REPLACE HVAC & BOILER
MULTIPLE ASSETS
RIVERBEND TREATMENT CENTER
ST. JOSEPH, MO

INDEX OF DRAWINGS

APPLICABLE CODES/DESIGN CONSIDERATIONS

INTERNATIONAL BUILDING CODE (IBC) 2021
THE AMERICAN WITH DISABILITIES ACT (ADAAG) 2010
INTERNATIONAL MECHANICAL CODE (IMC) 2021
INTERNATIONAL PLUMBING CODE (IPC) 2021
ASHRAE 90.1 - 2016 ENERGY STANDARD FOR BUILDINGS
NATIONAL ELECTRIC CODE (NEC) 2020

OWNER: STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT
DESIGN AND CONSTRUCTION

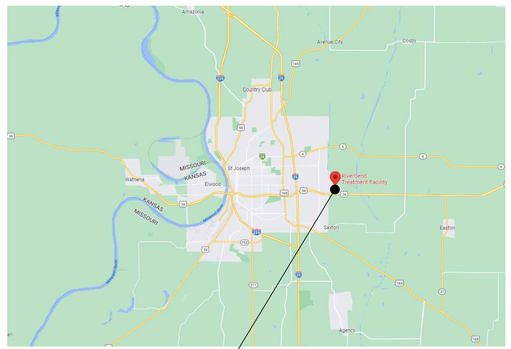
PROJECT MANAGEMENT: OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT
DESIGN AND CONSTRUCTION

DESIGNER: CROSSED SWORDS ENGINEERING

PROJECT NUMBER: H2305-01

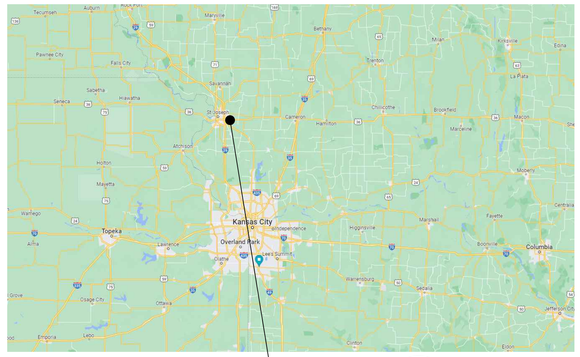
SITE NUMBER: 5718
ASSET NUMBER: MULTIPLE ASSETS

SITE LOCATION MAP



CROSSED SWORDS ENGINEERING
1619 NE OAK TREE DRIVE
LEE'S SUMMIT MO 64086
(816) 309-0099
ROBERT7721@AOL.COM
MO CERTIFICATE OF AUTHORITY
#2016003099

REGIONAL LOCATION MAP



ISSUED FOR CONSTRUCTION
5/17/2023

SHEET NUMBER:
G-001
1 OF 7 SHEETS
MAY 17, 2023

GENERAL SCOPE OF WORK REQUIREMENTS:

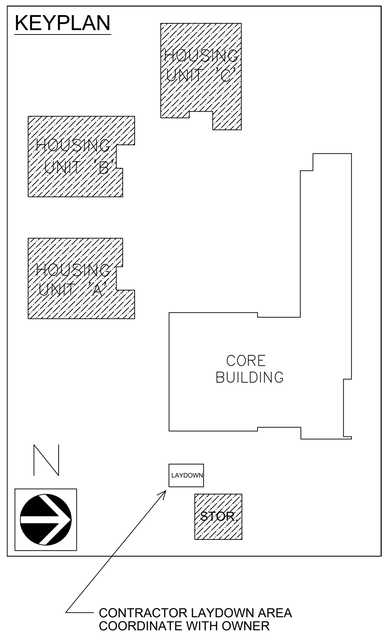
SCOPE OF WORK INCLUDES THE REPLACEMENT OF THE SPLIT SYSTEM AIRHANDLING UNITS, DX CONDENSING UNITS, DUCT FURNACES IN THE HOUSING UNITS. REPLACEMENT OF THE BOILER AND ASSESSORIES IN THE CORE BUILDING, AND INSTALLATION OF A NEW BUILDING AUTOMATION SYSTEM THROUGHOUT THE COMPLEX.

1. ALL MECHANICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH INTERNATIONAL MECHANICAL CODE (IMC) 2018 AND ASHRAE 90.1 2016 ENERGY STANDARD FOR BUILDINGS.
2. EXISTING DUCTWORK WILL BE MODIFIED AS REQUIRED TO FIT NEW HVAC EQUIPMENT CONNECTIONS.
3. ALL NEW DUCTWORK INSIDE BUILDINGS SHALL BE INSULATED ON THE EXTERIOR OF THE DUCTS PER SPECIFICATION 230700.
4. CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF HVAC AND PLUMBING EQUIPMENT WITH THE EXISTING BUILDINGS LAYOUTS, EQUIPMENT PADS, STRUCTURES, PIPING, ETC.
5. PERFORM ALL PLUMBING WORK IN ACCORDANCE INTERNATIONAL PLUMBING CODE (IPC) 2018 AND LOCAL CODES.
6. ALL ELECTRICAL WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH NFPA 70, 2020 NATIONAL ELECTRICAL CODE AND AND SUPPLEMENTARY STATE AND LOCAL CODES.

CONSTRUCTION PROJECT PHASING

THE HOUSING UNITS SHALL BE PHASED FOR CONSTRUCTION SUCH THAT ONLY ONE UNIT SHALL BE OUT OF OPERATION AT A TIME.

KEYPLAN



MECHANICAL SYMBOLS SHEETMETAL

- MANUAL VOLUME DAMPER.–VD
- FD — FIRE DAMPER–FD, SMOKE DAMPER–SD.
- TRANSITION PIECE FROM RECTANGULAR TO ROUND.
- a — TRANSITION PIECE.
- 3a
- FLEXIBLE CONNECTION.
- ELBOW WITH TURNING VANES.
- GRILLE OR REGISTER IN SIDE OF DUCT. SUPPLY, RETURN OR EXHAUST AS INDICATED.
- M M — MOTOR OPERATED DAMPER– SUPPLY, RETURN, EXHAUST OR OUTDOOR AIR AS INDICATED.
- EXHAUST OR RETURN AIR REGISTER OR GRILLE AS INDICATED IN BOTTOM OF DUCT.
- DIFFUSER IN BOTTOM OF DUCT–SQUARE OR ROUND AS INDICATED.
- SUPPLY OR DISCHARGE AIR DUCT. SOLID CROSS–UP OR TOWARDS, DASHED CROSS–DOWN OR AWAY.
- RETURN OR OUTDOOR AIR DUCT. SOLID CROSS–UP OR TOWARDS, DASHED CROSS–DOWN OR AWAY.
- SINGLE LINE SUPPLY DUCT.
- FLEXIBLE DUCT (72" MAXIMUM LENGTH)

DUCT SIZES IN INCHES (CLEAR INTERIOR OPENING)

- RECTANGULAR DUCT HORIZONTAL WIDTH BY VERTICAL HEIGHT
- ROUND DUCT = ⌀
- OVAL DUCT = ⊖

ABBREVIATIONS

SA – SUPPLY AIR	RG – RETURN GRILLE
RA – RETURN AIR	EG – EXHAUST GRILLE
EA – EXHAUST AIR	CD – CEILING DIFFUSER
SR – SUPPLY REGISTER	LD – LINEAR DIFFUSER
RR – RETURN REGISTER	P – PUMP
ER – EXHAUST REGISTER	EF – EXHAUST FAN
SG – SUPPLY GRILLE	BDD – BACK DRAFT DAMPER
OA – OUTSIDE AIR	AHU – AIR HANDLING UNIT
B – BOILER	VAV – VARIABLE AIR VOLUME
BV – BALANCE VALVE	WWF – WELDED WIRE FABRIC
WH – WATER HEATER	GC – GAGE COCK
TH – THERMOMETER	CF – CHEMICAL FEED SHOT FEEDER
ET – EXPANSION TANK	SV – SERVICE VALVE
AS – AIR SEPARATOR	RPZ – REDUCED PRESSURE ZONE
BFP – BACK FLOW PREVENTER	

MECHANICAL SYMBOLS PIPING SPECIALTIES

- ELBOW TURNED UP OR TOWARDS.
- ELBOW TURNED DOWN OR AWAY.
- TEE TURNED UP OR TOWARDS.
- TEE TURNED DOWN OR AWAY.
- ARROW IN LINE INDICATES DIRECTION OF FLOW.
- PITCH DOWN IN DIRECTION OF ARROW.
- SHUT OFF (GATE) VALVE.
- BALL VALVE.
- ANGLE GATE VALVE.
- ANGLE GLOBE VALVE.
- BUTTERFLY VALVE.
- AUTOMATIC CONTROL VALVE, TWO–WAY.
- AUTOMATIC CONTROL VALVE, THREE–WAY.
- PRESSURE REGULATING VALVE.
- GAS COCK VALVE
- CHECK VALVE.
- UNION.
- PRESSURE RELIEF OR SAFETY VALVE.
- REDUCED PRESSURE BACKFLOW ASSEMBLY
- BFP — BACKFLOW PREVENTER.
- CONSTANT FLOW VALVE
- FLOW CONTROL VALVE.
- PLUG VALVE.
- STRAINER.
- PIPE GUIDE.
- PIPE ANCHOR.
- FLEXIBLE PIPE CONNECTION.
- HB — HOSE BIB
- AAV — AUTOMATIC AIR VENT.
- AIR ELIMINATOR
- WATER HAMMER ARRESTER
- VACUUM BREAKER.
- GAGE COCK(PETE'S PLUG). PRESSURE TEMPERATURE TEST STATION.
- PRESSURE GAUGE.
- THERMOMETER.
- F&T — STEAM TRAP. F=FLOAT, T=THERMOSTATIC, D=THERMODYNAMIC.
- CONCENTRIC REDUCER.
- ECCENTRIC REDUCER.
- IN–LINE CIRCULATION PUMP

MECHANICAL SYMBOLS PLUMBING

- CLEANOUT. CO=CLEANOUT, FCO= FLOOR MOUNTED CLEANOUT
- FT — FOOTING OR UNDER FLOOR DRAIN TILE.
- S — SANITARY DRAIN LINE.
- PLUMBING VENT. V=VENT, VTR=VENT THRU ROOF, AV=ACID VENT.
- DOMESTIC COLD WATER–CW.
- DOMESTIC HOT WATER–HW. (120° UNLESS NOTED OTHERWISE).
- DOMESTIC HOT WATER CIRCULATING–HWC.
- GAS — NATURAL GAS
- FLOOR DRAIN–FD
- ROOF DRAIN–RD, DOWNSPOUT–DS.
- CW — COLD WATER
- HW — HOT WATER
- HWC — HOT WATER CIRCULATING
- V — VENT
- VTR — VENT THRU ROOF
- FCO — FLOOR CLEANOUT
- WCO — WALL CLEANOUT
- TMV — TEMPERED MIXING VALVE
- CHS — CHILLED/HOT WATER SUPPLY
- CHR — CHILLED/HOT WATER RETURN
- RL — REFRIGERANT LIQUID PIPING
- RS — REFRIGERANT SUCTION PIPING
- ST — LOW PRESSURE STEAM
- D — CONDENSATE DRAIN PIPING
- HWS — HEATING HOT WATER SUPPLY
- HWR — HEATING HOT WATER RETURN

MISCELLANEOUS

- POINT OF NEW CONNECTION TO EXISTING.
- EXISTING WORK TO BE REMOVED.
- EXISTING WORK
- NEW WORK
- *MECHANICAL EQUIPMENT CALL–OUT*
- BASE MOUNTED PUMP

GENERAL HVAC NOTES:

1. ALL DUCTWORK IS SHOWN IN SCHEMATIC FORM. DUCT RISES AND DROPS ARE NOT SHOWN, PROVIDE OFFSETS AS REQUIRED TO MEET SPACE REQUIREMENTS AND TO AVOID INTERFERENCE WITH OTHER TRADES. CONTRACTOR TO FIELD VERIFY DUCT SIZE, CONNECTIONS, CLEARANCES AND SERVICE PRIOR TO FINAL CONNECTION AND INSTALLATION OF DUCTWORK.
2. COORDINATE FINAL LOCATIONS OF DUCTWORK, AND MECHANICAL EQUIPMENT WITH LIGHTING, STRUCTURE, PIPING, SPRINKLER, DUCTWORK, ETC. PROVIDE OFFSETS, EASEMENTS OR RELOCATE DUCT AS REQUIRED TO AVOID CONFLICTS WITH WORK OF ALL TRADES.
3. DIFFUSERS, GRILLES, AND REGISTER LOCATIONS SHALL BE COORDINATED WITH REFLECTED CEILING PLANS AND ELECTRICAL LIGHTING PLANS.
4. ALL AUTOMATIC DAMPERS, FIRE DAMPERS, DAMPER OPERATORS, ETC. SHALL BE LOCATED ABOVE CEILINGS OR OTHER CONCEALED ACCESSIBLE LOCATIONS UNLESS NOTED OTHERWISE. LOCATE AND ARRANGE AUTOMATIC DAMPERS, DAMPER OPERATORS, ETC. TO BE ACCESSIBLE THROUGH LAY–IN CEILINGS OR 24"x24" ACCESS DOORS. PROVIDE AN ACCESS PANEL FOR ALL NON–ACCESSIBLE INSTALLATIONS.
5. PROVIDE RIGID METAL DUCT, WITH NO EXCEPTION, WHERE FIRE WALLS ARE PENETRATED.
6. FIRE DAMPERS SHALL BE INSTALLED AS REQUIRED IN ALL DUCTS PENETRATING FIRE RATED WALLS AS INDICATED ON DETAIL PLANS.
7. ELBOWS SHALL BE SQUARE ELBOWS CONSTRUCTED WITH TURNING VANES. RADIUS ELBOWS WITH CENTERLINE RADIUS OF NOT LESS THAN 1.5 TIMES THE DUCT WIDTH, MAY BE USED WHERE SPACE CONDITIONS PERMIT OR WHERE INDICATED ON DRAWINGS.
8. SLOPES FOR TRANSITIONS OR OTHER CHANGES IN DIMENSIONS SHALL BE MINIMUM 1 TO 4.
9. ALL BRANCH DUCT TAPS SHALL BE CONICAL FITTINGS ON ROUND MAINS AND 45° ENTRY FITTINGS ON RECTANGULAR MAINS.
10. MANUAL VOLUME DAMPERS SHALL BE PROVIDED ON ALL RETURN, SUPPLY, AND EXHAUST BRANCH DUCTS.
11. SUPPORT ALL DUCTWORK, EQUIPMENT, ETC. FROM TOP CHORD OF JOISTS OR STEEL FRAMING BEAMS.
12. UNLESS OTHERWISE INDICATED NO MECHANICAL SERVICES OR EQUIPMENT SHALL BE LOCATED OVER ELECTRICAL EQUIPMENT OR TELEPHONE EQUIPMENT ROOMS.
13. ALL DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS.
14. ALL SHEET METAL CONNECTIONS AND JOINTS SHALL BE SEALED TO SMACNA SEAL CLASS A.
15. FLEXIBLE RUNOUTS TO BE FACTORY INSULATED AND DO NOT REQUIRE FIELD INSULATION.
16. FLEXIBLE DUCTWORK SHALL BE A MINIMUM OF 36" TO A MAXIMUM OF 72" IN LENGTH.
17. PROVIDE DRAWBANDS AND U.L. 181 TYPE FOIL TAPE ON ALL ROUND FLEXIBLE DUCT CONNECTIONS.
18. ALL ROUND SHEET METAL SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE GALVANIZED SPIRAL CONDUIT.
19. SPRAY WASH EXISTING OUTSIDE AIR INTAKE LOUVERS AT HOUSING UNITS TO REMOVE ALGAE, OIL, FILM, DUST, ETC. USE CHEMICALS AS REQUIRED TO PROVIDE COMPLETE CLEANING.
20. DUCT PRESSURE CLASSIFICATIONS
    A. UNLESS NOTED OTHERWISE, RECTANGULAR AND ROUND SUPPLY DUCTWORK SHALL BE CONSTRUCTED AND REINFORCED TO MAINTAIN STRUCTURAL INTEGRITY AT PRESSURES AS HIGH AS + 2 IN. W.G.
    B. RECTANGULAR AND ROUND RETURN DUCTWORK AND ALL EXHAUST DUCTWORK SHALL BE CONSTRUCTED AND REINFORCED TO MAINTAIN STRUCTURAL INTEGRITY AT NEGATIVE PRESSURES AS LOW AS – 2 IN. W.G.

CONTROLS DEVICE SYMBOLS

- DP — LOCAL GAUGE OR DEVICE
- TTT — BAS CONTROL DEVICE
- T — TEMPERATURE SENSOR
- M — MOTION SENSOR
- CO2 — CO2 SENSOR
- CSD — CONTROL SAFETY DEVICE (BOILER)

CONTROLS DEVICE ABBREVIATIONS

CCV	COOLING CONTROL VALVE
DP	DIFFERENTIAL PRESSURE TRANSMITTER
FIT	FLOW INDICATING TRANSMITTER
FM	FLOW METER
HCV	HEATING CONTROL VALVE
LT	LEVEL TRANSMITTER
PG	PRESSURE GAUGE
PIT	PRESSURE INDICATING TRANSMITTER
SD	SMOKE DETECTOR
TG	TEMPERATURE GAUGE
TT	TEMPERATURE TRANSMITTER
TIT	TEMPERATURE INDICATING TRANSMITTER
TS	TEMPERATURE SWITCH
UVC	ULTRAVIOLET WAVE C AIR PURIFYER
ZSC	POSITION SWITCH CLOSED
ZSO	POSITION SWITCH OPEN
VSD	VARIABLE SPEED DRIVE

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

STATE OF MISSOURI — ROBERT FRANKLIN NORBER — E-27183 — REGISTERED PROFESSIONAL ENGINEER
5/17/2023

Veteran Owned Small Business — VOSB — VetBiz.gov

CROSSED SWORDS ENGINEERING
1619 NE OAK TREE DR.
LEE'S SUMMIT MO 64086
(816) 309-0099 Robert7721@aol.com
MO STATE CERTIFICATE OF AUTHORITY#2016003099

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

REPLACE HVAC & BOILER MULTIPLE ASSETS

RIVERBEND TREATMENT CENTER

ST. JOSEPH, MO 64507

PROJECT # H2305-01
SITE # 5718
ASSET # MULTIPLE ASSETS

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: 5/17/2023

CAD DWG FILE:M-001.DWG
DRAWN BY: PFS
CHECKED BY: RFS
DESIGNED BY: RFS

SHEET TITLE:
MECHANICAL LEGEND AND NOTES

SHEET NUMBER:
M-001

2 OF 7 SHEETS
MAY 17, 2023

GENERAL NOTES

1. CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF HVAC EQUIPMENT WITH THE EXISTING BUILDING'S LAYOUT, EQUIPMENT PADS, STRUCTURES, PIPING, ETC.
2. ALL MECHANICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE (IMC), AND ASHRAE 90.1 2016 ENERGY STANDARD FOR BUILDINGS.
3. EXISTING DUCTWORK WILL BE MODIFIED AS REQUIRED TO FIT NEW HVAC EQUIPMENT CONNECTIONS.
4. CONTRACTOR SHALL REPAIR ANY OUTSIDE DISTURBED LANDSCAPE TO LEVEL GRADE AND RESEED AS REQUIRED.

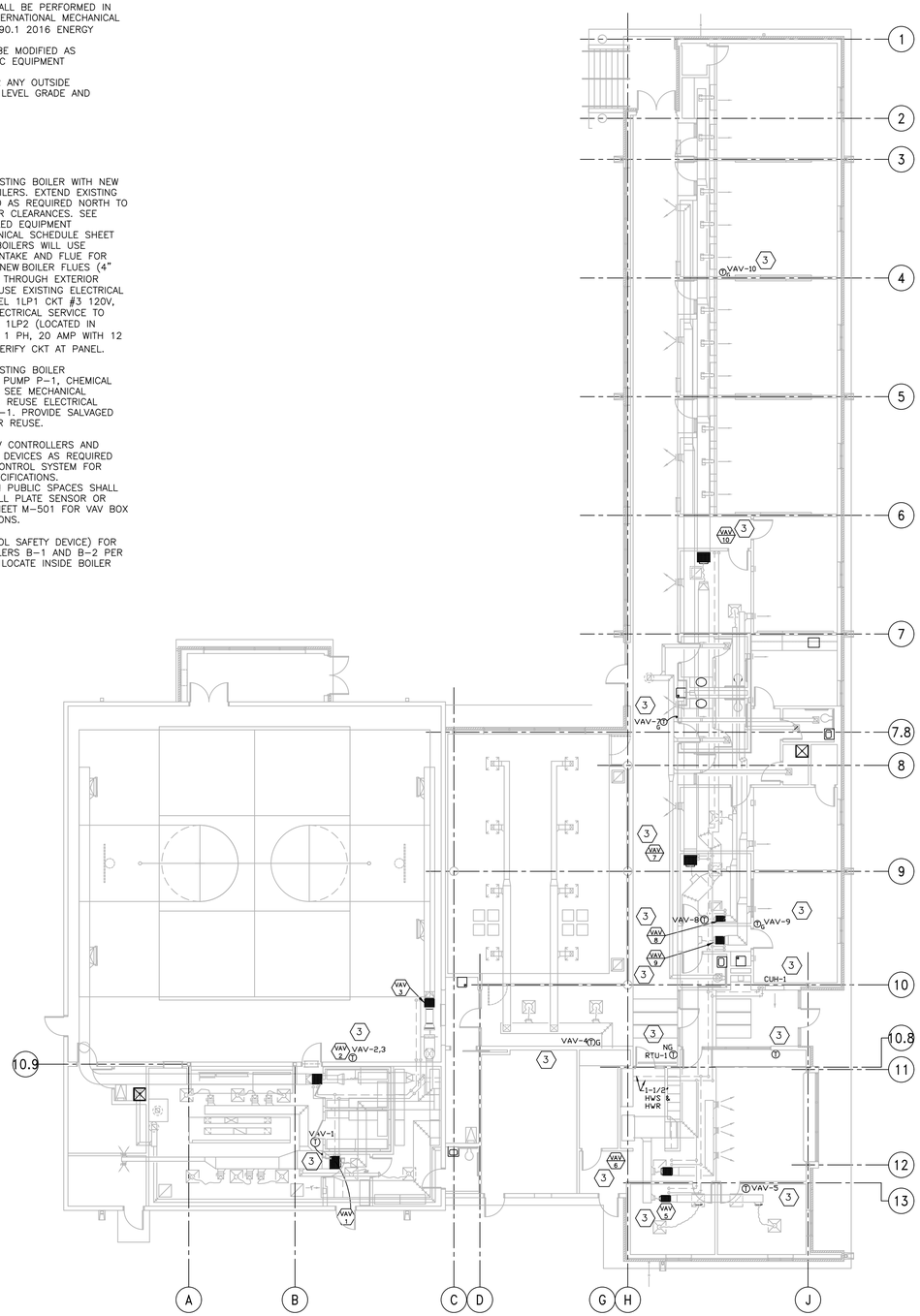
PLAN NOTES

(1) REMOVE AND REPLACE EXISTING BOILER WITH NEW 2 X 50% CONDENSING BOILERS. EXTEND EXISTING CONCRETE EQUIPMENT PAD AS REQUIRED NORTH TO ACCOMMODATE NEW BOILER CLEARANCES. SEE SHEET M-501 FOR DETAILED EQUIPMENT CONNECTIONS AND MECHANICAL SCHEDULE SHEET M-601 FOR EQUIPMENT. BOILERS WILL USE EXISTING THROUGH WALL INTAKE AND FLUE FOR NEW FRESH AIR INTAKES. NEW BOILER FLUES (4" CPVC) WILL BE INSTALLED THROUGH EXTERIOR WALL. BOILER B-1 TO REUSE EXISTING ELECTRICAL SERVICE CONNECTION PANEL 1LP1 CKT #3 120V, 20 AMP. PROVIDE NEW ELECTRICAL SERVICE TO BOILER B-2 USING PANEL 1LP2 (LOCATED IN KITCHEN) CKT 15, 120 V, 1 PH, 20 AMP WITH 12 AWG CU IN ¾" CONDUIT. VERIFY CKT AT PANEL.

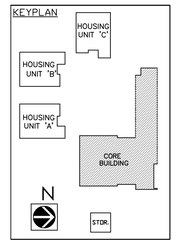
(2) REMOVE AND REPLACE EXISTING BOILER ACCESSORIES TO INCLUDE PUMP P-1, CHEMICAL SHOT FEEDER, STRAINERS, SEE MECHANICAL SCHEDULE. PRESERVE AND REUSE ELECTRICAL CONNECTIONS TO PUMP P-1. PROVIDE SALVAGED EQUIPMENT TO OWNER FOR REUSE.

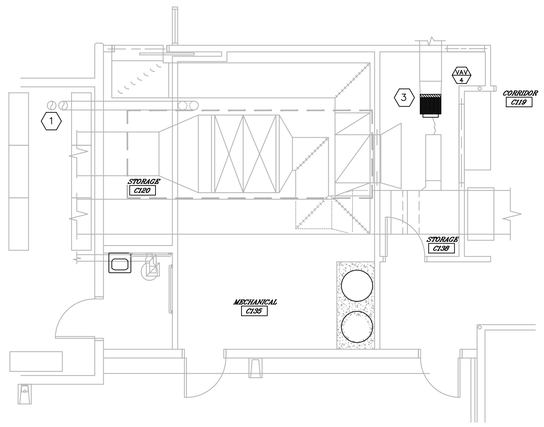
(3) REPLACE/INSTALL NEW VAV CONTROLLERS AND ASSOCIATED TEMPERATURE DEVICES AS REQUIRED TO INSTALL A NEW BAS CONTROL SYSTEM FOR ENTIRE COMPLEX PER SPECIFICATIONS. TEMPERATURE SENSORS IN PUBLIC SPACES SHALL BE HONEYWELL C7772 WALL PLATE SENSOR OR APPROVED EQUAL. SEE SHEET M-501 FOR VAV BOX PIPING SYSTEM MODIFICATIONS.

(4) INSTALL NEW CSD (CONTROL SAFETY DEVICE) FOR SAFE SHUT DOWN OF BOILERS B-1 AND B-2 PER ASME AND LOCAL CODES. LOCATE INSIDE BOILER ROOM AT DOOR EXIT.

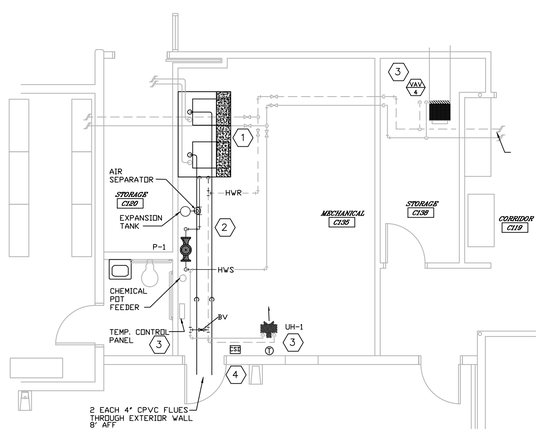


N CORE BUILDING FLOOR PLAN
SCALE: 1/8"=1'-0"





CORE BUILDING MECHANICAL ROOM PLAN
SCALE: 1/4"=1'-0" (UPPER LEVEL PLAN)



CORE BUILDING MECHANICAL ROOM PLAN
SCALE: 1/4"=1'-0" (LOWER LEVEL PLAN)

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

STATE OF MISSOURI
ROBERT F. SMITH
NUMBER E-27183
REGISTERED PROFESSIONAL ENGINEER
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REPLACE HVAC & BOILER MULTIPLE ASSETS

RIVERBEND TREATMENT CENTER

ST. JOSEPH, MO 64507

PROJECT # H2305-01
SITE # 5718
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REVISION:
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ISSUE DATE: 5/17/2023

CAD DWG FILE: M-101.DWG
DRAWN BY: RFS
CHECKED BY: JC
DESIGNED BY: RFS

SHEET TITLE:
MECHANICAL PLAN CORE BUILDING

SHEET NUMBER:
M-101

3 OF 7 SHEETS
MAY 17, 2023

GENERAL NOTES

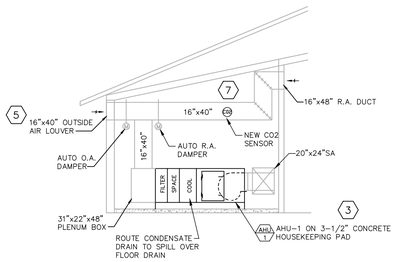
1. CONTRACTOR SHALL COORDINATE FINAL LOCATIONS OF HVAC EQUIPMENT WITH THE EXISTING BUILDING'S LAYOUT, EQUIPMENT PADS, STRUCTURES, PIPING, ETC.
2. ALL MECHANICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE (IMC), AND ASHRAE 90.1 2016 ENERGY STANDARD FOR BUILDINGS.
3. EXISTING DUCTWORK WILL BE MODIFIED AS REQUIRED TO FIT NEW HVAC EQUIPMENT CONNECTIONS.
4. CONTRACTOR SHALL REPAIR ANY OUTSIDE DISTURBED LANDSCAPE TO LEVEL GRADE AND RESEED AS REQUIRED.

PLAN NOTES

1. REMOVE AND REPLACE EXISTING OUTDOOR CONDENSING UNIT. REUSE EXISTING CONCRETE EQUIPMENT PAD. PROVIDE NEW RS&RL PIPING FROM CU TO INDOOR AHU. PRESERVE AND REUSE EXISTING ELECTRICAL SERVICE CONNECTION. SEE MECHANICAL EQUIPMENT SCHEDULE SHEET M-601.
2. REMOVE AND REPLACE EXISTING TEMPERATURE SENSOR. REPLACE WITH HIGH SECURITY TEMPERATURE SENSOR HONEYWELL C7772 OR EQUAL. LOCATE AT APPROX. 8' AFF ABOVE WATER FOUNTAIN. PROVIDE REMOTE READOUT FOR TEMPERATURE IN MECHANICAL ROOM. SEE SPECIFICATIONS.
3. REMOVE AND REPLACE EXISTING AHU. PRESERVE AND MODIFY EXISTING DUCTWORK AS REQUIRED FOR REMOVAL AND INSTALLATION OF NEW REPLACEMENT AHU. PRESERVE AND REUSE EXISTING ELECTRICAL SERVICE CONNECTION. REMOVE AND REPLACE ALL CONTROLS AND DEVICES AS REQUIRED FOR THE INSTALLATION OF A NEW BAS CONTROL SYSTEM. SEE MECHANICAL SCHEDULE SHEET M-601 AND SPECIFICATIONS.
4. REMOVE AND REPLACE EXISTING DUCT FURNACE. PRESERVE AND MODIFY EXISTING DUCTWORK, NATURAL GAS PIPING, AND ELECTRICAL SERVICE AS REQUIRED FOR REMOVAL AND INSTALLATION OF NEW DF. SEE MECHANICAL SCHEDULE.
5. EXISTING OUTSIDE AIR LOUVER. CLEAN AIR INTAKE LOUVER AND SCREENS. REPLACE/REPAIR INLET SCREENS AS REQUIRED.
6. EXISTING ELECTRIC UNIT HEATER. NO WORK/MODIFICATIONS REQUIRED.
7. INSTALL NEW DUCT MOUNTED CO2 SENSOR WITH READOUT, HONEYWELL MODEL C7232B1006 OR EQUAL.

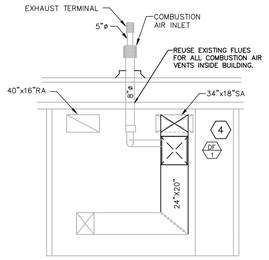
CONSTRUCTION PROJECT PHASING

THE HOUSING UNITS SHALL BE PHASED FOR CONSTRUCTION SUCH THAT ONLY ONE UNIT SHALL BE OUT OF OPERATION AT A TIME.



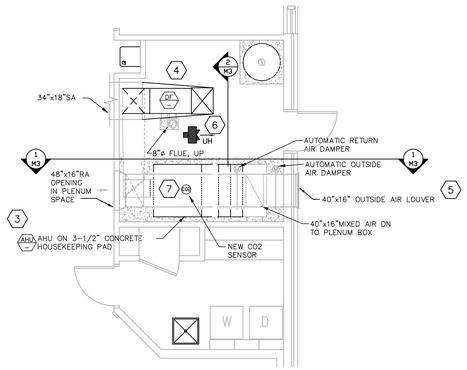
1 M102 SECTION LOOKING AT AHU-1
SCALE: 1/4"=1'-0"

NOTE:
MECHANICAL ROOM IS TYPICAL FOR UNIT 'B' & 'C'
UNIT 'A' IS MIRRORED.



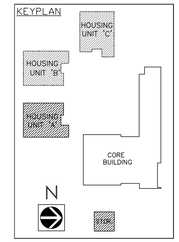
2 M102 SECTION LOOKING AT DF-1
SCALE: 1/4"=1'-0"

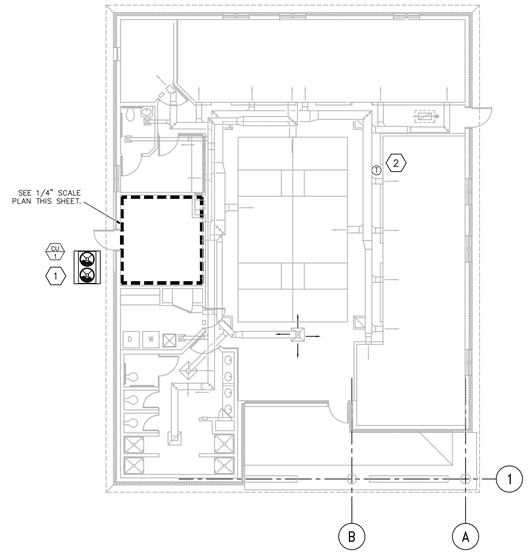
NOTES:
1. MECHANICAL ROOM IS TYPICAL FOR UNIT 'B' & 'C' UNIT 'A' IS MIRRORED.
2. CONSULT MANUFACTURERS INSTALLATION INSTRUCTIONS FOR DUCT FURNACE INSTALLATION



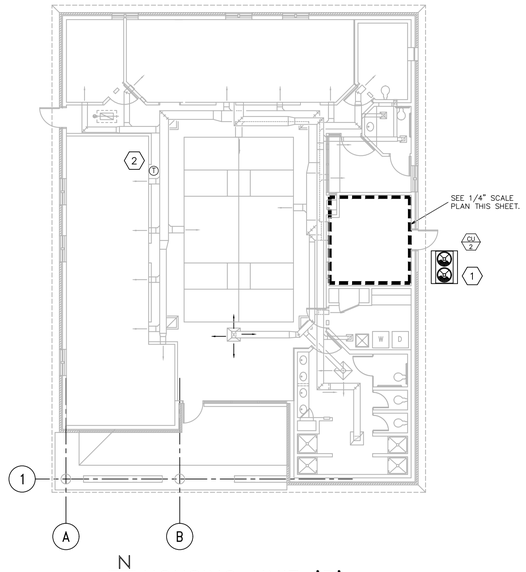
HOUSING UNIT MECHANICAL ROOM PLAN
SCALE: 1/4"=1'-0" (TYPICAL FOR UNIT'S A, B, & C)

NOTE:
MECHANICAL ROOM IS TYPICAL FOR UNIT 'B' & 'C'.
UNIT 'A' IS MIRRORED. AHU AND DUCT FURNACE NUMBERING IS 1 FOR "A", 2 FOR "B" AND 3 FOR "C".

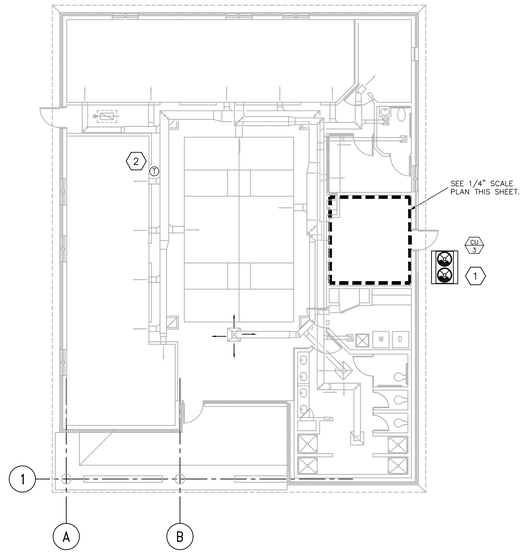




N HOUSING UNIT 'A'
SCALE: 1/8"=1'-0"



N HOUSING UNIT 'B'
SCALE: 1/8"=1'-0"



N HOUSING UNIT 'C'
SCALE: 1/8"=1'-0"

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

STATE OF MISSOURI
ROBERT FRANCIS SMITH
NUMBER E-27183
REGISTERED PROFESSIONAL ENGINEER
5/17/2023

Veteran Owned Small Business
VOSB
CVE

CROSSED SWORDS ENGINEERING
1619 NE OAK TREE DR.
LEE'S SUMMIT MO 64086
(816) 309-0099 Robert7721@aol.com
MO STATE CERTIFICATE OF AUTHORITY#2016003099

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

REPLACE HVAC & BOILER MULTIPLE ASSETS

RIVERBEND TREATMENT CENTER

ST. JOSEPH, MO 64507

PROJECT # H2305-01
SITE # 5718
ASSET # MULTIPLE ASSETS

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: 5/17/2023

CAD DWG FILE: M-101.DWG
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SHEET TITLE:
MECHANICAL PLAN HOUSING UNITS

SHEET NUMBER:
M-102

4 OF 7 SHEETS
MAY 17, 2023

CORE BUILDING HVAC – SEQUENCE OF OPERATIONS

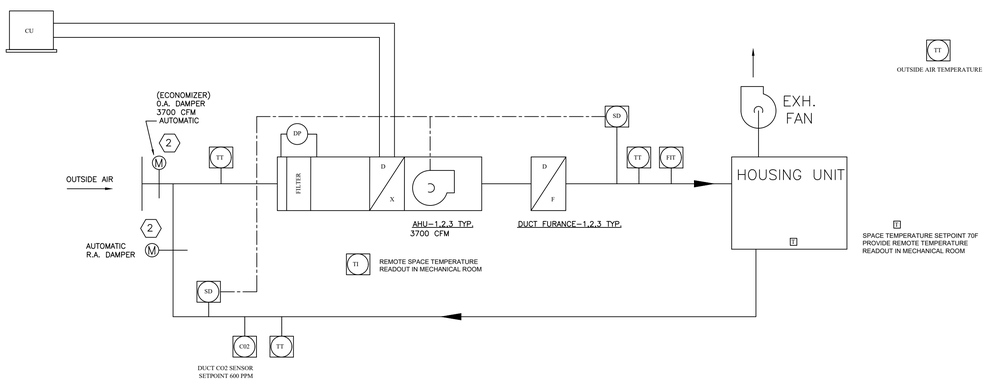
1. HEATING OR COOLING MODE SHALL BE AUTOMATICALLY SELECTED BY THE BAS SYSTEM. INITIAL SETTING FOR HEATING MODE "ON" SHALL BE BE WHEN THE OUTSIDE AIR TEMPERATURE IS AT OR BELOW 60 DEG F. COOLING MODE SHALL BE ENABLED "ON" WHEN OUTSIDE AIR TEMPERATURE IS AT OR ABOVE 65 DEG F. THESE SETTINGS SHALL BE FULLY ADJUSTABLE IN THE BAS CONTROL SYSTEM. MANUAL OVERRIDE SHALL BE AVAILABLE FOR THE OPERATOR.
2. WHEN SYSTEM IS IN COOLING MODE. EXISTING RTU–1 SHALL BE COMMANDED ON AND PROVIDE SUPPLY AIR AT 55 DEG F. ROOM TEMPERATURE SENSORS SHALL PROVIDE CONTROL TO EXISTING VAV BOX DAMPERS TO MAINTAIN ROOM TEMPERATURE SET POINTS. DUCT PRESSURE SENSOR SHALL CONTROL THE SUPPLY FAN WITH VARIABLE SPEED DRIVE TO MAINTAIN DUCT PRESSURE SETPOINT. (ADJUSTABLE). FLOW, TEMPERATURES AND PRESSURES SHALL BE MONITORED IN THE BAS SYSTEM.
3. ECONOMIZER MODE SHALL BE ENABLED FOR RTU WHEN OUTSIDE AIR TEMPERATURE IS AT OR BELOW 55 DEG F.
4. HYDRONIC PRIMARY AND SECONDARY PUMPING SYSTEM SHALL BE ENABLED/DISABLED BY THE BAS SYSTEM.
5. WHEN BAS SYSTEM IS IN HEATING MODE, BOILERS B–1 AND B–2 SHALL BE COMMANDED ON WITH THEIR CORRESPONDING CIRCULATION PUMP IN SEQUENCE TO MAINTAIN A HEATING SUPPLY TEMPERATURE OF 190 DEG F (OA RESET ADJUSTABLE). SUPPLY TEMPERATURE FROM EACH BOILER SHALL BE MONITORED IN THE BAS SYSTEM. BOILER STATUS, PUMP STATUS SHALL BE MONITORED IN THE BAS SYSTEM. PUMP P–1 VARIABLE SPEED DRIVE SHALL BE CONTROLLED BY THE DIFFERENTIAL PRESSURE SENSOR TO MAINTAIN SYSTEM DIFFERENTIAL PRESSURE OF 40' TDH (ADJUSTABLE). VAV TERMINAL BOX REHEAT CONTROL 2–WAY VALVES SHALL MODULATE TO MAINTAIN ROOM TEMPERATURE SETPOINTS.
6. BOILER SUPPLY TEMPERATURE OUTDOOR AIR RESET. WHEN OUTDOOR AIR TEMPERATURE IS 60 DEG F, BOILER SUPPLY TEMPERATURE SHALL BE 120 DEG F. WHEN OUTDOOR AIR TEMPERATURE IS 25 DEF F, BOILER SUPPLY TEMPERATURE SHALL BE 190 DEG F. ALL SETPOINTS SHALL BE ADJUSTABLE IN BAS SYSTEM.
7. ALL TEMPERATURE, PRESSURE, FLOW SENSORS SHALL BE DISPLAYED IN THE BAS CONTROL SYSTEM.
8. SMOKE DETECTOR(S) (SD) WILL SHUT DOWN RTU UPON DETECTION OF SMOKE.
9. SEE SPECIFICATION 230993 SEQUENCE OF OPERATIONS FOR ADDITIONAL INFORMATION.

HOUSING UNITS HVAC – SEQUENCE OF OPERATIONS

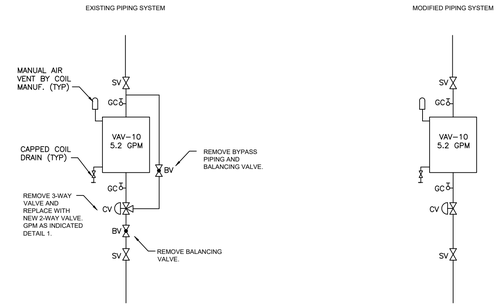
1. HEATING OR COOLING MODE SHALL BE AUTOMATICALLY SELECTED BY THE BAS SYSTEM. INITIAL SETTING FOR HEATING MODE "ON" SHALL BE BE WHEN THE OUTSIDE AIR TEMPERATURE IS AT OR BELOW 60 DEG F. COOLING MODE SHALL BE ENABLED "ON" WHEN OUTSIDE AIR TEMPERATURE IS AT OR ABOVE 65 DEG F. THESE SETTINGS SHALL BE FULLY ADJUSTABLE IN THE BAS CONTROL SYSTEM. MANUAL OVERRIDE SHALL BE AVAILABLE FOR THE OPERATOR.
2. WHEN SYSTEM IS IN COOLING MODE. AHU SHALL BE COMMANDED ON AND PROVIDE SUPPLY AIR AT 55 DEG F. ROOM TEMPERATURE SENSOR SHALL PROVIDE CONTROL TO AHU AND CONDENSING UNIT TO MAINTAIN ROOM TEMPERATURE SET POINT. TEMPERATURES SHALL BE MONITORED IN THE BAS SYSTEM.
3. WHEN BAS SYSTEM IS IN HEATING MODE, DUCT FURNACE SHALL BE COMMANDED ON IN STAGES TO MAINTAIN A HEATING ROOM TEMPERATURE SETPOINT OF 70 DEG F (ADJUSTABLE). SUPPLY TEMPERATURE FROM EACH AHU SHALL BE MONITORED IN THE BAS SYSTEM.
4. ECONOMIZER MODE SHALL BE ENABLED WHEN TEMPERATURE IS AT OR BELOW 55 DEG F.
5. THE OUTSIDE AIR DAMPER SHALL BE NORMALLY CLOSED. THE CO2 SENSOR IN THE SPACE SHALL BE MONITORED AND OA DAMPER OPENED IN ORDER TO MAINTAIN A CO2 LEVEL AT OR BELOW 600 PPM (ADJUSTABLE).
6. SMOKE DETECTOR(S) (SD) WILL SHUT DOWN THE AHU UPON DETECTION OF SMOKE.
7. SEE SPECIFICATION 230993 SEQUENCE OF OPERATIONS FOR ADDITIONAL INFORMATION.

PLAN NOTES

1. MODIFY VAV BOX/UH/CUH SYSTEM PIPING PER DETAIL 3. REMOVE THE 3–WAY VALVES, BYPASS PIPING AND BALANCING VALVES. REPLACE THE 3 WAY VALVES WITH 2 WAY VALVES WITH GPM MAXIMUM FLOWS AS INDICATED.
2. REUSE EXISTING DUCT MOUNTED CONTROL DAMPER. RECONNECT TO NEW BAS SYSTEM.
3. INSTALL NEW PIPING BYPASS WITH ADJUSTABLE BALANCE VALVE TO PROVIDE FOR PUMP P–1 MINIMUM FLOW. INSTALL ON SUPPLY AND RETURN LINES TO UH–1.

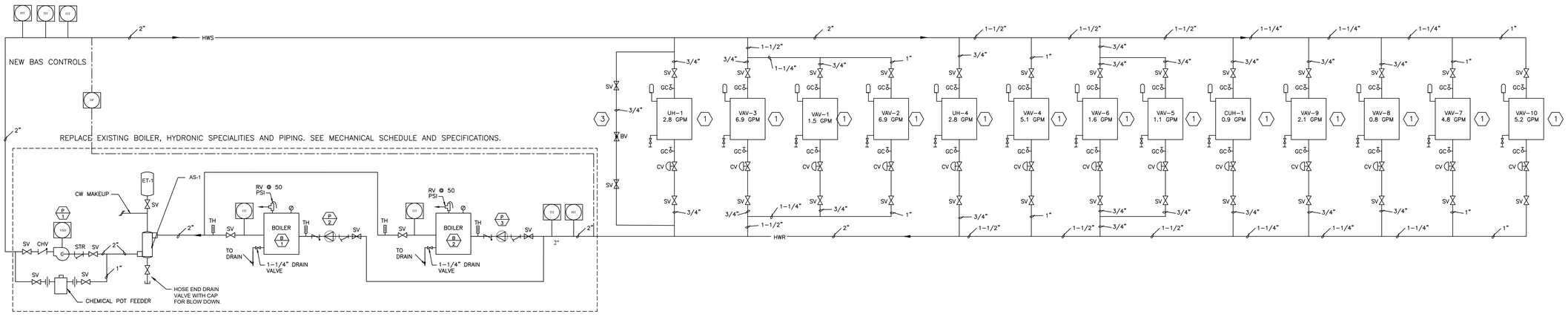


2 M-501 HOUSING UNIT AHU DIAGRAM
NOT TO SCALE



TYPICAL PER VAV BOX/UH/CUH

3 M-501 VAV BOX/UH/CUH CONVERSION TO 2 WAY VALVES
NOT TO SCALE



1 M-501 CORE BUILDING BOILER SYSTEM PIPING AND CONTROLS DIAGRAM
NOT TO SCALE

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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RIVERBEND TREATMENT CENTER

ST. JOSEPH, MO 64507

PROJECT #	H2305-01
SITE #	5718
ASSET #	MULTIPLE ASSETS

REVISION: DATE:
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ISSUE DATE: 5/17/2023

CAD DWG FILE: M-501.DWG
DRAWN BY: RFS
CHECKED BY: RFS
DESIGNED BY: RFS

SHEET TITLE:
MECHANICAL DETAILS

SHEET NUMBER:
M-501

AIR HANDLING UNIT SCHEDULE

PLAN MARK	UNIT IDENTIFICATION: LOCATION / AREA SERVED	UNIT TYPE	UNIT ARRANGEMENT	BASIS OF DESIGN: MANU	BASIS OF DESIGN: MODEL NUMBER	BASIS OF DESIGN: SIZE	SUPPLY FAN: SUPPLY (CFM)	MIN OA (CFM)	STATIC (IN. WG): EXT.	STATIC (IN. WG): TOTAL	FAN DATA: TYPE	FAN DATA: POSITION	FAN DATA: DIA (IN.)	FAN DATA: RPM	MOTOR DATA: HP	MOTOR DATA: BHP	MOTOR DATA: VOLTS/PH/HZ	FILTERS: TYPE	FILTERS: TOTAL AREA (SF)	COOLING COIL: COOLING AIRFLOW (CFM)	COOLING COIL: MAX. FV (FPM)	COOLING COIL: MATERIAL
AHU-1,2,3	HOUSING UNIT	DRAW THRU	HORIZONTAL COIL	YORK	SOLUTIONS SERIES	XTI-36x54	3700	425	1.8	3.3	AF	TOP HORIZONTAL	12-12	2752.0	5.0	3.1	208/3/60	2" FLAT	BY MANU	3700	600	COPPER AL FINS

PLAN MARK	DX COOLING CAPACITY: COOLING CAPACITY TOTAL (MBH)	COOLING CAPACITY SENSIBLE (MBH)	ENTERING AIR DB (DEG. F)	ENTERING AIR WB (DEG. F)	LEAVING AIR DB (DEG. F)	LEAVING AIR WB (DEG. F)	ELECTRICAL DATA: FLA	REMARKS
AHU-1,2,3	120.0	96.0	78.0	64.8	55.0	54.8	14	1

REMARKS:
1. HORIZONTAL, INDOOR CONFIGURATION. PROVIDE WITH VARIABLE FREQUENCY DRIVE.

AIR COOLED CONDENSING UNIT

PLAN MARK	UNIT IDENTIFICATION: LOCATION / AREA SERVED	CAPACITY (TONS) NOMINAL	BASIS OF DESIGN: MANUFACTURER	BASIS OF DESIGN: MODEL NUMBER	TYPE	COMPRESSOR NO.	AMBIENT TEMP DEG. F DB	MINIMUM UNIT EER	MINIMUM STEPS OF CONTROL	ELECTRICAL DATA: SERVICE (VOLTS/PH/HZ)	ELECTRICAL DATA: MCA	ELECTRICAL DATA: MOCP	REMARKS
CU-1,2,3	HOUSING UNITS	10.0	JOHNSON CONTROLS	J10YCC00A2G	SCROLL	1	95.0	11.0	2	208/3/60	46.4	60.0	1

REMARKS:
1. PROVIDE WITH HAIL GUARDS

BOILER SCHEDULE

PLAN MARK	UNIT IDENTIFICATION: LOCATION/ AREA SERVED	TYPE/ ARRANGEMENT	MAX PRESS	GAS HEATING DATA: BASIS OF DESIGN: MANUFACTURER	BASIS OF DESIGN: MODEL NUMBER	GAS TYPE	OUTPUT (MBH)	EFF	GPM FLOW	LEAVING WATER TEMP DEG F	RETURN WATER TEMP DEG F	ELECTRICAL DATA: SERVICE (VOLTS/PH/HZ)	HP	FLA	REMARKS
B1,2	CORE BUILDING	HOT WATER	150 PSI	LOCHINVAR	KNIGHT XL KBX0400N	NG	388.0	97.0%	21	190	153	115/1/60	0.5	15.5	1

REMARKS:
1. 2 X 50% SYSTEM. "VENT DIAMETER 4", AIR INTAKE DIAMETER 4".

DUCT FURNACE

PLAN MARK	UNIT IDENTIFICATION: LOCATION/ AREA SERVED	TYPE/ ARRANGEMENT	CFM	UNIT CAPACITY: BASIS OF DESIGN: MANUFACTURER	BASIS OF DESIGN: MODEL NUMBER	DIM INCHES LENGTH X WIDTH X HT	HEATING (MBH) INPUT	HEATING (MBH) OUTPUT	GAS CONN	ELECTRICAL DATA: SERVICE (VOLTS/PH/HZ)	MAX WATTS	REMARKS
DF-1,2,3	HOUSING UNITS	DUCT MOUNTED	3700	REZNOR	125	17 x 26 x 35	120.0	96.0	1/2"	115/1/60	70.0	1

REMARKS:
1. ENTERING AIR 63.5 DEG DB, LEAVING AIR 87 DEG DB. PROVIDE 2 STAGE CONTROL.

AIR SEPARATOR

PLAN MARK	UNIT IDENTIFICATION: LOCATION/ AREA SERVED	TYPE/ ARRANGEMENT	MAX PRESS	BASIS OF DESIGN: MANUFACTURER	BASIS OF DESIGN: MODEL NUMBER	INLET SIZE	CAPACITY GPM	TYPE CONNECTION	REMARKS
AS-1	CORE BUILDING	INLINE	150 PSI	BELL & GOSSETT	R-2	2"	50	NPT	1

REMARKS:
1. ASME INLINE WITH CEILING SUPPORT MOUNT. PROVIDE WITH AUTOMATIC AIR VENT BELL AND GOSSETT MODEL 107A. OR APPROVED EQUAL BY WATTS OR TACO.

PUMP SCHEDULE

PLAN MARK	UNIT IDENTIFICATION: UNIT TYPE	SERVICE	LOCATION SERVED	DESIGN DATA: FLOW (GPM)	HEAD (FT)	HP BHP	HP MTR	BASIS OF DESIGN: MANUF	BASIS OF DESIGN: MODEL	BASIS OF DESIGN: CAPACITY	ELECTRICAL: VOLTAGE	ELECTRICAL: PHASE	ELECTRICAL: HZ	REMARKS
BP 1	BOILER WATER	HEATING HOT WATER	CORE BUILDING	39	40	.9	1.5	BELL AND GOSSET	E-60 Series 1.5 X 1.5 X 7	1 X 100%	208/3	1	60	1
BP 2,3	BOILER WATER	BOILER CIRCULATION	BOILER	21	15	.125	.09	BELL AND GOSSET	PL-45	1 X 100%	120/1	1	60	2

REMARKS:
1. 1 x 100% CIRCULATING PUMPS TO VAV BOXES CORE BUILDING REHEAT SYSTEM. HEATING HOT WATER SYSTEM TEMPERATURE 160-190 DEF F. PROVIDE WITH VARIABLE SPEED DRIVE.
2. BOILER CIRCULATING PUMPS. 1 PER BOILER

EXPANSION TANKS

PLAN MARK	UNIT IDENTIFICATION: LOCATION/ AREA SERVED	TYPE/ ARRANGEMENT	MAX PRESS	BASIS OF DESIGN: MANUFACTURER	BASIS OF DESIGN: MODEL NUMBER	INLET SIZE	TANK VOLUME	TANK ACCEPTANCE VOLUME	TYPE	REMARKS
ET-1	CORE BUILDING	EXPANSION TANK	150 PSI	AMTROL EXTROL	AX-15(V)-DD	3/4"	8.6	3	DIAPHRAGM	1

REMARKS:
1. ASME VERTICAL FLOOR MOUNTED HYDRONIC TANK OR APPROVED EQUAL BY ARMSTRONG, TACO, OR WESSELS.

CHEMICAL SHOT FEEDER

PLAN MARK	UNIT IDENTIFICATION: LOCATION/ AREA SERVED	TYPE/ ARRANGEMENT	MAX PRESS	BASIS OF DESIGN: MANUFACTURER	BASIS OF DESIGN: MODEL NUMBER	INLET SIZE	OUTLET SIZE	DRAIN SIZE	VOLUME	MAX TEMP	REMARKS
CF-1	CORE BUILDING	CHEMICAL SHOT FEEDER	200 PSI	WESSELS NON-ASME	CPFT-3	3/4"	3/4"	3/4"	3 GALLON	200 F	1

REMARKS:
1. OR APPROVED EQUAL BY NEPTUE, BYRAN, OR BURNHAM.

NOTE: ALL MANUFACTURERS LISTED ARE BASIS OF DESIGN ONLY. ADDITIONAL MANUFACTURERS ARE LISTED IN PROJECT SPECIFICATIONS.

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SITE # 5718
ASSET # MULTIPLE ASSETS

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CHECKED BY: RFS
DESIGNED BY: RFS

SHEET TITLE:
MECHANICAL SCHEDULES NEW EQUIPMENT

SHEET NUMBER:
M-601

MECHANICAL SCHEDULES
EXISTING EQUIPMENT
FOR REFERENCE ONLY - USE WITH NEW BAS
CONTROL SYSTEM INSTALLATION

ROOFTOP PACKAGED AIR CONDITIONING UNIT

					SUPPLY FAN				DX COOLING COIL			INDIRECT FIRED GAS HEATING SECTION					CONDENSER		COMPRESSORS		ELECTRICAL		
															HEATING FUEL								
MARK	MFR.	MODEL NO.	NOMINAL TONS (COOLING)	REFRIG.	UNIT CFM	EXT. S.P. IN W.C.	HP	MIN. OUTSIDE AIR CFM	TOT. CAP. MBH	SENS. CAP. MBH	ENT. AIR DB/WB °F	FUEL TYPE	FIRING STAGES	TOT. CAP. MBH (HI/LOW) (3)	INPUT MBH (HI/LOW) (3)	HEATING VALUE BTU/CF	TYPE	AMBIENT. TEMP. °F	NO. OF COMP.	MIN EER	VOLTS	PHASE	NOTES
RTU-1	TRANE	YCD600A	41	R22	16,000	2.0	15	2875	491.8	420.6	79.0/65.3	NAT. GAS	2	324/243	400/300	1000	AIR COOLED	105	3	8.5	208	3	(1) (2) (3) (4) (5) (6)(7)

(1) UNIT SHALL BE PROVIDED WITH TWO POWERED EXHAUST (RELIEF) FANS SIZED FOR 25% EACH OF TOTAL DESIGN FLOW AT 0.25" ESP. FANS SHALL BE TWO SPEED (HIGH AND LOW).
(2) UNIT SHALL BE PROVIDED WITH 2", 30% EFFICIENT FILTERS, FARR 30-30 OR EQUAL BY AMERICAN AIR FILTER.
(3) HIGH STAGE IS TOTAL HEATING CAPACITY.
(4) MANUFACTURERS LISTED IN SPECIFICATION SHALL REVIEW ROOF PLAN SHEET M-2 TO VERFIY IF ANY DERATION IS NECESSARY BASED ON LAYOUT AND SCREENING OF RTU. RTU PHYSICAL DIMENSIONS SHALL BE EQUAL TO OR SMALLER IN SIZE THAN THE ONE SHOWN ON THE PLANS.
(5) PROVIDE WITH 100% DRY BULB ECONOMIZER.
(6) PROVIDE WITH FACTORY MOUNTED VARIABLE SPEED DRIVE AND VAV FROSTAT CONTROL.
(7) PROVIDE WITH FACTORY INSULATED ROOF CURB.

VAV TERMINAL BOX SCHEDULE

					AIRFLOW (CFM)							HEATING COIL DATA								
																		MAXIMUM PD		
MARK	MFR.	MODEL	SERVICE	TYPE	MAX.	MIN.	MAX. SP DROP (BOX+ COIL)	DESIGN INLET SIZE	MINIMUM DESIGN INLET SP	MINIMUM DESIGN OUTLET SIZE	MAXIMUM NOISE CRITERION VALUE	CFM	CAPACITY (MBH)	EAT	EWT	GPM	ROWS	AIR	WATER	NOTES
VAV-1	TITUS	DESV	KITCHEN	VAV-PRESS IND.	3100	0	0.50	16"	1.25	24X18	40	540	26.2	60	185	1.5	1	0.15	1.0	(1) (2)
VAV-2	TITUS	DESV	MULTIPURPOSE	VAV-PRESS IND.	2250	450	0.80	14"	1.25	20X17	40	1800	120.7	60	185	6.9	3	0.65	2.0	(1) (2)
VAV-3	TITUS	DESV	MULTIPURPOSE	VAV-PRESS IND.	2250	450	0.80	14"	1.25	20X17	40	1800	120.7	60	185	6.9	3	0.65	2.0	(1) (2)
VAV-4	TITUS	DESV	RECEPTION	VAV-PRESS IND.	2330	460	0.50	14"	1.25	20X17	35	1500	89.0	60	185	5.1	2	0.20	1.0	(1) (2)
VAV-5	TITUS	DESV	OFFICES (SW)	VAV-PRESS IND.	790	175	0.50	9"	1.25	14X12	35	390	19.0	60	185	1.1	2	0.15	1.0	(1) (2)
VAV-6	TITUS	DESV	CLERICAL	VAV-PRESS IND.	1200	325	0.50	12"	1.25	16X15	40	590	28.7	60	185	1.6	2	0.15	1.0	(1) (2)
VAV-7	TITUS	DESV	CORRIDOR	VAV-PRESS IND.	2700	0	0.20	16	1.25	24X18	35	1600	87.0	60	185	4.8	2	0.20	1.5	(1) (2)
VAV-8	TITUS	DESV	NURSES	VAV-PRESS IND.	460	105	0.30	7"	1.25	12X10	35	275	13.4	60	185	0.8	2	0.15	1.0	(1) (2)
VAV-9	TITUS	DESV	OFFICES	VAV-PRESS IND.	1515	325	0.60	12"	1.25	16X15	35	770	37.4	60	185	2.1	2	0.15	1.0	(1) (2)
VAV-10	TITUS	DESV	CLASSRMS/LIBRARY.	VAV-PRESS IND.	2550	750	0.60	16"	1.25	24X18	35	1500	92.1	60	185	5.2	2	0.20	1.5	(1) (2)

(1) FACTORY INSTALL CONTROLLER AND ACTUATOR SUPPLIED BY TEMPERATURE CONTROL CONTRACTOR.
(2) UNIT SHALL BE CAPABLE OF DUAL MINIMUM SET POINT TO REFLECT FIRSTLY THE MINIMUM SETPOINT SHOWN FOR THE COOLING AIRFLOW AND SECONDLY FOR THE HEATING AIRFLOW.

CABINET UNIT HEATER SCHEDULE

							HEATING						ELEC. DATA			
MARK	LOCATION	MFR.	MODEL	ARRANGEMENT	CFM	HP	EAT (°F)	MBH	GPM	EWT (°F)	TD (°F)	WPD (FT.)	V	PH	HZ	NOTES
CUH-1	MAIN ENTRY	VULCAN	RW-02	RECESSED WALL	230	1/15	60	15.6	0.9	185	35	0.25	120	1	60	(1) (2)

(1) PROVIDE WITH MOTOR STARTER W/ MANUAL RESET TOGGLE SWITCH AND THERMAL OVERLOAD.
(2) PROVIDE WITH DISCONNECT SWITCH WITH MOTOR OVERLOAD PROTECTION INSTALLED IN WIRING TO MOTOR.

UNIT HEATER SCHEDULE

MARK	MFR.	MODEL	HEAT CAP (MBH)	EAT (F°)	EWT (F°)	GPM	WATER PD (FT. HD.)	CFM	HP	VOLTS/ PHASE	NOTES
UH-4	TRANE	60-S	27	60	750	2.8	0.16	280	1/30	120/1	(1)

(1) WITH UNIT-MOUNTED THERMOSTAT

FAN SCHEDULE

MARK	MFR.	MODEL	TYPE	SERVICE	CFM	STATIC PRESS. (IN. W.C.)	FAN RPM	HP	VOLTS/ PHASE	DRIVE TYPE	NOTES
EF-1	COOK	70C15DH	CENTRIFUGAL ROOF VENTTILATOR	CORE BLDG.	125	0..375	700	1/10	120/1	DIRECT	(1) (2) (3)
EF-2	COOK	100C10	CENTRIFUGAL ROOF VENT. DOWN BLAST	DISHWASHER	300	0..375	1075	1/25	120/1	DIRECT	(1) (2) (3)
EF-3	COOK	90C15DM	CENTRIFUGAL ROOF VENTTILATOR	CORE BUILDING	350	0.625	1715	1/8	120/1	DIRECT	(1) (2) (3)
EF-4	COOK	90SQ15D	CENTRIFUGAL INLINE	UNIT 'A'	350	0.5	1075	1/6	120/1	DIRECT	(2) (3) (4)
EF-5	COOK	90SQ15D	CENTRIFUGAL INLINE	UNIT 'B'	425	0.5	1075	1/6	120/1	DIRECT	(2) (3) (4)
EF-6	COOK	90SQ15D	CENTRIFUGAL INLINE	UNIT 'C'	350	0.5	1075	1/6	120/1	DIRECT	(2) (3) (4)

(1) PROVIDE WITH 12" HIGH ROOF CURB WITH INTEGRAL AUTOMATIC DAMPER SUPPLIED BY FAN MANUFACTURER.
(2) PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH.
(3) PROVIDE WITH UNIT MOUNTED FAN SPEED CONTROLLER.
(4) PROVIDE WITH HANGING VIBRATION ISOLATORS.

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SHEET TITLE:
MECHANICAL SCHEDULES EXISTING EQUIPMENT

SHEET NUMBER:
M-602