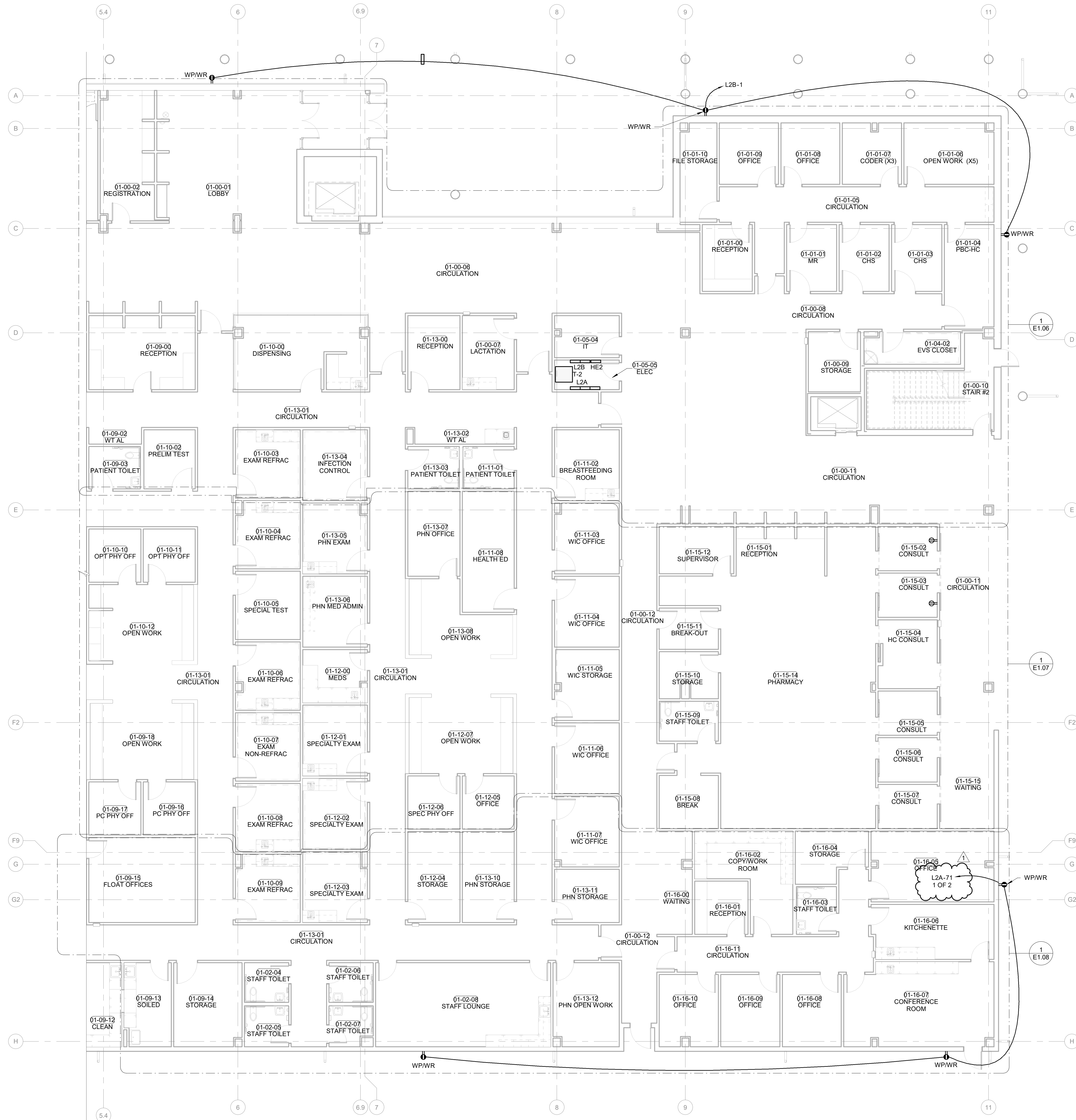
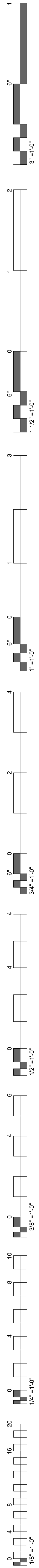
PROJECT PHASE:
BID PACKAGE 02


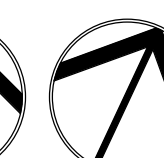
#	DATE	REVISION DESCRIPTION
1	3/30/20	BID PACKAGE 02 - ASI 03

DATE: 12-06-19
 JOB NUMBER: 18-01.01

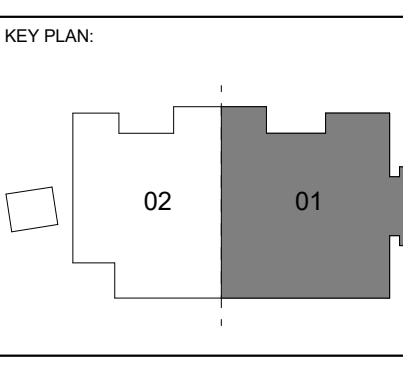
SHEET NUMBER:
M9.03

MECHANICAL CONTROLS





1 POWER PLAN LEVEL 01 SECTOR 01
 1/8" = 1'-0"

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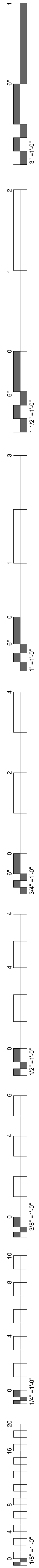


PROJECT PHASE
BID PACKAGE 02

#	DATE	REVISIONS	DESCRIPTION
1	3/30/20	BID PACKAGE 02 - ASI 03	

DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:
E1.02
POWER PLAN
LEVEL 01
SECTOR 01



KEYNOTES

26.24 MAKE CONNECTIONS TO AUTOMATIC FLUSH TOILETS/URINAL AND AUTOMATIC SINKS PER MANUFACTURER SPECIFICATIONS.

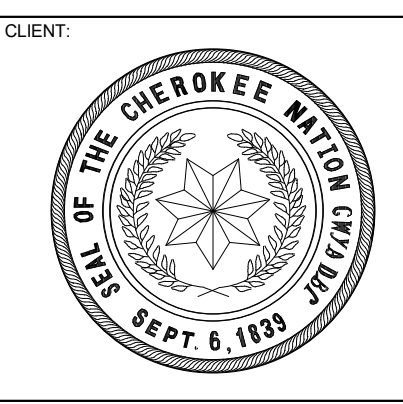
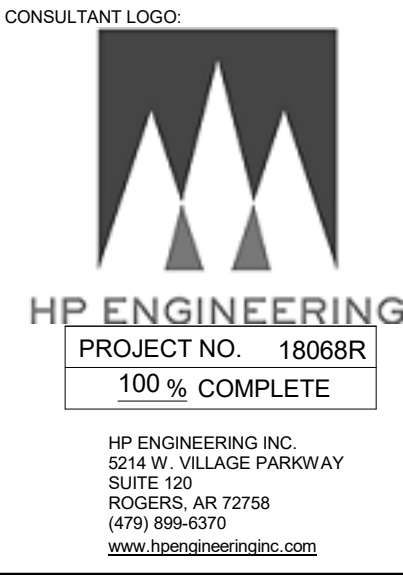
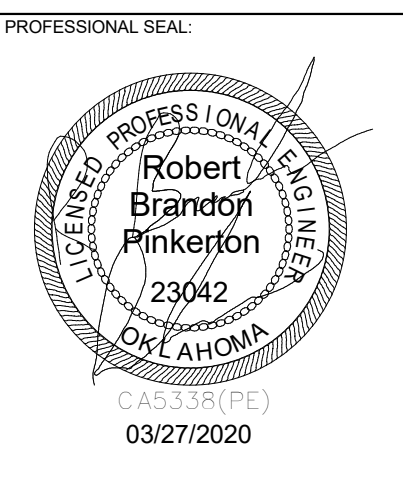
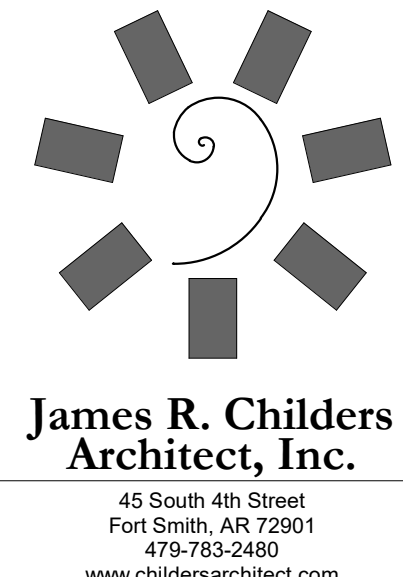
26.55 COORDINATE SUMP PUMP ALARM LOCATION WITH OWNER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH IN.

POWER PLAN NOTES

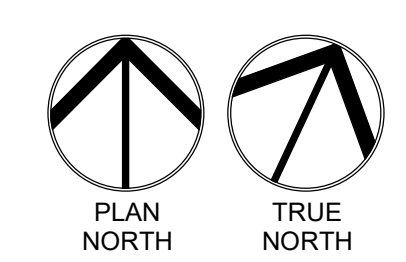
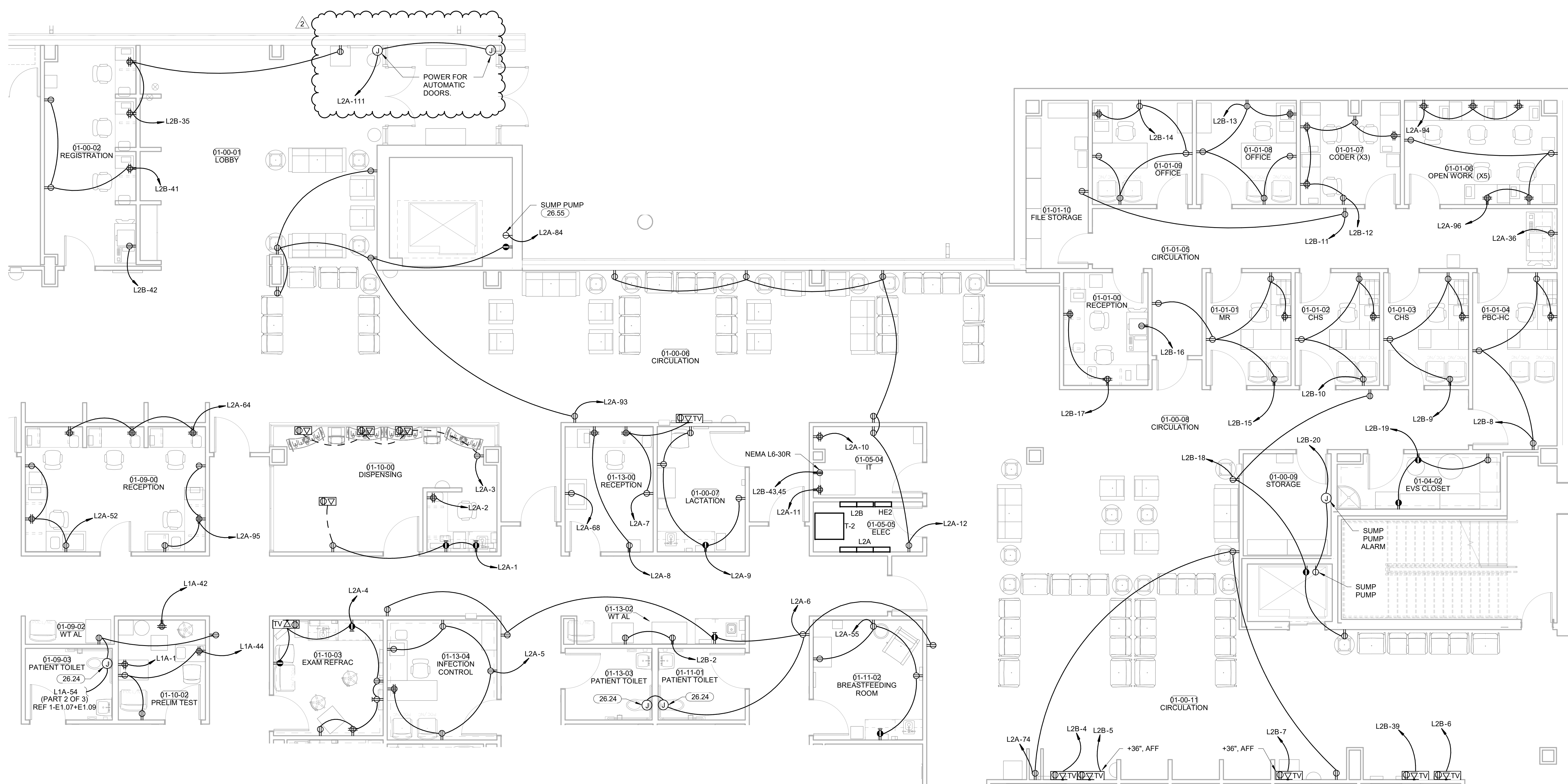
COORDINATE MOUNTING HEIGHTS FOR POWER ASSOCIATED WITH TV OUTLETS WITH ARCHITECT PRIOR TO ROUGH-IN.

E.C. SHALL COORDINATE ALL EQUIPMENT WITH THE ILO DESIGN DRAWINGS TO ENSURE PLACEMENT OF EQUIPMENT WORKS AS DESIGNED.

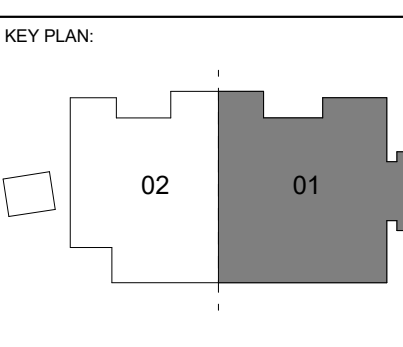
GROUNDING OF RECEPTACLES AND FIXED ELECTRICAL EQUIPMENT IN PATIENT CARE SPACES SHALL COMPLY WITH NEC 517.13.



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1 POWER PLAN LEVEL 01 SECTOR 01 NORTH
 3/16" = 1'-0"

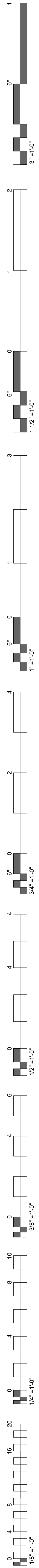


PROJECT PHASE:
 BID PACKAGE 02

#	DATE	REVISIONS / DESCRIPTION
1	1/19/20	BID PACKAGE 02 - ADD 01
2	3/30/20	BID PACKAGE 02 - ASH 03

DATE: 12-06-19
 JOB NUMBER: 18-01.01

SHEET NUMBER:
E1.06
 POWER PLAN
 LEVEL 01
 SECTOR 01 N



KEYNOTES

26.06 COORDINATE POWER REQUIREMENT WITH SP 200 FROM SCRIPTPRO.

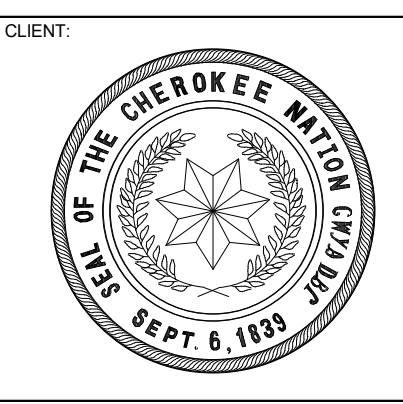
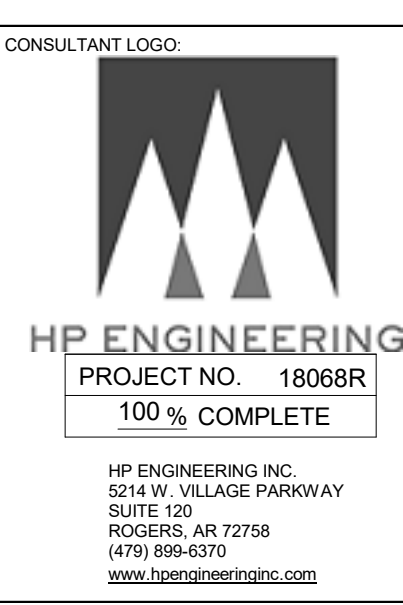
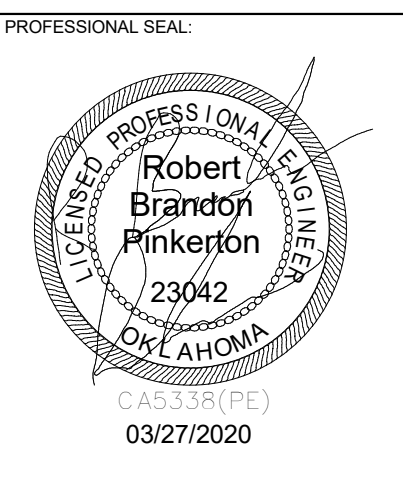
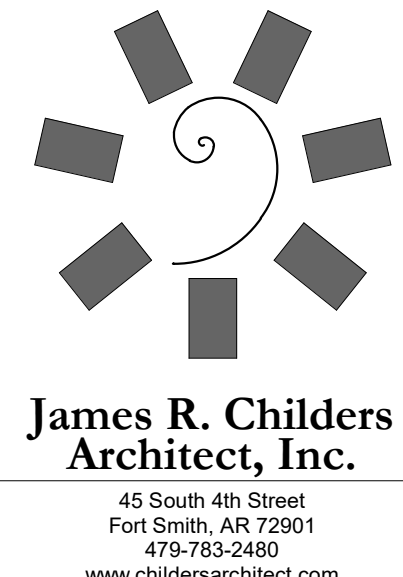
26.24 MAKE CONNECTIONS TO AUTOMATIC FLUSH TOILETS/URINAL AND AUTOMATIC SINKS PER MANUFACTURER SPECIFICATIONS.

POWER PLAN NOTES

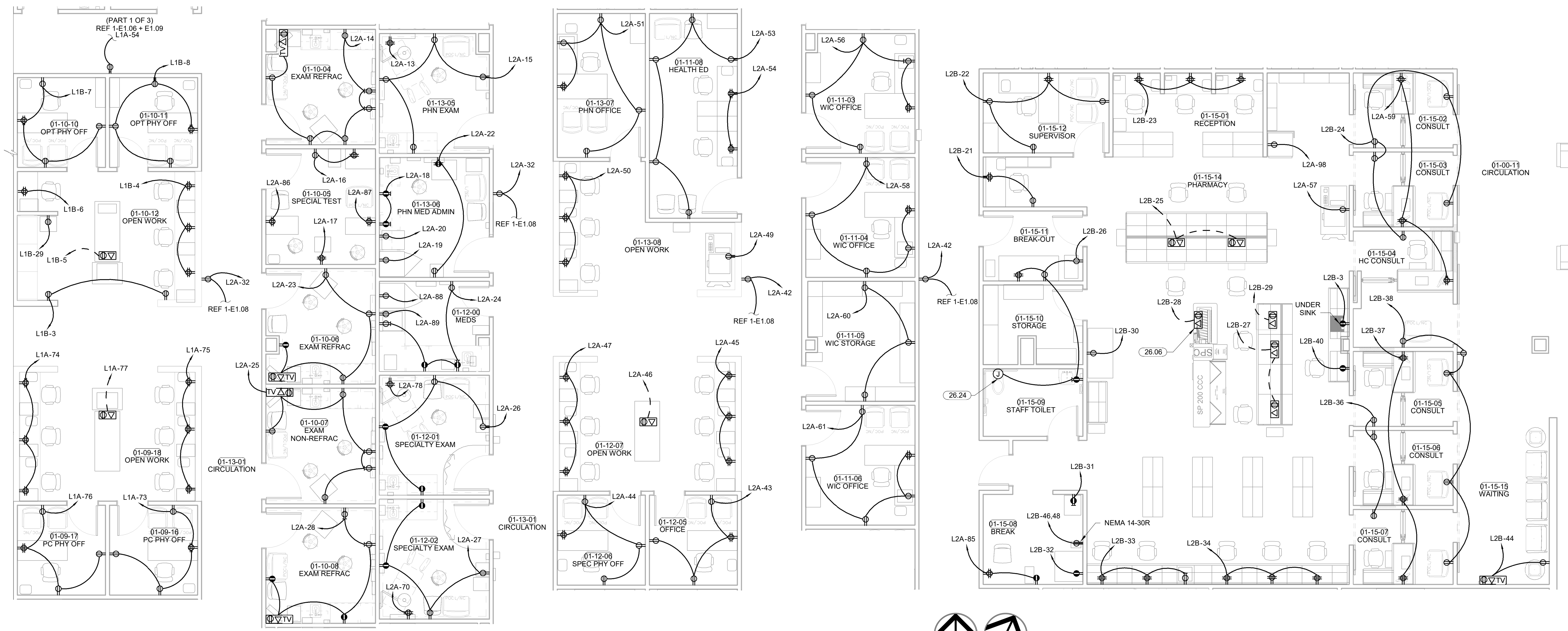
COORDINATE MOUNTING HEIGHTS FOR POWER ASSOCIATED WITH TV OUTLETS WITH ARCHITECT PRIOR TO ROUGH-IN.

E.C. SHALL COORDINATE ALL EQUIPMENT WITH THE I/O DESIGN DRAWINGS TO ENSURE PLACEMENT OF EQUIPMENT WORKS AS DESIGNED.

GROUNDING OF RECEPTACLES AND FIXED ELECTRICAL EQUIPMENT IN PATIENT CARE SPACES SHALL COMPLY WITH NEC 517.13.



WILMA P. MANKILLER HEALTH CENTER EXPANSION
 STILLWELL, OKLAHOMA



PLAN NORTH TRUE NORTH
1 POWER PLAN LEVEL 01 SECTOR 01 - CENTER
 3/16" = 1'-0"

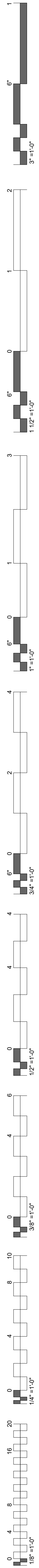
KEY PLAN

PROJECT PHASE
 BID PACKAGE 02

#	DATE	REVISION DESCRIPTION
1	1/19/20	BID PACKAGE 02 - ADD 01

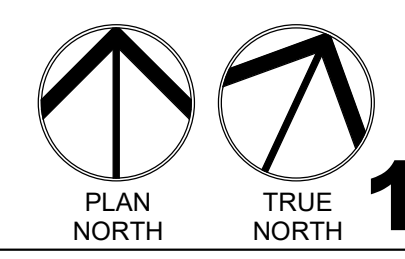
DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:
E1.07
POWER PLAN LEVEL 01 SECTOR 01 CTR

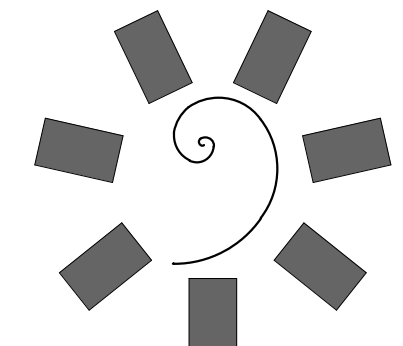


MECHANICAL POWER PLAN NOTES

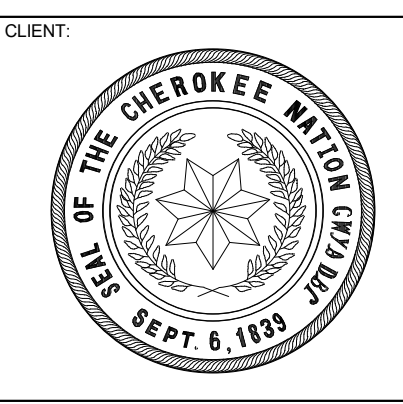
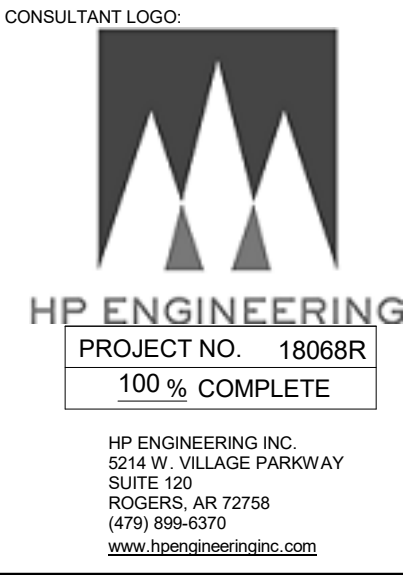
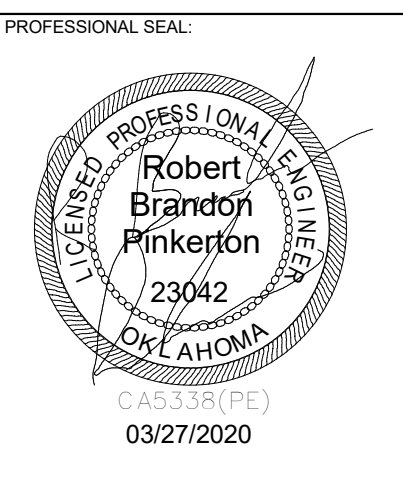
E.C. SHALL MAKE CONNECTIONS BETWEEN THE OUTDOOR AND INDOOR UNITS OF THE MINI-SPLIT SYSTEM.
 EXHAUST FANS SHALL BE CIRCUITED WITH LIGHTS UNLESS SHOWN OTHERWISE. REFER TO MECHANICAL PLANS FOR CONTROLS OF EXHAUST FANS.
 VAV DISCONNECTS ARE FACTORY INSTALLED.



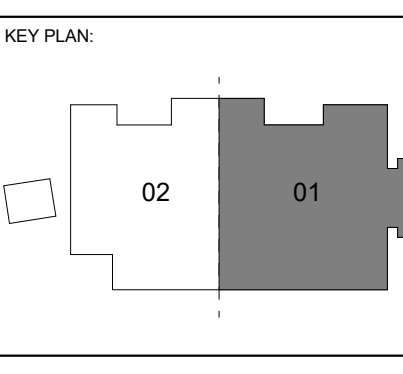
1 MECHANICAL POWER PLAN LEVEL 01 SECTOR 01
 1/8" = 1'-0"



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**WILMA P. MANKILLER HEALTH CENTER
 EXPANSION**
 STILLWELL, OKLAHOMA

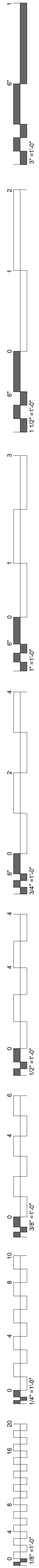


PROJECT PHASE:
BID PACKAGE 02

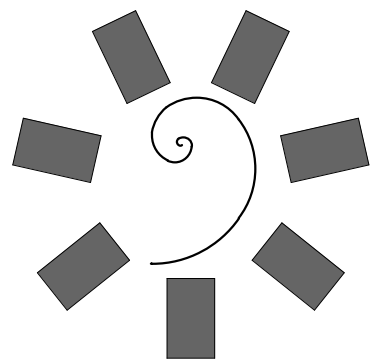
#	DATE	REVISIONS / DESCRIPTION
1	11/20/20	BID PACKAGE 02 - ADD 01
2	3/26/21	BID PACKAGE 02 - ASB 03

DATE: 12-06-19 JOB NUMBER: 18-01.01

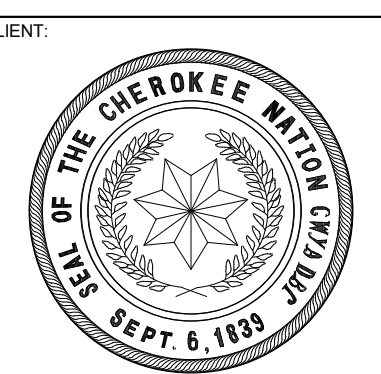
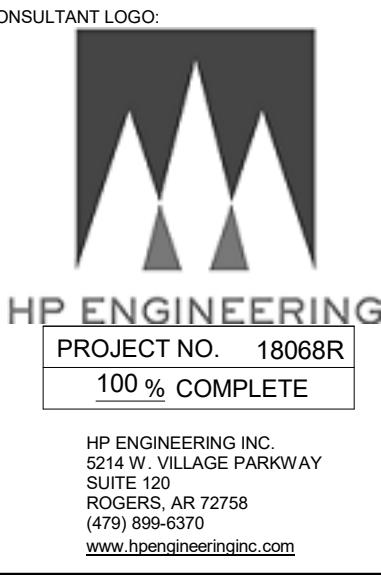
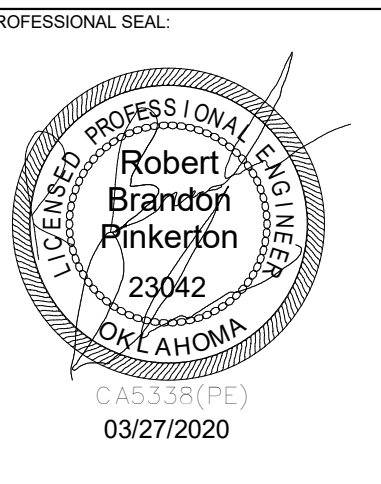
SHEET NUMBER:
E1.14
**MECH POWER
 PLAN LEVEL 01
 SECTOR 01**



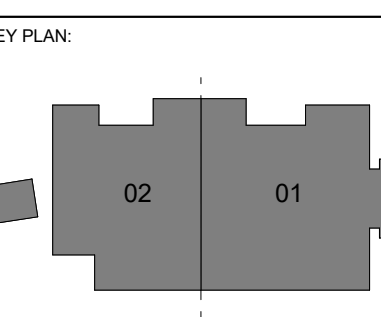
KEYNOTES
 26.52 PROVIDE WEATHERPROOF BOX, METALLIC IN USE COVER, AND ALL REQUIRED MATERIALS FOR INSTALLATION OF GFI MAINTENANCE RECEPTACLE TO BE MOUNTED ON UNISTRUT WITH DISCONNECT.



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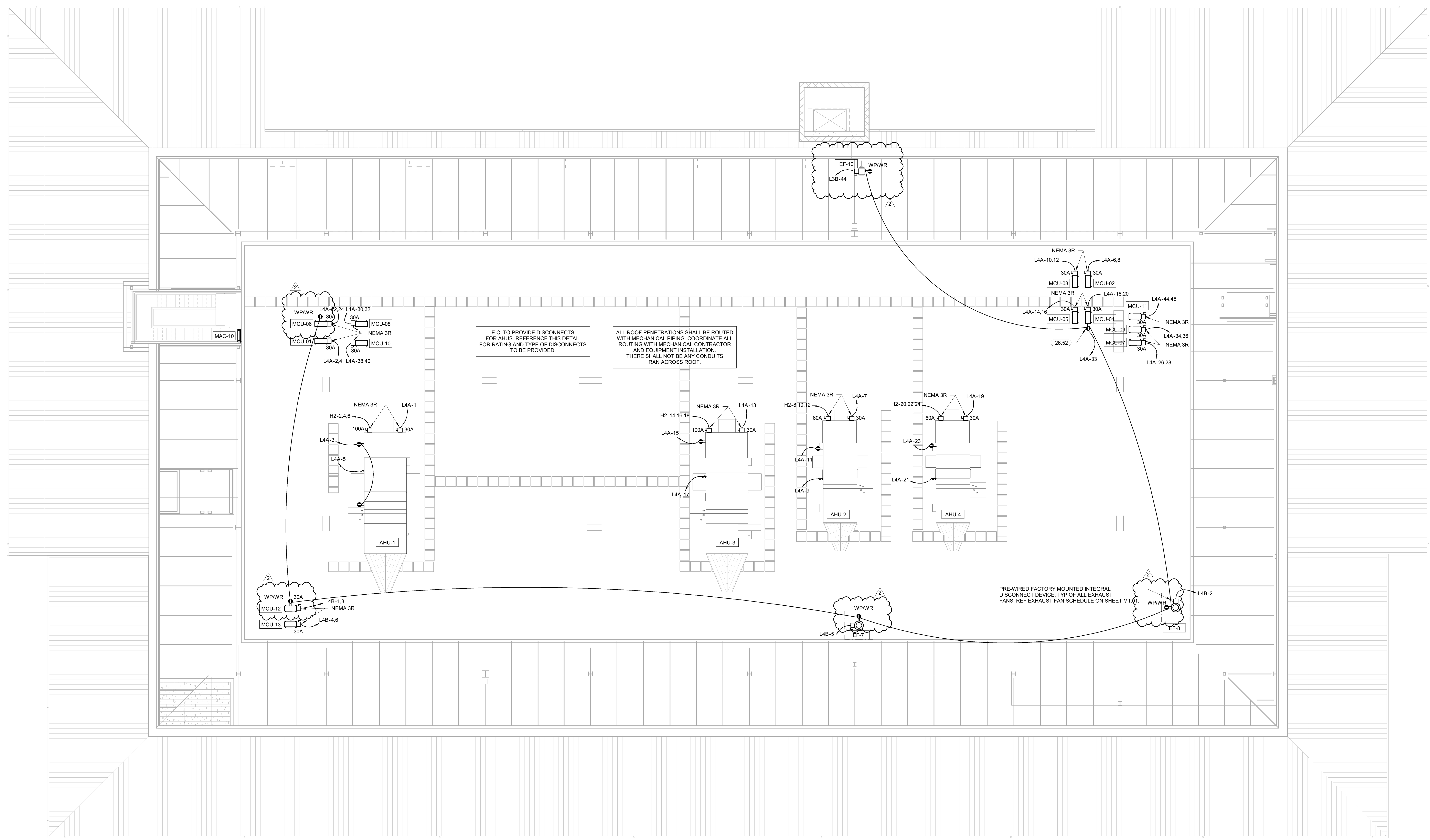
PROJECT PHASE:
 BID PACKAGE 02

#	DATE	REVISIONS / DESCRIPTION
1	1/18/20	BID PACKAGE 02 - ADD 01
2	3/30/20	BID PACKAGE 02 - ASB 03

DATE: 12-06-19
 JOB NUMBER: 18-01.01

SHEET NUMBER:
 E1.18

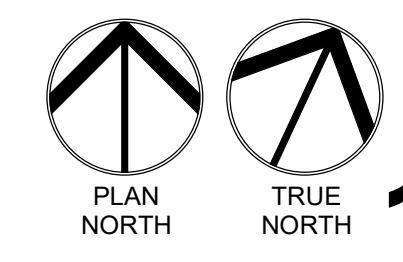
MECH POWER PLAN ROOF



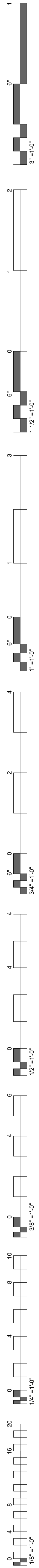
E.C. TO PROVIDE DISCONNECTS FOR AHUS. REFERENCE THIS DETAIL FOR RATING AND TYPE OF DISCONNECTS TO BE PROVIDED.

ALL ROOF PENETRATIONS SHALL BE ROUTED WITH MECHANICAL PIPING. COORDINATE ALL ROUTING WITH MECHANICAL CONTRACTOR AND EQUIPMENT INSTALLATION. THERE SHALL NOT BE ANY CONDUITS RAN ACROSS ROOF.

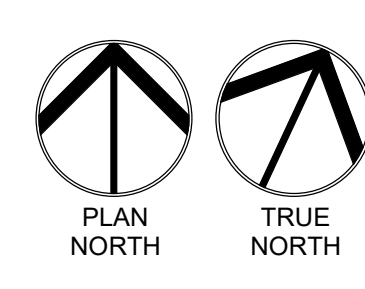
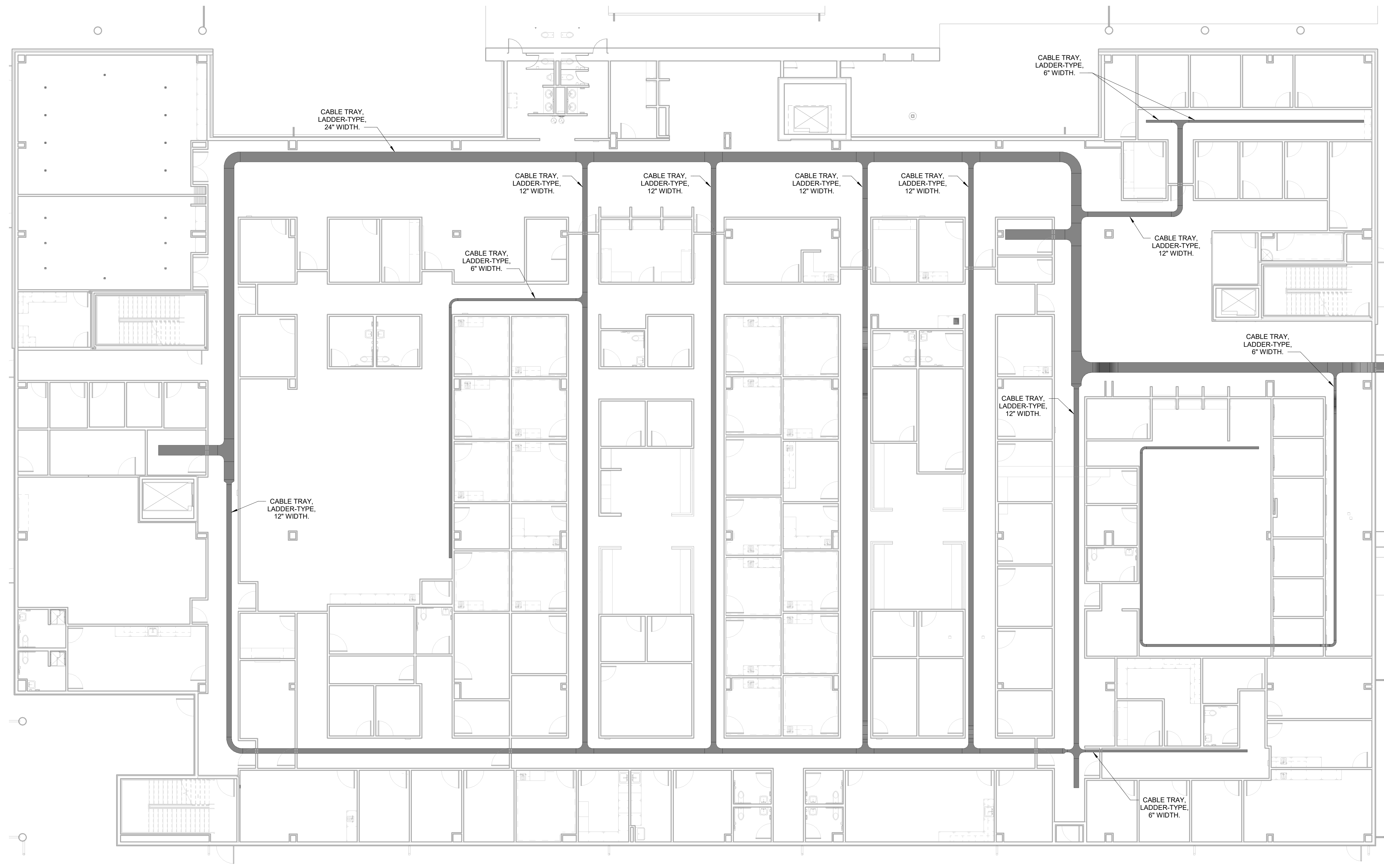
PRE-WIRED FACTORY MOUNTED INTEGRAL DISCONNECT DEVICE, TYP OF ALL EXHAUST FANS. REF EXHAUST FAN SCHEDULE ON SHEET M1-01.



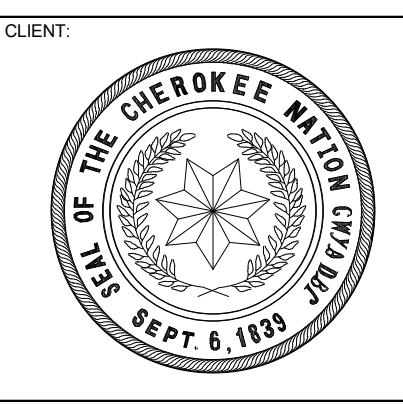
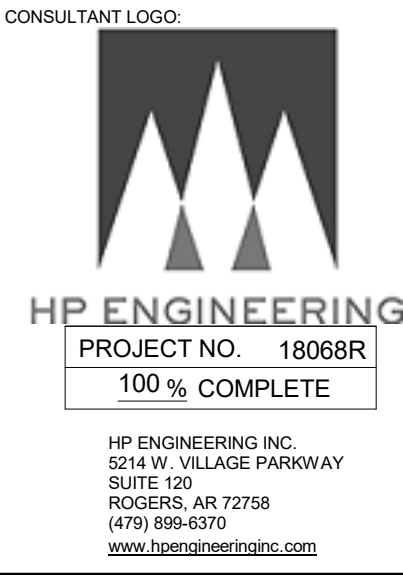
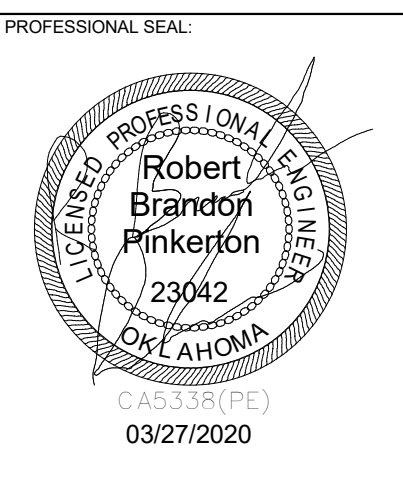
1 MECHANICAL POWER PLAN LEVEL 3
 1/8" = 1'-0"



CABLE TRAY NOTES
 PROVIDE SMOKE RATED PENETRATIONS AT ALL SMOKE WALLS. SEE ARCHITECTURAL SHEETS FOR SMOKE RATED WALL LOCATIONS.



1 FIRST FLOOR CABLE TRAY PLAN
 1" = 10'-0"



**WILMA P. MANKILLER HEALTH CENTER
 EXPANSION**
 STILLWELL, OKLAHOMA

KEY PLAN:

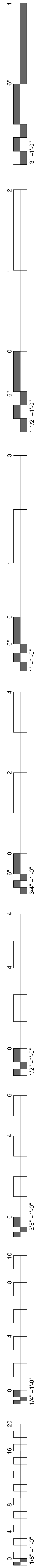
PROJECT PHASE:
 BID PACKAGE 02

#	DATE	REVISIONS DESCRIPTION
1	3/30/20	BID PACKAGE 02 - ASI 03

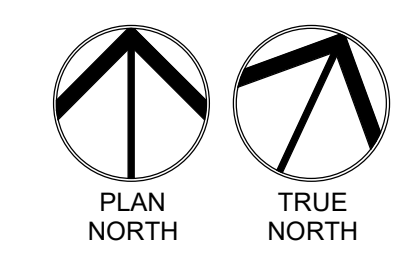
DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:
 E1.24

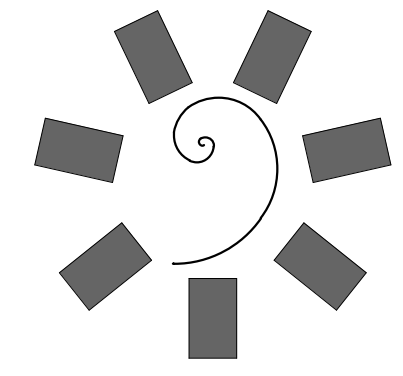
FIRST FLOOR
 CABLE TRAY
 PLAN



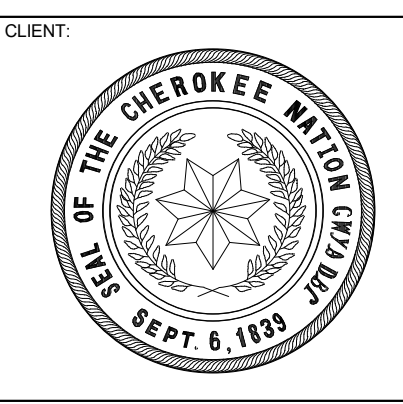
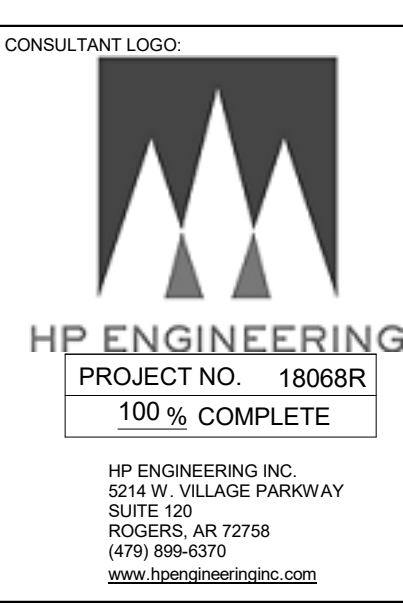
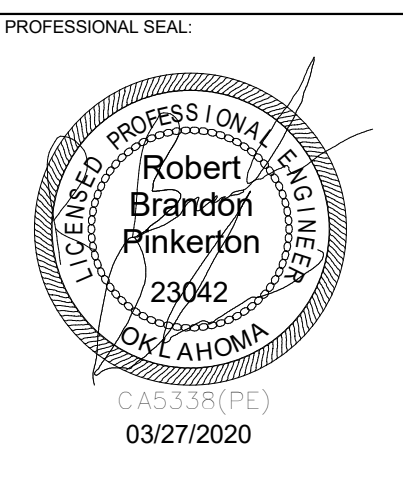
CABLE TRAY NOTES
 PROVIDE SMOKE RATED PENETRATIONS AT ALL SMOKE WALLS. SEE ARCHITECTURAL SHEETS FOR SMOKE RATED WALL LOCATIONS.



1 SECOND FLOOR CABLE TRAY PLAN
 1/8" = 1'-0"



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**WILMA P. MANKILLER HEALTH CENTER
 EXPANSION**
 STILLWELL, OKLAHOMA

KEY PLAN:
 [Blank space for key plan]

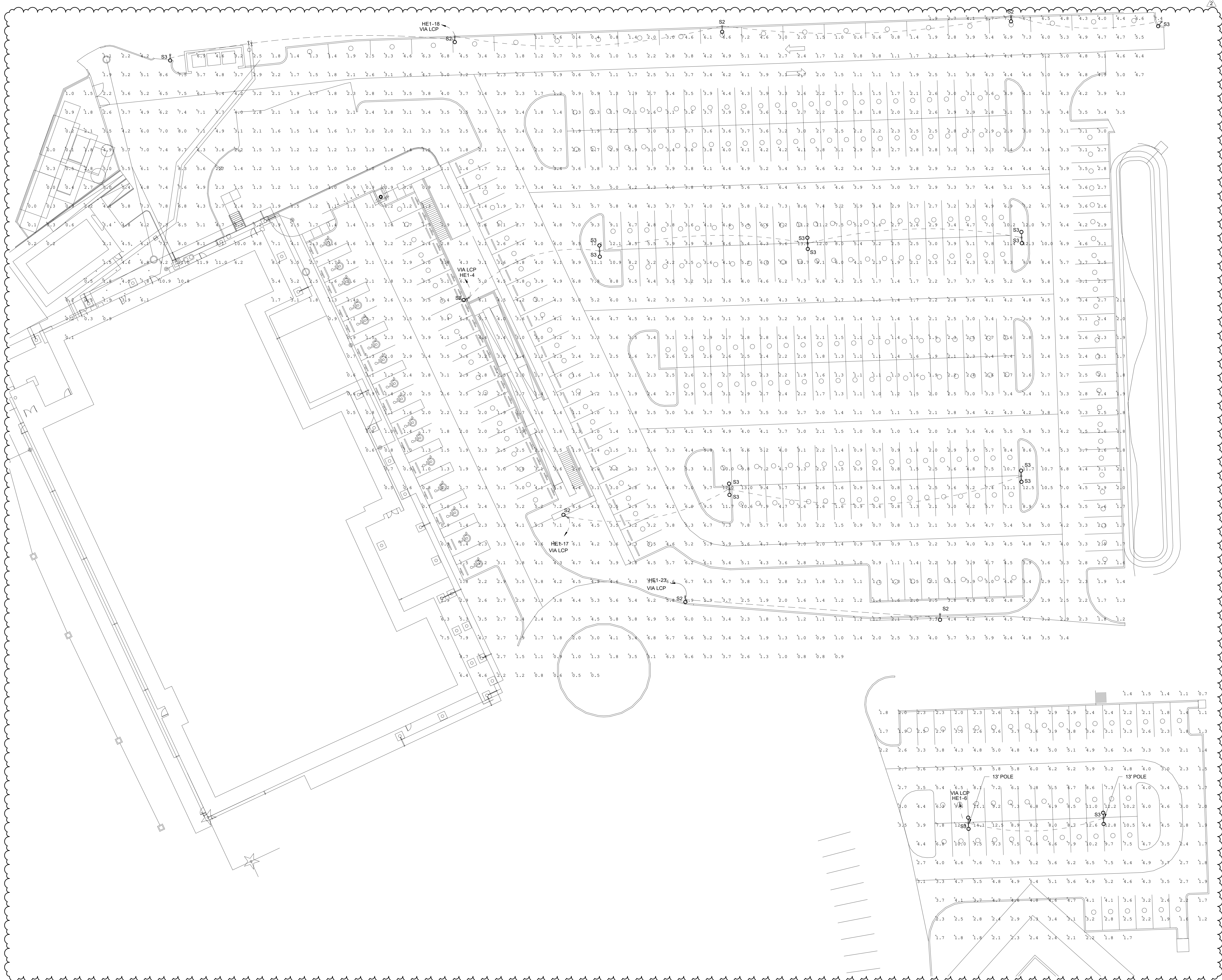
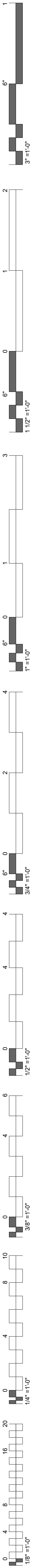
PROJECT PHASE:
 BID PACKAGE 02

#	DATE	REVISIONS	DESCRIPTION
1	3/30/20	BID PACKAGE 02 - ASI G3	

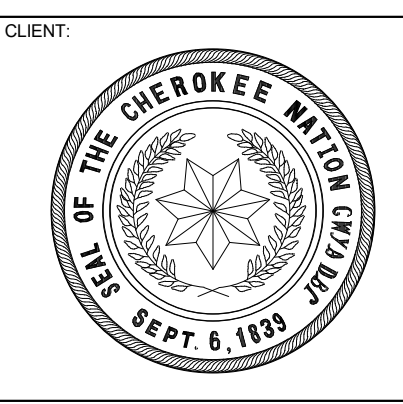
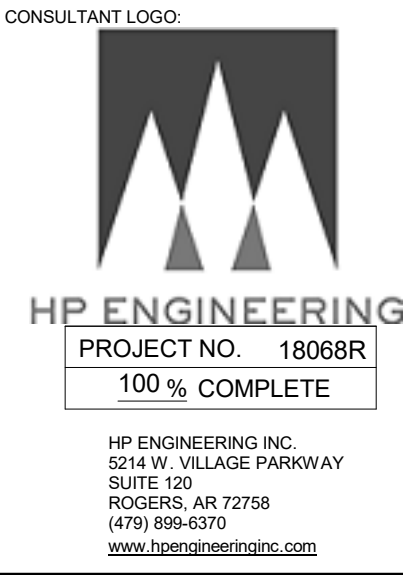
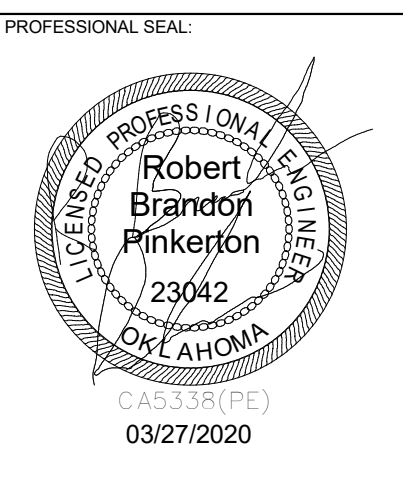
DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:
 E1.25

**SECOND FLOOR
 CABLE TRAY
 PLAN**



1 SITE LIGHTING PLAN
 1" = 20'-0"



WILMA P. MANKILLER HEALTH CENTER
EXPANSION
 STILLWELL, OKLAHOMA

KEY PLAN:

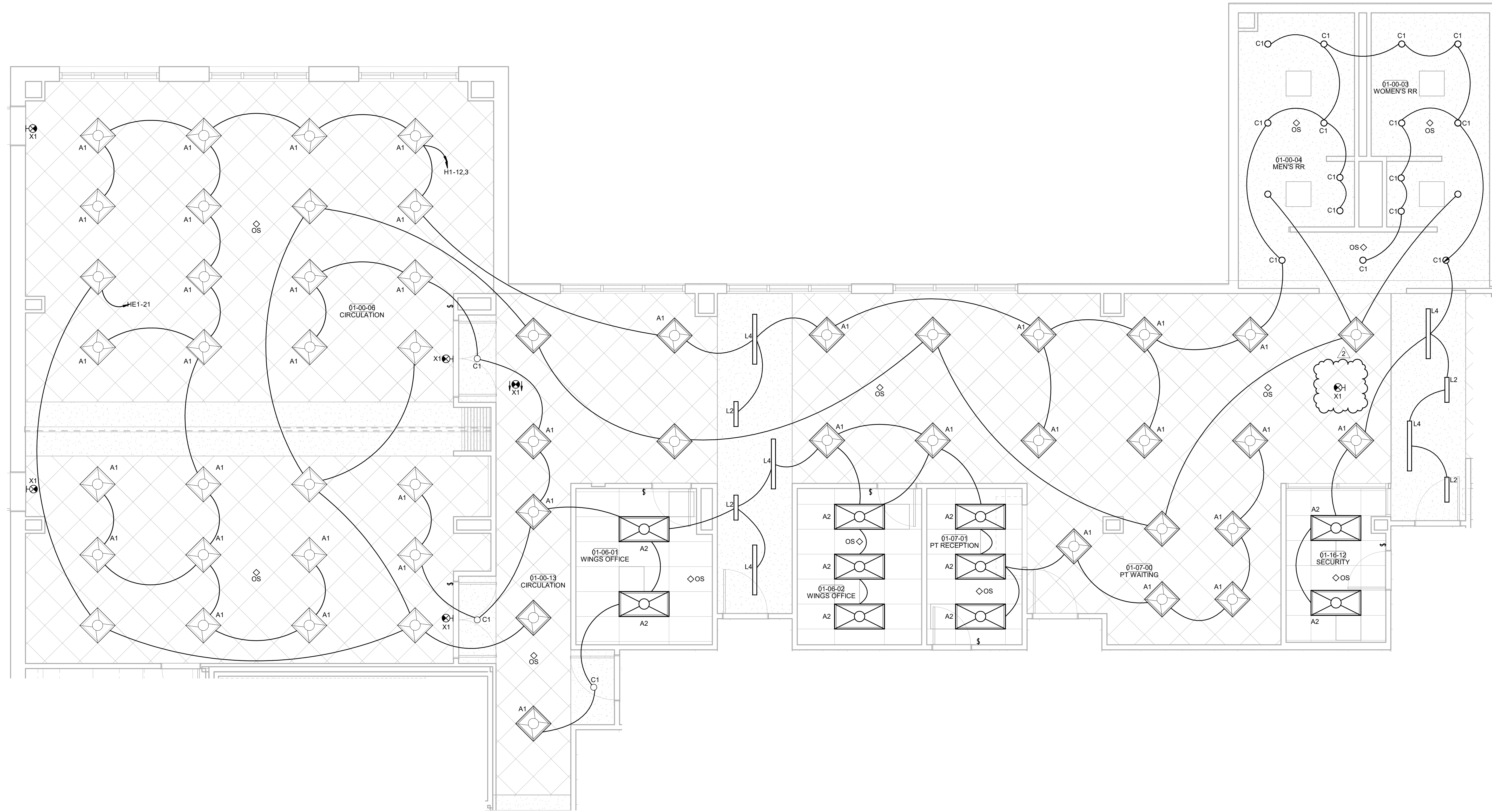
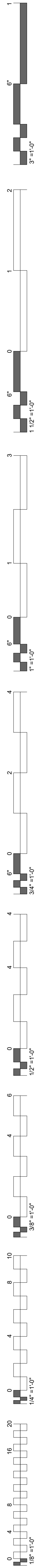
PROJECT PHASE:
BID PACKAGE 02

#	DATE	REVISIONS	DESCRIPTION
1	1/18/20	BID PACKAGE 02 - ADD 01	
2	3/30/20	BID PACKAGE 02 - ASB 03	

DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:
E2.05

SITE LIGHTING PLAN



 PLAN NORTH
 TRUE NORTH
1 NORTH SECTOR 2 ENLARGED LIGHTING
 1/4" = 1'-0"

WILMA P. MANKILLER HEALTH CENTER
EXPANSION
 STILLWELL, OKLAHOMA

KEY PLAN:

PROJECT PHASE:
 BID PACKAGE 02

#	DATE	REVISIONS / DESCRIPTION
1	1/19/20	BID PACKAGE 02 - ADD 01
2	3/30/20	BID PACKAGE 02 - ASB 03

DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:
E2.09

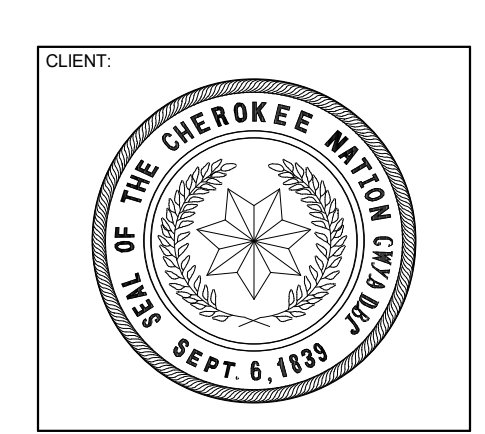
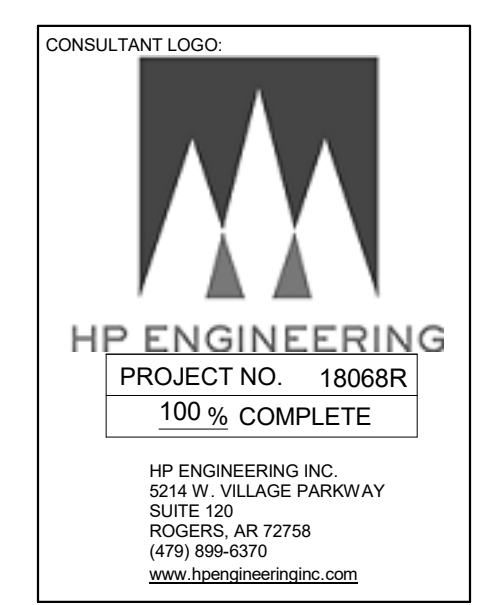
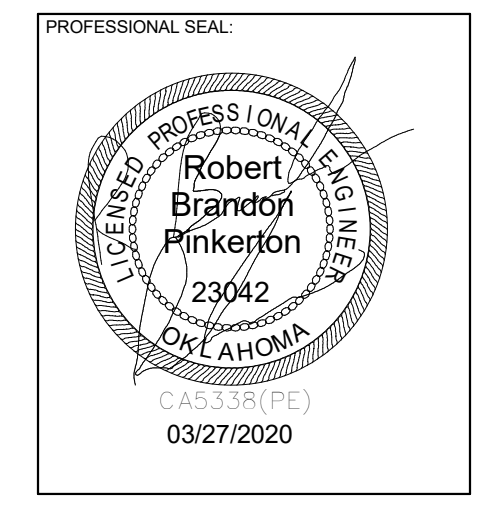
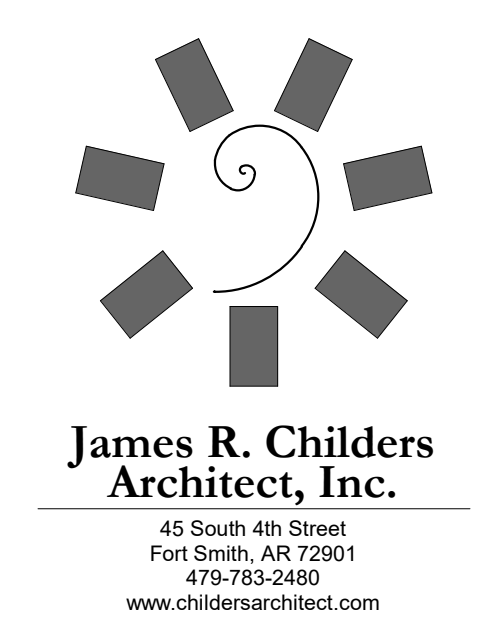
NORTH SECTOR
2 ENLARGED
LIGHTING PLAN

Branch Panel: L4A NEW Location: ELEC 02-05-12 Supply From: T4 Mounting: SURFACE Enclosure: NEMA 1 Notes: Table with columns: CKT, Load Name, CB, P, Wire, A, B, C, Wire, P, CB, Load Name, CKT. Includes summary table for Load Classification with Connected Load, Demand Factor, Estimated Demand, and Panel Totals.

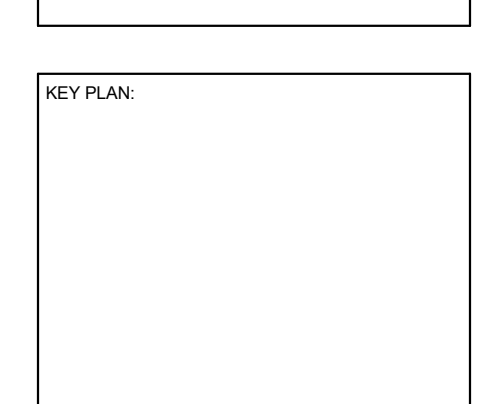
Branch Panel: HE4 NEW Location: ELEC 02-05-12 Supply From: HE1 Mounting: SURFACE Enclosure: NEMA 1 Notes: Table with columns: CKT, Load Name, CB, P, Wire, A, B, C, Wire, P, CB, Load Name, CKT. Includes summary table for Load Classification with Connected Load, Demand Factor, Estimated Demand, and Panel Totals.

Branch Panel: L4B NEW Location: ELEC 02-05-12 Supply From: Mounting: SURFACE Enclosure: NEMA 1 Notes: Table with columns: CKT, Load Name, CB, P, Wire, A, B, C, Wire, P, CB, Load Name, CKT. Includes summary table for Load Classification with Connected Load, Demand Factor, Estimated Demand, and Panel Totals.

PANELBOARD NOTES (#) 1. TERMINATE GROUND ON ISOLATED GROUND BUS. 2. INSTALL LOCKING DEVICE FURNISHED WITH PANELBOARD... EQUIPMENT GROUNDING CONDUCTOR SIZING CHART with table for Wire Size vs. BRKR Amperage.



WILMA P. MANKILLER HEALTH CENTER EXPANSION STILWELL, OKLAHOMA



PROJECT PHASE: BID PACKAGE 02

Table with columns: #, DATE, REVISIONS. Shows revision 1 on 11/20/20 and revision 2 on 2/14/20.

DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER: E3.04 PANEL SCHEDULES