REPLACE HVAC SYSTEM
ADMINISTRATION BUILDING

BLOOMFIELD VETERANS CEMETERY

OWNER: STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

DEPARTMENT OF
MO VETERANS COMMISSION

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

DESIGNER: STATE OF MISSOURI - OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT DESIGN
AND CONSTRUCTION: 301 W. HIGH STREET,
JEFFERSON CITY, MO. 65102

PROJECT NUMBER: U2002-01

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G-001

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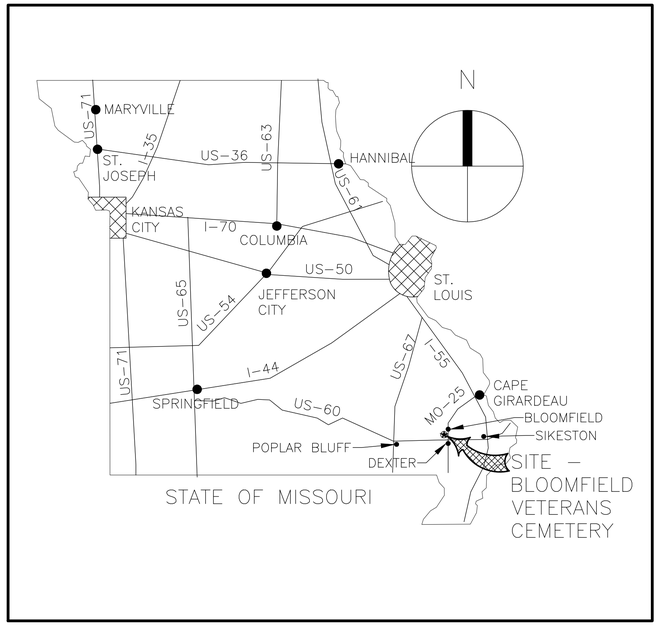
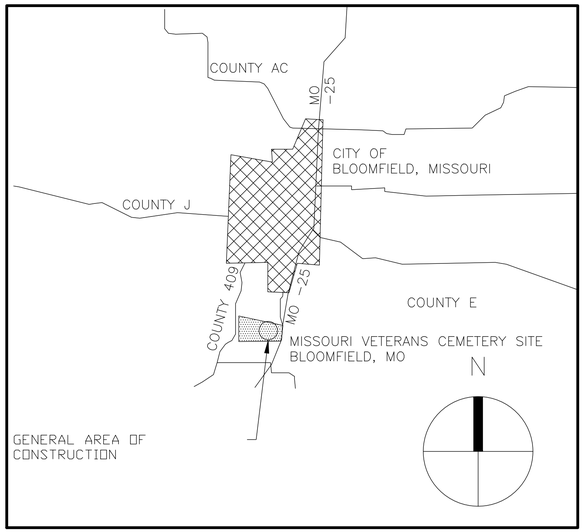


1 G-002 LOCATION MAP
NO SCALE



2 G-002 VICINITY MAP
NO SCALE

PROJECT GENERAL NOTES

1 COORDINATE CONSTRUCTION LIMITS, LAYDOWN AREA AND CONTRACTOR PARKING WITH CONSTRUCTION REPRESENTATIVE. LAYDOWN AREA SHALL BE APPROVED BY THE CONSTRUCTION REPRESENTATIVE & RESTORED TO ORIGINAL CONDITIONS AFTER CONSTRUCTION IS COMPLETE.

2 CONTRACTOR SHALL NOT BLOCK ACCESS TO BUILDINGS OR INFRASTRUCTURE.

3 DOCUMENT EXISTING CONDITIONS WITH PHOTOGRAPHS PRIOR TO PROCEEDING. REPAIR ALL DAMAGE TO EXISTING FACILITIES CAUSED BY CONSTRUCTION TO SATISFACTION OF THE CONSTRUCTION REPRESENTATIVE. MATCH EXISTING CONSTRUCTION AND FINISH.

4 COMPLY WITH THE INTERNATIONAL FIRE CODE INCLUDING THE REQUIREMENTS FOR FIRE SAFETY DURING CONSTRUCTION AND DEMOLITION AND FOR WELDING AND OTHER HOT WORK.

5 MINIMIZE HOT WORK WITHIN THE BUILDING. PROVIDE A FIRE WATCH FOR ALL DEMOLITION AND CONSTRUCTION HOT WORK (CUTTING, GRINDING, WELDING, SOLDERING, ETC.). MAINTAIN FIRE WATCH FOR AT LEAST 1 HOUR AFTER COMPLETION OF HOT WORK IN AREAS OF COMBUSTIBLE CONSTRUCTION.

6 AVAILABLE INFORMATION INDICATES PROJECT WORK AREAS DO NOT HAVE ASBESTOS. ADDRESS SUSPECTED HAZARDOUS MATERIALS IN WORK AREAS WITH CONSTRUCTION REPRESENTATIVE PRIOR TO PROCEEDING.

CONSTRUCTION PHASING AND SCHEDULING

1 THE PROJECT SHALL BE COMPLETED AS NECESSARY TO PROVIDE UNINTERRUPTED OPERATION OF THE FACILITY. THE SEQUENCING, PHASING, AND SCHEDULING OF ALL WORK SHALL BE DEPENDENT ON AND SUBJECT TO FACILITY OPERATIONS.

2 THE NATURE OF THIS PROJECT REQUIRES A HIGH LEVEL OF COORDINATION BY CONTRACTOR WITH OWNER. ALL WORK SHALL BE SCHEDULED WITH THE CONSTRUCTION REPRESENTATIVE AND BE SUBJECT TO THE FACILITY APPROVAL PRIOR TO PROCEEDING.

3 THE PROJECT REQUIRES OUTAGES TO BUILDING SYSTEMS. CONTRACTOR SHALL COMPLETE ALL RELATED WORK TO THE MAXIMUM EXTENT POSSIBLE PRIOR TO THE START OF OUTAGES. CONTRACTOR SHALL HAVE ALL REQUIRED MATERIALS ON SITE PRIOR TO START OF OUTAGES.

4 OUTAGES TO BUILDING SYSTEMS SHALL BE MADE DURING APPROVED OUTAGES AND WORK SHALL BE DONE AROUND–THE–CLOCK UNTIL THE TIE–IN IS COMPLETED.

5 OUTAGES WHICH AFFECT FIRE PROTECTION, FIRE ALARM, DEDICATED TELEPHONE, OR EMERGENCY MANAGEMENT SYSTEMS REQUIRE FIRE WATCHES. CONTRACTOR IS RESPONSIBLE FOR CONDUCTING FIRE WATCHES IN ALL AFFECTED AREAS.

6 OUTAGES SHALL BE COORDINATED WITH THE CONSTRUCTION REPRESENTATIVE AND ARE WEATHER DEPENDENT. CONTRACTOR SHALL NOTIFY CONSTRUCTION REPRESENTATIVE TWO (2) WEEKS IN ADVANCE OF DESIRED OUTAGE TIME. CONSTRUCTION REPRESENTATIVE WILL GIVE CONTRACTOR 72 HOURS ADVANCE NOTICE OF ACTUAL TIME FOR OUTAGE.

7 HVAC SYSTEM OUTAGES SHALL BE COMPLETED DURING ACCEPTABLE WEATHER CONDITIONS (BETWEEN 60°F & 80°F OUTDOOR AIR TEMPERATURE), UNLESS APPROVED OTHERWISE BY CONSTRUCTION REPRESENTATIVE. DURING SYSTEM OUTAGES, MAINTAIN AFFECTED OCCUPIED AREAS AT BETWEEN 65°F & 80°F. PROVIDE TEMPORARY HEATING OR COOLING AS REQUIRED.

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04	M-102	ADMIN BUILDING MECHANICAL PIPE DEMOLITION PLAN
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STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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REPLACE HVAC SYSTEM ADMINISTRATION BUILDING

BLOOMFIELD VETERANS CEMETERY
17357 STARS & STRIPES WAY
BLOOMFIELD, MO 63825

PROJECT # U2002-01
SITE # 6903
ASSET # 8136903001

REVISION:
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SITE MAPS, DRAWING INDEX, & GENERAL REQUIREMENTS

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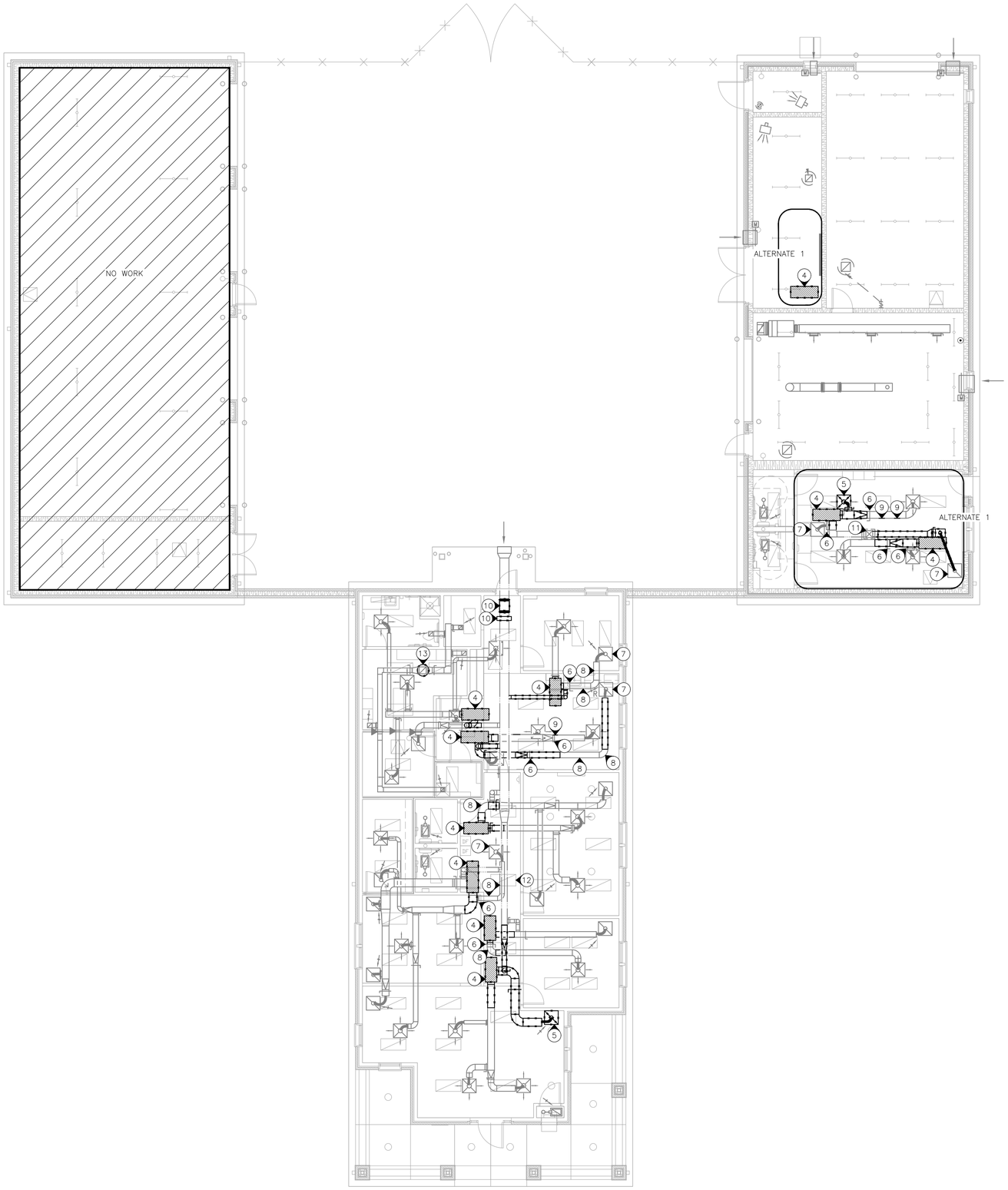

1 M-101 ADMINISTRATION BUILDING MECHANICAL HVAC DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

GENERAL DEMOLITION NOTES

1. DEMOLITION DRAWINGS AND PLANS ARE FROM FIELD TAKE-OFF AND ORIGINAL DRAWINGS. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY PRIOR TO BIDDING AND/OR CONSTRUCTION.
2. COVER ALL OPENINGS INTO THE BUILDING FROM THE WORK AREA. INSURE DEBRIS IS REMOVED FROM THE CONSTRUCTION AND DEMOLITION AREA AND AIR BORN DEBRIS IS NOT ALLOWED TO TRAVEL TO THE REMAINDER OF THE BUILDING. CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSAL OF ALL DEMOLISHED MATERIAL.
3. INSTALL TEMPORARY CAPS AT TERMINATION POINTS OF EXISTING DUCTWORK/PIPES TO REMAIN DURING DEMOLITION PHASES. CLEAN AIR DEVICES TO REMAIN OR BE REUSED IN NEW CONSTRUCTION.

DEMOLITION KEY NOTES

4. REMOVE AND DISPOSE OF HEAT PUMPS AND ALL ASSOCIATED SUPPORTS, DRAIN PANS, FLEXIBLE HOSES, VALVES, AND STRAINERS. REFERENCE SHEET M-102 FOR HEAT PUMP GROUND SOURCE WATER PIPE AND CONDENSATE DRAIN PIPE ROUTING.
5. REMOVE AIR DEVICE AND REPLACE WITH CEILING TILE. USE EXISTING TILE REMOVED FOR NEW CONSTRUCTION WHERE POSSIBLE.
6. RETAIN DAMPER FOR USE IN NEW CONSTRUCTION. REFERENCE NOTE 9 SHEET M-103 FOR NEW LOCATION.
7. RETAIN AIR DEVICE FOR USE IN NEW CONSTRUCTION. REFERENCE NOTE 10 SHEET M-103 FOR NEW LOCATION.
8. RETAIN DUCT FOR USE IN NEW CONSTRUCTION. REFERENCE NOTE 11 SHEET M-103 FOR NEW LOCATION.
9. CUT PENETRATION FOR NEW DUCT CONNECTION. REFERENCE M-103 FOR NEW DUCT SIZE.
10. REMOVE AND DISPOSE OF OUTDOOR AIR SUPPLY FAN OAF-1 AND DUCT HEATER DH-1 LOCATED IN ATTIC SPACE. OUTDOOR AIR DUCT AND ASSOCIATED BALANCE DAMPERS ARE LOCATED IN THE ATTIC. OAF-1 AND DH-1 SHOWN OFFSET FROM ACTUAL LOCATION FOR CLARITY.
11. REMOVE AND DISPOSE OF DUCT HEATER DH-2 LOCATED IN ATTIC SPACE. COORDINATE WITH ELECTRICAL CONTRACTOR.
12. COORDINATE WITH ELECTRICAL CONTRACTOR TO RELOCATE LIGHT FIXTURE. REFERENCE NOTE 12 SHEET M-103.
13. REMOVE AND DISPOSE OF EXHAUST FAN EF-1 LOCATED ON THE ROOF. ROOF CURB TO REMAIN FOR USE IN NEW CONSTRUCTION.

HVAC LEGEND

— · — · —	EQUIPMENT/MATERIALS TO BE REMOVED
———	EXISTING DUCT/AIR DEVICES TO REMAIN
——— ··· ———	EXISTING OUTDOOR AIR DUCT TO REMAIN

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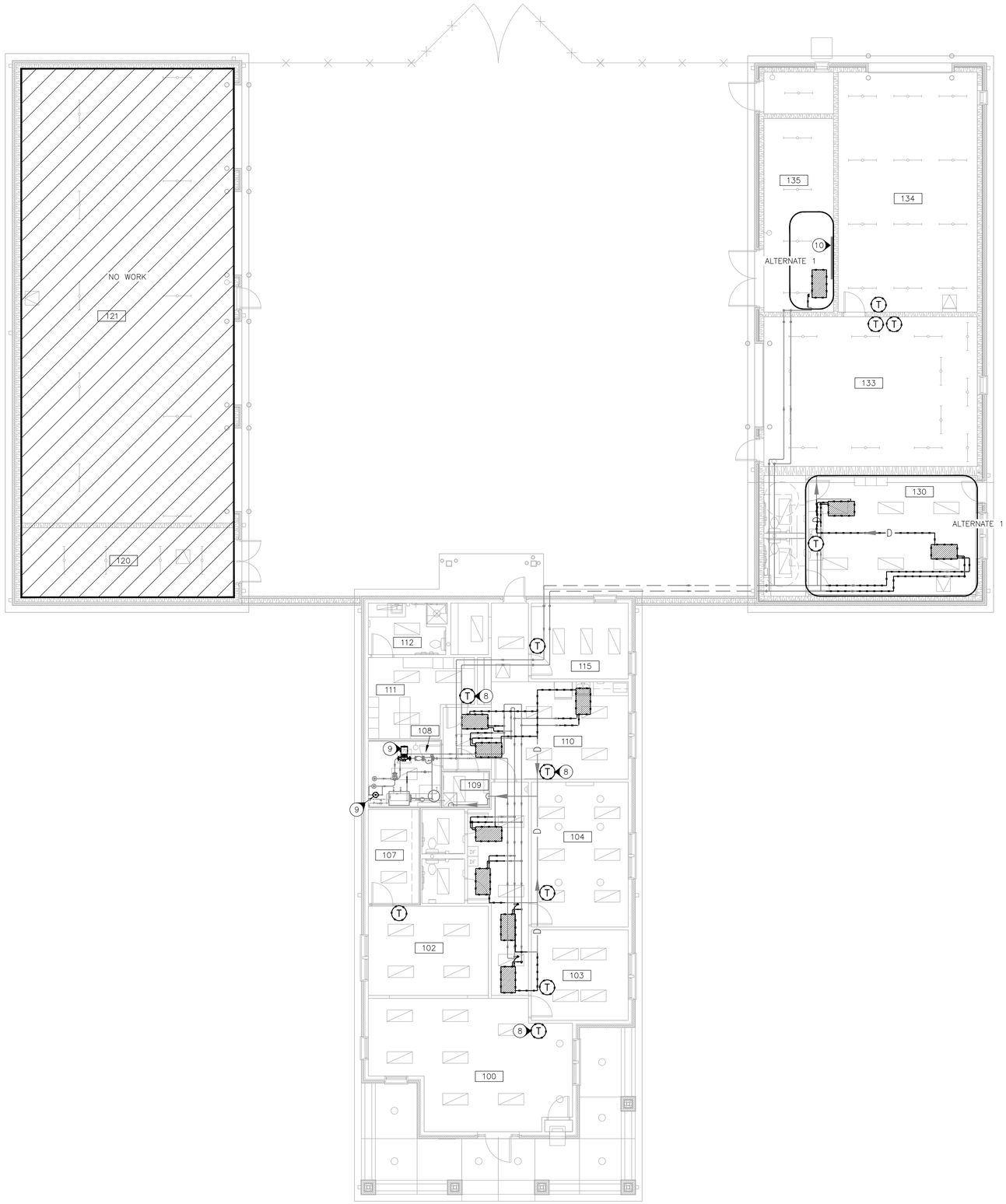
ADMIN BUILDING MECHANICAL HVAC DEMOLITION PLAN

SHEET NUMBER:
M-101

3 OF 12 SHEETS
7/12/2022



1 M-102 ADMINISTRATION BUILDING MECHANICAL PIPE DEMOLITION PLAN
SCALE: 1/8" = 1'-0"

DEMOLITION NOTES

(N) INDICATES KEYED NOTES

1 REFERENCE SHEET M-101 FOR GENERAL DEMOLITION NOTES.

2 GROUND SOURCE WATER (GSW) PIPE AND CONDENSATE DRAIN PIPE ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING PRIOR TO DEMOLITION. CONDENSATE DRAIN PIPE SHOWN OFFSET FOR CLARITY. EMERGENCY DRAIN NOT SHOWN. GSW MAINS LOCATED IN ATTIC.

4 REFERENCE SHEET M-601 FOR TEMPORARY EQUIPMENT BYPASS, FLUSHING, AND TESTING REQUIREMENTS PRIOR TO DEMOLITION.

5 TORCH CUTTING OF PIPE TO REMAIN IN SERVICE IS NOT ALLOWED. PIPE SHALL BE CUT WITH BAND SAW, PLASMA CUTTER, OR PORTABLE CUTTING AND BEVELING EQUIPMENT, WHICH MINIMIZES CONTAMINATION OF PIPE INTERIOR WITH CUTTING RESIDUE. ALL CUTTING RESIDUE SHALL BE CLEANED FROM INTERIOR OF PIPING TO THAT IS TO REMAIN.

6 REMOVE GROUND SOURCE WATER (GSW) PIPE, CONDENSATE DRAIN (D) PIPE, AND EMERGENCY DRAIN (ED) PIPE AS REQUIRED TO INSTALL NEW HEAT PUMPS. REMOVE GSW, D, AND ED BRANCH PIPES BACK TO MAIN AND CAP FOR HEAT PUMPS THAT WILL NOT BE REPLACED.

7 REMOVE AND DISPOSE OF EXISTING THERMOSTATS. CONTROL WIRE AND JUNCTION BOX SHALL REMAIN FOR USE IN NEW CONSTRUCTION EXCEPT AS NOTED. REFERENCE SHEET M-104 FOR NEW THERMOSTAT LOCATIONS.

(8) REMOVE AND DISPOSE OF CONTROL WIRE. PROVIDE COVER PLATE TO MATCH EXISTING FINISH.

(9) REMOVE AND DISPOSE OF GROUND SOURCE WATER PUMP (GSP-1) AND CHEMICAL FEEDER (CF-1).

(10) REMOVE AND DISPOSE OF WATTS RADIANT PANEL AND ALL ASSOCIATED EQUIPMENT INCLUDING 3 PUMPS, EXPANSION TANK, CHEMICAL FEEDER, TEMPERATURE/PRESSURE GUAGES, AND VALVES. REMOVE PIPE INSTALLED ON PANEL AND AS NEEDED TO COMPLETE THE WORK. PIPES TO FAN COIL UNIT AND RADIANT FLOOR ZONES SHALL REMAIN FOR USE IN NEW CONSTRUCTION. CLEAN AND FLUSH SYSTEM PER NOTES ON SHEET M-601.

HVAC LEGEND

- - - - - -	EQUIPMENT/MATERIALS TO BE REMOVED
———	EXISTING PIPE TO REMAIN
(T)	THERMOSTAT TO BE REMOVED

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ADMIN BUILDING MECHANICAL PIPE DEMOLITION PLAN

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4 OF 12 SHEETS
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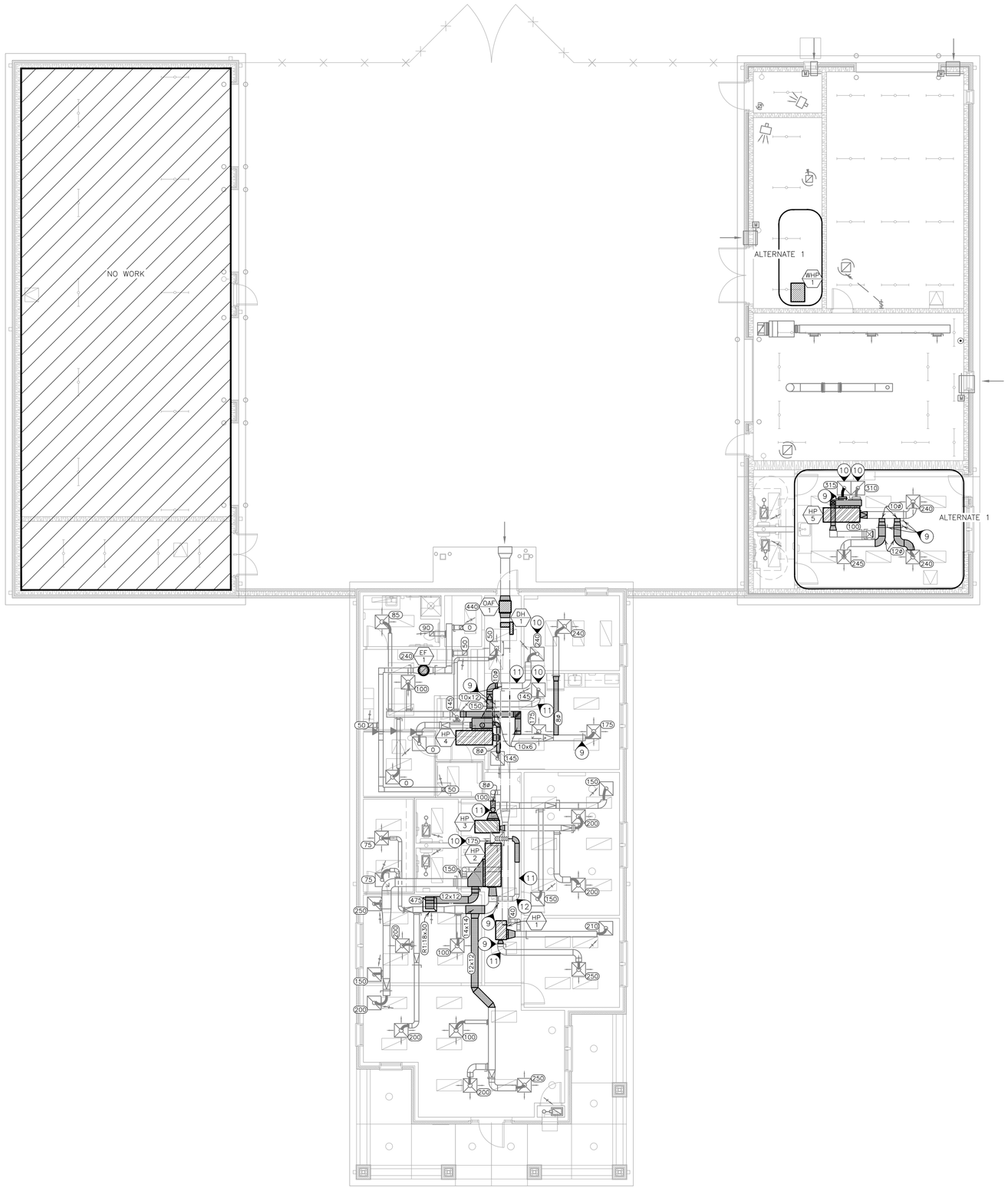

1 M-103 ADMINISTRATION BUILDING MECHANICAL HVAC CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"

GENERAL CONSTRUCTION NOTES

1. FABRICATION, INSTALLATION AND TESTING OF ALL HVAC SYSTEMS SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE INTERNATIONAL MECHANICAL CODE AND ALL MANUFACTURER INSTALLATION GUIDELINES.
2. ALL METALLIC AND FLEXIBLE DUCTS SHALL BE CONSTRUCTED AND INSTALLED AS SPECIFIED IN THE IMC AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS.
3. DUCT HAS BEEN DESIGNED TO FIT IN THE SPACE AVAILABLE AND TO AVOID CONFLICTS. CONTRACTOR SHALL FIELD VERIFY FOR ANY UNFORESEEN CONFLICTS PRIOR TO FABRICATING DUCT. CONTRACTOR SHALL COORDINATE WITH OTHER DISCIPLINES TO ENSURE ADEQUATE SPACE IS AVAILABLE FOR DUCT. IF DUCT IS ROUTED ABOVE OTHER DUCT, COORDINATE ELEVATION OF EACH DUCT PRIOR TO INSTALLATION TO ENSURE IT WILL FIT IN THE SPACE AVAILABLE.
4. THIRD PARTY, AABC OR NEBB CERTIFIED TESTING, ADJUSTING, AND BALANCING CONTRACTOR SHALL TEST AND BALANCE ALL SYSTEMS TO SPECIFIED VALUES AND PREPARE A BALANCE REPORT PER ASHRAE STANDARD 111 OR EQUAL. REPORT SHALL BE SENT TO THE ENGINEER FOR APPROVAL PRIOR TO FINAL COMPLETION. BALANCE DAMPERS ARE REQUIRED ON ALL AIR DEVICES. REFERENCE SPECIFICATIONS FOR ADDITIONAL INFORMATION.
5. ALL DUCTWORK WITH TWO DIMENSION <WxD> INDICATES RECTANGULAR DUCT. ALL <Dø> INDICATES ROUND DUCT. DIMENSIONS ARE INCHES MEASURED INSIDE. PROVIDE STANDARD TURNING VANES OR CURVED ELBOW WITH SQUARE THROAT ON RECTANGULAR DUCTS. ROUND DUCT SHALL MAINTAIN A CENTERLINE TURNING RADIUS OF 1.5 X DUCT DIAMETER. FLEXIBLE DUCT SHALL BE 5 FEET MAXIMUM LENGTH AND BE SUPPORTED TO MINIMIZE STATIC PRESSURE DROP.
6. ALL INSULATION SHALL MEET THE ASTM E 84 FLAME/SMOKE SPREAD INDEX OF 25/50 MAXIMUM. DUCT SEAMS SHALL BE SEALED. PROVIDE 1.5 INCH THICK EXTERNAL INSULATION WITH VAPOR BARRIER WITH MINIMUM THERMAL CONDUCTIVITY OF 0.25 BTU-IN/HR/SF/°F (R6) WHEN INSTALLED FOR DUCT LOCATED ABOVE THE CEILING.
7. PROVIDE SUITABLE SUPPORTS FOR STABILITY OF ALL HVAC DEVICES AND DUCT. AIR HANDLING EQUIPMENT SHALL BE PROVIDED WITH FLEXIBLE SUPPLY AND RETURN AIR DUCT CONNECTORS AT UNITS. HEAT PUMPS SHALL BY SUPPORTED FROM THE STRUCTURE ABOVE THE UNIT WITH ENGINEERED SEISMIC BRACING.
8. PROVIDE A TRAPPED CONDENSATE DRAIN PIPE FOR ALL EVAPORATORS. CONDENSATE PIPE SHALL BE 0.75 INCH INSIDE DIAMETER. PIPE AND INSULATION SHALL MATCH EXISTING. SLOPE IN THE DIRECTION OF DISCHARGE A MINIMUM OF 1/8" PER FOOT. CONNECT TO EXISTING CONDENSATE DRAIN SYSTEM.

KEY CONSTRUCTION NOTES

9. INSTALL EXISTING DAMPER RETAINED FROM DEMOLITION. REFERENCE NOTE 6 SHEET M-101.
10. NEW LOCATION FOR AIR DEVICE RETAINED FROM DEMOLITION. REFERENCE NOTE 7 SHEET M-101.
11. NEW LOCATION FOR DUCT RETAINED FROM DEMOLITION. REFERENCE NOTE 8 SHEET M-101.
12. COORDINATE WITH ELECTRICAL CONTRACTOR TO RELOCATE LIGHT FIXTURE AS SHOWN.

SEQUENCE OF OPERATION

1. TEST AND PROGRAM ALL THERMOSTATS FOR PROPER OPERATION. PROVIDE LABEL TO INDICATE EQUIPMENT CONTROLLED BY THERMOSTAT. INSTRUCT OWNER IN THE PROPER USE OF THERMOSTATS. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL REQUIRED SENSORS TO PROVIDE A COMPLETE OPERATING SYSTEM THAT IS CONTROLLED AS SPECIFIED BELOW.
2. OCCUPIED/UNOCCUPIED SHALL BE DETERMINED BY EXISTING TIME CLOCK. OUTDOOR AIR FAN OAF-1 SHALL OPERATE CONTINUOUSLY DURING OCCUPIED HOURS ONLY. ELECTRIC DUCT HEATER DH-1 SHALL BE INTERLOCKED WITH OAF-1 AND SHALL ONLY OPERATE WHEN OAF-1 IS OPERATING. DH-1 SHALL STAGE HEAT TO MAINTAIN A LEAVING AIR TEMPERATURE OF 50°F.
3. EXHAUST FAN EF-1 SHALL OPERATE CONTINUOUSLY DURING OCCUPIED HOURS ONLY.
4. HEAT PUMPS HP-1 THROUGH HP-4 SHALL OPERATE CONTINUOUSLY DURING OCCUPIED TIME PERIODS DELIVERING THE SPECIFIED OUTSIDE AIR FLOW WHILE MAINTAINING ROOM TEMPERATURE SETPOINT. THE UNITS SHALL RUN INTERMITTENTLY TO MAINTAIN THE UNOCCUPIED TIME PERIOD ROOM TEMPERATURE SETPOINT.
5. HEAT PUMP HP-5 (ALTERNATE 1) SHALL OPERATE INTERMITTENTLY TO MAINTAIN THE ROOM TEMPERATURE SETPOINT. UNIT SHALL BE MANUALLY DISABLED WHEN THE SPACE IS UNOCCUPIED.
6. RADIANT FLOOR – CHILLED WATER SYSTEM (ALTERNATE 1):
   - CIRCULATOR PUMP HWP-1 SHALL BE ENERGIZED MANUALLY FOR HEATING MODE. CIRCULATOR PUMP CWP-1 SHALL BE ENERGIZED MANUALLY FOR COOLING MODE. HWP-1 AND CWP-1 SHALL BE INTERLOCKED TO PREVENT SIMULTANEOUS OPERATION.
   - DURING THE HEATING MODE, WATER TO WATER HEAT PUMP WHP-1 SHALL OPERATE TO MAINTAIN BUFFER TANK BT-1 TANK TEMPERATURE. DURING THE COOLING MODE, WHP-1 SHALL OPERATE TO MAINTAIN THE CHILLED WATER SUPPLY TEMPERATURE. CHANGEOVER BETWEEN HEATING AND COOLING SHALL BE MANUAL.
   - DURING THE HEATING MODE, CIRCULATOR PUMPS RZP-1 AND RZP-2 SHALL OPERATE TO MAINTAIN SPACE TEMPERATURE IN EACH ZONE. DURING THE COOLING MODE, THE EXISTING FAN COIL UNIT SHALL OPERATE TO MAINTAIN WORK BAY COOLING SPACE TEMPERATURE.

HVAC LEGEND

AA / N	DEVICE SCHEDULE TAG
N / LNNN	DETAIL REFERENCE, NUMBER/SHEET
R1:18x30	RETURN AIR DEVICE: SIZE (INCHES X INCHES)
12x12	DUCT SIZE-RECTANGULAR (INCHES X INCHES)
8ø	DUCT SIZE-ROUND (INCHES DIAMETER)
3500	AIR FLOW (CUBIC FEET PER MINUTE)
———	EXISTING DUCT/AIR DEVICES TO REMAIN
———	NEW HVAC EQUIPMENT
———	NEW SUPPLY AIR
—·—	NEW RETURN AIR
—··—	NEW OUTSIDE AIR

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ADMIN BUILDING MECHANICAL HVAC CONSTRUCTION PLAN

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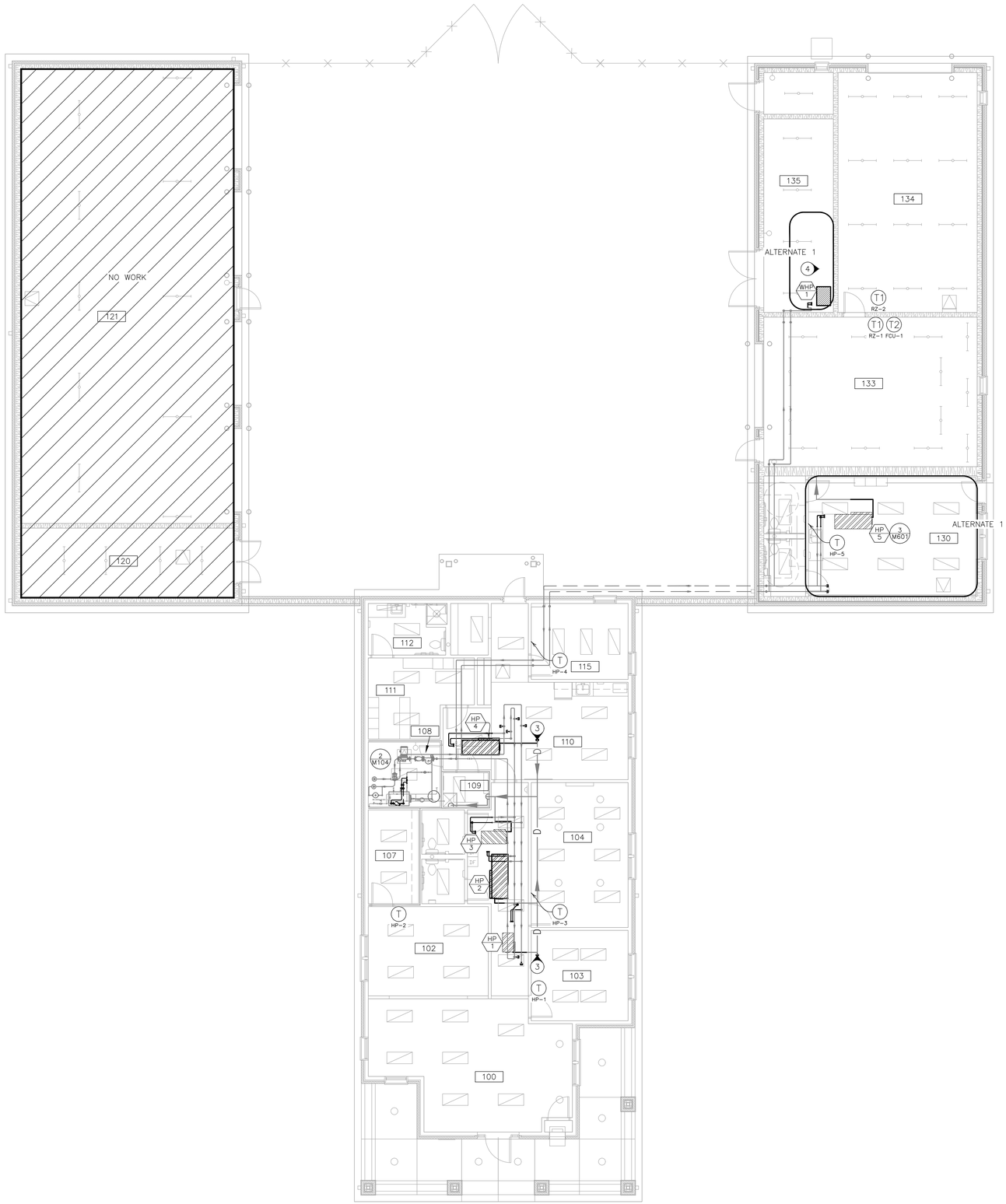
M-103

5 OF12 SHEETS
7/12/2022

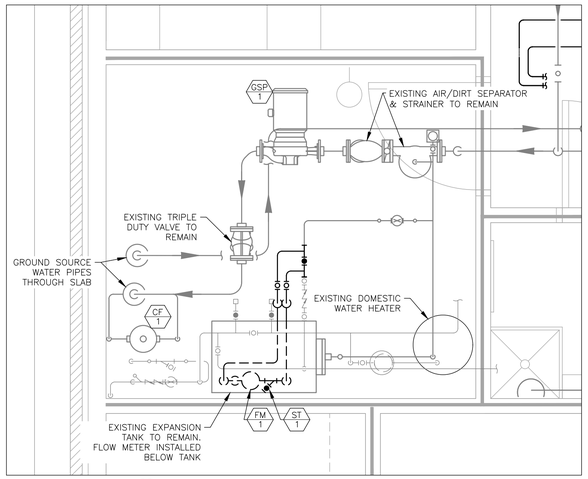


1 M-104 ADMINISTRATION BUILDING MECHANICAL PIPE CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"

CONSTRUCTION NOTES

(N) INDICATES KEYED NOTES

1. REFERENCE SHEET M-103 FOR GENERAL CONSTRUCTION NOTES.
2. REFERENCE SHEET M-601 FOR PIPING DIAGRAM AND HEAT PUMP PIPE CONNECTION DETAIL.
3. PROVIDE DRAIN CLEANOUT.
4. REFERENCE SHEET M-601 DETAIL 4 FOR RADIANT FLOOR AND CHILLED WATER PIPING DIAGRAMS.
5. 7-DAY PROGRAMMABLE THERMOSTAT (T) PROVIDED BY EQUIPMENT MANUFACTURER. THERMOSTAT (T1) SHALL BE HEATING ONLY HONEYWELL T822K1018/U OR EQUAL. THERMOSTAT (T2) SHALL BE COOLING ONLY HONEYWELL T834L1004/U OR EQUAL.



2 M-104 MECHANICAL ROOM CONSTRUCTION PLAN
SCALE: 1/2" = 1'-0"

HVAC LEGEND

AA N	DEVICE SCHEDULE TAG
N LNNN	DETAIL REFERENCE, NUMBER/SHEET
T HP-#	THERMOSTAT WITH EQUIPMENT LABEL
———	NEW GROUND SOURCE WATER PIPES
———	EXISTING GROUND SOURCE WATER PIPES
———	CONDENSATE DRAIN PIPE

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ADMIN BUILDING MECHANICAL PIPE CONSTRUCTION PLAN

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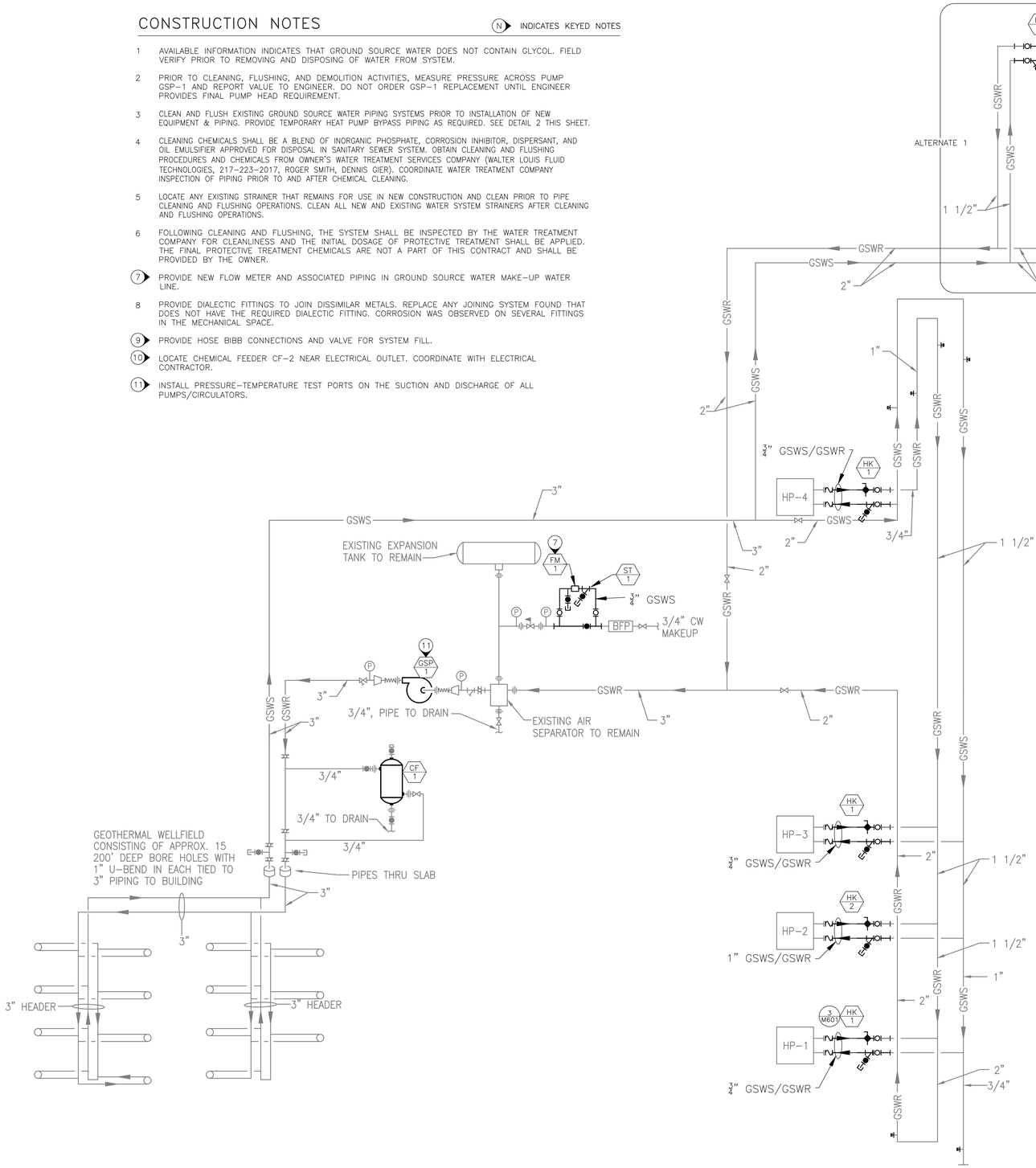
M-104

6 OF12 SHEETS
7/12/2022

CONSTRUCTION NOTES

(N) INDICATES KEYED NOTES

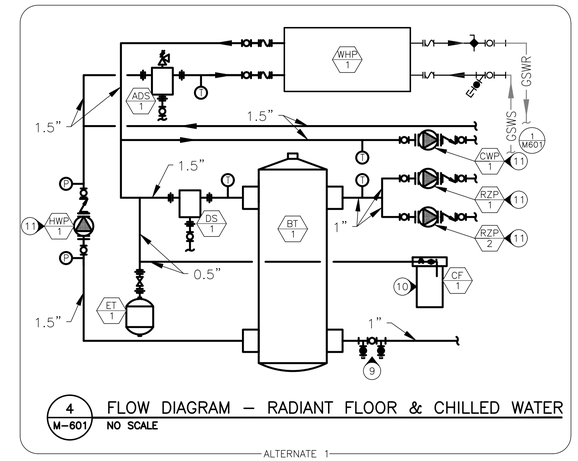
1. AVAILABLE INFORMATION INDICATES THAT GROUND SOURCE WATER DOES NOT CONTAIN GLYCOL. FIELD VERIFY PRIOR TO REMOVING AND DISPOSING OF WATER FROM SYSTEM.
2. PRIOR TO CLEANING, FLUSHING, AND DEMOLITION ACTIVITIES, MEASURE PRESSURE ACROSS PUMP GSP-1 AND REPORT VALUE TO ENGINEER. DO NOT ORDER GSP-1 REPLACEMENT UNTIL ENGINEER PROVIDES FINAL PUMP HEAD REQUIREMENT.
3. CLEAN AND FLUSH EXISTING GROUND SOURCE WATER PIPING SYSTEMS PRIOR TO INSTALLATION OF NEW EQUIPMENT & PIPING. PROVIDE TEMPORARY HEAT PUMP BYPASS PIPING AS REQUIRED. SEE DETAIL 2 THIS SHEET.
4. CLEANING CHEMICALS SHALL BE A BLEND OF INORGANIC PHOSPHATE, CORROSION INHIBITOR, DISPERSANT, AND OIL EMULSIFIER APPROVED FOR DISPOSAL IN SANITARY SEWER SYSTEM. OBTAIN CLEANING AND FLUSHING PROCEDURES AND CHEMICALS FROM OWNER'S WATER TREATMENT SERVICES COMPANY (WALTER LOUIS FLUID TECHNOLOGIES, 217-223-2017, ROGER SMITH, DENNIS GIER). COORDINATE WATER TREATMENT COMPANY INSPECTION OF PIPING PRIOR TO AND AFTER CHEMICAL CLEANING.
5. LOCATE ANY EXISTING STRAINER THAT REMAINS FOR USE IN NEW CONSTRUCTION AND CLEAN PRIOR TO PIPE CLEANING AND FLUSHING OPERATIONS. CLEAN ALL NEW AND EXISTING WATER SYSTEM STRAINERS AFTER CLEANING AND FLUSHING OPERATIONS.
6. FOLLOWING CLEANING AND FLUSHING, THE SYSTEM SHALL BE INSPECTED BY THE WATER TREATMENT COMPANY FOR CLEANLINESS AND THE INITIAL DOSAGE OF PROTECTIVE TREATMENT SHALL BE APPLIED. THE FINAL PROTECTIVE TREATMENT CHEMICALS ARE NOT A PART OF THIS CONTRACT AND SHALL BE PROVIDED BY THE OWNER.
7. (7) PROVIDE NEW FLOW METER AND ASSOCIATED PIPING IN GROUND SOURCE WATER MAKE-UP WATER LINE.
8. PROVIDE DIALECTIC FITTINGS TO JOIN DISSIMILAR METALS. REPLACE ANY JOINING SYSTEM FOUND THAT DOES NOT HAVE THE REQUIRED DIALECTIC FITTING. CORROSION WAS OBSERVED ON SEVERAL FITTINGS IN THE MECHANICAL SPACE.
9. (9) PROVIDE HOSE BIBB CONNECTIONS AND VALVE FOR SYSTEM FILL.
10. (10) LOCATE CHEMICAL FEEDER CF-2 NEAR ELECTRICAL OUTLET. COORDINATE WITH ELECTRICAL CONTRACTOR.
11. (11) INSTALL PRESSURE-TEMPERATURE TEST PORTS ON THE SUCTION AND DISCHARGE OF ALL PUMPS/CIRCULATORS.



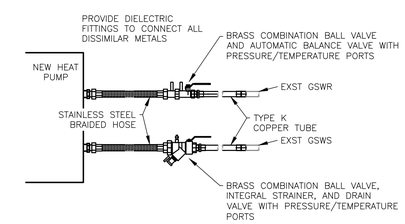
1 M-601 FLOW DIAGRAM – GROUND SOURCE WATER
SCALE: 1/8" = 1'-0"

HVAC LEGEND

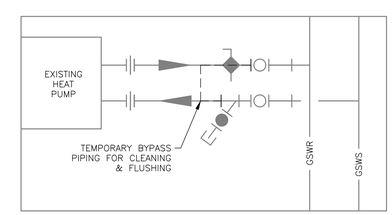
AA N	DEVICE SCHEDULE TAG
N LNNN	DETAIL REFERENCE, NUMBER/SHEET
	NEW GROUND SOURCE WATER PIPES
	EXISTING GROUND SOURCE WATER PIPES
	NEW CHILLED/HOT WATER WATER PIPES



4 M-601 FLOW DIAGRAM – RADIANT FLOOR & CHILLED WATER
NO SCALE



3 M-601 HEAT PUMP PIPING CONNECTION (TYPICAL)
NO SCALE



2 M-601 TEMPORARY BYPASS PIPING
NO SCALE

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

PROJECT DESIGN UNIT

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

DEPARTMENT OF MO VETERANS COMMISSION

REPLACE HVAC SYSTEM
ADMINISTRATION BUILDING

BLOOMFIELD VETERANS CEMETERY
17357 STARS & STRIPES WAY
BLOOMFIELD, MO 63825

PROJECT # U2002-01
SITE # 6903
ASSET # 8136903001

REVISION:
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DESIGNED BY: TLS

SHEET TITLE:
ADMIN BUILDING MECHANICAL PIPE DIAGRAM

SHEET NUMBER:
M-601

7 OF 12 SHEETS
7/12/2022

SCHEDULE NOTES

MANUFACTURERS LISTED ARE BASIS OF DESIGN. REFERENCE SPECIFICATIONS FOR ADDITIONAL APPROVED MANUFACTURERS.

HEAT PUMP SCHEDULE

			FAN			COOLING									HEATING								ELECTRICAL				
MARK	MFR	MODEL	SUPPLY AIRFLOW (CFM)	OUTDOOR AIRFLOW (CFM)	ESP (IN WG)	CAPACITY TOTAL (MBH)	CAPACITY SENSIBLE (MBH)	EAT (db°F/wb°F)	COIL LAT (db°F/wb°F)	EWT (°F)	LWT (°F)	WFR (GPM)	WPD (FT)	EER	CAPACITY (MBH)	EAT (db°F/wb°F)	COIL LAT (db°F/wb°F)	EWT (°F)	LWT (°F)	WFR (GPM)	WPD (FT)	COP	VOLTS PHASE	MCA	MOP	WEIGHT (LBS)	NOTES
HP-1	FHP	LV009; 1 STAGE	250	40	0.43	7.6	6.3	76/63	53.5/52.7	85	93.4	2.5	6	11.9	7.70	67	94.2	45	40.1	2.5	6.9	3.7	230/1	5.2	20	100	1,2,3,5
HP-2	FHP	LM036; 2 STAGE	1300	150	0.51	35.80	31.90	75/62	52.8/52.5	85	95.7	9	10.7	15.4	35.40	67	91.6	45	38.2	9	12.3	4.9	230/1	26.3	40	375	1,2,3,5
HP-3	FHP	LV015; 1 STAGE	400	100	0.41	12.80	10.40	78/64	54.6/53.2	85	93.9	4	15.5	12.2	12.60	65	92.8	45	40.1	4	17.9	3.6	230/1	8.1	20	136	1,2,3,5
HP-4	FHP	LM024; 2 STAGE	825	150	0.53	24.20	20.10	78/65	56/55.5	85	95.8	6	5.7	14.6	22.60	66	90.4	45	38.7	6	6.6	4.3	230/1	17.4	25	260	1,2,3,5
HP-5	FHP	LM024; 2 STAGE	725	100	0.40	23.50	19.70	78/64	53.4/53	85	95.5	6	5.7	14.8	22.60	59	86.7	45	38.6	6	6.6	4.7	230/1	14.6	25	260	1,2,4,5

ALTERNATE 1

NOTES
1 DESIGN CONDITIONS: SUMMER 95/74°F; WINTER 0°F
2 PROVIDE FACTORY MOUNTED DISCONNECT, ECM CONSTANT AIRFLOW FAN MOTOR, MERV 13 FILTERS WITH FILTER RACK, 7-DAY PROGRAMMABLE THERMOSTAT
3 PROVIDE HOT GAS REHEAT
4 PROVIDE UNIT WITH INTEGRAL 10 KW HEATER (9.6 KW AT 230/1), 61.3 MCA/ 70 MOP; SEPARATE POWER SOURCE
5 HEATING/COOLING CAPACITY BASED ON 20% METHANOL AND 80% WATER BY WEIGHT

WATER TO WATER HEAT PUMP SCHEDULE

				COOLING (LOAD)				COOLING (GROUND SOURCE)						HEATING (LOAD)				HEATING (GROUND SOURCE)					ELECTRICAL				
MARK	MFR	MODEL	CHILLER CAPACITY (MBH)	EWT (°F)	LWT (°F)	WFR (GPM)	WPD (FT)	EWT (°F)	LWT (°F)	WFR (GPM)	WPD (FT)	EER	HEATING CAPACITY (MBH)	EWT (°F)	LWT (°F)	WFR (GPM)	WPD (FT)	EWT (°F)	LWT (°F)	WFR (GPM)	WPD (FT)	COP	VOLTS PHASE	MCA	MOP	WEIGHT (LBS)	NOTES
WHP-1	FHP	WT-061; 2 STAGE	50.7	55	46.6	12	10.7	85	95.9	12	11.2	13.1	55.4	100	109.2	12	9	45	38.2	12	14.5	3.6	230/1	33.6	60	310	1,2,3

ALTERNATE 1

NOTES
1 DESIGN CONDITIONS: SUMMER 95/74°F; WINTER 0°F
2 LOAD SIDE HEATING/COOLING CAPACITY BASED ON 20% PROPOLYENE GLYCOL
3 GROUND SOURCE HEATING/COOLING CAPACITY BASED ON 20% METHANOL AND 80% WATER BY WEIGHT

GROUND SOURCE WATER PUMP SCHEDULE

MARK	MANUFACTURER	MODEL	FLOW (GPM)	HEAD (FT)	VOLTS/PHASE	HP	SPECIFICATION
GSP-1	Taco	KV SERIES 1507D	40	49	230/1	2	1.5 INCH FLANGE, VERTICAL CLOSE COUPLED, CAST IRON CASING, BRONZE IMPELLER & SHAFT SLEEVE, CERAMIC/EPT MECHANICAL SEAL, COPPER & BRASS SEAL FLUSH LINE ASSEMBLY SERVICE: GROUND SOURCE WATER CIRCULATING PUMP

NOTES
SEE NOTE 2 ON SHEET M-601 PRIOR TO ORDERING

FAN SCHEDULE

MARK	MANUFACTURER	MODEL	AIRFLOW (CFM)	ESP (IN WG)	VOLTS/PHASE	HP	WEIGHT (LBS)	NOTES
OAF-1	COOK	SQN-D VF	440		115/1	1/3	104	1,2
EF-1	COOK	ACE-D	240		115/1	1/8	26	1,3

NOTES
1 PROVIDE FACTORY DISCONNECT, FAN MOUNTED SPEED CONTROL
2 PROVIDE RUBBER-IN-SHEAR ISOLATORS FOR SUSPENSION MOUNT, ORIFICE PLATE 81
3 USE EXISTING ROOF CURB AND BACKDRAFT DAMPER

AIR DEVICE SCHEDULE

MARK	MANUFACTURER	MODEL	NECK SIZE (INCHxINCH)	FACE SIZE (INCHxINCH)	TYPE	SPECIFICATION	NOTES
R1	TITUS	PAR	SEE PLANS	24X24	RETURN	PERFORATED FACE, STEEL, WHITE	
BD-1	POTTORFF	CD-52	SEE PLANS FOR DUCT SIZE		BALANCE DAMPER OPPOSED BLADE RECTANGULAR	FRAME: 13 GAUGE GALVANIZED STEEL CHANNEL; BLADES: 6"X16 GAUGE EXTRUDED ALUMINUM AIRFOIL OPPOSED BLADE WITH PVC BLADE SEALS	1

NOTES
1 PROVIDE ACTUATOR STANDOFF BRACKET FOR 1.5 INCH INSULATION

ELECTRIC DUCT HEATER SCHEDULE

MARK	MANUFACTURER	MODEL	CAPACITY (KW)	EAT (°F)	COIL LAT (°F)	STAGES	CONTROL VOLTAGE (V)	LINE VOLTAGE	AMPS	NOTES
DH-1	INDEECO	QUA-7	7	0	50	SCR	24	230/1	30.43	1,2,3,4

NOTES
1 PROVIDE FACTORY DISCONNECT
2 PROVIDE 0-10 VDC SCR CONTROLLER AND CONTROL CIRCUIT TRANSFORMER; PROVIDE DUCT TEMPERATURE SENSOR; STAGE HEAT TO MAINTAIN A LEAVING AIR TEMPERATURE OF 50°F
3 PROVIDE AIRFLOW SWITCH AND THERMAL CUTOUT
4 REFERENCE PLANS FOR TERMINAL BOX OVERHAND AIR AIRFLOW DIRECTION

HYDRONIC SPECIALTIES SCHEDULE

MARK	MANUFACTURER	MODEL	PIPE SIZE (INCH)	TYPE	SPECIFICATION	NOTES
HK-1	HAYS FLUID CONTROLS	2516 MESURFLO	3/4, 1.0 (SEE PLANS)	HOSE KIT 2.5-9.0 GPM	2-WAY AUTOBALANCE VALVE W/PT TEST PORTS. INCLUDES STAINLESS STEEL BRAIDED HOSE, ISOLATION VALVES, Y-STRAINER WITH TEST PORT, BLOWDOWN VALVE AND HOSE CONNECTION	1
HK-2	HAYS FLUID CONTROLS	2524 MESURFLO	1	HOSE KIT 12 GPM	2-WAY AUTOBALANCE VALVE W/PT TEST PORTS. INCLUDES STAINLESS STEEL BRAIDED HOSE, ISOLATION VALVES, Y-STRAINER WITH TEST PORT, BLOWDOWN VALVE AND HOSE CONNECTION	1
FM-1	BADGER METER	M25B RECORDALL	3/4	POSITIVE DISPLACEMENT WATER METER	LEAD-FREE BRONZE ALLOY HOUSING, ENGINEERED POLYMER CHAMBER/DISC MATERIAL, STAINLESS STEEL TRIM, 32-120°F OPERATING TEMPERATURE, +/-1.5% ACCURACY, 0-150 PSI	
ST-1	WATTS	LF777S	3/4	WYE-PATTERN LEAD FREE STRAINER	LEAD-FREE BRONZE BODY, SOLID RETAINER CAP WITH EPDM GASKET, 304 STAINLESS STEEL MESH OR PERFORATED SCREEN	
CF-1	JL WINGERT	HP-5ASME-C	3/4	CHEMICAL BYPASS FEEDER	5 GALLON ASME CODE CONSTRUCTION WITH FILL, OUTLET, DRAIN, & INLET FITTINGS; MOUNTING LEGS, DOME BOTTOM	

NOTES
1 REFERENCE HEAT PUMP SCHEDULE TO DETERMINE REQUIRED FLOW RATE AND CONNECTION SIZE FOR EACH KIT

RADIANT FLOOR-CHILLED WATER PUMP SCHEDULE

MARK	MANUFACTURER	MODEL	FLOW (GPM)	HEAD (FT)	VOLTS/PHASE	HP	SPECIFICATION
HWP-1	ARMSTRONG	ASTRO SERIES 290CI	12	12	115/1	1/3	1.5 INCH FLANGE, WET ROTOR CIRCULATOR, CAST IRON BODY, NORYL IMPELLER, CERAMIC SHAFT & BEARINGS, EPDM GASKET MATERIAL SERVICE: WHP-1 CIRCULATING PUMP
CWP-1	ARMSTRONG	ASTRO SERIES 280CI	12	15	115/1	1/3	1.25 INCH FLANGE, WET ROTOR CIRCULATOR, CAST IRON BODY, NORYL IMPELLER, CERAMIC SHAFT & BEARINGS, EPDM GASKET MATERIAL SERVICE: FCU-1 CIRCULATING PUMP
RZP-1	ARMSTRONG	ASTRO SERIES 250CI	2	10	115/1	0.157	1.25 INCH FLANGE, WET ROTOR CIRCULATOR, CAST IRON BODY, NORYL IMPELLER, CERAMIC SHAFT & BEARINGS, EPDM GASKET MATERIAL SERVICE: RADIANT FLOOR HEAT CIRCULATING PUMP ZONE 1
RZP-2	ARMSTRONG	ASTRO SERIES 250CI	2.5	10	115/1	0.157	1.25 INCH FLANGE, WET ROTOR CIRCULATOR, CAST IRON BODY, NORYL IMPELLER, CERAMIC SHAFT & BEARINGS, EPDM GASKET MATERIAL SERVICE: RADIANT FLOOR HEAT CIRCULATING PUMP ZONE 2

NOTES
BASIS OF DESIGN PROVIDED BY MACK McCLAIN. PUMPS AND RADIANT FLOOR-CHILLED HYDRONIC SPECIALTIES PROVIDED AS A PACKAGED SYSTEM. PACKAGE SHALL INCLUDE ALL REQUIRED CONTROL RELAYS TO PROVIDE A COMPLETE SYSTEM CONTROLLED BY LINE-VOLTAGE HEATING OR COOLING ONLY THERMOSTATS. REFERENCE SEQUENCE OF OPERATION FOR ADDITIONAL INFORMATION. CONTRACTOR SHALL PROVIDE ALL REQUIRED VALVES, FITTINGS, PIPE AND TEMPERATURE AND PRESSURE GAUGES

RADIANT FLOOR-CHILLED WATER HYDRONIC SPECIALTIES SCHEDULE

MARK	MANUFACTURER	MODEL	PIPE SIZE (INCH)	TYPE	SPECIFICATION	NOTES
BT-1	AMTROL	HWBT 120-2/2-125	2	HOT WATER BUFFER TANK	ASME APPROVED STEEL BODY, ASME 150 LB FLANGES, TOP VENT, BOTTOM DRAIN	1
ET-1	AMTROL	RX-30	1/2	EXPANSION TANK	STEEL SHELL, HEAVY DUTY COMPOUND DIAPHRAGM, POLYPROPYLENE OXYGEN BARRIER LINER, STAINLESS STEEL CONNECTION, 4.4 GALLON, 12 PSIG FACTORY CHARGE	
ADS-1	NEXUS	FLAMCOVENT CLEAN SMART	3/4	AIR & DIRT SEPARATOR	COMPOSITE SHELL & SEPARATING ELEMENT, BRASS AIR VENT & DRAIN, BRASS & STEEL DIRT COLLECTOR ASSEMBLY, NEODYMIUM SUPERMAGNETS, SUITABLE FOR UP TO 50% GLYCOL	
DS-1	NEXUS	FLAMCO CLEAN SMART	3/4	DIRT SEPARATOR	COMPOSITE SHELL & SEPARATING ELEMENT, BRASS DRAIN, BRASS & STEEL DIRT COLLECTOR ASSEMBLY, NEODYMIUM SUPERMAGNETS, SUITABLE FOR UP TO 50% GLYCOL	
CF-2	JL WINGERT	CGL7	1/2	GLYCOL FEED SYSTEM	7 GALLON POLYETHYLENE TANK WITH GALLON MARKINGS, 1 GPM PUMP WITH CHECK VALVES & PRESSURE SWITCH, 304 SS PIPE & FITTINGS, 60 PSI BRASS RELIEF VALVE, PRESSURE GAUGE	2

ALTERNATE 1

NOTES
1 PROVIDE ACCESSORY SEISMIC RESTRAINTS
2 ELECTRICAL: 8 FT NEMA POWER CORD

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

PROJECT DESIGN UNIT

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DESIGN AND CONSTRUCTION

DEPARTMENT OF
MO VETERANS
COMMISSION

REPLACE HVAC SYSTEM
ADMINISTRATION
BUILDING

BLOOMFIELD VETERANS
CEMETERY
17357 STARS & STRIPES WAY
BLOOMFIELD, MO 63825

PROJECT # U2002-01
SITE # 6903
ASSET # 8136903001

REVISION:
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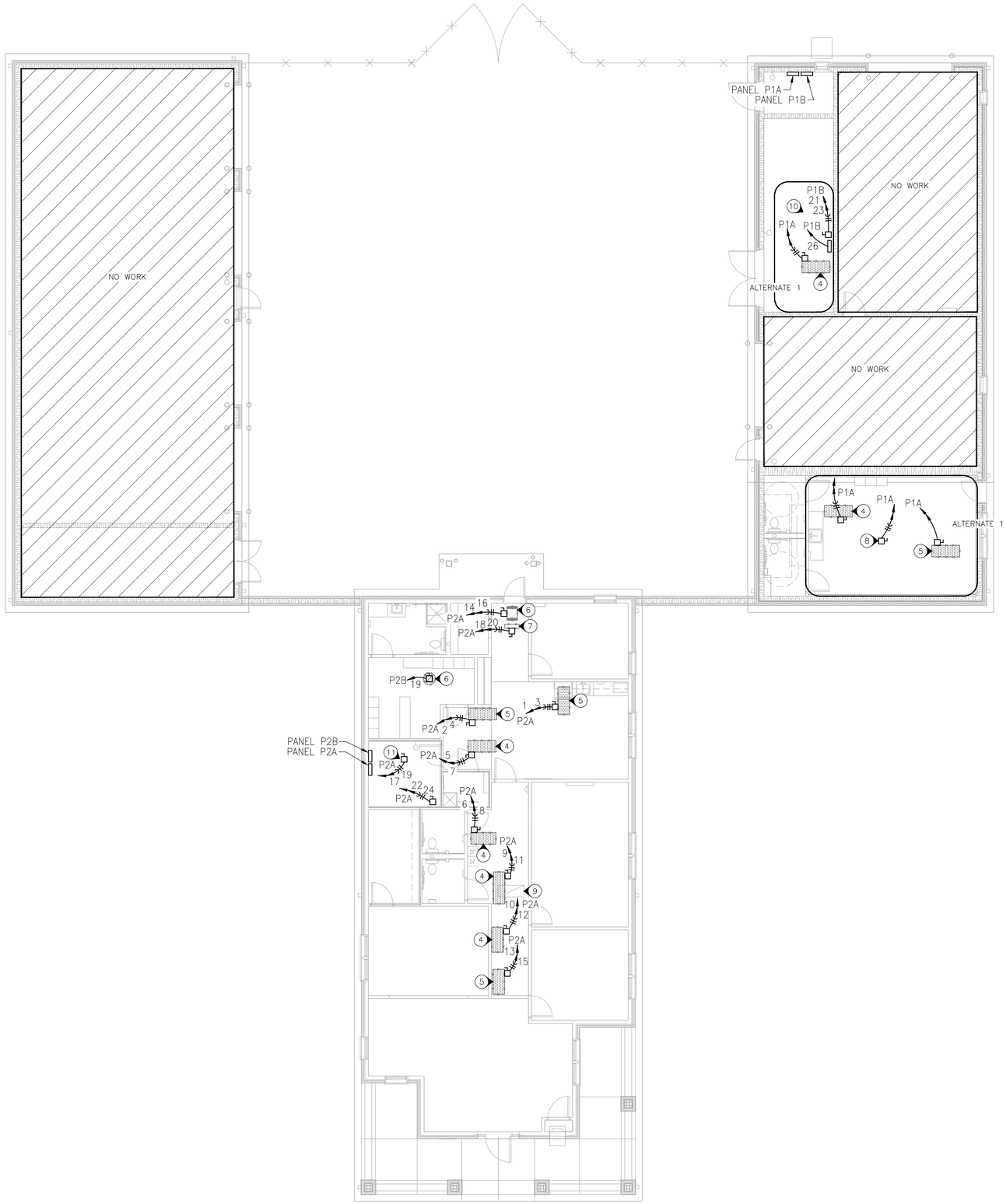
CAD DWG FILE: U200201_M
DRAWN BY: TLS
CHECKED BY: TLS
DESIGNED BY: TLS

SHEET TITLE:
SCHEDULES AND DETAILS

SHEET NUMBER:
M-602

8 OF 12 SHEETS
7/12/2022



1 ADMINISTRATION BUILDING ELECTRICAL DEMOLITION PLAN
E-101 SCALE: 1/8" = 1'-0"

GENERAL NOTES

1 ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE 2020 NATIONAL ELECTRIC CODE, ALL STATE AND LOCAL CODES, AND ALL MANUFACTURER INSTALLATION GUIDELINES.

2 ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ELECTRICAL PERMITTING FEES AND COORDINATION WITH LOCAL AUTHORITY FOR INSTALLATION INSPECTIONS.

3 ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL MATERIALS REQUIRED TO COMPLETE THE WORK. ALL EXPOSED LINE VOLTAGE WIRING SHALL BE PULLED IN PROPERLY SIZED CONDUIT (EMT) WITH APPROVED FITTINGS.

DEMOLITION KEY NOTES

4 DISCONNECT POWER FROM HEAT PUMP PRIOR TO DEMOLITION OF EQUIPMENT BY MECHANICAL CONTRACTOR. REMOVE DISCONNECT. VERIFY WIRE SIZE IS AS REQUIRED FOR NEW EQUIPMENT. REPLACE WIRES AS NEEDED.

5 DISCONNECT POWER FROM HEAT PUMP PRIOR TO DEMOLITION OF EQUIPMENT BY MECHANICAL CONTRACTOR. REMOVE DISCONNECT AND ALL ASSOCIATED WIRING AND CONDUIT BACK TO PANEL.

6 DISCONNECT POWER FROM FAN PRIOR TO DEMOLITION OF EQUIPMENT BY MECHANICAL CONTRACTOR.

7 DISCONNECT POWER FROM ELECTRIC DUCT HEATER PRIOR TO DEMOLITION OF EQUIPMENT BY MECHANICAL CONTRACTOR. EXISTING DISCONNECT SHALL BE USED FOR NEW CONSTRUCTION.

8 DISCONNECT POWER FROM ELECTRIC DUCT HEATER PRIOR TO DEMOLITION OF EQUIPMENT BY MECHANICAL CONTRACTOR. DISCONNECT AND ALL ASSOCIATED WRING SHALL BE RELOCATED AND USED IN NEW CONSTRUCTION. REFERENCE SHEET E-102 FOR NEW LOCATION.

9 RELOCATE LIGHT FIXTURE PER NOTE 6 E-102.

10 DISCONNECT POWER FROM 3 CIRCULATOR PUMPS PRIOR TO DEMOLITION OF EQUIPMENT BY MECHANICAL CONTRACTOR. DISCONNECT SHALL BE USED FOR NEW CONSTRUCTION.

11 DISCONNECT POWER FROM GROUND SOURCE WATER PUMP PRIOR TO DEMOLITION OF EQUIPMENT BY MECHANICAL CONTRACTOR. REMOVE DISCONNECT. VERIFY WIRE SIZE IS AS REQUIRED FOR NEW EQUIPMENT. REPLACE WIRES AS NEEDED.

HVAC LEGEND	
- - - - - - - -	EQUIPMENT/MATERIALS TO BE REMOVED

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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BLOOMFIELD VETERANS CEMETERY
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SHEET TITLE:
ADMIN BUILDING ELECTRICAL DEMOLITION PLAN

SHEET NUMBER:
E-101

9 OF 12 SHEETS
7/12/2022

1 E-102 ADMINISTRATION BUILDING ELECTRICAL CONSTRUCTION PLAN
SCALE: 1/8" = 1'-0"

CONSTRUCTION NOTES

(N) INDICATES KEYED NOTES

1 REFERENCE SHEET E-101 FOR GENERAL NOTES.

2. CONNECT POWER TO HEAT PUMP AFTER NEW EQUIPMENT IS INSTALLED BY MECHANICAL CONTRACTOR.
3. CONNECT POWER TO FANS EF-1 AND OAF-1 AFTER NEW EQUIPMENT IS INSTALLED BY MECHANICAL CONTRACTOR.
4. CONNECT POWER TO DUCT HEATER DH-1 AFTER NEW EQUIPMENT IS INSTALLED BY MECHANICAL CONTRACTOR.
5. SEPARATE POWER SOURCE IS REQUIRED FOR THE AUXILIARY HEATER LOCATED IN HEAT PUMP HP-5. CONNECT POWER AFTER NEW EQUIPMENT IS INSTALLED BY MECHANICAL CONTRACTOR. USE DISCONNECT RETAINED FROM DUCT HEATER DEMOLITION.
6. RELOCATE EXISTING LIGHT FIXTURE AS SHOWN.
7. CONNECT POWER TO PUMPS AFTER NEW EQUIPMENT IS INSTALLED BY MECHANICAL CONTRACTOR.

HVAC LEGEND

AA / N	DEVICE SCHEDULE TAG

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

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ADMIN BUILDING ELECTRICAL CONSTRUCTION PLAN

SHEET NUMBER:
E-102

10 OF 12 SHEETS
7/12/2022

LEGEND

AA / N	DEVICE SCHEDULE TAG (REFERENCE M–601)

CONSTRUCTION NOTES

(N) INDICATES KEYED NOTES

1. REPLACE EXISTING PANEL SCHEDULES WITH NEW TYPE WRITTEN PANEL SCHEDULES.
2. (2) REMOVE WIRES BACK TO PANEL. RETAIN BREAKER FOR USE AS SPARE.
3. (3) RETAIN WIRES AND BREAKER FOR USE WITH HEAT PUMP HP–5 ELECTRIC HEATER.
4. (4) USE EXISTING SPARE BREAKER AND ROUTE NEW WIRES TO PUMP CWP–1.

DISTRIBUTION PANEL P1A

120/240 VOLTS, 1 PHASE, 3 WIRE
800 AMPS MAIN BREAKER

SURFACE MOUNTED
WITH EQUIPMENT GROUND BAR

FULLY RATED 22000 AIC

LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLE	CONN. VA	CIRC. NO.	LOAD – VA ø A	LOAD – VA ø B	CIRC. NO.	CONN. VA	BREAKER AMPS	BREAKER POLE	LOAD DESCRIPTION
HEAT PUMP	20	2	1900		5120			3220	40*	2	HIGH PRESS. WASHER
			1900			5120		3220			
HEAT PUMP	20	2	1900		6900			5000	50	2	ELEC DUCT HTR
			1900			6900		5000			
ELEC UNIT HTR #2	20	2	1500		2295			795	20	2	VEH. EXH SYSTEM
			1500			2295		795			EXH FAN #14
ELEC UNIT HTR #1	20	2	1500		2365			865	20	1	EXH FAN #9
			1500			2195		695	20	1	EXH FAN #10
WATER–TO–WATER H.P.	40	2	3610		4305			695	20	1	EXH FAN #11
			3610			4140		530	20	1	EXH FAN #12
PANEL P2A	400	2	25,800		32,300			6500	100	2	PANEL P1B
			25,800			32,300		6500			
XFMR PT1	100	2	8250		10,150			1900	70	2	PANEL P3
			8250			10,150		1900			
FAN COIL UNIT	20	2	360		12,810			12,450	200	2	PANEL P4
			360			12,810		12,450		1	
WASH BAY WATER HEATER	50*	2	4500		4500				20	1	SPARE
			4500			4500			20	1	SPARE
SPARE	20	1							20	1	SPARE
SPARE	20	1								1	SPACE
SPARE	20	1								1	SPACE
					80,745	80,410					

* = GFCI BREAKER

1 / E–601 P1A PANEL SCHEDULE – EXISTING

PANELBOARD P1B

120/240 VOLTS, 1 PHASE, 3 WIRE
100 AMP M.L.O.

SURFACE MOUNTED
WITH EQUIPMENT GROUND BAR

FULLY RATED 22000 AIC

LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLE	CONN. VA	CIRC. NO.	LOAD – VA ø A	LOAD – VA ø B	CIRC. NO.	CONN. VA	BREAKER AMPS	BREAKER POLE	LOAD DESCRIPTION
LIGHTS – RM 133	20	1	754	1	1454		2	700	20	1	LIGHTS – RM 135, 136
LTS – RM 130–132	20	1	614	3		2294	4	1680	20	1	LIGHTS – RM 134
RECP – RM 130	20	1	1500	5	2220		6	720	20	1	RECP – RM 133–135
RECP – RM 130–132	20	1	900	7		1440	8	540	20	1	RECP – RM 133
RECP – RM 130, 132	20	1	540	9	1350		10	810	20	1	OUTSIDE LIGHTS
RECP – RM 134–136	20	1	900	11		3780	12	2880	20	1	WATER TREATMENT SYS.
OH DOOR	20	2	670	13	3550		14	2880	20	1	WATER TREATMENT SYS.
			670	15		3670	16	3000	40	2	ELEC WATER HTR
OH DOOR	20	2	670	17	3670		18	3000			
			670	19		2340	20	1670	20	2	HYDRAULIC LIFT
CHILLED WATER PUMP	20	2	370	21	2040		22	1670			
			370	23		870	24	500	20	1	SIGN LIGHTS
SPARE	20	1		25	500		26	500	20	1	RAD. FLR. SYS. C.P.
GEN CONTROLS	20	1		27		100	28	100	20	1	TIME CLOCK/LTG CONT.
GEN HEATER	20	1		29	100		30	100	20	1	CARBON MONOXIDE DET.
SPARE		1		31			32		30*	1	SPARE
SPARE		1		33			34		30*	1	SPARE
SPACE		1		35			36			1	SPACE
SPACE		1		37			38			1	SPACE
SPACE		1		39			40			1	SPACE
SPACE		1		41			42			1	SPACE
					14,884	14,494					

* = GFCI BREAKER

2 / E–601 P1B PANEL SCHEDULE – EXISTING

DISTRIBUTION PANEL P1A

120/240 VOLTS, 1 PHASE, 3 WIRE
800 AMPS MAIN BREAKER

SURFACE MOUNTED
WITH EQUIPMENT GROUND BAR

FULLY RATED 22000 AIC

	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLE	CONN. VA	CIRC. NO.	LOAD – VA ø A	LOAD – VA ø B	CIRC. NO.	CONN. VA	BREAKER AMPS	BREAKER POLE	LOAD DESCRIPTION	
ALTERNATE 1 HP 5	HEAT PUMP	25	2	1404		4624			3220	40*	2	HIGH PRESS. WASHER	
				1404			4624		3220				
(2)	SPARE	20	2			5544			5544	50	2	ELEC DUCT HTR	(3) ALTERNATE 1
							5544		5544				
	ELEC UNIT HTR #2	20	2	1500		2295			795	20	2	VEH. EXH SYSTEM	
				1500			2295		795			EXH FAN #14	
	ELEC UNIT HTR #1	20	2	1500		2365			865	20	1	EXH FAN #9	
				1500			2195		695	20	1	EXH FAN #10	
ALTERNATE 1 WHP 1	WATER–TO–WATER H.P.	60	2	3228		3923			695	20	1	EXH FAN #11	
				3228			3758		530	20	1	EXH FAN #12	
	PANEL P2A	400	2	25,800		32,300			6500	100	2	PANEL P1B	
				25,800			32,300		6500				
	XFMR PT1	100	2	8250		10,150			1900	70	2	PANEL P3	
				8250			10,150		1900				
	FAN COIL UNIT	20	2	360		12,810			12,450	200	2	PANEL P4	
				360			12,810		12,450		1		
	WASH BAY WATER HEATER	50*	2	4500		4500				20	1	SPARE	
				4500			4500			20	1	SPARE	
	SPARE	20	1							20	1	SPARE	
	SPARE	20	1								1	SPACE	
	SPARE	20	1								1	SPACE	
						78,511	78,176						

* = GFCI BREAKER

3 / E–601 P1A PANEL SCHEDULE – NEW CONSTRUCTION

PANELBOARD P1B

120/240 VOLTS, 1 PHASE, 3 WIRE
100 AMP M.L.O.

SURFACE MOUNTED
WITH EQUIPMENT GROUND BAR

FULLY RATED 22000 AIC

	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLE	CONN. VA	CIRC. NO.	LOAD – VA ø A	LOAD – VA ø B	CIRC. NO.	CONN. VA	BREAKER AMPS	BREAKER POLE	LOAD DESCRIPTION	
	LIGHTS – RM 133	20	1	754	1	1454		2	700	20	1	LIGHTS – RM 135, 136	
	LTS – RM 130–132	20	1	614	3		2294	4	1680	20	1	LIGHTS – RM 134	
	RECP – RM 130	20	1	1500	5	2220		6	720	20	1	RECP – RM 133–135	
	RECP – RM 130–132	20	1	900	7		1440	8	540	20	1	RECP – RM 133	
	RECP – RM 130, 132	20	1	540	9	1350		10	810	20	1	OUTSIDE LIGHTS	
	RECP – RM 134–136	20	1	900	11		3780	12	2880	20	1	WATER TREATMENT SYS.	
	OH DOOR	20	2	670	13	3550		14	2880	20	1	WATER TREATMENT SYS.	
				670	15		3670	16	3000	40	2	ELEC WATER HTR	
	OH DOOR	20	2	670	17	3670		18	3000				
				670	19		2340	20	1670	20	2	HYDRAULIC LIFT	
ALTERNATE 1 HWP 1	HOT WATER PUMP	20	2	370	21	2040		22	1670				
				370	23		870	24	500	20	1	SIGN LIGHTS	
ALTERNATE 1 CWP 1	CHILLED WATER PUMP	20	1		25	500		26	500	20	1	RAD. FLR. SYS. C.P.	RZP 1 / RZP 2
(4)	GEN CONTROLS	20	1		27		100	28	100	20	1	TIME CLOCK/LTG CONT.	ALTERNATE 1
	GEN HEATER	20	1		29	100		30	100	20	1	CARBON MONOXIDE DET.	
	SPARE		1		31			32		30*	1	SPARE	
	SPARE		1		33			34		30*	1	SPARE	
	SPACE		1		35			36			1	SPACE	
	SPACE		1		37			38			1	SPACE	
	SPACE		1		39			40			1	SPACE	
	SPACE		1		41			42			1	SPACE	
						14,884	14,494						

* = GFCI BREAKER

4 / E–601 P1B PANEL SCHEDULE – NEW CONSTRUCTION

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

PROJECT DESIGN UNIT

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF MO VETERANS COMMISSION

REPLACE HVAC SYSTEM
ADMINISTRATION BUILDING

BLOOMFIELD VETERANS CEMETERY
17357 STARS & STRIPES WAY
BLOOMFIELD, MO 63825

PROJECT # U2002-01
SITE # 6903
ASSET # 8136903001

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE:

CAD DWG FILE: U200201_E
DRAWN BY: TLS
CHECKED BY: TLS
DESIGNED BY: TLS

SHEET TITLE:
PANEL SCHEDULES

SHEET NUMBER:
E-601

LEGEND

AA / N	DEVICE SCHEDULE TAG (REFERENCE M-601)

CONSTRUCTION NOTES

(N) INDICATES KEYED NOTES

1 REPLACE EXISTING PANEL SCHEDULES WITH NEW TYPE WRITTEN PANEL SCHEDULES.

(2) REMOVE WIRES BACK TO PANEL. RETAIN BREAKER FOR USE AS SPARE.

PANELBOARD P2A — 120/240 VOLTS, 1 PHASE, 3 WIRE — 400 AMPS MAIN BREAKER — SURFACE MOUNTED — FULLY RATED 10000 AIC — WITH EQUIPMENT GROUND BAR

LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLE	CONN. VA	CIRC. NO.	LOAD – VA ø A	LOAD – VA ø B	CIRC. NO.	CONN. VA	BREAKER AMPS	BREAKER POLE	LOAD DESCRIPTION
HEAT PUMP	20	2	760	1	1820		2	1060	20	2	HEAT PUMP
			760	3		1820	4	1060			
HEAT PUMP	20	2	1060	5	2120		6	1060	20	2	HEAT PUMP
			1060	7		2120	8	1060			
HEAT PUMP	20	2	1900	9	2660		10	760	20	2	HEAT PUMP
			1900	11		2660	12	760			
HEAT PUMP	20	2	1060	13	1625		14	565	20	2	OUTSIDE AIR FAN
			1060	15		1625	16	565			
GROUND SOURCE WATER PUMP	30	2	1955	17	9455		18	7500	80	2	ELEC DUCT HTR
			1955	19		9455	20	7500			
PANEL P2B	100	2	5700	21	14700		22	9000	100	2	ELEC WATER HTR
			5700	23		14700	24	9000			
SPARE	20	1		25			26		20	1	SPARE
SPACE	20	1		27			28		20	1	SPARE
SPACE		1		29			30			1	SPARE
					32,380	32,380					

1 / E-602 P2A PANEL SCHEDULE – EXISTING

PANELBOARD P2B — 120/240 VOLTS, 1 PHASE, 3 WIRE — 100 AMP M.L.O. — SURFACE MOUNTED — FULLY RATED 10000 AIC — WITH EQUIPMENT GROUND BAR

LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLE	CONN. VA	CIRC. NO.	LOAD – VA ø A	LOAD – VA ø B	CIRC. NO.	CONN. VA	BREAKER AMPS	BREAKER POLE	LOAD DESCRIPTION
LTS–RM 100,101,103	20	1	1284	1	2358		2	1074	20	1	LTS – RM 102,105–109
LIGHTS – RM 104	20	1	1128	3		2029	4	901	20	1	LTS – RM 110, 112–115
RECP – RM 110, 115	20	1	720	5	1620		6	900	20	1	RECP – RM 103, 104
RECP – RM 115	20	1	720	7		1620	8	900	20	1	RECP – RM 100, 103
RECP – RM 102	20	1	900	9	2400		10	1500	20	1	RECP – MICROWAVE
RECP – RM 100	20	1	1440	11		2940	12	1500	20	1	RECP – GARBAGE DISPOS.
RECP – RM 105–107	20	1	1020	13	2100		14	1080	20	1	RECP – RM 104, 110
RECP – RM 108–112	20	1	1440	15		2115	16	675	20	1	RECP – REFRIGERATOR
OUTSIDE LIGHTS	20	1	1125	17	1305		18	180	20	1	RECP – PHONE SWITCH
EXH FAN #1	20	1	865	19		1365	20	500	20	1	F.A./SECURITY PANEL
RECP – DATA SERVER	20	1	180	21	360		22	180	20	1	RECP – COUNTERTOP
EXIST & EMERG LTS	20	1		23		100	24	100	20	1	HVAC TIME CLOCK
SPRINKLER	20	1		25			26		20	1	SPARE
SPACE		1		27			28		50	2	STOVE
SPACE		1		29			30				
					10,143	10,169					

2 / E-602 P2B PANEL SCHEDULE – EXISTING

PANELBOARD P2A — 120/240 VOLTS, 1 PHASE, 3 WIRE — 400 AMPS MAIN BREAKER — SURFACE MOUNTED — FULLY RATED 10000 AIC — WITH EQUIPMENT GROUND BAR

	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLE	CONN. VA	CIRC. NO.	LOAD – VA ø A	LOAD – VA ø B	CIRC. NO.	CONN. VA	BREAKER AMPS	BREAKER POLE	LOAD DESCRIPTION	
(2)	SPARE	20	2		1			2		20	2	SPARE	(2)
					3			4					
HP 4	HEAT PUMP	25	2	1740	5	2544		6	804	20	2	HEAT PUMP	HP 3
				1740	7		2544	8	804				
HP 2	HEAT PUMP	40	2	2688	9	3211		10	523	20	2	HEAT PUMP	HP 1
				2688	11		3211	12	523				
(2)	SPARE	20	2		13	528		14	528	20	2	OUTSIDE AIR FAN	OAF 1
					15		528	16	528				
GSP 1	GROUND SOURCE WATER PUMP	30	2	1380	17	5032		18	3652	80	2	ELEC DUCT HTR	DH 1
				1380	19		5032	20	3652				
	PANEL P2B	100	2	5700	21	14,700		22	9000	100	2	ELEC WATER HTR	
				5700	23		14,700	24	9000				
	SPARE	20	1		25			26		20	1	SPARE	
	SPACE	20	1		27			28		20	1	SPARE	
	SPACE		1		29			30			1	SPARE	
						26,015	26,015						

3 / E-602 P2A PANEL SCHEDULE – NEW CONSTRUCTION

PANELBOARD P2B — 120/240 VOLTS, 1 PHASE, 3 WIRE — 100 AMP M.L.O. — SURFACE MOUNTED — FULLY RATED 10000 AIC — WITH EQUIPMENT GROUND BAR

	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLE	CONN. VA	CIRC. NO.	LOAD – VA ø A	LOAD – VA ø B	CIRC. NO.	CONN. VA	BREAKER AMPS	BREAKER POLE	LOAD DESCRIPTION
	LTS–RM 100,101,103	20	1	1284	1	2358		2	1074	20	1	LTS – RM 102,105–109
	LIGHTS – RM 104	20	1	1128	3		2029	4	901	20	1	LTS – RM 110, 112–115
	RECP – RM 110, 115	20	1	720	5	1620		6	900	20	1	RECP – RM 103, 104
	RECP – RM 115	20	1	720	7		1620	8	900	20	1	RECP – RM 100, 103
	RECP – RM 102	20	1	900	9	2400		10	1500	20	1	RECP – MICROWAVE
	RECP – RM 100	20	1	1440	11		2940	12	1500	20	1	RECP – GARBAGE DISPOS.
	RECP – RM 105–107	20	1	1020	13	2100		14	1080	20	1	RECP – RM 104, 110
	RECP – RM 108–112	20	1	1440	15		2115	16	675	20	1	RECP – REFRIGERATOR
	OUTSIDE LIGHTS	20	1	1125	17	1305		18	180	20	1	RECP – PHONE SWITCH
EF 1	EXH FAN #1	20	1	89	19		589	20	500	20	1	F.A./SECURITY PANEL
	RECP – DATA SERVER	20	1	180	21	360		22	180	20	1	RECP – COUNTERTOP
	EXIST & EMERG LTS	20	1		23		100	24	100	20	1	HVAC TIME CLOCK
	SPRINKLER	20	1		25			26		20	1	SPARE
	SPACE		1		27			28		50	2	STOVE
	SPACE		1		29			30				
						10,143	9,393					

4 / E-602 P2B PANEL SCHEDULE – NEW CONSTRUCTION

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

PROJECT DESIGN UNIT

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION

DEPARTMENT OF MO VETERANS COMMISSION

REPLACE HVAC SYSTEM
ADMINISTRATION BUILDING

BLOOMFIELD VETERANS CEMETERY
17357 STARS & STRIPES WAY
BLOOMFIELD, MO 63825

PROJECT # U2002-01
SITE # 6903
ASSET # 8136903001

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE:

CAD DWG FILE: U200201_E
DRAWN BY: TLS
CHECKED BY: TLS
DESIGNED BY: TLS

SHEET TITLE:
PANEL SCHEDULES

SHEET NUMBER:
E-602