ABBREVIATIONS

NOT ALL ABBREVIATIONS OR SYMBOLS WILL BE UTILIZED FOR EVERY PROJECT

A

A/E	ARCHITECT / ENGINEER
AAHX	AIR TO AIR HEAT EXCHANGER
AB	AIR BLENDER
AAV	AUTOMATIC AIR VENT
ACC	AIR COOLED CONDENSER
ACU	AIR CONDITIONING UNIT
AF	AFTER FILTER
AFCV	AIR FLOW CONTROL VALVE
AFF	ABOVE FINISHED FLOOR
AFM	AIR FLOW MEASURING DEVICE
AFW	AIR FOIL WHEEL (FAN)
AHU	AIR-HANDLING UNIT
AMP	AMPERAGE
AP	ACCESS PANEL
APD	AIR PRESSURE DROP
ARI	AIR CONDITIONING AND REFRIGERATION INSTITUTE
AS	AIR SEPARATOR
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AW	AIR WASHER
AXF	AXIAL FLOW

B

B	BOILER
BD	BUTTERFLY DAMPER
BDD	BACKDRAFT DAMPER
BFP	BACKFLOW PREVENTER
BHP	BRAKE HORSEPOWER
BHX	BOILER BLOWDOWN HEAT EXCHANGER
BIW	BACKWARD INCLINED WHEEL (FAN)
BSC	BIOLOGICAL SAFETY CABINETS
BT	BLOWOFF TANK
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR

C

C	CENTIGRADE (CELSIUS)
CC	COOLING COIL
CCD	COOLING COIL CONDENSATE DRAIN
CENT	CENTRIFUGAL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFT	CUBIC FEET
CFP	CHEMICAL FEED PUMP
CH	CHILLER
CHP	CHILLED WATER PUMP
CHW	CHILLER WATER
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CI	CAST IRON
CM	CUBIC METER
CM/S	CUBIC METER PER SECOND
CO	CARBON MONOXIDE
CO2	CARBON DIOXIDE
COMP	COMPRESSOR UNIT
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CS	CONDENSATE STORAGE TANK
CSG	CLEAN STEAM GENERATOR
CT	COOLING TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME
CW	COLD WATER (POTABLE)
CC	CHILLED WATER COOLING COIL
CWP	CONDENSER WATER PUMP
CWR	CONDENSER WATER RETURN
CWS	CONDENSER WATER SUPPLY

D

Db	DRY-BULB TEMPERATURE
DB	DECIBELS
DDC	DIRECT DIGITAL CONTROLS
DEG	DEGREE
DIA	DIAMETER
DIW	DEIONIZED WATER
DP	DEW POINT TEMPERATURE
DPA	DIFFERENTIAL PRESSURE ASSEMBLY
DPS	DIFFERENTIAL PRESSURE SENSOR
DSD	DUCT SMOKE DETECTOR
DX	DIRECT EXPANSION

E

EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EC	EVAPORATIVE COOLER
ECC	ENGINEERING CONTROL CENTER
ECU	EVAPORATIVE CONDENSER UNIT
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EGS	EMERGENCY GAS SHUTOFF
EGT	ENTERING GLYCOL TEMPERATURE
EH	EXHAUST HOOD
EJ	EXPANSION JOINT
EMD	END OF MAIN DRIP (STEAM)
ENT	ENTERING
ERC	ELECTRIC REHEAT COIL
ERP	ELECTRIC RADIANT PANEL
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
ETO	ETHYLENE OXIDE
ETR	EXISTING TO REMAIN
EUH	ELECTRIC UNIT HEATER
EWC	EVAPORATIVE WATER COOLER
EWT	ENTERING WATER TEMPERATURE
EX.	EXISTING

F

F	FAHRENHEIT
F&T	FLOAT AND THERMOSTATIC
FA	FREE AREA
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FCUC	FAN COIL UNIT COOLING ONLY
FCUH	FAN COIL UNIT HEATING ONLY
FCW	FORWARD CURVED WHEEL (FAN)
FD	FIRE DAMPER
FSD	COMBINATION FIRE / SMOKE DAMPER
FF	FINAL FILTER
FHX	FLUE GAS/FEEDWATER HEAT EXCHANGER
FM	FLOW METER
FOP	FUEL OIL PUMP
FOT	FUEL OIL TANK
FOHX	FUEL OIL HEAT EXCHANGER
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FPTU	FAN POWERED TERMINAL UNIT
FRP	FIBER REINFORCED POLYESTER
FS	FLOW SWITCH
FSTAT	FREEZESTAT
FT	FEET
FT-LB	FOOT-POUND
FTR	FIN TUBE RADIATION
FV	FACE VELOCITY

G

GA	GAUGE
GAL	GALLONS
GH	GRAVITY HOOD
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GS	GALVANIZED STEEL

H

H	HUMIDIFIER
H&CW	HOT & COLD WATER
HAC	HOUSEKEEPING AID CLOSET
HB	HOSE BIBB
HC	HEATING COIL
HD	HEAD
HOA	HAND/OFF/AUTOMATIC
HP	HEAT PUMP
HP	HORSEPOWER
HPDT	HIGH PRESSURE DRIP TRAP
HPR	HIGH PRESSURE RETURN (STEAM CONDENSATE)
HPS	HIGH PRESSURE SUPPLY (STEAM) (61-300 PSIG)
HRC	HEAT RECOVERY COIL
HRD	HEAT RECOVERY DEVICE
HRP	HYDRONIC RADIANT (CEILING) PANEL
HRW	HEAT RECOVERY WHEEL
HSTAT	HUMIDISTAT
HTM	HUMIDIFIER TERMINAL
HUM	HUMIDIFIER UNIT MOUNTED
HVU	HEATING AND VENTILATING UNIT
HW	HOT WATER
HC	HOT WATER HEATING COIL
HHP	HEATING HOT WATER PUMP
HHR	HEATING HOT WATER RETURN
HHS	HEATING HOT WATER SUPPLY
HHUH	HOT WATER UNIT HEATER
HX	HEAT EXCHANGER
HZ	HERTZ

I

I/O	INPUT/OUTPUT
IAQ	INDOOR AIR QUALITY
IBT	INVERTED BUCKET TRAP
ICF	IN-LINE CENTRIFUGAL FAN
ID	INSIDE DIAMETER
IFB	INTEGRAL FACE AND BYPASS
IN	INCHES
IN HG	INCHES OF MERCURY
IN WC	INCH WATER COLUMN
IN WG	INCH WATER GAUGE
IN-LB	INCH-POUND
IPLV	INTEGRATED PART LOAD VALUE
IRH	INFRARED HEATER
IS	INSECT SCREEN
IU	INDUCTION UNIT
IV	INLET VANES

J

J	INTENTIONALLY LEFT BLANK

K

kg	KILOGRAM
kg/HR	KILOGRAM PER HOUR
kPa	KILOPASCAL
kW	KILOWATT
kWh	KILOWATT HOUR

L

L	LITER
L/h	LITERS PER HOUR (OR LITERS/HOUR)
L/m	LITERS PER MINUTE (OR LITERS/MINUTE)
L/s	LITERS PER SECOND (OR LITERS/SECOND)
LAT	LEAVING AIR TEMPERATURE
LBS/HR	POUNDS PER HOUR
LF	LINEAR FOOT (FEET)
LGT	LEAVING GLYCOL TEMPERATURE
LH	LATENT HEAT
LPG	LIQUID PROPANE GAS
LPR	LOW PRESSURE RETURN (STEAM CONDENSATE)
LPRC	LOW PRESSURE STEAM RETURN (CLEAN)
LLHX	LIQUID TO LIQUID HEAT EXCHANGER
LPS	LOW PRESSURE SUPPLY (STEAM) (0-15 PSIG)
LPSC	LOW PRESSURE STEAM (CLEAN)
LSD	LINEAR SLOT DIFFUSER
LTCP	LOCAL TEMPERATURE CONTROL PANEL
LVG	LEAVING
LVR	LOUVER
LWT	LEAVING WATER TEMPERATURE

M

M	METER, SI UNIT
M/s	METERS PER SECOND (OR METERS/SECOND)
MA	MIXED AIR
MAT	MIXED AIR TEMPERATURE
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MB	MIXING BOX
MBH	1000 BTUH
MCA	MINIMUM BRANCH CIRCUIT AMPACITY
MERV	MINIMUM EFFICIENCY REPORTING VALUE
MH	MANHOLE
MHP	MOTOR HORSEPOWER
MIN	MINIMUM
MM	MILLIMETER
MOV	MOTOR OPERATED VALVE
MPR	MEDIUM PRESSURE RETURN (STEAM CONDENSATE)
MPS	MEDIUM PRESSURE SUPPLY (STEAM) (16-60 PSIG)
MTD	MEAN TEMPERATURE DIFFERENCE
MVD	MANUAL VOLUME DAMPER
MZ	MULTI-ZONE

N

NA	NOT APPLICABLE
NC	NOISE CRITERIA
NG	NATURAL GAS
NGFM	NATURAL GAS FLOWMETER
NOAA	NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION
NOM	NOMINAL
NPLV	NON-STANDARD PART LOAD VALUE
NPSH	NET POSITIVE SUCTION HEAD
NTS	NOT TO SCALE

O

OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OD	OUTSIDE DIAMETER
OFM	OIL FLOWMETER
OSD	ORGANIC SOIL FILTER

P

P	PUMP
PA	PASCAL
PC	PUMPED CONDENSATE
PCF	POUNDS PER CUBIC FOOT (FEET)
PD	PRESSURE DROP
PF	PRE-FILTER
PG	PRESSURE GAGE
PGW	PROPYLENE GLYCOL-WATER (SOLUTION)
PHC	PREHEAT COIL
PPM	PARTS PER MILLION
PRS	PRESSURE REGULATING (VALVE) STATION
PRV	PRESSURE REGULATING VALVE
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH – ABSOLUTE
PSIG	POUNDS PER SQUARE INCH – GAGE
PSS	PRIMARY SECONDARY SYSTEM
PSV	PRESSURE SAFETY VALVE
PTAC	PACKAGED TERMINAL AIR CONDITIONER

Q

Q	INTENTIONALLY LEFT BLANK

R

R/E	RETURN OR EXHAUST
RA	RETURN AIR
RAD	REFRIGERANT AIR DRYER
RAF	RADIO FREQUENCY
RAHX	ROTARY AIR HEAT EXCHANGER
RAT	RETURN AIR TEMPERATURE
RCCH	REMOTE CONDENSER CHILLER
RCU	RECIPROCATING CHILLER UNIT
RD	REFRIGERANT DISCHARGE
REA	RELIEF AIR
RF	RETURN FAN
RH	RELATIVE HUMIDITY
RHC	REHEAT COIL
RHG	REFRIGERANT HOT GAS
RL	REFRIGERANT LIQUID LINE
RLA	RUN LOAD AMPERE
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RS	REFRIGERANT SUCTION
RTU	ROOF TOP UNIT
RV	RELIEF VALVE

S

SA	SUPPLY AIR
SAD	SOUND ATTENUATING DEVICE
SAT	SUPPLY AIR TEMPERATURE
SC	SHADING COEFFICIENT
SCFM	STANDARD CUBIC FEET PER MINUTE
SCR	SILICON CONTROLLED RECTIFIER
SD	SMOKE DAMPER
SEN	SENSIBLE HEAT
SF	SUPPLY FAN
SH	STEAM HUMIDIFIER
SHC	STEAM HEATING COIL
SI	SQUARE INCHES
SP	STATIC PRESSURE
SP GR	SPECIFIC GRAVITY
SPS	STATIC PRESSURE SENSOR
SQ FT	SQUARE FOOT (FEET)
SS	STAINLESS STEEL
SSHX	STEAM TO STEAM HEAT EXCHANGER
SSR	SOLID SEPARATOR
ST	STEAM TRAP
SUH	STEAM UNIT HEATER
SVS	STEAM VENT SILENCER
SWHX	STEAM TO WATER HEAT EXCHANGER

T

T&PCV	TEMPERATURE AND PRESSURE CONTROL VALVE
TAB	TESTING, ADJUSTING, BALANCE
TD	TEMPERATURE DIFFERENCE
TDH	TOTAL DYNAMIC HEAD
TDS	TOTAL DISSOLVED SOLIDS
TG	TRANSFER GRILLE
TP	TRAP
TSP	TOTAL STATIC PRESSURE
TSTAT	THERMOSTAT
TU	TERMINAL UNIT
TWU	THRU-WALL UNIT

U

UC	UNDER CUT
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
URV	UPBLAST UNIT VENTILATOR

V

V	VALVE
VAF	VANE-AXIAL FAN
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER (MANUAL OPPOSED BLADE)
VFD	VARIABLE FREQUENCY DRIVE
VI	VIBRATION ISOLATOR
VIV	VARIABLE INLET VANES
VP	VACUUM PUMP
VPS	VARIABLE PRIMARY SYSTEM
VR	VACUUM (STEAM CONDENSATE) RETURN
VSD	VARIABLE SPEED DRIVE
VUH	VERTICAL UNIT HEATER

W

W	WATTS
WAG	WASTE ANESTHESIA GAS
Wb	WET-BULB (TEMPERATURE)
WC	WATER COOLED
WCCH	WATER COOLED CHILLER
WCCU	WATER COOLED CONDENSING UNIT
WCHP	WATER COOLED HEAT PUMPS
WCPU	WATER COOLED PACKAGED UNIT
WF	WATER FILTER
WFM	WATER FLOWMETER
WG	WATER GAGE
WPD	WATER SIDE PRESSURE DROP

X

X	INTENTIONALLY LEFT BLANK

Y

YR	YEAR

Z

Z	INTENTIONALLY LEFT BLANK

GENERAL ANNOTATIONS

- NAME / NUMBER — ROOM TAG
- 1 — OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT DESIGNATION
- 26-P-3 — BUILDING NUMBER WHERE EQUIPMENT IS LOCATED; EQUIPMENT ABBREVIATION (PUMP); PUMP NO. 3 IN BUILDING NO. 26 — **MECHANICAL EQUIPMENT TAG**
- 26-TU-1-1 — BUILDING NUMBER WHERE EQUIPMENT IS LOCATED; ITEM (TERMINAL UNIT); ITEM NUMBER (TERMINAL UNIT NO. 1); SERVED BY AIR HANDLER UNIT NO. 1 — **TERMINAL UNIT TAG**
- 1 / XX-XX — DETAIL NUMBER / SHEET NUMBER
- 1 / MH-100 — SECTION NUMBER / SHEET NUMBER
- (H) — HUMIDISTAT
- (T) — THERMOSTAT
- (H/T) — COMBINATION HUMIDSTAT & THERMOSTAT
- [H] — HUMIDITY SENSOR
- [T] — TEMPERATURE SENSOR
- DP — DIFFERENTIAL PRESSURE SENSOR; INDICATES ADJACENT RELATIVE SPACE

GENERAL PIPING SYMBOLS

- EXISTING TO REMAIN
- EXISTING TO BE DEMOLISHED
- NEW PIPE
- CONNECT NEW TO EXISTING
- LIMIT OF DEMOLITION

HVAC PIPING TYPES

BO	BOILER BLOWOFF
CBD	CONTINUOUS BLOWDOWN
CD	CONDENSATE DRAIN
CF	CHEMICAL FEED
CHR	CHILLED WATER RETURN
CHS	CHILLED WATER SUPPLY
CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
DR	DRIP RETURN
FWPD	FEEDWATER PUMP DISCHARGE
FWPS	FEEDWATER PUMP SUCTION
HHR	HEATING HOT WATER RETURN
HHS	HEATING HOT WATER SUPPLY
HPC	HIGH PRESSURE STEAM CONDENSATE
HPS	HIGH PRESSURE STEAM SUPPLY
LPS	LOW PRESSURE STEAM SUPPLY
LPC	LOW PRESSURE STEAM CONDENSATE
MPS	MEDIUM PRESSURE STEAM SUPPLY
MPC	MEDIUM PRESSURE STEAM CONDENSATE
PC	PUMPED CONDENSATE
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
QV	CRYOGEN VENT
VR	VACUUM RETURN

HVAC VALVE SYMBOLS

- ANGLE GLOBE VALVE
- BALL VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- CONTROL VALVE
- CONTROL VALVE, THREE WAY
- GATE VALVE
- GLOBE VALVE
- MV / AV — MANUAL OR AUTOMATIC AIR VENT
- MOTOR CONTROLLED VALVE
- PRESSURE REDUCING VALVE
- SAFETY RELIEF VALVE
- PRESSURE INDEPENDENT CONTROL VALVE

HVAC PIPING SYMBOLS

- ANCHOR
- CAP
- DIRECTION OF FLOW
- DIRECTION OF PIPE PITCH (DOWN)
- EJ — EXPANSION JOINT
- FLANGE CONNECTION
- FLOAT & THERMOSTATIC STEAM TRAP
- FLEXIBLE CONNECTOR
- FM — FLOW METER
- INVERTED BUCKET STEAM TRAP
- PIPE RISER
- PIPE DROP
- PRESSURE AND TEMPERATURE TEST PLUG
- PRESSURE GAUGE
- PUMP
- QUICK-COUPLE HOSE CONNECTOR
- REDUCER (CONCENTRIC)
- REDUCER (ECCENTRIC)
- STRAINER
- STRAINER WITH BLOWOFF AND HOSE CONNECTION
- TEE
- TEE UP
- TEE DOWN
- THERMOMETER
- UNION

GENERAL DUCT SYMBOLS

- EXISTING TO REMAIN
- EXISTING TO BE DEMOLISHED
- NEW DUCT (INSIDE DIMENSIONS: W" X D")
- CONNECT NEW TO EXISTING
- LIMIT OF DEMOLITION
- ELBOW WITH TURNING VANES
- ROUND ELBOW
- EXHAUST, RELIEF, MAKE UP, OR OUTSIDE AIR DUCT UP
- EXHAUST, RELIEF, MAKE UP, OR OUTSIDE AIR DUCT DOWN
- RETURN DUCT UP
- RETURN DUCT DOWN
- SUPPLY AIR DUCT UP
- SUPPLY AIR DUCT DOWN
- BRANCH DUCT WITH CONICAL FITTING & MANUAL VOLUME DAMPER
- SQUARE TO ROUND TRANSITION
- BRANCH DUCT WITH HIGH EFFICIENCY TAKE-OFF (HETO) BRANCH FITTING & MANUAL VOLUME DAMPER
- BD — DAMPERS: (BD, FD, FSD, MD, SD, VD)
- SD-1 / 300 — TYPE / AIRFLOW (CFM)
- RG-1 / 300 — TYPE / AIRFLOW (CFM)
- EG-1 / 300 — TYPE / AIRFLOW (CFM)

GENERAL NOTES:

A. MECHANICAL PLANS AND SECTIONS ARE INTENDED TO ACCURATELY ILLUSTRATE THE SCOPE OF WORK BUT ARE STILL DIAGRAMMATIC IN NATURE.

B. MECHANICAL DRAWINGS DO NOT SHOW ALL ACCESSORIES TO BE INSTALLED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL SYSTEMS ARE FULLY FUNCTIONAL AND COMPLIANT WITH APPLICABLE CODES.

C. THE EXISTING CONDITIONS DEPICTED IN THESE PLANS ARE BASED ON AS-BUILT DOCUMENTATION AND INFORMATION OBTAINED FROM FIELD SURVEYS AND ARE AS ACCURATE AS POSSIBLE. DUE TO OBSTRUCTIONS, CEILINGS, ETC., NOT ALL CONDITIONS COULD BE VERIFIED. THE CONTRACTOR SHALL SURVEY THE SITE PRIOR TO BID AND NOTIFY THE ARCHITECT/ENGINEER OF ANY CONFLICTS, OBSTRUCTIONS, OR INCONSISTENCIES PREVENTING INSTALLATION OF THE MECHANICAL SYSTEM.

D. ALL EXPOSED UNINSULATED PIPING SHALL BE PAINTED PER THE SPECIFICATION SECTION "PAINTING".

E. COORDINATE FAN COIL (FCU) AND TERMINAL UNIT (TU/VAV/CV) REHEAT COIL RIGHT OR LEFT HAND COIL CONNECTIONS WITH PIPING PLANS.

F. ALL FLUE AND COMBUSTION AIR PIPING FROM GAS-FIRED EQUIPMENT SHALL BE SIZED BY THE GAS-FIRED EQUIPMENT MANUFACTURER BASED ON THE SPECIFIC PIPE ROUTING AND ELEVATIONS FOR THIS PROJECT. REFER TO MANUFACTURERS INSTALLATION MANUAL AND LOCAL CODE REQUIREMENTS FOR REQUIRED FLUE AND COMBUSTION AIR PIPING MATERIALS.

G. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.

H. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO AND WITHIN 50' OF ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS) THROUGHOUT MECHANICAL EQUIPMENT ROOMS. DO THE SAME FOR SUPPORTS OF STEAM MAINS WITHIN 50' OF BOILER OR PRESSURE REDUCING VALVES.

I. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.

J. MAINTAIN A MINIMUM OF 6'-8" CLEARANCE TO UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.

K. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.

L. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.

M. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.

N. CONCRETE HOUSEKEEPING PADS TO SUIT MECHANICAL EQUIPMENT SHALL BE SIZED AND LOCATED BY THE MECHANICAL CONTRACTOR. MINIMUM CONCRETE PAD THICKNESS SHALL BE 4". PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 4" ON EACH SIDE. CONCRETE HOUSEKEEPING PADS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE SIZE AND LOCATION OF CONCRETE HOUSEKEEPING PADS.

O. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, ETC.) IS SUB-CONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.

P. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.

Q. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

R. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS WHERE REQUIRED TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT.

S. ALL DUCTWORK, PIPING AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS.WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.

T. ALL ROOF MOUNTED EQUIPMENT CURBS FOR EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR. COORDINATE INSTALLATION WITH GENERAL CONTRACTOR.

U. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.

V. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH AN APPROVED FIRE STOPPING MATERIAL.

W. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT AND ROOFTOP UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH P-TRAP, AND PIPED TO NEAREST DRAIN. SEE DETAILS AND SPECIFICATIONS FOR DEPTH OF AIR CONDITIONING CONDENSATE TRAP.

X. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.

PIPING GENERAL NOTES:

A. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.

B. ELEVATIONS AS SHOWN ON THE DRAWINGS ARE TO THE CENTERLINE OF ALL PRESSURE PIPING AND TO THE INVERT OF ALL GRAVITY PIPING.

C. MAINTAIN A MINIMUM OF 3'-6" OF GROUND COVER OVER ALL UNDERGROUND HVAC PIPING (EDIT DEPTH OF GROUND COVER TO SUIT FROST LINE DEPTH AND PROJECT REQUIREMENTS).

D. UNLESS OTHERWISE NOTED, ALL CHILLED WATER AND HEATING WATER PIPING SHALL BE 3/4" SIZE (EDIT SYSTEM TYPE OR PIPE SIZE TO SUIT PROJECT REQUIREMENTS).

E. PROVIDE AN AIR VENT AT THE HIGH POINT OF EACH DROP IN THE HEATING WATER, CHILLED WATER, AND OTHER CLOSED WATER PIPING SYSTEMS (EDIT SYSTEM TYPES TO SUIT PROJECT REQUIREMENTS). ALL PIPING SHALL GRADE TO LOW POINTS. PROVIDE HOSE END DRAIN VALVES AT THE BOTTOM OF ALL RISERS AND LOW POINTS.

F. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO UNDERSIDE OF STRUCTURE OR SLAB, WITH SPACE FOR INSULATION IF REQUIRED.

G. INSTALL PIPING SO THAT ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.

H. ALL VALVES SHALL BE INSTALLED SO THAT VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.

I. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS).

J. PROVIDE CHAINWHEEL OPERATORS FOR ALL VALVES IN EQUIPMENT ROOMS MOUNTED GREATER THAN 7'-0" ABOVE FLOOR LEVEL; CHAIN SHALL EXTEND TO 7'-0" ABOVE FLOOR LEVEL.

K. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS.

L. UNIONS AND/OR FLANGES SHALL BE INSTALLED AT EACH PIECE OF EQUIPMENT, IN BYPASSES, AND IN LONG PIPING RUNS (100' OR MORE) TO PERMIT DISASSEMBLY FOR ALTERATION AND REPAIRS.

M. PITCH STEAM PIPING DOWNWARD IN THE DIRECTION OF FLOW 1/4" IN 10' (1" IN 40') MINIMUM. PITCH ALL STEAM RETURN LINES DOWNWARD IN THE DIRECTION OF CONDENSATE FLOW 1/2" PER 10' (1" IN 20') MINIMUM. WHERE LENGTH OF BRANCH LINES ARE LESS THAN 8', PITCH BRANCH LINES TOWARD MAINS 1/2" PER FOOT MINIMUM.

N. PITCH UP ALL STEAM AND CONDENSATE RUNOUTS TO RISERS AND EQUIPMENT 1/2" PER FOOT. WHERE THIS PITCH CANNOT BE OBTAINED, RUNOUTS OVER 8' IN LENGTH SHALL BE ONE SIZE LARGER THAN NOTED.

O. TAP ALL BRANCH LINES FROM TOP OF STEAM MAINS (45° PREFERRED, 90° ACCEPTABLE).

P. PROVIDE AN END OF MAIN DRIP AT EACH RISE IN THE STEAM MAIN. PROVIDE CONDENSATE DRIPS AT THE BOTTOM OF ALL STEAM RISERS, DOWNFED RUNOUTS TO EQUIPMENT, RADIATORS, ETC., AT END OF MAINS AND LOW POINTS, AND AHEAD OF ALL PRESSURE REGULATORS, CONTROL VALVES, ISOLATION VALVES, AND EXPANSION JOINTS.

Q. ON STRAIGHT STEAM PIPING RUNS WITH NO NATURAL DRAINAGE POINTS, INSTALL DRIP LEGS AT INTERVALS NOT EXCEEDING 200' WHERE PIPE IS PITCHED DOWNWARD IN THE DIRECTION OF STEAM FLOW AND A MAXIMUM OF 100' WHERE THE PIPE IS PITCHED UP SO THAT CONDENSATE FLOW IS OPPOSITE OF STEAM FLOW.

R. STEAM TRAPS SHALL BE MINIMUM 3/4" IN SIZE.

S. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING.

T. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.

U. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.

V. ALL PIPING WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

W. PROVIDE FLEXIBLE CONNECTIONS IN ALL PIPING SYSTEMS CONNECTED TO PUMPS, CHILLERS, COOLING TOWERS, AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION EXCEPT WATER COILS. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AS CLOSE TO THE EQUIPMENT AS POSSIBLE OR AS INDICATED ON THE DRAWINGS.

X. SLOPE REFRIGERANT PIPING ONE PERCENT IN THE DIRECTION OF OIL RETURN. LIQUID LINES MAY BE INSTALLED LEVEL.

Y. INSTALL HORIZONTAL REFRIGERANT HOT GAS DISCHARGE PIPING WITH 1/2" PER 10' DOWNWARD SLOPE AWAY FROM THE COMPRESSOR.

Z. INSTALL HORIZONTAL REFRIGERANT SUCTION LINES WITH 1/2" PER 10' DOWNWARD SLOPE TO THE COMPRESSOR, WITH NO LONG TRAPS OR DEAD ENDS WHICH MAY CAUSE OIL TO SEPARATE FROM THE SUCTION GAS AND RETURN TO THE COMPRESSOR IN DAMAGING SLUGS.

AA. PROVIDE LINE SIZE LIQUID INDICATORS IN MAIN LIQUID LINE LEAVING CONDENSER OR RECEIVER. INSTALL MOISTURE LIQUID INDICATORS IN LIQUID LINES BETWEEN FILTER DRYERS AND THERMOSTATIC EXPANSION VALVES AND IN LIQUID LINE TO RECEIVER.

BB. PROVIDE LINE SIZE STRAINER UPSTREAM OF EACH AUTOMATIC VALVE. PROVIDE SHUTOFF VALVE ON EACH SIDE OF STRAINER.

CC. PROVIDE PERMANENT FILTER DRYERS IN LOW TEMPERATURE SYSTEMS AND SYSTEMS USING HERMETIC COMPRESSORS.

DD. PROVIDE REPLACEABLE CARTRIDGE FILTER DRYERS WITH THREE-WAY VALVE BYPASS A ASSEMBLY FOR SOLENOID VALVES, ADJACENT TO RECEIVERS.

EE. PROVIDE REFRIGERANT CHARGING VALVE CONNECTIONS IN LIQUID LINE BETWEEN RECEIVER SHUTOFF VALVE AND EXPANSION VALVE.

HVAC/SHEET METAL GENERAL NOTES:

A. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE HVAC SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.

B. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.

C. IN CORRIDORS WHERE CEILING SPEAKERS AND AIR DIFFUSERS ARE INDICATED BETWEEN THE SAME LIGHT FIXTURES, INSTALL BOTH DEVICES AT THE QUARTER POINTS BETWEEN THE SAME FIXTURE.

D. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS AND HUMIDISTATS 4'-0" (CENTERLINE) ABOVE FINISHED FLOOR.

E. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.

F. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.

G. PROVIDE ALL 90° SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN DISHWASHER, KITCHEN, AND LAUNDRY EXHAUST SHALL BE UNVANED SMOOTH RADIUS CONSTRUCTION WITH A RADIUS EQUAL TO 1.5 TIMES THE WIDTH OF THE DUCT. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.

H. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.

I. FIELD ERECTED AND FACTORY ASSEMBLED AIR HANDLING UNIT COILS SHALL BE ARRANGED FOR REMOVAL FROM THE UPSTREAM SIDE WITHOUT DISMANTLING SUPPORTS. PROVIDE GALVANIZED STRUCTURAL STEEL SUPPORTS FOR ALL COILS (EXCEPT LOWEST COIL) IN BANKS OVER TWO COILS HIGH TO PERMIT INDEPENDENT REMOVAL OF ANY COIL.

J. ALL AIR HANDLING UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.

K. LOCATE ALL MECHANICAL EQUIPMENT (SINGLE DUCT, DUAL DUCT, VARIABLE VOLUME, CONSTANT VOLUME AND FAN POWERED BOXES, FAN COIL UNITS, CABINET HEATERS, UNIT HEATERS, UNIT VENTILATORS, COILS, STEAM HUMIDIFIERS, ETC.) FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS AND VALVING.

L. FINNED TUBE RADIATION ENCLOSURES SHALL BE WALL TO WALL UNLESS OTHERWISE INDICATED.

M. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN, AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS, AND OTHER EQUIPMENT WHICH REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.

N. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF REQUIRED.

M. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5' MAXIMUM LENGTH.

O. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

P. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, HUMIDIFIERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/OR INSPECTION.

Q. PROVIDE ACCESS DOORS IN DUCTWORK FOR OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.

R. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING STRAPS. GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.

S. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MOUNTING THE SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS.

T. TERMINATE GAS VENTS FOR UNIT HEATERS, WATER HEATERS, HIGH PRESSURE PARTS WASHER, HIGH PRESSURE CLEANER, AND OTHER GAS APPLIANCES A MINIMUM OF 3'-0" ABOVE ROOF WITH RAIN CAP (NOTE TO DESIGNER: EDIT APPLIANCES AND HEIGHT ABOVE ROOF TO MEET CODE AND TO SUIT PROJECT REQUIREMENTS).

U. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

V. LOUVER SIZES, LOCATIONS, MOUNTING, AND DETAILS SHALL BE COORDINATED WITH OTHER TRADES INVOLVED. REFER TO ARCHITECTURAL SPECIFICATIONS FOR DETAILED DESCRIPTIONS.

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KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP: J. ROSS MYLES, LICENSED PROFESSIONAL ENGINEER, 27054, KANSAS, 12-21-2022

Drawing Title: **LEGEND AND ABBREVIATIONS**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number: 589-704

Building Number: 26

Drawing Number: **M-000**

Drawing # 117 OF 190

Veterans Health Administration

VA U.S. Department of Veterans Affairs

12/19/2022 2:09:02 PM

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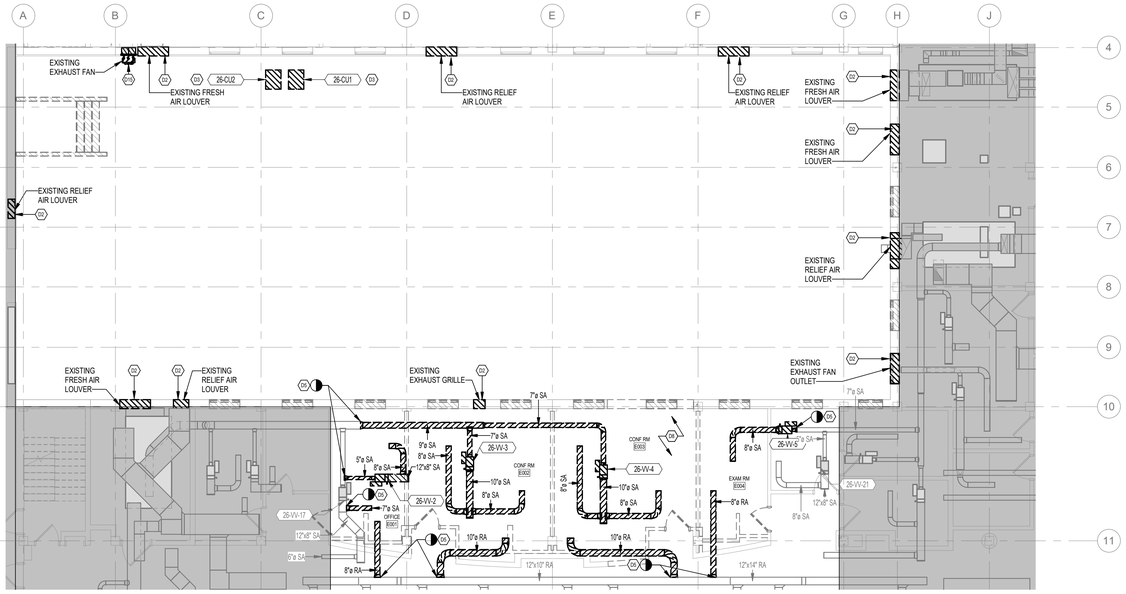
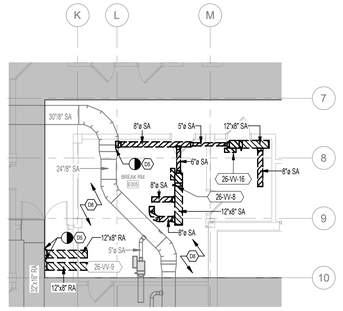


2 GROUND FLOOR MECHANICAL HVAC DUCT DEMOLITION PLAN - PHASE ONE
1/8" = 1'-0"



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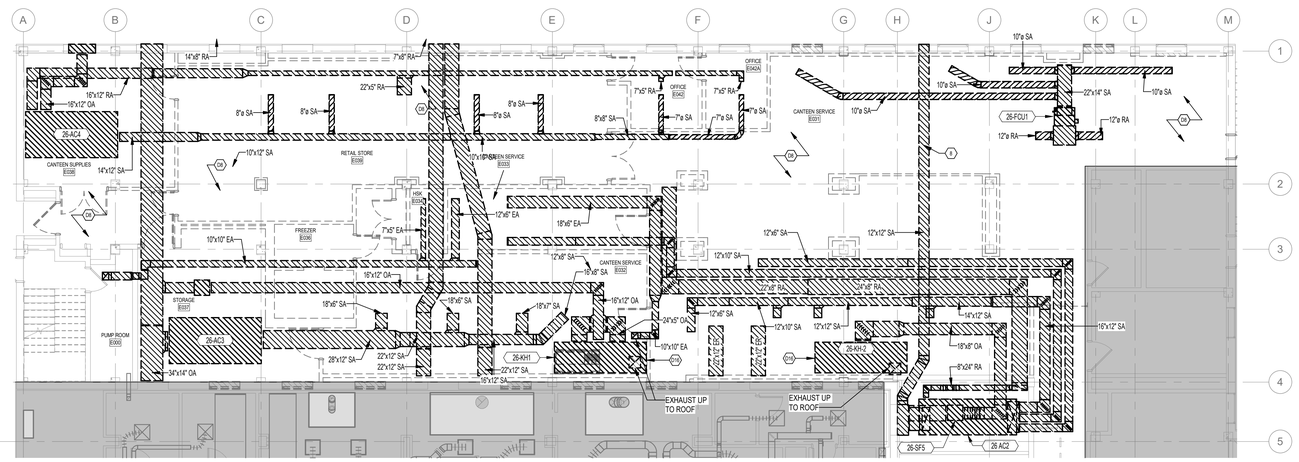
1/8" = 1'-0"



1 GROUND FLOOR MECHANICAL HVAC DUCT DEMOLITION PLAN - PHASE TWO
1/8" = 1'-0"

DEMOLITION KEYNOTES

D2 CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING LOUVER AND ASSOCIATED ACCESSORIES.

D3 CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING OUTDOOR CONDENSING UNITS AND ASSOCIATED PIPING TO EXTERIOR WALL. ROUTE REFRIGERANT PIPING FROM NEW CONDENSING UNITS TO EXISTING WALK-IN FREEZER AND COOLER. REFER TO MH104 FOR NEW CONDENSING UNIT LOCATIONS. COORDINATE DEMOLITION AND INSTALLATION WITH VA TO ENSURE SERVICE TO THE CANTEEN IS NOT INTERRUPTED.

D5 CONTRACTOR SHALL DEMOLISH DUCTWORK AND ALL ASSOCIATED EQUIPMENT, GRILLES, DAMPERS, AND ACCESSORIES BACK TO MAIN BRANCH AND CAP.

D8 CONTRACTOR SHALL DEMOLISH ALL DIFFUSERS/GRILLES, THERMOSTATS, DAMPERS, AND ANY OTHER ACCESSORIES ASSOCIATED WITH THE CURRENT HVAC SYSTEM NOT EXPLICITLY LABELED TO REMAIN.

D15 CONTRACTOR SHALL DEMOLISH EXHAUST FAN AND ASSOCIATED ACCESSORIES.

D16 CONTRACTOR SHALL DEMOLISH KITCHEN HOOD.

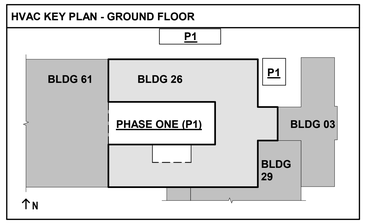
KEYNOTES

8 TEMPORARY DUCT TO BE ADDED DURING PHASE 1 AND TO BE DEMOLISHED DURING PHASE 2.

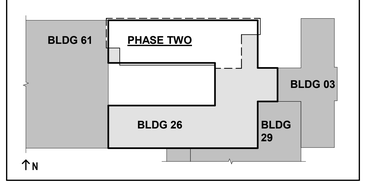
PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE G0011 - PHASING PLANS FOR MORE INFORMATION.

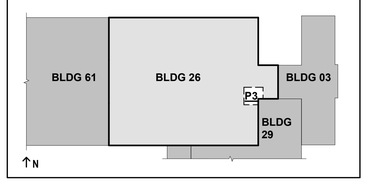
HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



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NO.	REVISION DESCRIPTION	DATE

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KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES DAWSON 27054 KANSAS PROFESSIONAL ENGINEER 12-21-2022

Drawing Title
GROUND FLOOR MECHANICAL DUCT DEMOLITION PLANS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **MHD101**

Drawing # 118 OF 190

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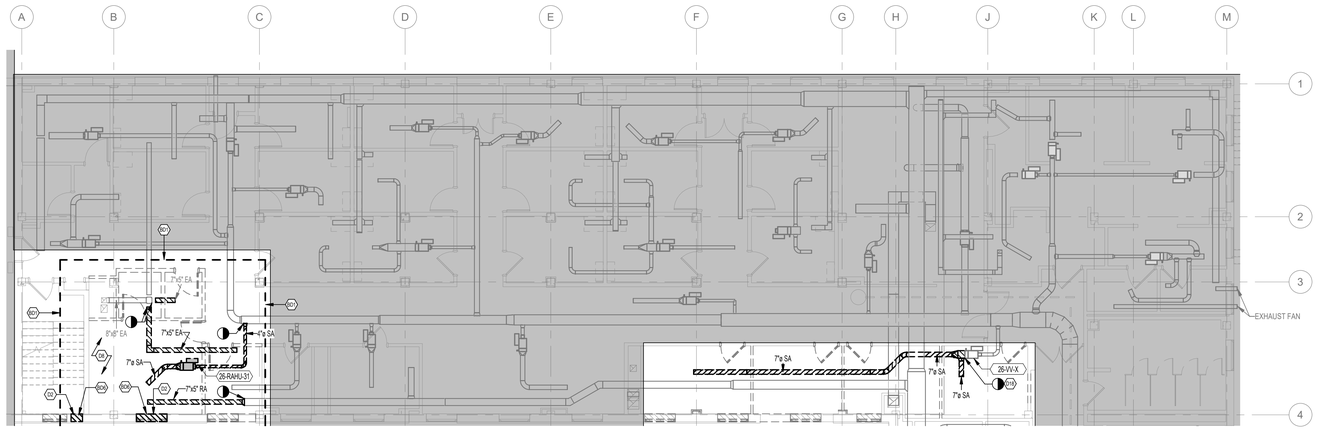
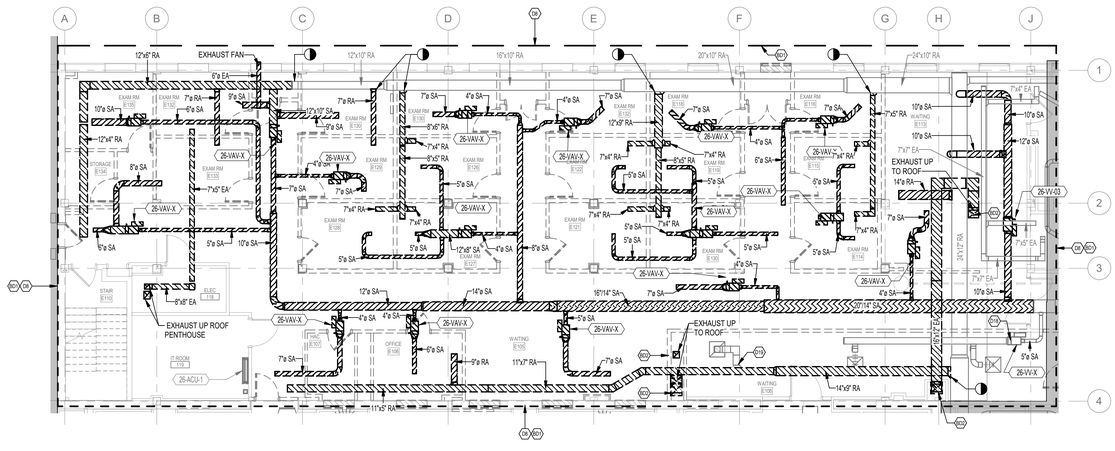


2 FIRST FLOOR MECHANICAL HVAC DUCT DEMOLITION PLAN - PHASE ONE
1/8" = 1'-0"



1 FIRST FLOOR MECHANICAL HVAC DUCT DEMOLITION PLAN - PHASE TWO
1/8" = 1'-0"

DEMOLITION KEYNOTES

D2 CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING LOUVER AND ASSOCIATED ACCESSORIES.

D8 CONTRACTOR SHALL DEMOLISH ALL DIFFUSERS/GRILLES, THERMOSTATS, DAMPERS, AND ANY OTHER ACCESSORIES ASSOCIATED WITH THE CURRENT HVAC SYSTEM NOT EXPLICITLY LABELED TO REMAIN.

D1 8 TERMINAL UNIT TO REMAIN TEMPORARILY TO SERVE PATIENT CORRIDOR DURING PHASE1. DEMOLISH TERMINAL UNIT, HEATING WATER PIPING, TEMPORARY DUCT AND AIR DEVICES ONCE PHASE ONE IS COMPLETE.

D1 9 RETURN AIR DEVICE AND ASSOCIATED DUCT TO BE DEMOLISHED ONCE PHASE 1 IS COMPLETE.

BID DEDUCT KEYNOTES

BD1 FOR BID DEDUCT, THIS AREA TO REMAIN. NO DEMOLITION TO OCCUR EXCEPT WHERE SPECIFICALLY INDICATED.

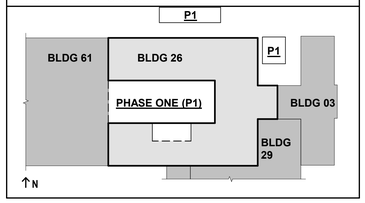
BD2 FOR BID DEDUCT, DUCTWORK UP TO EXHAUST FAN WILL BE DEMOLISHED AND REMOVED.

BD6 FOR BID DEDUCT, DEMOLISH AND REMOVE EXHAUST GRILLE AND INTAKE LOUVER IN LOCATION SHOWN. PREPARE SPACE TO ROUTE DUCTWORK UP TO ROOF.

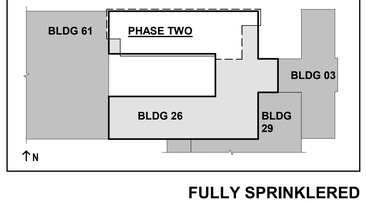
PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



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KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

DENNIS R. ROSS MYERS — 27054 — 12/21/2022 — KANSAS — PROFESSIONAL ENGINEER

Drawing Title
FIRST FLOOR MECHANICAL HVAC DUCT DEMOLITION PLAN

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **MHD102**

Drawing # 119 OF 190

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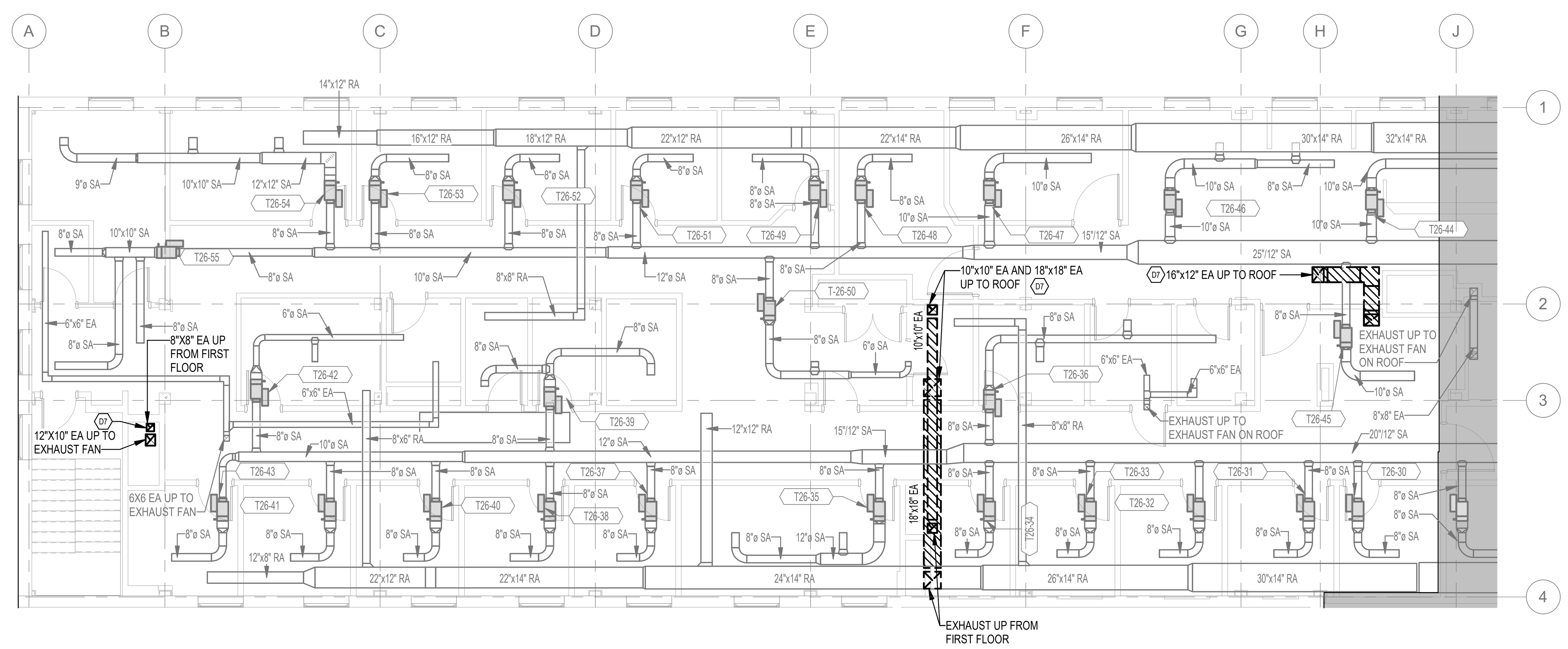
DEMOLITION KEYNOTES

D7 CONTRACTOR SHALL DEMOLISH EXHAUST DUCTWORK UP TO EXHAUST FAN ON ROOF.



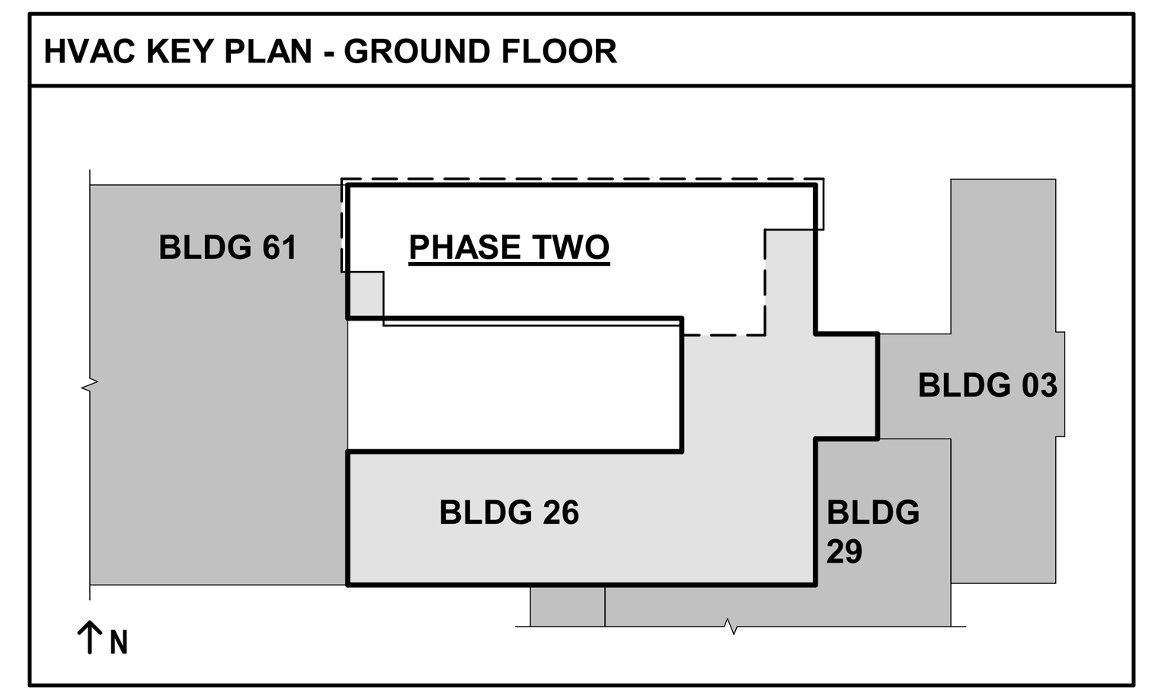
1 SECOND FLOOR MECHANICAL HVAC DUCT DEMOLITION PLAN - PHASE TWO

1/8" = 1'-0"

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



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STAMP: J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title: **SECOND FLOOR MECHANICAL HVAC DUCT DEMOLITION PLANS**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number: 589-704

Building Number: 26

Drawing Number: **MHD103**

Drawing # 120 OF 190

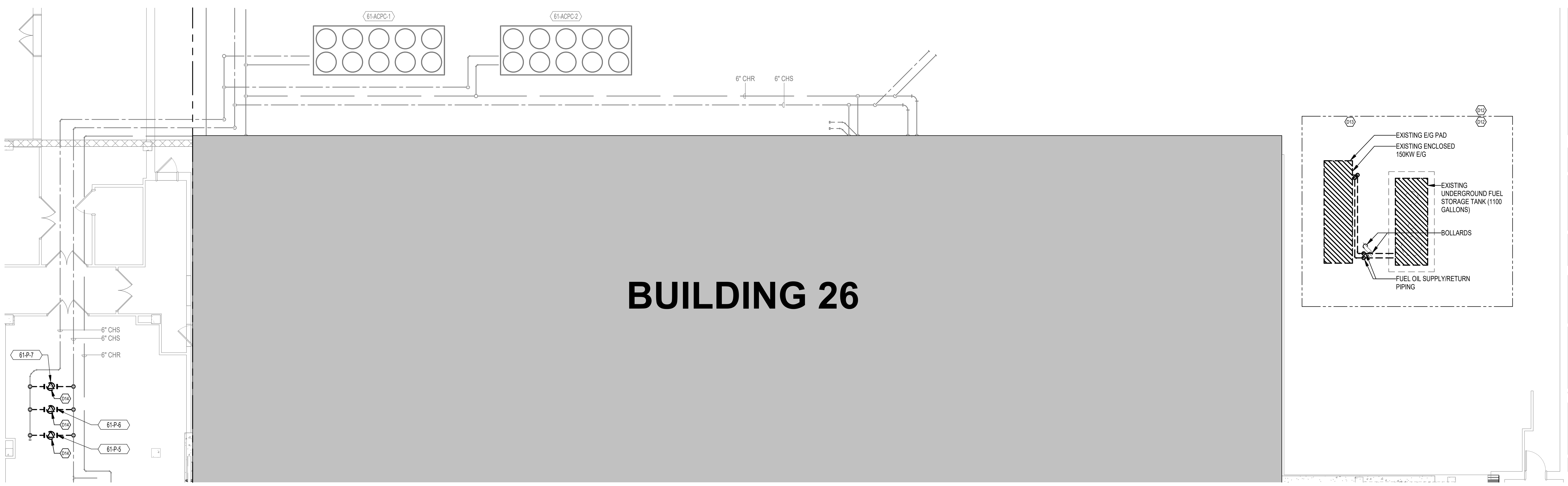
Veterans Health Administration

VA U.S. Department of Veterans Affairs

VA FORM 08-6231

DEMOLITION KEYNOTES

- D12 REFER TO ELECTRICAL PLANS FOR ENGINE GENERATOR DEMOLITION INFORMATION.
- D13 REFER TO ELECTRICAL PLANS FOR TEMPORARY ENGINE GENERATOR FOR USE DURING DEMOLITION AND INSTALLTION OF NEW.
- D14 CONTRACTOR SHALL DEMOLISH EXISTING CHILLED WATER PUMPS, ACCESSORIES, PIPING, AND VALVES FROM INLET AND OUTLET TO EXISTING TEE AT HEADER. COORDINATE WITH CONTROLS CONTRACTOR TO ENSURE NEW PUMPS HAVE ALL NECESSARY COMPONENTS TO RECONNECT TO BAS.



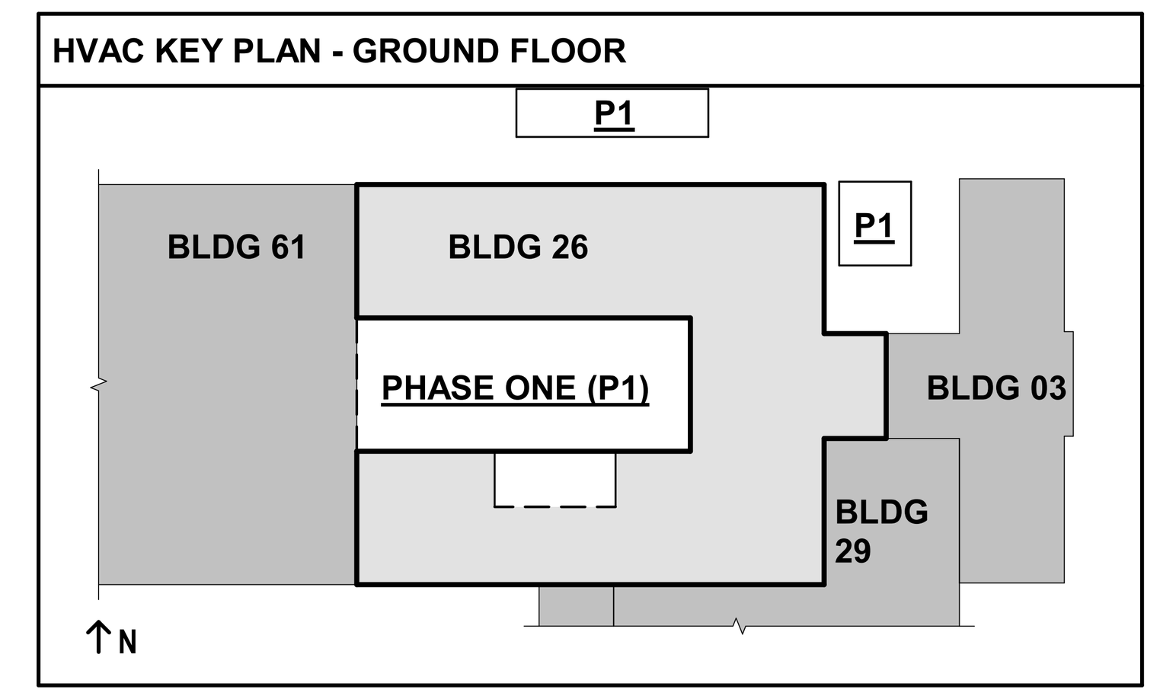
1 SERVICE YARD DEMOLITION PLAN - PHASE ONE

1/8" = 1'-0"

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER	MECH / ELEC / PLUMB / TECH ENGR	FIRE PROTECTION ENGINEER
H2B, INC. 1225 N. LOOP WEST, SUITE 800 HOUSTON, TX 77008 (713) 864-2900	SPUR DESIGN 25219 MADISON AVE, SUITE 100 KANSAS CITY, MO 64108 (913) 369-7200	POOLE FIRE PROTECTION, INC. 19910 WEST 161ST STREET OLATHE, KANSAS 66062 (913) 829-8690
INDUSTRIAL HYGENIST	HEALTHCARE PLANNER	PHYSICAL SECURITY
RIVERFRONT HEALTH & SAFETY 1139 OLIVE STREET, ST. LOUIS, MO 63101 (314) 436-9492	INNOVA GROUP 3196 N. SWAN ROAD TUCSON, AZ 85712 (520) 886-8650	FORCE PROTECT 10901 FRONT BEACH ROAD, STE 1415 PANAMA CITY, FL 32407 (502) 836-4232

ARCHITECT: SPUR PROJECT #: 2016

SPUR DESIGN, LLC
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(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

Drawing Title: **SERVICE YARD DEMOLITION PLAN**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number: 589-704

Building Number: 26

Drawing Number: **MHD104**

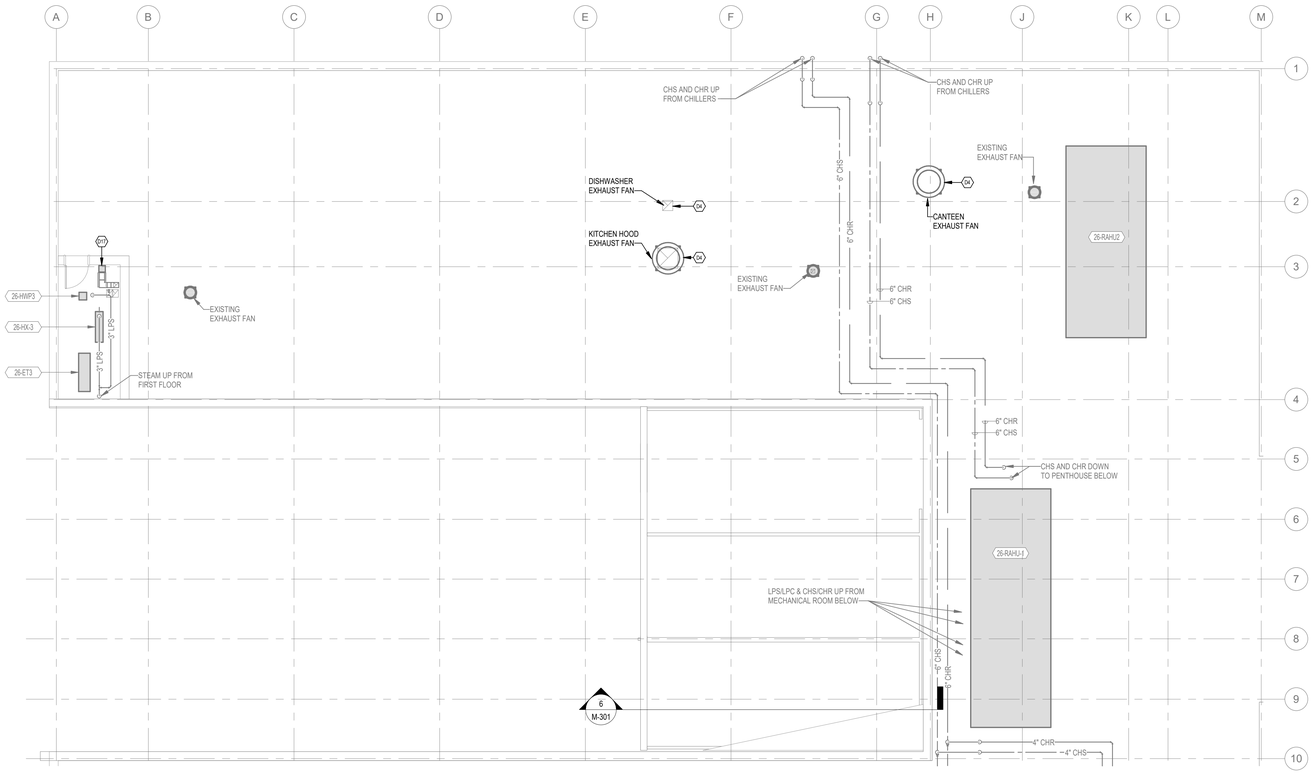
Drawing # 121 OF 190

Veterans Health Administration

VA U.S. Department of Veterans Affairs

12/19/2022 2:09:22 PM

VA FORM 08-6231



1 ROOF MECHANICAL HVAC DUCT AND PIPING DEMOLITION PLAN - PHASE TWO
1/8" = 1'-0"

DEMOLITION KEYNOTES

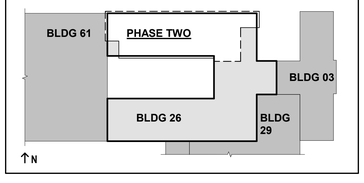
D4 CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING EXHAUST FAN. EXISTING FAN CURB TO REMAIN. SHALL BE CAPPED, SEALED WEATHER-TIGHT AND INSULATED WITH 3" THICK POLYISOCYANURATE BOARD.

D17 CONTRACTOR SHALL DEMOLISH ROOF MOUNTED EXHAUST FAN AND DUCT.

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE G1011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



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NO.	REVISION DESCRIPTION	DATE

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CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
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OLATHE, KANSAS 66062
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INDUSTRIAL HYGENIST
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HEALTHCARE PLANNER
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PHYSICAL SECURITY
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10901 FRONT BEACH ROAD, STE 1415
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(502) 836-4232

ARCHITECT:

SPUR PROJECT #: 2016

SPUR DESIGN, LLC
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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES BRENNAN 27054 KANSAS PROFESSIONAL ENGINEER 12/1/2022

Drawing Title
ROOF MECHANICAL HVAC DUCT AND PIPING DEMOLITION PLAN

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **MHPD101**

Drawing # 122 OF 190

Veterans Health Administration

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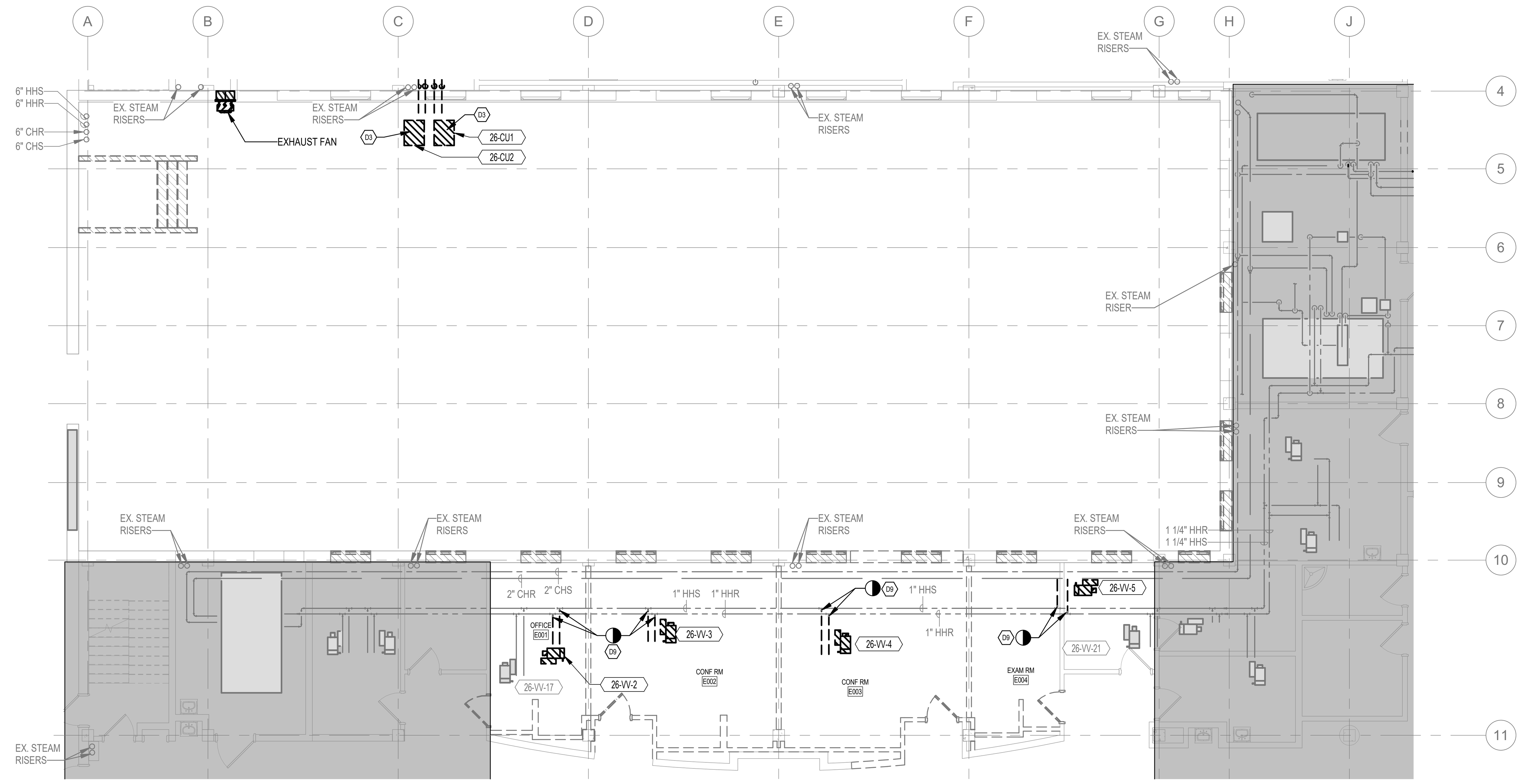
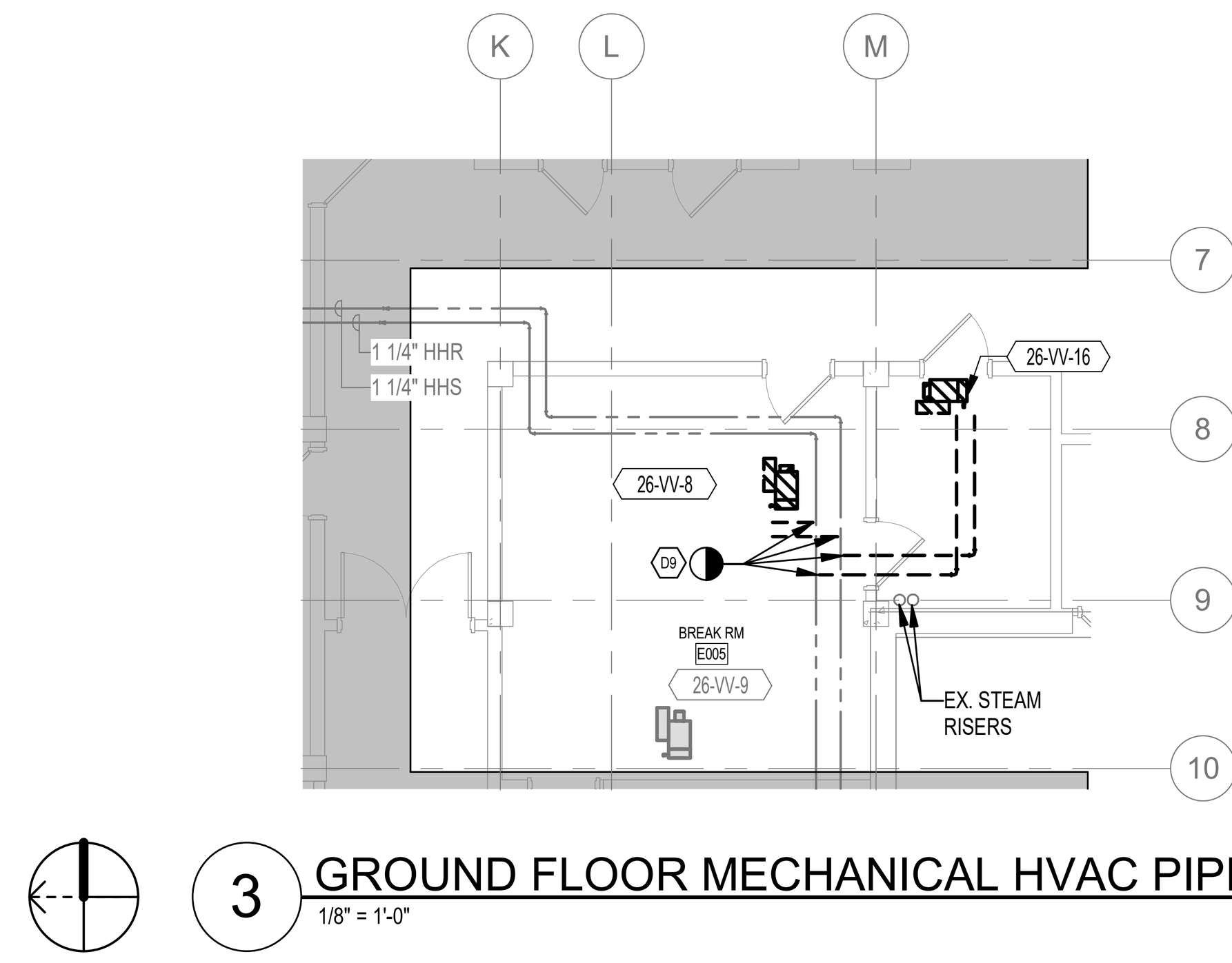
DEMOLITION KEYNOTES

- D3 CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING OUTDOOR CONDENSING UNITS AND ASSOCIATED PIPING TO EXTERIOR WALL. ROUTE REFRIGERANT PIPING FROM NEW CONDENSING UNITS TO EXISTING WALK-IN FREEZER AND COOLER. REFER TO MH104 FOR NEW CONDENSING UNIT LOCATIONS. COORDINATE DEMOLITION AND INSTALLATION WITH VA TO ENSURE SERVICE TO THE CANTEEN IS NOT INTERRUPTED.
- D9 CONTRACTOR SHALL DEMOLISH AND REMOVE HYDRONIC WATER, STEAM, OR CONDENSATE PIPING AND ACCESSORIES FROM ASSOCIATED TERMINAL UNIT, FAN COIL UNIT, OR AHU BACK TO DEMARCATION POINT SHOWN. CAP EXISTING TEE AT MAIN BRANCH.
- D10 CONTRACTOR SHALL DEMOLISH AND REMOVE AIR HANDLING UNIT AND ASSOCIATED DUCTS, PIPING, SUPPORTS, AND ACCESSORIES BACK TO DEMARCATION POINT.



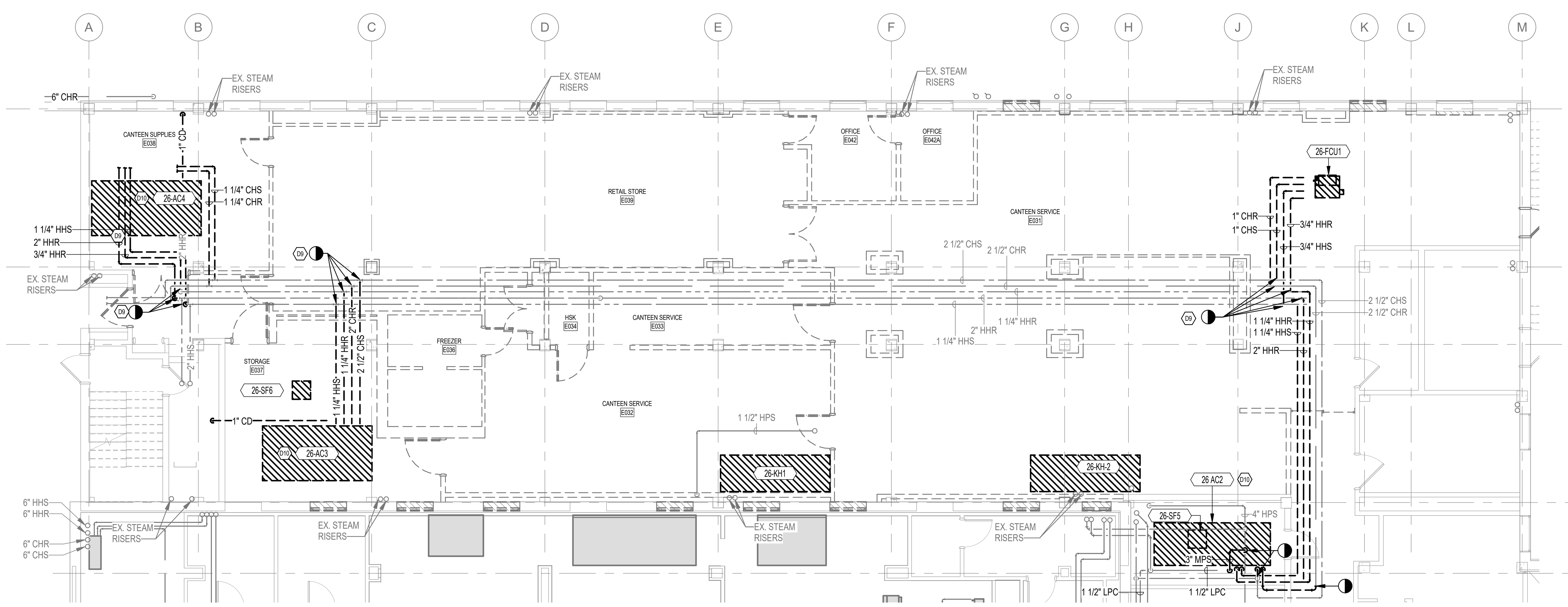
2 GROUND FLOOR MECHANICAL HVAC PIPING DEMOLITION PLAN - PHASE ONE

1/8" = 1'-0"



3 GROUND FLOOR MECHANICAL HVAC PIPING DEMOLITION PLAN - PHASE ONE

1/8" = 1'-0"



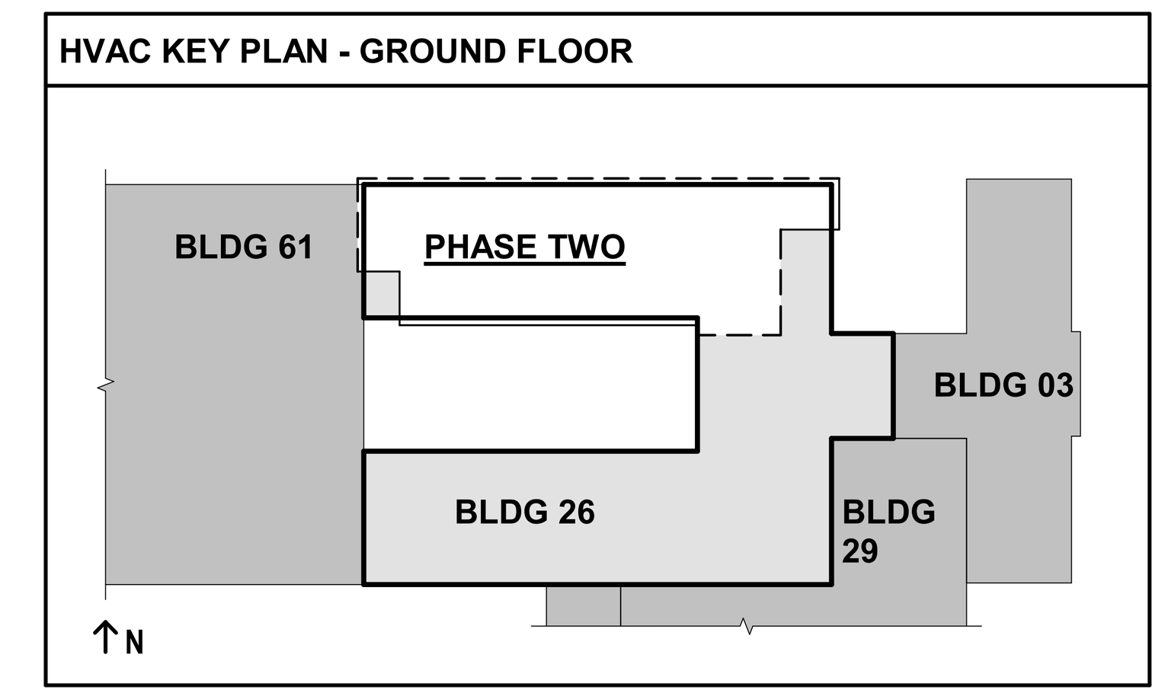
1 GROUND FLOOR MECHANICAL HVAC PIPING DEMOLITION PLAN - PHASE TWO

1/8" = 1'-0"

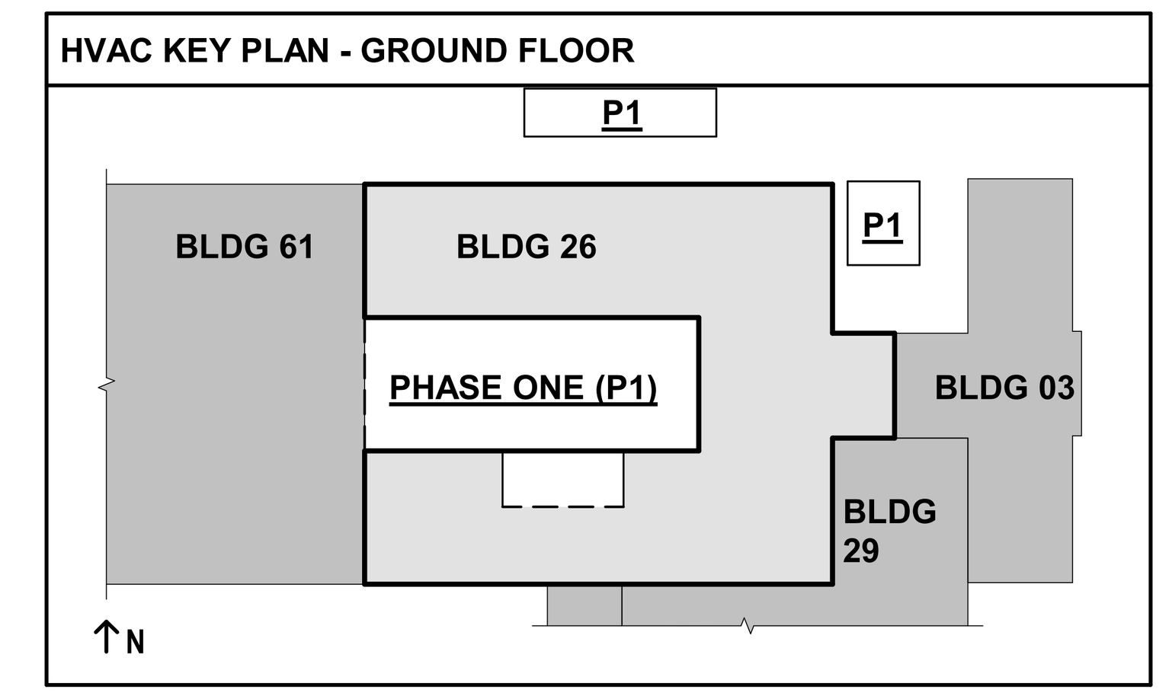
PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

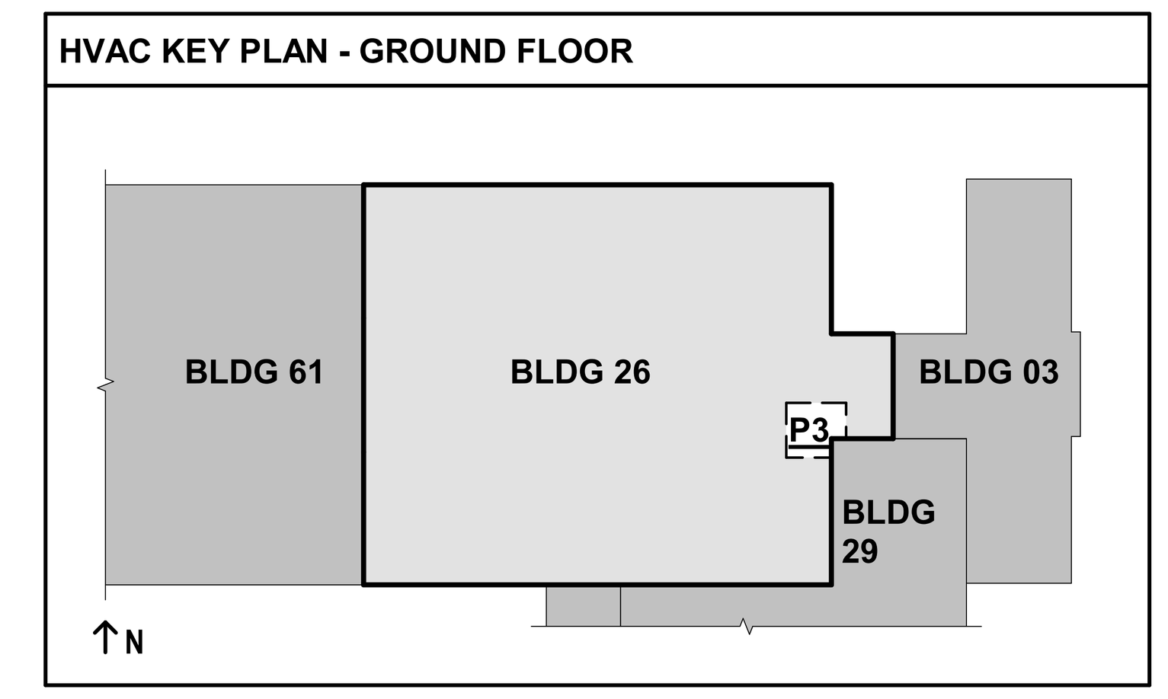
HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



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100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
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(713) 864-2900

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INDUSTRIAL HYGENIST
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PHYSICAL SECURITY
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(502) 836-4232

ARCHITECT: SPUR PROJECT #: 2016

SPUR DESIGN, LLC
312 SW 25TH STREET
Oklahoma City, OK 73109
(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP: J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title: **GROUND FLOOR MECHANICAL HVAC PIPING DEMOLITION PLANS**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date: 12/21/2022 | Checked: JRM | Drawn: GT

Project Number: 589-704

Building Number: 26

Drawing Number: **MPD101**

Drawing # 123 OF 190

Veterans Health Administration

VA U.S. Department of Veterans Affairs

12/19/2022 2:09:28 PM

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DEMOLITION KEYNOTES

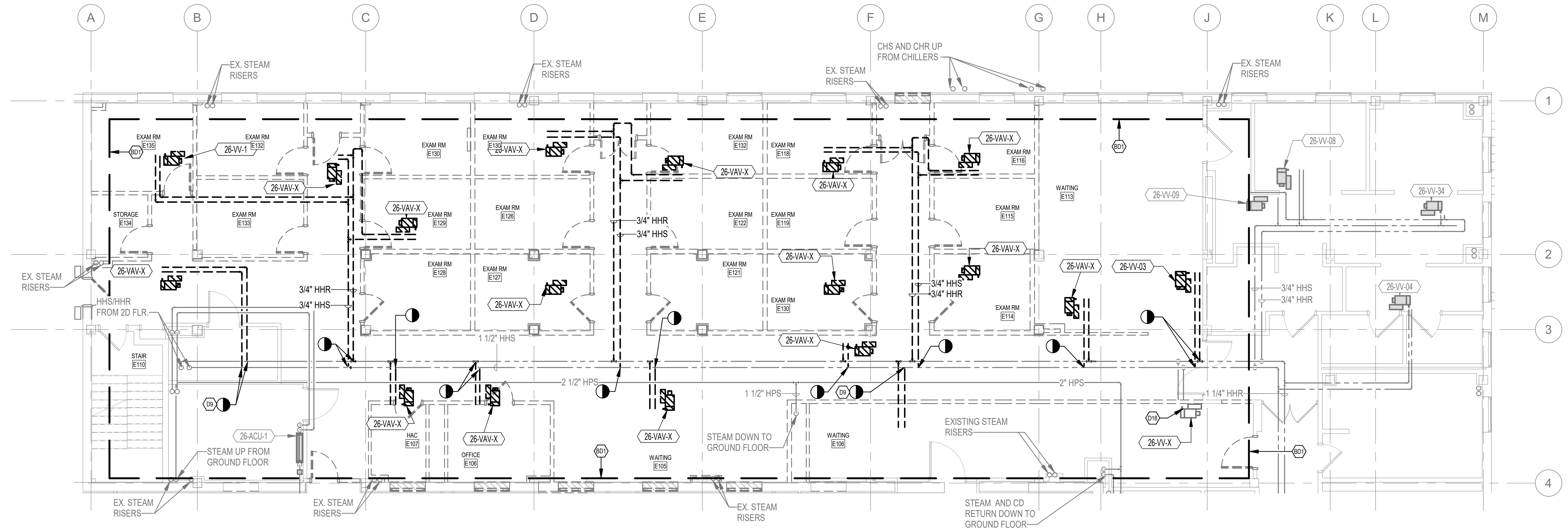
D9 CONTRACTOR SHALL DEMOLISH AND REMOVE HYDRONIC WATER, STEAM, OR CONDENSATE PIPING AND ACCESSORIES FROM ASSOCIATED TERMINAL UNIT, FAN COIL UNIT, OR AHU BACK TO DEMARCATION POINT SHOWN. CAP EXISTING TEE AT MAIN BRANCH.

D11 CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING CHILLED WATER PIPING BACK TO WALL AND UP TO ROOF. COORDINATE DEMOLITION AND INSTALLATION OF NEW PIPING WITH VA TO ENSURE NO DISRUPTION OF SERVICES TO BUILDING 61. REFER TO MP-101 FOR NEW PIPING ROUTING.

D18 TERMINAL UNIT TO REMAIN TEMPORARILY TO SERVE PATIENT CORRIDOR DURING PHASE1. DEMOLISH TERMINAL UNIT, HEATING WATER PIPING, TEMPORARY DUCT AND AIR DEVICES ONCE PHASE ONE IS COMPLETE.

BID DEDUCT KEYNOTES

BD1 FOR BID DEDUCT, THIS AREA TO REMAIN. NO DEMOLITION TO OCCUR EXCEPT WHERE SPECIFICALLY INDICATED.

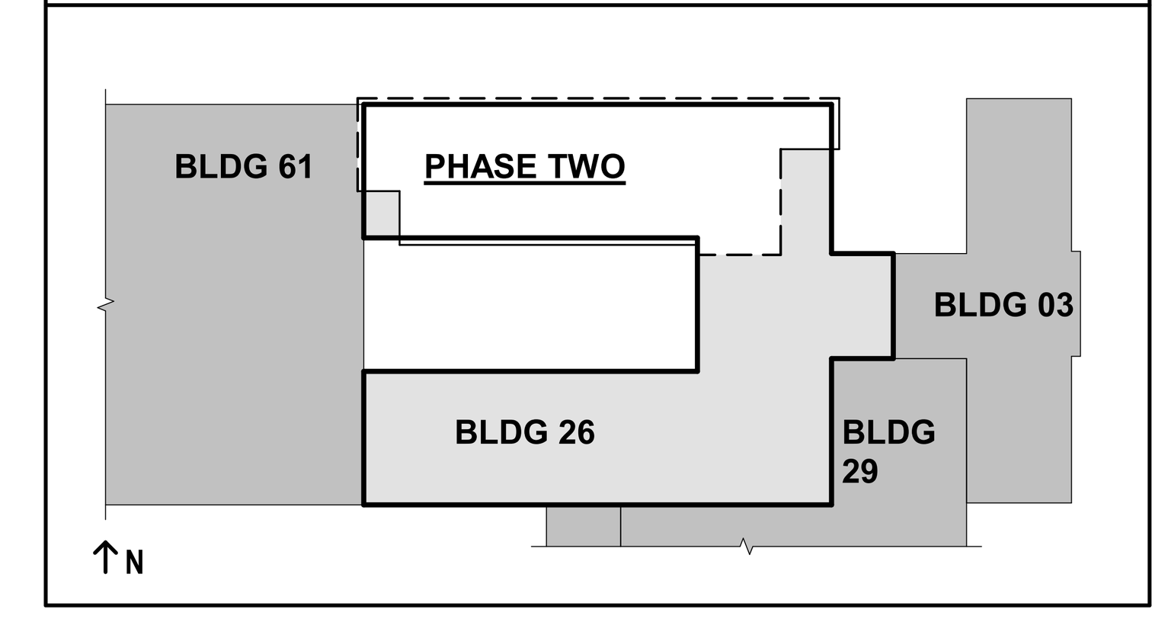


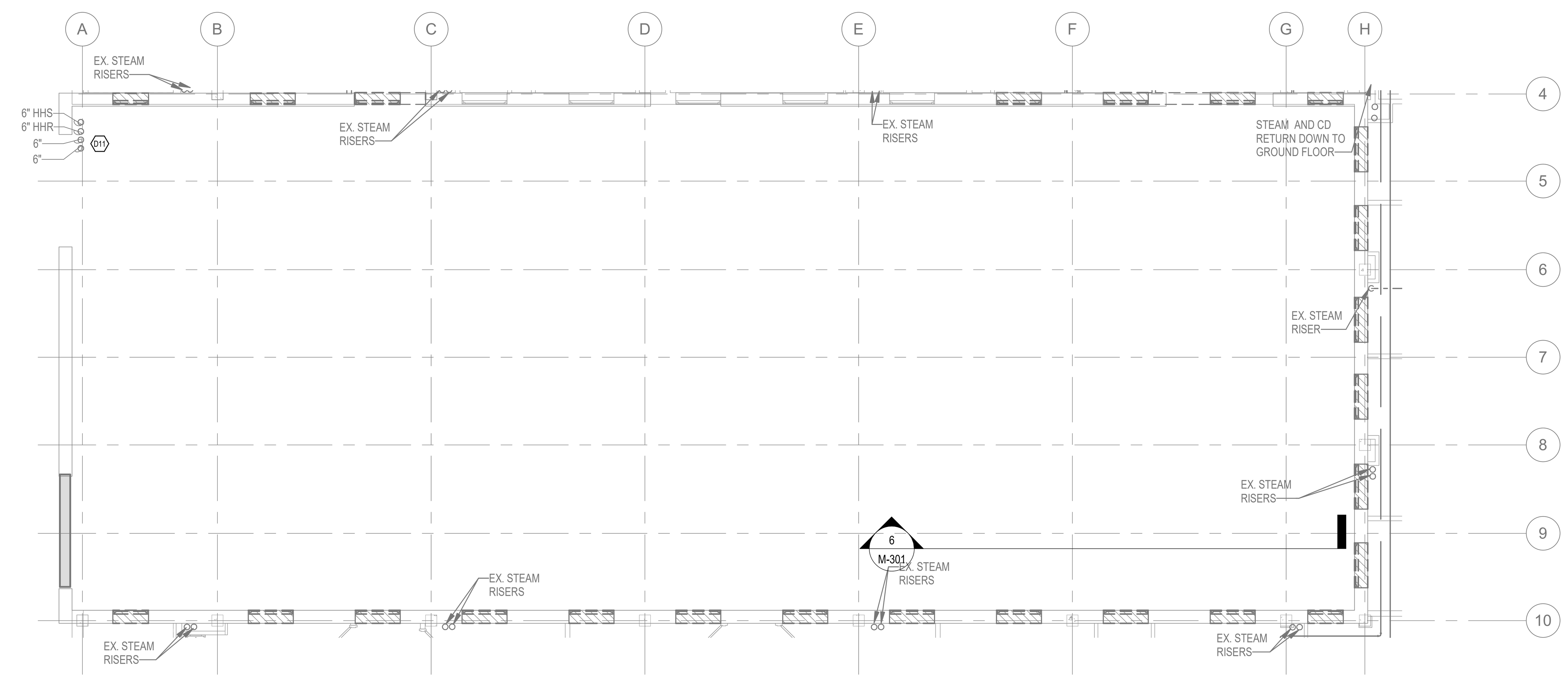
2 FIRST FLOOR MECHANICAL HVAC PIPING DEMOLITION PLAN - PHASE TWO
1/8" = 1'-0"

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

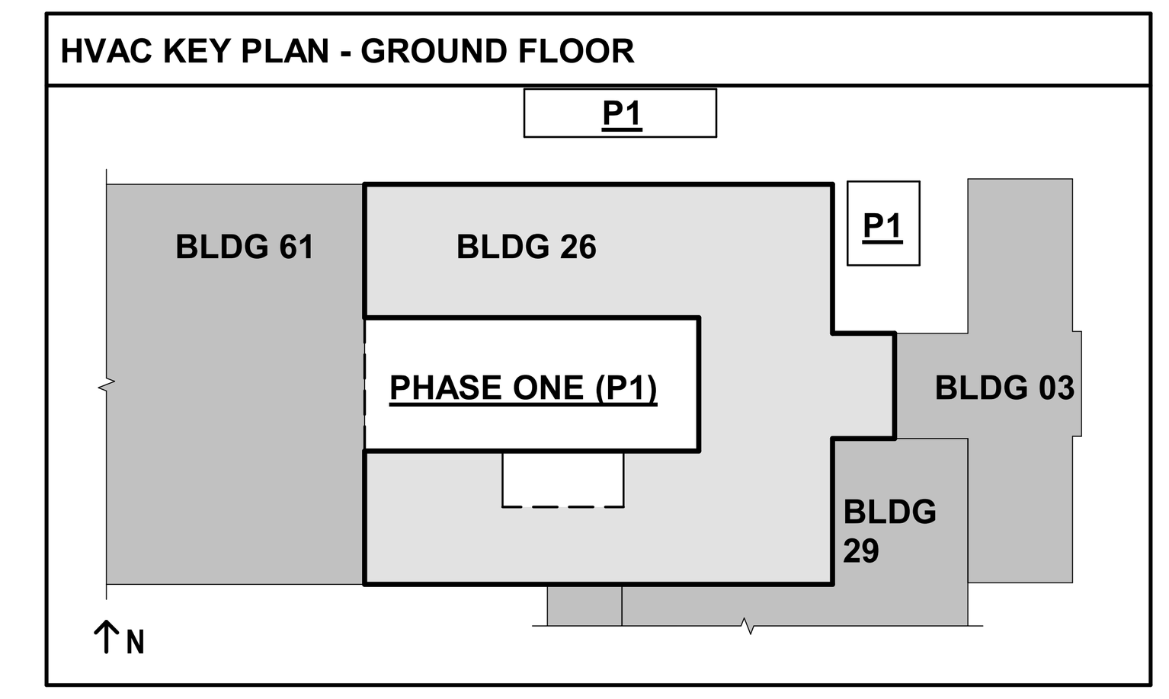
HVAC KEY PLAN - GROUND FLOOR





1 FIRST FLOOR MECHANICAL HVAC PIPING DEMOLITION PLAN - PHASE ONE
1/8" = 1'-0"

HVAC KEY PLAN - GROUND FLOOR



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100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
HOUSTON, TX 77008
(713) 864-2900

MECH / ELEC / PLUMB / TECH ENGR
SPUR DESIGN
25219 MADISON AVE, SUITE 100
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FIRE PROTECTION ENGINEER
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19910 WEST 161ST STREET
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INDUSTRIAL HYGENIST
RIVERFRONT HEALTH & SAFETY
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10901 FRONT BEACH ROAD, STE 1415
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ARCHITECT:

SPUR PROJECT #: 2016

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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:
J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title: FIRST FLOOR MECHANICAL HVAC PIPING DEMOLITION PLAN

VA Health Care System Approval:

Project Title: CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location: 5500 EAST KELLOGG AVENUE WICHITA, KANSAS 67218

Date: 12/21/2022 | Checked: JRM | Drawn: GT

Project Number: 589-704

Building Number: 26

Drawing Number: MPD102

Drawing # 124 OF 190

Veterans Health Administration

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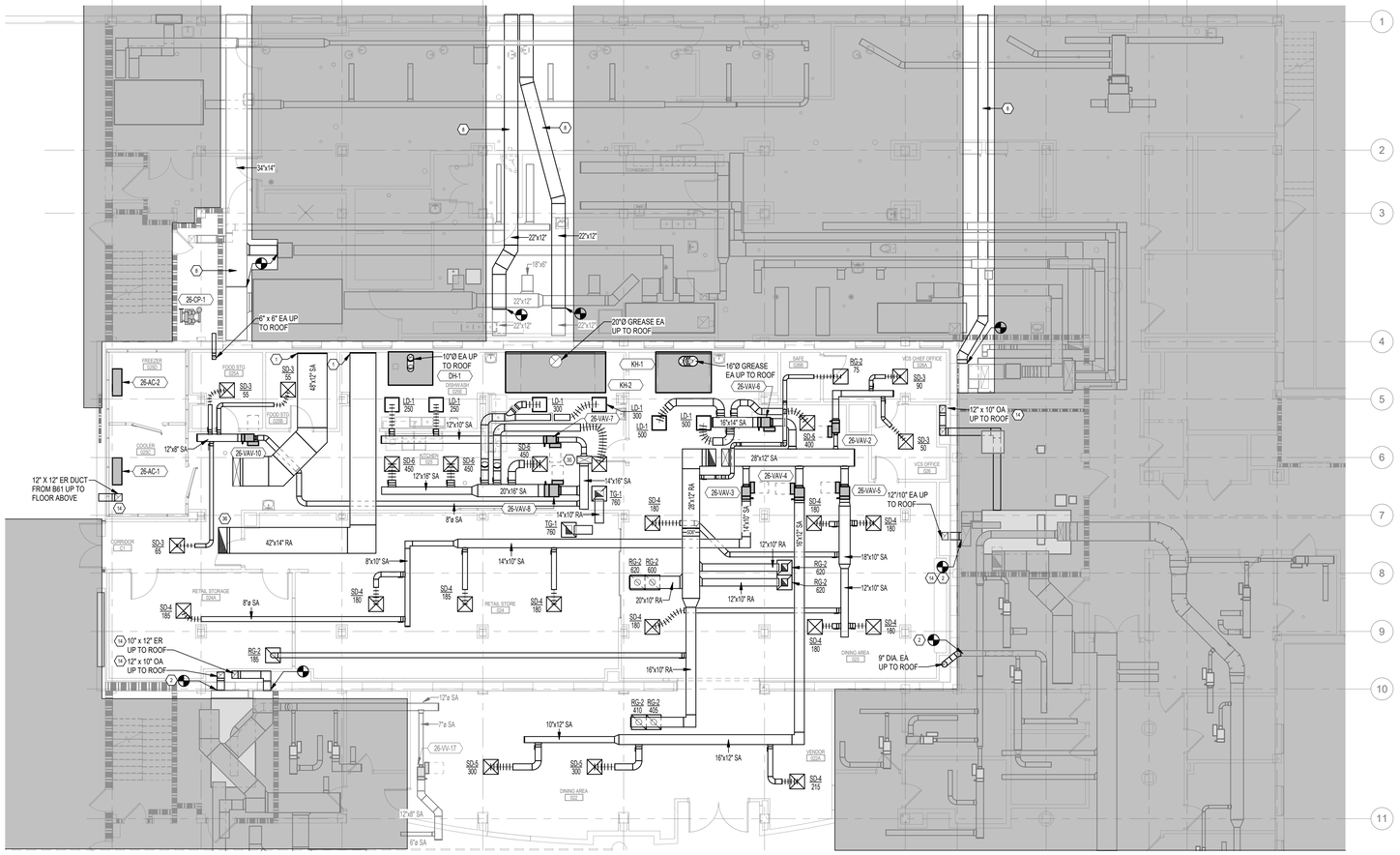
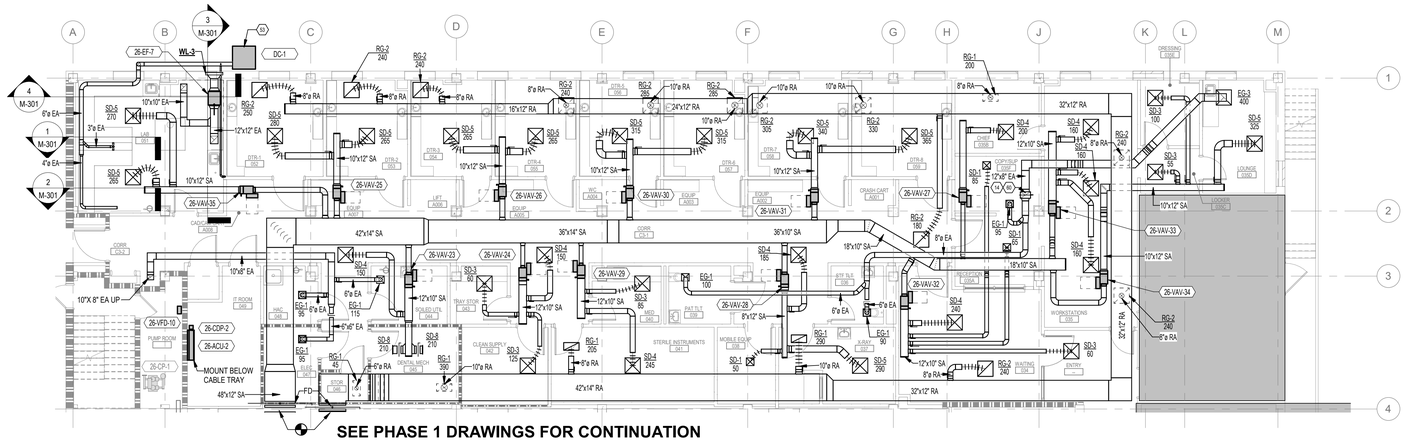
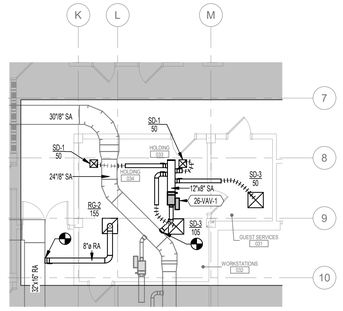


1 GROUND FLOOR MECHANICAL HVAC DUCT PLAN - PHASE 2
1/8" = 1'-0"



1 GROUND FLOOR MECHANICAL HVAC DUCT PLAN - PHASE 1
1/8" = 1'-0"

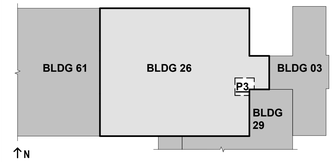


3 GROUND FLOOR MECHANICAL HVAC DUCT PLAN - PHASE THREE
1/8" = 1'-0"

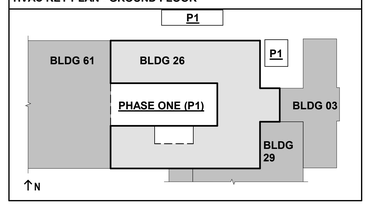
KEYNOTES

1 CONTRACTOR SHALL CAP DUCTWORK FOR CONTINUATION INTO PHASE 2.
2 CONTRACTOR SHALL CONNECT TO EXISTING DUCT AND ROUTE UP TO ROOF.
8 TEMPORARY DUCT TO BE ADDED DURING PHASE 1 AND TO BE DEMOLISHED DURING PHASE 2.
14 CONTRACTOR SHALL INSTALL FIRE DAMPERS WHERE DUCT PENETRATES FLOOR.
35 SA DUCT UP TO FIRST FLOOR.
36 RA DUCT UP TO FIRST FLOOR.
53 EXISTING DENTAL DUST COLLECTOR TO BE RELOCATED FROM EXISTING DENTAL LAB IN BUILDING 19. PLACE AS CLOSE TO BUILDING 26 AS ALLOWED AND DUCT THROUGH WALL TO NEW LAB.
60 16"x10" EA UP TO SECOND FLOOR.

HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



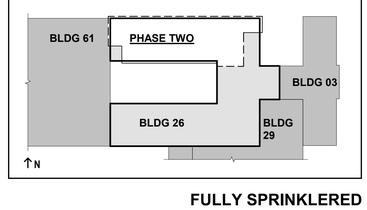
PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE G0011 - PHASING PLANS FOR MORE INFORMATION.

RATED PARTITIONS AND BARRIERS

- FIRE - 1 HOUR
- FIRE - 2 HOUR
- FIRE - 3 HOUR
- FIRE / SMOKE - 1 HOUR
- FIRE / SMOKE - 2 HOUR
- FIRE / SMOKE - 3 HOUR

HVAC KEY PLAN - GROUND FLOOR



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100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
HOUSTON, TX 77008
(713) 864-2900

MECH / ELEC / PLUMB / TECH ENGR
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ARCHITECT: SPUR PROJECT #: 2016

spur DESIGN

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(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLER — LICENSED — 27054 — 12-21-2022 — KANSAS — PROFESSIONAL ENGINEER

Drawing Title
GROUND FLOOR MECHANICAL DUCT PLANS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date: **12/21/2022** | Checked: JRM | Drawn: GT

Project Number: **589-704**
Building Number: **26**
Drawing Number: **MH101**
Drawing # 125 OF 190

Veterans Health Administration
VA | U.S. Department of Veterans Affairs

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VA FORM 08-6231

DEMOLITION KEYNOTES

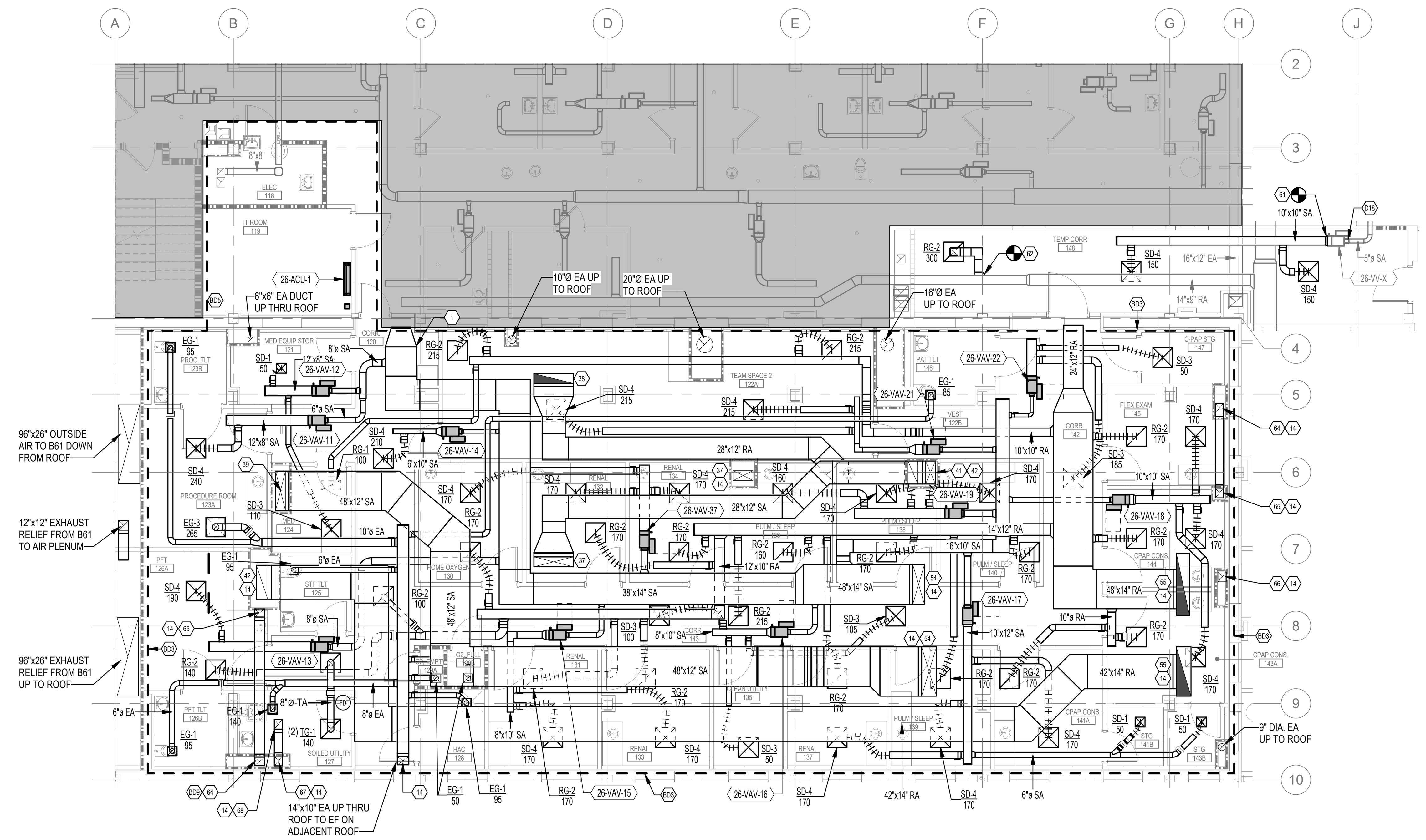
D18 TERMINAL UNIT TO REMAIN TEMPORARILY TO SERVE PATIENT CORRIDOR DURING PHASE1. DEMOLISH TERMINAL UNIT, HEATING WATER PIPING, TEMPORARY DUCT AND AIR DEVICES ONCE PHASE ONE IS COMPLETE.

KEYNOTES

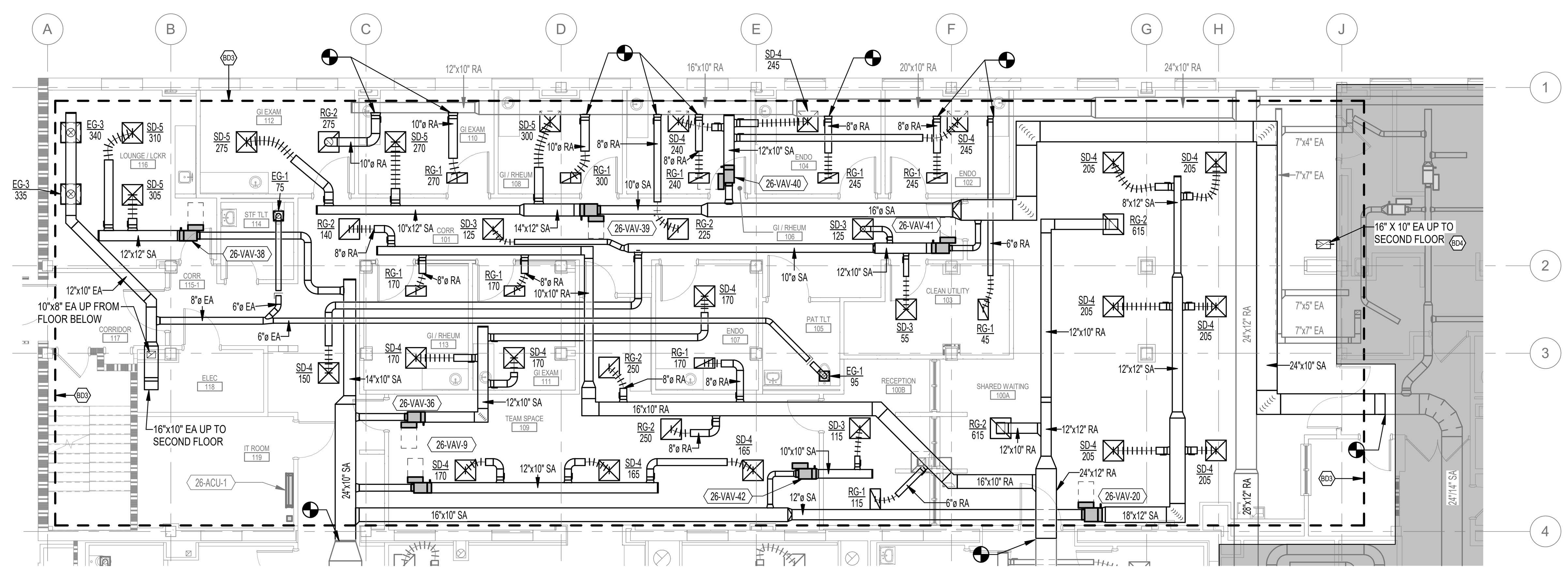
1 CONTRACTOR SHALL CAP DUCTWORK FOR CONTINUATION INTO PHASE 2.
14 CONTRACTOR SHALL INSTALL FIRE DAMPERS WHERE DUCT PENETRATES FLOOR.
37 SA DUCT UP THROUGH ROOF.
38 RA DUCT UP THROUGH ROOF.
39 SA DUCT DOWN TO FIRST FLOOR.
41 SA DUCT DOWN TO GROUND FLOOR.
42 RA DUCT DOWN TO GROUND FLOOR.
54 SA DUCT DOWN FROM AHU IN PENTHOUSE ABOVE.
55 RA DUCT UP TO AHU IN PENTHOUSE ABOVE.
61 CONNECT NEW SUPPLY AIR DUCTWORK AND AIR DEVICES TO EXISTING TERMINAL UNIT TO TEMPORARILY SERVE THE PATIENT ACCESS CORRIDOR. DEMOLISH ONCE PHASE 1 IS COMPLETE.
62 CONNECT NEW RETURN AIR DUCTWORK AND DEVICE TO EXISTING RETURN AIR DUCT TO TEMPORARILY SERVE THE PATIENT ACCESS CORRIDOR. DEMOLISH ONCE PHASE 1 IS COMPLETE.
64 12"x10" OA UP FROM GROUND FLOOR. COORDINATE RISER WITH STRUCTURAL FRAMING.
65 12"x10" OA UP THROUGH PENTHOUSE AND/OR ROOF. COORDINATE WITH STRUCTURAL FRAMING.
66 12"x10" EA UP THROUGH ROOF. COORDINATE WITH STRUCTURAL FRAMING.
67 12"x10" ER UP FROM BELOW. COORDINATE WITH STRUCTURAL FRAMING.
68 12"x10" ER UP THROUGH ROOF. COORDINATE WITH STRUCTURAL FRAMING.

BID DEDUCT KEYNOTES

BD3 FOR BID DEDUCT, THIS AREA TO REMAIN. NO NEW WORK TO OCCUR EXCEPT WHERE SPECIFIALLY INDICATED.
BD4 FOR BID DEDUCT, DUCTWORK UP TO NEW EXHAUST FAN WILL BE INSTALLED.
BD5 FOR BID DEDUCT, ROUTE EXHAUST AND OUTSIDE AIR DUCTWORK UP TO THIRD FLOOR ROOF.
BD9 FOR BID DEDUCT, DUCTWORK UP TO ROOF WILL BE INSTALLED.



2 FIRST FLOOR MECHANICAL HVAC DUCT PLAN - PHASE 1
1/8" = 1'-0"



1 FIRST FLOOR MECHANICAL HVAC DUCT PLAN - PHASE 2
1/8" = 1'-0"

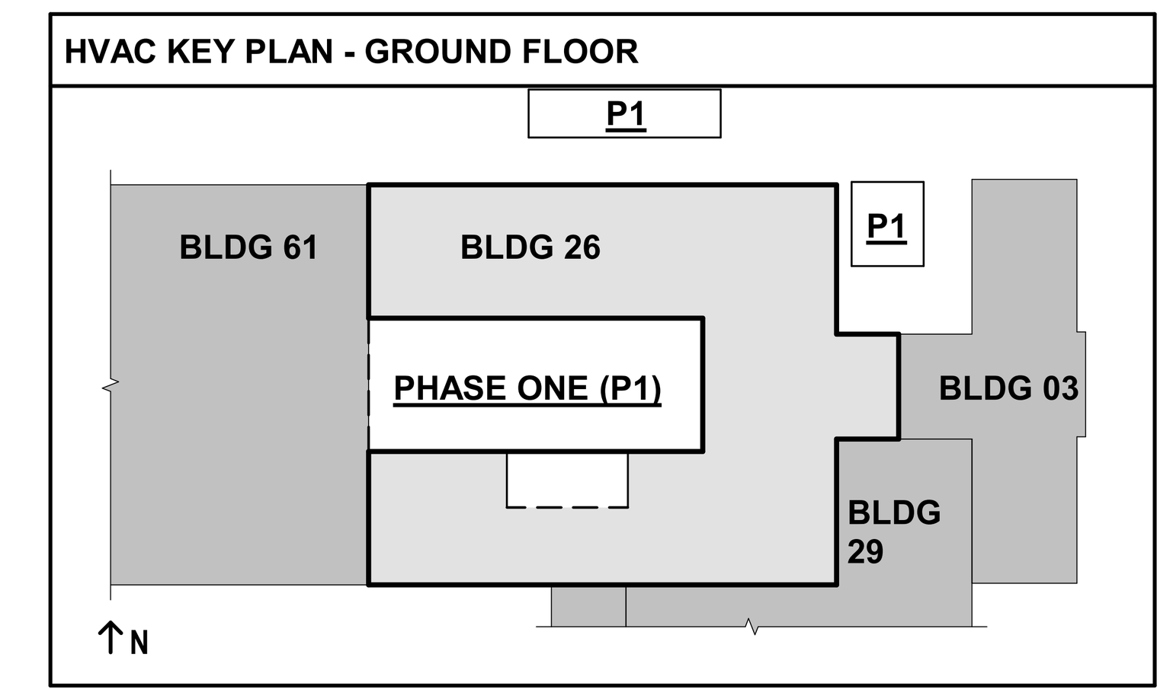
PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN, REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

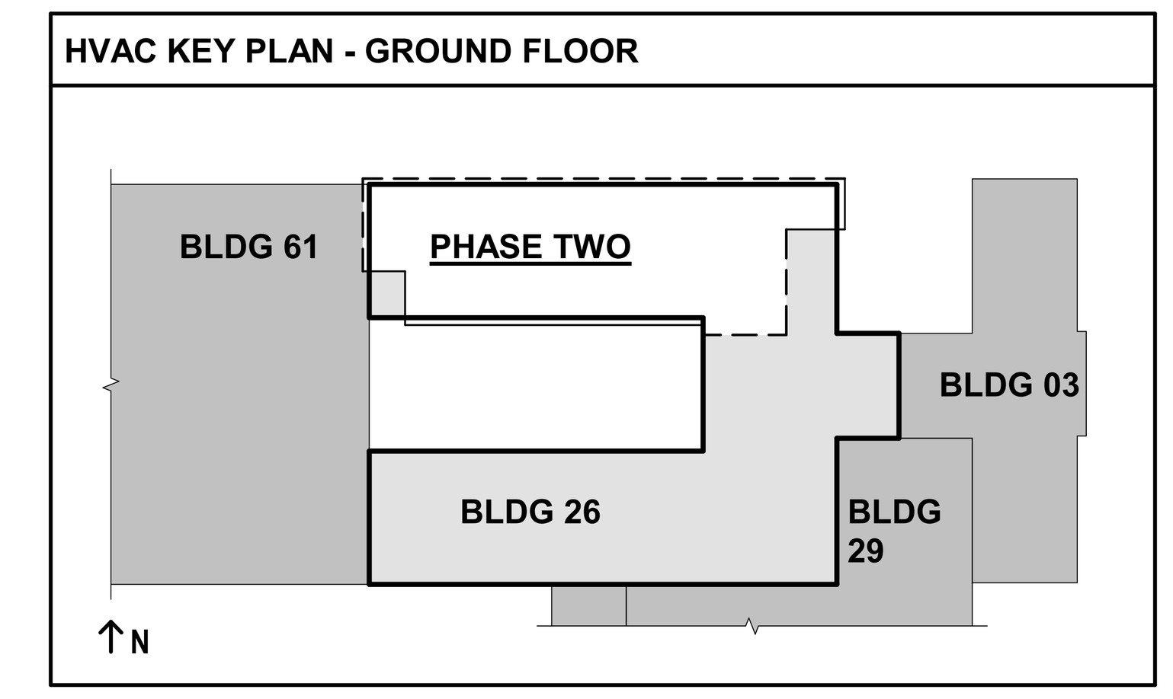
RATED PARTITIONS AND BARRIERS

- FIRE - 1 HOUR
- FIRE - 2 HOUR
- FIRE - 3 HOUR
- FIRE / SMOKE - 1 HOUR
- FIRE / SMOKE - 2 HOUR
- FIRE / SMOKE - 3 HOUR

HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



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100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
HOUSTON, TX 77008
(713) 864-2900

MECH / ELEC / PLUMB / TECH ENGR
SPUR DESIGN
25219 MADISON AVE, SUITE 100
KANSAS CITY, MO 64108
(913) 369-7200

FIRE PROTECTION ENGINEER
POOLE FIRE PROTECTION, INC.
19910 WEST 161ST STREET
OLATHE, KANSAS 66062
(913) 829-8690

INDUSTRIAL HYGENIST
RIVERFRONT HEALTH & SAFETY
1139 OLIVE STREET,
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(314) 436-9492

HEALTHCARE PLANNER
INNOVA GROUP
3196 N. SWAN ROAD
TUCSON, AZ 85712
(520) 886-8650

PHYSICAL SECURITY
FORCE PROTECT
10901 FRONT BEACH ROAD, STE 1415
PANAMA CITY, FL 32407
(502) 836-4232

ARCHITECT: SPUR PROJECT #: 2016

spur DESIGN

SPUR DESIGN, LLC
312 SW 25TH STREET
Oklahoma City, OK 73109
(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP: J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title: **FIRST FLOOR MECHANICAL DUCT PLANS**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date: 12/21/2022 | Checked: JRM | Drawn: GT

Project Number: 589-704

Building Number: 26

Drawing Number: **MH102**

Drawing # 126 OF 190

Veterans Health Administration

VA U.S. Department of Veterans Affairs

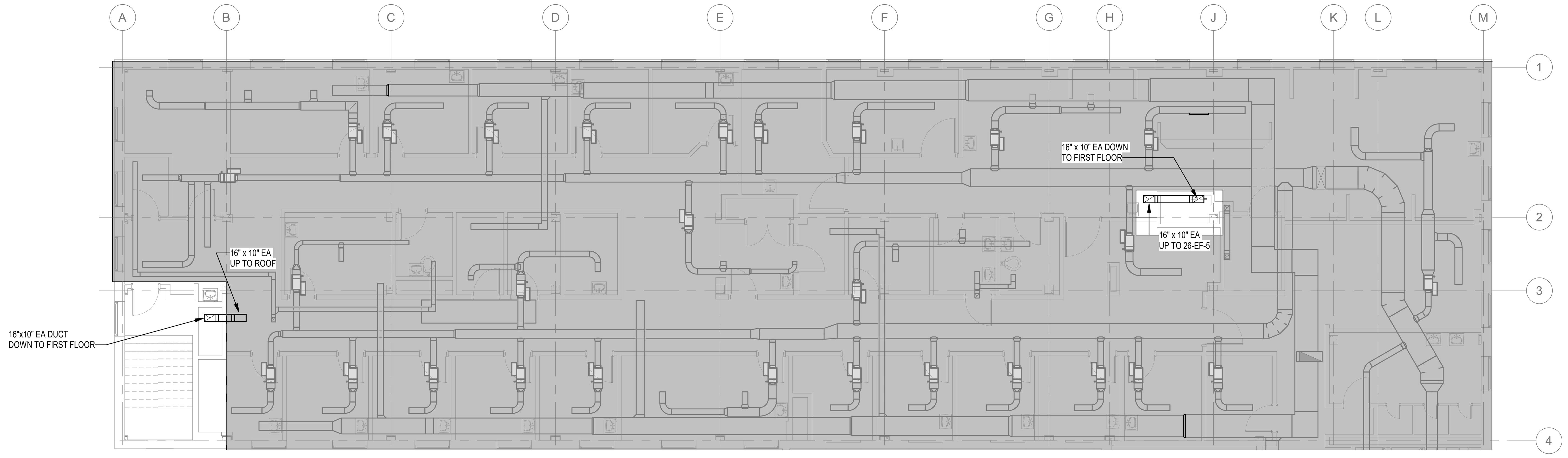
12/19/2022 2:09:50 PM

VA FORM 08-6231

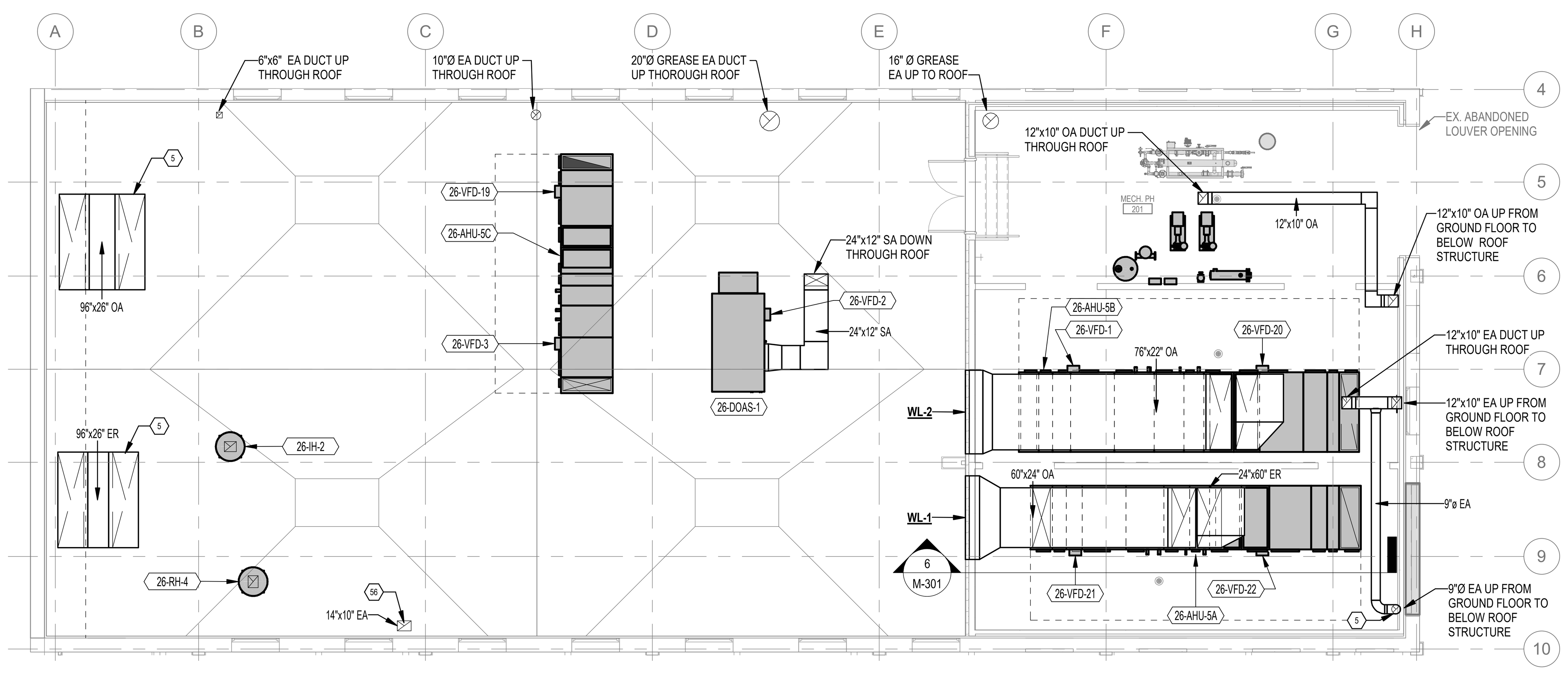
KEYNOTES

5 CONTRACTOR SHALL PROVIDE GOOSENECK TERMINATION FOR DUCT TERMINATING ABOVE ROOF.

56 14"x10" EXHAUST DUCT UP TO 26-EF-4 ON ADJACENT ROOF. PROVIDE VERTICAL DUCT SUPPORTS ALONG EXISTING WALL.



2 SECOND FLOOR MECHANICAL HVAC DUCT PLAN - PHASE 2
1/8" = 1'-0"

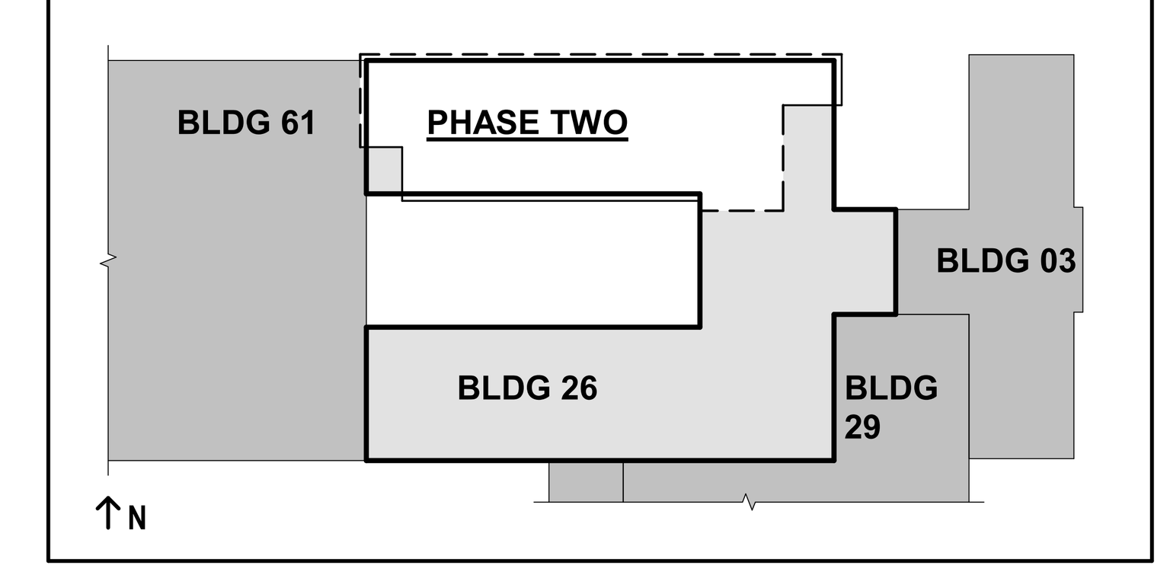


1 SECOND FLOOR MECHANICAL HVAC DUCT PLAN - PHASE 1
1/8" = 1'-0"

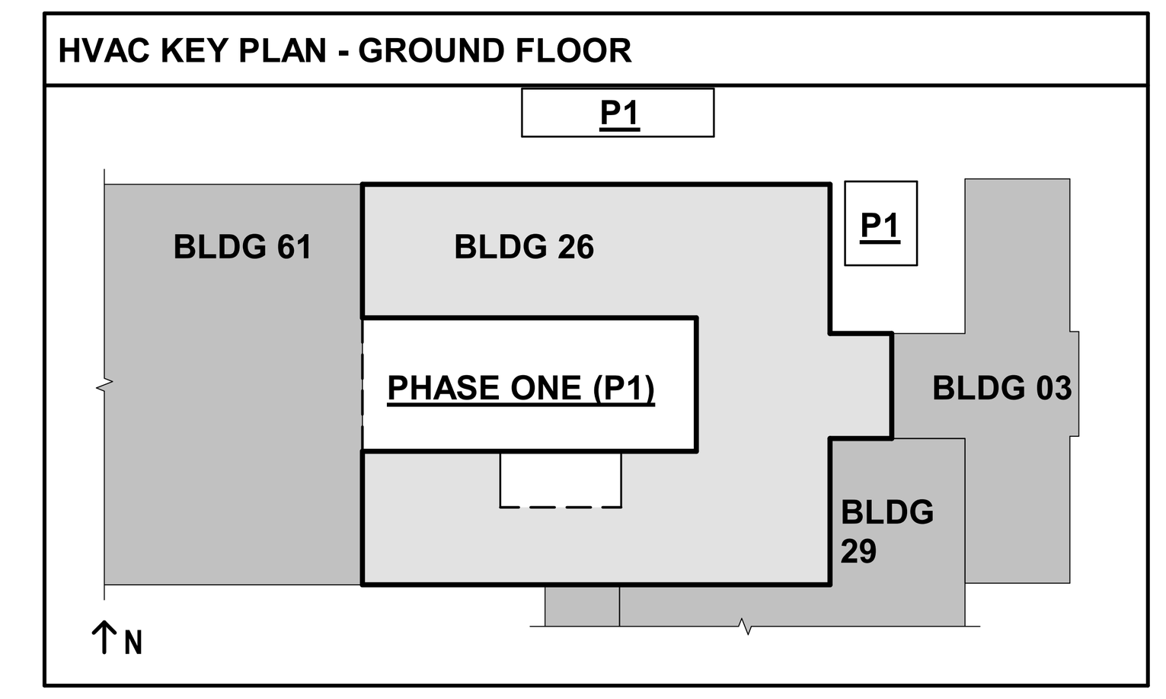
PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



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NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
HOUSTON, TX 77008
(713) 864-2900

MECH / ELEC / PLUMB / TECH ENGR
SPUR DESIGN
25219 MADISON AVE, SUITE 100
KANSAS CITY, MO 64108
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FIRE PROTECTION ENGINEER
POOLE FIRE PROTECTION, INC.
19910 WEST 161ST STREET
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INDUSTRIAL HYGENIST
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HEALTHCARE PLANNER
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PHYSICAL SECURITY
FORCE PROTECT
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ARCHITECT: SPUR PROJECT #: 2016

SPUR DESIGN, LLC
312 SW 25TH STREET
Oklahoma City, OK 73109
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KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP: J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title: **SECOND FLOOR MECHANICAL DUCT PLANS**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number: 589-704

Building Number: 26

Drawing Number: **MH103**

Drawing # 127 OF 190

Veterans Health Administration

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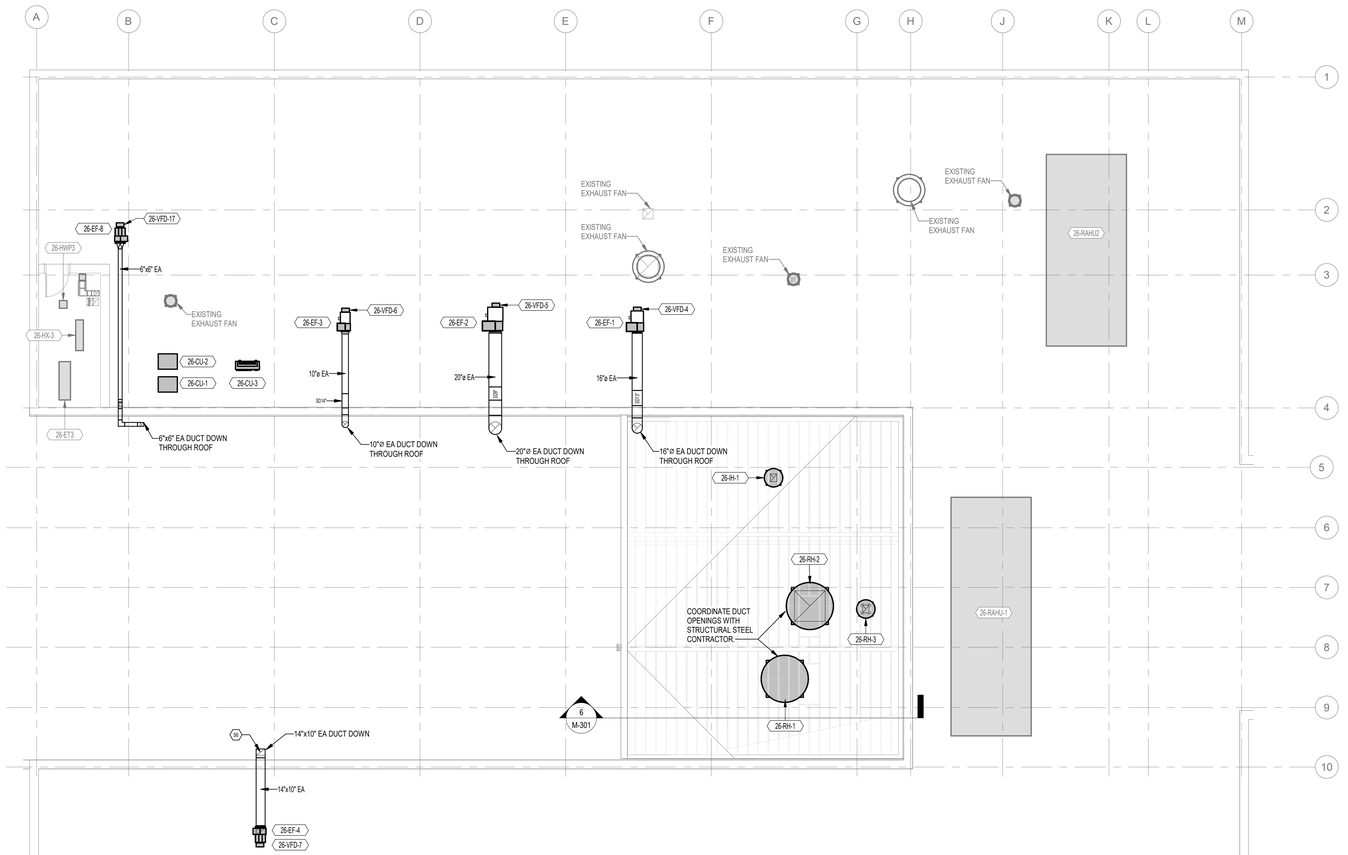
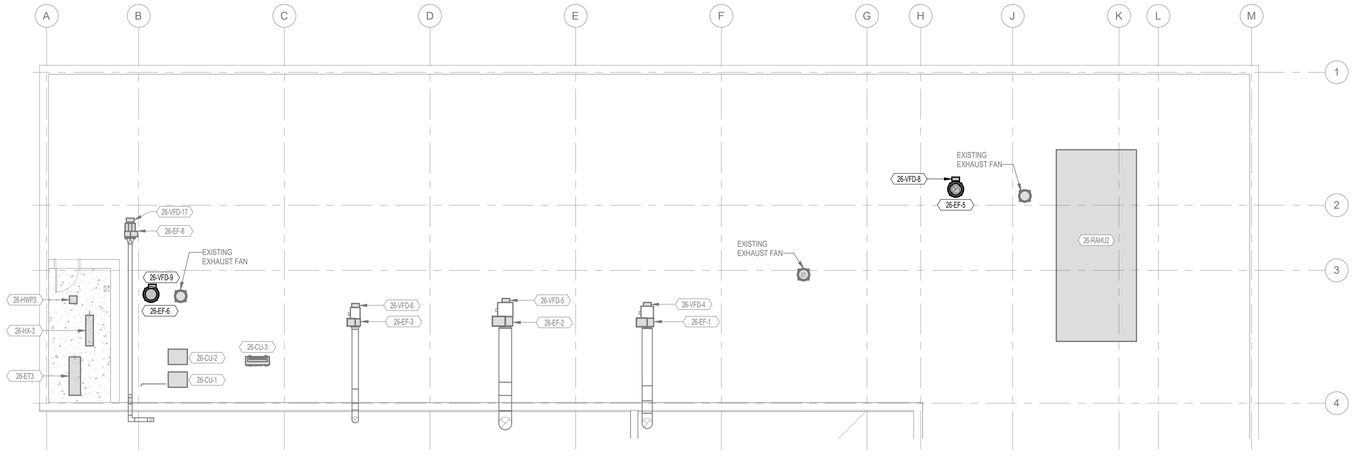


2 ROOF LEVEL MECHANICAL HVAC PLAN - PHASE ONE
1/8" = 1'-0"



1 ROOF LEVEL MECHANICAL HVAC PLAN - PHASE TWO
1/8" = 1'-0"

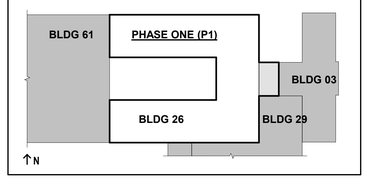
KEYNOTES

56 14"x10" EXHAUST DUCT UP TO 26-EF-4 ON ADJACENT ROOF. PROVIDE VERTICAL DUCT SUPPORTS ALONG EXISTING WALL.

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - ROOF



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CONSULTANTS:

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1225 N. LOOP WEST, SUITE 800
HOUSTON, TX 77008
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PHYSICAL SECURITY
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PANAMA CITY, FL 32407
(502) 836-4232

ARCHITECT:

SPUR PROJECT #: 2016

spur DESIGN

SPUR DESIGN, LLC
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Oklahoma City, OK 73109
(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES DENSEN 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
ROOF MECHANICAL DUCT PLANS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number
589-704

Building Number
26

Drawing Number
MH104

Drawing # 128 OF 190

Veterans Health Administration

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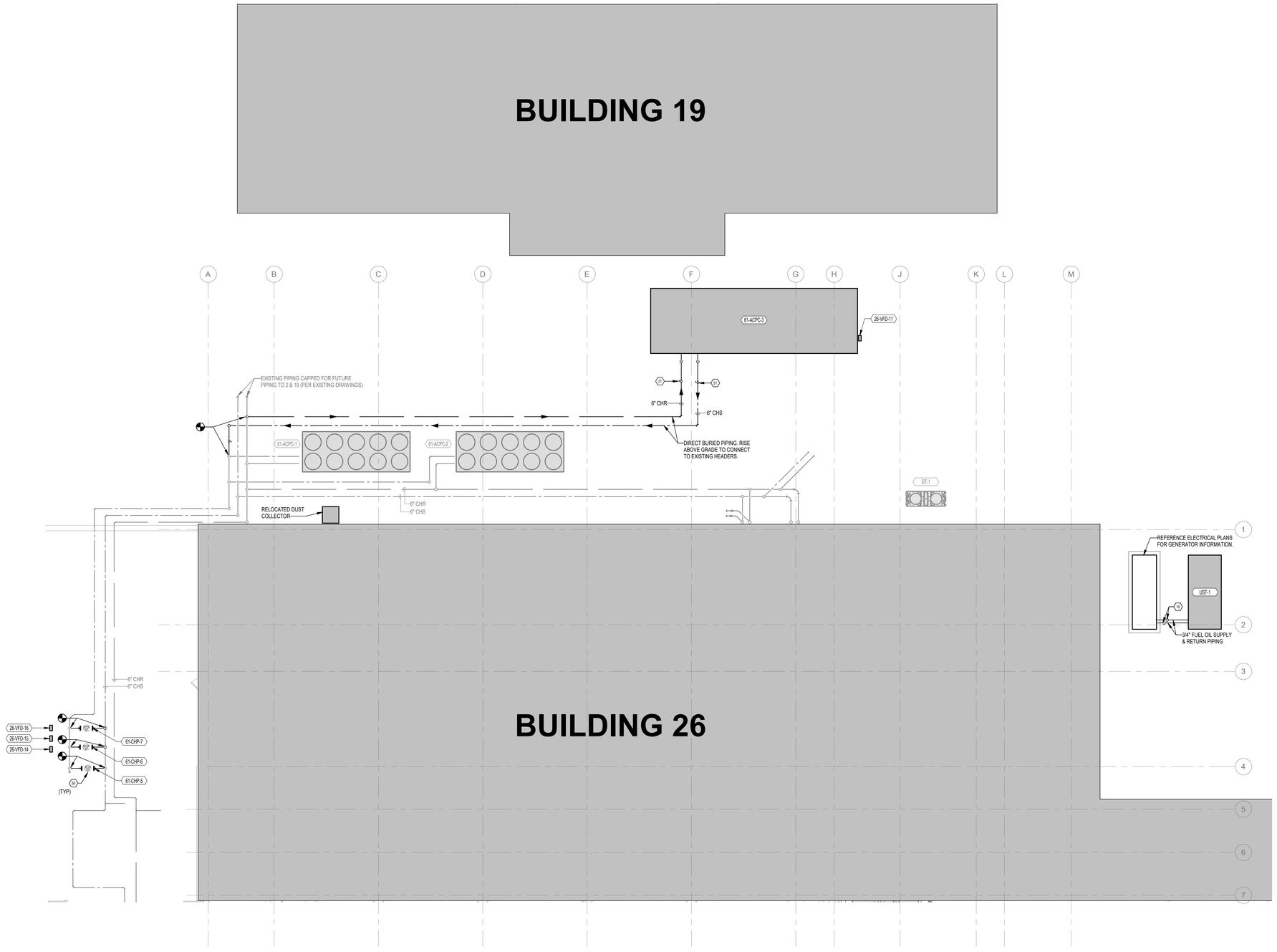


1 SERVICE YARD PLAN - PHASE ONE
1/8" = 1'-0"

KEYNOTES

19 ROUTE FUEL OIL SUPPLY AND RETURN PIPING DOWN IN LOCATION SHOWN. ROUTE UNDERGROUND TO FUEL STORAGE TANK. ROUTE PIPING A MINIMUM OF 12" BELOW REGIONAL FROST LINE.

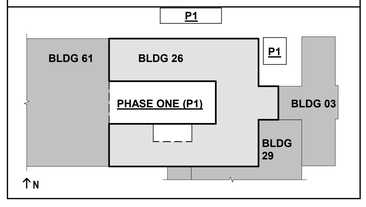
21 CONTRACTOR SHALL INSTALL SHUT OFF VALVES IN LOCATION SHOWN.

50 CONTRACTOR TO INSTALL NEW PUMPS, VALVES, ACCESSORIES, AND PIPING FROM PUMP INLET AND OUTLET TO EXISTING TEE AT HEADER. PROVIDE ALL COMPONENTS AND WIRING TO CONNECT NEW PUMPS TO EXISTING BUILDING AUTOMATION SYSTEM UTILIZING EXISTING CONTROLS SEQUENCE(S).

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE G011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



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100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER	MECH / ELEC / PLUMB / TECH ENGR	FIRE PROTECTION ENGINEER
H2B, INC. 1225 N. LOOP WEST, SUITE 800 HOUSTON, TX 77008 (713) 864-2900	SPUR DESIGN 25219 MADISON AVE, SUITE 100 KANSAS CITY, MO 64108 (913) 369-7200	POOLE FIRE PROTECTION, INC. 19910 WEST 161ST STREET OLATHE, KANSAS 66062 (913) 829-8690
INDUSTRIAL HYGENIST	HEALTHCARE PLANNER	PHYSICAL SECURITY
RIVERFRONT HEALTH & SAFETY 1139 OLIVE STREET, ST. LOUIS, MO 63101 (314) 436-9492	INNOVA GROUP 3196 N. SWAN ROAD TUCSON, AZ 85712 (520) 886-8650	FORCE PROTECT 10901 FRONT BEACH ROAD, STE 1415 PANAMA CITY, FL 32407 (502) 836-4232

ARCHITECT: SPUR PROJECT #: 2016

spur DESIGN

SPUR DESIGN, LLC
312 SW 25TH STREET
Oklahoma City, OK 73109
(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES JENSEN 27054 KANSAS PROFESSIONAL ENGINEER 12/21/2022

Drawing Title
SERVICE YARD NEW WORK PLAN

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number
589-704

Building Number
26

Drawing Number
MH105
Drawing # 129 OF 190

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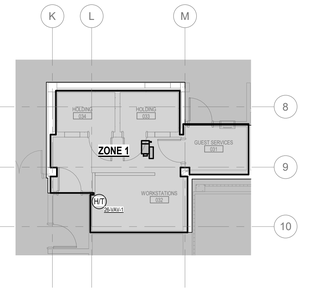
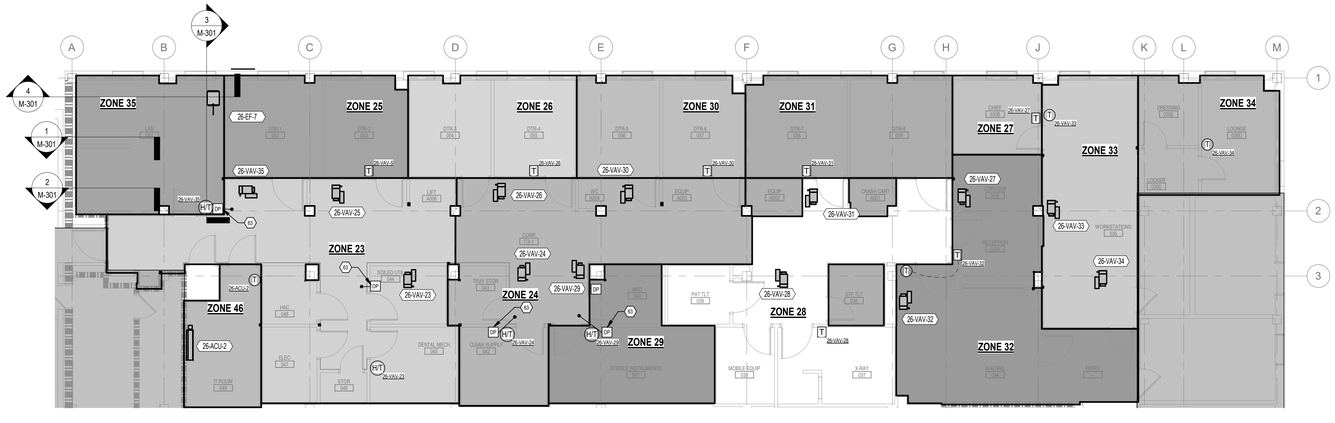
VA FORM 08-6231

2 GROUND FLOOR HVAC ZONING PLAN - PHASE ONE
1/8" = 1'-0"



3 GROUND FLOOR HVAC ZONING PLAN - PHASE THREE
1/8" = 1'-0"

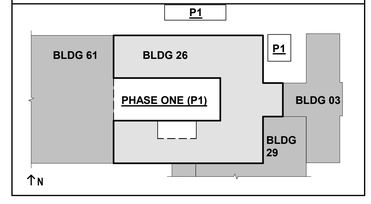


1 GROUND FLOOR HVAC ZONING PLAN - PHASE TWO
1/8" = 1'-0"

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE G0Y1 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



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100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
HOUSTON, TX 77008
(713) 864-2900

INDUSTRIAL HYGENIST
RIVERFRONT HEALTH & SAFETY
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(314) 436-9492

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HEALTHCARE PLANNER
INNOVA GROUP
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TUCSON, AZ 85712
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FIRE PROTECTION ENGINEER
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PHYSICAL SECURITY
FORCE PROTECT
10901 FRONT BEACH ROAD, STE 1415
PANAMA CITY, FL 32407
(502) 836-4232

ARCHITECT:

SPUR PROJECT #: 2016

SPUR DESIGN, LLC
312 SW 25TH STREET
Oklahoma City, OK 73109
(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES KIRK — 27054 — 12/21/2022 — KANSAS — PROFESSIONAL ENGINEER

Drawing Title: **GROUND FLOOR ZONING PLANS**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date: **12/21/2022** | Checked: JRM | Drawn: GT

Project Number: **589-704**

Building Number: **26**

Drawing Number: **MH106**

Drawing # 130 OF 190

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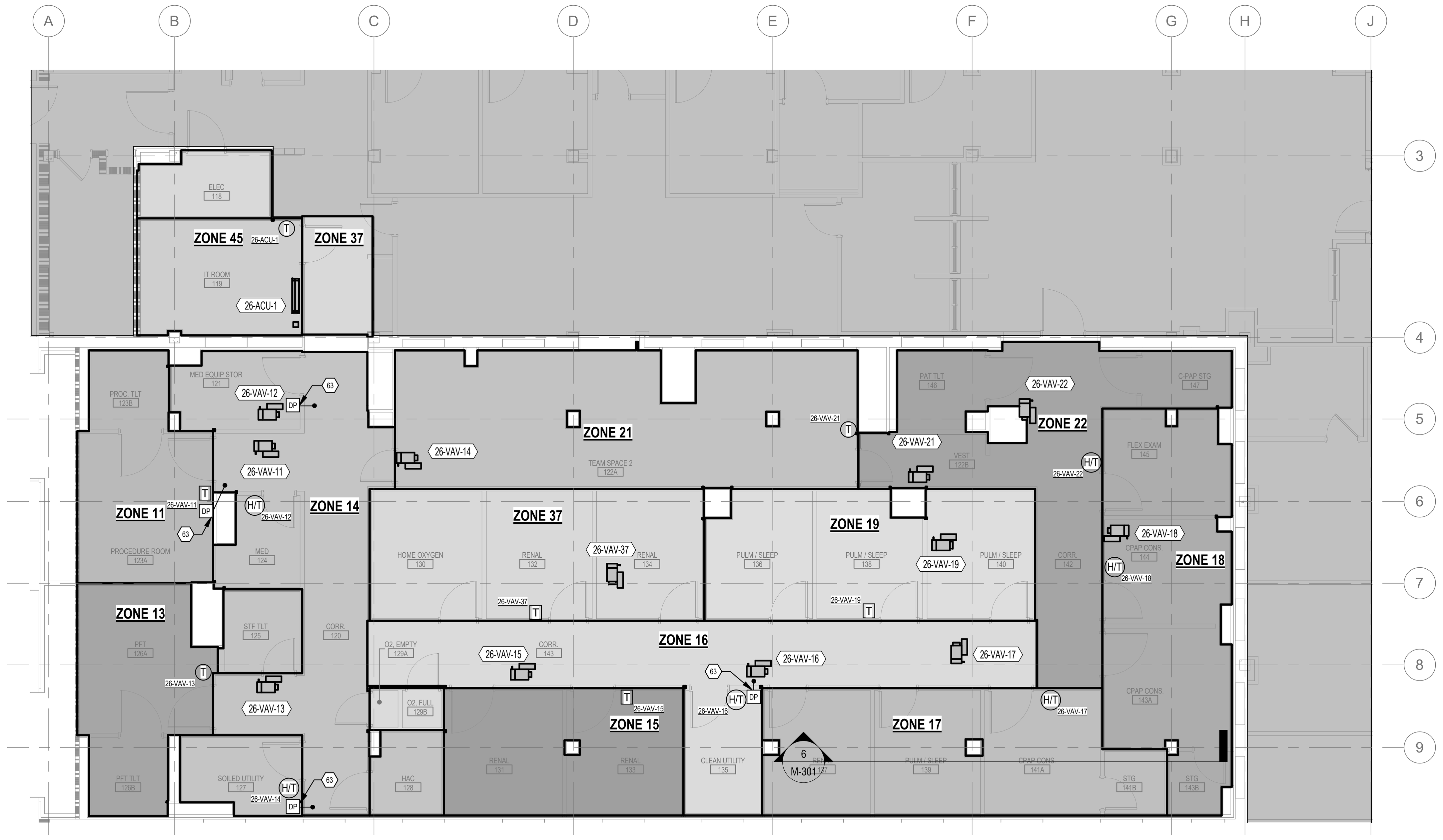
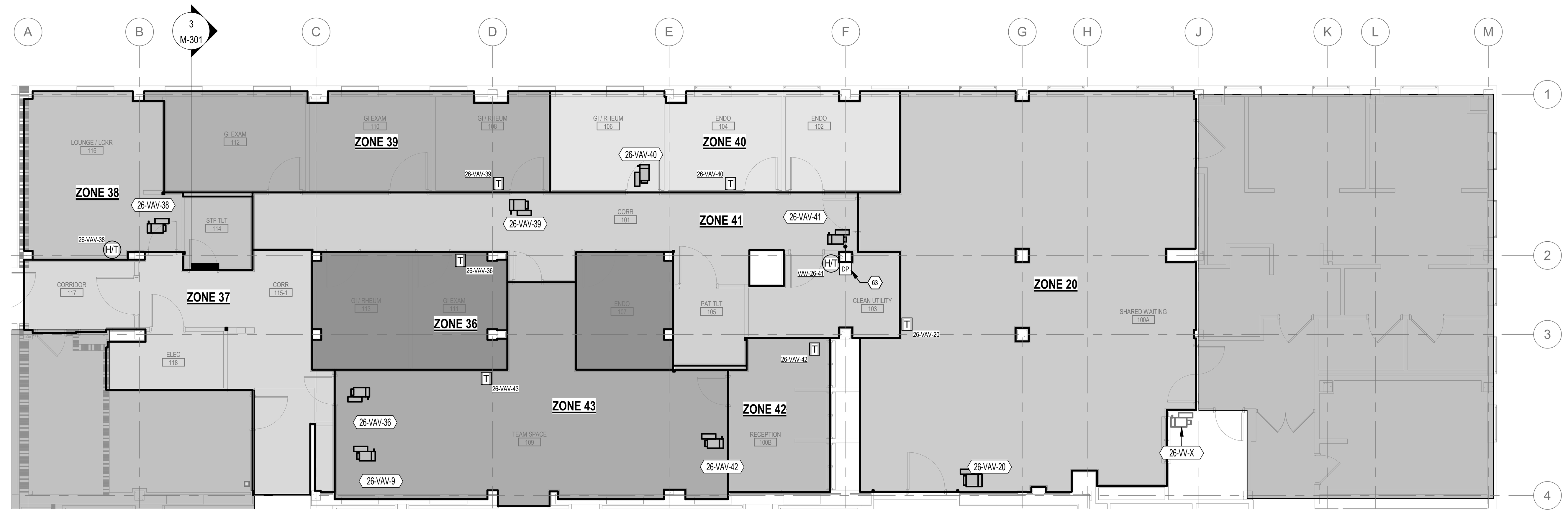


2 FIRST FLOOR HVAC ZONING PLAN - PHASE ONE
1/8" = 1'-0"

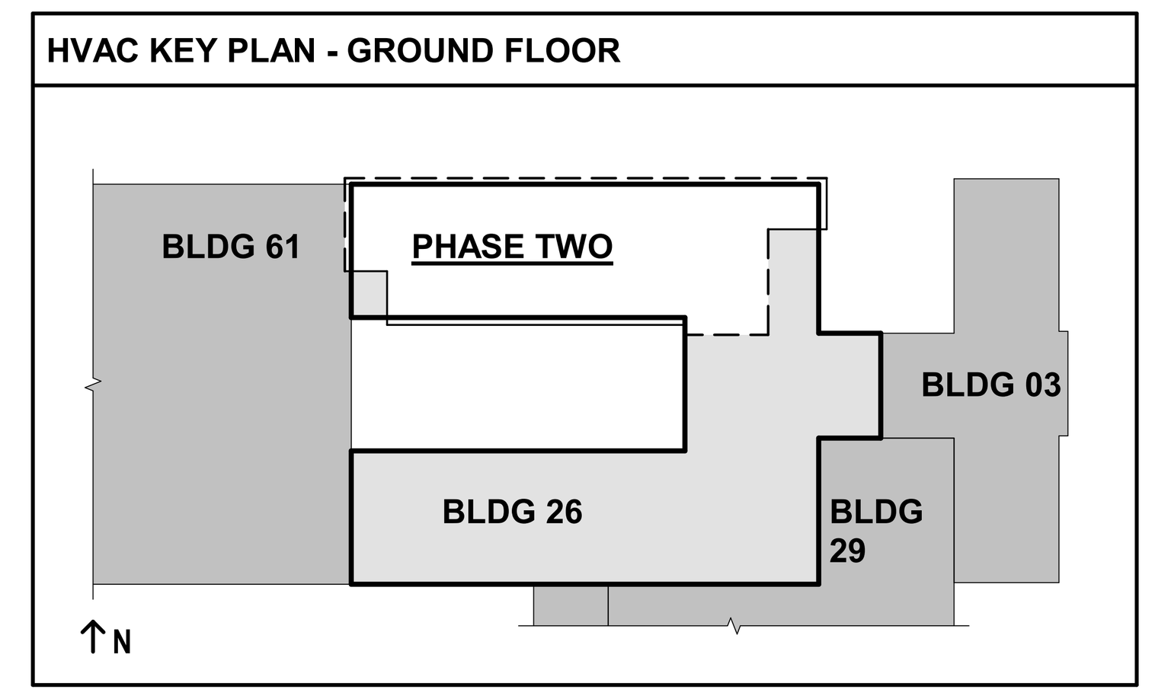


1 FIRST FLOOR HVAC ZONING PLAN - PHASE TWO
1/8" = 1'-0"

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN, REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



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NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
HOUSTON, TX 77008
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PANAMA CITY, FL 32407
(502) 836-4232

ARCHITECT:

SPUR PROJECT #: 2016

spur DESIGN

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Oklahoma City, OK 73109
(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
FIRST FLOOR ZONING PLANS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number
589-704

Building Number
26

Drawing Number
MH107

Drawing # 131 OF 190

Veterans Health Administration

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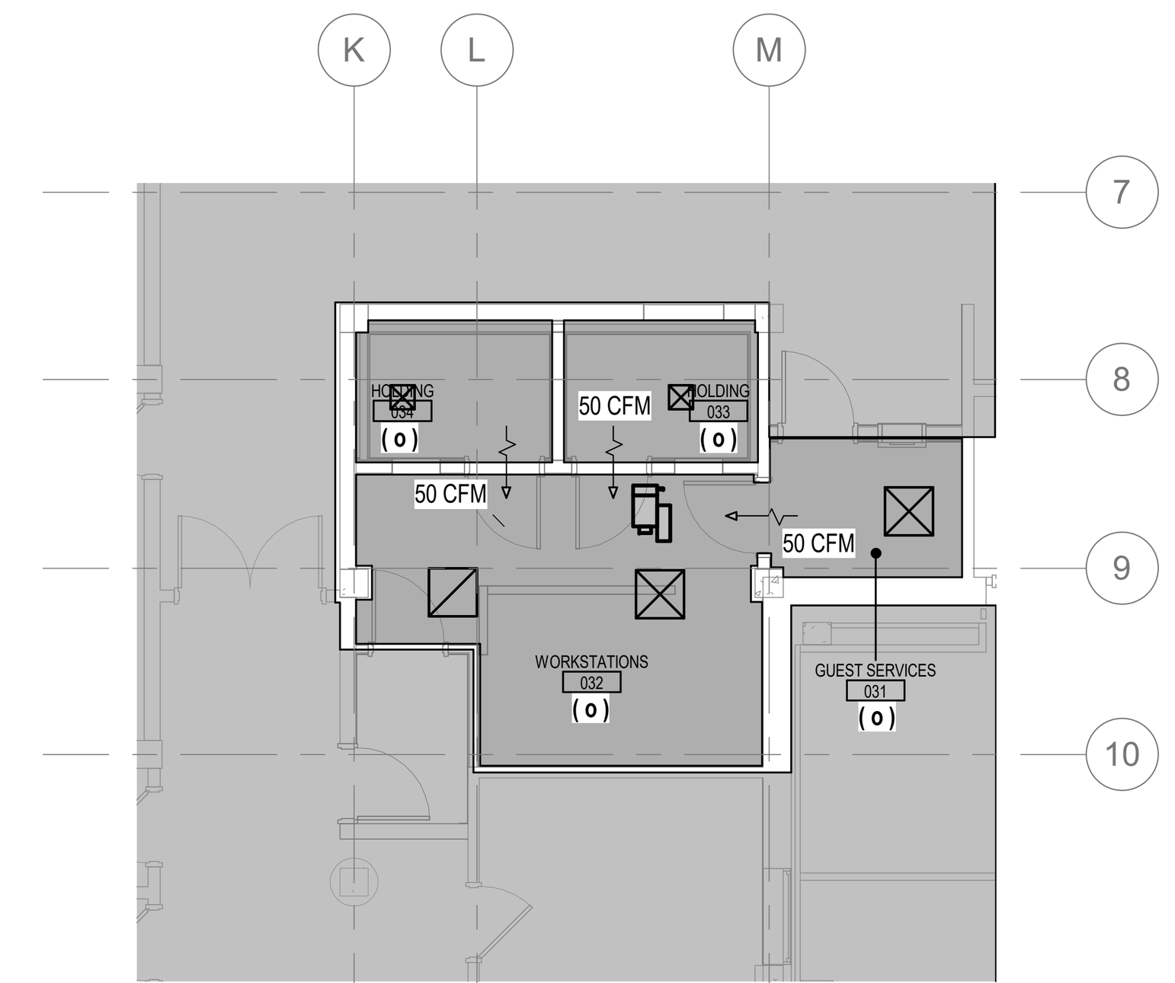
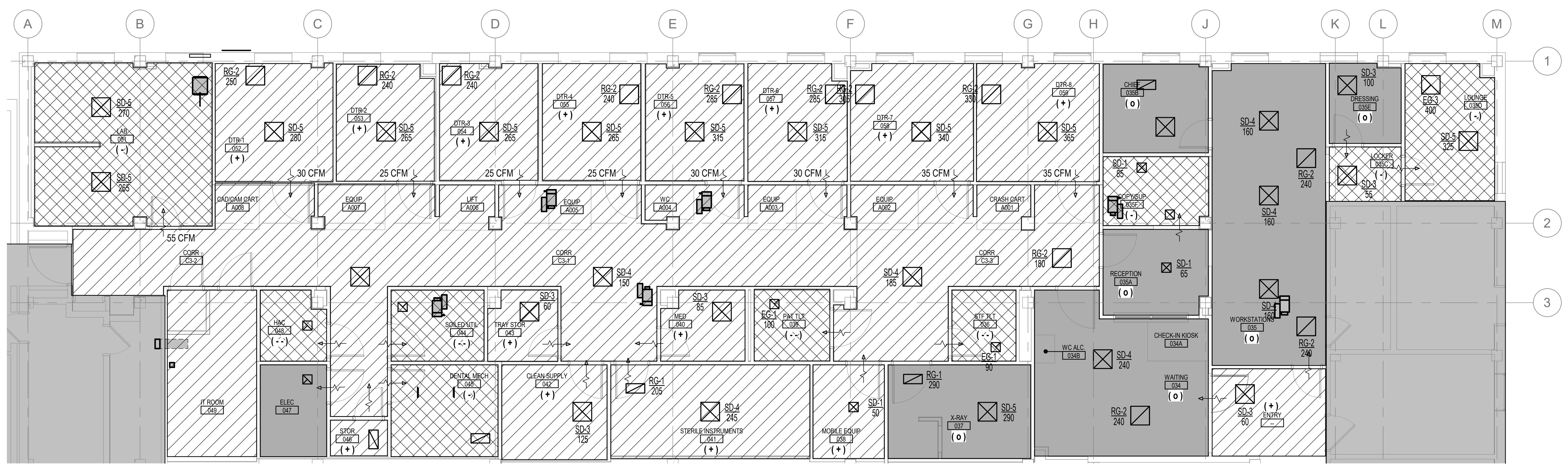
12/19/2022 2:10:11 PM

VA FORM 08-6231

2 GROUND FLOOR AIR PRESSURIZATION PLAN - PHASE ONE
1/8" = 1'-0"



3 GROUND FLOOR AIR PRESSURIZATION PLAN - PHASE THREE
1/8" = 1'-0"



1 GROUND FLOOR AIR PRESSURIZATION PLAN - PHASE TWO
1/8" = 1'-0"

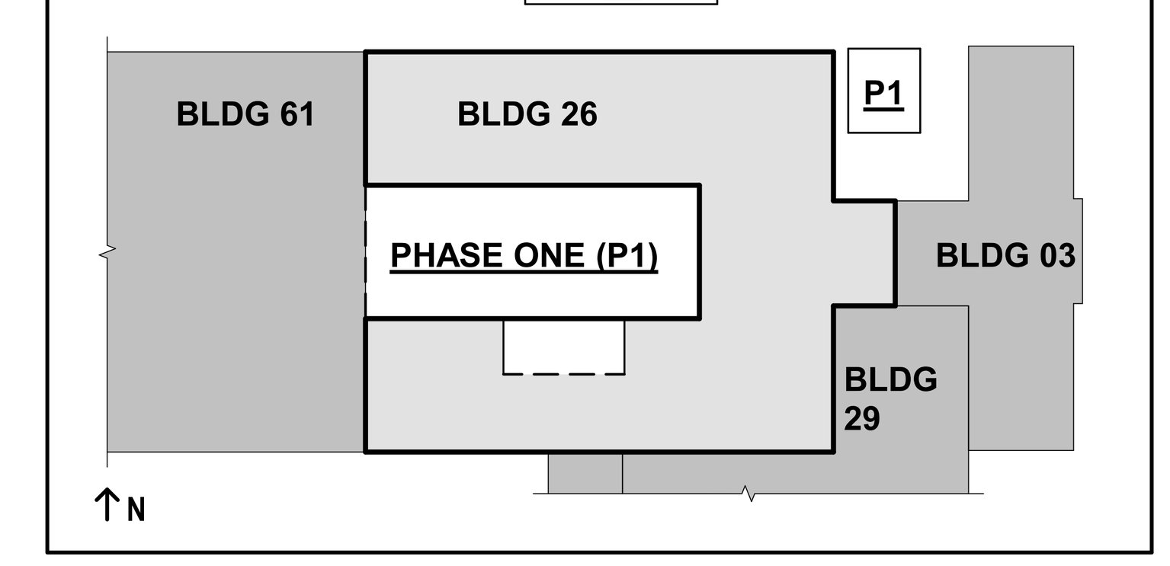
HATCH LEGEND

- POSITIVE PRESSURE (+)
  DOUBLE POSITIVE PRESSURE (++)
- NUETRAL PRESSURE (o)
- NEGATIVE PRESSURE (-)
  DOUBLE NEGATIVE PRESSURE (- -)

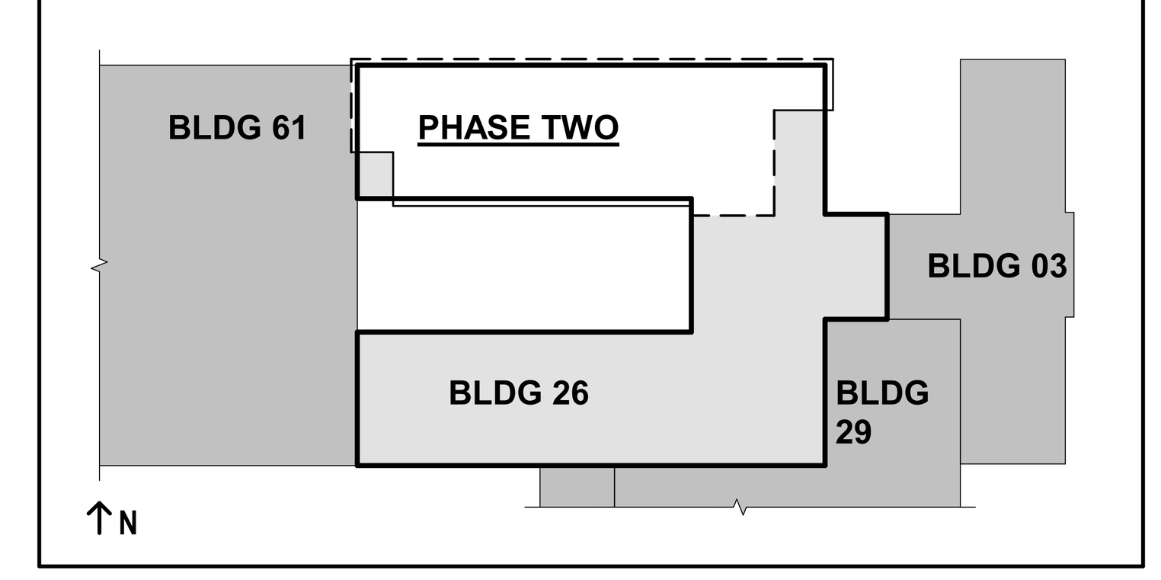
PHASING AND PROJECT SCOPE LEGEND

- AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

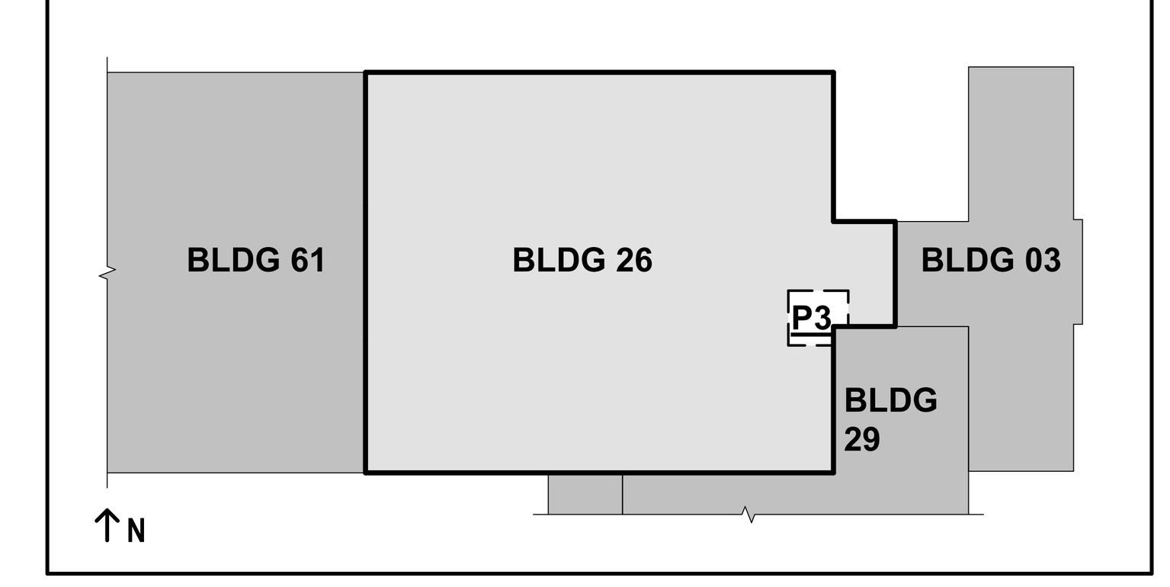
HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



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CONSULTANTS:

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HOUSTON, TX 77008
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INNOVA GROUP
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ARCHITECT: SPUR PROJECT #: 2016

SPUR DESIGN, LLC
312 SW 25TH STREET
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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP: J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title: **GROUND FLOOR AIR PRESSURIZATION PLANS**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date: **12/21/2022** | Checked: JRM | Drawn: GT

Project Number: **589-704**

Building Number: **26**

Drawing Number: **MH108**

Drawing # 132 OF 190

Veterans Health Administration

VA U.S. Department of Veterans Affairs

VA FORM 08-6231

2 FIRST FLOOR HVAC ZONING PLAN - PHASE ONE
1/8" = 1'-0"

1 FIRST FLOOR HVAC ZONING PLAN - PHASE TWO
1/8" = 1'-0"

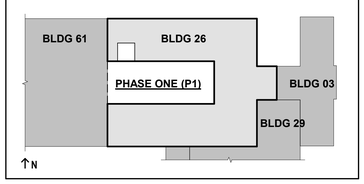
HATCH LEGEND

- POSITIVE PRESSURE (+)
  DOUBLE POSITIVE PRESSURE (++)
- NUETRAL PRESSURE (ø)
- NEGATIVE PRESSURE (-)
  DOUBLE NEGATIVE PRESSURE (- -)

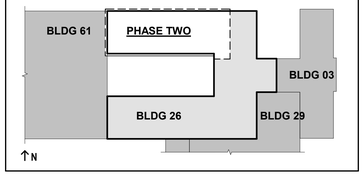
PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE G011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - FIRST FLOOR



HVAC KEY PLAN - FIRST FLOOR



FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
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ARCHITECT:

SPUR PROJECT #: 2016

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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES KIRK — 27054 — 12/21/2022 — KANSAS — PROFESSIONAL ENGINEER

Drawing Title
FIRST FLOOR AIR PRESSURIZATION PLANS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **MH109**

Drawing # 133 OF 190

Veterans Health Administration

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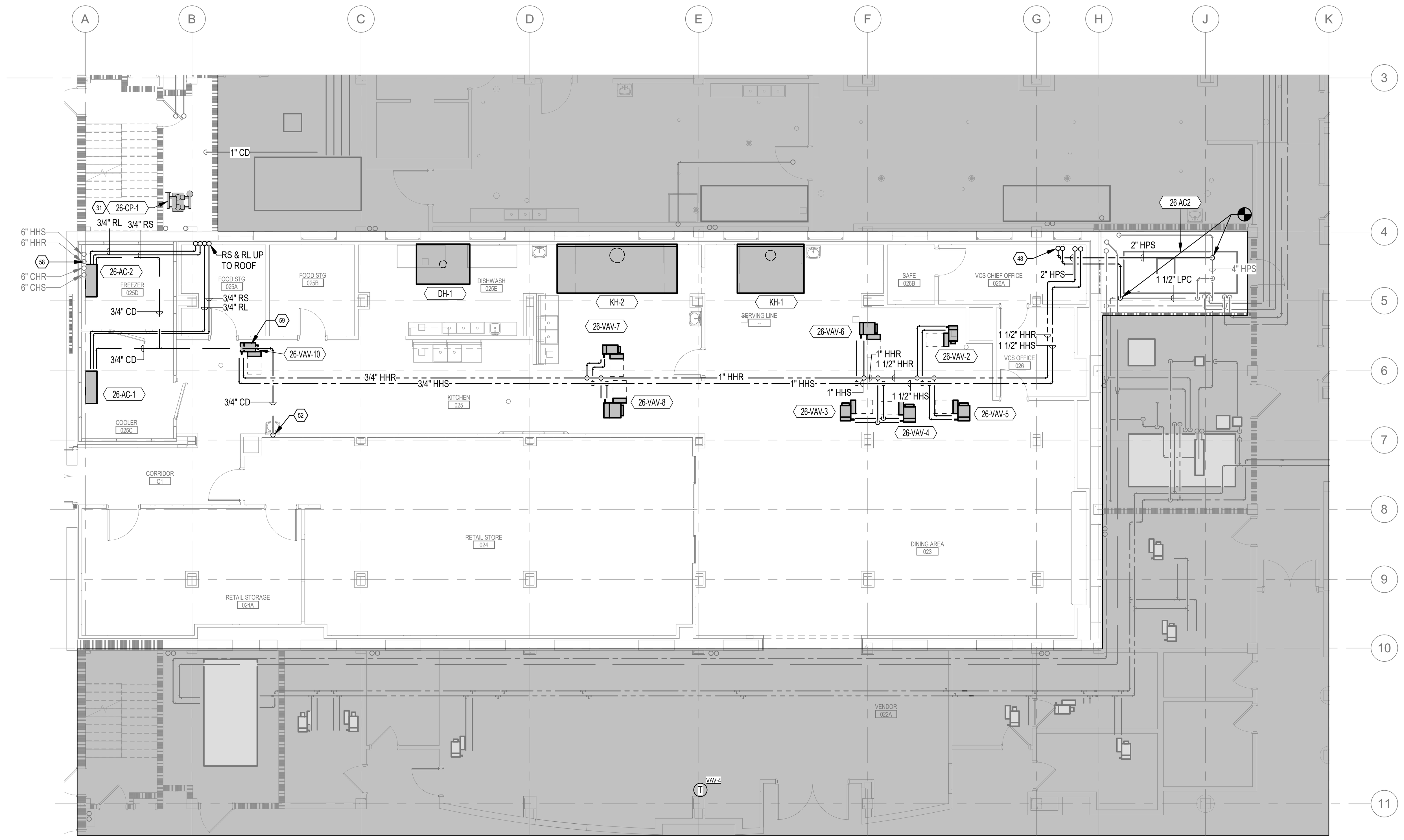
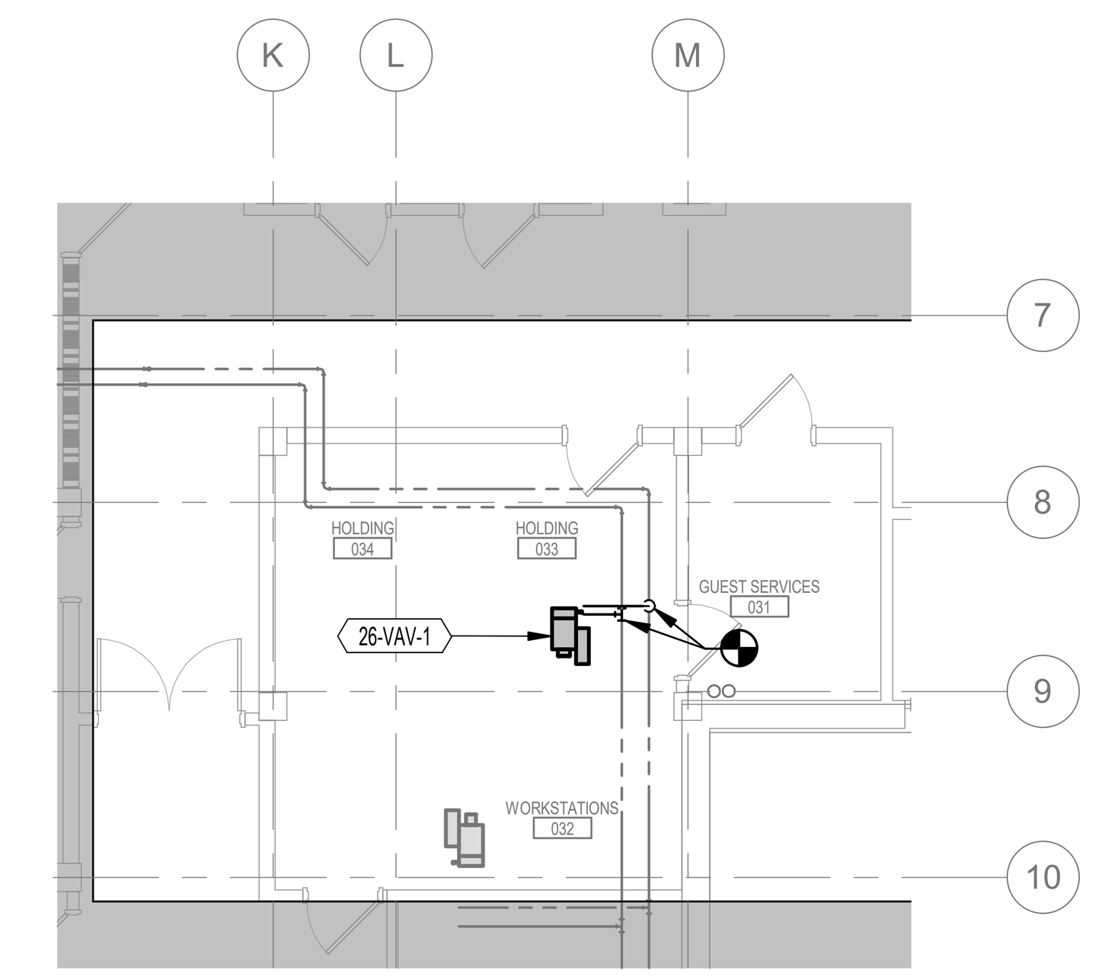
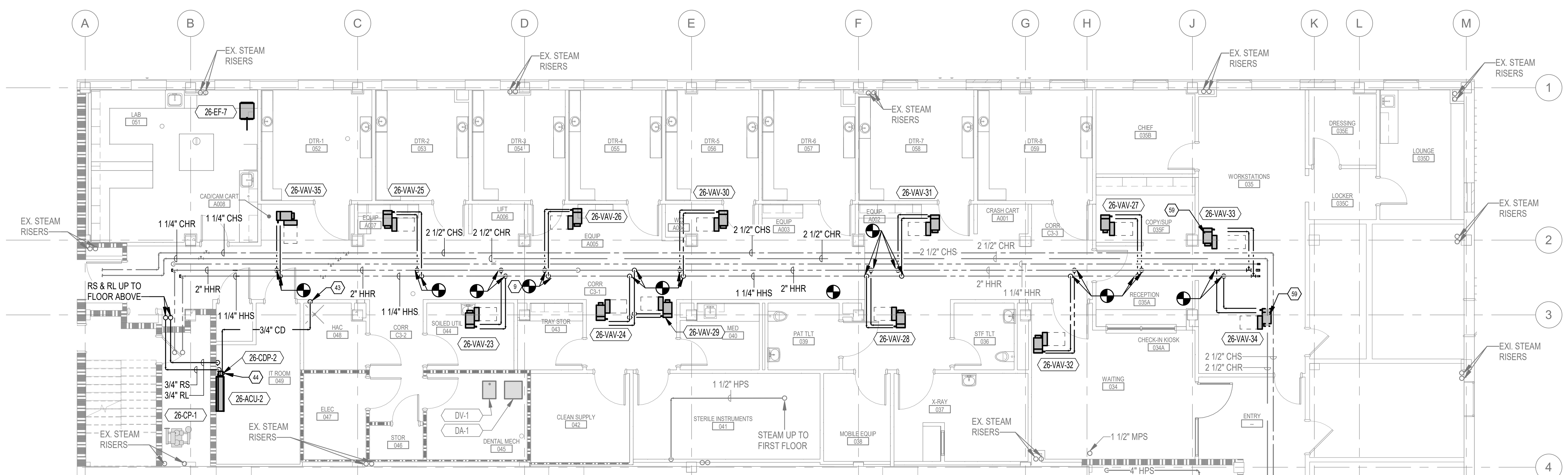


2 GROUND FLOOR MECHANICAL HVAC PIPING PLAN - PHASE ONE
1/8" = 1'-0"



3 GROUND FLOOR MECHANICAL HVAC PIPING PLAN - PHASE THREE
1/8" = 1'-0"

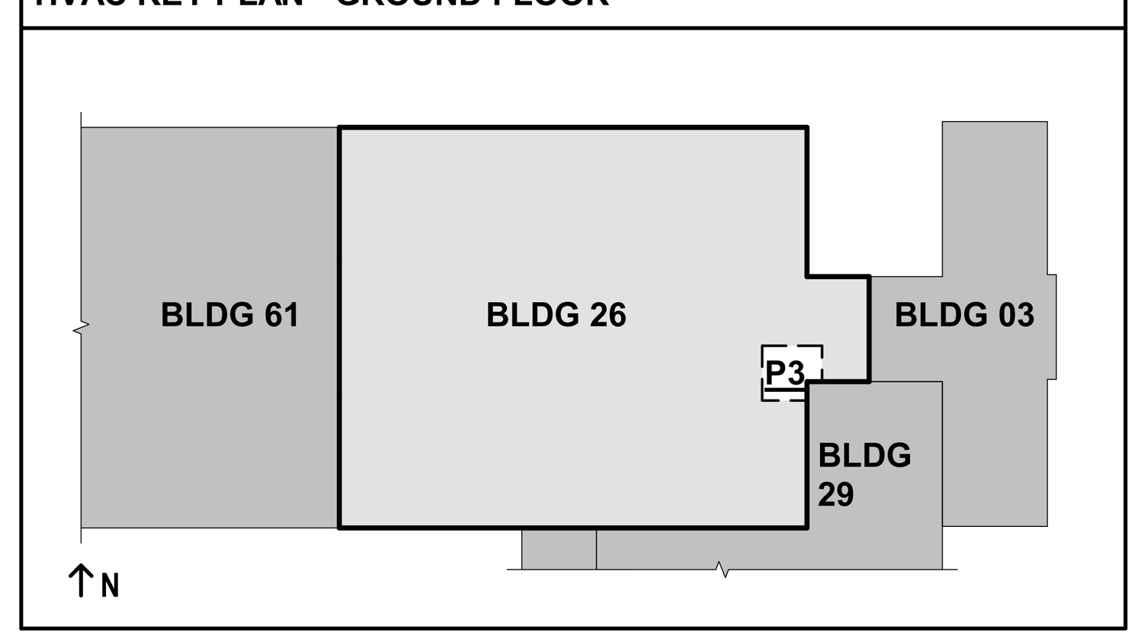


1 GROUND FLOOR MECHANICAL HVAC PIPING PLAN - PHASE TWO
1/8" = 1'-0"

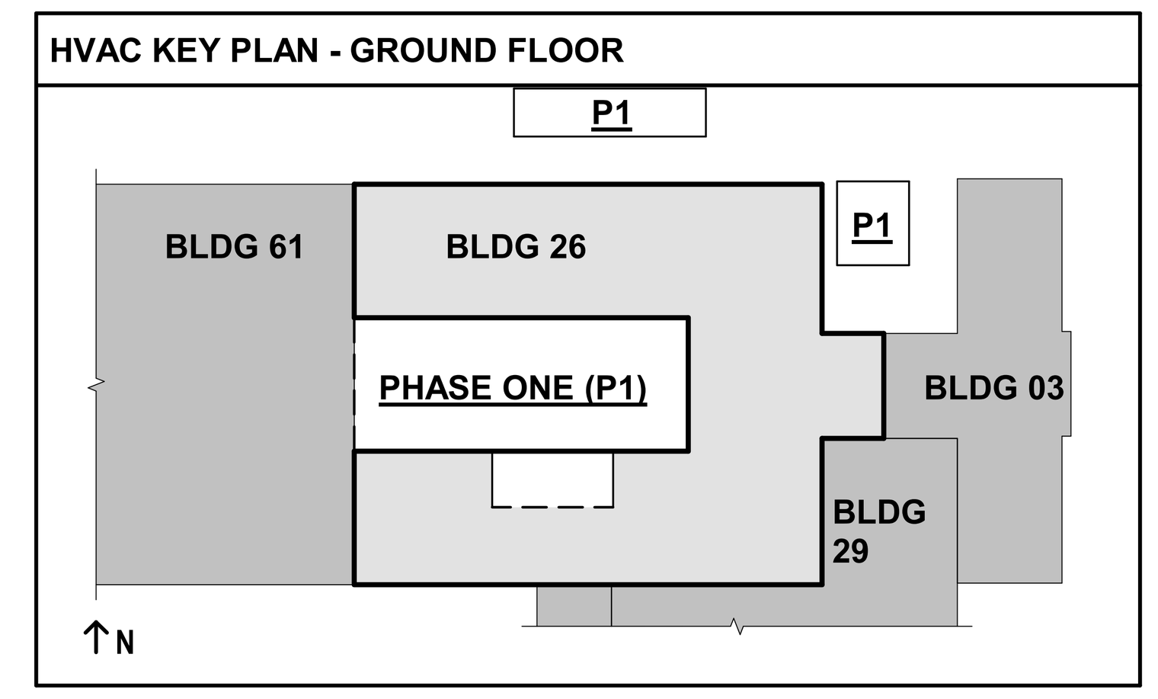
KEYNOTES

9 CONNECT NEW HEATING WATER REHEAT COIL BRANCH PIPING TO EXISTING MAIN. REFER TO COIL PIPING CONNECTION DETAIL FOR FINAL CONNECTION DETAILS.
31 CONTRACTOR SHALL REPLACE EXISTING STEAM CONDENSATE RETURN PUMP PACKAGE AND RECONNECT TO EXISTING PIPING.
43 3/4" CONDENSATE PIPE DOWN IN WALL. TERMINATE AT MOP SINK.
44 3/4" CONDENSATE PIPE UP TO ABOVE CEILING.
48 2"HPS (80 PSI) UP TO HEAT EXCHANGERS IN PENTHOUSE.
52 ROUTE CONDENSATE DRAIN DOWN IN WALL TO SINK TAILPIECE.
58 EXISTING CHILLED WATER PIPING ALONG EXTERIOR WALL.
59 PROVIDE 3-WAY VALVE FOR HEATING WATER FOR VAV'S AT THE END OF A HEATING WATER LOOP/RUN.

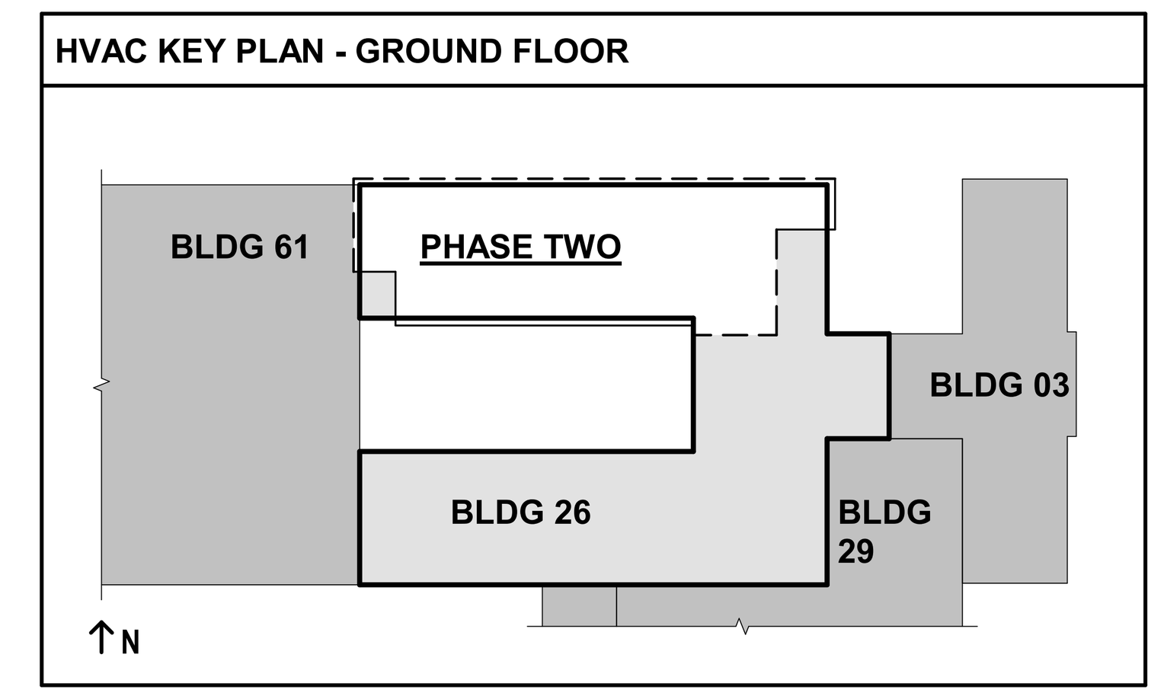
HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR



PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

RATED PARTITIONS AND BARRIERS

- FIRE - 1 HOUR
- FIRE - 2 HOUR
- FIRE - 3 HOUR
- FIRE / SMOKE - 1 HOUR
- FIRE / SMOKE - 2 HOUR
- FIRE / SMOKE - 3 HOUR

FULLY SPRINKLERED

100% BID SET

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CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
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ARCHITECT: SPUR PROJECT #: 2016

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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:
J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title: GROUND FLOOR MECHANICAL HVAC PIPING PLAN
VA Health Care System Approval:

Project Title: CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS
Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218
Date: 12/21/2022 | Checked: JRM | Drawn: GT

Project Number: 589-704
Building Number: 26
Drawing Number: MP101
Drawing # 134 OF 190

Veterans Health Administration
VA U.S. Department of Veterans Affairs

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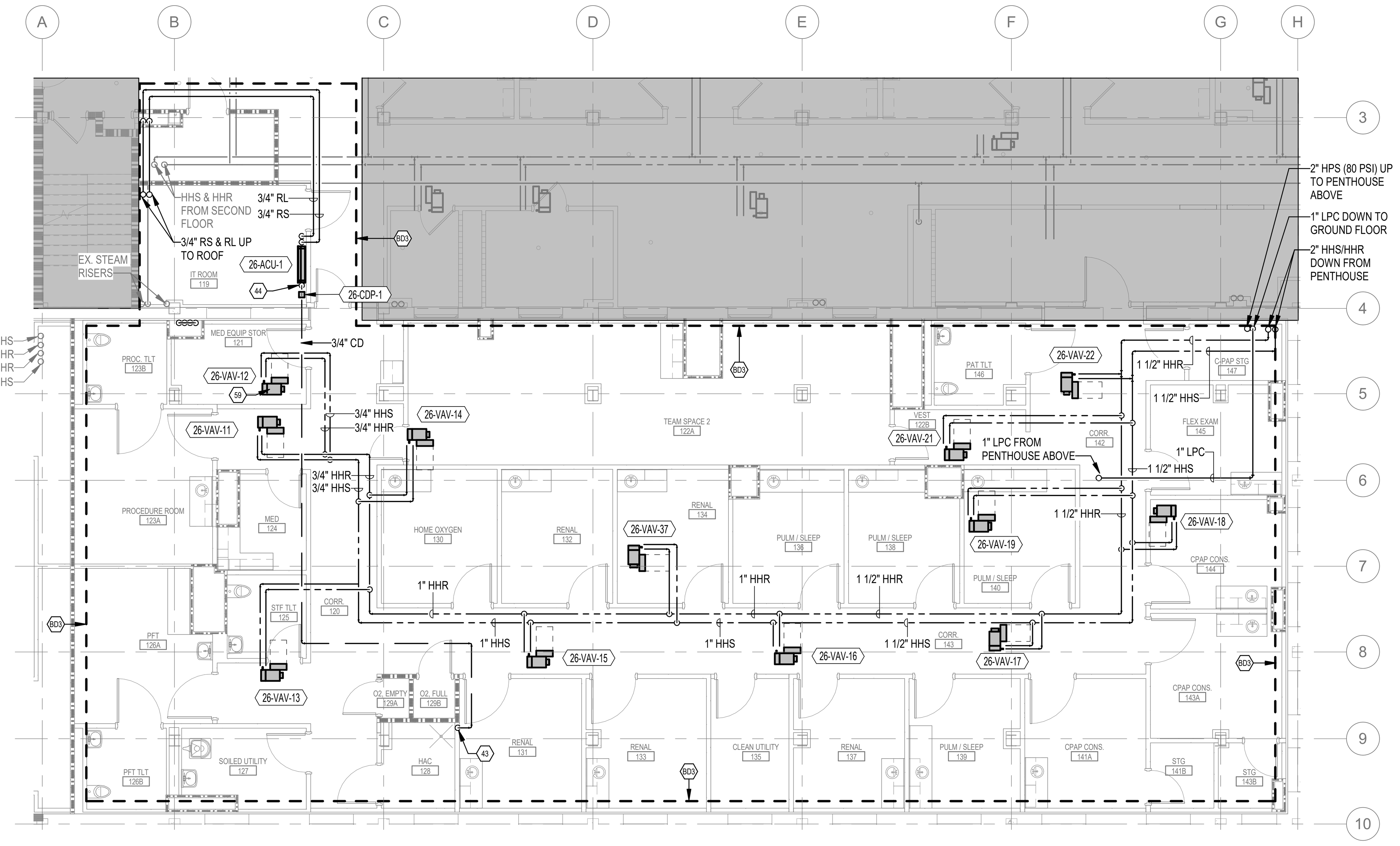
KEYNOTES

43 3/4" CONDENSATE PIPE DOWN IN WALL. TERMINATE AT MOP SINK.
44 3/4" CONDENSATE PIPE UP TO ABOVE CEILING.
59 PROVIDE 3-WAY VALVE FOR HEATING WATER FOR VAV'S AT THE END OF A HEATING WATER LOOP/RUN.
61 CONNECT NEW SUPPLY AIR DUCTWORK AND AIR DEVICES TO EXISTING TERMINAL UNIT TO TEMPORARILY SERVE THE PATIENT ACCESS CORRIDOR. DEMOLISH ONCE PHASE 1 IS COMPLETE.

BID DEDUCT KEYNOTES

BD3 FOR BID DEDUCT, THIS AREA TO REMAIN. NO NEW WORK TO OCCUR EXCEPT WHERE SPECIFIALLY INDICATED.



2 FIRST FLOOR MECHANICAL HVAC PIPING PLAN - PHASE ONE
1/8" = 1'-0"

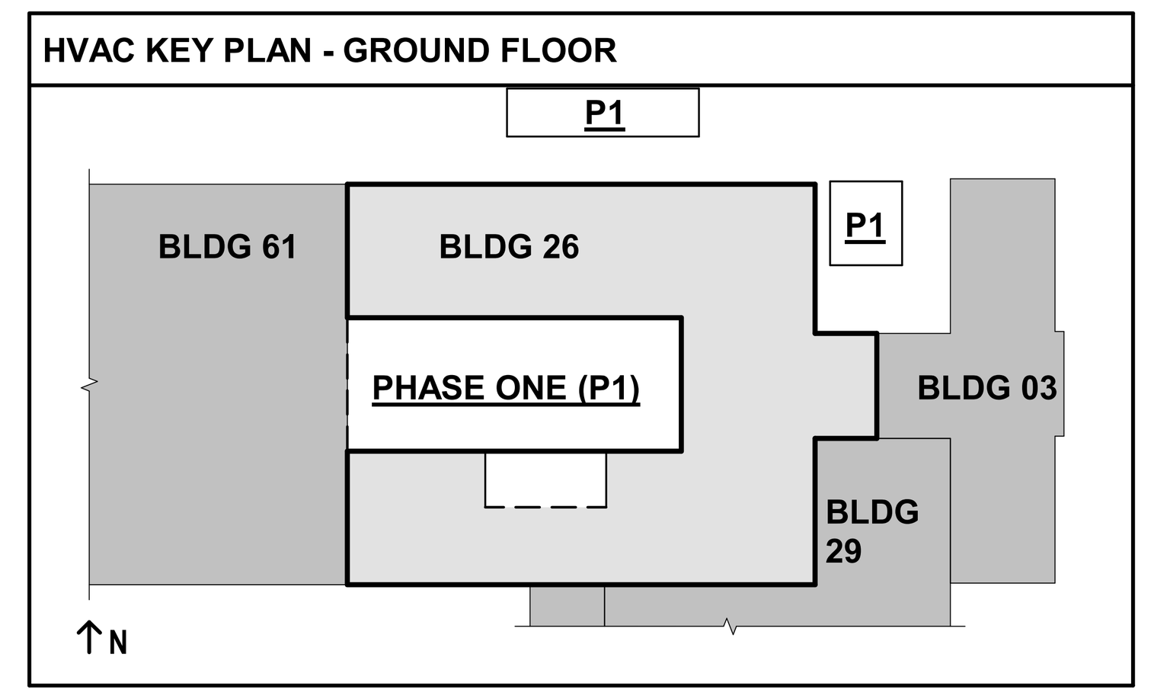
PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

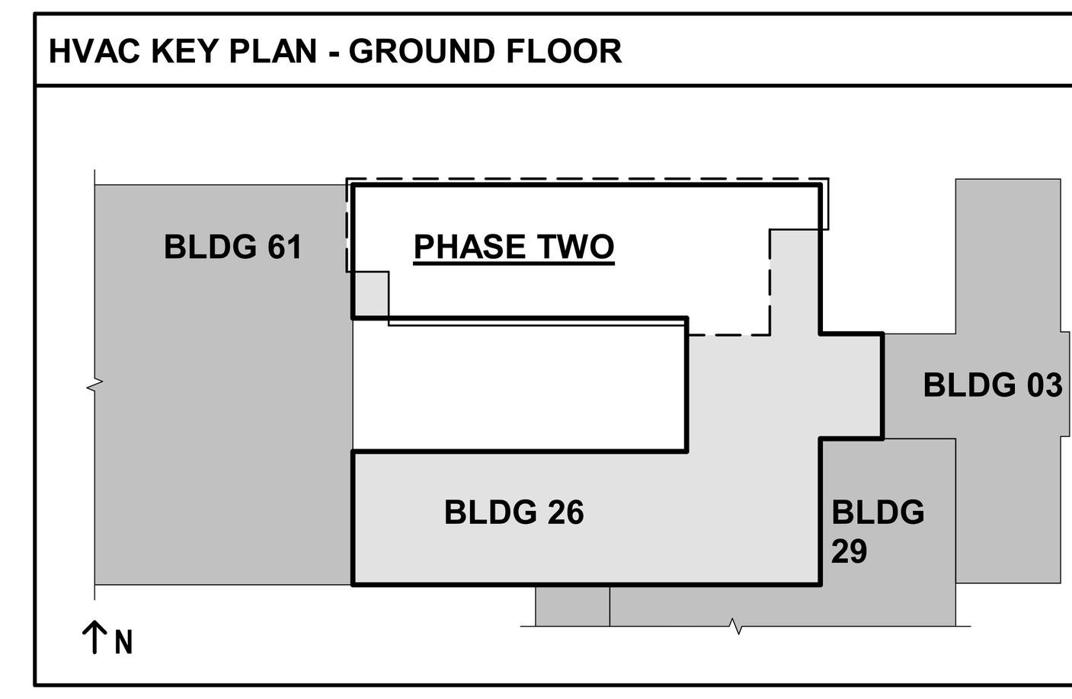
RATED PARTITIONS AND BARRIERS

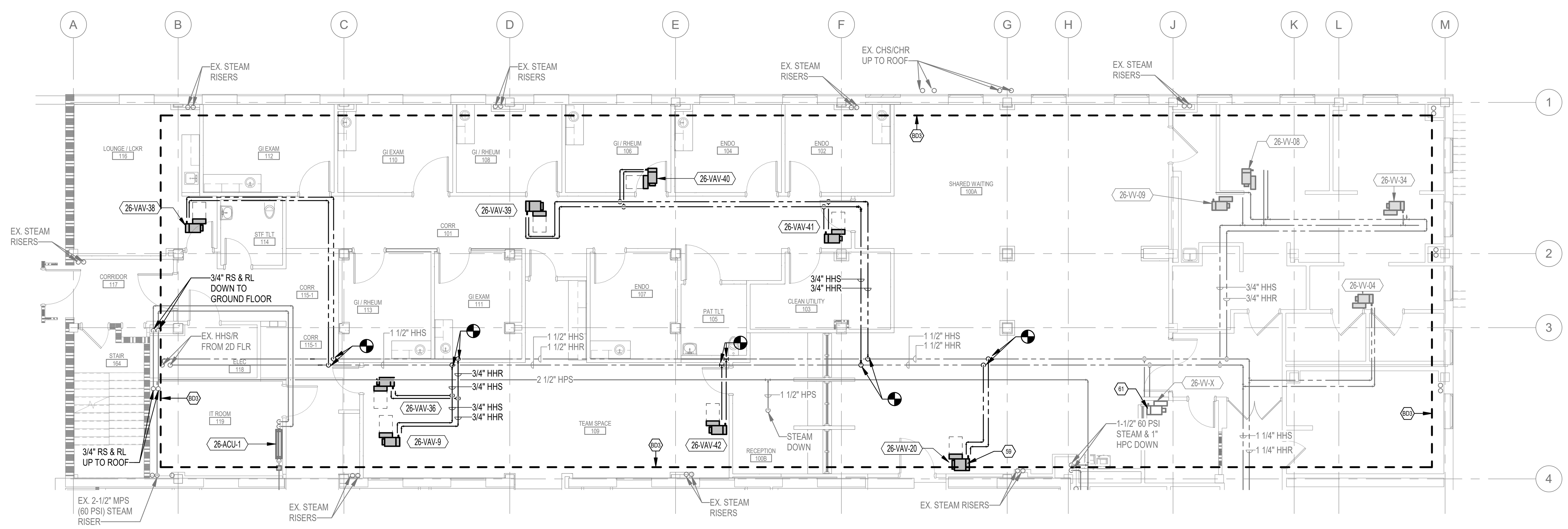
- FIRE - 1 HOUR
- FIRE - 2 HOUR
- FIRE - 3 HOUR
- FIRE / SMOKE - 1 HOUR
- FIRE / SMOKE - 2 HOUR
- FIRE / SMOKE - 3 HOUR

HVAC KEY PLAN - GROUND FLOOR



HVAC KEY PLAN - GROUND FLOOR





1 FIRST FLOOR MECHANICAL HVAC PIPING PLAN - PHASE TWO
1/8" = 1'-0"

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
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ARCHITECT: SPUR PROJECT #: 2016

SPUR DESIGN, LLC
312 SW 25TH STREET
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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP: J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title: **FIRST FLOOR MECHANICAL HVAC PIPING PLAN**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date: **12/21/2022** | Checked: JRM | Drawn: GT

Project Number: **589-704**

Building Number: **26**

Drawing Number: **MP102**

Drawing # 135 OF 190

Veterans Health Administration

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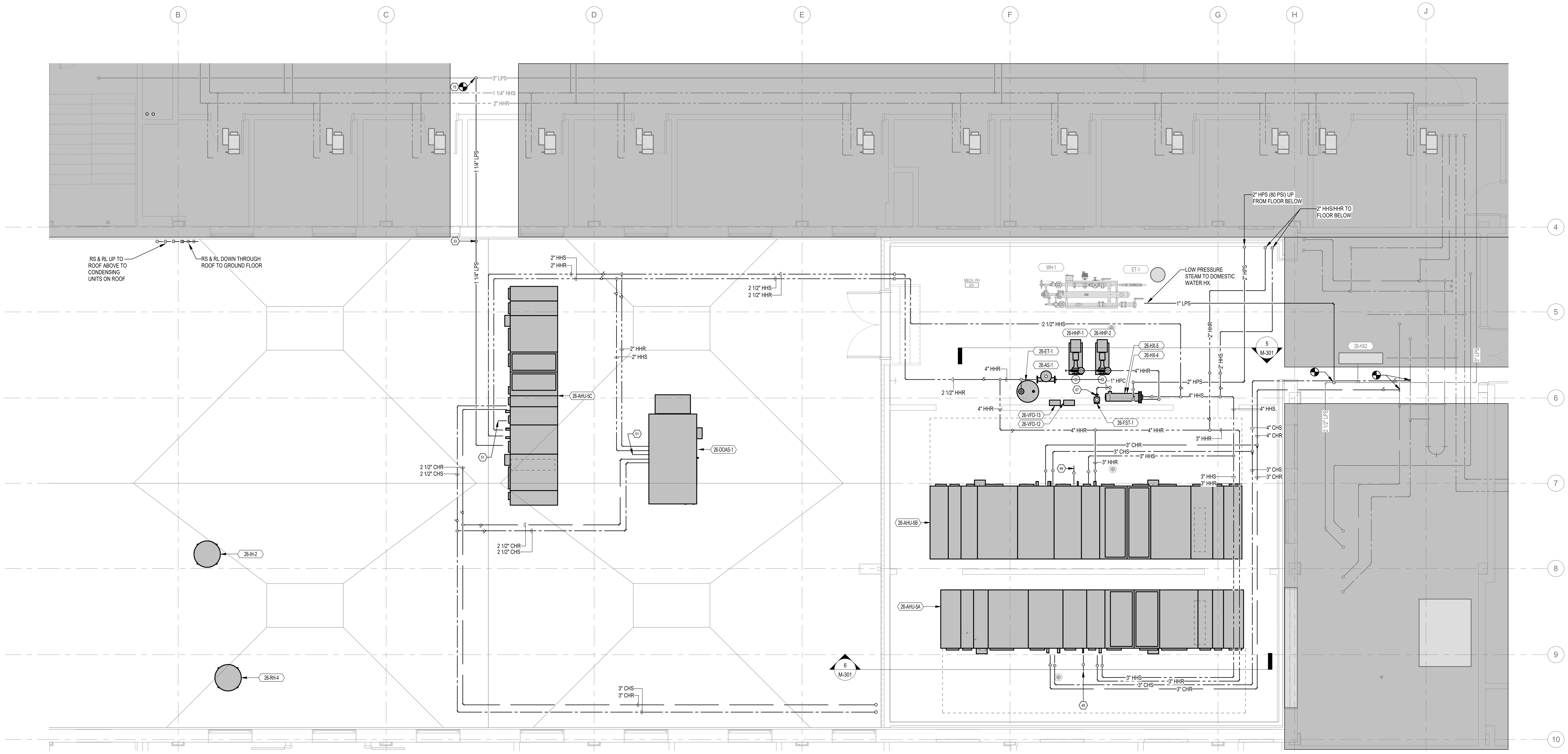
KEYNOTES

15 CONNECT NEW LOW PRESSURE STEAM AND CONDENSATE TO EXISTING LPS AND LPC PIPING IN ADJACENT MECHANICAL ROOM.
33 CONTRACTOR SHALL PROVIDE HEAT TRACING FOR ALL EXPOSED PIPING.
49 2" CONDENSATE TO FLOOR DRAIN.
51 ROUTE CONDENSATE DRAIN TO NEAREST ROOF DRAIN.
57 1" LPC DOWN THROUGH FLOOR. SEE FLOOR BELOW FOR PIPE ROUTING. VENT FLASH TANK PIPING UP THROUGH ROOF.



1 SECOND FLOOR MECHANICAL HVAC PIPING PLAN PHASE ONE
1/4" = 1'-0"

FULLY SPRINKLERED

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NO.	REVISION DESCRIPTION	DATE

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CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
1225 N. LOOP WEST, SUITE 800
HOUSTON, TX 77008
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25219 MADISON AVE, SUITE 100
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ARCHITECT:

SPUR PROJECT #: 2016

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KS ARCH REG. NO. A-930, EXP. 12/31/2021
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STAMP:

J. ROSS MYLES LICENSED 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
SECOND FLOOR MECHANICAL HVAC PIPING PLAN

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number
589-704

Building Number
26

Drawing Number
MP103

Drawing # 136 OF 190

Veterans Health Administration

VA U.S. Department of Veterans Affairs

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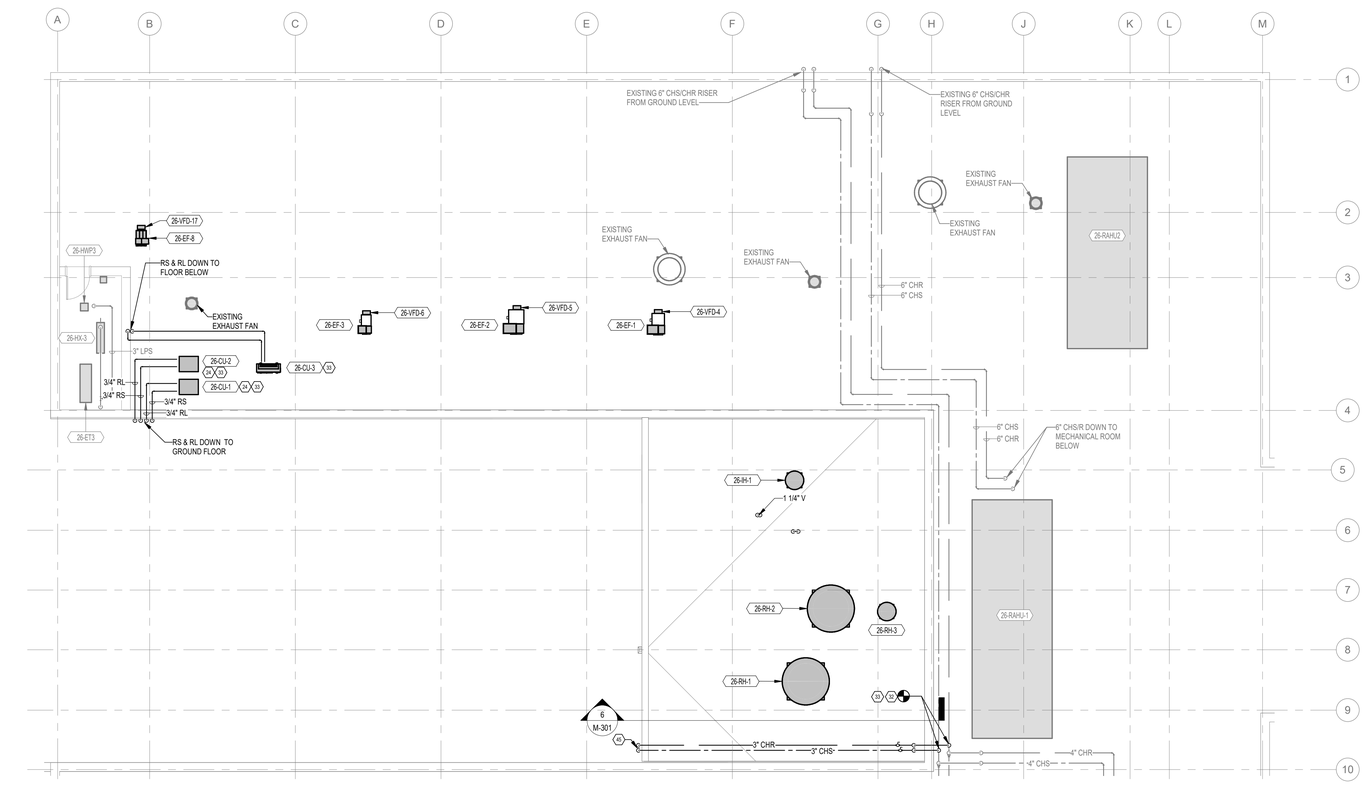


1 ROOF LEVEL MECHANICAL HVAC PLAN - PHASE ONE
1/8" = 1'-0"

KEYNOTES

24 CONTRACTOR SHALL PROVIDE ROOF MOUNTED EQUIPMENT RAILS. INSTALL REFRIGERANT LINE SET, THERMOSTATIC EXPANSION VALVE, SOLENOID VALVE, TEMPERATURE CONTROL, SIGHT GLASS, FILTER DRIER, PRESSURE CONTROL, CRANKCASE HEATER, LOW AMBIENT CONTROLS, AND WEATHERPROOF HOUSING AS APPLICABLE PER MANUFACTURER'S INSTRUCTIONS. PROVIDE PIPE CURB ASSEMBLY FOR ROOF PENETRATIONS. SEAL PIPING PENETRATIONS THROUGH COOLER/FREEZER ROOF AS REQUIRED.

32 CONTRACTOR SHALL CONNECT NEW 3" CHILLED WATER PIPING TO EXISTING MAINS IN LOCATION SHOWN. PROVIDE SHUT OFF VALVES AS INDICATED.

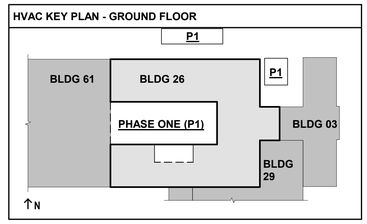
33 CONTRACTOR SHALL PROVIDE HEAT TRACING FOR ALL EXPOSED PIPING.

45 CHS & CHS PIPING DOWN ALONG PENTHOUSE EXTERIOR WALL TO ROOF.

PHASING AND PROJECT SCOPE LEGEND

AREAS OF WORK OUTSIDE OF CURRENT PHASE OR OUTSIDE OF PROJECT SCOPE SHOWN. REFERENCE GI011 - PHASING PLANS FOR MORE INFORMATION.

HVAC KEY PLAN - GROUND FLOOR



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NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

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H2B, INC.
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ARCHITECT: SPUR PROJECT #: 2016

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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES OSENSKI 27054 12/21/2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
ROOF MECHANICAL HVAC PIPING PLAN

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **MP104**

Drawing # 137 OF 190

Veterans Health Administration

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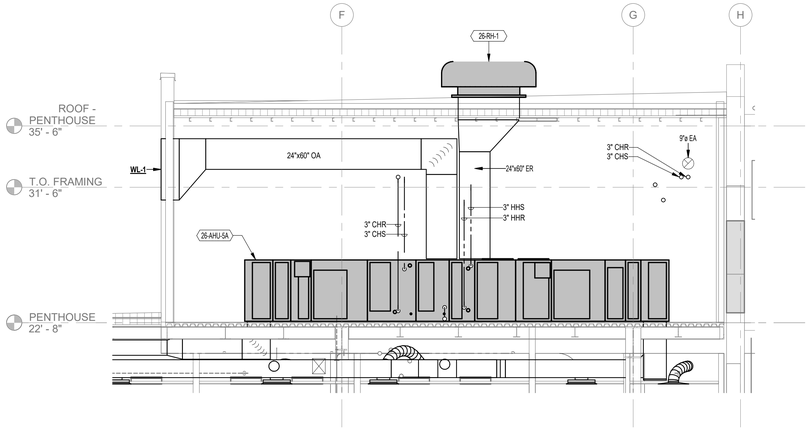
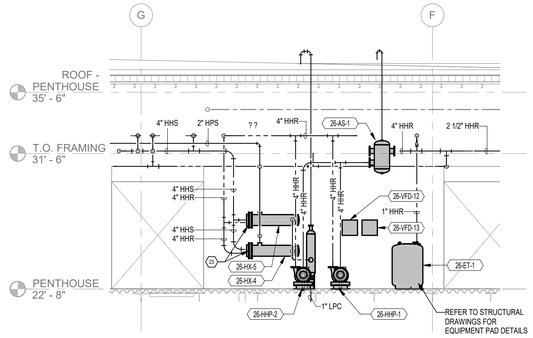


6 AIR HANDLING UNIT SECTION
1/4" = 1'-0"



5 PENTHOUSE PUMP SECTION
1/4" = 1'-0"

KEYNOTES

23 CONTRACTOR SHALL MOUNT HEAT EXCHANGER AND AIR SEPARATOR NO HIGHER THAN 7' ABOVE FINISHED FLOOR TO ALLOW FOR PROPER ACCESS AND MAINTENANCE. PROVIDE STEEL FRAME OR SKID MOUNTED OPTION.

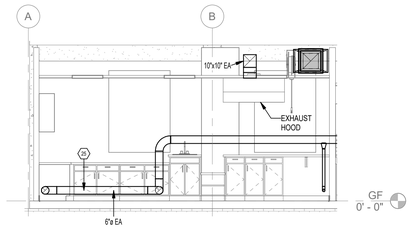
25 CONTRACTOR SHALL ROUTE DUST COLLECTION EXHAUST DUCT THROUGH CABINETRY.

26 CONTRACTOR SHALL ROUTE DUCT UP THROUGH WALL TO FISH MOUTH.

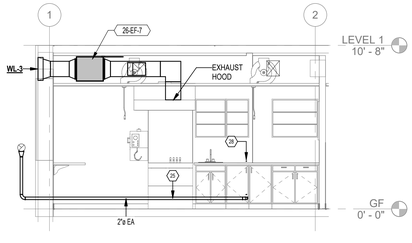
27 CONTRACTOR SHALL CONNECT FLEX DUCT CONNECTION FROM MICROBLASTING STATION TO DUST COLLECTION DUCT IN THIS AREA. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR MORE INFORMATION.

28 CONTRACTOR SHALL ROUTE DUCT UP THROUGH WALL TO OPENING IN LOCATION SHOWN.

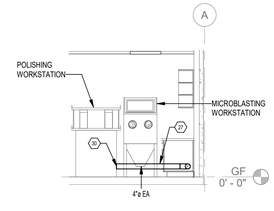
30 CONTRACTOR SHALL CONNECT DUST COLLECTION DUCTWORK TO OPENING IN POLISHING WORKSTATION. REFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR MORE INFORMATION.



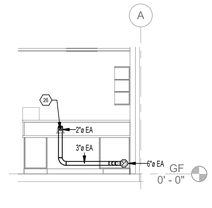
4 DENTAL LAB EAST WALL SECTION
1/4" = 1'-0"



3 DENTAL LAB SOUTH WALL SECTION
1/4" = 1'-0"



2 DENTAL LAB WEST WALL SECTION
1/4" = 1'-0"



1 DENTAL LAB WORK STATION SECTION
1/4" = 1'-0"

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER
H2B, INC.
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ARCHITECT:

SPUR PROJECT #: 2016

spur DESIGN

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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES DENSMORE 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL SECTIONS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number
589-704

Building Number
26

Drawing Number
M-301
Drawing # 138 OF 190

Veterans Health Administration

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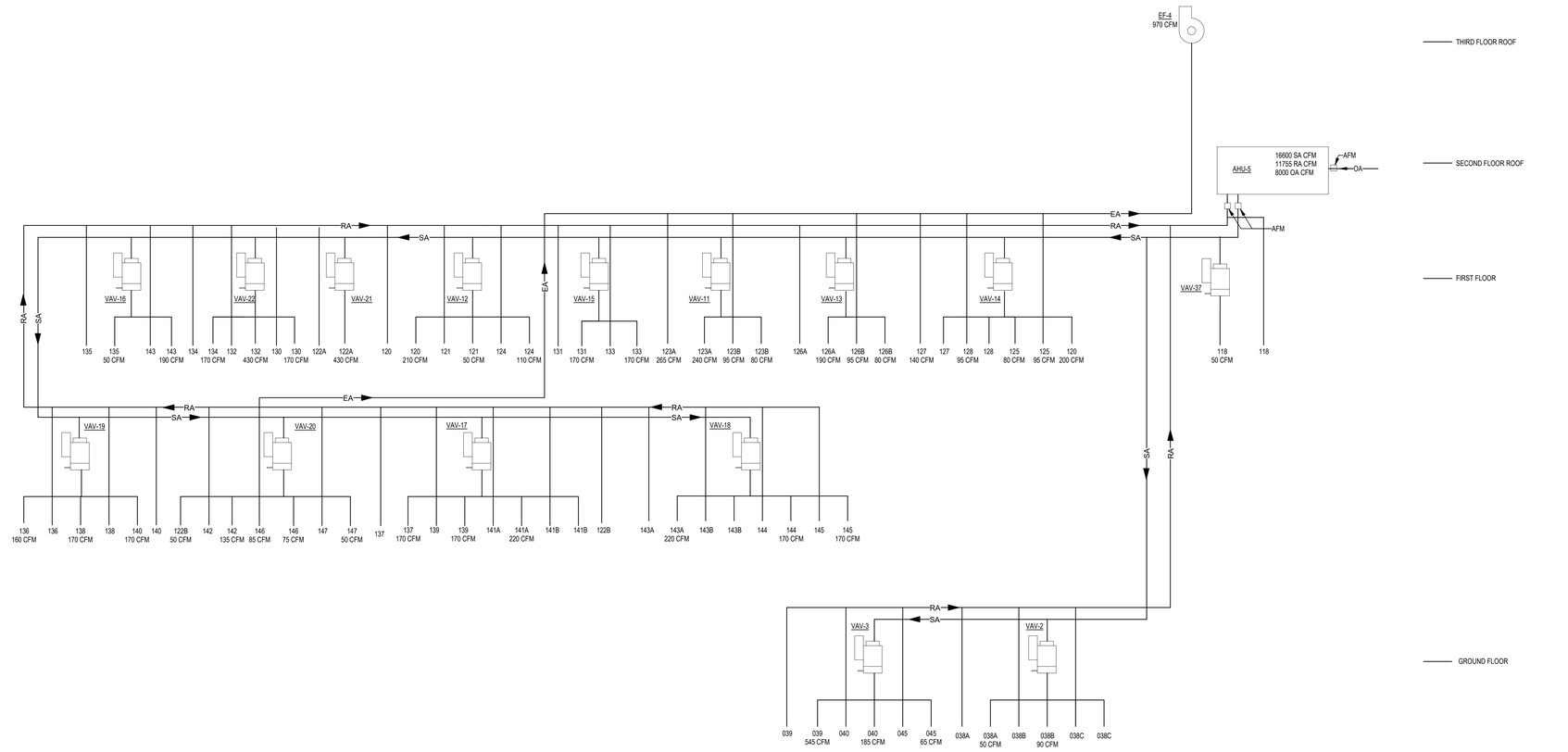
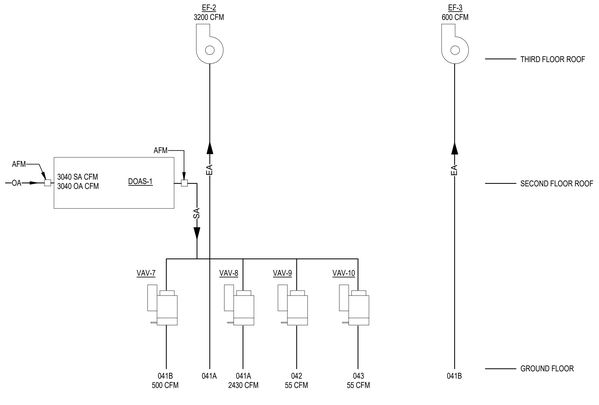
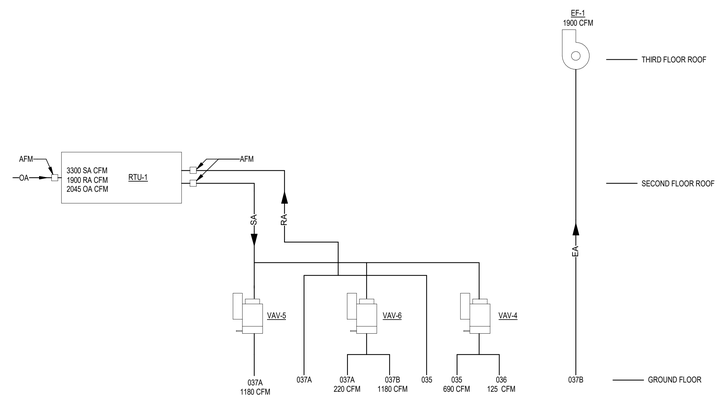


1 26-AHU-5 AIR FLOW DIAGRAM
NOT TO SCALE



2 26-DOAS-2 AIR FLOW DIAGRAM
NOT TO SCALE



3 26-RTU-1 AIR FLOW DIAGRAM
NOT TO SCALE

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ARCHITECT:

SPUR PROJECT #: 2016

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Drawing Title
PHASE 1 AIR FLOW DIAGRAMS

VA Health Care System Approval:

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5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date	Checked	Drawn
12/21/2022	JRM	GT

Project Number
589-704

Building Number
26

Drawing Number
M-401
Drawing # 139 OF 190

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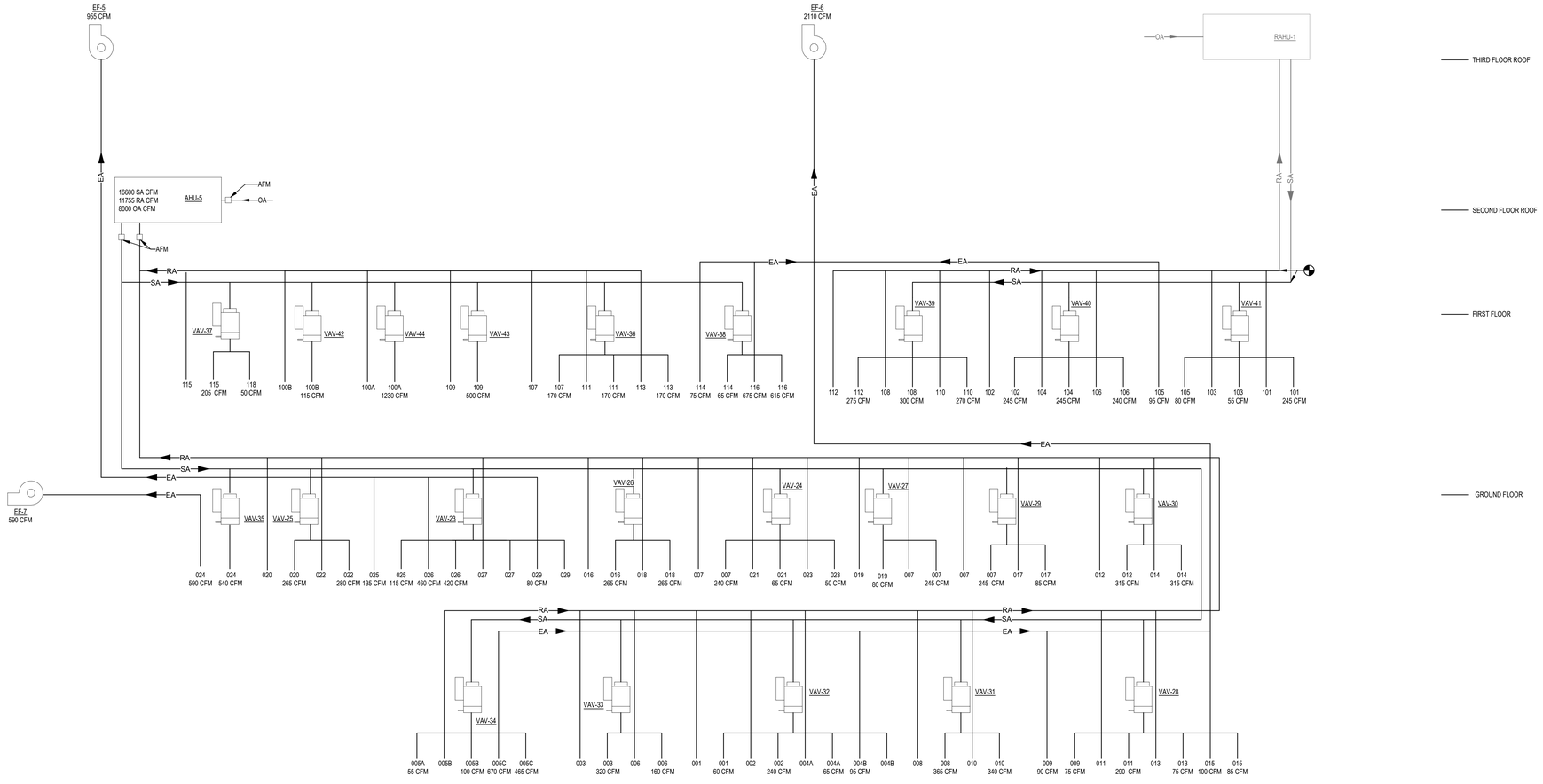

1 26-AHU-5 AIR FLOW DIAGRAM _ PHASE 2
NOT TO SCALE

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CONSULTANTS:

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ARCHITECT:

SPUR PROJECT #: 2016

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KS ENGR REG. NO. E-2586, EXP. 12/31/2021

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Drawing Title
PHASE 2 AIR FLOW DIAGRAMS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **M-402**

Drawing # 140 OF 190

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U.S. Department of Veterans Affairs

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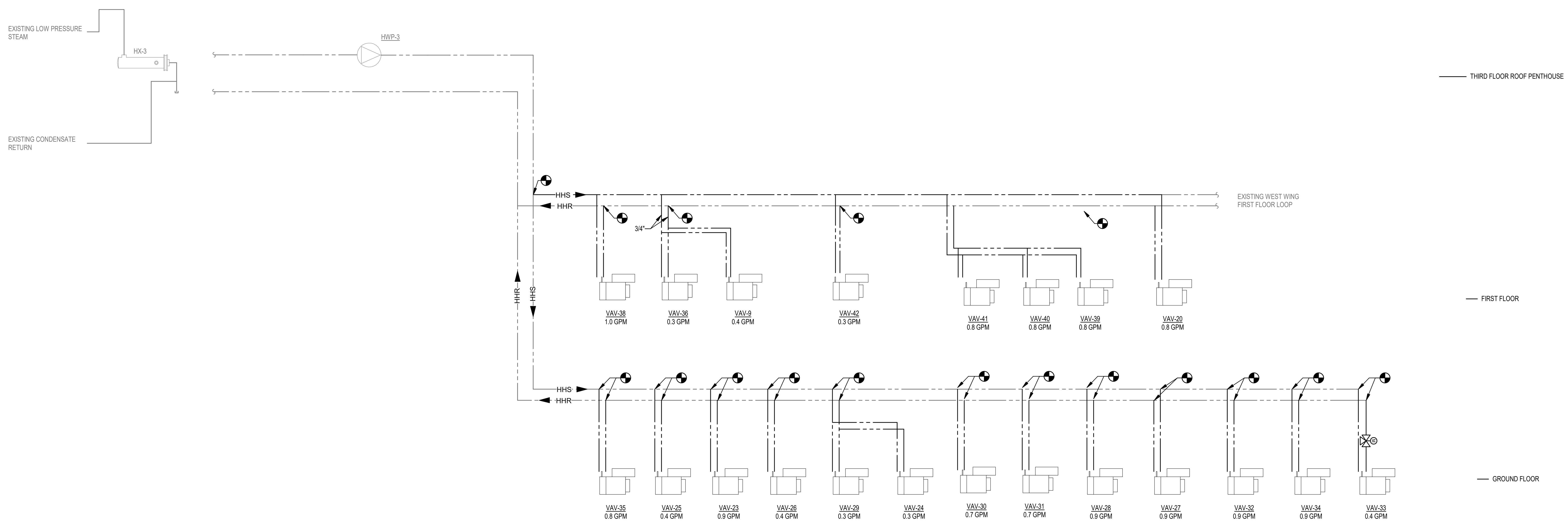
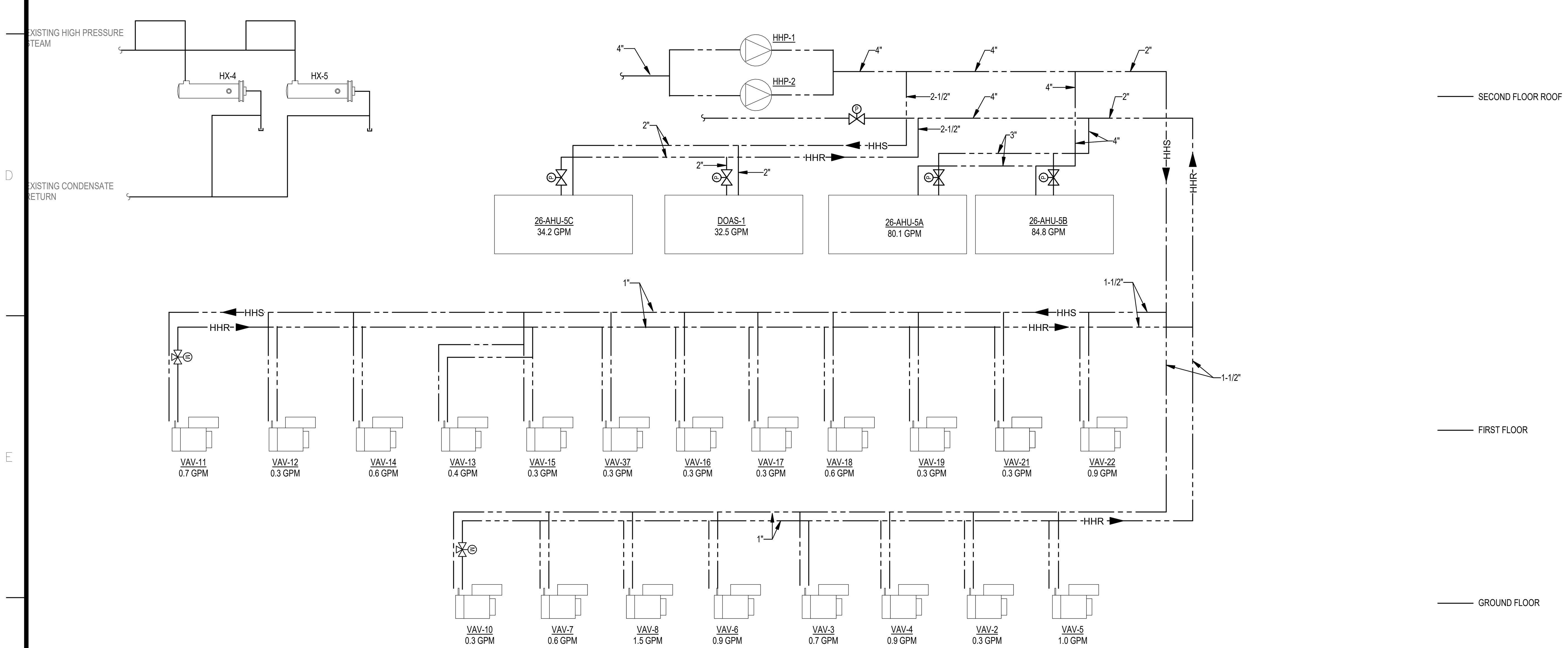
GENERAL NOTES:

1. PROVIDE SEISMIC BRACING ON DUCTWORK, PIPING, AND EQUIPMENT IN ACCORDANCE WITH VA STANDARD H-18-8, AND ASCE 7 CHAPTER 13. REFER TO STRUCTURAL DRAWINGS FOR ALL APPLICABLE SEISMIC CRITERIA.
2. NEW HEATING WATER SUPPLY AND RETURN BRANCHES TO TERMINAL UNITS TO BE 3/4" UNLESS TAGGED OTHERWISE.



2 HEATING HOT WATER FLOW DIAGRAM HX-3

NOT TO SCALE



1 HEATING HOT WATER FLOW DIAGRAM NEW LOOP

NOT TO SCALE

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

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ARCHITECT: SPUR PROJECT #: 2016

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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

Drawing Title: **HYDRONIC FLOW DIAGRAMS**

VA Health Care System Approval:

Project Title: **CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS**

Location: 5500 EAST KELLOGG AVENUE, WICHITA, KANSAS 67218

Date: 12/21/2022 | Checked: JRM | Drawn: GT

Project Number: 589-704

Building Number: 26

Drawing Number: **M-403**

Drawing # 141 OF 190

Veterans Health Administration

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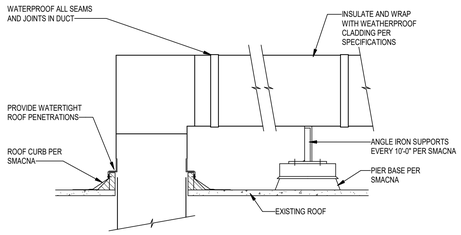
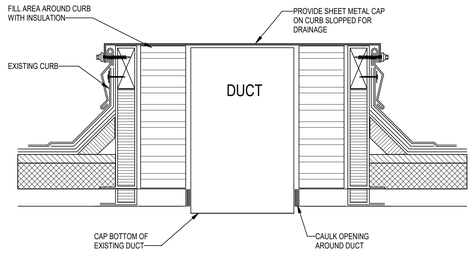
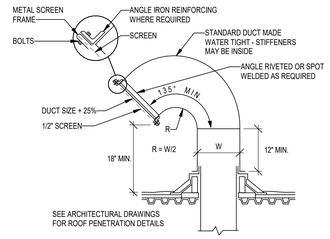


NOTE:
PENETRATIONS THROUGH SKYLIGHTS SHALL BE MADE WATERPROOF. SEAL OPEN AREAS OF SKYLIGHT WITH SHEETMETAL AND PROVIDE SHEETMETAL CANT ANGLED TO DRAIN WATER AWAY FROM DUCT PENETRATION AND ONTO ROOF. ALL PENETRATIONS SHALL BE MADE IN ACCORDANCE WITH SMACNA MANUAL OR AS APPROVED BY THE CONTRACTING OFFICER.

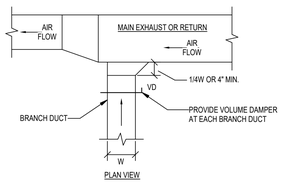
12 DUCT ROOF PENETRATION AND SUPPORT DETAIL
NOT TO SCALE



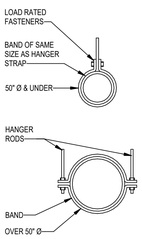
11 TYPICAL CAPPED FAN ROOF CURB DETAIL
NOT TO SCALE



10 TYPICAL GOOSENECK DETAIL
NOT TO SCALE



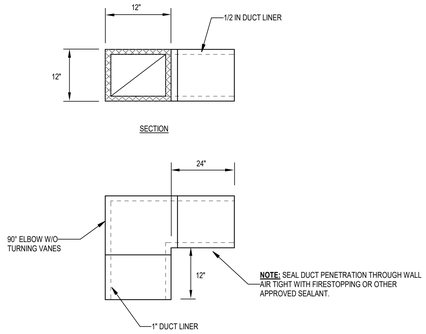
9 EXHAUST OR RETURN BRANCH DETAIL
NOT TO SCALE



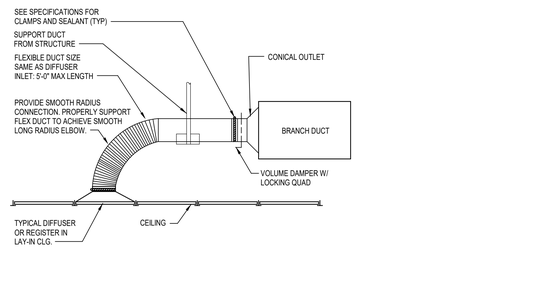
HANGER STRAPS OR RODS			
MAX. DUCT Ø IN.	QUANTITY/SIZE IN.	MAX. LOAD LBS.	MAX. SPACING IN.
26	ONE 1 x 22 GA STRAP	260	144
36	ONE 1 x 18 GA STRAP	420	144
50	ONE 1 x 16 GA STRAP	700	144
60	TWO 3/8 Ø. RODS	1320	144
84	TWO 1/2 Ø RODS	2500	144

NOTE:
TABULATED DATA FROM SMACNA ALLOWS FOR DUCT REINFORCING AND INSULATION, BUT NO EXTERNAL LOAD.

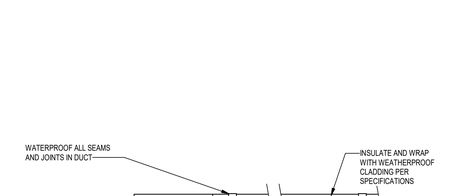
8 ROUND DUCT HANGERS DETAIL
NOT TO SCALE



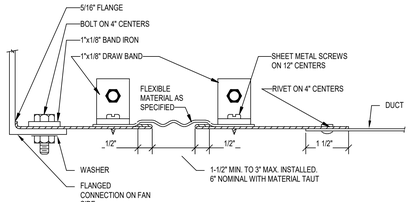
7 TRANSFER DUCT DETAIL
NOT TO SCALE



6 CEILING DIFFUSER FLEXIBLE DUCT DETAIL
NOT TO SCALE

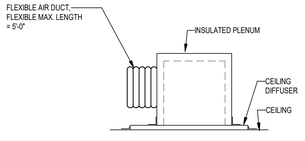


RECTANGULAR FLEXIBLE CONNECTION



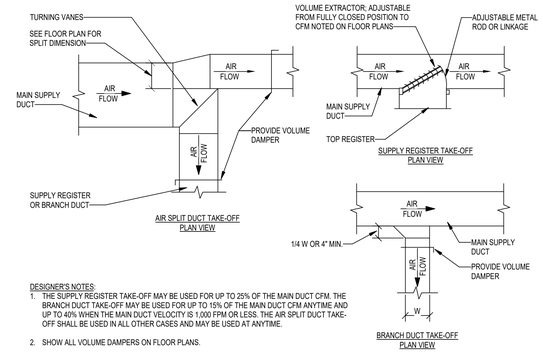
ROUND FLEXIBLE CONNECTION

4 FLEXIBLE DUCT CONNECTIONS DETAIL
NOT TO SCALE



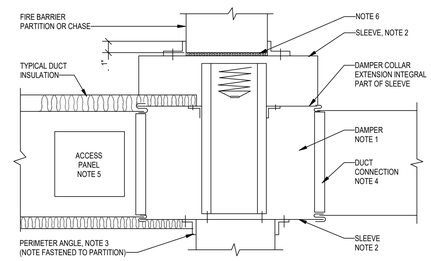
NOTE: THIS DETAIL APPLIES TO SUPPLY GRILLE, RETURN GRILLE AND EXHAUST GRILLE

3 TYPICAL FIRST FLOOR CEILING DIFFUSER DETAIL
NOT TO SCALE



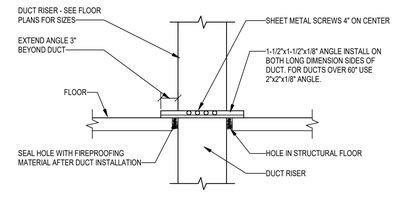
DESIGNER'S NOTES:
1. THE SUPPLY REGISTER TAKE-OFF MAY BE USED FOR UP TO 25% OF THE MAIN DUCT CFM. THE BRANCH DUCT TAKE-OFF MAY BE USED FOR UP TO 15% OF THE MAIN DUCT CFM ANYTIME AND UP TO 40% WHEN THE MAIN DUCT VELOCITY IS 1,000 FPM OR LESS. THE AIR SPLIT DUCT TAKE-OFF SHALL BE USED IN ALL OTHER CASES AND MAY BE USED AT ANYTIME.
2. SHOW ALL VOLUME DAMPERS ON FLOOR PLANS.

2 SUPPLY DUCTWORK TAKE-OFFS DETAIL
NOT TO SCALE

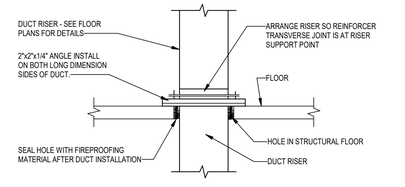


NOTES:
1. A VERTICAL DAMPER IS SHOWN. HORIZONTAL DAMPER INSTALLATION, IS SIMILAR. FOLLOW DAMPER MANUFACTURER'S INSTRUCTIONS, INCLUDING FASTENER OPTIONS AND GAUGES FOR SLEEVE AND PERIMETER ANGLES. FIRE DAMPERS MUST BE INSTALLED IN THE PARTITION OR FLOOR AND NOT OUTSIDE THE PENETRATION.
2. GALVANIZED SLEEVE: GAGE NOT LESS THAN CONNECTING DUCT. FASTEN SLEEVE TO DAMPER FRAME AND TO PERIMETER ANGLES.
3. PERIMETER ANGELS: GALVANIZED STEEL, NOT LESS THAN 1 1/2"x1 1/2" [40x40mm], 14 GAGE, TO PROVIDE 1" [25mm] MINIMUM OVERLAP OF OPENING ON ALL 4 SIDES.
4. BREAKAWAY DUCT CONNECTION; CONTRACTOR'S OPTION OF TYPES SHOWN IN SMACNA. ACCESS PANELS: SIZE AND LOCATION TO PERMIT SERVICING THE FUSIBLE LINK OR LINKS.
5. PROVIDE 1/4" TO 1/2" [6 TO 15mm] CLEARANCE ON HEIGHT AND WIDTH. FILL OPEN SPACE WITH ROCK WOOL FIRESTOP FIBER.
6. ALL DUCT WORK RISERS WHICH ARE RUN EXPOSED, SUCH AS THRU ATTIC FLOORS AND MECHANICAL ROOM FLOORS, SHALL BE PROVIDED WITH 3" [75mm] HIGH CONCRETE CURB AROUND OPENING FOR DUCT.

5 FIRE DAMPER INSTALLATION DETAIL
NOT TO SCALE



0.5 INCH WG TO 2 INCHES WG DUCT RISER SUPPORT



2 INCHES WG TO 4 INCHES WG DUCT RISER SUPPORT

NOTE:
1. ALL DUCT WORK RISERS WHICH ARE RUN EXPOSED, SUCH AS THRU ATTIC FLOORS AND FAN ROOM FLOORS SHALL BE PROVIDED WITH A 3" HIGH CONCRETE CURB AROUND OPENING FOR DUCT.

1 DUCT RISER SUPPORTS DETAIL
NOT TO SCALE:

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JOSS MYLES LAW — LICENSED — 27054 — 12-21-2022 — KANSAS — PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL DETAILS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
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Date **12/21/2022** | Checked JRM | Drawn GT

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Building Number **26**

Drawing Number
M-501
Drawing # 142 OF 190

Veterans Health Administration

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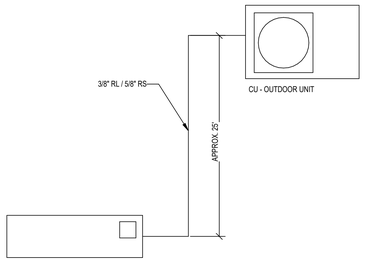
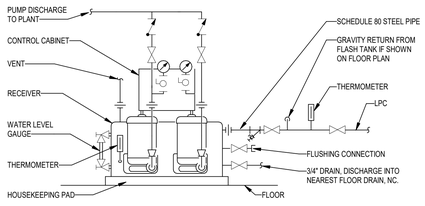


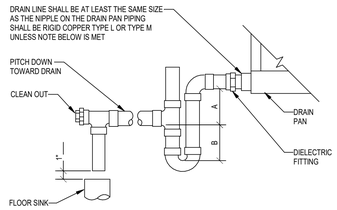
NOTE:

1. INSTALLING CONTRACTOR SHALL VERIFY WITH EQUIPMENT MANUFACTURER PIPE SIZES AND MAXIMUM RUN LENGTHS TO ENSURE PROPER OPERATION.
2. CONTRACTOR TO INSTALL OIL TRAPS IN REFRIGERANT LINE BEFORE EVAPORATOR COIL AND NEAR CONDENSING UNIT TO HELP PREVENT OIL BUILD-UP IN COILS.

12 CONDENSING UNIT PIPING DIAGRAM DETAIL
NOT TO SCALE



11 CONDENSATE PUMPS - PIPING CONNECTIONS DETAIL
NOT TO SCALE



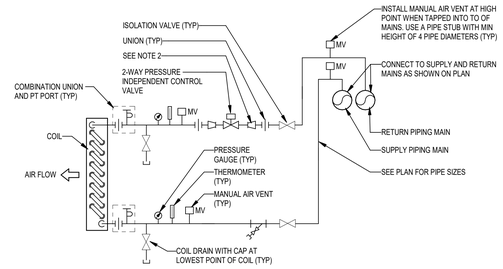
NOTES:

1. CPVC PIPE MAY BE USED ONLY IF APPROVED BY LOCAL VA AND IS INDOORS AND DOES NOT PASS THROUGH RATED BARRIERS.
2. DIELECTRIC FITTING TO BE USED WHEN TWO DISSIMILAR METALS ARE TO BE CONNECTED.

UNIT TYPE	A	B
DRAW THRU	2" PLUS X	X
BLOW THRU	1" MINIMUM	2X

WHERE X = STATIC PRESSURE IN PAN

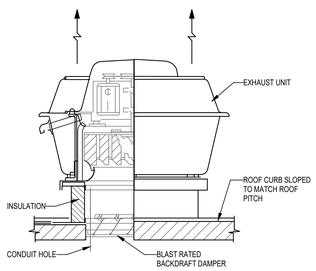
10 AIR HANDLING UNIT DRAIN TRAP DETAIL
NOT TO SCALE



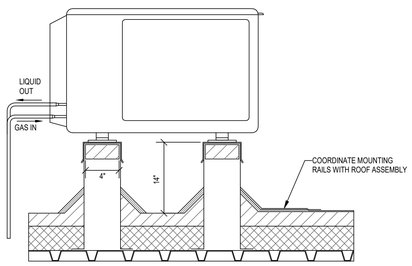
NOTES:

1. INSTALL CONTROL VALVE BETWEEN UNIONS OR FLANGES.
2. PROVIDE CONCENTRIC REDUCERS BOTH SIDES OF CONTROL VALVE AS REQUIRED.
3. REPLACE UNION/FLANGE SET WITH A FLEXIBLE PIPE CONNECTOR WHERE EQUIPMENT IS SUPPORTED OR SUSPENDED BY SPRING ISOLATORS.
4. ARRANGEMENT SHOWN FOR FULL FLOW THROUGH COIL ON FAILURE.

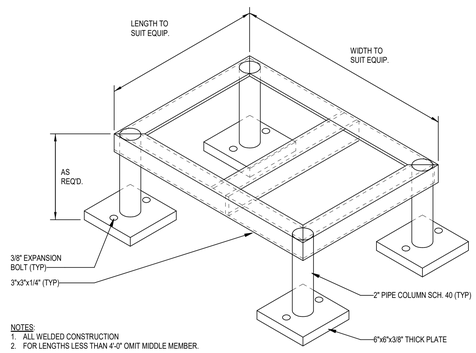
9 AHU COIL PIPING CONNECTION DETAIL
NOT TO SCALE



8 UPBLAST EXHAUST FAN DETAIL
NOT TO SCALE



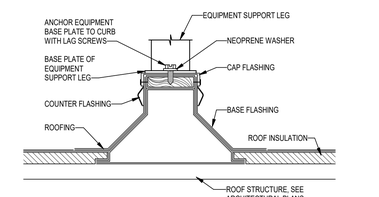
5 CONDENSING UNIT MOUNTING RAIL DETAIL
NOT TO SCALE



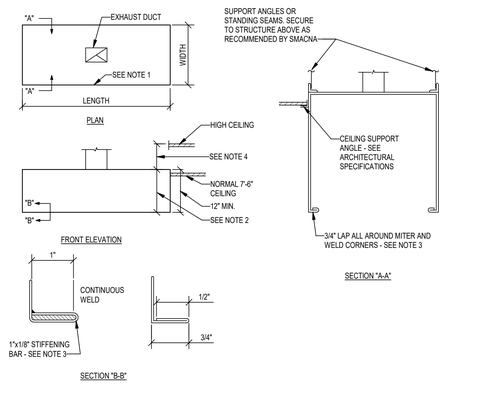
NOTES:

1. ALL WELDED CONSTRUCTION
2. FOR LENGTHS LESS THAN 4'-0" OMIT MIDDLE MEMBER.

7 TYPICAL EQUIPMENT SUPPORT FRAME DETAIL
NOT TO SCALE



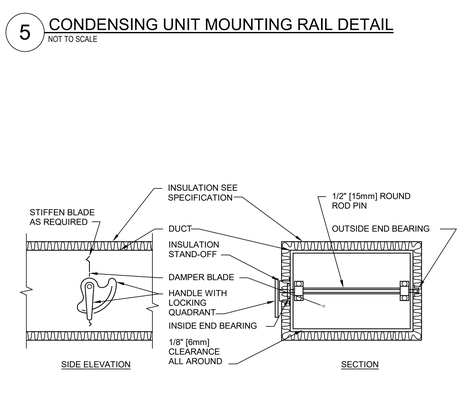
6 ROOF BASE RAIL DETAIL
NOT TO SCALE*



NOTES:

1. HOODS SHALL BE STAINLESS STEEL, SEE SPECIFICATIONS. FOR HOOD SIZE & LOCATION SEE EQUIPMENT SCHEDULE. FOR EXHAUST CONNECTIONS SEE FLOOR PLANS.
2. ALL HOODS SHALL BE 6'-0" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED. HOODS OVER URNS SHALL BE 7'-6" MINIMUM ABOVE FINISHED FLOOR.
3. HOODS OVER 6'-0" LONG WITH 2 OR MORE SECTIONS SHALL HAVE INSIDE STANDING SEAM AND 1"x1/8" STIFFENING BAR - SEE SECTION "B-B".
4. EXTEND SIDE AND END SHEET TO SUIT HIGH CEILING WHEN REQUIRED.
5. DETAIL SHOWS HOOD IN OPEN SPACE. WHEN HOOD IS INSTALLED AT WALL OR PARTITION SECURE TO WALL OR PARTITION WITH EXPANSION BOLTS.

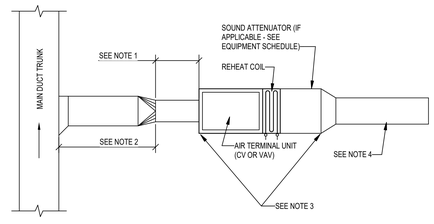
4 KITCHEN HOOD DETAIL
NOT TO SCALE



NOTE:

1. DELETE INSULATION STAND-OFF ON DUCTWORK WITHOUT EXTERIOR INSULATION.
2. DETAIL SHOWS SINGLE BLADE DAMPER. DAMPER INSTALLATION SHALL BE SIMILAR FOR MULTI-BLADE DAMPERS & ROUND DAMPERS.

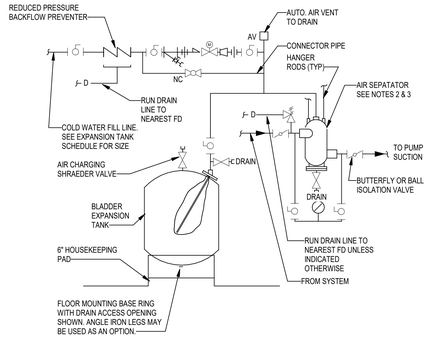
3 VOLUME DAMPER DETAIL
NOT TO SCALE



NOTES:

1. RIGID STRAIGHT TERMINAL UNIT INLET LENGTH SHALL BE A MINIMUM OF 3 TIMES THE DIAMETER OF INLET.
2. A BRANCH DUCT SERVING AN INDIVIDUAL ATU MAY BE THE SAME SIZE AS THE BOX INLET, PROVIDED THE EQUIVALENT LENGTH OF THE BRANCH DUCT, AS SHOWN, DOES NOT EXCEED 10 FEET. FOR LONGER LENGTHS, INCREASE THE DUCT SIZE AND PROVIDE A DUCT TRANSITION TO MAINTAIN THE DUCT STATIC PRESSURE DROP AT OR BELOW 0.2"/100'.
3. COMPONENT ARRANGEMENT MAY VARY BY MANUFACTURER. PROVIDE INSULATION W/VAPOR BARRIER FOR CONNECTING DUCT SECTIONS.
4. ALLOW AT LEAST 5 DUCT DIAMETERS OF STRAIGHT DUCT BETWEEN THE ATU OUTLET AND THE FIRST BRANCH DUCT.

2 DUCT CONNECTION - VAV DETAIL
NOT TO SCALE



NOTES:

1. SEE EXPANSION TANK SYSTEM SCHEDULE FOR COMPONENT SIZES.
2. FOR HOT WATER SYSTEMS 2" AND SMALLER AND CHILLED WATER SYSTEMS USE IN-LINE AIR PURGER IN LIEU OF AIR SEPARATOR.
3. SET PRESSURE REDUCING VALVE SO PRESSURE AT HIGHEST POINT IN SYSTEM HAS A MINIMUM OF 4 PSIG.

1 FLOOR MOUNTED EXPANSION TANK - PIPING CONNECTIONS
NOT TO SCALE

FULLY SPRINKLERED

100% BID SET

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CONSULTANTS:

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Drawing Title
MECHANICAL DETAILS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **M-502**

Drawing # 143 OF 190

Veterans Health Administration

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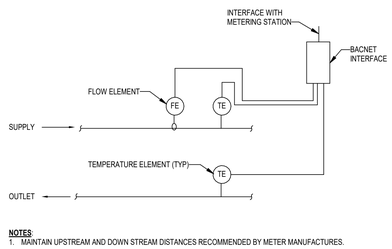
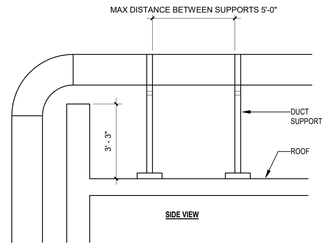


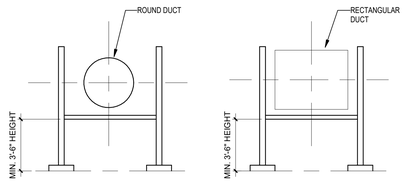
NOTES:
1. MAINTAIN UPSTREAM AND DOWN STREAM DISTANCES RECOMMENDED BY METER MANUFACTURES.

12 WATERFLOW MEASURING DEVICE DETAIL
NOT TO SCALE



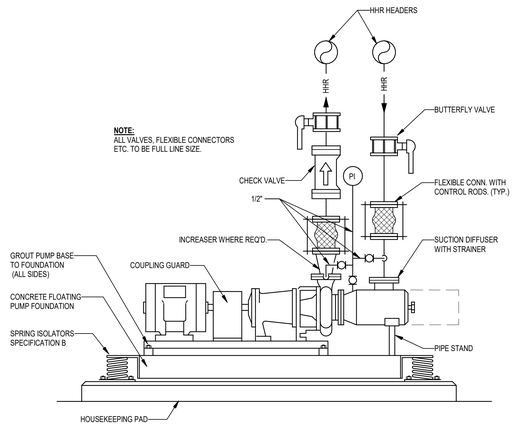
SIDE VIEW

11 ROOF PARAPHET DUCT SUPPORT SIDE VIEW DETAIL
NOT TO SCALE

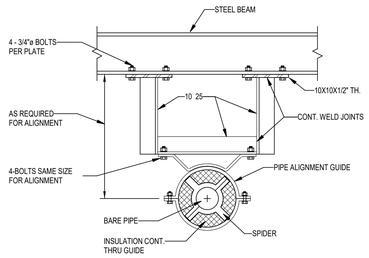


FRONT VIEW

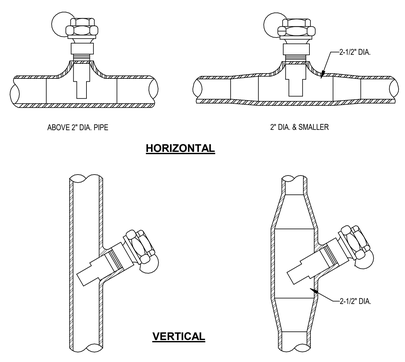
10 ROOF PARAPHET DUCT SUPPORT FRONT VIEW DETAIL
NOT TO SCALE



9 END SUCTION PUMP PIPING AND INSTALLATION DETAIL
NOT TO SCALE



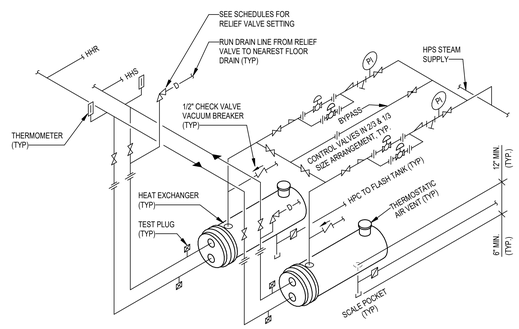
8 PIPE GUIDE DETAIL
NOT TO SCALE



HORIZONTAL

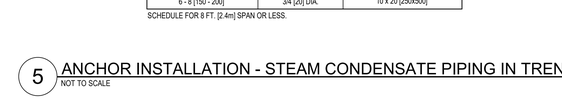
VERTICAL

7 INSTALLATION OF THERMOMETER WELLS DETAIL
NOT TO SCALE



NOTES:
1. THE ABOVE DETAIL SHOWS REQUIRED PIPING FOR TWO HEAT EXCHANGERS IN PARALLEL.
2. PROVIDE SADDLE SUPPORTS AND LEGS OR HANGERS FOR HEAT EXCHANGER. MOUNTING HEIGHT SHALL BE ADJUSTED TO FACILITATE GRAVITY RETURN OF STEAM CONDENSATE.
3. MAKE THE BYPASS THE SAME SIZE AS THE CONNECTIONS TO THE CONTROL VALVES.
4. CONTROL VALVES SHALL BE IN A 1/3 AND 2/3 SIZE ARRANGEMENT.

6 HEAT EXCHANGER STEAM TO HOT WATER PIPING DETAIL
NOT TO SCALE

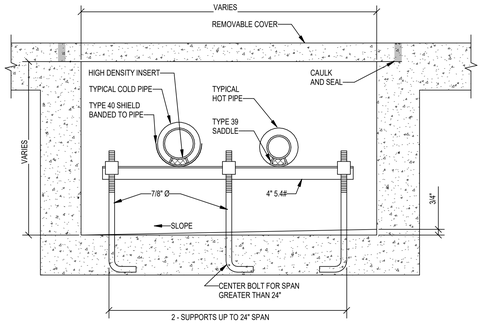


PLAN VIEW

SCHEDULE		
SIZE OF PIPE INCH [mm]	SIZE OF "U" BOLT INCH [mm]	SIZE OF CHANNEL INCH [mm]
1 - 2 [25 - 50]	3/8 [10] DIA.	6 x 10.5 [150x265]
2-1/2 - 5 [65 - 125]	1/2 [15] DIA.	8 x 13.75 [200x345]
6 - 8 [150 - 200]	3/4 [20] DIA.	10 x 20 [250x500]

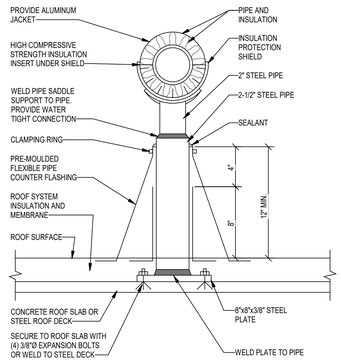
SCHEDULE FOR 8 FT. [2.4m] SPAN OR LESS.

5 ANCHOR INSTALLATION - STEAM CONDENSATE PIPING IN TRENCH
NOT TO SCALE



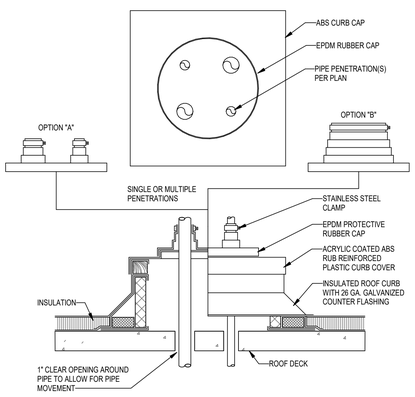
NOTES:
1. COORDINATE TRENCH DETAIL WITH ARCHITECTURAL & STRUCTURAL.
2. REFER TO SPECIFICATION, SEALING & CAULKING.

4 PIPE TRENCH IN BUILDING DETAIL
NOT TO SCALE

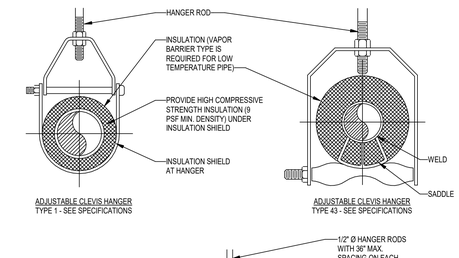


NOTES:
1. PROVIDE RESTRAINING CLAMPS 8'-0" O.C.

3 PIPE ON ROOF SUPPORT DETAIL
NOT TO SCALE



2 PIPE ROOF PENETRATION CURB DETAIL
NOT TO SCALE



NOTES:
1. SEE SPECIFER FOR DETAILED HANGER REQUIREMENTS.

SIDE VIEW TRAPEZE HANGER FOR UP TO 1000 LB. UNIFORM LOAD

MAXIMUM PIPE/TUBING SUPPORT SPACING																	
NOM. SIZE	IN.	THRU 3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16	18	20	24
PIPE	FT.	7	7	7	9	10	11	12	14	16	17	19	22	23	25	27	28	30	32
TUBING	FT.	5 FT	6	7	8	8	9	10	12	13	14	16	-	-	-	-	-	-	-
NOTE: FOR TRAPEZE HANGER TAKE SPACING OF SMALLEST SIZE ON TRAPEZE.																			

1 PIPE HANGERS DETAIL
NOT TO SCALE

FULLY SPRINKLERED

100% BID SET

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Drawing # 144 OF 190

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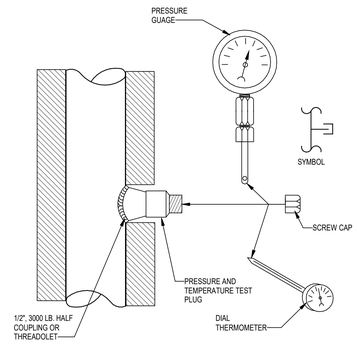
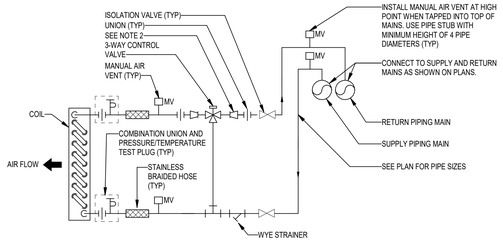


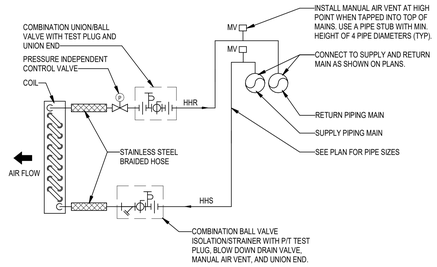
11 PRESSURE & TEMPERATURE TEST PLUG DETAIL
NOT TO SCALE



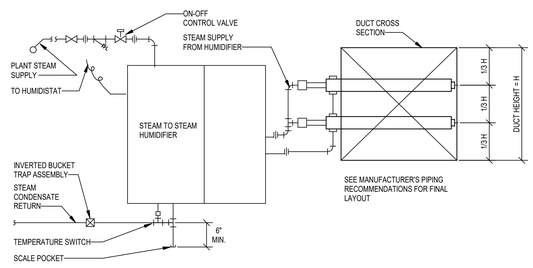
NOTES:

1. INSTALL CONTROL VALVE BETWEEN UNIONS OR FLANGES.
2. PROVIDE CONCENTRIC REDUCERS ON BOTH SIDES OF CONTROL VALVE AS REQUIRED.
3. REPLACE UNION/FLANGE SET WITH A FLEXIBLE PIPE CONNECTOR WHERE EQUIPMENT IS SUPPORTED OR SUSPENDED BY SPRING ISOLATORS.
4. ARRANGEMENT SHOWN FOR FULL FLOW THROUGH COIL ON FAILURE.

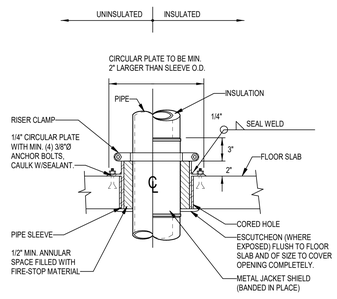
10 FCU-VAV COIL PIPING CONNECTION - 3-WAY CONTROL VALVE
NOT TO SCALE



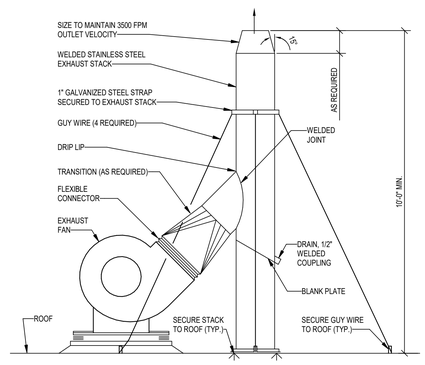
9 FCU-VAV COIL PIPING CONNECTION - PIC
NOT TO SCALE



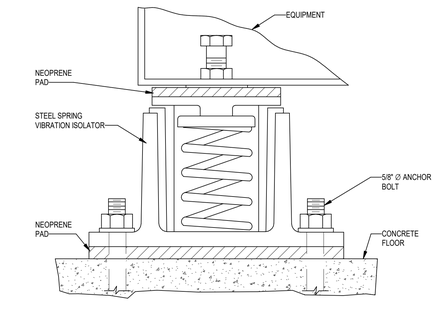
8 STEAM TO STEAM HUMIDIFIER - PIPING CONNECTIONS DETAIL
NOT TO SCALE



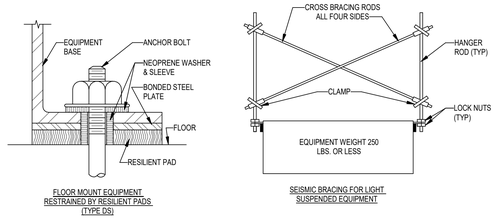
7 PIPE THROUGH FLOOR PENETRATION DETAIL
NOT TO SCALE



6 UTILITY SET EXHAUST STACK DETAIL
NOT TO SCALE

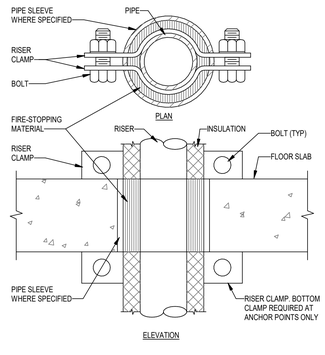


5 VIBRATION ISOLATION SPRING DETAIL
NOT TO SCALE*



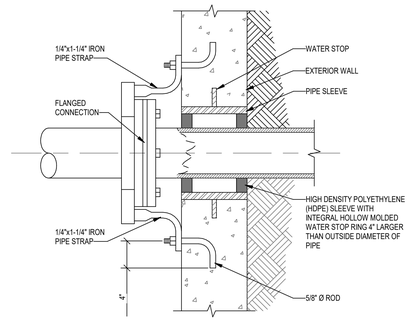
NOTE:
1. NOT REQUIRED FOR AIR TERMINAL UNITS.

4 SEISMIC BRACING FOR EQUIPMENT DETAIL
NOT TO SCALE

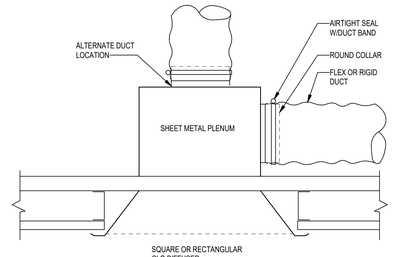


NOTES:
1. PROVIDE ANCHORS ONLY WHERE SHOWN ON DRAWINGS.
2. EXTEND SLEEVE ABOVE FLOOR WHERE SPECIFIED.

3 SUPPORT ANCHOR FOR PIPE RISER DETAIL
NOT TO SCALE



2 SUPPORT ANCHOR (CHILLED WATER) DETAIL
NOT TO SCALE



1 TYPICAL FLEXIBLE DUCT CONNECTION AT SUPPLY AIR DEVICE DETAIL
NOT TO SCALE

FULLY SPRINKLERED

100% BID SET

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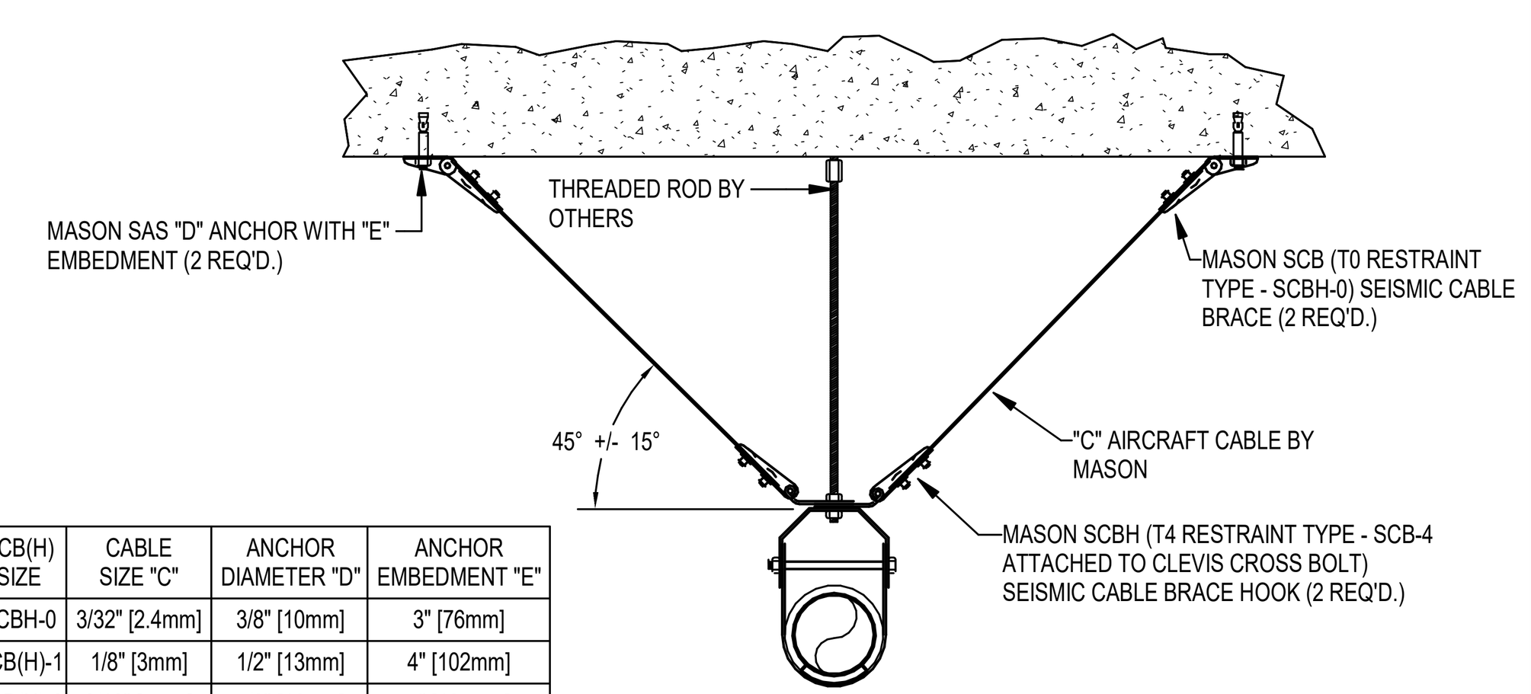
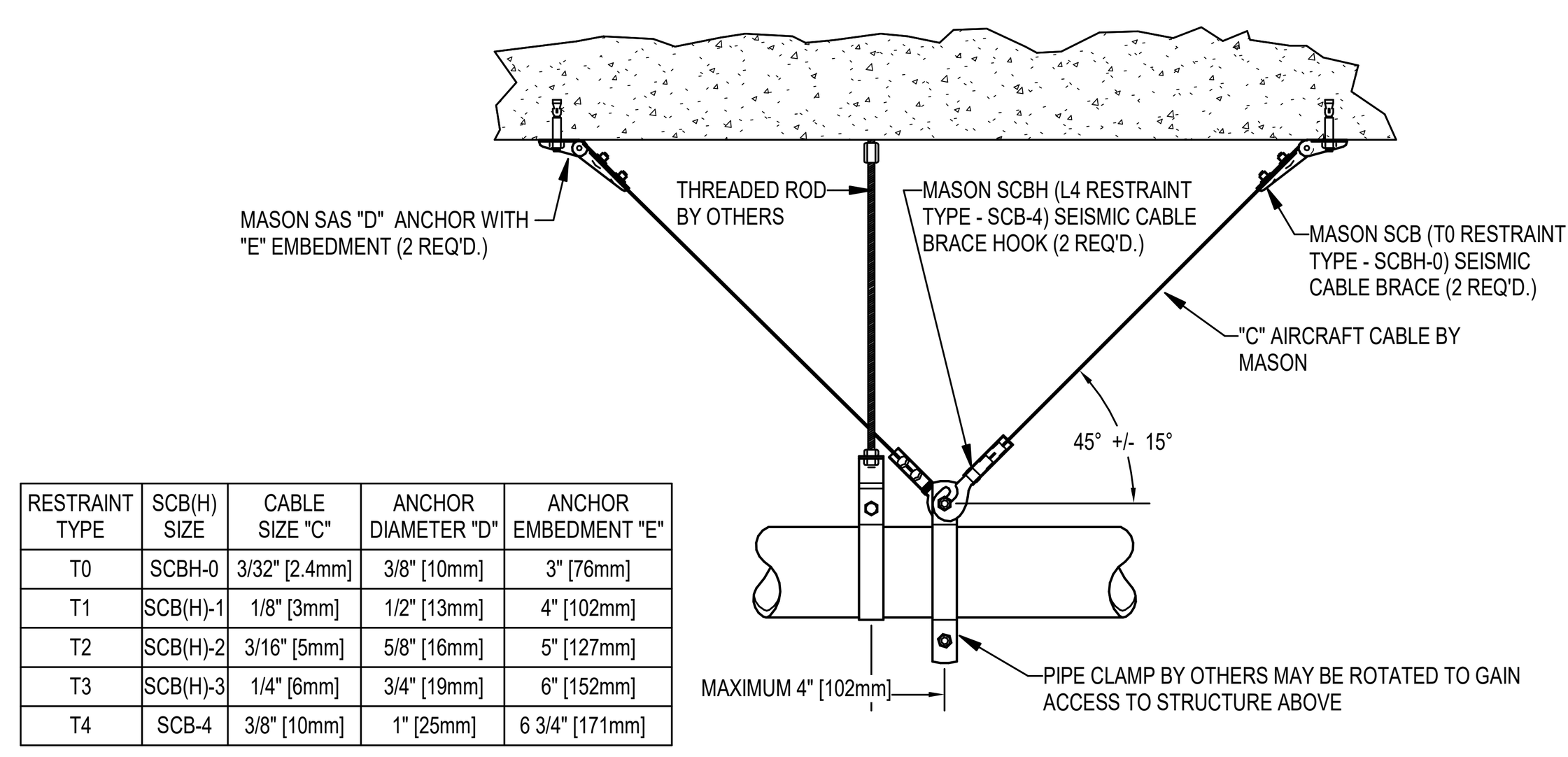
VA FORM 08-6231



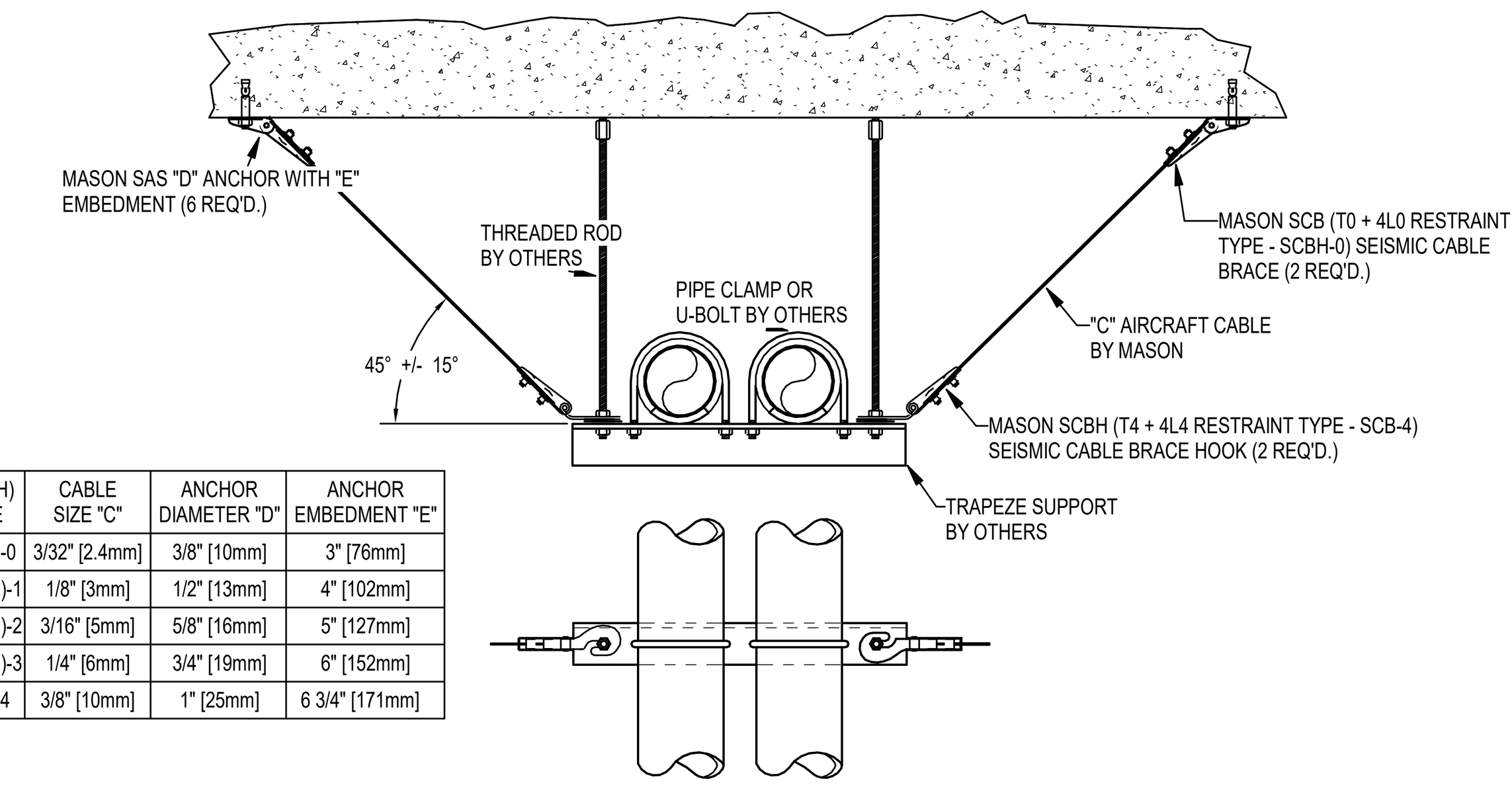
RESTRAINT TYPE	SCB(H) SIZE	CABLE SIZE "C"	ANCHOR DIAMETER "D"	ANCHOR EMBEDMENT "E"
T0	SCBH-0	3/32" [2.4mm]	3/8" [10mm]	3" [76mm]
T1	SCB(H)-1	1/8" [3mm]	1/2" [13mm]	4" [102mm]
T2	SCB(H)-2	3/16" [5mm]	5/8" [16mm]	5" [127mm]
T3	SCB(H)-3	1/4" [6mm]	3/4" [19mm]	6" [152mm]
T4	SCB-4	3/8" [10mm]	1" [25mm]	6 3/4" [171mm]

TRANSVERSE SEISMIC CABLE BRACE FOR CLEVIS SUPPORTED PIPE



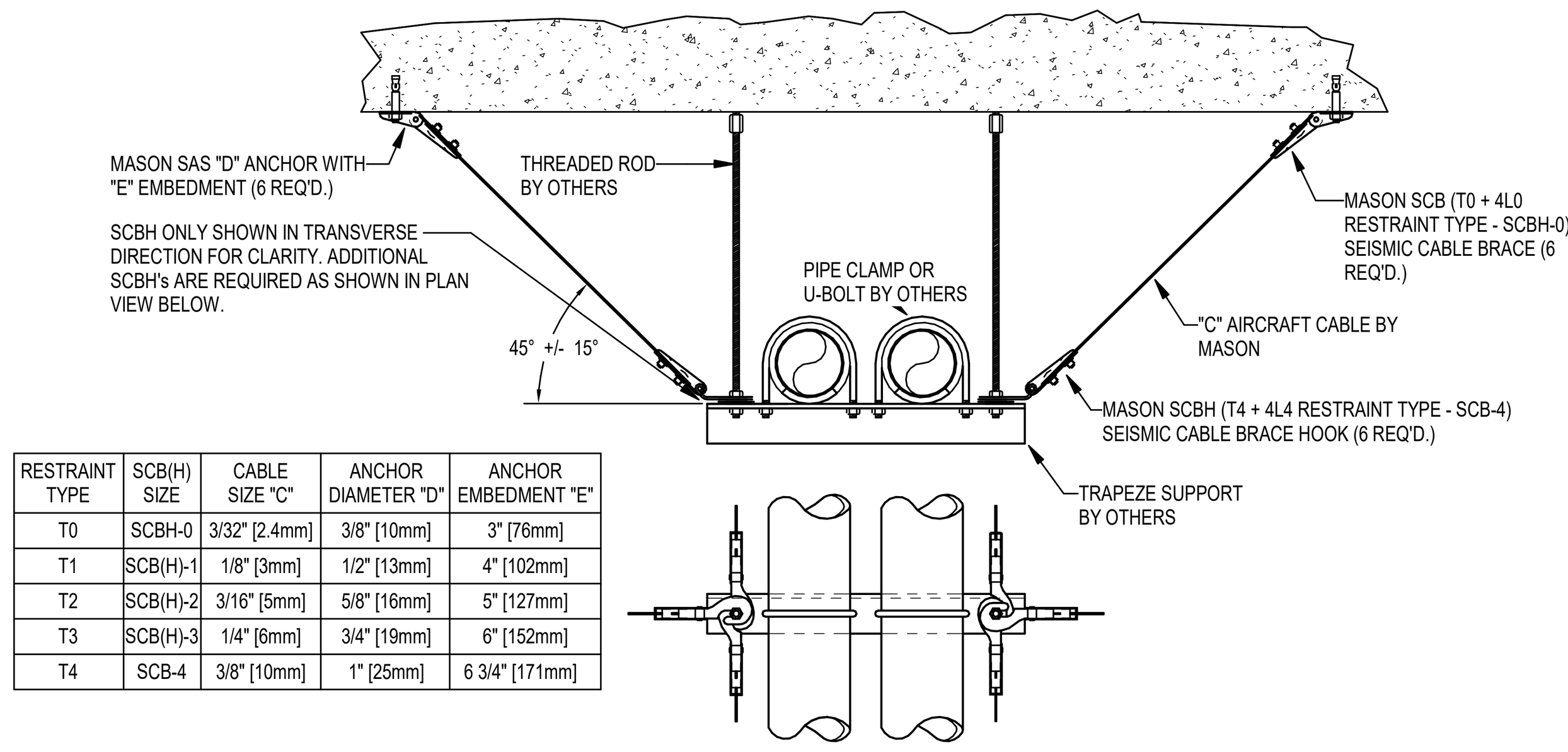
RESTRAINT TYPE	SCB(H) SIZE	CABLE SIZE "C"	ANCHOR DIAMETER "D"	ANCHOR EMBEDMENT "E"
T0	SCBH-0	3/32" [2.4mm]	3/8" [10mm]	3" [76mm]
T1	SCB(H)-1	1/8" [3mm]	1/2" [13mm]	4" [102mm]
T2	SCB(H)-2	3/16" [5mm]	5/8" [16mm]	5" [127mm]
T3	SCB(H)-3	1/4" [6mm]	3/4" [19mm]	6" [152mm]
T4	SCB-4	3/8" [10mm]	1" [25mm]	6 3/4" [171mm]

LONGITUDINAL SEISMIC CABLE BRACE FOR CLEVIS SUPPORTED PIPE



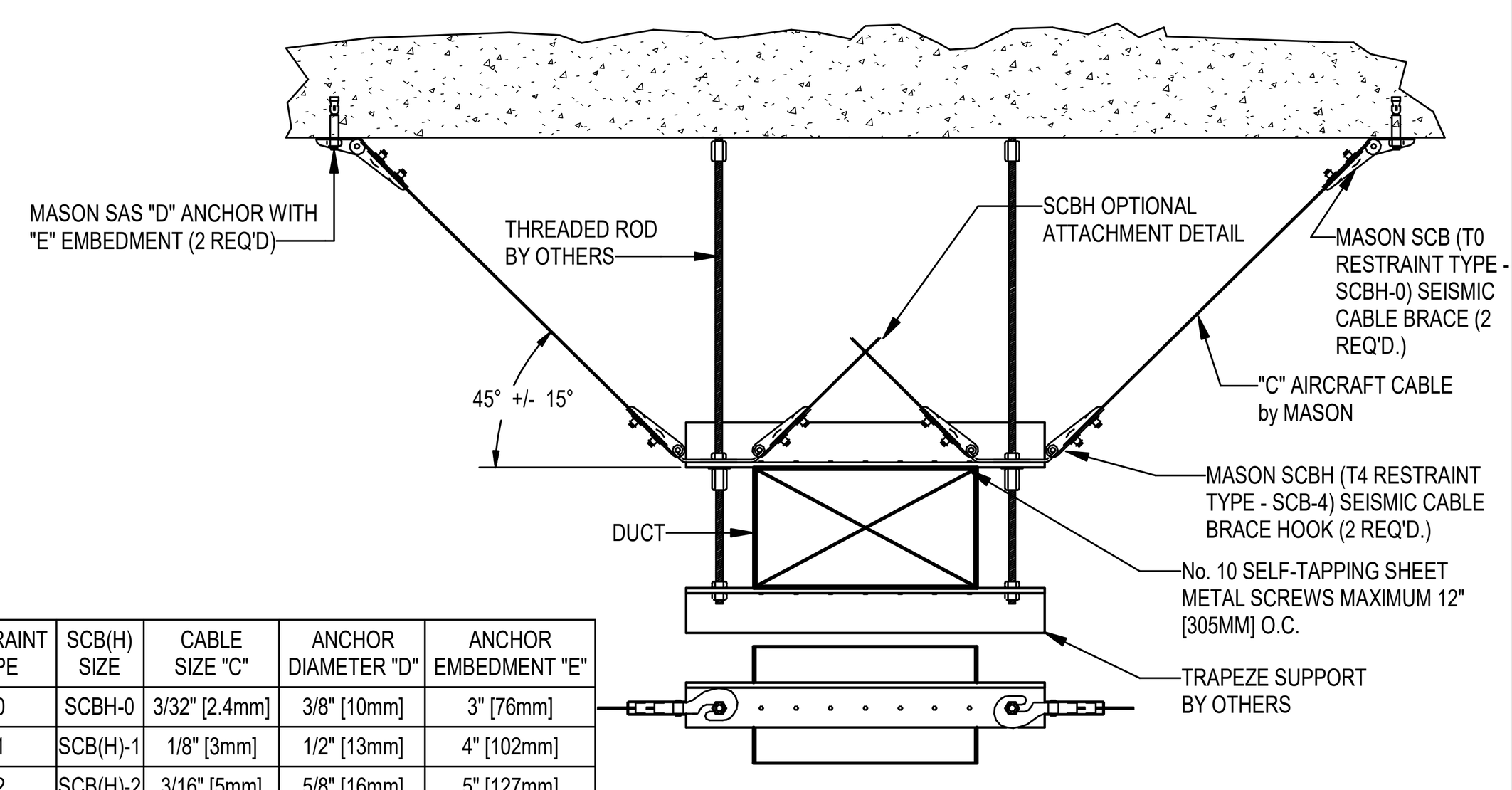
RESTRAINT TYPE	SCB(H) SIZE	CABLE SIZE "C"	ANCHOR DIAMETER "D"	ANCHOR EMBEDMENT "E"
T0	SCBH-0	3/32" [2.4mm]	3/8" [10mm]	3" [76mm]
T1	SCB(H)-1	1/8" [3mm]	1/2" [13mm]	4" [102mm]
T2	SCB(H)-2	3/16" [5mm]	5/8" [16mm]	5" [127mm]
T3	SCB(H)-3	1/4" [6mm]	3/4" [19mm]	6" [152mm]
T4	SCB-4	3/8" [10mm]	1" [25mm]	6 3/4" [171mm]

TRANSVERSE SEISMIC CABLE BRACE FOR TRAPEZE SUPPORTED PIPE



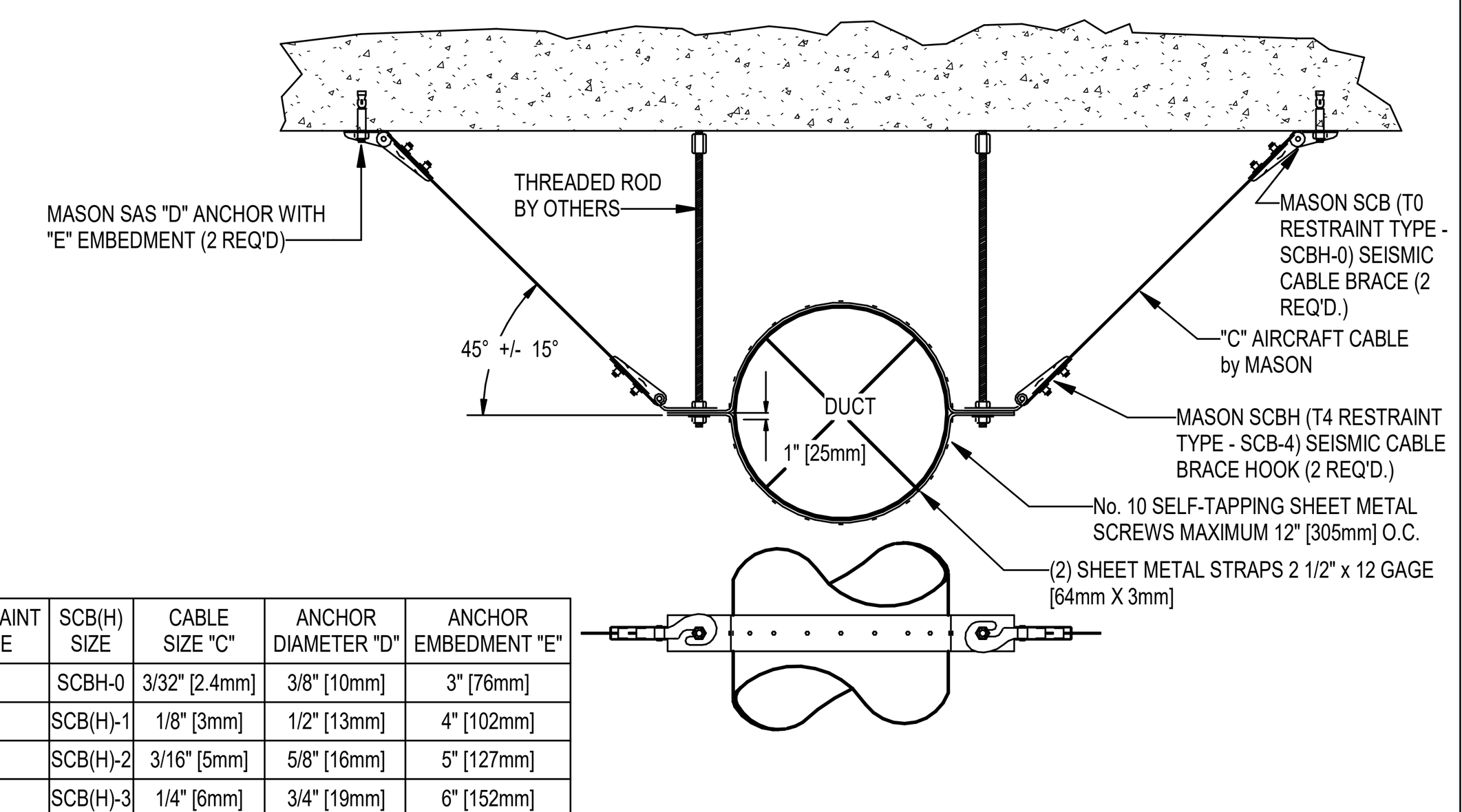
RESTRAINT TYPE	SCB(H) SIZE	CABLE SIZE "C"	ANCHOR DIAMETER "D"	ANCHOR EMBEDMENT "E"
T0	SCBH-0	3/32" [2.4mm]	3/8" [10mm]	3" [76mm]
T1	SCB(H)-1	1/8" [3mm]	1/2" [13mm]	4" [102mm]
T2	SCB(H)-2	3/16" [5mm]	5/8" [16mm]	5" [127mm]
T3	SCB(H)-3	1/4" [6mm]	3/4" [19mm]	6" [152mm]
T4	SCB-4	3/8" [10mm]	1" [25mm]	6 3/4" [171mm]

ALL-DIRECTIONAL SEISMIC CABLE BRACE FOR TRAPEZE SUPPORTED PIPE



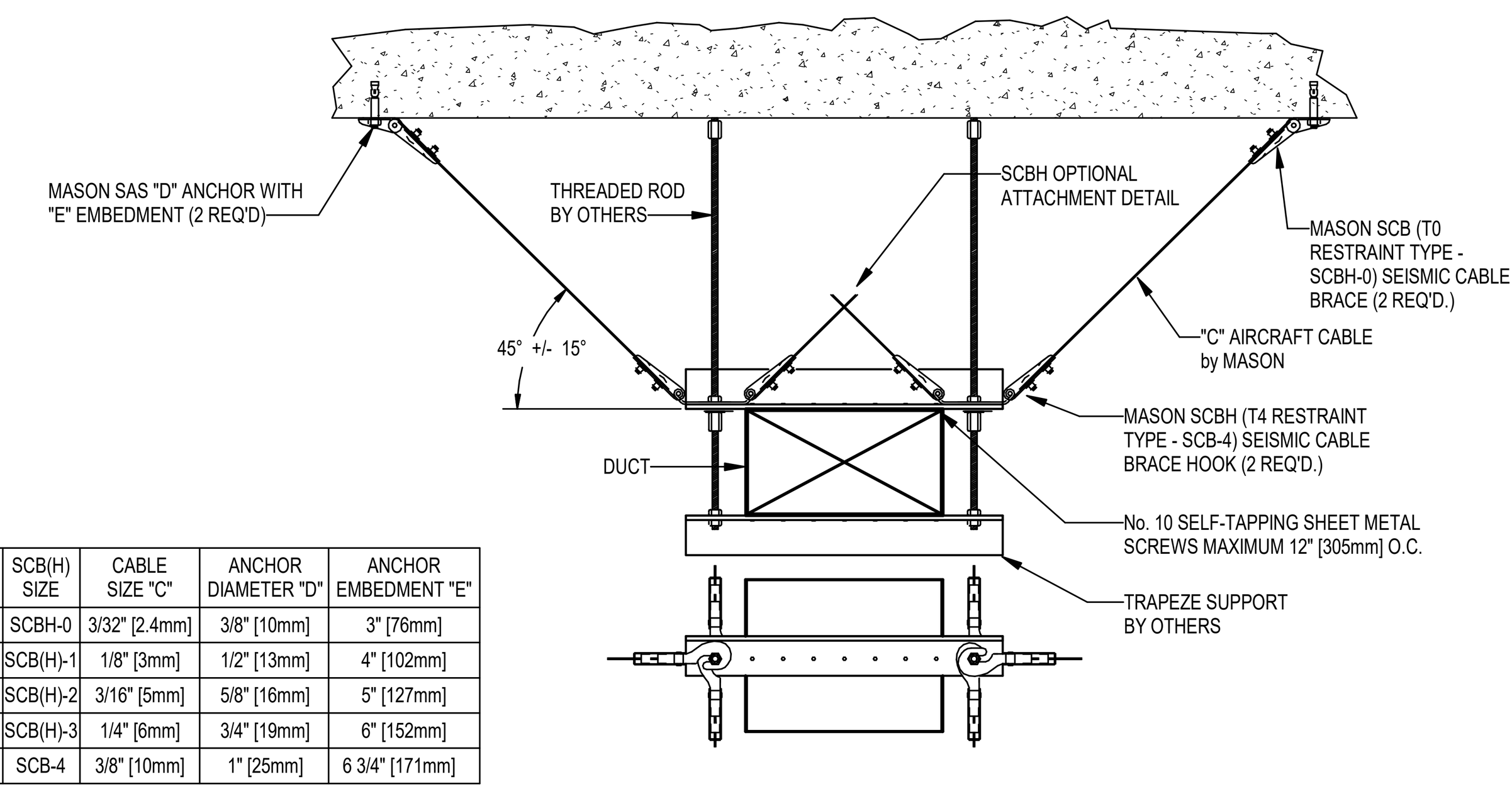
RESTRAINT TYPE	SCB(H) SIZE	CABLE SIZE "C"	ANCHOR DIAMETER "D"	ANCHOR EMBEDMENT "E"
T0	SCBH-0	3/32" [2.4mm]	3/8" [10mm]	3" [76mm]
T1	SCB(H)-1	1/8" [3mm]	1/2" [13mm]	4" [102mm]
T2	SCB(H)-2	3/16" [5mm]	5/8" [16mm]	5" [127mm]
T3	SCB(H)-3	1/4" [6mm]	3/4" [19mm]	6" [152mm]
T4	SCB-4	3/8" [10mm]	1" [25mm]	6 3/4" [171mm]

TRANSVERSE SEISMIC CABLE BRACE FOR RECTANGULAR/OVAL DUCT



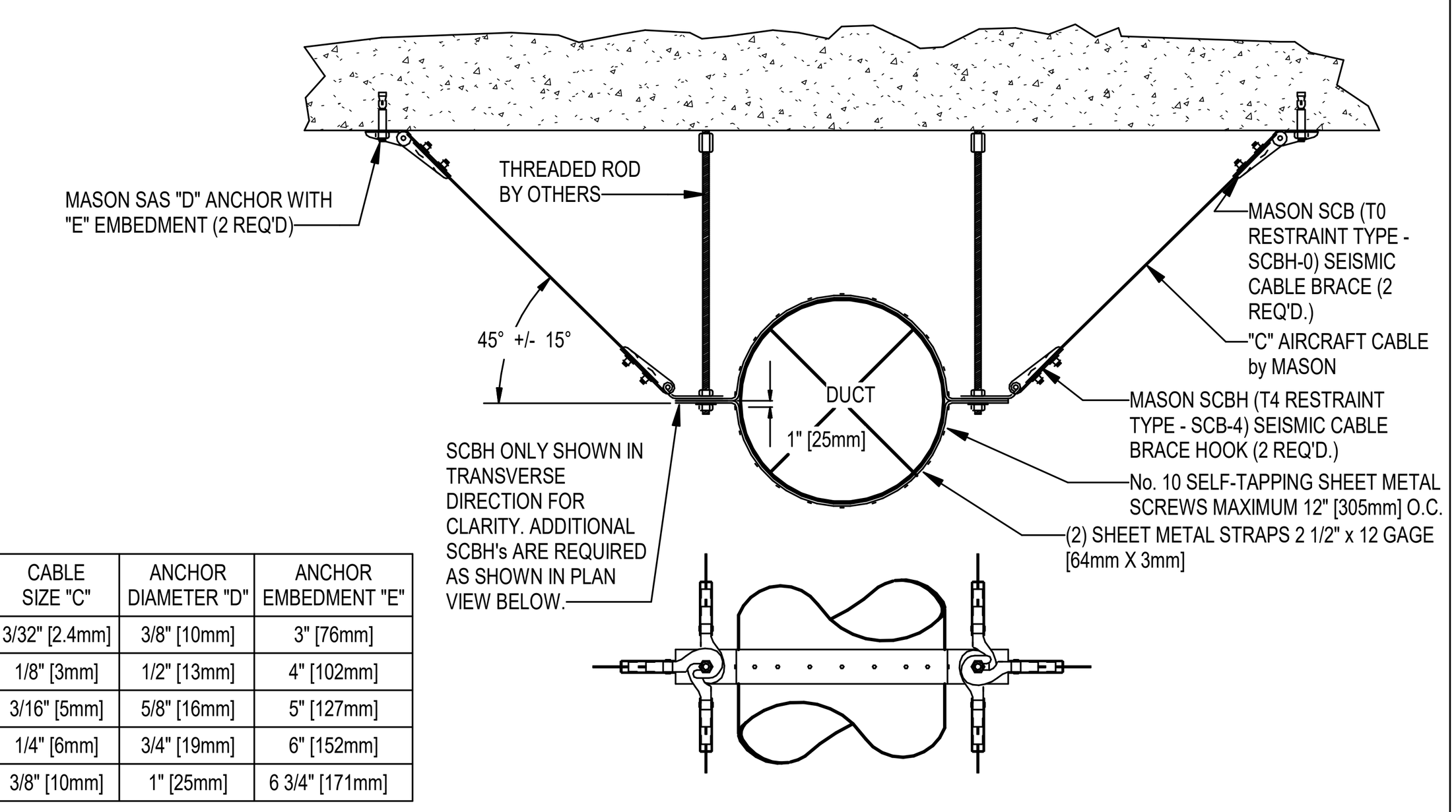
RESTRAINT TYPE	SCB(H) SIZE	CABLE SIZE "C"	ANCHOR DIAMETER "D"	ANCHOR EMBEDMENT "E"
T0	SCBH-0	3/32" [2.4mm]	3/8" [10mm]	3" [76mm]
T1	SCB(H)-1	1/8" [3mm]	1/2" [13mm]	4" [102mm]
T2	SCB(H)-2	3/16" [5mm]	5/8" [16mm]	5" [127mm]
T3	SCB(H)-3	1/4" [6mm]	3/4" [19mm]	6" [152mm]
T4	SCB-4	3/8" [10mm]	1" [25mm]	6 3/4" [171mm]

TRANSVERSE SEISMIC CABLE BRACE FOR ROUND DUCT



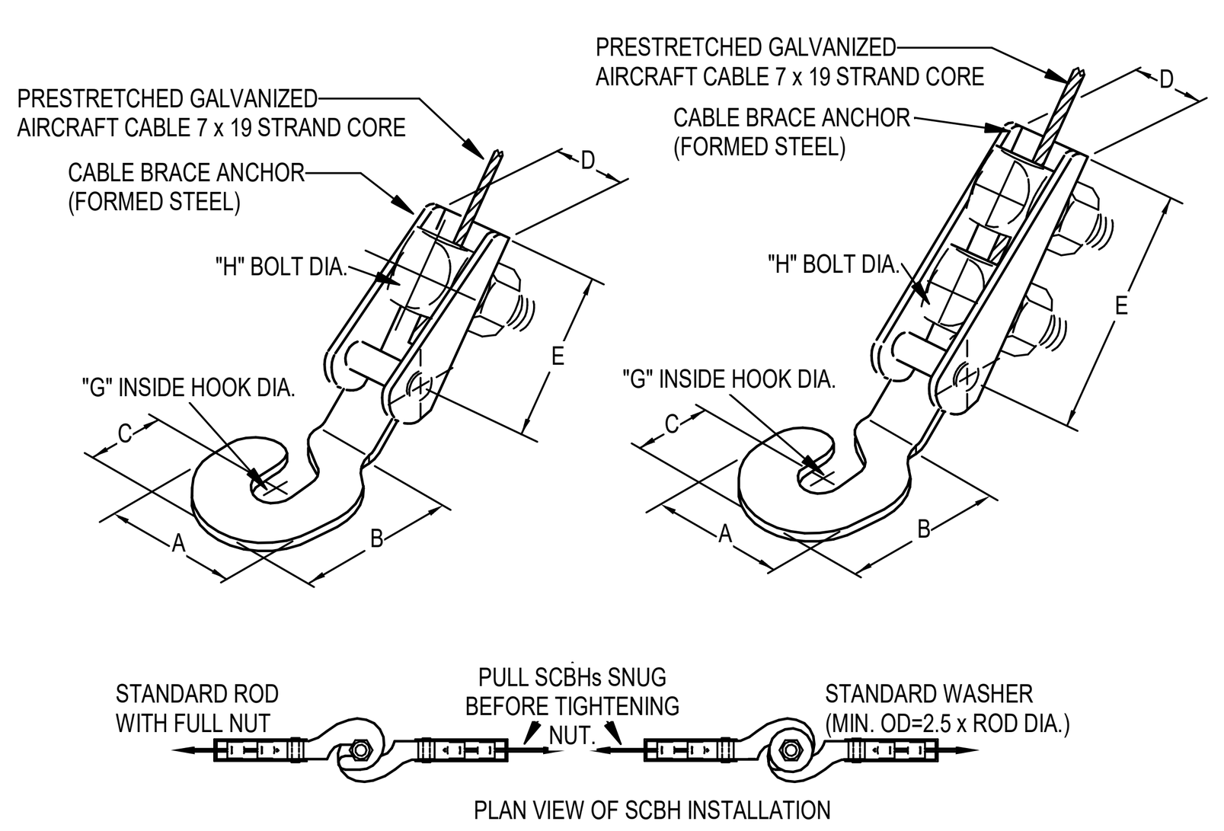
RESTRAINT TYPE	SCB(H) SIZE	CABLE SIZE "C"	ANCHOR DIAMETER "D"	ANCHOR EMBEDMENT "E"
T0	SCBH-0	3/32" [2.4mm]	3/8" [10mm]	3" [76mm]
T1	SCB(H)-1	1/8" [3mm]	1/2" [13mm]	4" [102mm]
T2	SCB(H)-2	3/16" [5mm]	5/8" [16mm]	5" [127mm]
T3	SCB(H)-3	1/4" [6mm]	3/4" [19mm]	6" [152mm]
T4	SCB-4	3/8" [10mm]	1" [25mm]	6 3/4" [171mm]

ALL-DIRECTIONAL SEISMIC CABLE BRACE FOR RECTANGULAR/OVAL DUCT



RESTRAINT TYPE	SCB(H) SIZE	CABLE SIZE "C"	ANCHOR DIAMETER "D"	ANCHOR EMBEDMENT "E"
T0	SCBH-0	3/32" [2.4mm]	3/8" [10mm]	3" [76mm]
T1	SCB(H)-1	1/8" [3mm]	1/2" [13mm]	4" [102mm]
T2	SCB(H)-2	3/16" [5mm]	5/8" [16mm]	5" [127mm]
T3	SCB(H)-3	1/4" [6mm]	3/4" [19mm]	6" [152mm]
T4	SCB-4	3/8" [10mm]	1" [25mm]	6 3/4" [171mm]

ALL-DIRECTIONAL SEISMIC CABLE BRACE FOR ROUND DUCT



TYPE SCBH ASSEMBLY RATINGS AS CONTROLLED BY CABLE BREAKING STRENGTH

SIZE	CABLE DIA. in (mm)	OSHPD MAX. RATINGS lbs (kN)	MINIMUM TORQUE ON BOLTS ft-lbs (N-m)
SCBH-0	3/32 (2.4)	500 (2.2)	25 (34)
SCBH-1	1/8 (3.0)	975 (4.3)	25 (34)
SCBH-2	3/16 (5.0)	2050 (9.1)	45 (61)
SCBH-3	1/4 (6.0)	3150 (14.0)	55 (75)

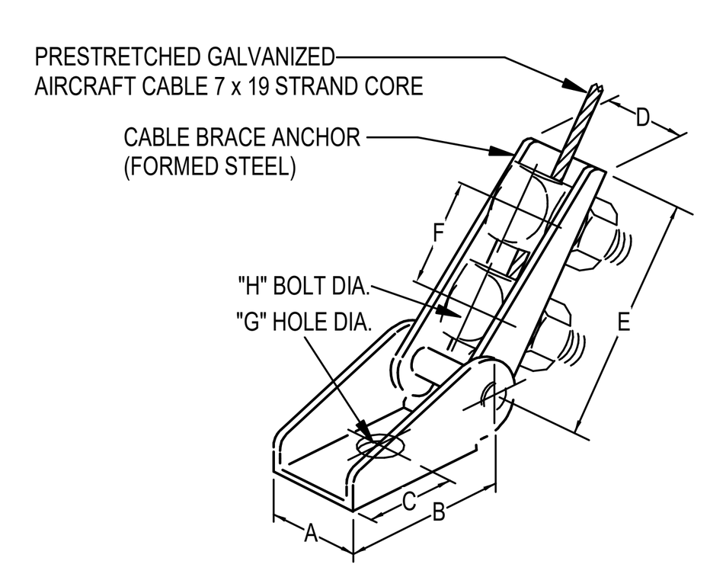
TYPE SCBH ANCHOR DIMENSIONS - inches (mm)

SIZE	STANDARD ROD SIZE	ADDITIONAL ROD SIZES WITH WASHER*	A	B	C	D	E	F	G	H
SCBH-0	3/8 (10)	3/8 (10)	1 3/8 (35)	2 1/16 (52)	11/16 (18)	15/16 (24)	1 3/4 (44)	- -	3/8 (10)	1/2 (13)
SCBH-1	5/8 (16)	3/8 TO 1/2 (10 TO 13)	1 7/8 (48)	2 3/8 (60)	1 (25)	1 (25)	3 3/8 (86)	1 1/2 (38)	5/8 (16)	1/2 (13)
SCBH-2	7/8 (22)	1/2 TO 3/4 (13 TO 19)	2 7/8 (73)	3 3/4 (95)	1 3/8 (35)	1 3/16 (30)	4 3/8 (111)	1 3/4 (44)	7/8 (22)	5/8 (16)
SCBH-3	1 1/8 (29)	5/8 TO 1 (16 TO 25)	3 1/2 (89)	4 3/4 (121)	1 3/4 (44)	1 7/16 (37)	4 3/4 (121)	2 (51)	1 1/8 (29)	3/4 (19)

SCBH - SEISMIC CABLE BRACE WITH HOOK ATTACHMENT

TYPE SCB ASSEMBLY RATINGS AS CONTROLLED BY CABLE BREAKING STRENGTH

CABLE DIA. SIZE	OSHPD MAX. RATINGS in (mm)	lbs (kN)	MINIMUM TORQUE ON BOLTS ft-lbs (N-m)
SCB-1	1/8 (3.0)	975 (4.3)	25 (34)
SCB-2	3/16 (5.0)	2050 (9.1)	45 (61)
SCB-3	1/4 (6.0)	3150 (14.0)	55 (75)
SCB-4	3/8 (10.0)	6875 (30.5)	200 (271)



TYPE SCB ANCHOR DIMENSIONS - inches (mm)

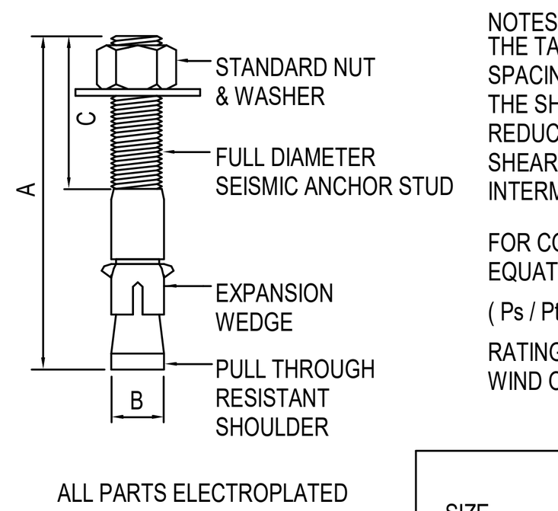
Size	A	B	C	D	E	F	G	H
SCB-1	1 3/8 (35)	2 (51)	1 (25)	15/16 (24)	3 3/8 (86)	1 1/2 (38)	9/16 (14)	1/2 (13)
SCB-2	1 5/8 (41)	2 3/4 (70)	1 3/8 (35)	1 3/16 (30)	4 3/8 (111)	1 3/4 (44)	11/16 (17)	5/8 (16)
SCB-3	2 (51)	3 1/2 (89)	1 3/4 (44)	1 7/16 (37)	4 3/4 (121)	2 (51)	13/16 (21)	3/4 (19)
SCB-4	3 1/8 (79)	5 (127)	2 1/2 (64)	1 15/16 (49)	5 3/4 (146)	2 1/4 (57)	1 5/16 (33)	1 (25)

SCB - SEISMIC CABLE BRACE

TYPE SAS ANCHOR STUD RATINGS

SIZE	STONE AGGREGATE CONCRETE 3000 psi (20 Mpa) TENSION* (lbs)	(kg)t	TENSION WITH 33% INCREASE (lbs)	(kg)t	SHEAR (lbs)	(kg)t	SHEAR WITH 33% INCREASE (lbs)	(kg)t	4000 psi (27 Mpa) TENSION* (lbs)	(kg)t	TENSION WITH 33% INCREASE (lbs)	(kg)t	SHEAR (lbs)	(kg)t	SHEAR WITH 33% INCREASE (lbs)	(kg)t	LIGHTWEIGHT CONCRETE FILLED STEEL DECK 3000 psi (20 Mpa) TENSION* (lbs)	(kg)t	SHEAR (lbs)	(kg)t
SAS-3/8	325	148	435	198	765	347	1020	465	330	150	440	200	770	350	1027	467	300	136	1015	461
SAS-1/2	595	270	795	361	1540	699	2053	935	616	280	821	373	1565	711	2086	948	430	195	1260	573
SAS-5/8	885	402	1180	536	2260	1025	3013	1370	945	430	1260	573	2440	1110	3253	1479	525	238	1470	668
SAS-3/4	1095	498	1460	664	3650	1660	4866	2212	1095	498	1460	664	3650	1660	4866	2212	640	291	2010	914
SAS-1									4815	2184			9355	4243						

* THESE TENSION VALUES ARE APPLICABLE WHEN THE ANCHORS ARE INSTALLED WITHOUT SPECIAL INSPECTION AS SET FORTH IN SECTION 1701.1 OF THE UBC OR SECTION 1704 OF THE IBC. WHEN ANCHORS ARE INSTALLED WITH SPECIAL INSPECTION AS SET FORTH IN SECTION 1701.1 OF THE UBC OR SECTION 1704 OF THE IBC, THE TABULATED VALUES MAY BE INCREASED BY 100%. FOR kN DIVIDE kg BY 102



ALL PARTS ELECTROPLATED

NOTES
THE TABULATED VALUES ARE FOR ANCHORS INSTALLED AT THE SPECIFIED SPACINGS AND EDGE DISTANCES. SPACINGS MAY BE REDUCED BY 50% PROVIDED THE SHEAR AND TENSION VALUES ARE REDUCED BY 40%. EDGE DISTANCES MAY BE REDUCED BY 50% PROVIDED THE TENSION VALUES ARE REDUCED BY 40% AND THE SHEAR VALUES ARE REDUCED BY 50%. LINEAR INTERPOLATION MAY BE USED FOR INTERMEDIATE SPACINGS.

FOR COMBINED TENSION AND SHEAR FORCES ON ANCHORS, USE THE FOLLOWING EQUATIONS:

$(Ps / Pt)^{5/3} + (Vs / Vt)^{5/3} < 1.0$, WHERE: Ps & Vs ARE APPLIED FORCES & Pt AND Vt ARE ALLOWABLE FORCES

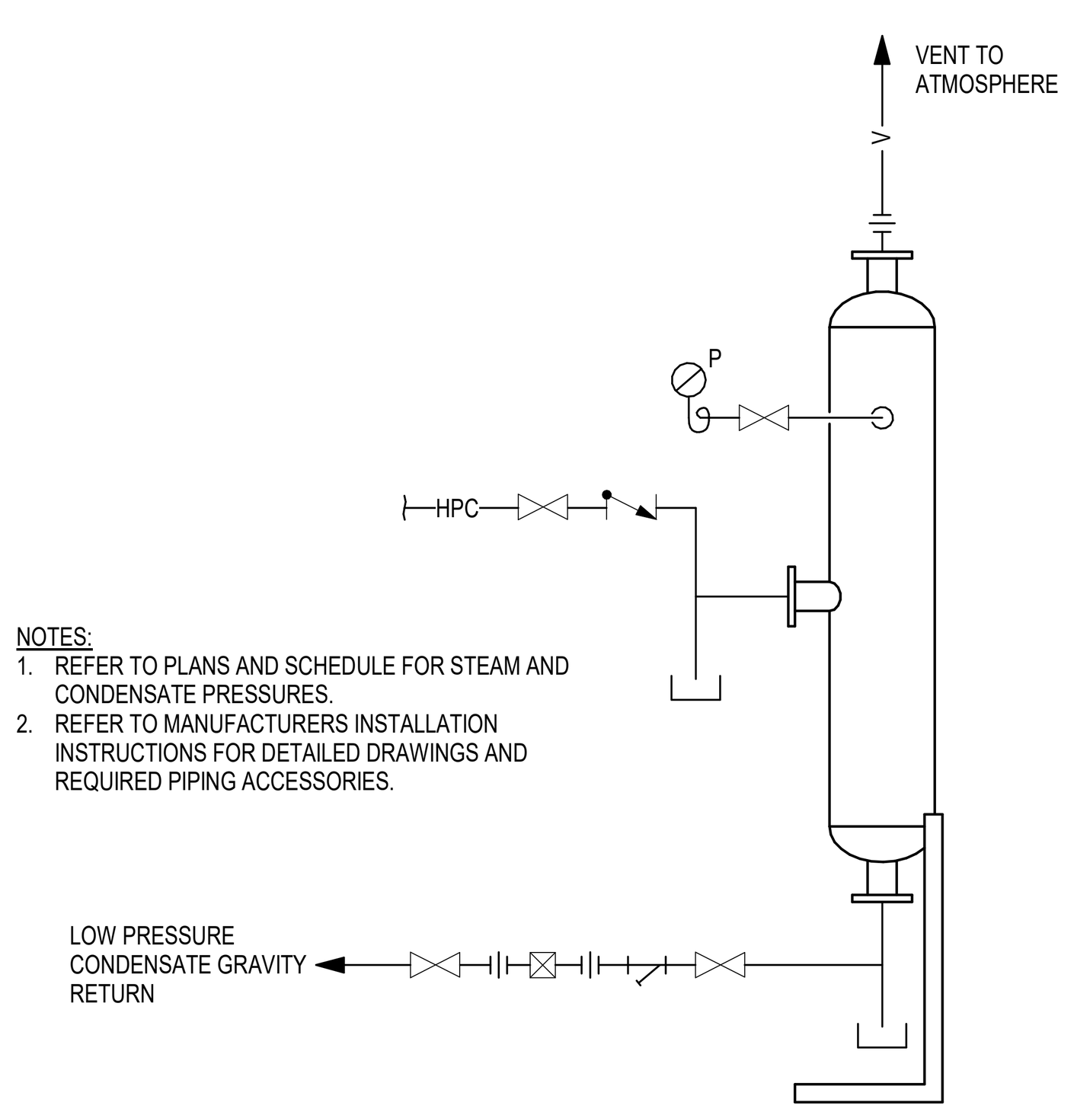
RATINGS MAY BE INCREASED 33 1/3% TO ACCOMODATE PERIODIC FORCES SUCH AS WIND OR SEISMIC LOADS. RATINGS ARE FROM ICBO-ES REPORT 1821.

TYPE SAS ANCHOR STUD DIMENSIONS

SIZE	A (in)	A (mm)	B (in)	B (mm)	C (in)	C (mm)	MINIMUM ANCHOR EMBEDMENT (in)	(mm)	MINIMUM EDGE DISTANCE (in)	(mm)	MINIMUM ANCHOR SPACING (in)	(mm)
SAS-3/8	3	76	3/8	10	1 1/4	32	1 3/4	44	2 5/8	67	5 1/4	133
SAS-1/2	4 1/4	108	1/2	13	1 1/2	38	2 3/4	70	3 3/4	95	7 1/2	191
SAS-5/8	5	127	5/8	16	1 3/4	44	3 1/4	83	4 7/8	124	9 3/4	248
SAS-3/4	7	178	3/4	19	2	51	5	127	5 5/8	143	11 1/4	286
SAS-1	9	229	1	25	2 1/4	57	6 3/4	171	6	152	12	305

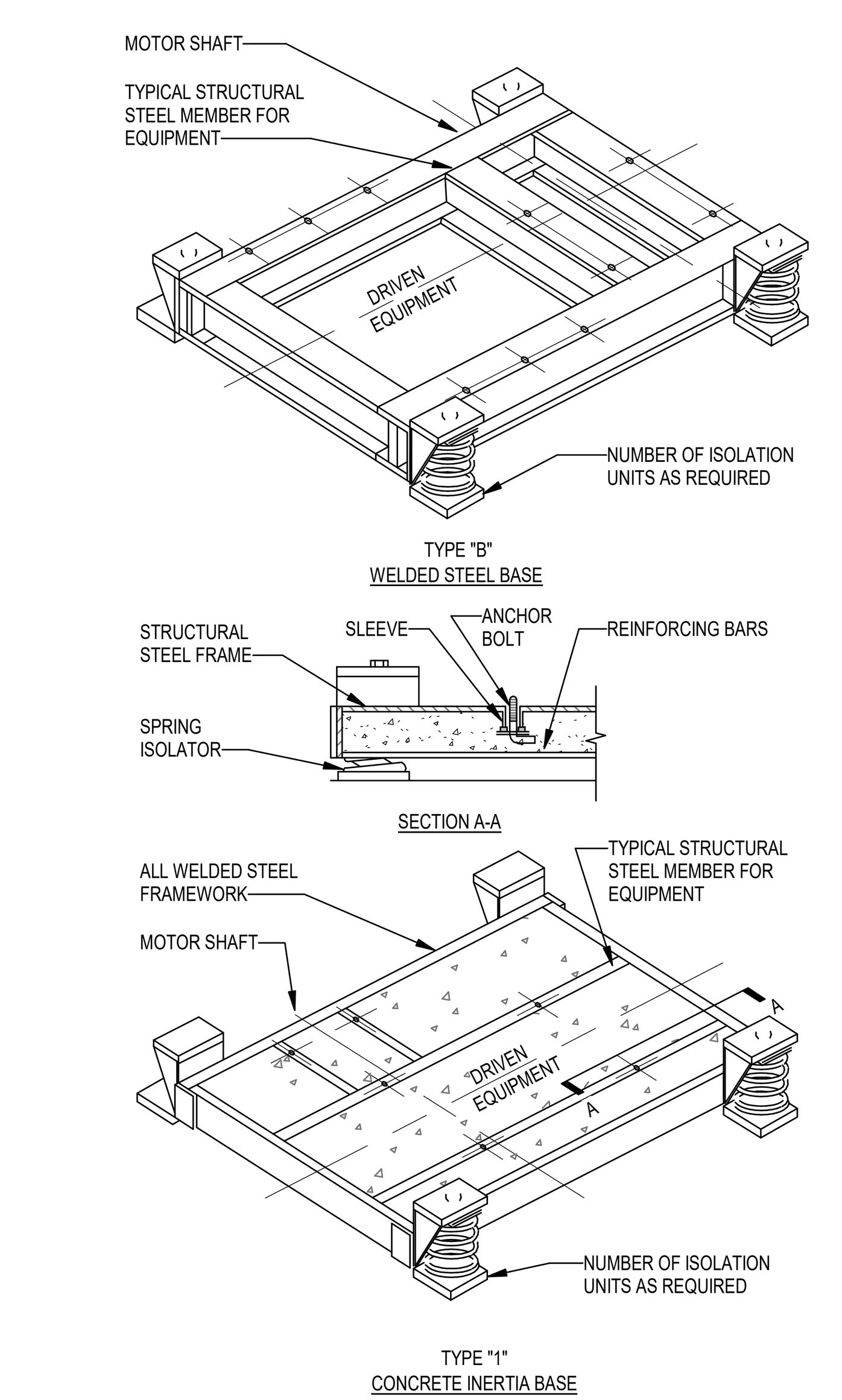
SAS - SEISMIC ANCHOR STUD

3 SEISMIC SUPPORT FOR DUCT & PIPING DETAILS
NOT TO SCALE



NOTES:
1. REFER TO PLANS AND SCHEDULE FOR STEAM AND CONDENSATE PRESSURES.
2. REFER TO MANUFACTURERS INSTALLATION INSTRUCTIONS FOR DETAILED DRAWINGS AND REQUIRED PIPING ACCESSORIES.

2 TYPICAL VERTICAL STEAM FLASH TANK
NOT TO SCALE



1 VIBRATION ISOLATION BASES DETAIL
NOT TO SCALE"

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

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FIRE PROTECTION ENGINEER
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OLATHE, KANSAS 66062
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ARCHITECT:
SPUR PROJECT #: 2016

SPUR DESIGN, LLC
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Oklahoma City, OK 73109
(405) 842-6100
KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

Drawing Title
MECHANICAL DETAILS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**
Building Number **26**
Drawing Number **M-505**
Drawing # 146 OF 190

Veterans Health Administration
VA U.S. Department of Veterans Affairs

12/19/2022 2:10:56 PM
VA FORM 08-6231

EXHAUST FAN SCHEDULE (EF)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	FAN DATA: DESIGN AIRFLOW (CFM)	FAN DATA: ESP ("WC)	FAN DATA: HP	FAN DATA: FAN SPEED (RPM)	MOUNTING	DRIVE	ELECTRICAL DATA: FLA (A)	ELECTRICAL DATA: VOLTS/PH	WEIGHT (LBS)	NOTES
KITCHEN												
26-EF-1	CAPTIVEAIRE / USBI150D-RM	EAST WING ROOF	1,900	1.50	1.50	1,565	ROOF	DIRECT	2.0	460/3	296	1, 4-12
26-EF-2	CAPTIVEAIRE / USBI180D-RM	EAST WING ROOF	3,200	1.50	3.00	1,346	ROOF	DIRECT	4.3	460/3	423	1, 4-12
26-EF-3	CAPTIVEAIRE / USBI110D-RM	EAST WING ROOF	600	0.50	1.00	1,210	ROOF	DIRECT	3.1	208/3	177	1, 4-12
GENERAL												
26-EF-4	GREENHECK / USF-10	WEST WING ROOF	970	0.50	0.75	1,503	ROOF	DIRECT	13.8	460/3	146	1-9, 12
26-EF-5	GREENHECK / CUE-099-A	EAST WING ROOF	955	0.50	0.25	1,725	ROOF	DIRECT	1.1	460/3	48	1-9, 12
26-EF-6	GREENHECK / CUE-100-A	EAST WING ROOF	1,200	0.50	0.25	1,725	ROOF	DIRECT	1.1	460/3	73	1-9, 12
26-EF-7	GREENHECK / SQ-120-VG	DENTAL LAB CEILING	590	0.75	0.50	1,267	CEILING	DIRECT	6.6	115/1	55	1-9, 12
26-EF-8	GREENHECK / USF-06	EAST WING ROOF	210	0.10	0.25	671	ROOF	DIRECT	5.8	115/1	98	1-9, 12

NOTES:
1. ELEVATION: 1302 FEET ABOVE SEA LEVEL. AIRFLOWS SHOWN INCLUDE ALTITUDE CORRECTION VALUES.
2. PROVIDE WITH MINIMUM 14" HIGH ROOF CURB.
3. PROVIDE WITH BIRD SCREEN AND BACKDRAFT DAMPER.
4. PROVIDE WITH SPRING VIBRATION ISOLATION.
5. VARIABLE FREQUENCY DRIVE TO BE PROVIDED BY DIVISION 23 CONTRACTOR. COORDINATE INSTALLATION WITH DIVISION 26 CONTRACTOR.
6. DISCONNECT SWITCH FURNISHED AND INSTALLED BY DIVISION 26 CONTRACTOR.
7. STARTER FURNISHED AND INSTALLED BY DIVISION 26 CONTRACTOR.
8. FAN MOTOR SHALL BE SPARK RESISTANT AND OF EXPLOSION PROOF CONSTRUCTION.
9. FAN ASSEMBLY SHALL BE OF CORROSION RESISTANT CONSTRUCTION.
10. PROVIDE WITH GREASE BOX.
11. EXHAUST FAN OUTLET TO BE A MINIMUM OF 40" ABOVE FINISHED FLOOR.
12. BACKDRAFT DAMPER TO BE BLAST RATED.

WALL LOUVER SCHEDULE (WL)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	AIRFLOW (CFM)	WIDTH (IN)	HEIGHT (IN)	FREE AREA (%)	PRESSURE DROP ("WC)	VELOCITY (FPM)	WEIGHT (LBS)	NOTES
OUTSIDE AIR									
WL-1	RUSKIN / ELF375DX	3,115	84"	48"	60	0.01	204	170	ALL LISTED
WL-2	RUSKIN / ELF375DX	3,430	84"	48"	60	0.01	204	170	ALL LISTED
EXHAUST AIR									
WL-3	RUSKIN / ELF375DX	590	27"	18"	43	0.02	408	25	ALL LISTED

NOTES:
1. PROVIDE WITH BIRDSCREEN.
2. SUBJECT TO CHANGE BASED ON BLAST MODELING RESULTS.

KITCHEN HOOD SCHEDULE (DH & KH)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	LENGTH	EXHAUST (CFM)	MAKEUP (CFM)	FIRE SYSTEM: TYPE	FIRE SYSTEM: SIZE	WEIGHT (LBS)	NOTES
DISHWASHER									
DH-1	CAPTIVEAIRE / 5412 VHB-G	025E DISHWASH	6' - 0"	600	100	N/A	N/A	153	1,5-6
GREASE									
KH-1	CAPTIVEAIRE / 6012 SND-2	-- SERVING LINE	7' - 6"	1,900	253	ANSUL R102	3.0/3.0	420	1-4,7
KH-2	CAPTIVEAIRE / 6612 SND-2	025 KITCHEN	12' - 6"	3,200	256	ANSUL R102	3.0/3.0	683	1-4,7

NOTES:
1 HOOD CONSTRUCTION TO BE 430 STAINLESS STEEL WHERE EXPOSED.
2. PROVIDE WITH UL. LISTED RECESSED ROUND LED FIXTURED AND LED LIGHTS.
3. PROVIDE WITH GREASE DRAIN.
4. PROVIDE WITH FIELD WRAPPER, STAINLESS STEEL BACKSPLASH, AND VERTICAL END PANELS.
5. HOOD CONSTRUCTION TO BE 430 STAINLESS STEEL THROUGHOUT.
6. INTERLOCK WITH EF-1.
7. INTERLOCK WITH EF-2 & EF-3.

RELIEF HOOD SCHEDULE (RH)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	DESIGN AIR FLOW (CFM)	PRESSURE DROP (" WG)	NOTES
26-RH-1	GREENHECK/GRS-48	ROOF	6,730	0.10	ALL LISTED
26-RH-2	GREENHECK/GRS-48	ROOF	8,225	0.10	ALL LISTED
26-RH-3	GREENHECK/GRS-15	ROOF	800	0.10	ALL LISTED
26-RH-4	GREENHECK/GRS-15	ROOF	800	0.10	ALL LISTED

NOTES:
1. PROVIDE WITH ROOF CURB
2. PROVIDE WITH BACKDRAFT DAMPER
3. PROVIDE WITH BIRDSCREEN

INTAKE HOOD SCHEDULE (IH)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	DESIGN AIR FLOW (CFM)	PRESSURE DROP (IN. WG)	NOTES
26-IH-1	GREENHECK/GRS-15	ROOF	700	0.10	1-3
26-IH-2	GREENHECK/GRS-15	ROOF	700	0.10	1-3

NOTES:
1. PROVIDE WITH ROOF CURB
2. PROVIDE WITH BACKDRAFT DAMPER
3. PROVIDE WITH BIRDSCREEN

AIR HANDLING UNIT SCHEDULE (AHU)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	SUPPLY FAN: DESIGN CFM	SUPPLY FAN: MIN O/A	SUPPLY FAN: FAN RPM (MAX)	SUPPLY FAN: TSP (IN WC)	SUPPLY FAN: ESP ("WC)	SUPPLY FAN: # MOTORS	SUPPLY FAN: HP (EA)	SUPPLY FAN: VOLTS/PH	SUPPLY FAN: FLA (A)	CHILLED WATER COOLING COIL: FLOW (GPM)	CHILLED WATER COOLING COIL: TOTAL (MBH)	CHILLED WATER COOLING COIL: SENSIBLE (MBH)	CHILLED WATER COOLING COIL: EWT (°F)	CHILLED WATER COOLING COIL: LWT (°F)	CHILLED WATER COOLING COIL: MIN ROWS	CHILLED WATER COOLING COIL: EAT DB (°F)	CHILLED WATER COOLING COIL: LAT DB (°F)	CHILLED WATER COOLING COIL: APD ("WC)	CHILLED WATER COOLING COIL: WPD (FT HD)	HOT WATER HEATING COIL: TOTAL (MBH)	HOT WATER HEATING COIL: EAT DB (°F)	HOT WATER HEATING COIL: LAT DB (°F)	HOT WATER HEATING COIL: FLOW (GPM)	HOT WATER HEATING COIL: EWT (°F)	HOT WATER HEATING COIL: LWT (°F)	HOT WATER HEATING COIL: APD ("WC)	HOT WATER HEATING COIL: WPD ("WC)	FILTERS: PRE-FILTER: PF-1 MERV	FILTERS: PRE-FILTER: PF-1 IN	FILTERS: PRE-FILTER: PF-2 MERV	FILTERS: PRE-FILTER: PF-2 IN	FILTERS: AFTER-FILTER MERV	FILTERS: AFTER-FILTER IN	WEIGHT (LBS)	NOTES
26-AHU-5A	DAIKIN / CAH014GDGM	SECOND FLOOR PENTHOUSE	6,730	3,115	3,345	5.0	2.5	1	10.0	460/3	12.5	88	422	326	44.0	54.0	10	100.0	53.0	1.2	14.3	613	4	55	64	180.0	160.0	0.4	16.4	7	2	11	2	14	2	4200	2-5
26-AHU-5B	DAIKIN / CAH016GDGM	SECOND FLOOR PENTHOUSE	8,225	3,430	3,453	4.9	2.5	1	10.0	460/3	12.5	108	521	399	44.0	54.0	12	100.0	54.0	1.4	13.6	743	4	55	78	180.0	160.0	0.4	5.9	7	2	11	2	14	2	5001	2-5
26-AHU-5C	DAIKIN / CAH013DGM	SECOND FLOOR ROOF	4,170	2,045	1,750	3.8	2.5	1	5.0	460/3	13.2	47.6	235	178	44.0	54.0	8	100.0	53.0	0.7	15.6	328.3	4	55	34.2	180.0	160.0	0.1	4.2	7	2	11	2			3000	ALL LISTED

NOTES:
1. INTERLOCK WITH EF-1
2. CHILLED WATER AND HEATING WATER COILS ARE SIZED BASED ON 30% PROPYLENE GLYCOL.
3. PROVIDE 2 PRE-FILTER AND 1 AFTER FILTER. PF-1 = MERV 7, PF-2 = MERV 11, AF-1 = MERV 13.
4. DISCONNECT TO BE PROVIDED AND INSTALLED BY ELEC.
5. PROVIDE DRISTEEM ULTRA-SORB MODEL MP OR EQUAL STEAM TO STEAM HUMIDIFIER. LEAVING RH = 50%, LOAD = 250 LBS/HR, STEAM PRESSURE = 5 PSI

RETURN FAN SCHEDULE

MARK	LOCATION	FAN DATA: DESIGN AIRFLOW (CFM)	FAN DATA: ESP ("WC)	FAN DATA: HP	FAN DATA: FAN SPEED (RPM)	FAN DATA: MOUNTING	FAN DATA: DRIVE	ELECTRICAL DATA: FLA (A)	ELECTRICAL DATA: VOLTS/PH	NOTES
26-RF-5A	26-AHU-5A	6,730	1.50	5.00	1,750	AHU	DIRECT	6.6	460/3	ALL LISTED
26-RF-5B	26-AHU-5B	8,225	1.50	7.50	1,750	AHU	DIRECT	9.8	460/3	ALL LISTED
26-RF-5C	26-AHU-5C	4,170	1.50	2.00	1,750	AHU	DIRECT	3.4	460/3	ALL LISTED

NOTES:
1. EACH RETURN FAN IS INTEGRAL TO THE ASSOCIATED AHU IT SERVES

DEDICATED OUTSIDE AIR SYSTEM SCHEDULE (DOAS)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	SUPPLY FAN ARRAY: DESIGN CFM	SUPPLY FAN ARRAY: MIN O/A	SUPPLY FAN ARRAY: FAN RPM (MAX)	SUPPLY FAN ARRAY: TSP (IN WC)	SUPPLY FAN ARRAY: # MOTORS	SUPPLY FAN ARRAY: HP (EA)	SUPPLY FAN ARRAY: FLA (EA)	SUPPLY FAN ARRAY: V/PH	CHILLED WATER COOLING COIL: FLOW (GPM)	CHILLED WATER COOLING COIL: TOTAL (MBH)	CHILLED WATER COOLING COIL: SENSIBLE (MBH)	CHILLED WATER COOLING COIL: EWT (°F)	CHILLED WATER COOLING COIL: LWT (°F)	CHILLED WATER COOLING COIL: MIN ROWS	CHILLED WATER COOLING COIL: EAT DB (°F)	CHILLED WATER COOLING COIL: LAT DB (°F)	CHILLED WATER COOLING COIL: APD ("WC)	CHILLED WATER COOLING COIL: WPD ("WC)	HOT WATER HEATING COIL: SENSIBLE (MBH)	HOT WATER HEATING COIL: EAT DB (°F)	HOT WATER HEATING COIL: LAT DB (°F)	HOT WATER HEATING COIL: FLOW (GPM)	HOT WATER HEATING COIL: EWT (°F)	HOT WATER HEATING COIL: LWT (°F)	HOT WATER HEATING COIL: APD ("WC)	HOT WATER HEATING COIL: WPD ("WC)	FILTERS: PRE-FILTER: PF-1 MERV	FILTERS: PRE-FILTER: PF-1 IN	FILTERS: PRE-FILTER: PF-2 MERV	FILTERS: PRE-FILTER: PF-2 IN	FILTERS: AFTER-FILTER MERV	FILTERS: AFTER-FILTER IN	ELECTRICAL: V/PH	WEIGHT (LBS)	NOTES
26-DOAS-1	VALENT / VX-112	SECOND FLOOR ROOF	3,040	3,040	1,716	2.3	1	2.0	7.3	208/3	41.3	195	195	45.0	55.0	6	111.0	52.3	0.3	11.0	317.4	0	96.4	32.5	180.0	160.0	0.1	4.4	8	2	13	2	-	-	208/3	1755	ALL LISTED

NOTES
1. ELEVATION: 1302 FEET ABOVE SEA LEVEL. COIL CAPACITIES AND AIRFLOWS SHOWN INLCUDE ALTITUDE CORRECTION VALUES.
2. DISCONNECT SWITCH FURNISHED AND INSTALLED BY DIVISION 26 CONTRACTOR.
3. VFD TO BE FURNISHED BY DIVISION 23 CONTRACTOR. COORDINATE INSTALLATION WITH DIVISION 26 CONTRACTOR.
4. COIL SELECTION SHALL BE CONSTRUCTED WITH COPPER FINS.
5. COOLING COIL LEAVING AIR TEMPERATURE SHALL ACCOUNT FOR FAN HEAT. UNIT LEAVING AIR TEMPERATURE SHALL BE 55 DEG. F.
6. PROVIDE UNIT COIL PERFORMANCE CURVES WITH AIRFLOW AND CAPACITY VS. WATER FLOW.
7. INTERLOCK WITH EF-2 & EF-3.
8. UNIT SIZED FOR 30% PROPYLENE GLYCOL CHILLED WATER.

AIR COOLED CHILLER SCHEDULE (ACPC)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	TYPE	LOCATION	COOLING SECTION: AMBIENT TEMP (F°)	COOLING SECTION: MIN. CAP. (TONS)	COOLING SECTION: DESIGN FLOW (GPM)	COOLING SECTION: MIN/IMUM FLOW (GPM)	COOLING SECTION: FLUID TYPE	COOLING SECTION: EWT (F°)	COOLING SECTION: LWT (F°)	COOLING SECTION: WPD ("WC)	COOLING SECTION: REFR TYPE	EFFICIENCY: COP	EFFICIENCY: EER (ACTUAL)	ELECTRICAL: KW	ELECTRICAL: MCA	ELECTRICAL: MOCP	ELECTRICAL: V/PH	WEIGHT (LBS)	NOTES
61-ACPC-1	TRANE RTAC170	SCREW	SERVICE YARD	101.1	153.3	360	54	30% GLYCOL	55.00	44.00	14	R-134A	3.04	10.4	198	333	450	460/3		9
61-ACPC-2	TRANE RTAC170	SCREW	SERVICE YARD	101.1	153.3	360	54	30% GLYCOL	55.00	44.00	14	R-134A	3.04	10.4	198	333	450	460/3		9
61-ACPC-3	AAON / LZ-2LRG-S	SCROLL	SERVICE YARD	101.1	264.4	529	265	30% GLYCOL	55.00	42.31	16	R-410A	4.41	15.05	211	986	1000	208/3	42715	1-8

NOTES
1. ELEVATION: 1302 FEET ABOVE SEA LEVEL. COIL CAPACITIES AND AIRFLOWS SHOWN INLCUDE ALTITUDE CORRECTION VALUES.
2. PROVIDE CHILLER WITH SINGLE-POINT POWER CONNECTION.
3. DISCONNECT SWITCH FURNISHED AND INSTALLED BY DIVISION 26 CONTRACTOR.
4. UNIT SIZED FOR 30% PROPYLENE GLYCOL.
5. PROVIDE CONDENSER COIL HAIL GUARDS.
6. PROVIDE WITH EC CONDENSER FANS.
7. PROVIDE STRAINER AT CHILLER INLET.
8. REFER TO M-705 FOR CHILLER CONTROL DIAGRAM.
9 EXISTING CHILLER SHOWN FOR REFERENCE ONLY.

VARIABLE AIR VOLUME TERMINAL UNIT - HOT WATER REHEAT (VAV)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	INLET SIZE (IN)	AIRFLOW DATA (CFM): DESIGN	AIRFLOW DATA (CFM): MIN (OA)	AIRFLOW DATA (CFM): HEATING	REHEAT COIL DATA: EAT DB (°F)	REHEAT COIL DATA: LAT DB (°F)	REHEAT COIL DATA: CAPACITY (BTUH)	REHEAT COIL DATA: EWT (°F)	REHEAT COIL DATA: LWT (°F)	REHEAT COIL DATA: # OF ROWS	REHEAT COIL DATA: FLOW (GPM)	REHEAT COIL DATA: WPD ("WC)	CONTROL XFMR: INPUT V/PH	NOTES
AHU-2 (EX)															
26-VAV-1	TITUS / DESV	6"	255	100	100	55.0	92.1	4,000	180.0	152.9	1	0.3	0.08	115/1	1-5
AHU-5A															
26-VAV-23	TITUS / DESV	8"	570	50	180	55.0	90.0	11,800	180.0	134.6	1	0.9	0.11	115/1	1-5
26-VAV-24	TITUS / DESV	6"	335	355	150	55.0	90.0	5,700	180.0	146.5	1	0.3	0.12	115/1	1-5
26-VAV-25	TITUS / DESV	8"	545	220	165	55.0	90.0	6,300	180.0	148.6	1	0.4	0.15	115/1	1-5
26-VAV-26	TITUS / DESV	8"	530	210	160	55.0	90.0	6,100	180.0	147.9	1	0.4	0.14	115/1	1-5
26-VAV-27	TITUS / DESV	6"	355	355	230	55.0	95.0	15,400	180.0	139.0	1	0.8	0.26	115/1	1-5
26-VAV-28	TITUS / DESV	8"	525	360	360	55.0	95.0	15,600	180.0	139.0	1	0.8	0.14	115/1	1-5
26-VAV-29	TITUS / DESV	6"	200	50	100	55.0	90.0	4,900	180.0	146.5	1	0.5	0.15	115/1	1-5
26-VAV-30	TITUS / DESV	8"	630	210	190	55.0	90.0	7,200	180.0	152.4	1	0.5	0.20	115/1	1-5
26-VAV-31	TITUS / DESV	8"	705	260	210	55.0	90.0	8,000	180.0	157.0	1	0.7	0.30	115/1	1-5
26-VAV-32	TITUS / DESV	8"	450	425	225	55.0	90.0	8,500	180.0	160.4	1	0.9	0.46	115/1	1-5
26-VAV-33	TITUS / DESV	8"	480	275	155	55.0	90.0	5,900	180.0	147.2	1	0.5	0.13	115/1	1-5
26-VAV-34	TITUS / DESV	8"	480	70	180	55.0	90.0	8,500	180.0	160.4	1	0.9	0.10	115/1	1-5
26-VAV-35	TITUS / DESV	8"	535	260	260	55.0	90.0	9,900	180.0	155.8	1	0.8	0.11	115/1	1-5
AHU-5B															
26-VAV-9	TITUS / DESV	8"	500	500	170	55.0	90.0	6,500	180.0	149.4	1	0.4	0.16	115/1	1-5
26-VAV-11	TITUS / DESV	6"	240	120	120	55.0	90.0	4,000	180.0	142.7	1	0.5	0.09	115/1	1-5
26-VAV-12	TITUS / DESV	6"	160	30	35	55.0	90.0	5,700	180.0	146.5	1	0.3	0.12	115/1	1-5
26-VAV-13	TITUS / DESV	6"	190	50	75	55.0	90.0	4,900	180.0	154.8	1	0.4	0.11	115/1	1-5
26-VAV-14	TITUS / DESV	6"	210	110	30	55.0	91.5	2,300	180.0	142.8	1	0.6	0.08	115/1	1-5
26-VAV-15	TITUS / DESV	6"	340	210	100	55.0	92.1	4,000	180.0	152.9	1	0.3	0.08	115/1	1-5
26-VAV-16	TITUS / DESV	6"	255	105	25	55.0	90.0	1,500	180.0	152.5	1	0.3	0.08	115/1	1-5
26-VAV-17	TITUS / DESV	8"	610	320	150	55.0	90.0	5,700	180.0	146.5	1	0.3	0.12	115/1	1-5
26-VAV-18	TITUS / DESV	6"	560	110	150	55.0	90.0	2,800	180.0	146.0	1	0.6	0.07	115/1	1-5
26-VAV-19	TITUS / DESV	8"	500	310	150	55.0	90.0	5,700	180.0	146.5	1	0.3	0.12	115/1	1-5
26-VAV-20	TITUS / DESV	12"	1,230	1,230	415	55.0	90.0	15,800	180.0	156.3	1	1.4	0.25	115/1	1-5
26-VAV-21	TITUS / DESV	6"	430	430	145	55.0	90.0	5,500	180.0	145.8	1	0.3	0.11	115/1	1-5
26-VAV-22	TITUS / DESV	6"	185	75	50	55.0	90.0	6,600	180.0	164.8	1	0.9	0.35	115/1	1-5
26-VAV-36	TITUS / DESV	8"	510	295	150	55.0	90.0	5,700	180.0	146.5	1	0.3	0.12	115/1	1-5
26-VAV-37	TITUS / DESV	8"	510	310	150	55.0	90.0	5,700	180.0	146.5	1	0.3	0.12	115/1	1-5
26-VAV-38	TITUS / DESV	8"	615	205	350	55.0	90.0	6,000	180.0	124.5	1	1.0	0.12	115/1	1-5
26-VAV-42	TITUS / DESV	8"	115	115	60	55.0	103.9	3,200	180.0	158.6	1	0.3	0.08	115/1	1-5
AHU-5C															
26-VAV-2	TITUS / DESV	6"	140	130	70	55.0	100.2	3,400	180.0	156.9	1	0.3	0.08	115/1	1-5
26-VAV-3	TITUS / DESV	10"	795	405	405	55.0	90.0	15,400	180.0	134.8	2	0.7	0.13	115/1	1-5
26-VAV-4	TITUS / DESV	12"	815	815	280	55.0	90.0	10,600	180.0	157.0	1	0.9	0.12	115/1	1-5
26-VAV-5	TITUS / DESV	12"	1,085	1,085	365	55.0	90.0	13,900	180.0	151.0	1	1.0	0.16	115/1	1-5
26-VAV-6	TITUS / DESV	12"	1,400	345	345	55.0	90.0	13,100	180.0	149.7	1	0.9	0.14	115/1	1-5
DOAS-1															
26-VAV-7	TITUS / DESV	8"	500	270	270	55.0	92.3	10,900	180.0	143.2	2	0.6	0.08	115/1	1-5
26-VAV-8	TITUS / DESV	14"	2,430	1,095	1,095	55.0	90.0	41,600	180.0	123.4	2	1.5	0.14	115/1	1-5
26-VAV-10	TITUS / DESV	6"	175	120	55	55.0	106.0	3,000	180.0	159.4	1	0.3	0.07	115/1	1-5
RAHU-1 (EX)															
26-VAV-39	TITUS / DESV	10"	845	295	250	55.0	90.0	9,500	180.0	154.9	1	0.8	0.10	115/1	1-5
26-VAV-40	TITUS / DESV	8"	730	300	215	55.0	90.0	8,200	180.0	158.2	1	0.8	0.34	115/1	1-5
26-VAV-41	TITUS / DESV	6"	455	125	305	55.0	90.0	8,400	180.0	159.3	1	0.8	0.40	115/1	1-5

NOTES:
1. ELEVATION: 1302 FEET ABOVE SEA LEVEL. COIL CAPACITIES AND AIRFLOWS SHOWN INCLUDE ALTITUDE CORRECTION VALUES.
2. INLET SIZE SHOWN IS THE MINIMUM ALLOWABLE INLET SIZE. NO SMALLER SIZES SHALL BE ACCEPTED.
3. PROVIDE FACTORY INSTALLED CONTROL POWER (CP) TRANSFORMER. COORDINATE PRIMARY POWER WITH DIVISION 26 CONTRACTOR.
4. PROVIDE FACTORY INSTALLED PRESSURE INDEPENDENT DDC CONTROL PACKAGE.
5. PROVIDE BOX WITH EITHER RIGHT HAND OR LEFT HAND CONFIGURATION AS SHOWN ON DRAWINGS.

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

12/19/2022 2:11:04 PM

VA FORM 08-6231

CONSULTANTS:

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SPUR PROJECT #: 2016

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KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:

ROSS MYLES GREENSLATE 27054 KANSAS PROFESSIONAL ENGINEER 12-21-2022

Drawing Title
MECHANICAL SCHEDULES

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date: **12/21/2022** | Checked: JRM | Drawn: GT

Project Number: **589-704**

Building Number: **26**

Drawing Number: **M-601**

Drawing # 147 OF 190

Veterans Health Administration

VA | U.S. Department of Veterans Affairs

VARIABLE FREQ. DRIVE (VFD)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	EQUIPMENT SERVED	NOTES
26-VFD-1	YASKAWA / MULTIDRIVE	26-AHU-5B	ALL LISTED
26-VFD-2	YASKAWA / MULTIDRIVE	26-MAU-1	ALL LISTED
26-VFD-3	YASKAWA / MULTIDRIVE	26-AHU-5C	ALL LISTED
26-VFD-4	YASKAWA / MULTIDRIVE	26-EF-1	ALL LISTED
26-VFD-5	YASKAWA / MULTIDRIVE	26-EF-2	ALL LISTED
26-VFD-6	YASKAWA / MULTIDRIVE	26-EF-3	ALL LISTED
26-VFD-7	YASKAWA / MULTIDRIVE	26-EF-4	ALL LISTED
26-VFD-8	YASKAWA / MULTIDRIVE	26-EF-5	ALL LISTED
26-VFD-9	YASKAWA / MULTIDRIVE	26-EF-6	ALL LISTED
26-VFD-10	YASKAWA / MULTIDRIVE	26-EF-7	ALL LISTED
26-VFD-11	YASKAWA / MULTIDRIVE	61-ACC-3	ALL LISTED
26-VFD-12	YASKAWA / MULTIDRIVE	26-HHP-1	ALL LISTED
26-VFD-13	YASKAWA / MULTIDRIVE	26-HPP-2	ALL LISTED
26-VFD-14	YASKAWA / MULTIDRIVE	61-CHP-5	ALL LISTED
26-VFD-15	YASKAWA / MULTIDRIVE	61-CHP-6	ALL LISTED
26-VFD-16	YASKAWA / MULTIDRIVE	61-CHP-7	ALL LISTED
26-VFD-17	YASKAWA / MULTIDRIVE	26-EF-8	ALL LISTED
26-VFD-19	YASKAWA / MULTIDRIVE	26-AHU-5C	ALL LISTED
26-VFD-20	YASKAWA / MULTIDRIVE	26-AHU-5B	ALL LISTED
26-VFD-21	YASKAWA / MULTIDRIVE	26-AHU-5A	ALL LISTED
26-VFD-22	YASKAWA / MULTIDRIVE	26-AHU-5A	ALL LISTED

NOTES:
1. VARIABLE FREQUENCY DRIVE TO BE FURNISHED AND INSTALLED BY THE DIVISION 23 CONTRACTOR. COORDINATE ALL ELECTRICAL CONNECTIONS WITH DIVISION 26 CONTRACTOR.
2. VARIABLE FREQUENCY DRIVE OUTPUT TO COINCIDE WITH ASSOCIATED EQUIPMENT REQUIREMENTS PER THEIR SCHEDULED OPERATING VALUES.
3. PROVIDE WITH 42" FRONT CLEARANCE.
4. DIVISION 23 CONTRACTOR SHALL PROVIDE DRIP SHIELD MOUNTED 6" BELOW DUCTWORK OR PIPING ROUTED ABOVE EQUIPMENT.

DIFFUSER, REGISTER, AND GRILLE SCHEDULE

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	MOUNTING	TYPE	FACE SIZE	NECK SIZE	MAX NC	NOTES
SUPPLY							
SD-1	TITUS/TMS	CEILING	LOUVERED FACE	12"x12"	6"ø	30	ALL LISTED
SD-3	TITUS/TMS	CEILING	LOUVERED FACE	24"x24"	6"ø	30	ALL LISTED
SD-4	TITUS/TMS	CEILING	LOUVERED FACE	24"x24"	8"ø	30	ALL LISTED
SD-5	TITUS/TMS	CEILING	LOUVERED FACE	24"x24"	10"ø	30	ALL LISTED
SD-6	TITUS/TMS	CEILING	LOUVERED FACE	24"x24"	12"ø	30	ALL LISTED
SD-8	TITUS/272	DUCT	DOUBLE DEFLECTION	14"x8"	12"x6"	30	ALL LISTED
EXHAUST							
EG-1	TITUS/PAR	CEILING	PERFORATED FACE	12"x12"	10"x10"	30	ALL LISTED
EG-3	TITUS/PAR	CEILING	PERFORATED FACE	24"x24"	22"x22"	30	ALL LISTED
RETURN							
RG-1	TITUS/PAR	CEILING	PERFORATED FACE	24"x12"		30	ALL LISTED
RG-2	TITUS/PAR	CEILING	PERFORATED FACE	24"x24"		30	ALL LISTED
SUPPLY							
LD-1	CAPTIVEAIRE/DI-PSP	CEILING	DROP-IN PERFORATED SUPPLY PLENUM	24"x24"	12"ø	30	ALL LISTED
TRANSFER							
TG-1	TITUS/PAR	CEILING	PERFORATED FACE	24"x24"		30	ALL LISTED

NOTES:
1. PROVIDE VOLUMEN DAMPER AT TAP TO MAIN DUCT. IF TAP IS ABOVE INACCESSIBLE CEILING, PROVIDE OPPOSED BLADE DAMPER FOR GRILLES AND RADIAL DAMPERS IN DIFFUSERS WITH ROUND NECK AT FACE OF DEVICE.
2. FRAME TYPE TO MATCH CEILING OR WALL CONSTRUCTION. COORDINATE WITH ARCHITECTURAL PLANS AND REFLECTED CEILING PLAN.
3. REFER TO PLANS TO NECK SIZES NOT LISTED IN SCHEDULE.

DUCT CONSTRUCTION SCHEDULE

SMACNA HVAC Duct Construction Standards with VA overrides. Refer to Specification section 233100 HVAC Ducts and Casings for gage and joint requirements

DUCTS CONNECTED TO	DUCT MATERIAL	PRESSURE CLASS	SEAL CLASS	LEAKAGE CLASS (RECT)	LEAKAGE CLASS (RND)
SUPPLY					
FAN COIL UNITS, FURNACES, HEAT PUMPS, AND TERMINAL UNITS	GALVANIZED SHEETMETAL	2	A	16	8
CONSTANT VOLUME AIR HANDLING UNITS	GALVANIZED SHEETMETAL	2	A	8	4
VARIABLE AIR VOLUME AIR HANDLING UNITS - MED PRESSURE	GALVANIZED SHEETMETAL	3	A	8	4
VARIABLE AIR VOLUME AIR HANDLING UNITS - HIGH PRESSURE	GALVANIZED SHEETMETAL	4	A	4	2
EQUIPMENT NOT LISTED	GALVANIZED SHEETMETAL	2	A	8	4
OUTSIDE AIR					
EQUIPMENT NOT LISTED	GALVANIZED SHEETMETAL	2	A	16	8
RETURN					
FAN COIL UNITS, FURNACES, HEAT PUMPS, AND TERMINAL UNITS	GALVANIZED SHEETMETAL	2	A	16	8
CONSTANT VOLUME AIR HANDLING UNITS	GALVANIZED SHEETMETAL	2	A	16	8
VARIABLE AIR VOLUME AIR HANDLING UNITS	GALVANIZED SHEETMETAL	2	A	8	4
EQUIPMENT NOT LISTED	GALVANIZED SHEETMETAL	2	A	16	8
EXHAUST					
GENERAL CLEAN EXHAUST (ASHRAE 62.1 CLASS 1 OR 2)	GALVANIZED SHEETMETAL	2	A	16	8
AIR HANDLING UNITS	GALVANIZED SHEETMETAL	2	A	8	4
KITCHEN HOODS	304 STAINLESS STEEL	2	A	4	2
DISHWASHER OR HIGH HUMIDITY LOCATIONS	304 STAINLESS STEEL	2	A	4	2
FUME HOOD, LABORATORY AND PROCESS AIR (ASHRAE 62.1 CLASS 3 OR 4)	304 STAINLESS STEEL	3	A	4	2
EQUIPMENT NOT LISTED	GALVANIZED SHEETMETAL	2	A	16	8

STEAM CONDENSATE FLASH TANK SCHEDULE (FST)

MARK	BASIS OF DESIGN (MANUFACTURER/MODEL)	LOCATION	SERVICE	TYPE	CAPACITY (LB/HR)	INLET PRESS (PSI)	COND PRESS (PSI)	PERCENT FLASH	WORKING PRESSURE (PSI)	NOTES
26-FST-1	CEMLINE / V4FST	201 MECH. PH	STEAM COND	VERTICAL	1,500	80	60	2	150	ALL LISTED

NOTES:
1. PROVIDE VERTICAL FLASH TANK WITH STAINLESS STEEL WEAR PLATE
2. TANK MUST BE REGISTERED WITH THE NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS.

CONDENSATE PUMP SCHEDULE (CDP)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	SERVES	MAX FLOW (GPH)	VOLTS/PH	NOTES
26-CDP-1	SAUERMANN / SI-30	26-ACU-1	5	230/1	ALL LISTED
26-CDP-2	SAUERMANN / SI-30	26-ACU-2	5	230/1	ALL LISTED

NOTES:
1. PROVIDE WITH IMOUTING AND DETECTION UNIT NSTALLATION KIT.
2. PROVIDE WITH CLEAR PVC HOSE AND SELF-SEALING FITTING TO CONNECT DISCHARGE TUBE TO DRAIN PIPING.

UNDERGROUND STOR. TANK SCHEDULE (UST)

MARK	BASIS OF DESIGN (MANUFACTURER/MODEL)	MATERIAL	CAPACITY (GAL)	DIAMETER	LENGTH	NOTES
UST-1	ZCL / XERXES	FIBERGLASS	2,500	6'	13' - 5 3/4"	ALL LISTED

NOTES:
1. PROVIDE WITH SUMP AND COLLAR.
2. PROVIDE DOUBLE WALL STORAGE TANK WITH LEAK DETECTION SYSTEM.

DUST COLLECTOR SCHEDULE (DC)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	DESIGN AIR FLOW (CFM)	HORSE POWER (HP)	VOLTS/PH	NOTES
DC-1	DONALDSON TORIT / CAB 84	1230	3	460/3	ALL LISTED

NOTES
1. DUST COLLECTOR TO BE RELOCATED FROM EXISTING LOCATION. SCHEDULED INFORMATION SHOWN FOR REFERENCE ONLY.

HYDRONIC PUMP SCHEDULE (CHP/HHP)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	TYPE	FLUID TYPE	FLOW (GPM)	HEAD (FT)	OPERATING RPM	ELECTRICAL HP	ELECTRICAL VOLTS/PH	WEIGHT (LBS)	NOTES
26-HHP-1	Bell & Gossett / 2.5 BB	201 MECH. PENTHOUSE	END SUCTION PUMP	30% PROPYLENE GLYCOL	285	80	1,723	10.0	460/3	365	1-5
26-HHP-2	Bell & Gossett / 2.5 BB	201 MECH. PENTHOUSE	END SUCTION PUMP	30% PROPYLENE GLYCOL	285	80	1,723	10.0	460/3	365	1-5
CHILLED WATER											
61-CHP-5	TACO / KV4013D	BLDG. 61 MECH. ROOM	VERTICAL INLINE	30% PROPYLENE GLYCOL	495	115	1,760	20.0	460/3	800	1-5
61-CHP-6	TACO / KV4013D	BLDG. 61 MECH. ROOM	VERTICAL INLINE	30% PROPYLENE GLYCOL	495	115	1,760	20.0	460/3	800	1-5
61-CHP-7	TACO / KV4013D	BLDG. 61 MECH. ROOM	VERTICAL INLINE	30% PROPYLENE GLYCOL	495	115	1,760	20.0	460/3	800	1-5

NOTES:
1. ELEVATION: 1302 FEET ABOVE SEA LEVEL FLOWS SHOWN INLCUDE ALTITUDE CORRECTION VALUES.
2. DISCONNECT SWITCH FURNISHED AND INSTALLED BY DIVISION 26 CONTRACTOR.
3. VARIABLE FREQUENCY DRIVE TO BE PROVIDED BY DIVISION 23 CONTRACTOR. COORDINATE INSTALLATION WITH DIVISION 26 CONTRACTOR.
4. PUMP MOTOR SHALL BE NON-OVERLOADING THROUGHOUT THE FULL RANGE OF THE PUMP CURVE.
5. PROVIDE WITH SHAFT GROUNDING.

STEAM CONDENSATE RECEIVER/PUMP SCHEDULE (CP)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	DESCRIPTION	TYPE	FLOW (GPM)	HEAD (PSIG)	OPERATING RPM	ELECTRICAL HP	ELECTRICAL VOLTS/PH	NOTES
STEAM CONDENSATE										
26-CP-1	B&G XYLEM / 75CBE75-40	GROUND FLR PUMP RM	FLOOR MTD CAST IRON PUMP RECEIVER PACKAGE	2-STAGE HORIZ	75	35	3,500	5.0	230/1	ALL LISTED

NOTES
1. PROVIDE WITH CAST IRON RECEIVER, SIMPLEX DRIP PROOF CENTRIFUGAL PUMP W/TEFC MOTOR, INLET BASKET STRAINER, AND WATER LEVEL GAUGE W/SHUTOFF VALVE.
2. PROVIDE ELECTRONIC CONTROLLER, MAGNETIC PUMP STARTER, FUSED DISCONNECT, AND PILOT LIGHT PUMP OPERATION INDICATOR.

HEAT EXCHANGER SCHEDULE (HX)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	STEAM SIDE FLOW (LB/HR)	STEAM SIDE OPERATING PRESS. (PSI)	STEAM SIDE PD ALLOWED (PSI)	WATER SIDE FLOW (GPM)	WATER SIDE EWT (°F)	WATER SIDE LWT (°F)	WATER SIDE OPERATING PRESS. (PSI)	NOTES
26-HX-4	BELL & GOSSETT / QSU-103-2	201 MECH. PH	3045	80	18.9	285	160	180	0	ALL LISTED
26-HX-5	BELL & GOSSETT / QSU-103-2	201 MECH. PH	3045	80	18.9	285	160	180	0	ALL LISTED

NOTES:
1. SUPPORT FROM FLOOR WITH ANGLE IRON FRAME OR SKID MOUNTED ASSEMBLY FOR HX, PUMPS, AIR SEPARATOR, EXPANSION TANK, FLASH TANK, AND ACCESSORIES.
2. SIZE STEAM TRAP FOR A SAFETY FACTOR OF 3:1 AT 1/2 MAXIMUM PRESSURE DIFFERENTIAL.
3. 30% PROPYLENE GLYCOL / WATER MIXTURE.

EXPANSION TANK SCHEDULE (ET)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	TANK VOLUME (GAL.)	ACCEPTANCE VOLUME (GAL.)	WEIGHT (LBS)	NOTES
26-ET-1	BELL & GOSSETT / B-200	201 MECH. PH	53.0	53.0	285	ALL LISTED

NOTES
1. TANK SELECTED AT 125 PSI, 240°F MAX.

AIR SEPARATOR SCHEDULE (AS-X)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	MAX FLOW (GPM)	PRESSURE DROP (''WC)	WEIGHT (LBS)	NOTES
26-AS-1	BELL & GOSSETT / RL-4F	201 MECH. PENTHOUSE	300	1.60	263	ALL LISTED

NOTES:
1. PROVIDE WITH STRAINER.
2. SEPARATOR SELECTED AT 125 PSI, 375°F MAX.

WALK-IN COOLER & FREEZER

MARK	BASIS OF DESIGN (MANUFACTURER/MODEL)	LOCATION	ASSOCIATED UNIT	DESIGN (CFM)	FINS/INCH	CAPACITY (BTUH)	UNIT SETPOINT (°F)	ELECTRICAL MCA (A)	ELECTRICAL V/PH	WEIGHT	NOTES
26-AC-1	RUSSELL/ RU6A094ADA	COOLER	26-CU-1	1,570	6	9,400	36	15	115/1	55	1-3
26-AC-2	RUSSELL/ RU6E077DDA	FREEZER	26-CU-2	1,570	6	7,700	-22	15	208/1	55	1-4

NOTES
1. ELEVATION: 1302 FEET ABOVE SEA LEVEL.CAPACITIES AND AIRFLOWS SHOWN INLCUDE ALTITUDE CORRECTION VALUES.
2. PROVIDE WITH DUAL SPEED ECM.
3. REFRIGERANT TO BE R404A.
4. PROVIDE WITH ELECTRIC DEFROST.

SPLIT SYSTEM INDOOR UNIT SCHEDULE (ACU)

MARK	BASIS OF DESIGN (MANUFACTURER/MODEL)	LOCATION	SUPPLY AIRFLOW (CFM)	COOLING DATA TOTAL (BTU/hr)	COOLING DATA SENSIBLE CAP	COOLING DATA EAT DB (°F)	COOLING DATA LAT DB (°F)	HEAT DATA INPUT (MBH)	HEAT DATA EAT DB (°F)	HEAT DATA LAT DB (°F)	ELECTRICAL MCA (A)	ELECTRICAL RLA (A)	ELECTRICAL V/PH	NOTES
26-ACU-1	LG / ARNU21833K4A	IT ROOM 119	495	19.1	13.6	81	55	21.5	64	108.0	0.65	0.5	208/1	ALL LISTED
26-ACU-2	LG / ARUN303SVA4	IT ROOM 030	815	30.0	21.6	81	55	32.0	64	104.0	0.65	0.5	208/1	ALL LISTED

NOTES
1. INSTALL PER MANUFACTURERS RECOMMENDATIONS. CONTRACTOR SHALL VERIFY WITH EQUIPMENT SUPPLIER EXACT ROUTING AND SIZE OF INSULATED REFRIGERANT PIPING.
2. DIVISION 26 CONTRACTOR TO PROVIDE DISCONNECT SWITCH FOR EVAPORATOR SECTION AND CONDENSING SECTION.
3. PROVIDE WITH MANUFACTURERS WALL MOUNTED THERMOSTAT, WALL MOUNTING HARDWARE, AND INTEGRAL CONDENSATE PANS WITH LEAK DETECTION AND PUMP.

CONDENSING UNIT SCHEDULE (CU)

MARK	BASIS OF DESIGN (MANUFACTURER / MODEL)	LOCATION	ASSOCIATED UNIT	COOLING CAP. (BTUH)	ELECTRICAL MCA (A)	ELECTRICAL MOPD (A)	ELECTRICAL V/PH	WEIGHT (LBS)	NOTES
26-CU-1	SAUERMANN / SI-30	EAST WING ROOF	26-AC-1	11630	15	20	208/1	195	ALL LISTED
26-CU-2	SAUERMANN / SI-30	EAST WING ROOF	26-AC-2	10800	44	60	208/1	352	ALL LISTED
26-CU-3	LG / ARUN048GSS4	EAST WING ROOF	26-ACU-1 & 2	4800	30	50	208/1	100	ALL LISTED

NOTES:
1. PROVIDE LOW AMBIENT CONTROLS KIT TO 0° F.
2. EQUIPMENT SIZED FOR 100 °F AMBIENT TEMPERATURE.
3. COORDINATE WITH THE MANUFACTURER THE HORIZONTAL AND VERTICAL REFRIGERANT PIPE ROUTING TO DETERMINE PIPE SIZES FOR THE REFRIGERANT PIPING.
4. PROVIDE ROOF MOUNTED EQUIPMENT SUPPORT RAILS.
5. DISCONNECT SWITCH FURNISHED BY DIVISION 26 CONTRACTOR.
6. PROVIDE CONDENSER COIL HAIL GUARDS.

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

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STAMP:
ROSS MYLES DENSON 27054 12-21-2021 KANSAS PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL SCHEDULES

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **M-602**

Drawing # 148 OF 190

Veterans Health Administration

VA | U.S. Department of Veterans Affairs

12/19/2022 2:11:20 PM

VA FORM 08-6231

POINTS LIST - STANDARD TRENDING INTERVALS

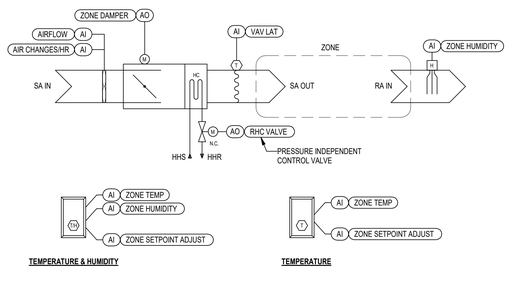
POINT NAME	TREND INTERVAL	OPERATIONAL TREND DURATION	TESTING TREND DURATION
AI	15 MIN.	24 HOURS	3 DAYS
BI	CHANGE OF VALUE	24 HOURS	3 DAYS
AO	15 MIN.	24 HOURS	3 DAYS
BO	CHANGE OF VALUE	24 HOURS	3 DAYS
CALC	1 HOUR	30 DAYS	N/A

NOTES:
1. SEE EQUIPMENT POINT LISTS FOR EQUIPMENT SPECIFIC TRENDING REQUIREMENTS.

POINTS LIST SCHEDULE (VAV-X)

POINTS NAME	HARDWARE POINTS				SOFTWARE POINTS						SHOWN ON GRAPHIC
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	
VAV ATU (VAV-X)											
ZONE DAMPER		X							X		X
REHEAT COIL											
RHC VALVE		X							X		X
MISCELLANEOUS											
ZONE TEMP	X								X		X
ZONE SETPOINT ADJUST	X								X		X
ZONE HUMIDITY	X										X
VAV LAT	X								X		X
AIRFLOW	X								X		X
AIR CHANGES PER HOUR	X										X
SETPOINTS	**VALUES**										
ZONE COOLING SETPOINT	NOTE 2				X				X		
ZONE HEATING SETPOINT	NOTE 2				X				X		
ZONE HUMIDITY SETPOINT	NOTE 2				X						
VAV LAT SETPOINT	SEE VAV ATU SCHEDULE				X						
PRIMARY AIRFLOW SETPOINT	SEE VAV ATU SCHEDULE				X						
MINIMUM AIRFLOW SETPOINT	SEE VAV ATU SCHEDULE				X						
ALARMS	**DESCRIPTION**									**ALARM**	**ALARM DELAY**
HIGH LEAVING AIR TEMP	VAV LAT IS GREATER THAN 110 DEGREES (ADJ.)									X	10 MIN.
LOW LEAVING AIR TEMP	VAV LAT IS LESS THAN 45 DEGREES (ADJ.)									X	10 MIN.
HIGH ZONE TEMP	ZONE TEMPERATURE IS GREATER THAN ITS COOLING SETPOINT BY 5 DEGREES (ADJ.)									X	10 MIN.
LOW ZONE TEMP	ZONE TEMPERATURE IS LESS THAN ITS HEATING SETPOINT BY 5 DEGREES (ADJ.)									X	10 MIN.
HIGH ZONE HUMIDITY	ZONE HUMIDITY IS GREATER THAN ITS SETPOINT									X	5 MIN.
LOW ZONE HUMIDITY	ZONE HUMIDITY IS LESS THAN ITS SETPOINT									X	5 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET M-701 FOR APPLICABLE SETPOINTS.
3. VAV AIR TERMINAL UNIT FURNISHED WITH FACTORY INSTALLED CONTROLS. COORDINATE CONTROLLER WITH VAV MANUFACTURER.



SEQUENCE OF OPERATIONS
VAV AIR TERMINAL UNIT (VAV-X)

GENERAL DESCRIPTION
The single duct variable air volume terminal unit (VAV ATU) with a hot water reheat coil provides heating, cooling, ventilation, and dehumidification for the conditioned space as shown on the drawings. The unit shall operate subject to a digital display space combination humidity/temperature sensor and a VAV box controller.

OPERATING MODES

OCCUPIED MODE - COOLING
The VAV ATU and reheat coil shall be in Occupied Mode - Cooling when the associated space is within occupied hours as defined by the project design conditions schedule AND the associated zone temperature is above its cooling setpoint.

OCCUPIED MODE - HEATING
The VAV ATU and reheat coil shall be in Occupied Mode - Heating when the associated space is within occupied hours as defined by the project design conditions schedule AND the associated zone temperature is below its heating setpoint.

DEHUMIDIFICATION MODE
The VAV ATU and reheat coil shall be in Dehumidification Mode when the associated space is above its high humidity limit as defined by the project design conditions schedule.

UNOCCUPIED MODE
The VAV ATU and reheat coil shall be in unoccupied mode when the associated space is outside of occupied hours as defined by the project design conditions schedule

COMPONENT CONTROLS
The VAV ATU zone damper and reheat coil shall operate to maintain the zone temperature setpoint. The occupant shall have the ability to adjust the zone temperature 3 deg up and 2 deg down from the setpoint defined by the project design conditions schedule.

ZONE DAMPER

OCCUPIED MODE – COOLING:
The zone damper shall modulate between its scheduled minimum and primary airflow values to maintain the zone temperature setpoint as defined by the project design conditions schedule.

OCCUPIED MODE – HEATING:
The zone damper shall modulate down to its scheduled minimum airflow. If more heat is required, the zone damper shall modulate to its minimum heating airflow setpoint (adj.)

DEHUMIDIFICATION MODE:
The zone damper shall operate as if in Occupied Mode – Cooling.

UNOCCUPIED MODE:
The zone damper shall modulate down to its scheduled minimum airflow.
On a call for heat, The zone damper shall operate as if in occupied mode to maintain the unoccupied zone temperature setpoint.

REHEAT COIL VALVE

OCCUPIED MODE – COOLING:
The reheat coil valve shall be off.

OCCUPIED MODE – HEATING:
The reheat coil valve shall modulate to maintain the scheduled VAV ATU leaving air temperature until the zone temperature is within its setpoints.

DEHUMIDIFICATION MODE:
The humidity sensor shall measure the associated zone relative humidity and modulate the reheat coil valve to maintain a leaving air temperature setpoint 1 deg less than the zone cooling setpoint until the zone humidity is within its setpoints.

UNOCCUPIED MODE:
On a call for heat, The reheat coil valve shall operate as if in occupied mode to maintain the unoccupied zone temperature heating setpoint.

2 TYPICAL VARIABLE AIR VOLUME TERMINAL UNIT (VAV-X) CONTROL DIAGRAM
NOT TO SCALE

PROJECT DESIGN CONDITIONS

CLIMATE CONDITIONS	
WEATHER STATION	2017 ASHRAE CLIMATE DATA / WICHITA, KS, USA
ASHRAE CLIMATE ZONE	4
HEATING 99.6% (F DB)	7.6 °F (99.6% F DB)
HUMIDIFICATION 99.6% (DP / HR / MCDB)	-2.5°F / 5.0 / 11.5 °F
COOLING 0.4% (DB / MCWB)	101.1 °FDb / 73.2 °FWb
DEHUMIDIFICATION 0.4% (DP / HR / MCDB)	74.2 °FDb / 134.2 / 83.7 °FWb
MAX. AMBIENT DB TEMP (50 YRS)	-10.9 °F
MIN. AMBIENT DB TEMP (50 YRS)	113.1 °F
BUILDING OPERATING HOURS (VERIFY WITH STATION)	
MONDAY - FRIDAY	7:00 a.m. - 6:00 p.m.
SATURDAY	7:00 a.m. - 6:00 p.m.
SUNDAY	7:00 a.m. - 6:00 p.m.

NOTES:
1. ZONE LEVEL OCCUPANCY HOUR SCHEDULE SHALL BE PER BUILDING OPERATING HOURS UNLESS OTHERWISE SCHEDULED.
2. ZONE LEVEL SET POINT CONDITIONS SHALL BE AS SCHEDULED UNLESS OTHERWISE SCHEDULED OR NOTED FOR ROOM SPECIFIC SPACE CONDITIONS.
3. ZONE LEVEL SET POINT CONDITIONS SHALL RESET TO UNOCCUPIED UNTIL PATIENT ROOM SETPOINTS ARE SATISFIED.
4. DIVISION 23 CONTRACTOR TO PROVIDE ROOM AIR BALANCE WHERE POSSIBLE. AIR BALANCE SHALL BE NEUTRAL FOR NON-CRITICAL SPACES NOT SHOWN IN SCHEDULE.

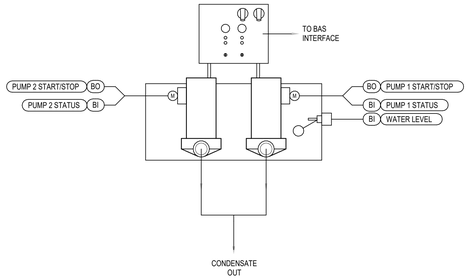
HVAC DESIGN MANUAL

SPACE / UNIT DESCRIPTIONS	COOLING		HEATING		HUMIDIFICATION		MAX. NOISE LEVEL NC	ROOM AIR BALANCE (o) (+) (-) (- -) (+ +)	NOTES	INCLUDE IN SCHEDULE
	OCC. °F Db	UNOCC. °F Db	OCC. °F Db	UNOCC. °F Db	MAX. %RH	MIN. %RH				
DENTAL CLINIC										
X-RAY PANORAMIC / CEPHALOMETRIC	75	78	70	68	60%	20%	35	(o)	1-4	Yes
MULTI-FUNCTIONAL DENTAL TREATMENT ROOM	75	78	70	68	60%	20%	40	(+)	1-4	Yes
SPECIAL NEEDS PATIENT DENTAL TREATMENT ROOM	75	78	70	68	60%	20%	40	(+)	1-4	Yes
STERILE INSTRUMENT STORAGE	70	72	70	68	55%	30%	40	(+)	1-4	Yes
DENTAL EQUIPMENT MECHANICAL ROOM	80	82	65	68	NA	NA	40	(-)	1-4	Yes
GENERAL PURPOSE LABORATORY	75	78	70	68	60%	20%	40	(-)	1-4	Yes
NON-PATIENT ROOMS - SUPPORT AREAS										
CLERICAL WORKSTATION	75	78	70	68	60%	20%	40	(o)	1-4	Yes
CORRIDORS	75	78	70	68	60%	20%	40	(+)	1-4	Yes
DRESSING ROOM	NA	NA	NA	NA	NA	NA	35	(o)	1-4	Yes
GIFT SHOP (RETAIL STORE)	75	78	70	68	60%	20%	40	(o)	1-4	Yes
MEDICATION ROOM	75	78	70	68	60%	20%	40	(+)	1-4	Yes
LOCKER ROOM (WITHOUT TOILETS)	75	78	70	68	60%	20%	40	(-)	1-4	Yes
LOUNGE	75	78	70	68	60%	20%	40	(-)	1-4	Yes
OFFICES	75	78	70	68	60%	20%	40	(o)	1-4	Yes
TOILETS - PUBLIC (INTERIOR)	NA	NA	NA	NA	NA	NA	40	(- -)	1-4	Yes
TOILETS - PUBLIC (PERIMETER)	NA	NA	68	NA	NA	NA	40	(- -)	1-4	Yes
WAITING ROOMS	75	78	70	68	60%	20%	40	(o)	1-4	Yes
NON-PATIENT ROOMS - MISCELLANEOUS AREAS										
CLEAN UTILITY/STORAGE ROOM	NA	NA	NA	NA	NA	NA	40	(+)	1-4	Yes
COPY/PRINTING ROOM (SMALL)	NA	NA	NA	NA	NA	NA	40	(-)	1-4	Yes
ELECTRICAL ROOM - SATELLITE AND MAIN ELECTRICAL ROOMS WITH INTERNAL HEAT GAIN	86	NA	40	NA	NA	NA	45	(o)	1-4	Yes
HOUSEKEEPING AID CLOSET (HAC)	NA	NA	NA	NA	NA	NA	40	(- -)	1-4	Yes
SOILED UTILITY AND STORAGE ROOM	NA	NA	NA	NA	NA	NA	40	(- -)	1-4	Yes
GAS CYLINDER STORAGE ROOM	NA	NA	NA	NA	NA	NA	40	(- -)	1-4	Yes
VESTIBULES	NA	NA	50	NA	NA	NA	40	(+)	1-4	Yes
WALK-IN REFRIGERATOR AND FREEZERS	NA	NA	NA	NA	NA	NA	NA	(+)	1-4	Yes
DENTAL CLINIC										
X-RAY PANORAMIC / CEPHALOMETRIC	75	78	70	68	60%	20%	35	(o)	1-4	Yes
MULTI-FUNCTIONAL DENTAL TREATMENT ROOM	75	78	70	68	60%	20%	40	(+)	1-4	Yes
STERILE INSTRUMENT STORAGE	70	72	70	68	55%	30%	40	(+)	1-4	Yes
DENTAL EQUIPMENT MECHANICAL ROOM	80	82	65	68	NA	NA	40	(-)	1-4	Yes
GENERAL PURPOSE LABORATORY	75	78	70	68	60%	20%	40	(-)	1-4	Yes
LABORATORY PORCELAIN / CERAMICS	75	78	70	68	60%	20%	40	(-)	1-4	Yes

POINTS LIST SCHEDULE - STEAM CONDENSATE PUMP (CP-X)

POINTS NAME	HARDWARE POINTS				SOFTWARE POINTS						SHOWN ON GRAPHIC
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	
PUMPS											
PUMP 1 START/STOP				X					X		X
PUMP 2 START/STOP				X					X		X
PUMP 1 STATUS			X						X		X
PUMP 2 STATUS			X						X		X
RECEIVER											
WATER LEVEL				X					X		X
ALARMS	**DESCRIPTION**									**ALARM**	**ALARM DELAY**
COMMON ALARM	ALL APPLICABLE UNITARY ALARMS.									X	10 MIN.
HIGH WATER LEVEL ALARM	IF THE WATER LEVEL IS ABOVE THE STANDARD UNITARY SETPOINT VALUE.									X	5 MIN.
CONDENSATE PUMP 1 FAILURE	COMMANDED ON, BUT THE STATUS IS OFF.									X	10 MIN.
CONDENSATE PUMP 2 FAILURE	COMMANDED ON, BUT THE STATUS IS OFF.									X	10 MIN.
CONDENSATE PUMP 1 IN HAND	COMMANDED OFF, BUT THE STATUS IS ON.									X	10 MIN.
CONDENSATE PUMP 2 IN HAND	COMMANDED OFF, BUT THE STATUS IS ON.									X	10 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET XX-M-701 FOR APPLICABLE TREND INTERVALS.



SEQUENCE OF OPERATIONS
STEAM CONDENSATE PUMP (CP-1)

GENERAL DESCRIPTION
The duplex steam condensate pumps with condensate storage tank and manufacturer provided control panel will operate as lead/standby to provide steam condensate removal from the steam supply system as shown on the drawings.

OPERATING MODES

NORMAL OPERATING MODE
The steam condensate pump shall be in normal operating mode at all times unless overridden by the other mode outlined in this sequence.

STANDBY MODE
Standby mode shall be activated upon failure of the lead pump. Standby mode shall be disabled upon manual reset, and the system will reset to normal operation.

COMPONENT CONTROLS

LEAD PUMP

NORMAL OPERATING MODE: The pump shall be activated (subject to the unit manufacturer's standard unitary safeties and controls) upon receiving a water level status.

STANDBY MODE: The pump shall be off.

STANDBY PUMP

NORMAL OPERATING MODE: The pump shall be off.

STANDBY MODE: The pump shall be activated (subject to the unit manufacturer's standard unitary safeties and controls) upon receiving a water level status.

1 STEAM CONDENSATE PUMP (CP-1) TYPICAL CONTROL DIAGRAM
NOT TO SCALE

MECHANICAL CONTROLS LEGEND

ABBREVIATIONS

A
AI ANALOG INPUT
AO ANALOG OUTPUT
AV ANALOG VIRTUAL
AFS AIRFLOW STATION
AF AFTER FILTER
AFCV AIRFLOW CONTROL VALVE
AHU AIR HANDLING UNIT

B
BAC BUILDING AUTOMATION CONTROL
BI BINARY INPUT
BO BINARY OUTPUT
BV BINARY VIRTUAL
BP BUILDING PRESSURE
BPC BUILDING PRESSURE CONTROL

C
CC COOLING COIL
CHW CHILLED WATER
CP CIRCULATING PUMP
CT CURRENT TRANSMITTER

D
DD DIRECT DRIVE
DX DIRECT EXPANSION
DP DIFFERENTIAL PRESSURE

E
EA EXHAUST AIR
EAT ENTERING AIR TEMPERATURE
ECM ELECTRONICALLY COMMUTATED MOTOR
EF EXHAUST FAN
ER ENERGY RECOVERY
EWT ENTERING WATER TEMPERATURE

F
FF FINAL FILTER
FSD FIRE SMOKE DAMPER

G
GF GAS FURNACE

H
HC HEATING COIL
HGB HOT GAS BYPASS
HW HOT WATER

I
IFB INTEGRAL FACE AND BYPASS

L
LAT LEAVING AIR TEMPERATURE
HGB HOT GAS BYPASS
LWT LEAVING WATER TEMPERATURE

M
MAT MIXED AIR TEMPERATURE
MOA MINIMUM OUTSIDE AIR

N
NG NATURAL GAS

O
OA OUTSIDE AIR
OCC OCCUPANCY
OX OXYGEN
OXS OXYGEN SENSOR

P
PCC PRECOOLING COIL
PF PREFILTER
PHC PREHEAT COIL

R
RA RETURN AIR
RF RETURN FAN
RHC REHEAT COIL
R/E RETURN/EXHAUST
R/R RETURN/RELIEF

S
SA SUPPLY AIR
SF SUPPLY FAN
SD SMOKE DAMPER

T
TCP TEMPERATURE CONTROL PANEL
TA TRANSFER AIR
TMV THERMOSTATIC MIXING VALVE
TCV TEMPERATURE CONTROL VALVE

U
UV ULTRAVIOLET

V
VFD VARIABLE FREQUENCY DRIVE
VOC VOLATILE ORGANIC COMPOUND

SYMBOLS

EQUIPMENT

CHW — CHILLED WATER COIL
DX — DIRECT EXPANSION COIL
HW — HOT WATER COIL
HW / IFB — HOT WATER INTEGRAL FACE AND BYPASS COIL
ELEC — ELECTRIC HEATING COIL
GAS FURNACE
HUMIDIFIER DISPERSION GRID
M — MODULATING OPPOSED BLADE DAMPER
M — MODULATING PARALLEL BLADE DAMPER
SD — SMOKE DAMPER
BACKDRAFT DAMPER
M — VAV ATU MODULATING DAMPER
M — 2-POSITION OPPOSED BLADE DAMPER
M — 2-POSITION PARALLEL BLADE DAMPER
FILTER
BLOWER FAN
PLENUM FAN
PUMP
CT — CURRENT TRANSMITTER
M — 2-WAY MODULATING CONTROL VALVE
M — 3-WAY MODULATING CONTROL VALVE
THERMOSTATIC MIXING VALVE
XX — XXXX — POINT TYPE / POINT NAME

SENSORS & DEVICES

AFS — AIRFLOW STATION
AIRFLOW SENSOR
SD — SMOKE DETECTOR
T — TEMPERATURE SENSOR
FRZ — FREEZESTAT
H — HUMIDITY SENSOR
DAMPER POSITION INDICATOR
H / L — DIFFERENTIAL PRESSURE SENSOR
L / H — RETURN/EXHAUST AIR DUCT STATIC PRESSURE SENSOR
H / L — SUPPLY AIR DUCT STATIC PRESSURE SENSOR

PIPING

T — TEMPERATURE SENSOR
P — PRESSURE SENSOR
FLOW METER
AQUASTAT

ZONE

T — ZONE TEMPERATURE SENSOR
H — ZONE HUMIDITY SENSOR
O — ZONE OCCUPANCY SENSOR
L / H — POSITIVE SPACE DIFFERENTIAL PRESSURE SENSOR
H / L — NEGATIVE SPACE DIFFERENTIAL PRESSURE SENSOR

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

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ROSS MYLES DESIGNER 27054 12-1-2021 KANSAS PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL CONTROLS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**
Building Number **26**
Drawing Number **M-701**
Drawing # 149 OF 190

Veterans Health Administration
VA | U.S. Department of Veterans Affairs

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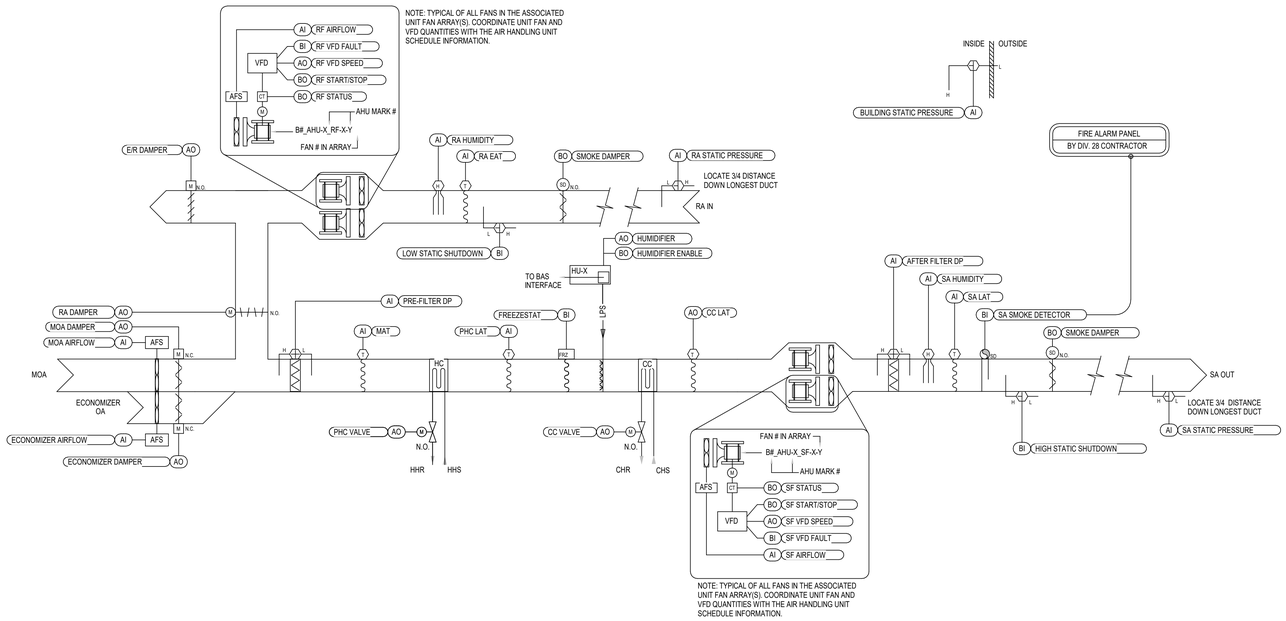
VA FORM 08-6231



POINTS LIST SCHEDULE - VARIABLE AIR VOLUME AIR HANDLING UNIT (26-AHU-5)

POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS SETPOINT	AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
OUTSIDE AIR												
OA TEMPERATURE	X									X		X
OA ENTHALPY	X											
MIXED AIR												
PRE-FILTER 1 DIFFERENTIAL PRESSURE	X									X	X	X
PRE-FILTER 2 DIFFERENTIAL PRESSURE	X									X	X	X
MIXED AIR TEMPERATURE	X									X		X
PRE-HEAT COIL												
PHC VALVE		X								X		X
PHC LAT	X									X		X
FREEZESTAT			X							X	X	X
HUMIDIFIER												
HUMIDIFIER		X								X		X
HUMIDIFIER ENABLE				X						X		X
COOLING COIL												
CC VALVE		X								X		X
CC LAT	X									X		X
SUPPLY AIR												
SF AIRFLOW	X									X		X
SF STATUS			X							X		X
SF START/STOP				X						X		X
SF VFD FAULT			X								X	X
SF VFD SPEED		X								X		X
AFTER FILTER DIFFERENTIAL PRESSURE	X									X	X	X
SA LAT	X									X		X
SA HUMIDITY	X									X	X	X
SA SMOKE DETECTOR			X							X	X	X
HIGH STATIC SHUTDOWN			X							X		X
SA SMOKE DAMPER				X						X		X
SA STATIC PRESSURE	X									X		X
RETURN AIR												
RF AIRFLOW	X									X		X
RF STATUS			X							X		X
RF START/STOP				X						X		X
RF VFD FAULT			X								X	X
RF VFD SPEED		X								X		X
RA EAT	X									X		X
RA HUMIDITY	X									X		X
LOW STATIC SHUTDOWN			X							X	X	X
RA SMOKE DAMPER		X								X		X
RA STATIC PRESSURE	X									X		X
RA DAMPER		X								X		X
RELIEF/EXHAUST												
E/R DAMPER		X								X		X
MISCELLANEOUS												
BUILDING STATIC PRESSURE	X									X		X
SETPOINTS												
EMERGENCY SHUTDOWN					N/A		X			X	X	
BUILDING DIFFERENTIAL PRESSURE SETPOINT					.03 IN WG					X		
PHC LAT SETPOINT					NOTE 3	X				X		
CC LAT SETPOINT					NOTE 3	X				X		
RA STATIC PRESSURE SETPOINT					NOTE 3	X				X		
RA HUMIDITY SETPOINT					NOTE 3	X				X		
SA LAT SETPOINT					55°F	X				X		
SA STATIC PRESSURE SETPOINT					NOTE 3	X				X		
SA HUMIDITY SETPOINT					NOTE 3	X				X		

ALARM	DESCRIPTION	ALARM	ALARM_
HIGH MIXED AIR TEMPERATURE	IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.)	X	10 MIN.
LOW MIXED AIR TEMPERATURE	IF THE MIXED AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)	X	10 MIN.
HIGH SUPPLY AIR TEMPERATURE	IF THE SUPPLY AIR TEMPERATURE IS 5°F GREATER THAN ITS SETPOINT (ADJ.)	X	10 MIN.
LOW SUPPLY AIR TEMPERATURE	IF THE SUPPLY AIR TEMPERATURE IS 5°F LESS THAN ITS SETPOINT (ADJ.)	X	10 MIN.
HIGH RETURN AIR TEMPERATURE	IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.)	X	10 MIN.
LOW RETURN AIR TEMPERATURE	IF THE RETURN AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)	X	10 MIN.
HIGH SUPPLY AIR HUMIDITY	IF THE SUPPLY AIR HUMIDITY IS GREATER THAN 90% (ADJ.)	X	5 MIN.
LOW SUPPLY AIR HUMIDITY	IF THE SUPPLY AIR HUMIDITY IS LESS THAN 30% (ADJ.)	X	5 MIN.
HIGH RETURN AIR HUMIDITY	IF THE RETURN AIR HUMIDITY IS GREATER THAN 70% (ADJ.)	X	5 MIN.
LOW RETURN AIR HUMIDITY	IF THE RETURN AIR HUMIDITY IS LESS THAN 35% (ADJ.)	X	5 MIN.
HIGH SUPPLY AIR STATIC PRESSURE	IF THE SUPPLY AIR STATIC PRESSURE IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW SUPPLY AIR STATIC PRESSURE	IF THE SUPPLY AIR STATIC PRESSURE IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.
HIGH RETURN AIR STATIC PRESSURE	IF THE RETURN AIR STATIC PRESSURE IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW RETURN AIR STATIC PRESSURE	IF THE RETURN AIR STATIC PRESSURE IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.
SUPPLY FAN FAILURE	COMMANDED ON, BUT THE STATUS IS OFF	X	10 MIN.
SUPPLY FAN IN HAND	COMMANDED OFF, BUT THE STATUS IS ON	X	10 MIN.
SUPPLY FAN RUNTIME EXCEEDED	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)	X	10 MIN.
RETURN FAN FAILURE	COMMANDED ON, BUT THE STATUS IS OFF	X	10 MIN.
RETURN FAN IN HAND	COMMANDED OFF, BUT THE STATUS IS ON	X	10 MIN.
RETURN FAN RUNTIME EXCEEDED	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)	X	10 MIN.
PRE-FILTER 1 CHANGE REQUIRED	PRE-FILTER 1 HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
PRE-FILTER 2 CHANGE REQUIRED	PRE-FILTER 2 HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
AFTER FILTER CHANGE REQUIRED	AFTER FILTER HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
PRE-FILTER 1 MISSING	PRE-FILTER 1 D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR
PRE-FILTER 2 MISSING	PRE-FILTER 2 D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR
AFTER FILTER MISSING	AFTER FILTER D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR
HIGH BUILDING STATIC PRESSURE	IF THE BUILDING STATIC PRESSURE IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW BUILDING STATIC PRESSURE	IF THE BUILDING STATIC PRESSURE IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET M-701 FOR APPLICABLE SETPOINTS.
3. SEE EQUIPMENT SCHEDULES FOR SETPOINT VALUES.

SEQUENCE OF OPERATIONS
VARIABLE AIR VOLUME AIR HANDLING UNIT (26-AHU-5)

GENERAL DESCRIPTION
The variable air volume (VAV) air handling unit (26-AHU-5) described by this sequence of operations consists of the following features. These features include a variable speed supply fan array, variable speed return/relief fan array, hot water preheating coil, humidifier, and chilled water cooling coil that operate with zone level variable air volume terminal units to provide heating, ventilation, air-conditioning, and humidification for the conditioned space as shown on the drawings.

OPERATING MODES

SYSTEM START UP MODE
The AHU shall be in system start up mode for after the unit has been enabled. The AHU will automatically reset to Occupied Mode after a user definable amount of time.

MORNING WARM UP MODE
The AHU shall be in morning warm up mode prior to the occupied hours of operation per the project design conditions schedule shown on the control drawings AND when there is a call for heating. The start time shall automatically adjust based on the outside air temperature and the zone temperature setpoints.

MORNING COOL DOWN MODE
The AHU shall be in morning cool down mode prior to the occupied hours of operation per the project design conditions schedule shown on the control drawings AND when there is a call for cooling. The start time shall automatically adjust based on the outside air temperature and the zone temperature setpoints.

OCCUPIED MODE
The AHU shall be in occupied mode per the project design conditions schedule shown on the control drawings.

UNOCCUPIED MODE
The AHU shall be in unoccupied mode for all periods not included in the occupied hours of operation per the project design conditions schedule shown on the control drawings. Overrides of unoccupied schedule shall be defined by zone level controls.

ECONOMIZER MODE – OUTSIDE AIR TEMPERATURE ENABLED
The unit shall be in economizer mode when:
The supply fan status is on;
AND the AHU is not in freeze protection mode;
AND the outside air temperature is less than 65°F (adj.);
AND the outside air temperature is less than the return air temperature;
AND there is a call for cooling.

FREEZE PROTECTION MODE – LEVEL 1
The unit shall be in freeze protection mode – level 1 when the level 1 low limit temperature controller senses a mixed air temperature of 42°F (adj.) or less. The unit shall automatically reset when the mixed air temperature is above 43°F (adj.).

FREEZE PROTECTION MODE – LEVEL 2
The unit shall be in freeze protection mode – level 2 when the level 2 low limit temperature controller senses a mixed air temperature of 35°F (adj.) or less. Freeze Protection Mode – Level 2 shall be disabled by manual reset.

CONTROL SETPOINT RESETS

SUPPLY AIR STATIC PRESSURE RESET – TRIM AND RESPOND
Supply air static pressure setpoint shall be reset using the trim and respond logic within the range of 0.5 in. w.g. to the static pressure setpoint determined during balancing. The control system shall monitor the zone level VAV box damper position to determine a pressure request, which is defined as any zone actuator at greater than 90% open.
Trim and Respond Logic: When the fan is OFF, the setpoint shall be reset to the default value. While the fan is proven ON, every 2 minutes, decrease the setpoint by 0.04 in. w.g. (adj.) if there is one (adj.) or less zone pressure request. If there is more than one (adj.) zone pressure request, every 2 minutes, increase the setpoint by 0.03 in. w.g. (adj.) times the number of pressure requests, but no more than 0.12 in. w.g.

SAFETIES, OVERRIDES, AND INTERLOCKS

SMOKE DETECTOR INTERLOCK
The unit shall be disabled via hard wired interlock at the fan start circuit on activation of a system smoke detector.

FIRE ALARM CONTROL PANEL INTERLOCK
The unit shall be disabled via hard wired interlock at the fan start circuit upon receipt of signal from fire alarm control panel.

SMOKE DAMPER INTERLOCK
Associated system smoke dampers shall be closed via hard wired interlock whenever the supply fan is off.

SUPPLY FAN INTERLOCK
Relief/Return fans shall be interlocked to be OFF with the associated unit supply fan.

HIGH SUPPLY AIR STATIC PRESSURE INTERLOCK
The unit shall be disabled via hard wired interlock at the supply fan start circuit upon activation of duct high pressure controller.

LOW RETURN AIR STATIC PRESSURE INTERLOCK
The unit shall be disabled via hard wired interlock at the return fan start circuit upon activation of duct low pressure controller.

FREEZE PROTECTION MODE – LEVEL 1 INTERLOCK
The supply fan shall be enabled by via hard wired interlock at the supply fan start circuit from the level 1 low limit temperature controller.

FREEZE PROTECTION MODE – LEVEL 2 INTERLOCK
The supply fan shall be disabled by via hard wired interlock at the supply fan start circuit from the level 2 low limit temperature controller.

CONTROL SYSTEM INTERLOCK
Control power shall be removed from actuators when the associated system turns off.

COMPONENT CONTROLS

SUPPLY PLENUM FAN ARRAY CONTROL – MULTIDRIVE VFD

SYSTEM START UP MODE
The fan(s) shall energize and slowly ramp to the initial minimum fan speed determined during system startup.

MORNING WARM UP MODE
The fan(s) shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The fan(s) shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall measure duct static pressure and modulate the fan(s) VFD speed to maintain the duct static pressure setpoint. The minimum fan speed setting shall be established during balancing.

UNOCCUPIED MODE (*USER SELECTION*)
The fan(s) shall operate as if in Occupied Mode.
OR
The fan(s) shall be OFF.

ECONOMIZER MODE – OUTSIDE AIR TEMPERATURE ENABLED
The fan(s) shall operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 1
The fan(s) shall be ON and operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 2
The fan(s) shall be OFF.

EXHAUST FAN ARRAY CONTROL– BUILDING PRESSURE

SYSTEM START UP MODE
The fan(s) shall energize and slowly ramp to the initial minimum fan speed determined during system startup.

MORNING WARM UP MODE
The fan(s) shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The fan(s) shall operate as if in Occupied Mode.

OCCUPIED MODE
The fan(s) shall be ON whenever the associated air handling unit supply fan(s) is ON.
The controller shall measure building static pressure and modulate the fan(s) VFD speed to maintain the building static pressure setpoint.

UNOCCUPIED MODE (*USER SELECTION*)
The fan(s) shall operate as if in Occupied Mode.
OR
The fan(s) shall be OFF.

ECONOMIZER MODE – OUTSIDE AIR TEMPERATURE ENABLED
The fan(s) shall operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 1
The fan(s) shall be ON and operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 2
The fan(s) shall be OFF.

MIXED AIR DAMPERS WITH ECONOMIZER

SYSTEM START UP MODE
If the outside air temperature is below 42°F (adj.), the MOA damper shall be CLOSED, the RA damper shall be OPEN, and the economizer damper shall be CLOSED. After the supply fan has reached minimum fan speed, the MOA damper shall slowly open until fully OPEN. The MOA, RA, and economizer dampers will operate as if in Occupied Mode when the mixed air temperature is above 43°F (adj.). If the outside air temperature is above 43°F (adj.), the MOA, RA, and economizer dampers shall operate as if in Occupied Mode.

MORNING WARM UP MODE
The MOA, RA, and economizer dampers shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The MOA, RA, and economizer dampers shall operate as if in Occupied Mode.

OCCUPIED MODE
The MOA damper shall be fully OPEN, the RA damper shall be OPEN, and the economizer damper shall be CLOSED.
MOA Active Control: The MOA damper shall be OPEN, and the RA damper shall modulate to satisfy the minimum outside airflow setpoint as indicated by the minimum outside airflow measuring station.

UNOCCUPIED MODE (*USER SELECTION*)
The MOA, RA, and economizer dampers shall operate as if in Occupied Mode.
OR
The MOA damper shall be CLOSED, the RA damper shall be fully OPEN, and the economizer damper shall be CLOSED.

ECONOMIZER MODE – OUTSIDE AIR TEMPERATURE ENABLED
The MOA damper shall be fully OPEN. The RA and economizer dampers shall modulate in opposing directions to maintain the mixed air temperature setpoint.

FREEZE PROTECTION MODE – LEVEL 1
The MOA damper shall be CLOSED, the RA damper shall be fully OPEN, and the economizer damper shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 2
The MOA damper shall be CLOSED, the RA damper shall be fully OPEN, and the economizer damper shall be CLOSED.

RELIEF/EXHAUST AIR DAMPERS

SYSTEM START UP MODE
The relief/exhaust air damper shall operate as if in Occupied Mode.

MORNING WARM UP MODE
The relief/exhaust air damper shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The relief/exhaust air damper shall operate as if in Occupied Mode.

OCCUPIED MODE
The relief/exhaust air damper is enabled and shall operate subject to the building pressure controller to maintain the building pressure setpoint.
When the return plenum fan array is ON, the relief/exhaust air damper shall be OPEN.
When the return plenum fan array is OFF, the relief/exhaust air damper shall modulate to maintain the building pressure setpoint.

UNOCCUPIED MODE (*USER SELECTION*)
The relief/exhaust air damper shall operate as if in Occupied Mode.
OR
The relief/exhaust air damper shall be CLOSED.

ECONOMIZER MODE – OUTSIDE AIR TEMPERATURE ENABLED
The relief/exhaust air damper shall operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 1
The relief/exhaust air damper shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 2
The relief/exhaust air damper shall be CLOSED.

PREHEAT COIL – HOT WATER VALVE – MODULATING

SYSTEM START UP MODE
If the outside air temperature is below 42°F (adj.), the hot water coil valve shall be fully OPEN. The hot water coil valve will operate as if in Occupied Mode when the mixed air temperature is above 43°F (adj.).
If the outside air temperature is above 43°F (adj.), the hot water coil valve shall operate as if in Occupied Mode.

MORNING WARM UP MODE
The hot water coil valve shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The hot water coil valve shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall modulate hot water valve to maintain the heating coil leaving air temperature setpoint.

UNOCCUPIED MODE (*USER SELECTION*)
The hot water coil valve shall operate as if in Occupied Mode.
OR
The hot water coil valve shall be CLOSED.

ECONOMIZER MODE – OUTSIDE AIR TEMPERATURE ENABLED
The hot water coil valve shall operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 1
The hot water coil valve shall be fully OPEN.

FREEZE PROTECTION MODE – LEVEL 2
The hot water coil valve shall be fully OPEN.

COOLING COIL – CHILLED WATER VALVE – MODULATING

SYSTEM START UP MODE
If the outside air temperature is below 42°F (adj.), the chilled water coil valve shall be fully OPEN. The chilled water coil valve will operate as if in Occupied Mode when the mixed air temperature is above 43°F (adj.).
If the outside air temperature is above 43°F (adj.), the chilled water coil valve shall operate as if in Occupied Mode.

MORNING WARM UP MODE
The chilled water coil valve shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The chilled water coil valve shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall modulate chilled water valve to maintain the cooling coil leaving air temperature setpoint.

UNOCCUPIED MODE (*USER SELECTION*)
The chilled water coil valve shall operate as if in Occupied Mode.
OR
The chilled water coil valve shall be CLOSED.

ECONOMIZER MODE – OUTSIDE AIR TEMPERATURE ENABLED
The chilled water coil valve shall operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 1
The chilled water coil valve shall be fully OPEN.

FREEZE PROTECTION MODE – LEVEL 2
The chilled water coil valve shall be fully OPEN.

FILTER MONITORING – HOURS
ALL MODES
The controller shall monitor the fan runtime to provide a maintenance reminder at 50% of filter elapsed time (1100 hours) and an alarm at 100% elapsed time (2200 hours)

HUMIDIFIER

SYSTEM START UP MODE
The humidifier shall be OFF.

MORNING WARM UP MODE
The humidifier shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The humidifier shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall measure the return air humidity and modulate the humidifier to maintain a setpoint of 50% RH (adj.). The humidifier shall be enabled whenever the supply fan status is ON.
The humidifier shall be OFF whenever the supply air humidity rises from 90% RH to 95% RH (adj.) or on loss of supply fan status.
Humidity Reset Schedule: The return air humidity setpoint shall be reset subject to the outdoor ambient temperature. The initial reset schedule shall be user adjustable and set for 30% RH at 30°F and above and 20% RH at 20°F and below.

UNOCCUPIED MODE (*USER SELECTION*)
The humidifier shall operate as if in Occupied Mode.
OR
The humidifier shall be OFF.

ECONOMIZER MODE – OUTSIDE AIR TEMPERATURE ENABLED
The humidifier shall operate as if in Occupied Mode.
When the humidifier energy demand exceeds the mechanical energy saved by the economizer, then the economizer shall be OFF and mechanical cooling shall be used to maintain the humidity low limit setpoint.

FREEZE PROTECTION MODE – LEVEL 1
The humidifier shall be OFF.

FREEZE PROTECTION MODE – LEVEL 2
The humidifier shall be OFF.

1 VARIABLE AIR VOLUME AIR HANDLING UNIT (26-AHU-5) CONTROL DIAGRAM
NOT TO SCALE

FULLY SPRINKLERED
100% BID SET

NO.	REVISION DESCRIPTION	DATE

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ROSS MYLES OPENSHAW 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL CONTROLS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **M-702**

Drawing # 150 OF 190

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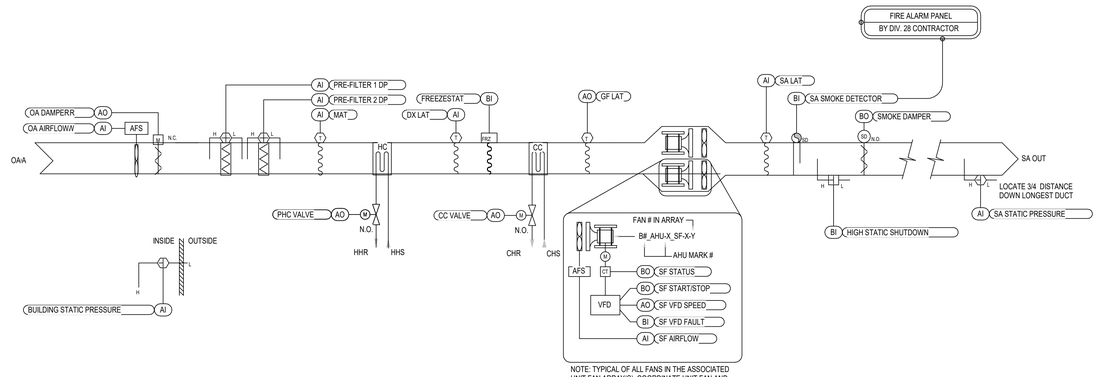


NOTE: TYPICAL OF ALL FANS IN THE ASSOCIATED UNIT FAN ARRAY(S). COORDINATE UNIT FAN AND VFD QUANTITIES WITH THE AIR HANDLING UNIT SCHEDULE INFORMATION.

POINTS LIST SCHEDULE - VARIABLE AIR VOLUME AIR HANDLING UNIT (AHU-X)

POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS SETPOINT	AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
OUTSIDE AIR												
OA TEMPERATURE	X									X		
OA DAMPER		X								X		X
OA AIRFLOW	X									X		X
PRE-FILTER 1 DIFFERENTIAL PRESSURE	X									X	X	X
PRE-FILTER 2 DIFFERENTIAL PRESSURE	X									X	X	X
PRE-HEAT COIL												
PHC VALVE		X								X		X
PHC LAT	X									X		X
FREEZESTAT			X							X	X	X
HUMIDIFIER												
HUMIDIFIER		X								X		X
HUMIDIFIER ENABLE				X						X		X
COOLING COIL												
CC VALVE		X								X		X
CC LAT	X									X		X
SUPPLY AIR												
SF AIRFLOW	X									X		X
SF STATUS			X							X		X
SF START/STOP				X						X		X
SF VFD FAULT			X								X	X
SF VFD SPEED		X								X		X
AFTER FILTER DIFFERENTIAL PRESSURE	X									X	X	X
SA LAT	X									X		X
SA HUMIDITY	X									X	X	X
SA SMOKE DETECTOR			X							X	X	X
HIGH STATIC SHUTDOWN			X							X		X
SA SMOKE DAMPER				X						X		X
SA STATIC PRESSURE	X									X		X
SETPOINTS												
EMERGENCY SHUTDOWN					N/A		X			X	X	
PHC LAT SETPOINT					NOTE 3	X				X		
CC LAT SETPOINT					NOTE 3	X				X		
SA LAT SETPOINT					55°F	X				X		
SA STATIC PRESSURE SETPOINT					NOTE 3	X				X		
SA HUMIDITY SETPOINT					NOTE 3	X				X		

ALARM	DESCRIPTION	ALARM	ALARM...
HIGH PHC LEAVING AIR TEMPERATURE	IF THE PHC LEAVING AIR TEMPERATURE IS GREATER THAN 90° F (ADJ.)	X	10 MIN.
LOW PHC LEAVING AIR TEMPERATURE	IF THE PHC LEAVING AIR TEMPERATURE IS LESS THAN 45 F (ADJ.)	X	10 MIN.
HIGH SUPPLY AIR TEMPERATURE	IF THE SUPPLY AIR TEMPERATURE IS 5 F GREATER THAN ITS SETPOINT (ADJ.)	X	10 MIN.
LOW SUPPLY AIR TEMPERATURE	IF THE SUPPLY AIR TEMPERATURE IS 5 F LESS THAN ITS SETPOINT (ADJ.)	X	10 MIN.
HIGH SUPPLY AIR HUMIDITY	IF THE SUPPLY AIR HUMIDITY IS GREATER THAN 90% (ADJ.)	X	5 MIN.
LOW SUPPLY AIR HUMIDITY	IF THE SUPPLY AIR HUMIDITY IS LESS THAN 30% (ADJ.)	X	5 MIN.
HIGH SUPPLY AIR STATIC PRESSURE	IF THE SUPPLY AIR STATIC PRESSURE IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW SUPPLY AIR STATIC PRESSURE	IF THE SUPPLY AIR STATIC PRESSURE IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.
SUPPLY FAN FAILURE	COMMANDED ON, BUT THE STATUS IS OFF	X	10 MIN.
SUPPLY FAN IN HAND	COMMANDED OFF, BUT THE STATUS IS ON	X	10 MIN.
SUPPLY FAN RUNTIME EXCEEDED	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)	X	10 MIN.
PRE-FILTER 1 CHANGE REQUIRED	PRE-FILTER 1 HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
PRE-FILTER 2 CHANGE REQUIRED	PRE-FILTER 2 HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
AFTER FILTER CHANGE REQUIRED	AFTER FILTER HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
PRE-FILTER 1 MISSING	PRE-FILTER 1 D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR
PRE-FILTER 2 MISSING	PRE-FILTER 2 D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR
AFTER FILTER MISSING	AFTER FILTER D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET XX-M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET XX-M-701 FOR APPLICABLE SETPOINTS.
3. SEE EQUIPMENT SCHEDULES FOR SETPOINT VALUES.

POINTS LIST SCHEDULE - SHELL & TUBE HEAT EXCHANGER (HX-X)

POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
STEAM SIDE											
HX-4 - STEAM VALVE 1/3		X									X
HX-4 - STEAM VALVE 2/3		X									X
HX-5 - STEAM VALVE 1/3		X									X
HX-5 - STEAM VALVE 2/3		X									X
WATER SIDE											
HWS TEMPERATURE	X								X	X	X
HWR TEMPERATURE	X								X		X
SETPOINTS											
OUTSIDE AIR TEMPERATURE					X						X
HWS TEMPERATURE SETPOINT					X						X
HWR TEMPERATURE SETPOINT					X						X

ALARMS	DESCRIPTION	ALARM	ALARM DELAY
HIGH HWS TEMPERATURE	IF THE HWS TEMPERATURE IS 20°F (ADJ.) GREATER THAN THE SETPOINT.	X	10 MIN.
LOW HWS TEMPERATURE	IF THE HWS TEMPERATURE IS 20°F (ADJ.) LESS THAN THE SETPOINT.	X	10 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.

SEQUENCE OF OPERATIONS
DEDICATED OUTSIDE AIR SYSTEM (DOAS-1)

GENERAL DESCRIPTION
The 100% OA DOAS described by this sequence of operations consists of the following features. These features include a variable speed supply fan array, hot water preheating coil, and chilled water cooling coil that operate to provide heating, ventilation, and air-conditioning for the conditioned space as shown on the drawings.

OPERATING MODES

SYSTEM START UP MODE
The DOAS shall be in system start up mode for after the unit has been enabled. The DOAS will automatically reset to Occupied Mode after a user definable amount of time.

MORNING WARM UP MODE
The DOAS shall be in morning warm up mode prior to the occupied hours of operation per the project design conditions schedule shown on the control drawings AND when there is a call for heating. The start time shall automatically adjust based on the outside air temperature and the zone temperature setpoints.

MORNING COOL DOWN MODE
The DOAS shall be in morning cool down mode prior to the occupied hours of operation per the project design conditions schedule shown on the control drawings AND when there is a call for cooling. The start time shall automatically adjust based on the outside air temperature and the zone temperature setpoints.

OCCUPIED MODE
The DOAS shall be in occupied mode per the project design conditions schedule shown on the control drawings.

UNOCCUPIED MODE
The DOAS shall be in unoccupied mode for all periods not included in the occupied hours of operation per the project design conditions schedule shown on the control drawings. Overrides of unoccupied schedule shall be defined by zone level controls.

FREEZE PROTECTION MODE – LEVEL 1
The unit shall be in freeze protection mode – level 1 when the level 1 low limit temperature controller senses a preheat coil leaving air temperature of 42°F (adj.) or less.
The unit shall automatically reset when the mixed air temperature is above 43°F (adj.).

FREEZE PROTECTION MODE – LEVEL 2
The unit shall be in freeze protection mode – level 2 when the level 2 low limit temperature controller senses a preheat coil leaving air temperature of 35°F (adj.) or less.
Freeze Protection Mode – Level 2 shall be disabled by manual reset.

CONTROL SETPOINT RESETS

SUPPLY AIR STATIC PRESSURE RESET – TRIM AND RESPOND
Supply air static pressure setpoint shall be reset using the trim and respond logic within the range of 0.5 in. w.g. to the static pressure setpoint determined during balancing. The control system shall monitor the zone level VAV box damper position to determine a pressure request, which is defined as any zone actuator at greater than 90% open.
Trim and Respond Logic: When the fan is OFF, the setpoint shall be reset to the default value. While the fan is proven ON, every 2 minutes, decrease the setpoint by 0.04 in. w.g. (adj.) if there is one (adj.) or less zone pressure request. If there is more than one (adj.) zone pressure request, every 2 minutes, increase the setpoint by 0.03 in. w.g. (adj.) times the number of pressure requests, but no more than 0.12 in. w.g.

SAFETIES, OVERRIDES, AND INTERLOCKS

SMOKE DETECTOR INTERLOCK
The unit shall be disabled via hard wired interlock at the fan start circuit on activation of a system smoke detector.

FIRE ALARM CONTROL PANEL INTERLOCK
The unit shall be disabled via hard wired interlock at the fan start circuit upon receipt of signal from fire alarm control panel.

SMOKE DAMPER INTERLOCK
Associated system smoke dampers shall be closed via hard wired interlock whenever the supply fan is off.

HIGH SUPPLY AIR STATIC PRESSURE INTERLOCK
The unit shall be disabled via hard wired interlock at the supply fan start circuit upon activation of duct high pressure controller.

FREEZE PROTECTION MODE – LEVEL 1 INTERLOCK
The supply fan shall be enabled by via hard wired interlock at the supply fan start circuit from the level 1 low limit temperature controller.

FREEZE PROTECTION MODE – LEVEL 2 INTERLOCK
The supply fan shall be disabled by via hard wired interlock at the supply fan start circuit from the level 2 low limit temperature controller.

CONTROL SYSTEM INTERLOCK
Control power shall be removed from actuators when the associated system turns off.

COMPONENT CONTROLS

SUPPLY PLENUM FAN ARRAY CONTROL – MULTIDRIVE VFD

SYSTEM START UP MODE
The fan(s) shall energize and slowly ramp to the initial minimum fan speed determined during system startup.

MORNING WARM UP MODE
The fan(s) shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The fan(s) shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall measure duct static pressure and modulate the fan(s) VFD speed to maintain the duct static pressure setpoint. The minimum fan speed setting shall be established during balancing.

UNOCCUPIED MODE *(USER SELECTION)*
The fan(s) shall operate as if in Occupied Mode.
OR
The fan(s) shall be OFF.

FREEZE PROTECTION MODE – LEVEL 1
The fan(s) shall be ON and operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 2
The fan(s) shall be OFF.

OUTSIDE AIR DAMPER

MORNING WARM UP MODE
The OA damper shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The OA damper shall operate as if in Occupied Mode.

OCCUPIED MODE
The OA damper shall be fully OPEN.

UNOCCUPIED MODE *(USER SELECTION)*
The OA damper shall operate as if in Occupied Mode.
OR
The OA damper shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 1
The OA damper shall operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 2
The OA damper shall be CLOSED.

PREHEAT COIL – HOT WATER VALVE – MODULATING

SYSTEM START UP MODE
If the outside air temperature is below 42°F (adj.), the hot water coil valve shall be fully OPEN. The hot water coil valve will operate as if in Occupied Mode when the mixed air temperature is above 43°F (adj.).
If the outside air temperature is above 43°F (adj.), the hot water coil valve shall operate as if in Occupied Mode.

MORNING WARM UP MODE
The hot water coil valve shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The hot water coil valve shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall modulate hot water valve to maintain the heating coil leaving air temperature setpoint.

UNOCCUPIED MODE *(USER SELECTION)*
The hot water coil valve shall operate as if in Occupied Mode.
OR
The hot water coil valve shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 1
The hot water coil valve shall be fully OPEN.

FREEZE PROTECTION MODE – LEVEL 2
The hot water coil valve shall be fully OPEN.

COOLING COIL – CHILLED WATER VALVE – MODULATING

SYSTEM START UP MODE
If the outside air temperature is below 42°F (adj.), the chilled water coil valve shall be fully OPEN. The chilled water coil valve will operate as if in Occupied Mode when the mixed air temperature is above 43°F (adj.).
If the outside air temperature is above 43°F (adj.), the chilled water coil valve shall operate as if in Occupied Mode.

MORNING WARM UP MODE
The chilled water coil valve shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The chilled water coil valve shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall modulate chilled water valve to maintain the cooling coil leaving air temperature setpoint.

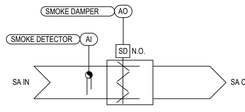
UNOCCUPIED MODE *(USER SELECTION)*
The chilled water coil valve shall operate as if in Occupied Mode.
OR
The chilled water coil valve shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 1
The chilled water coil valve shall be fully OPEN.

FREEZE PROTECTION MODE – LEVEL 2
The chilled water coil valve shall be fully OPEN.

FILTER MONITORING – HOURS
ALL MODES
The controller shall monitor the fan runtime to provide a maintenance reminder at 50% of filter elapsed time (1100 hours) and an alarm at 100% elapsed time (2200 hours)

3 DEDICATED OUTSIDE AIR UNIT (DOAS-2) CONTROL DIAGRAM
NOT TO SCALE



SEQUENCE OF OPERATIONS
SMOKE DAMPER (SD-X)

SMOKE DETECTION:
Upon detection of smoke by the smoke detector, the smoke damper shall close and send an alarm to the fire alarm control panel.

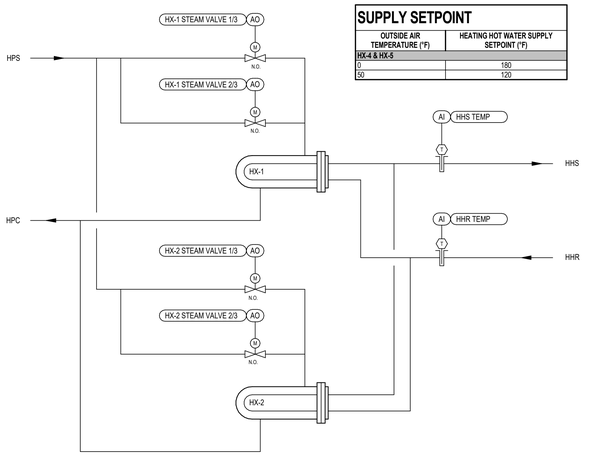
POINTS LIST SCHEDULE (SD-X)

POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
SD (SD-X)											
ACTUATOR POSITION		X							X		X
MISCELLANEOUS											
SMOKE DETECTION	X								X		X

ALARMS	DESCRIPTION	ALARM	ALARM DELAY
SMOKE DETECTION	SMOKE DETECTION.	X	10 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET M-701 FOR APPLICABLE SETPOINTS.

2 SMOKE DAMPER (SD-X) TYPICAL CONTROL DIAGRAM
NOT TO SCALE



SUPPLY SETPOINT

OUTSIDE AIR TEMPERATURE (°F)	HEATING HOT WATER SUPPLY SETPOINT (°F)
HX-4 & HX-5	
0	180
50	120

SEQUENCE OF OPERATIONS
STEAM TO HOT WATER SHELL & TUBE HEAT EXCHANGER (HX-4 & HX-5)

GENERAL DESCRIPTION
The steam to hot water shell and tube heat exchanger is used to heat water for the heating hot water system and its components as shown on the drawings.

OPERATING MODES

NORMAL OPERATING MODE
The heat exchanger shall be in normal operating mode at all times unless overridden by the other mode outlined in this sequence.

STANDBY MODE
Standby mode shall be activated upon failure of the lead heat exchanger. Standby mode shall be disabled by manual reset.

FREEZE PROTECTION MODE
The heat exchanger shall be in freeze protection mode when the outside air temperature is less than 38°F (adj.).

COMPONENT CONTROLS

HEAT EXCHANGER 1

NORMAL OPERATING MODE

HEAT EXCHANGER
The heat exchanger shall be enabled to run whenever a definable number of hot water coils need heating and outside air temperature is less than 65°F (adj.). To prevent short cycling, the heat exchanger shall run for and be off for minimum adjustable times (both user definable).

STEAM VALVE (1/3)
The steam valve shall be enabled whenever the heat exchanger is called to run AND heating hot water supply temperature is below its setpoint. (1/3) valve shall close when capacity is exceeded and (2/3) valve shall open. When (2/3) valve capacity is exceeded, (1/3) shall reopen and modulate to maintain heating hot water setpoint.

STEAM VALVE (2/3)
The steam valve shall be enabled whenever the heat exchanger is called to run AND heating hot water supply temperature is below its setpoint AND steam valve (1/3) capacity has been exceeded. The valve shall modulate to maintain the heating hot water setpoint.

STANDBY MODE

HEAT EXCHANGER
The heat exchanger shall be disabled.

STEAM VALVE (1/3)
The steam valve shall be closed.

STEAM VALVE (2/3)
The steam valve shall be closed.

FREEZE PROTECTION MODE

HEAT EXCHANGER
The heat exchanger shall be enabled to run.

STEAM VALVE (1/3)
The steam valve shall be open to 100%. The steam valve shall be closed whenever the heating hot water supply rises 20°F (adj.) above its setpoint.

STEAM VALVE (2/3)
The steam valve shall be open to 100%. The steam valve shall be closed whenever the heating hot water supply rises 20°F (adj.) above its setpoint..

HEAT EXCHANGER 2

NORMAL OPERATING MODE

HEAT EXCHANGER
The heat exchanger shall be disabled.

STEAM VALVE (1/3)
The steam valve shall be closed.

STEAM VALVE (2/3)
The steam valve shall be closed.

STANDBY MODE

HEAT EXCHANGER
Upon failure of the lead heat exchanger, the standby heat exchanger shall be activated and shall operate as the lead heat exchanger until manually reset to normal operating mode.

STEAM VALVE (1/3)
Upon failure of the lead heat exchanger, the standby heat exchanger shall be activated and shall operate as the lead heat exchanger until manually reset to normal operating mode.

STEAM VALVE (2/3)
Upon failure of the lead heat exchanger, the standby heat exchanger shall be activated and shall operate as the lead heat exchanger until manually reset to normal operating mode.

FREEZE PROTECTION MODE

HEAT EXCHANGER
The heat exchanger shall be enabled to run.

STEAM VALVE (1/3)
The steam valve shall be open to 100%. The steam valve shall be closed whenever the heating hot water supply rises 20°F (adj.) above its setpoint.

STEAM VALVE (2/3)
The steam valve shall be open to 100%. The steam valve shall be closed whenever the heating hot water supply rises 20°F (adj.) above its setpoint.

1 HEATING HOT WATER HEAT EXCHANGER (HX-4 & HX-5) TYPICAL CONTROL DIAGRAM
NOT TO SCALE

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

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ROSS MYLES JORGENSEN 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL CONTROLS

VA Health Care System Approval:

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CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
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Building Number **26**

Drawing Number **M-703**

Drawing # 151 OF 190

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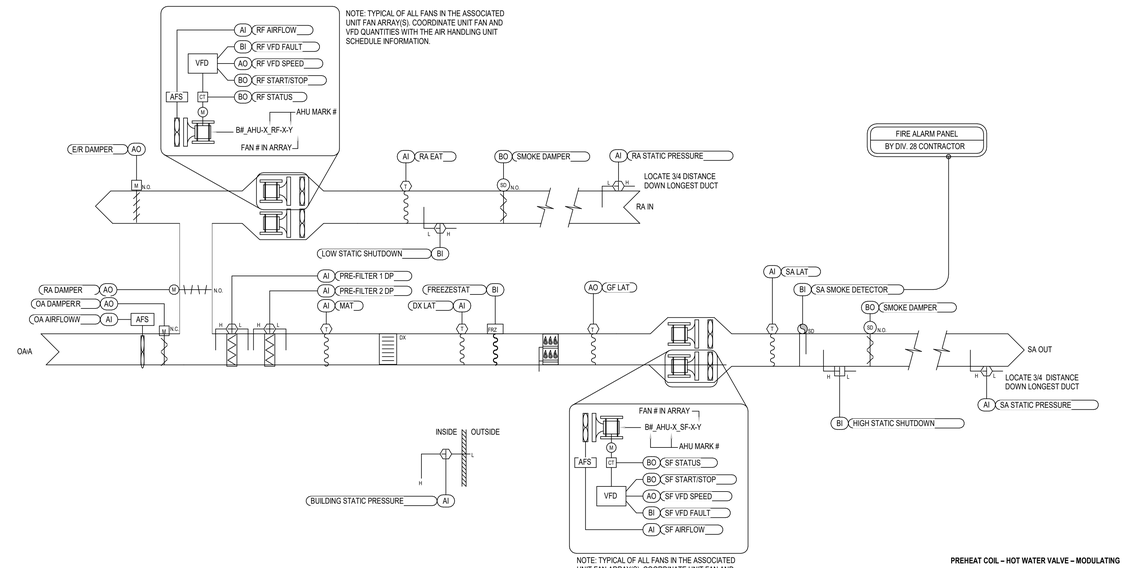


NOTE: TYPICAL OF ALL FANS IN THE ASSOCIATED UNIT FAN ARRAY(S). COORDINATE UNIT FAN AND VFD QUANTITIES WITH THE AIR HANDLING UNIT SCHEDULE INFORMATION.

NOTE: TYPICAL OF ALL FANS IN THE ASSOCIATED UNIT FAN ARRAY(S). COORDINATE UNIT FAN AND VFD QUANTITIES WITH THE AIR HANDLING UNIT SCHEDULE INFORMATION.

POINTS LIST SCHEDULE - ROOFTOP AIR HANDLING UNIT (26-RTU-1)

POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS SETPOINT	AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
OUTSIDE AIR												
OA TEMPERATURE	X									X		
OA ENTHALPY	X											
MIXED AIR												
PRE-FILTER 1 DIFFERENTIAL PRESSURE	X									X	X	X
PRE-FILTER 2 DIFFERENTIAL PRESSURE	X									X	X	X
MIXED AIR TEMPERATURE	X									X		X
PRE-HEAT COIL												
PHC VALVE		X								X		X
PHC LAT	X									X		X
FREEZESTAT			X							X	X	X
COOLING COIL												
CC VALVE		X								X		X
CC LAT	X									X		X
SUPPLY AIR												
SF AIRFLOW	X									X		X
SF STATUS			X							X		X
SF START/STOP				X						X		X
SF VFD FAULT			X								X	X
SF VFD SPEED		X								X		X
AFTER FILTER DIFFERENTIAL PRESSURE	X									X	X	X
SA LAT	X									X		X
SA HUMIDITY	X									X	X	X
SA SMOKE DETECTOR			X							X	X	X
HIGH STATIC SHUTDOWN			X							X		X
SA SMOKE DAMPER				X						X		X
SA STATIC PRESSURE	X									X		X
RETURN AIR												
RF AIRFLOW	X									X		X
RF STATUS			X							X		X
RF START/STOP				X						X		X
RF VFD FAULT			X								X	X
RF VFD SPEED		X								X		X
RA EAT	X									X		X
LOW STATIC SHUTDOWN			X							X	X	X
RA SMOKE DAMPER		X								X		X
RA STATIC PRESSURE	X									X		X
RA DAMPER		X								X		X
RELIEF/EXHAUST												
E/R DAMPER		X								X		X
MISCELLANEOUS												
BUILDING STATIC PRESSURE	X									X		X
SETPOINTS												
EMERGENCY SHUTDOWN					N/A		X			X	X	
BUILDING DIFFERENTIAL PRESSURE SETPOINT					.03 IN WG					X		
PHC LAT SETPOINT					NOTE 3	X				X		
CC LAT SETPOINT					NOTE 3	X				X		
RA STATIC PRESSURE SETPOINT					NOTE 3	X				X		
SA LAT SETPOINT					55°F	X				X		
SA STATIC PRESSURE SETPOINT					NOTE 3	X				X		

ALARM	DESCRIPTION	ALARM	ALARM...
HIGH MIXED AIR TEMPERATURE	IF THE MIXED AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.)	X	10 MIN.
LOW MIXED AIR TEMPERATURE	IF THE MIXED AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)	X	10 MIN.
HIGH SUPPLY AIR TEMPERATURE	IF THE SUPPLY AIR TEMPERATURE IS 5°F GREATER THAN ITS SETPOINT (ADJ.)	X	10 MIN.
LOW SUPPLY AIR TEMPERATURE	IF THE SUPPLY AIR TEMPERATURE IS 5°F LESS THAN ITS SETPOINT (ADJ.)	X	10 MIN.
HIGH RETURN AIR TEMPERATURE	IF THE RETURN AIR TEMPERATURE IS GREATER THAN 90°F (ADJ.)	X	10 MIN.
LOW RETURN AIR TEMPERATURE	IF THE RETURN AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)	X	10 MIN.
HIGH SUPPLY AIR STATIC PRESSURE	IF THE SUPPLY AIR STATIC PRESSURE IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW SUPPLY AIR STATIC PRESSURE	IF THE SUPPLY AIR STATIC PRESSURE IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.
HIGH RETURN AIR STATIC PRESSURE	IF THE RETURN AIR STATIC PRESSURE IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW RETURN AIR STATIC PRESSURE	IF THE RETURN AIR STATIC PRESSURE IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.
SUPPLY FAN FAILURE	COMMANDED ON, BUT THE STATUS IS OFF	X	10 MIN.
SUPPLY FAN IN HAND	COMMANDED OFF, BUT THE STATUS IS ON	X	10 MIN.
SUPPLY FAN RUNTIME EXCEEDED	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)	X	10 MIN.
RETURN FAN FAILURE	COMMANDED ON, BUT THE STATUS IS OFF	X	10 MIN.
RETURN FAN IN HAND	COMMANDED OFF, BUT THE STATUS IS ON	X	10 MIN.
RETURN FAN RUNTIME EXCEEDED	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.)	X	10 MIN.
PRE-FILTER 1 CHANGE REQUIRED	PRE-FILTER 1 HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
PRE-FILTER 2 CHANGE REQUIRED	PRE-FILTER 2 HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
AFTER FILTER CHANGE REQUIRED	AFTER FILTER HAS BEEN IN USE FOR MORE THAN 2200 HOURS (ADJ.) OR THE FILTER D.P. EXCEEDED ITS LIMIT.	X	1 HOUR
PRE-FILTER 1 MISSING	PRE-FILTER 1 D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR
PRE-FILTER 2 MISSING	PRE-FILTER 2 D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR
AFTER FILTER MISSING	AFTER FILTER D.P. LOWER THAN ITS NEW FILTER LIMIT.	X	1 HOUR
HIGH BUILDING STATIC PRESSURE	IF THE BUILDING STATIC PRESSURE IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW BUILDING STATIC PRESSURE	IF THE BUILDING STATIC PRESSURE IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET M-701 FOR APPLICABLE SETPOINTS.
3. SEE EQUIPMENT SCHEDULES FOR SETPOINT VALUES.

SEQUENCE OF OPERATIONS
ROOFTOP UNIT (RTU-1)

GENERAL DESCRIPTION
The rooftop unit (RTU) described by this sequence of operations consists of the following features. These features include a variable speed supply fan array, variable speed return/relief fan array, hot water preheating coil, and chilled water cooling coil that operate with zone level variable air volume terminal units to provide heating, ventilation, air-conditioning, and humidification for the conditioned space as shown on the drawings.

OPERATING MODES

SYSTEM START UP MODE
The RTU shall be in system start up mode for after the unit has been enabled. The RTU will automatically reset to Occupied Mode after a user definable amount of time.

MORNING WARM UP MODE
The RTU shall be in morning warm up mode prior to the occupied hours of operation per the project design conditions schedule shown on the control drawings AND when there is a call for heating. The start time shall automatically adjust based on the outside air temperature and the zone temperature setpoints.

MORNING COOL DOWN MODE
The RTU shall be in morning cool down mode prior to the occupied hours of operation per the project design conditions schedule shown on the control drawings AND when there is a call for cooling. The start time shall automatically adjust based on the outside air temperature and the zone temperature setpoints.

OCCUPIED MODE
The RTU shall be in occupied mode per the project design conditions schedule shown on the control drawings.

UNOCCUPIED MODE
The RTU shall be in unoccupied mode for all periods not included in the occupied hours of operation per the project design conditions schedule shown on the control drawings. Overrides of unoccupied schedule shall be defined by zone level controls.

FREEZE PROTECTION MODE – LEVEL 1
The unit shall be in freeze protection mode – level 1 when the level 1 low limit temperature controller senses a preheat coil leaving air temperature of 42°F (adj.) or less.
The unit shall automatically reset when the mixed air temperature is above 43°F (adj.).

FREEZE PROTECTION MODE – LEVEL 2
The unit shall be in freeze protection mode – level 2 when the level 2 low limit temperature controller senses a preheat coil leaving air temperature of 35°F (adj.) or less.
Freeze Protection Mode – Level 2 shall be disabled by manual reset.

CONTROL SETPOINT RESETS

SUPPLY AIR STATIC PRESSURE RESET – TRIM AND RESPOND
Supply air static pressure setpoint shall be reset using the trim and respond logic within the range of 0.5 in. w.g. to the static pressure setpoint determined during balancing. The control system shall monitor the zone level VAV box damper position to determine a pressure request, which is defined as any zone actuator at greater than 90% open.
Trim and Respond Logic: When the fan is OFF, the setpoint shall be reset to the default value. While the fan is proven ON, every 2 minutes, decrease the setpoint by 0.04 in. w.g. (adj.) if there is one (adj.) or less zone pressure request. If there is more than one (adj.) zone pressure request, every 2 minutes, increase the setpoint by 0.03 in. w.g. (adj.) times the number of pressure requests, but no more than 0.12 in. w.g.

SAFETIES, OVERRIDES, AND INTERLOCKS

SMOKE DETECTOR INTERLOCK
The unit shall be disabled via hard wired interlock at the fan start circuit on activation of a system smoke detector.

FIRE ALARM CONTROL PANEL INTERLOCK
The unit shall be disabled via hard wired interlock at the fan start circuit upon receipt of signal from fire alarm control panel.

SMOKE DAMPER INTERLOCK
Associated system smoke dampers shall be closed via hard wired interlock whenever the supply fan is off.

HIGH SUPPLY AIR STATIC PRESSURE INTERLOCK
The unit shall be disabled via hard wired interlock at the supply fan start circuit upon activation of duct high pressure controller.

FREEZE PROTECTION MODE – LEVEL 1 INTERLOCK
The supply fan shall be enabled by via hard wired interlock at the supply fan start circuit from the level 1 low limit temperature controller.

FREEZE PROTECTION MODE – LEVEL 2 INTERLOCK
The supply fan shall be disabled by via hard wired interlock at the supply fan start circuit from the level 2 low limit temperature controller.

CONTROL SYSTEM INTERLOCK
Control power shall be removed from actuators when the associated system turns off.

COMPONENT CONTROLS

SUPPLY PLENUM FAN ARRAY CONTROL – MULTIDRIVE VFD

SYSTEM START UP MODE
The fan(s) shall energize and slowly ramp to the initial minimum fan speed determined during system startup.

MORNING WARM UP MODE
The fan(s) shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The fan(s) shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall measure duct static pressure and modulate the fan(s) VFD speed to maintain the duct static pressure setpoint. The minimum fan speed setting shall be established during balancing.

UNOCCUPIED MODE *(USER SELECTION)*
The fan(s) shall operate as if in Occupied Mode.
OR
The fan(s) shall be OFF.

FREEZE PROTECTION MODE – LEVEL 1
The fan(s) shall be OFF.

FREEZE PROTECTION MODE – LEVEL 2
The fan(s) shall be OFF.

EXHAUST FAN ARRAY CONTROL– BUILDING PRESSURE

SYSTEM START UP MODE
The fan(s) shall energize and slowly ramp to the initial minimum fan speed determined during system startup.

MORNING WARM UP MODE
The fan(s) shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The fan(s) shall operate as if in Occupied Mode.

OCCUPIED MODE
The fan(s) shall be ON whenever the associated air handling unit supply fan(s) is ON.
The controller shall measure building static pressure and modulate the fan(s) VFD speed to maintain the building static pressure setpoint.

UNOCCUPIED MODE *(USER SELECTION)*
The fan(s) shall operate as if in Occupied Mode.
OR
The fan(s) shall be OFF.

FREEZE PROTECTION MODE – LEVEL 1
The fan(s) shall be ON and operate as if in Occupied Mode.
OR
The fan(s) shall be OFF.

FREEZE PROTECTION MODE – LEVEL 1
The fan(s) shall be ON and operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 2
The fan(s) shall be OFF.

RELIEF/EXHAUST AIR DAMPERS

SYSTEM START UP MODE
The relief/exhaust air damper shall operate as if in Occupied Mode.

MORNING WARM UP MODE
The relief/exhaust air damper shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The relief/exhaust air damper shall operate as if in Occupied Mode.

OCCUPIED MODE
The relief/exhaust air damper is enabled and shall operate subject to the building pressure controller to maintain the building pressure setpoint.
When the return plenum fan array is ON, the relief/exhaust air damper shall be OPEN.
When the return plenum fan array is OFF, the relief/exhaust air damper shall modulate to maintain the building pressure setpoint.

UNOCCUPIED MODE *(USER SELECTION)*
The relief/exhaust air damper shall operate as if in Occupied Mode.
OR
The relief/exhaust air damper shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 1
The relief/exhaust air damper shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 2
The relief/exhaust air damper shall be CLOSED.

RETURN PLENUM FAN ARRAY CONTROL– BUILDING PRESSURE

SYSTEM START UP MODE
The fan(s) shall energize and slowly ramp to the initial minimum fan speed determined during system startup.

MORNING WARM UP MODE
The fan(s) shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The fan(s) shall operate as if in Occupied Mode.

OCCUPIED MODE
The fan(s) shall be ON whenever the associated air handling unit supply fan(s) is ON.
The controller shall measure building static pressure and modulate the fan(s) VFD speed to maintain the building static pressure setpoint.

UNOCCUPIED MODE *(USER SELECTION)*
The fan(s) shall operate as if in Occupied Mode.
OR
The fan(s) shall be OFF.

FREEZE PROTECTION MODE – LEVEL 1
The fan(s) shall be ON and operate as if in Occupied Mode.
OR
The fan(s) shall be OFF.

FREEZE PROTECTION MODE – LEVEL 1
The fan(s) shall be ON and operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 2
The fan(s) shall be OFF.

OUTSIDE AIR DAMPER

MORNING WARM UP MODE
The OA damper shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The OA damper shall operate as if in Occupied Mode.

OCCUPIED MODE
The OA damper shall be fully OPEN.

UNOCCUPIED MODE *(USER SELECTION)*
The OA damper shall operate as if in Occupied Mode.
OR
The OA damper shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 1
The OA damper shall operate as if in Occupied Mode.

FREEZE PROTECTION MODE – LEVEL 2
The OA damper shall be CLOSED.

PREHEAT COIL – HOT WATER VALVE – MODULATING

SYSTEM START UP MODE
If the outside air temperature is below 42°F (adj.), the hot water coil valve shall be fully OPEN. The hot water coil valve will operate as if in Occupied Mode when the mixed air temperature is above 43°F (adj.).
If the outside air temperature is above 43°F (adj.), the hot water coil valve shall operate as if in Occupied Mode.

MORNING WARM UP MODE
The hot water coil valve shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The hot water coil valve shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall modulate hot water valve to maintain the heating coil leaving air temperature setpoint.

UNOCCUPIED MODE *(USER SELECTION)*
The hot water coil valve shall operate as if in Occupied Mode.
OR
The hot water coil valve shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 1
The hot water coil valve shall be fully OPEN.

FREEZE PROTECTION MODE – LEVEL 2
The hot water coil valve shall be fully OPEN.

COOLING COIL – CHILLED WATER VALVE – MODULATING

MORNING WARM UP MODE
The cooling coil shall operate as if in Occupied Mode.

MORNING COOL DOWN MODE
The cooling coil valve shall operate as if in Occupied Mode.

OCCUPIED MODE
The controller shall modulate cooling coil valve to maintain the cooling coil leaving air temperature setpoint.

UNOCCUPIED MODE *(USER SELECTION)*
The cooling coil valve shall operate as if in Occupied Mode.
OR
The cooling coil valve shall be CLOSED.

FREEZE PROTECTION MODE – LEVEL 1
The cooling coil valve shall be fully OPEN.

FREEZE PROTECTION MODE – LEVEL 2
The cooling coil valve shall be fully OPEN.

FILTER MONITORING – HOURS
ALL MODES
The controller shall monitor the fan runtime to provide a maintenance reminder at 50% of filter elapsed time (1100 hours) and an alarm at 100% elapsed time (2200 hours)

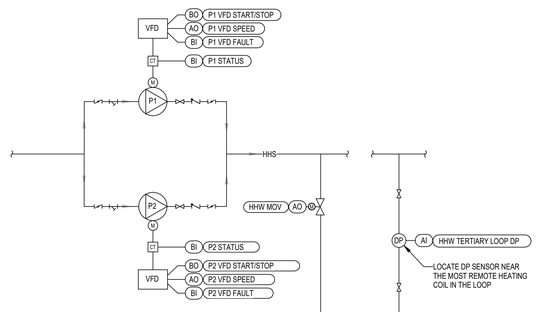
TERTIARY HW LOOP POINTS LIST

POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
TERTIARY LOOP											
HW TERTIARY LOOP DP	X										X
PUMP VFD SPEED (TYP. 2)		X									X
PUMP STATUS (TYP. 2)			X								X
PUMP VFD FAULT (TYP. 2)			X							X	X
PUMP VFD START/STOP (TYP. 2)				X							X
BY-PASS CONTROL VALVE STATUS		X							X		X
SETPOINTS											
PRIMARY LOOP DP SETPOINT					X						
HWS TEMPERATURE SETPOINT					X						
TERTIARY LOOP DP SETPOINT					X						

ALARMS	DESCRIPTION	ALARM	ALARM DELAY
PUMP FAILURE (TYP. 2)	PUMP IS COMMANDED ON, BUT THE STATUS IS OFF.	X	10 MIN.
RUNNING IN HAND (TYP. 2)	PUMP IS COMMANDED OFF, BUT THE STATUS IS ON.	X	10 MIN.
RUNTIME EXCEEDED (TYP. 2)	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.	X	10 MIN.
HIGH TERTIARY LOOP DP	TERTIARY LOOP DP IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW TERTIARY LOOP DP	TERTIARY LOOP DP IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET M-701

2 ROOFTOP UNIT (RTU-1) CONTROL DIAGRAM
NOT TO SCALE



SEQUENCE OF OPERATIONS
HEATING HOT WATER TERTIARY PUMPS
(HHP-1 & HHP-2)

GENERAL DESCRIPTION
The inline pumps will operate in a lead/standby manner to provide heating hot water to hot water coils serving the conditioned space as shown on the drawings.

OPERATING MODES

NORMAL OPERATING MODE:
The pumps shall be in normal operating mode at all times unless overridden by the other modes outlined in this sequence.

BACKUP MODE:
Backup mode shall be activated upon failure of the lead pump. Backup mode shall be disabled by manual reset and the system will revert to normal operation.

COMPONENT CONTROLS

LEAD PUMP (P1)

NORMAL OPERATING MODE:
The controller shall modulate the pump to maintain the HHW Tertiary Loop DP setpoint as determined by final test and balance. The VFDs minimum speed shall not drop below 20%.

BACKUP MODE:
The pump shall operate as if in normal operating mode.

STANDBY PUMP (P2)

NORMAL OPERATING MODE:
The pump shall be off.

BACKUP MODE:
Upon failure of the lead pump, the lag pump shall be activated and shall operate as the lead pump and modulate subject to the differential setpoint until manually reset to normal operating mode by the system operator.

HEATING HOT WATER - MOTORIZED CONTROL VALVE (HHW-MOV)
Valve shall open to maintain minimum gpm (80 gpm ADJ.) across the pumps when the system load requires less than the minimum setpoint.

1 HEATING HOT WATER LOOP DIFFERENTIAL PRESSURE CONTROL DIAGRAM
NOT TO SCALE

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

12/19/2022 2:11:31 PM

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STAMP:
ROSS MYLES BRANSTETTER 27054 12/21/2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL CONTROLS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

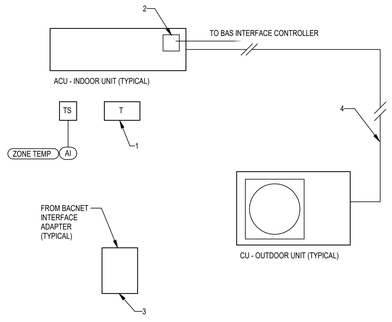
Drawing Number **M-704**

Drawing # 152 OF 190

Veterans Health Administration

VA | U.S. Department of Veterans Affairs

VA FORM 08-6231



NOTES:
1. WALL MOUNTED WIRELESS THERMOSTAT PROVIDED WITH UNIT
2. PROVIDE BACNET INTERFACE ADAPTER WITH FAN COIL UNIT
3. BAS CONTROLLER INTERFACE TO OPERATOR'S WORK STATION PROVIDED BY TEMP. CONTROL CONTRACTOR
4. FAN COIL CONTROL WIRING (PROVIDED WITH UNIT INSTALLED BY MECHANICAL CONTRACTOR)
5. LOW AMBIENT CONTROLS TO 0° F.

SEQUENCE OF OPERATIONS
SPLIT SYSTEM HEAT PUMP

GENERAL DESCRIPTION
The split system heat pump consists of an indoor fan coil unit (ACU) and outdoor condensing unit (CU) that provides cooling for the conditioned space as shown on the drawings. The indoor fan coil unit provides independent temperature control for the space served.

OPERATING MODES
COOLING MODE
A call for cooling from the zone level establishes a call for cooling. Initial setpoints are as scheduled in the points list unless otherwise shown on the project design conditions schedule.

SAFETIES, OVERRIDES, AND INTERLOCKS
REMOTE SHUTDOWN
The unit shall shut down and generate an alarm upon receiving a remote shutdown signal indicating the unit has been taken offline.

COMPONENT CONTROLS

OUTDOOR CONDENSING UNIT (DS-1, DS-2)
The condensing unit shall operate subject to the integrated factory digital controls (DDC) system.

INDOOR UNIT (ACU-1, ACU-2)

FAN: The fan switch shall be set to auto with the fan speed shall be auto or as note in the equipment schedule.

FILTER MONITORING: The controller shall monitor the fan runtime to provide maintenance reminder at 50% of filter elapsed time (1100 hours) and an alarm at 100% elapsed time (2200 hours).

SPACE TEMPERATURE MONITORING (TS)
The building automation system shall monitor the spaces served with a space temperature sensor with adjustable alarm settings for high limit and low limit temperature settings. The alarm shall be annunciated at the operator's workstation with graphical interface.

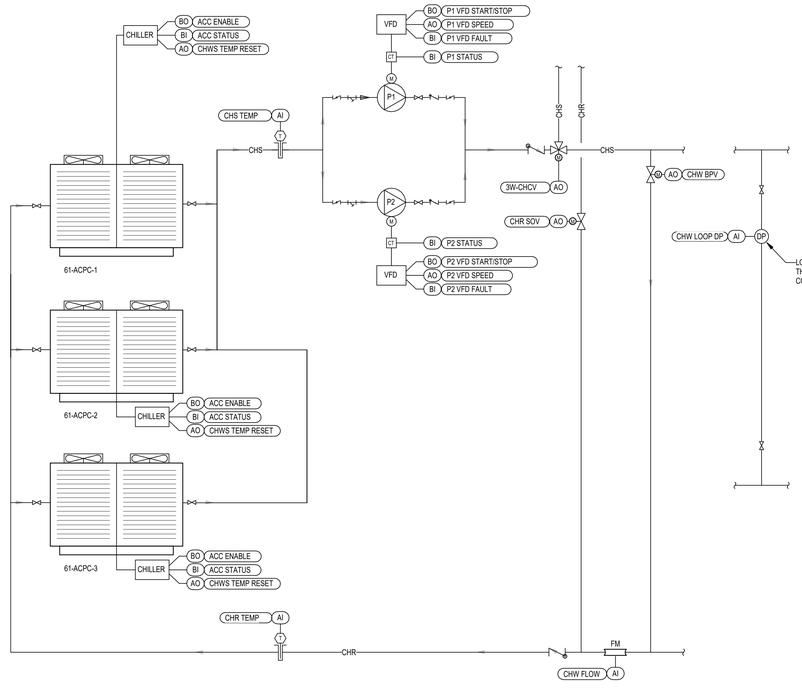
POINTS LIST SCHEDULE - SPLIT SYSTEM HEAT PUMP

POINTS NAME	HARDWARE POINTS				SOFTWARE POINTS						SHOWN ON GRAPHIC	NOTES
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM		
ACU												
FAN SLOW SPEED				X					X			3,6
FAN LOW SPEED				X					X			3,6
FAN MEDIUM SPEED				X					X			3,6
FAN HIGH SPEED				X					X			3,6
FAN STATUS			X						X			3,6
DISCHARGE AIR TEMPERATURE	X								X			3
ZONE TEMPERATURE	X								X		X	3,4
SMOKE DETECTOR			X						X	X		3,6
COMPRESSOR												
COMPRESSOR STAGE 1				X					X			3,6
REVERSING VALVE				X					X			3,6
REMOTE START/STOP				X					X			3,4
BAS INTERFACE COMM LINK											X	5
SETPOINTS												
EMERGENCY SHUTDOWN					NA							3
ZONE COOLING SETPOINT					NOTE 2						X	3,6

ALARMS	DESCRIPTION	ALARM	ALARM DELAY	
FAN FAILURE	COMMANDED ON, BUT THE STATUS IS OFF.	X	10 MIN.	1,3,6
FAN IN HAND	COMMANDED OFF, BUT THE STATUS IS ON.	X	10 MIN.	1,3
FAN RUNTIME EXCEEDED	FAN RUNTIME HAS EXCEEDED A USER DEFINABLE LIMIT.	X	10 MIN.	1,3,6
COMPRESSOR RUNTIME EXCEEDED	COMPRESSOR RUNTIME HAS EXCEEDED A USER DEFINABLE LIMIT.	X	10 MIN.	1,3,6
LOW DISCHARGE AIR TEMPERATURE	IF THE DISCHARGE AIR TEMPERATURE IS LESS THAN 45°F (ADJ.)	X	10 MIN.	1,3
HIGH ZONE TEMPERATURE	IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY 5°F (ADJ.).	X	10 MIN.	1,3,6
FILTER CHANGE REQUIRED	FILTER USE HAS EXCEEDED A USER DEFINABLE LIMIT.	X	10 MIN.	1,3,6

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET XX-M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET XX-M-701 FOR APPLICABLE SETPOINTS.
3. ACU AND CONDENSING UNIT FURNISHED WITH FACTORY INSTALLED CONTROLS. COORDINATE CONTROLLER WITH ACU AND CONDENSING UNIT MANUFACTURER.
4. TCC FIELD INSTALLED DEVICE. SEE PLANS FOR LOCATION.
5. BACNET BTL INTERFACE COMMUNICATION LINK PROVIDED WITH EQUIPMENT. COORDINATE REQUIREMENTS WITH SECTION 230923 AND TEMPERATURE CONTROL CONTRACTOR.
6. MAPPED CONTROL AND MONITORING THROUGH BACNET COMMUNICATION LINK TO BUILDING MANAGEMENT SYSTEM.

2 SPLIT SYSTEM HEAT PUMP TYPICAL CONTROL DIAGRAM
NOT TO SCALE



1 AIR COOLED CHILLER (ACPC-1, ACPC-2, & ACPC-3) W/N+1 TYPICAL CONTROL DIAGRAM
NOT TO SCALE

SEQUENCE OF OPERATIONS
AIR-COOLED CHILLER
(61-ACPC-3)

If a component in the following sequence does not include a sequence of operation for one of the listed operating modes, the operating mode shall not affect the operation of the component.

GENERAL DESCRIPITON
The air-cooled chiller and associated chilled water pumps provide primary & backup chilled water to the associated cooling equipment as shown on the drawings.

OPERATING MODES

COOLING MODE
Cooling mode is the standard operating mode and shall be activated when there is a call for cooling AND the outside air temperature is greater than 50 degF (adj.)

BACKUP COOLING MODE
Backup cooling mode shall be activated upon failure of the air-cooled chiller [OR failure of both lead and standby pumps]

FREEZE-PROTECTION MODE
Freeze-protection mode shall be activated when the outside air temperature is below 38 degF (adj.) and the chilled water temperature falls below 42 degF (adj.)

STANDBY PUMP MODE
Standby Pump Mode shall be activated upon failure of the lead pump. Standby pump mode shall be disabled via manual reset.

SAFETIES, OVERIDES, AND INTERLOCKS

EMERGENCY SHUTDOWN INTERLOCK
The unit shall be shutdown via hardwired interlock upon the receipt of an emergency shutdown signal.

CONTROL SETPOINT RESETS

CHILLED WATER SUPPLY TEMPERATURE RESET
The chilled water supply temperature setpoint shall be reset using trim and respond logic within the range as listed in the "setpoint reset range" column of the points list. The control system shall monitor the cooling coil valve positions to determine a chilled water request, which is defined as any chilled water valve at greater than 90% Open.

Trim and Respond Logic: When the chiller is off, reset setpoint to the default value. While the chiller status is proven operational, Every 5 minutes, increase the setpoint by 2 degF (adj.) if there is one (adj.) or less cooling coil chilled water requests. If there is more than one cooling coil chilled water requests, increase the setpoint by 2 degF (adj.) times the number of cooling coil chilled water requests until the chilled water temperature reaches its default chilled water setpoint value.

COMPONENT CONTROLS

LEAD CHILLER (61-ACPC-1)

COOLING MODE
After the lead pump status is proven operational, the chiller shall be commanded on and shall operate subject to manufacturer safeties and controls. The chiller shall be disabled prior to the lead pump.

FREEZE PROTECTION MODE
The chiller shall operate subject to manufacturer safeties and controls for freeze protection.

LAG CHILLER (61-ACPC-3)

COOLING MODE
The chiller shall be off.

BACKUP COOLING MODE
Upon failure of the lead chiller AND the receipt of a pump status, the backup chiller shall be activated and shall operate subject to manufacturer safeties and controls.

FREEZE PROTECTION MODE
The chiller shall operate subject to manufacturer safeties and controls for freeze protection.

STANDBY CHILLER (61-ACPC-2)

COOLING MODE
The chiller shall be off.

BACKUP COOLING MODE
Upon failure of the lead chiller AND the lag chiller AND the receipt of a pump status, the backup chiller shall be activated and shall operate subject to manufacturer safeties and controls.

FREEZE PROTECTION MODE
The chiller shall operate subject to manufacturer safeties and controls for freeze protection.

LEAD PUMP (P1)

COOLING MODE
The lead pump shall start prior to the chiller being enabled and shall stop when the chiller is disabled via user adjustable delay.

The controller shall modulate the pump to maintain the CHW Loop DP setpoint as determined by final test and balance. The VFDs minimum speed shall not drop below 20%. The pump shall remain operational for 2 min. (adj.) after the chiller status is proven to be disabled.
The lead pump, lag pump, and standby pump shall alternate lead/standby responsibility every 2 months (adj.)

FREEZE PROTECTION MODE
The pump shall be commanded to run and shall operate at its minimum speed.

LAG PUMP (P2)

COOLING MODE
The pump shall be off.

STANDBY PUMP MODE
Upon failure of the lead pump, the standby pump shall be activated and shall operate as the lead pump under all active operating modes.

STANDBY PUMP (P3)

COOLING MODE
The pump shall be off.

BACKUP COOLING MODE
The pump shall be off.

STANDBY PUMP MODE
Upon failure of the lead pump AND the lag pump., the standby pump shall be activated and shall operate as the lead pump under all active operating modes.

CHILLED WATER BYPASS VALVE

COOLING MODE
The controller shall measure the chilled water flow through the chiller and, if chilled water demand falls below 20%, the controller shall modulate the chilled water bypass valve open to maintain the minimum chilled water flow rate setpoint.

BACKUP COOLING MODE
The valve shall be closed.

3-WAY BACKUP CHW CONTROL VALVE (3W-CHCV)

COOLING MODE:
The control valve shall be closed shall be closed.

BACKUP COOLING MODE:
The 3-way valve shall modulate open as required to maintain the CHW Loop DP Setpoint.

STANDBY PUMP MODE
The valve shall be closed.

FREEZE PROTECTION MODE
The valve shall be closed.

SITE CHILLED WATER RETURN SHUTOFF VALVE (CHR SOV)

COOLING MODE:
The valve shall be closed.

BACKUP COOLING MODE:
The valve shall be open.

STANDBY PUMP MODE:
The valve shall be closed.

FREEZE PROTECTION MODE
The valve shall be closed.

MISC. MONITORING
ALL MODES:
The chilled water supply and return temperatures shall be monitored.

AIR COOLED CHILLER SYSTEM POINTS LIST (61-ACPC-3)

POINTS NAME	HARDWARE POINTS				SOFTWARE POINTS						SHOWN ON GRAPHIC
	AI	AO	BI	BO	AV	BV	LOOP	SCHED	TREND	ALARM	
AIR-COOLED CHILLER											
ACC STATUS			X						X		X
ACC ENABLE				X							X
EMERGENCY SHUTDOWN			X						X	X	
CHILLED WATER											
CHW LOOP DP	X								X		X
CHW FLOW	X								X		X
CHWR TEMP	X								X		X
CHWS TEMP	X								X		X
CHW BPV		X							X		X
SITE CHWR SOV		X							X		X
3-WAY SITE CHWS CONTORL VALVE (3W-CHWCV)		X							X		X
CHWS TEMP RESET		X							X		X
PUMPS											
PUMP VFD SPEED (TYP. 2)		X							X		X
PUMP STATUS (TYP. 2)			X						X		X
PUMP VFD FAULT (TYP. 2)			X							X	X
PUMP VFD START/STOP (TYP. 2)				X					X		X

SETPOINTS								SETPOINT RESET RANGE
CHW LOOP DP SETPOINT				X			X		-
CHWS TEMP SETPOINT				X			X		45°F - 55°F
CHW FLOW SETPOINT				X			X		-
OUTSIDE AIR TEMP SETPOINT				X					-

ALARMS	DESCRIPTION	ALARM	ALARM DELAY
ACC FAILURE	CHILLER IS COMMANDED ON, BUT THE STATUS IS OFF.	X	10 MIN.
ACC RUNNING IN HAND	CHILLER IS COMMANDED OFF, BUT THE STATUS IS ON.	X	10 MIN.
ACC RUNTIME EXCEEDED	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.	X	10 MIN.
PUMP FAILURE (TYP. 2)	PUMP IS COMMANDED ON, BUT THE STATUS IS OFF.	X	10 MIN.
RUNNING IN HAND (TYP. 2)	PUMP IS COMMANDED OFF, BUT THE STATUS IS ON.	X	10 MIN.
RUNTIME EXCEEDED (TYP. 2)	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.	X	10 MIN.
LOW CHW FLOW	IF THE CHWS FLOW RATE IS 25% (ADJ.) LESS THAN SETPOINT.	X	5 MIN.
HIGH CHWS TEMP	CHWS TEMPERATURE IS ABOVE 55 DEG (ADJ.)	X	5 MIN.
LOW CHWS TEMP	CHWS TEMPERATURE IS LESS THAN 38 DEG (ADJ.)	X	5 MIN.
HIGH CHW DP	TERTIARY LOOP DP IS 25% GREATER THAN SETPOINT (ADJ.)	X	5 MIN.
LOW CHW DP	TERTIARY LOOP DP IS 25% LESS THAN SETPOINT (ADJ.)	X	5 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET M-701 FOR APPLICABLE SETPOINTS.

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

STRUCTURAL / CIVIL ENGINEER	MECH / ELEC / PLUMB / TECH ENGR	FIRE PROTECTION ENGINEER
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KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:
JOSS MYLES DESNOYER 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL CONTROLS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number
M-705
Drawing # 153 OF 190

Veterans Health Administration

VA | U.S. Department of Veterans Affairs

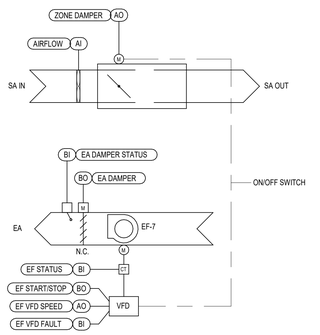
12/19/2022 2:11:33 PM

VA FORM 08-6231

POINTS LIST SCHEDULE (EF-7 & VAV)

POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
VAV ATU (VAV-45)											
AIRFLOW	X								X		X
ZONE DAMPER		X							X	X	X
EXHAUST FAN (EF-7)											
EF VFD SPEED		X							X		X
EF STATUS			X						X		X
EF START/STOP				X					X		X
EF VFD FAULT				X						X	X
DAMPER											
EXHAUST AIR DAMPER STATUS			X						X	X	X
EXHAUST AIR DAMPER				X					X		X
SETPOINTS	**VALUES**										
PRIMARY AIRFLOW SETPOINT	SEE VAV ATU SCHEDULE				X						
MINIMUM AIRFLOW SETPOINT	SEE VAV ATU SCHEDULE				X						
ALARMS	**DESCRIPTION**									**ALARM**	**ALARM DELAY**
VAV ZONE DAMPER FAILURE	COMMANDED OPEN, BUT THE STATUS IS CLOSED									X	10 MIN.
VAV ZONE DAMPER IN HAND	COMMANDED CLOSED, BUT THE STATUS IS OPEN									X	10 MIN.
EXHAUST AIR DAMPER FAILURE	COMMANDED OPEN, BUT THE STATUS IS CLOSED									X	10 MIN.
EXHAUST AIR DAMPER IN HAND	COMMANDED CLOSED, BUT THE STATUS IS OPEN									X	10 MIN.
EF FAILURE	COMMANDED ON, BUT THE STATUS IS OFF									X	10 MIN.
EF IN HAND	COMMANDED OFF, BUT THE STATUS IS ON									X	10 MIN.
EF RUNTIME EXCEEDED	FAN RUNTIME EXCEEDS A USER DEFINABLE LIMIT									X	10 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET M-701 FOR APPLICABLE SETPOINTS.
3. VAV AIR TERMINAL UNIT FURNISHED WITH FACTORY INSTALLED CONTROLS. COORDINATE CONTROLLER WITH VAV MANUFACTURER.



SEQUENCE OF OPERATIONS
EXHAUST FAN (EF-7)

GENERAL DESCRIPTION
The exhaust fan provides exhaust ventilation to the dental lab as shown on drawings.

OPERATING MODES

HOOD ON MODE
The exhaust fan shall be in hood on mode when the room switch is set to "on."

HOOD OFF MODE
The exhaust fan shall be in hood off mode when the room switch is set to "off."

COMPONENT CONTROL LOOPS

EXHAUST FAN – ON/OFF
- When the HOA switch is in hand position, the variable speed supply fan shall operate at a speed set manually by the operator at the user interface of the drive.
- When the HOA switch is in off position, the fan shall be off.
- When the HOA switch is in auto position, the variable speed supply fan shall operate subject to the unit enable signal, and unit operating modes.

HOOD ON MODE:
- The exhaust fan shall be enabled after the EA damper has proven operable.
- The exhaust fan shall be commanded to run and shall maintain a user defined constant speed.

HOOD OFF MODE:
The exhaust fan shall be off.

MOTORIZED DAMPER

HOOD ON MODE:
The motorized damper shall be open. The motorized damper shall open 30 sec (adj.) prior to activation of the exhaust fan.

HOOD OFF MODE:
The motorized damper shall be closed. The motorized damper shall close 30 sec (adj.) after the fan is OFF.

SEQUENCE OF OPERATIONS
VAV AIR TERMINAL UNIT (VAV-45)

GENERAL DESCRIPTION
The single duct variable air volume terminal unit (VAV ATU) provides exhaust ventilation for the dental lab as shown on the drawings.

OPERATING MODES

HOOD ON MODE
The VAV ATU shall be in hood on mode when the room switch is set to "on."

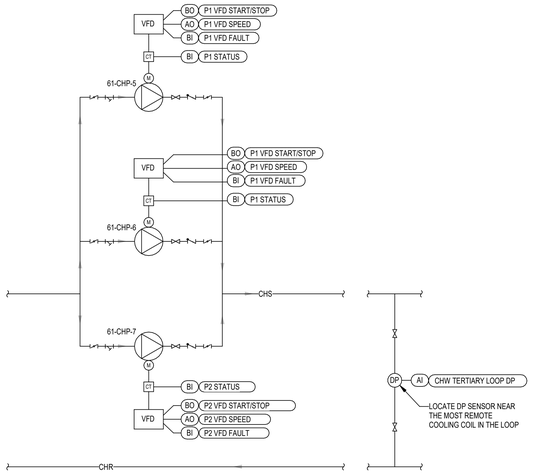
HOOD OFF MODE
The VAV ATU shall be in hood off mode when the room switch is set to "off."

ZONE DAMPER

HOOD ON MODE:
The zone damper shall be closed.

HOOD OFF MODE:
The zone damper shall open to the setpoint as shown on the equipment schedule.

3 DENTAL LAB EXHAUST FAN (EF-7) & VARIABLE AIR VOLUME TERMINAL UNIT CONTROL DIAGRAM
NOT TO SCALE



SEQUENCE OF OPERATIONS
CHILLED WATER TERTIARY PUMPS
(61-CHP-5, 61-CHP-6 & 61-CHP-7)

GENERAL DESCRIPTION
The inline pumps will operate in a lead/standby manner to provide chilled water to chilled water coils serving the conditioned space as shown on the drawings.

OPERATING MODES

NORMAL OPERATING MODE:
The pumps shall be in normal operating mode at all times unless overridden by the other modes outlined in this sequence.

BACKUP MODE:
Backup mode shall be activated upon failure of the lead pump. Backup mode shall be disabled by manual reset and the system will revert to normal operation.

COMPONENT CONTROLS

LEAD PUMP (61-CHP-5)

NORMAL OPERATING MODE:
The controller shall modulate the pump to maintain the CHW Tertiary Loop DP setpoint as determined by final test and balance. The VFDs minimum speed shall not drop below 20%.

BACKUP MODE:
The pump shall operate as if in normal operating mode.

LAG PUMP (61-CHP-6)

NORMAL OPERATING MODE:
The pump shall be off unless called upon to provide support to the lead pump. The controller shall modulate the pump to maintain the CHW Tertiary Loop DP setpoint as determined by final test and balance. The VFDs minimum speed shall not drop below 20%.

BACKUP MODE:
The pump shall operate as if in normal operating mode.

STANDBY PUMP (61-CHP-7)

NORMAL OPERATING MODE:
The pump shall be off.

BACKUP MODE:
Upon failure of the lead pump, the standby pump shall be activated and shall operate as the lead pump and modulate subject to the differential setpoint until manually reset to normal operating mode by the system operator.

4 CHILLED WATER LOOP DIFFERENTIAL PRESSURE CONTROL DIAGRAM
NOT TO SCALE

TERTIARY CHW LOOP POINTS LIST

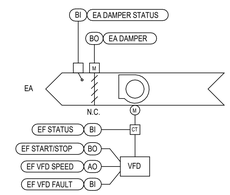
POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
TERTIARY LOOP											
CHW TERTIARY LOOP DP	X										X
PUMP VFD SPEED (TYP. 3)		X									X
PUMP STATUS (TYP. 3)			X								X
PUMP VFD FAULT (TYP. 3)			X							X	X
PUMP VFD START/STOP (TYP. 3)				X							X
SETPOINTS											
PRIMARY LOOP DP SETPOINT					X						
CHWS TEMPERATURE SETPOINT					X						
TERTIARY LOOP DP SETPOINT					X						
ALARMS	**DESCRIPTION**									**ALARM**	**ALARM DELAY**
PUMP FAILURE (TYP. 3)	PUMP IS COMMANDED ON, BUT THE STATUS IS OFF.									X	10 MIN.
RUNNING IN HAND (TYP. 3)	PUMP IS COMMANDED OFF, BUT THE STATUS IS ON.									X	10 MIN.
RUNTIME EXCEEDED (TYP. 3)	STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT.									X	10 MIN.
HIGH TERTIARY LOOP DP	TERTIARY LOOP DP IS 25% GREATER THAN SETPOINT (ADJ.)									X	5 MIN.
LOW TERTIARY LOOP DP	TERTIARY LOOP DP IS 25% LESS THAN SETPOINT (ADJ.)									X	5 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET XX-M-701 FOR APPLICABLE TREND INTERVALS.
2. SEE PROJECT DESIGN CONDITIONS SCHEDULE ON SHEET XX-M-701 FOR APPLICABLE SETPOINTS.

POINTS LIST SCHEDULE - GENERAL EXHAUST FAN (EF-X)

POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
EXHAUST FAN											
EF VFD SPEED		X							X		X
EF STATUS			X						X		X
EF START/STOP				X					X		X
EF VFD FAULT			X							X	X
DAMPER											
EXHAUST AIR DAMPER STATUS			X						X		X
EXHAUST AIR DAMPER				X					X		X
ALARMS	**DESCRIPTION**									**ALARM**	**ALARM DELAY**
EXHAUST AIR DAMPER FAILURE	COMMANDED OPEN, BUT THE STATUS IS CLOSED									X	10 MIN.
EXHAUST AIR DAMPER IN HAND	COMMANDED CLOSED, BUT THE STATUS IS OPEN									X	10 MIN.
EF FAILURE	COMMANDED ON, BUT THE STATUS IS OFF									X	10 MIN.
EF IN HAND	COMMANDED OFF, BUT THE STATUS IS ON									X	10 MIN.
EF RUNTIME EXCEEDED	FAN RUNTIME EXCEEDS A USER DEFINABLE LIMIT									X	10 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET XX-M-701 FOR APPLICABLE TREND INTERVALS.



SEQUENCE OF OPERATIONS
EXHAUST FANS (EF-4 TO EF-6, EF-8)

GENERAL DESCRIPTION
The exhaust fan provides general exhaust ventilation to the conditioned space(s) as shown on the drawings.

OPERATING MODES

OCCUPIED MODE
The exhaust fan shall be in occupied mode per the project design conditions schedule shown on sheet M-701.

UNOCCUPIED MODE
The exhaust fan shall be in unoccupied mode for all periods not included in the occupied hours of operation.

COMPONENT CONTROL LOOPS

EXHAUST FAN – ON/OFF
- When the HOA switch is in hand position, the variable speed supply fan shall operate at a speed set manually by the operator at the user interface of the drive.
- When the HOA switch is in off position, the fan shall be off.
- When the HOA switch is in auto position, the variable speed supply fan shall operate subject to the unit enable signal, and unit operating modes.

OCCUPIED MODE:
- The exhaust fan shall be enabled after the EA damper has proven operable.
- The exhaust fan shall be commanded to run and shall maintain a user defined constant speed.

UNOCCUPIED MODE:
The exhaust fan shall be off.

MOTORIZED DAMPER

OCCUPIED MODE:
The motorized damper shall be open. The motorized damper shall open 30 sec (adj.) prior to activation of the exhaust fan.

UNOCCUPIED MODE:
The motorized damper shall be closed. The motorized damper shall close 30 sec (adj.) after the fan is OFF.

2 GENERAL EXHAUST FAN (EF-4, EF-5, EF-6, EF-8) TYPICAL CONTROL DIAGRAM
NOT TO SCALE

POINTS LIST SCHEDULE - CANTEEN EXHAUST FAN (EF-X)

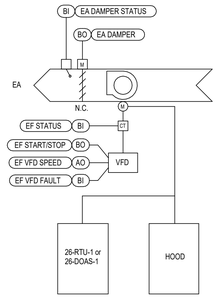
POINTS NAME	HARDWARE POINTS AI	AO	BI	BO	SOFTWARE POINTS AV	BV	LOOP	SCHED	TREND	ALARM	SHOWN ON GRAPHIC
EXHAUST FAN											
EF VFD SPEED		X							X		X
EF STATUS			X						X		X
EF START/STOP				X					X		X
EF VFD FAULT			X							X	X
DAMPER											
EXHAUST AIR DAMPER STATUS			X						X		X
EXHAUST AIR DAMPER				X					X		X
ALARMS	**DESCRIPTION**									**ALARM**	**ALARM DELAY**
EXHAUST AIR DAMPER FAILURE	COMMANDED OPEN, BUT THE STATUS IS CLOSED									X	10 MIN.
EXHAUST AIR DAMPER IN HAND	COMMANDED CLOSED, BUT THE STATUS IS OPEN									X	10 MIN.
EF FAILURE	COMMANDED ON, BUT THE STATUS IS OFF									X	10 MIN.
EF IN HAND	COMMANDED OFF, BUT THE STATUS IS ON									X	10 MIN.
EF RUNTIME EXCEEDED	FAN RUNTIME EXCEEDS A USER DEFINABLE LIMIT									X	10 MIN.

NOTES:
1. SEE STANDARD TRENDING POINTS LIST SCHEDULE ON SHEET M-701 FOR APPLICABLE TREND INTERVALS.

INTERLOCK SCHEDULE - CANTEEN EXHAUST FANS

FAN/ UNIT INTERLOCK	HOOD/UNIT INTERLOCK	OCCUPIED - HOOD ON CFM	OCCUPIED - HOOD ON ACH	OCCUPIED - HOOD OFF CFM	OCCUPIED - HOOD OFF ACH	UNOCCUPIED CFM	UNOCCUPIED ACH
26-RTU-1							
26-EF-1	26-KH-1	1400	40	345	10	70	2
26-DOAS-1							
26-EF-2	26-KH-2	2430	22	1095	10	220	2
26-EF-3	26-DH-1	600	22	270	10	55	2

NOTES:
1. SEE INDIVIDUAL CONTROLS FOR 26-RTU-1 AND 26-DOAS-1 CONTROLS SEQUENCES.



SEQUENCE OF OPERATIONS
CANTEEN EXHAUST FANS (EF-1 TO EF-3)

GENERAL DESCRIPTION
The exhaust fan provides general exhaust ventilation to the conditioned space(s) as shown on the drawings.

OPERATING MODES

OCCUPIED MODE - HOOD ON
The exhaust fan shall be in occupied mode - hood on per the project design conditions schedule shown on sheet M-701 AND when the hood(s) interlocked with the exhaust fan are ON.

OCCUPIED MODE - HOOD OFF
The exhaust fan shall be in occupied mode per the project design conditions schedule shown on sheet M-701 AND when the hood(s) interlocked with the exhaust fan are OFF.

UNOCCUPIED MODE
The exhaust fan shall be in unoccupied mode for all periods not included in the occupied hours of operation.

COMPONENT CONTROL LOOPS

EXHAUST FAN – ON/OFF
- When the HOA switch is in hand position, the variable speed supply fan shall operate at a speed set manually by the operator at the user interface of the drive.
- When the HOA switch is in off position, the fan shall be off.
- When the HOA switch is in auto position, the variable speed supply fan shall operate subject to the unit enable signal, and unit operating modes.

OCCUPIED MODE:
- The exhaust fan shall be enabled after the EA damper has proven operable.
- The exhaust fan shall be commanded to run and shall maintain a user defined constant speed.

UNOCCUPIED MODE:
The exhaust fan shall be off.

MOTORIZED DAMPER

OCCUPIED MODE:
The motorized damper shall be open. The motorized damper shall open 30 sec (adj.) prior to activation of the exhaust fan.

UNOCCUPIED MODE:
The motorized damper shall be closed. The motorized damper shall close 30 sec (adj.) after the fan is OFF.

1 CANTEEN EXHAUST FAN (EF-1, EF-2, EF-3) TYPICAL CONTROL DIAGRAM
NOT TO SCALE

FULLY SPRINKLERED

100% BID SET

NO.	REVISION DESCRIPTION	DATE

CONSULTANTS:

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PANAMA CITY, FL 32407
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ARCHITECT:
SPUR PROJECT #: 2016

spur DESIGN

SPUR DESIGN, LLC
312 SW 25TH STREET
Oklahoma City, OK 73109
(405) 842-6100

KS ARCH REG. NO. A-930, EXP. 12/31/2021
KS ENGR REG. NO. E-2586, EXP. 12/31/2021

STAMP:
ROSS MYLES DENSEN 27054 12-21-2022 KANSAS PROFESSIONAL ENGINEER

Drawing Title
MECHANICAL CONTROLS

VA Health Care System Approval:

Project Title
CONSTRUCT INFILL OF BUILDING 26 AND RENOVATE SPECIALTY CARE CLINICS

Location
5500 EAST KELLOGG AVENUE
WICHITA, KANSAS 67218

Date **12/21/2022** | Checked JRM | Drawn GT

Project Number **589-704**

Building Number **26**

Drawing Number **M-706**

Drawing # 154 OF 190

Veterans Health Administration

VA | U.S. Department of Veterans Affairs

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VA FORM 08-6231