# BOTHWELL LODGE STATE HISTORIC SITE
# INSTALL NEW HEATING UNIT
# SEDALIA, MO

KLINGNER
& ASSOCIATES, P.C.
Engineers • Architects • Surveyors

OWNER: STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR
MISSOURI STATE PARKS

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

DESIGNER: KLINGNER & ASSOCIATES, P.C.

PROJECT NUMBER: X2331-01

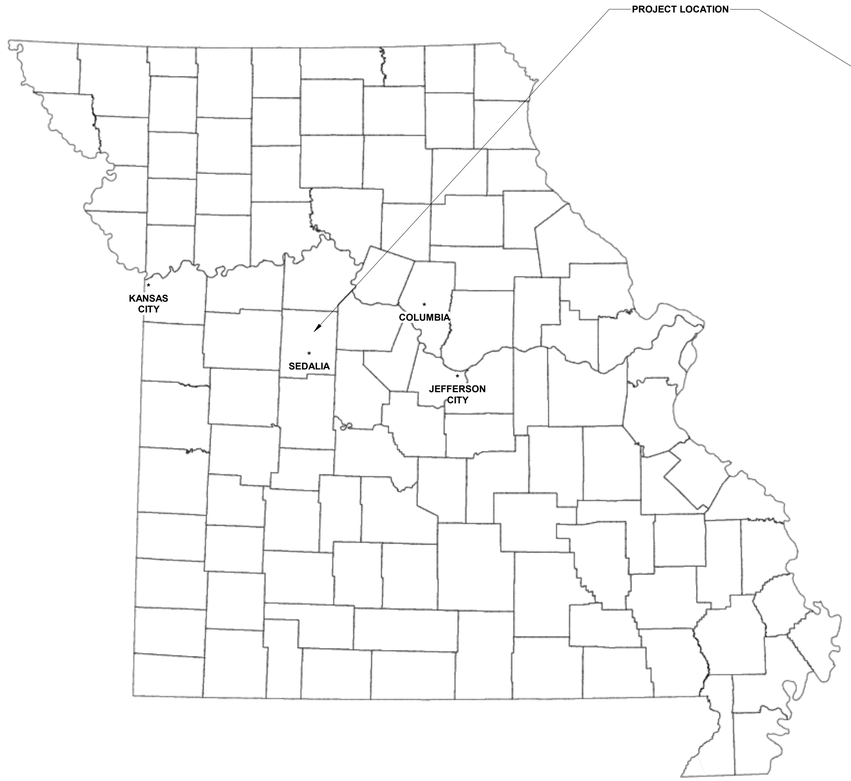
SITE NUMBER: 5303 - BOTHWELL LODGE
STATE HISTORIC SITE

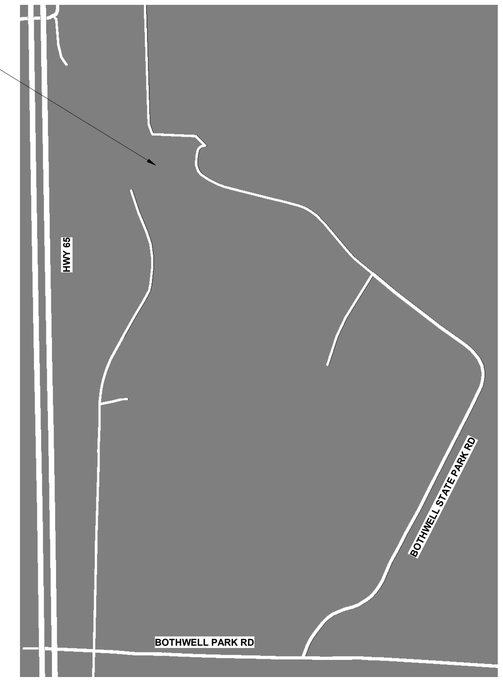
ASSET NUMBER: 7815303002 - BOTHWELL LODGE

SHEET NUMBER:

G001

SHEET 1 OF 12
SEPTEMBER 9, 2024




**PROJECT ADDRESS:**

BOTHWELL LODGE
19349 BOTHWELL STATE PARK RD
SEDALIA, MO 65301

## SHEET INDEX:



## GENERAL PLUMBING AND MECHANICAL NOTES:

1. ALL WORK SHALL COMPLY WITH APPLICABLE LOCAL, STATE, AND NATIONAL CODES AND REGULATIONS.
2. PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS, ACCESSORIES, TOOLS, EQUIPMENT, TRANSPORTATION, LABOR, SERVICES AND OPERATIONS NECESSARY FOR A COMPLETE PLUMBING SYSTEM INCLUDING FIXTURES, SANITARY SEWERS, CLEANOUTS, WATER SUPPLY PIPING, AND NATURAL GAS PIPING.
3. PLUMBING CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ARRANGE FOR ALL INSPECTIONS REQUIRED BY STATE OR LOCAL AUTHORITIES.
4. MATERIALS MUST BE NEW, IN FIRST CLASS CONDITION.
5. WORK SHALL BE DONE BY TRAINED, EXPERIENCED, SKILLED, JOURNEYMAN UNDER AN APPROVED FULL TIME SUPERVISOR. WORK SHALL BE PERFORMED IN A NEAT WORKLIKE MANNER.
6. PIPE INSTALLATION SHALL BE COORDINATED WITH OTHER TRADES.
7. PIPING SHALL BE SEPARATELY HUNG AND ANCHORED, FREE TO EXPAND AND CONTRACT QUIETLY, WITHOUT IMPOSING STRAINS ON STRUCTURE, PIPING, VALVES, DEVICES, AND EQUIPMENT. PIPING SHALL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES.
8. CONNECTIONS BETWEEN DISSIMILAR METALS SHALL BE SEPARATED BY DIELECTRIC COUPLINGS
9. CONTRACTOR SHALL PERFORM EXCAVATION REQUIRED TO INSTALL HIS WORK.
10. PIPING, ETC., SHALL BE TESTED TO AT LEAST 125 PSI.
11. PIPE HANGERS AND SUPPORTS SHALL MEET THE LOCAL SEISMIC REQUIREMENTS.
12. PROVIDE BALL VALVE ON PIPES TO EACH GROUP OF FIXTURES OR TO EACH PIECE OF EQUIPMENT.
13. PLUMBING CONTRACTOR SHALL INSTALL GAS PIPING TO WITHIN 2' OF EACH APPLIANCE AND TERMINATE WITH A GAS COCK. HVAC CONTRACTOR TO MAKE FINAL CONNECTION.
14. LOCATE ALL SHUT-OFFS, CLEANOUTS, AND OTHER DEVICES REQUIRING ACCESS IN AN EASILY ACCESSIBLE AREA.
15. DRAWINGS ARE SCHEMATIC AND SHOW APPROXIMATE LOCATIONS OF PIPING. EXACT LOCATIONS SHALL BE COORDINATED BY THE CONTRACTOR AND VERIFIED IN THE FIELD PRIOR TO ROUGH-IN.
16. PLUMBING CONTRACTOR SHALL COORDINATE ALL PLUMBING VENTS THROUGH ROOFS WITH HVAC EQUIPMENT AND BUILDING OPENINGS TO ENSURE CODE COMPLIANCE WITH MINIMUM SEPARATION DISTANCES.
17. SEE ARCHITECTURAL SHEET FOR FIRE RATED CONSTRUCTION LOCATIONS. ALL PLUMBING PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE UL LISTED OF EQUAL OR GREATER HOUR RATING.

## PLUMBING AND MECHANICAL PIPING SYMBOLS

- 2" — PIPE SIZE TAG (DIAMETER)
- ABOVE GROUND PIPING
- BELOW GROUND PIPING
- (E) — EXISTING PIPE TAG
- PIPING BEING DEMOLISHED
- G — NATURAL GAS
- CD — CONDENSATE DRAINAGE
- CW — DOMESTIC COLD WATER
- HYDRONIC HEATING WATER SUPPLY
- HYDRONIC HEATING WATER RETURN
- SS — SANITARY SEWER
- PIPE DROP
- PIPE RISE
- PIPE TEE
- CAP
- 4" 4" 2" — PLUG
- REDUCING 45 DEGREE TEE
- 45 DEGREE TEE
- CIRCUIT SETTER
- BALL VALVE
- CHECK VALVE
- MOTORIZED CONTROL VALVE
- CONNECT TO EXISTING

## GENERAL ELECTRICAL NOTES:

1. APPLICABLE STANDARDS: NFPA-70, NFPA-101, STATE BUILDING CODES, AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) OF 1971 AND ALL AMENDMENTS THERETO; EQUIPMENT, DEVICES, APPARATUS, SYSTEMS, AND INSTALLATIONS SHALL BE ENTIRELY SUITABLE AND SAFE FOR EACH INTENDED APPLICATION AND BE IN FULL COMPLIANCE WITH APPLICABLE STANDARDS, REQUIREMENTS, RULES, REGULATIONS, CODES, STATUTES, ORDINANCES, ETC., OF MUNICIPAL, COUNTY, AND STATE GOVERNMENTS, OWNER'S INSURANCE COMPANY, LOCAL UTILITIES, AND LABOR REGULATIONS. NOTHING CONTAINED IN THESE PLANS AND SPECIFICATIONS SHALL BE CONSTRUED TO CONFLICT WITH THESE LAWS, CODES, AND ORDINANCES.
2. DRAWINGS ARE SCHEMATIC AND SHOW APPROXIMATE LOCATIONS OF ELECTRICAL EQUIPMENT. EXACT LOCATIONS SHALL BE COORDINATED BY THE CONTRACTOR AND VERIFIED IN THE FIELD PRIOR TO ROUGH-IN.
3. INSTALLATIONS WHICH INCLUDE ELECTRICAL FIXTURES, DEVICES, CONDUIT, SWITCHES, PANELS, HANGERS, WIRE, CABLE, STANDARDS, ETC., MUST BE ENTIRELY SUITABLE FOR TEMPERATURES, HUMIDITY, DAMP AREAS, VOLTAGE, FREQUENCY, AND ALL INSTALLATION CONDITIONS ENCOUNTERED.
4. INSTALLATION MUST BE ENTIRELY SAFE IN EVERY RESPECT, AND MUST NOT CREATE ANY CONDITIONS OF ANY KIND WHICH WILL BE HARMFUL TO ANY OCCUPANT OF THE BUILDING. IF CONTRACTOR BELIEVES THAT INSTALLATION WILL NOT BE SAFE FOR ALL PEOPLE, HE/SHE SHALL SO REPORT IN WRITING TO ENGINEER BEFORE ANY EQUIPMENT IS PURCHASED OR WORK IS INSTALLED, GIVING EXACT RECOMMENDATIONS, AND REASONS FOR THEM.
5. GROUNDING: ALL GROUNDING SHALL BE IN STRICT ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NEC).
6. INSTALLATION OF ELECTRICAL DEVICES SHALL BE COORDINATED WITH OTHER TRADES AS NECESSARY TO PREVENT ANY CONFLICTS DURING CONSTRUCTION.
7. LOW VOLTAGE CONDUIT AND JUNCTION BOXES SHALL BE INSTALLED BY THE ELECTRICAL CONTRACTOR.
8. EQUIPMENT GROUNDING CONDUCTORS SHALL BE PULLED WITH ALL BRANCH CIRCUITS. CONDUIT SHALL NOT BE USED AS A GROUND U.N.O.
9. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIALS, ACCESSORIES, TOOLS, EQUIPMENT, TRANSPORTATION, LABOR, SERVICES AND OPERATIONS NECESSARY FOR A COMPLETE ELECTRICAL SYSTEM.
10. ELECTRICAL CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND ARRANGE FOR ALL INSPECTIONS REQUIRED BY STATE OR LOCAL AUTHORITIES.
11. MATERIALS MUST BE NEW, IN FIRST CLASS CONDITION.
12. CONDUIT SHALL BE SEPARATELY HUNG AND ANCHORED, FREE TO EXPAND AND CONTRACT QUIETLY, WITHOUT IMPOSING STRAINS ON STRUCTURE, DEVICES, AND EQUIPMENT. CONDUIT SHALL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES.
13. CONTRACTOR SHALL PERFORM EXCAVATION REQUIRED TO INSTALL HIS WORK.

## ELECTRICAL SYMBOLS

- SINGLE RECEPTACLE
- STANDARD DUPLEX RECEPTACLE
- S — SINGLE POLE SWITCH
- S LV — LOW VOLTAGE SWITCH
- SAFETY DISCONNECT SWITCH (FUSED)
- SAFETY DISCONNECT SWITCH (NON-FUSED)
- CIRCUIT BREAKER PANEL
- LOW VOLTAGE POWER CIRCUIT
- LINE VOLTAGE POWER CIRCUIT
- 2"ø EMT — CONDUIT SIZE AND TYPE
- SURFACE MOUNTED RACEWAY
- CONDUIT TRANSITION UP
- CONDUIT TRANSITION DOWN
- BRANCH CIRCUIT HOME RUN
- UE — UNDERGROUND ELECTRIC
- OHE — OVERHEAD ELECTRIC
- DOOR CONTACT SWITCH
- CONNECT TO EXISTING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RYAN M. STONECIPHER
2024-09-09
NUMBER PE-2013000634
PROFESSIONAL ENGINEER

RYAN M. STONECIPHER
MO # PE-2013000634

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**INSTALL NEW HEATING UNIT**

**BOTHWELL LODGE STATE HISTORIC SITE**

**19349 BOTHWELL STATE PARK RD**
**SEDALIA, MO 65301**

PROJECT # X233101
SITE # 5303
ASSET # 7815303002

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ISSUE DATE:09/09/2024

CAD DWG FILE:
DRAWING BY: RMS
CHECKED BY: SFD
DESIGNED BY: RMS

SHEET TITLE:

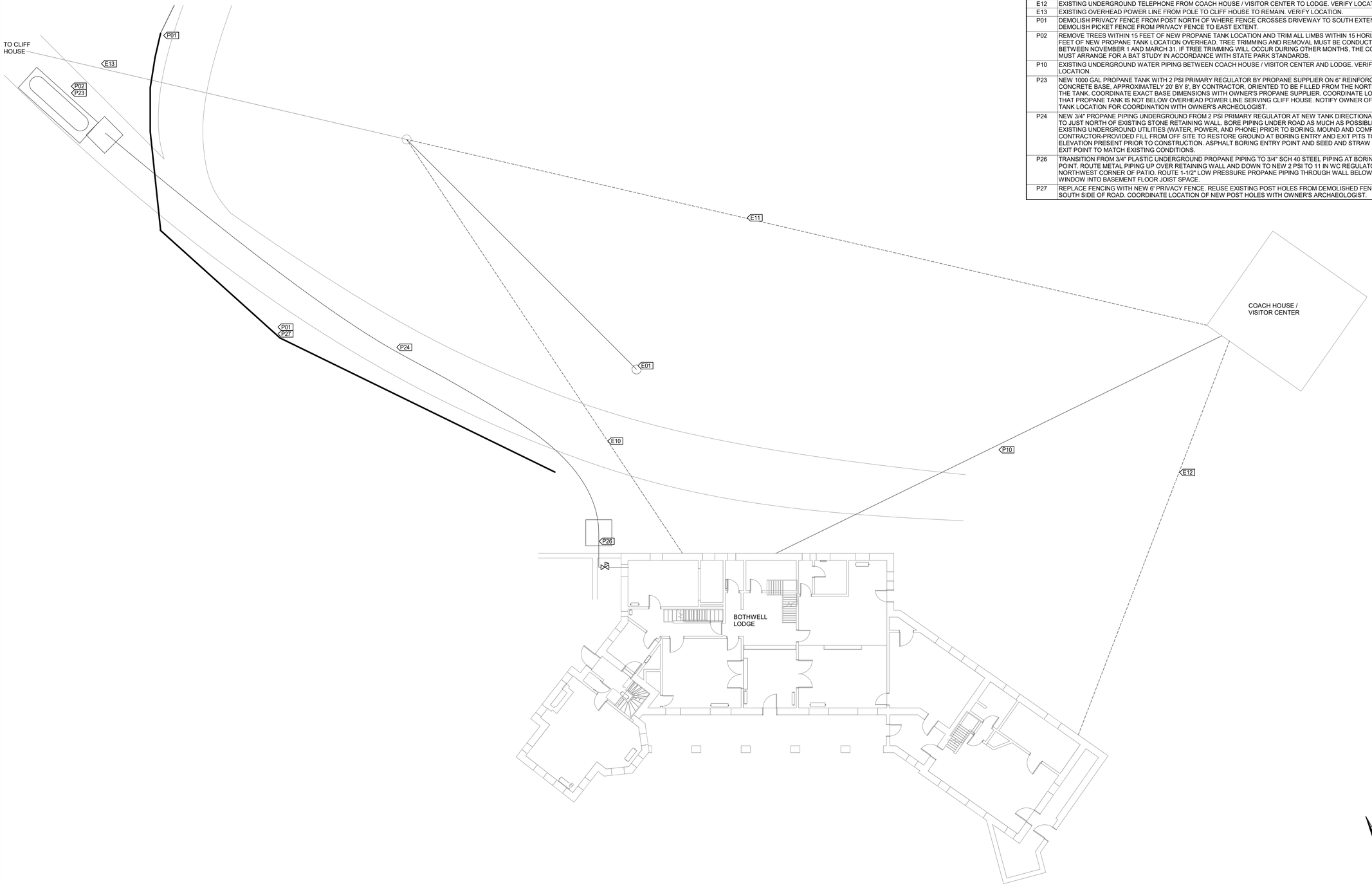
**INDEX PAGE**

SHEET NUMBER:

# G002

SHEET 2 OF 12

SEPTEMBER 9, 2024




1 SITE MEP PLAN
1" = 10'-0"

0 10' 20'
SCALE: 1" = 10'

## KEYNOTE LEGEND

| VALUE | DESCRIPTION |
|---|---|
| E01 | DEMOLISH POLE LIGHT, OVERHEAD WIRING, AND MEANS OF DISCONNECT ON UPSTREAM POLE. |
| E10 | EXISTING UNDERGROUND ELECTRICAL FROM POLE TO BUILDING TO REMAIN. VERIFY LOCATION. |
| E11 | EXISTING UNDERGROUND ELECTRICAL FROM POLE TO COACH HOUSE / VISITOR CENTER TO REMAIN. VERIFY LOCATION. |
| E12 | EXISTING UNDERGROUND TELEPHONE FROM COACH HOUSE / VISITOR CENTER TO LODGE. VERIFY LOCATION. |
| E13 | EXISTING OVERHEAD POWER LINE FROM POLE TO CLIFF HOUSE TO REMAIN. VERIFY LOCATION. |
| P01 | DEMOLISH PRIVACY FENCE FROM POST NORTH OF WHERE FENCE CROSSES DRIVEWAY TO SOUTH EXTENT AND DEMOLISH PICKET FENCE FROM PRIVACY FENCE TO EAST EXTENT. |
| P02 | REMOVE TREES WITHIN 15 FEET OF NEW PROPANE TANK LOCATION AND TRIM ALL LIMBS WITHIN 15 HORIZONTAL FEET OF NEW PROPANE TANK LOCATION OVERHEAD. TREE TRIMMING AND REMOVAL MUST BE CONDUCTED BETWEEN NOVEMBER 1 AND MARCH 31. IF TREE TRIMMING WILL OCCUR DURING OTHER MONTHS, THE CONTRACTOR MUST ARRANGE FOR A BAT STUDY IN ACCORDANCE WITH STATE PARK STANDARDS. |
| P10 | EXISTING UNDERGROUND WATER PIPING BETWEEN COACH HOUSE / VISITOR CENTER AND LODGE. VERIFY LOCATION. |
| P23 | NEW 1000 GAL PROPANE TANK WITH 2 PSI PRIMARY REGULATOR BY PROPANE SUPPLIER ON 6" REINFORCED CONCRETE BASE, APPROXIMATELY 20' BY 8', BY CONTRACTOR, ORIENTED TO BE FILLED FROM THE NORTH END OF THE TANK. COORDINATE EXACT BASE DIMENSIONS WITH OWNER'S PROPANE SUPPLIER. COORDINATE LOCATION SO THAT PROPANE TANK IS NOT BELOW OVERHEAD POWER LINE SERVING CLIFF HOUSE. NOTIFY OWNER OF INTENDED TANK LOCATION FOR COORDINATION WITH OWNER'S ARCHEOLOGIST. |
| P24 | NEW 3/4" PROPANE PIPING UNDERGROUND FROM 2 PSI PRIMARY REGULATOR AT NEW TANK DIRECTIONAL BORED TO JUST NORTH OF EXISTING STONE RETAINING WALL. BORE PIPING UNDER ROAD AS MUCH AS POSSIBLE. LOCATE EXISTING UNDERGROUND UTILITIES (WATER, POWER, AND PHONE) PRIOR TO BORING. MOUND AND COMPACT CONTRACTOR-PROVIDED FILL FROM OFF SITE TO RESTORE GROUND AT BORING ENTRY AND EXIT PITS TO ELEVATION PRESENT PRIOR TO CONSTRUCTION. ASPHALT BORING ENTRY POINT AND SEED AND STRAW BORING EXIT POINT TO MATCH EXISTING CONDITIONS. |
| P26 | TRANSITION FROM 3/4" PLASTIC UNDERGROUND PROPANE PIPING TO 3/4" SCH 40 STEEL PIPING AT BORING EXIT POINT. ROUTE METAL PIPING UP OVER RETAINING WALL AND DOWN TO NEW 2 PSI TO 11 IN WC REGULATOR IN NORTHWEST CORNER OF PATIO. ROUTE 1-1/2" LOW PRESSURE PROPANE PIPING THROUGH WALL BELOW KITCHEN WINDOW INTO BASEMENT FLOOR JOIST SPACE. |
| P27 | REPLACE FENCING WITH NEW 6' PRIVACY FENCE. REUSE EXISTING POST HOLES FROM DEMOLISHED FENCE ALONG SOUTH SIDE OF ROAD. COORDINATE LOCATION OF NEW POST HOLES WITH OWNER'S ARCHAEOLOGIST. |

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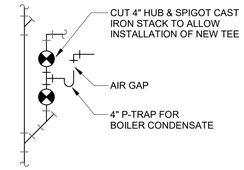
CAD DWG FILE:
DRAWING BY: RMS
CHECKED BY: SFD
DESIGNED BY: RMS

SHEET TITLE:
**MEP SITE PLAN**

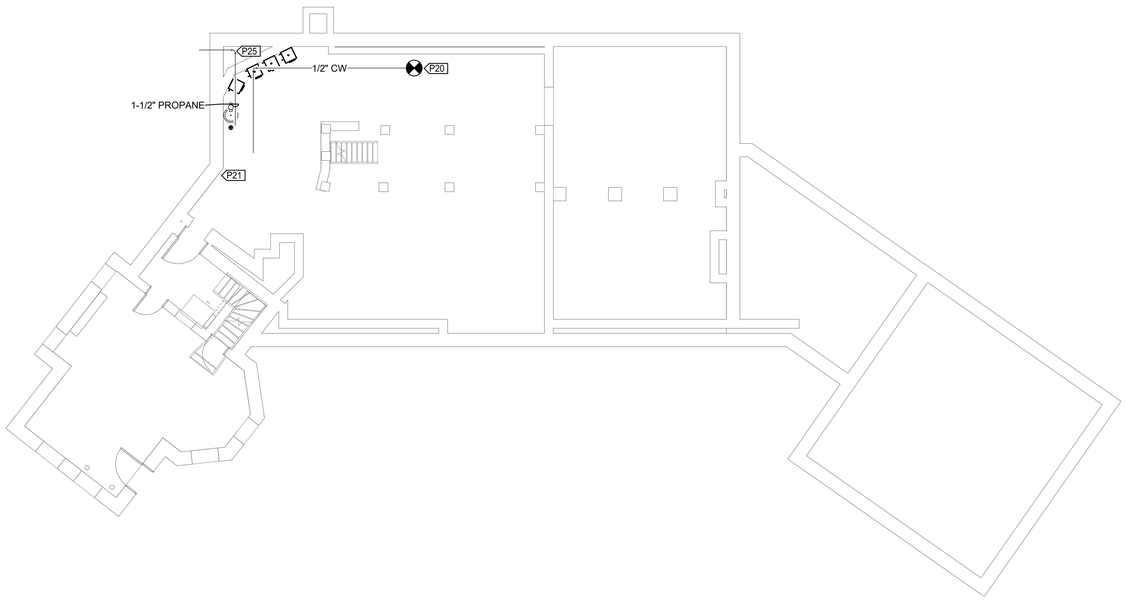
SHEET NUMBER:
# MEP100

SHEET 3 OF 12
SEPTEMBER 9, 2024

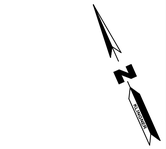
| KEYNOTE LEGEND | |
|---|---|
| VALUE | DESCRIPTION |
| P20 | EXTEND 1/2" COLD WATER PIPING FROM EXISTING PIPING IN CLOSET TO NEW BACKFLOW PREVENTER FOR BOILER FEED/MAKEUP. |
| P21 | EXTEND SANITARY PIPING FROM STACK TO NEW P-TRAP AND HUB DRAIN TO RECEIVE BOILER CONDENSATE. |
| P25 | PROVIDE AND INSTALL 1-1/2" SCH 40 STEEL PROPANE PIPING TO NEW BOILERS TIGHT TO STRUCTURE ABOVE. PAINT YELLOW FOR IDENTIFICATION. |




CONDENSATE HUB DRAIN DETAIL
NTS




1 BASEMENT PLUMBING PLAN
1/8" = 1'-0"




0 4' 8' 16'
SCALE: 1/8" = 1'-0"

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BOTHWELL LODGE STATE HISTORIC SITE

19349 BOTHWELL STATE PARK RD
SEDALIA, MO 65301

PROJECT # X233101
SITE # 5303
ASSET # 7815303002

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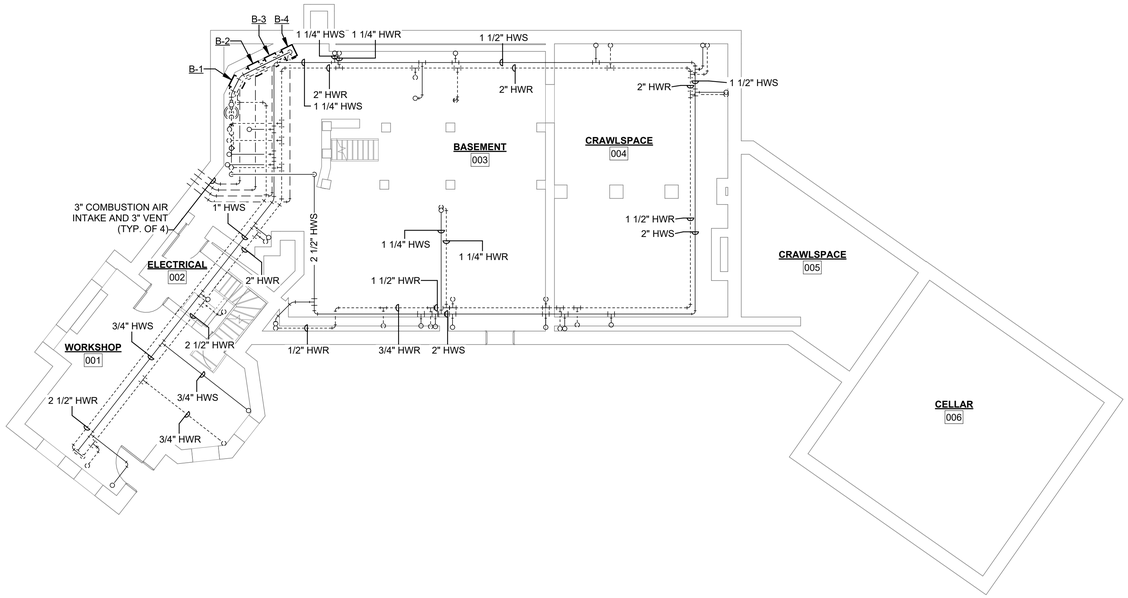
ISSUE DATE:09/09/2024

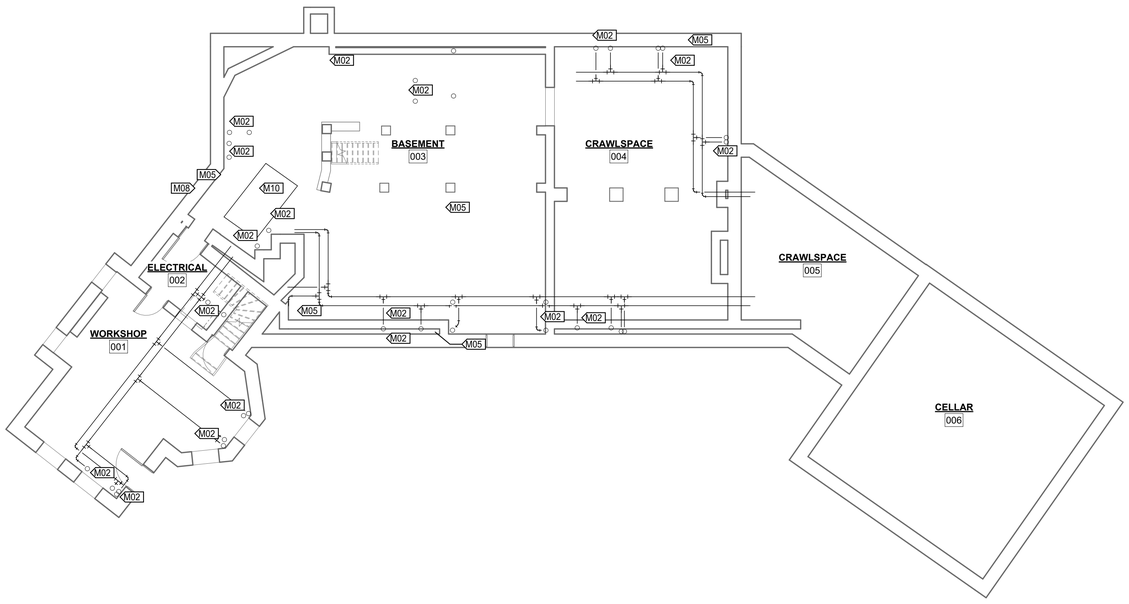
CAD DWG FILE:
DRAWING BY: RMS
CHECKED BY: SFD
DESIGNED BY: RMS

SHEET TITLE:
PLUMBING PLANS AND DETAILS

SHEET NUMBER:
P100
SHEET 4 OF 12
SEPTEMBER 9, 2024




2 BASEMENT MECHANICAL PLAN
1/8" = 1'-0"




1 BASEMENT MECHANICAL DEMO PLAN
1/8" = 1'-0"

| KEYNOTE LEGEND | |
|---|---|
| VALUE | DESCRIPTION |
| M02 | DEMOLISH ALL EXPOSED STEAM AND CONDENSATE PIPING IN BASEMENT GREATER THAN 3 FEET AWAY FROM BOILER. |
| M05 | DRY CORE DRILL NEW OPENING FOR PIPING. REFER TO NEW WORK PLAN. |
| M08 | UNINSTALL WINDOW AND RETURN TO OWNER. ENSURE OPENING IS COVERED AND SECURE UNTIL NEW WORK IS COMPLETED. |
| M10 | EXISTING, ABANDONED STEAM BOILER, BOILER SPECIALTIES, AND PIPING WITHIN 3 FEET OF BOILER TO REMAIN. |

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

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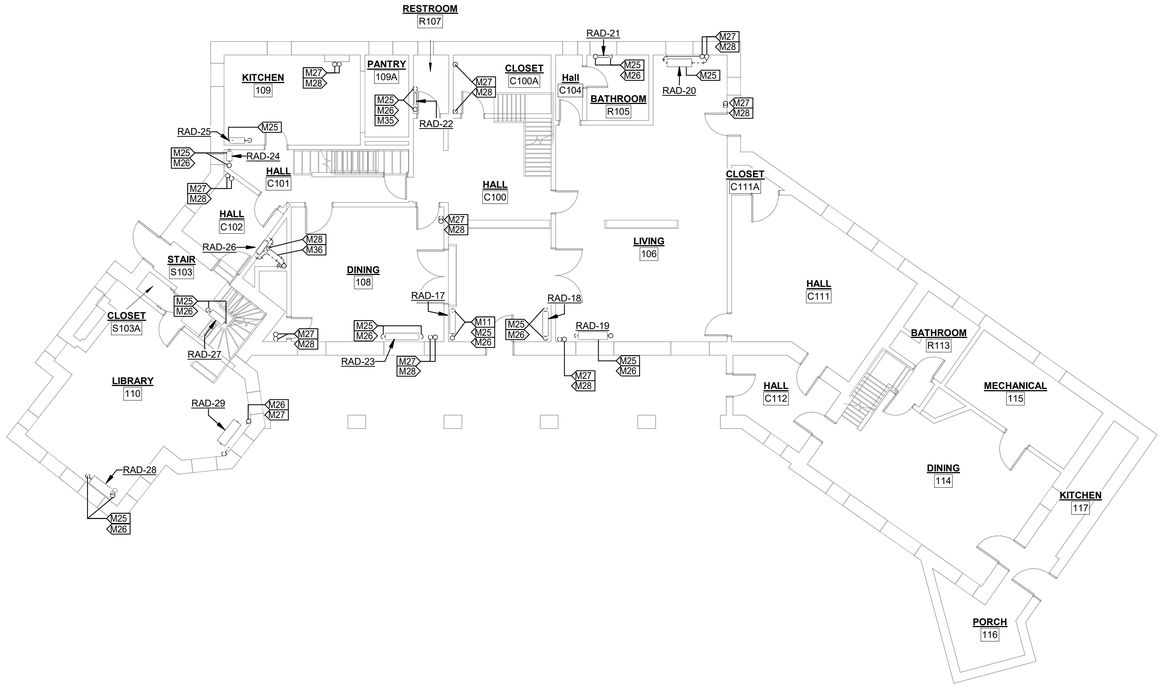
CAD DWG FILE:
DRAWING BY: CRB
CHECKED BY: SFD
DESIGNED BY: RMS

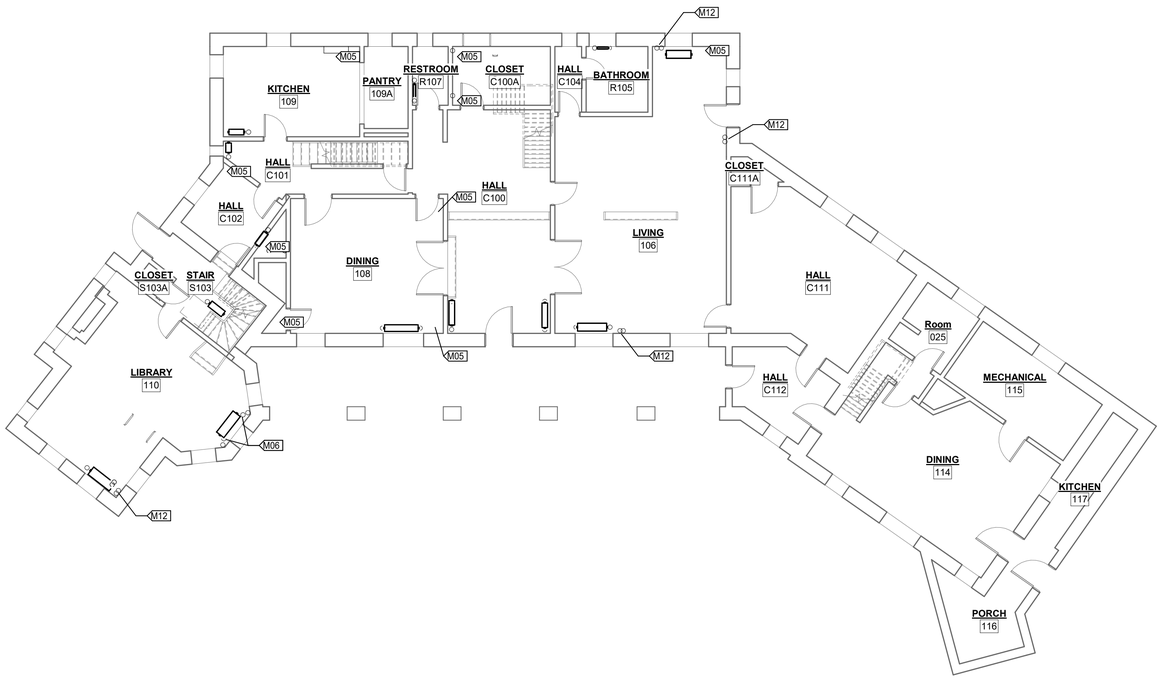
SHEET TITLE:
BASEMENT MECHANICAL PLANS

SHEET NUMBER:
M100

SHEET 5 OF 12
SEPTEMBER 9, 2024




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




1 FIRST FLOOR MECHANICAL DEMO PLAN
1/8" = 1'-0"

## KEYNOTE LEGEND

| VALUE | DESCRIPTION |
|---|---|
| M05 | DRY CORE DRILL NEW OPENING FOR PIPING. REFER TO NEW WORK PLAN. |
| M06 | DEMOLISH EXPOSED STEAM AND CONDENSATE PIPING TO MAX. 6" ABOVE FLOOR. CAP AND ABANDON PIPING STUB. SALVAGE VALVES AND STEAM TRAPS AND RETURN TO OWNER. |
| M11 | EXISTING RADIATOR WITH CRACKED BODY. OWNER TO REPAIR RADIATOR PRIOR TO CONTRACTOR CONNECTING TO NEW PIPING. |
| M12 | EXISTING ABANDONED STEAM AND CONDENSATE PIPING TO REMAIN. CAP BOTTOM OF PIPING IN BASEMENT. |
| M25 | CONNECT NEW HYDRONIC SUPPLY AND RETURN PIPING TO EXISTING RADIATOR. REFER TO DETAIL FOR ARRANGEMENT OF NEW CONTROL VALVE, LOCK SHIELD VALVE, AND AIR VENT. |
| M26 | EXTEND NEW HYDRONIC SUPPLY AND RETURN PIPING DOWN THROUGH EXISTING FLOOR OPENING AND THROUGH CEILING BELOW. SUPPORT WITH FLOOR CLAMP. |
| M27 | EXTEND NEW HYDRONIC SUPPLY AND RETURN PIPING FROM ABOVE DOWN TO FLOOR. ROUTE AS CLOSE TO WALL AS POSSIBLE WITHOUT EXTRA OFFSETS AT FLOOR. SUPPORT FROM WALL WITH STANDOFFS PAINTED TO MATCH EXISTING AND SUPPORT WITH FLOOR CLAMP. |
| M28 | EXTEND NEW HYDRONIC SUPPLY AND RETURN PIPING DOWN THROUGH NEW FLOOR OPENING. SUPPORT WITH FLOOR CLAMP. |
| M35 | HOLE SAW SHELF IN CLOSET TO CREATE OPENING FOR NEW PIPING. |
| M36 | REFER TO DETAIL FOR PIPING TO RAD-12 AND RAD-26. |

0 4' 8' 16'
SCALE: 1/8" = 1'-0"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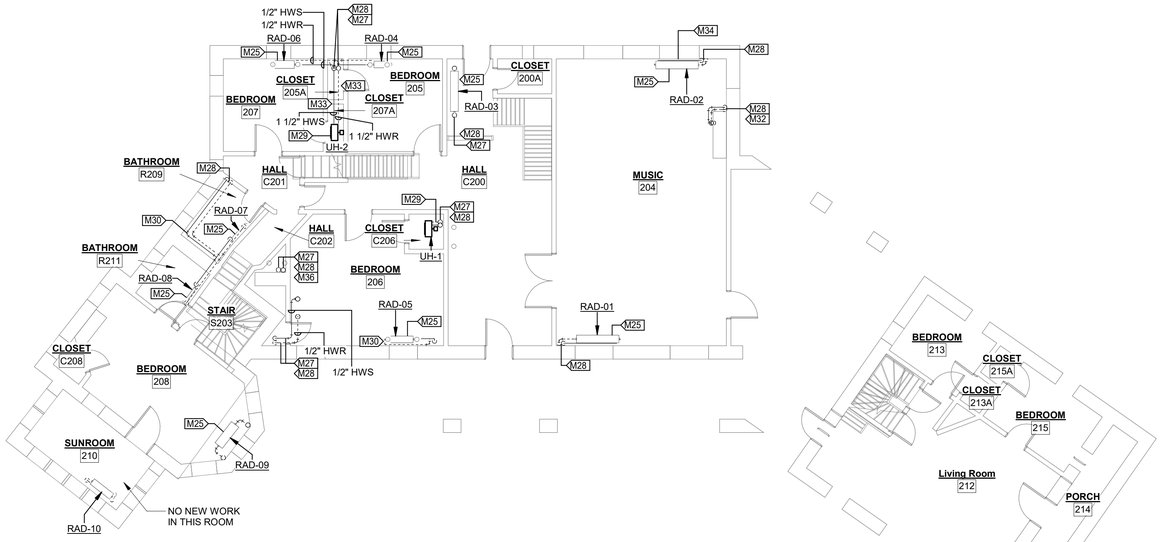
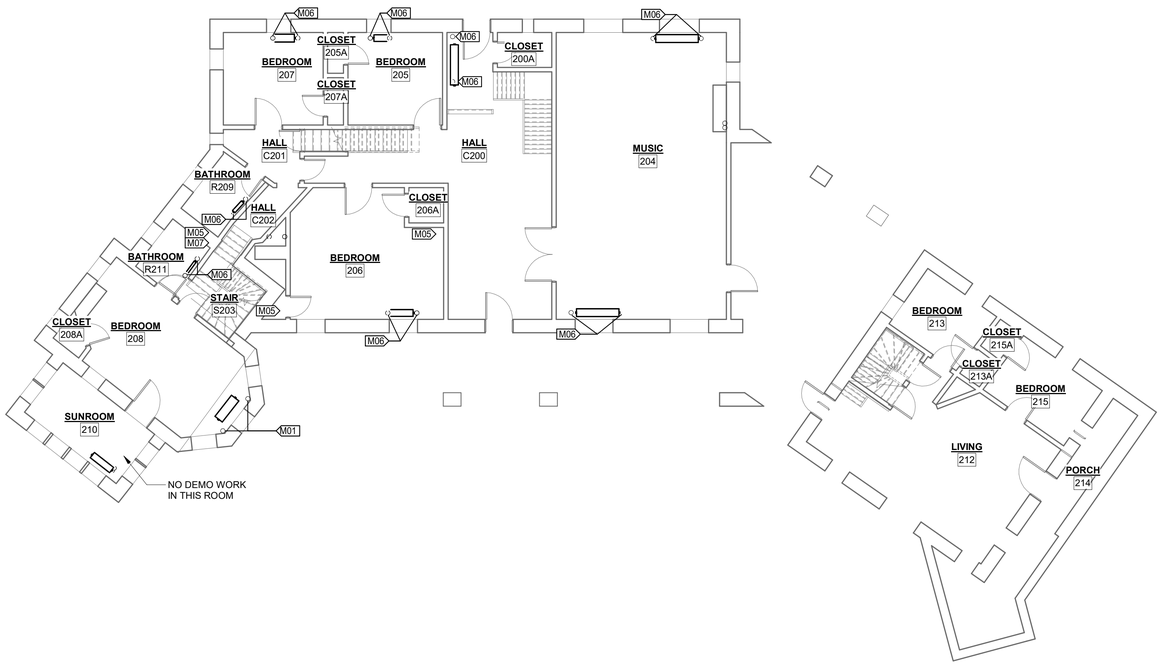
SHEET TITLE:
FIRST FLOOR MECHANICAL PLANS

SHEET NUMBER:
M101

SHEET 6 OF 12
SEPTEMBER 9, 2024




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




1 SECOND FLOOR MECHANICAL DEMO PLAN
1/8" = 1'-0"

## KEYNOTE LEGEND

| VALUE | DESCRIPTION |
|---|---|
| M01 | DEMOLISH EXPOSED STEAM AND CONDENSATE PIPING DOWN THROUGH FLOOR. SALVAGE VALVES AND STEAM TRAPS AND RETURN TO OWNER. |
| M05 | DRY CORE DRILL NEW OPENING FOR PIPING. REFER TO NEW WORK PLAN. |
| M06 | DEMOLISH EXPOSED STEAM AND CONDENSATE PIPING TO MAX. 6" ABOVE FLOOR. CAP AND ABANDON PIPING STUB. SALVAGE VALVES AND STEAM TRAPS AND RETURN TO OWNER. |
| M07 | LIMIT EXTENTS OF WALL DEMOLITION TO MINIMIZE DAMAGE TO EXISTING PLASTERWORK "TILE" TO WITHIN AREA COVERED BY NEW PIPE ESCUTCHEON. |
| M25 | CONNECT NEW HYDRONIC SUPPLY AND RETURN PIPING TO EXISTING RADIATOR. REFER TO DETAIL FOR ARRANGEMENT OF NEW CONTROL VALVE, LOCK SHIELD VALVE, AND AIR VENT. |
| M27 | EXTEND NEW HYDRONIC SUPPLY AND RETURN PIPING FROM ABOVE DOWN TO FLOOR. ROUTE AS CLOSE TO WALL AS POSSIBLE WITHOUT EXTRA OFFSETS AT FLOOR. SUPPORT FROM WALL WITH STANDOFFS PAINTED TO MATCH EXISTING AND SUPPORT WITH FLOOR CLAMP. |
| M28 | EXTEND NEW HYDRONIC SUPPLY AND RETURN PIPING DOWN THROUGH NEW FLOOR OPENING. SUPPORT WITH FLOOR CLAMP. |
| M29 | CONNECT NEW HYDRONIC PIPING TO NEW UNIT HEATER. CONFIGURE UNIT HEATER CONTROLS FOR FAN TO BE ON WHENEVER UNIT HEATER IS POWERED. |
| M30 | ROUTE NEW HYDRONIC PIPING TO TIGHT TO WALLS AND TO EXISTING RADIATORS. PAINT TO MATCH EXISTING WALLS. |
| M32 | ROUTE PIPING TO RAD-16 UP WALL, WEST PAST MOLDING, SOUTH, AND UP THROUGH CEILING INTO BEDROOM 302. JOG IN PIPING MAY BE UP TO 45 DEGREES FROM VERTICAL AND FROM HORIZONTAL TO MINIMIZE FITTINGS. |
| M33 | PAINT WALL BEHIND NEW PIPING OR THROUGH WHICH NEW PIPING PENETRATES TO MATCH ADJACENT WALLS, FROM CORNER TO CORNER AND FROM TOP OF BASEBOARD TO CEILING. |
| M34 | PAINT WALL BEHIND RAD-02 ONLY IN AREA BEHIND RADIATOR, TOUCHED UP AND BLENDED TO MATCH THE REST OF THE SAME WALL. |
| M36 | REFER TO DETAIL FOR PIPING TO RAD-12 AND RAD-26. |

N

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

STATE OF MISSOURI
RYAN M. STONECIPHER
2014-014101
NUMBER PE-2013000634
PROFESSIONAL ENGINEER

RYAN M. STONECIPHER
MO # PE-2013000634

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MISSOURI STATE CERTIFICATE OF AUTHORITY #000866

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

INSTALL NEW HEATING UNIT

BOTHWELL LODGE STATE HISTORIC SITE

19349 BOTHWELL STATE PARK RD
SEDALIA, MO 65301

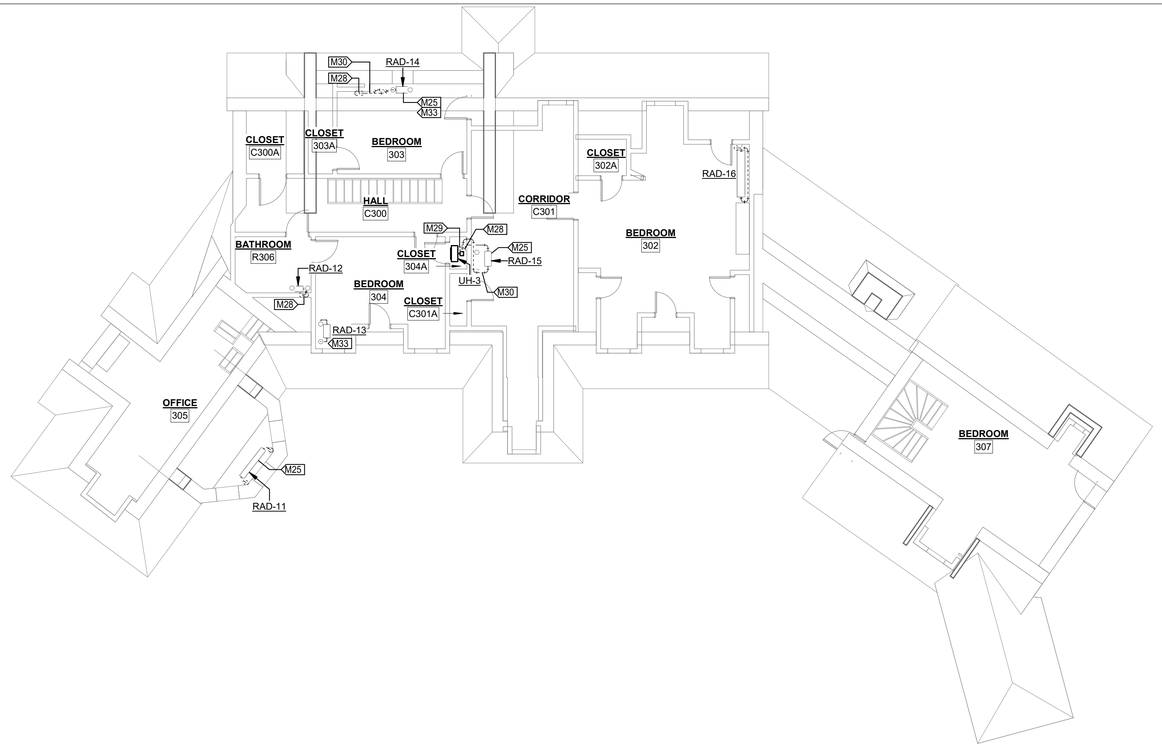
PROJECT # X233101
SITE # 5303
ASSET # 7815303002

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE:09/09/2024

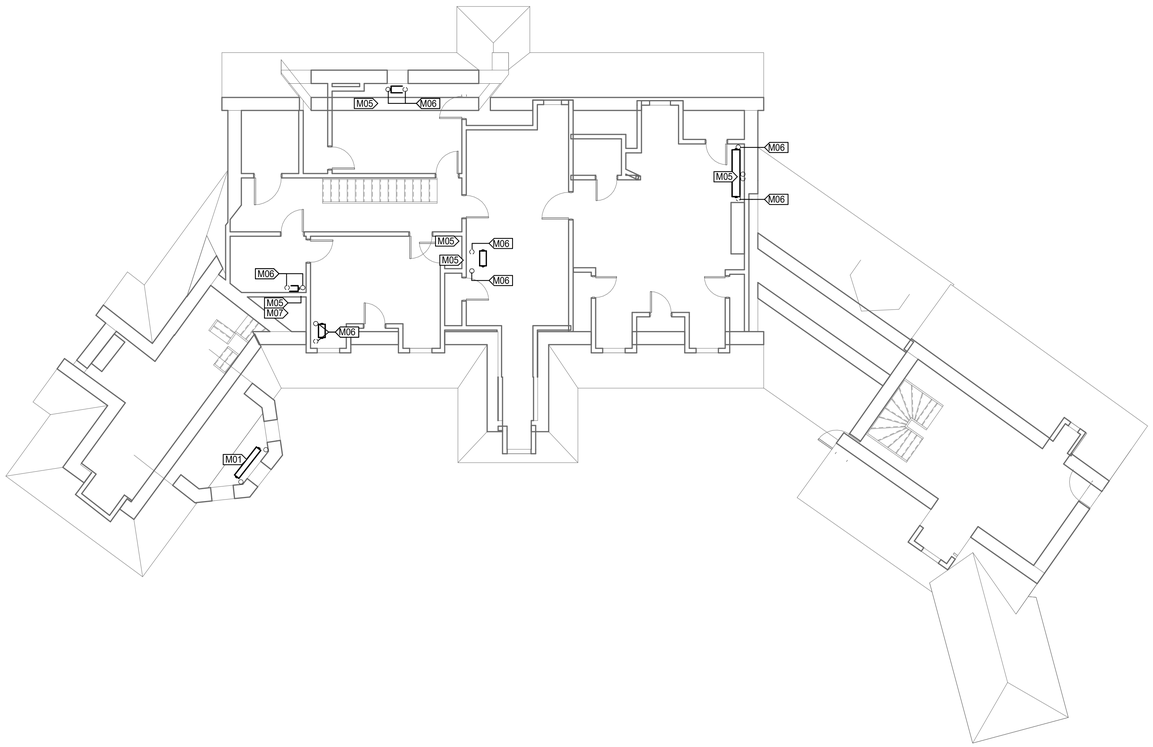
CAD DWG FILE:
DRAWING BY: CRB
CHECKED BY: SFD
DESIGNED BY: RMS

SHEET TITLE:
SECOND FLOOR MECHANICAL PLANS

SHEET NUMBER:
M102
SHEET 7 OF 12
SEPTEMBER 9, 2024




2 THIRD FLOOR MECHANICAL PLAN
1/8" = 1'-0"




1 THIRD FLOOR MECHANICAL DEMO PLAN
1/8" = 1'-0"

**KEYNOTE LEGEND**

| VALUE | DESCRIPTION |
|---|---|
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| M25 | CONNECT NEW HYDRONIC SUPPLY AND RETURN PIPING TO EXISTING RADIATOR. REFER TO DETAIL FOR ARRANGEMENT OF NEW CONTROL VALVE, LOCK SHIELD VALVE, AND AIR VENT. |
| M28 | EXTEND NEW HYDRONIC SUPPLY AND RETURN PIPING DOWN THROUGH NEW FLOOR OPENING. SUPPORT WITH FLOOR CLAMP. |
| M29 | CONNECT NEW HYDRONIC PIPING TO NEW UNIT HEATER. CONFIGURE UNIT HEATER CONTROLS FOR FAN TO BE ON WHENEVER UNIT HEATER IS POWERED. |
| M30 | ROUTE NEW HYDRONIC PIPING TO TIGHT TO WALLS AND TO EXISTING RADIATORS. PAINT TO MATCH EXISTING WALLS. |
| M33 | PAINT WALL BEHIND NEW PIPING OR THROUGH WHICH NEW PIPING PENETRATES TO MATCH ADJACENT WALLS, FROM CORNER TO CORNER AND FROM TOP OF BASEBOARD TO CEILING. |

0 4' 8' 16'
SCALE: 1/8" = 1'-0"

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MICHAEL L. PARSON, GOVERNOR

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2024-09-09
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INSTALL NEW HEATING UNIT

BOTHWELL LODGE STATE HISTORIC SITE

19349 BOTHWELL STATE PARK RD
SEDALIA, MO 65301

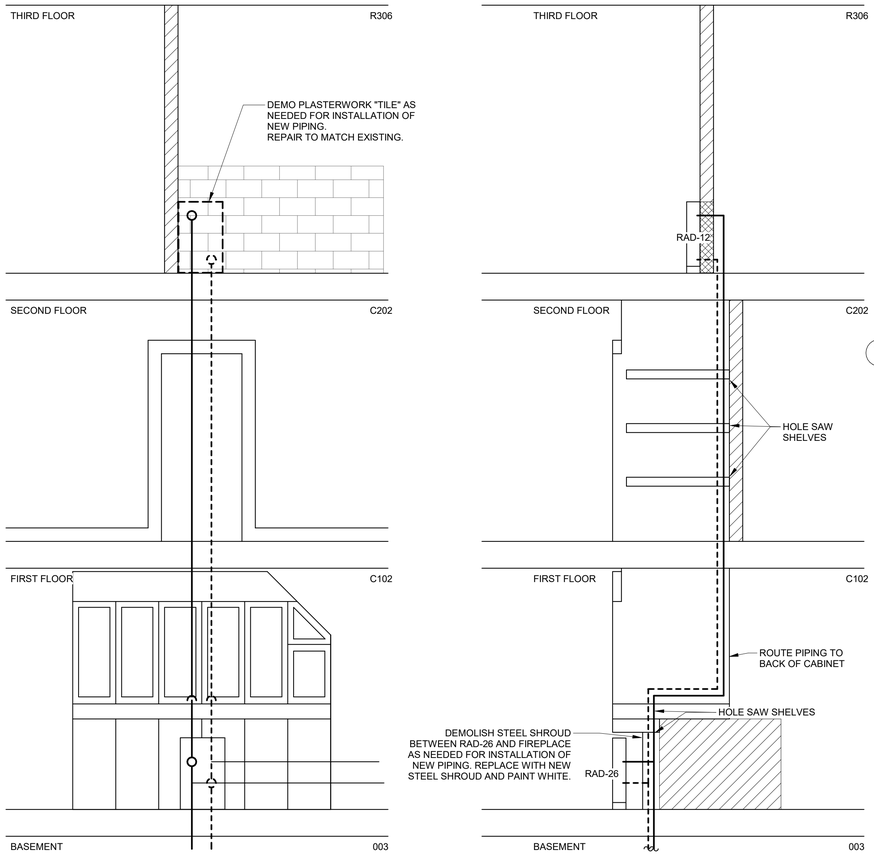
PROJECT # X233101
SITE # 5303
ASSET # 7815303002

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE:09/09/2024

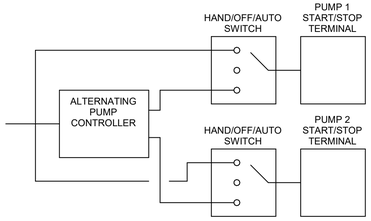
CAD DWG FILE:
DRAWING BY: CRB
CHECKED BY: SFD
DESIGNED BY: RMS

SHEET TITLE:
THIRD FLOOR MECHANICAL PLANS

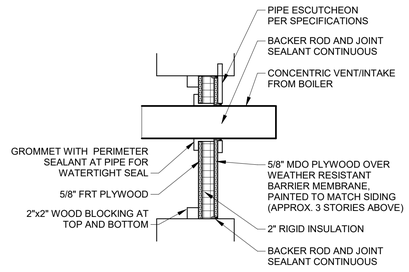
SHEET NUMBER:
M103
SHEET 8 OF 12
SEPTEMBER 9, 2024



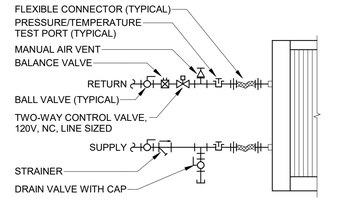

6 RAD-12 & RAD-26 PIPE ROUTING DETAILS
NTS




7 PUMP CONTROL DETAIL
NTS




5 VENT THROUGH WINDOW OPENING DETAIL
NTS




4 UNIT HEATER COIL CONNECTION DETAIL
NTS

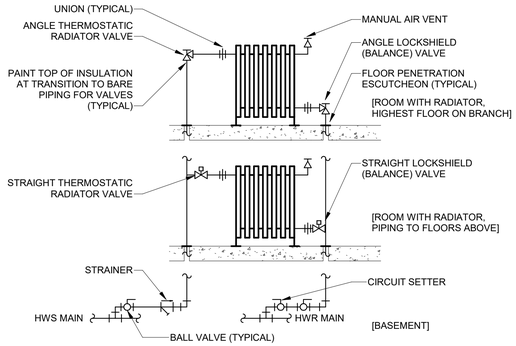
NOTES:
1. REFER TO SPECIFCATIONS FOR PIPE MATERIAL AND VALVE AND ACCESSORIES REQUIREMENTS.

SEQUENCE OF OPERATIONS

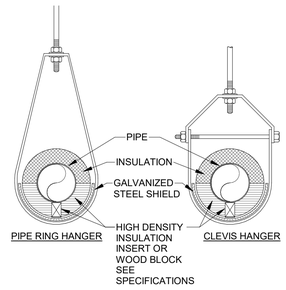
BOILERS
A CASCADING BOILER CONTROLLER APPROVED FOR USE BY THE BOILER MANUFACTURER SHALL STAGE AND/OR MODULATE BOILERS TO MAXIMIZE TURNDOWN AND ASSOCIATED FUEL EFFICIENCY IN RESPONSE TO CHANGES IN DEMAND. BOILERS SHALL BE CONFIGURED TO MAINTAIN A LEAVING WATER TEMPERATURE LINEARLY SET BACK BY OUTDOOR AIR TEMPERATURE, WITH A LEAVING WATER TEMPERATURE OF 90 DEG. F WHEN THE OUTDOOR AIR TEMPERATURE IS AT OR ABOVE 70 F AND A LEAVING WATER TEMPERATURE OF 180 F WHEN THE OUTDOOR AIR TEMPERATURE IS AT OR BELOW 40 F.

PUMPS
AN ALTERNATING PUMP CONTROLLER SHALL RUN ONE PUMP AT A TIME, SWITCHING PUMPS EVERY 7 DAYS (ADJUSTABLE) TO EVEN WEAR ON BOTH PUMPS. EACH PUMP SHALL HAVE A HAND/OFF/AUTO SWITCH TO ALLOW MANUAL OVERRIDE DURING PUMP MAINTENANCE OR FAILURE AND AUTOMATIC START/STOP BY THE ALTERNATING PUMP CONTROLLER DURING NORMAL OPERATION. BOTH PUMPS SHOULD BE CONFIGURED TO MAINTAIN A CONSTANT PRESSURE DIFFERENTIAL ACROSS THE PUMP CORRESPONDING TO THE MINIMUM PRESSURE REQUIRED FOR DESIGN FLOW AT ALL TERMINAL HEATING EQUIPMENT AND THE END OF LINE BYPASS. THE PRESSURE DIFFERENTIAL SET POINT SHALL BE DETERMINED BY THE T.A.B. CONTRACTOR.

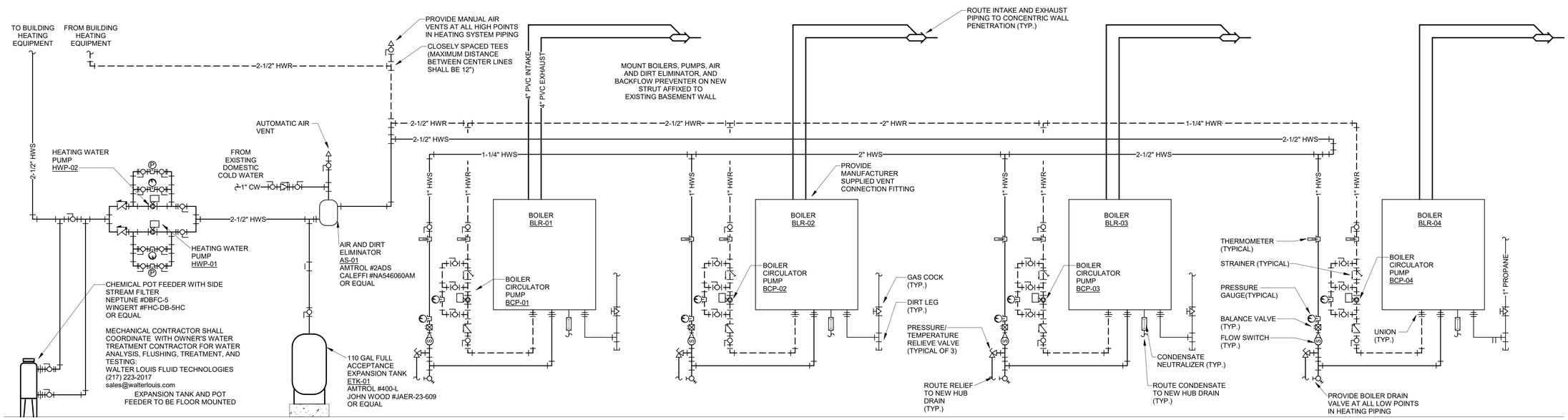
RADIATORS
LOCKSHIELD VALVES AT THE RETURN SIDE OF THE RADIATOR SHALL BE USED TO BALANCE THE FLOW AT EACH RADIATOR TO




3 RADIATOR CONNECTION DETAIL (HYDRONIC)
NTS




2 INSULATED PIPE AT HANGER DETAIL
NTS




1 HYDRONIC EQUIPMENT AND PIPING GENERAL ARRANGEMENT
NTS

**STATE OF MISSOURI**
**MICHAEL L. PARSON, GOVERNOR**

STATE OF MISSOURI
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**OFFICE OF ADMINISTRATION**
**DIVISION OF FACILITIES MANAGEMENT,**
**DESIGN AND CONSTRUCTION**

**INSTALL NEW HEATING UNIT**

**BOTHWELL LODGE STATE HISTORIC SITE**

**19349 BOTHWELL STATE PARK RD**
**SEDALIA, MO 65301**

PROJECT # X233101
SITE # 5303
ASSET # 7815303002

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE:09/09/2024

CAD DWG FILE:
DRAWING BY: RMS
CHECKED BY: SFD
DESIGNED BY: RMS

SHEET TITLE:
**MECHANICAL DETAILS**

SHEET NUMBER:
# M501

SHEET 9 OF 12
SEPTEMBER 9, 2024

## Unit Heater Schedule

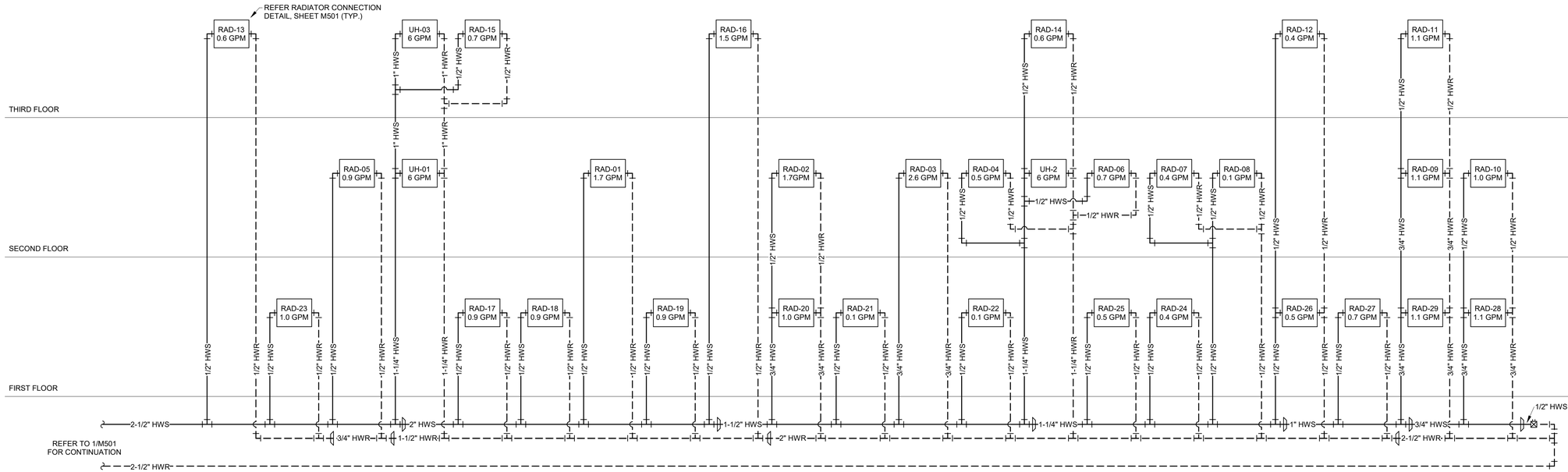
| Mark | Description | Hydronic Performance | | Air Performance | | Electrical | | | Manufacturer | Model | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Flow | Pressure Drop | Flow | Throw | Voltage | FLA | MOCP | | | |
| UH-1 | Hydronic Unit Heater | 6.3 GPM | 1.0 ftH2O | 1,340 CFM | 33 ft | 120 V | 4 A | 15 A | Modine | HC 86S | |
| UH-2 | Hydronic Unit Heater | 6.3 GPM | 1.0 ftH2O | 1,340 CFM | 33 ft | 120 V | 4 A | 15 A | Modine | HC 86S | |
| UH-3 | Hydronic Unit Heater | 6.3 GPM | 1.0 ftH2O | 1,340 CFM | 33 ft | 120 V | 4 A | 15 A | Modine | HC 86S | |

## Pump Schedule

| Mark | Description | Hydronic Performance | | | Voltage | Full Load Amps | MOCP | Manufacturer | Model | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Flow | Head | | | | | | | |
| | | | Dynamic | Static | | | | | | |
| HWP-01 | Wet Rotor Circulator | 44.1 GPM | 35 ftH2O | 37.5 ftH2O | 120 V | 4.6 A | 15 A | Grundfos | MAGNA3 40-180 GF | |
| HWP-02 | Wet Rotor Circulator | 44.1 GPM | 35 ftH2O | 37.5 ftH2O | 120 V | 4.6 A | 15 A | Grundfos | MAGNA3 40-180 GF | |

## Boiler Schedule

| Mark | Description | Gas Heat | | | Hydronic Performance | | Electrical | | | Manufacturer | Model | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fuel Type | Input | Thermal Efficiency | Flow | Pressure Drop | Voltage | FLA | MOCP | | | |
| B-1 | Condensing Propane Boiler | Propane | 199,999 Btu/h | 95.0% | 9.9 GPM | 7.9 ftH2O | 240 V | 1.2 A | 15 A | Hamilton | HWH-199 | |
| B-2 | Condensing Propane Boiler | Propane | 199,999 Btu/h | 95.0% | 9.9 GPM | 7.9 ftH2O | 240 V | 1.2 A | 15 A | Hamilton | HWH-199 | |
| B-3 | Condensing Propane Boiler | Propane | 199,999 Btu/h | 95.0% | 9.9 GPM | 7.9 ftH2O | 240 V | 1.2 A | 15 A | Hamilton | HWH-199 | |
| B-4 | Condensing Propane Boiler | Propane | 199,999 Btu/h | 95.0% | 9.9 GPM | 7.9 ftH2O | 240 V | 1.2 A | 15 A | Hamilton | HWH-199 | |




1 HEATING SYSTEM FLOW DIAGRAM
NTS


STATE OF MISSOURI
MICHAEL L. PARSON, GOVERNOR

STATE OF MISSOURI
RYAN M. STONECIPHER
2024-09-09
NUMBER PE-2013000634
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OFFICE OF ADMINISTRATION
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DESIGN AND CONSTRUCTION

**INSTALL NEW HEATING UNIT**

**BOTHWELL LODGE STATE HISTORIC SITE**

**19349 BOTHWELL STATE PARK RD**
**SEDALIA, MO 65301**

PROJECT # X233101
SITE # 5303
ASSET # 7815303002

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE:09/09/2024

CAD DWG FILE:
DRAWING BY: GCS
CHECKED BY: SFD
DESIGNED BY: RMS

SHEET TITLE:

**MECHANICAL SCHEDULES AND HEATING SYSTEM FLOW DIAGRAM**

SHEET NUMBER:

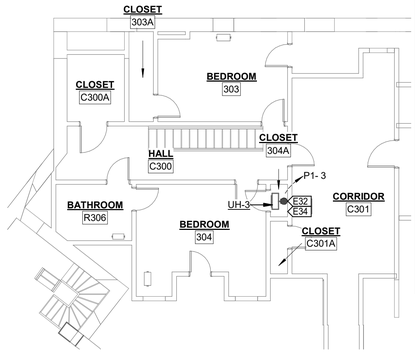
# M701

SHEET 10 OF 12

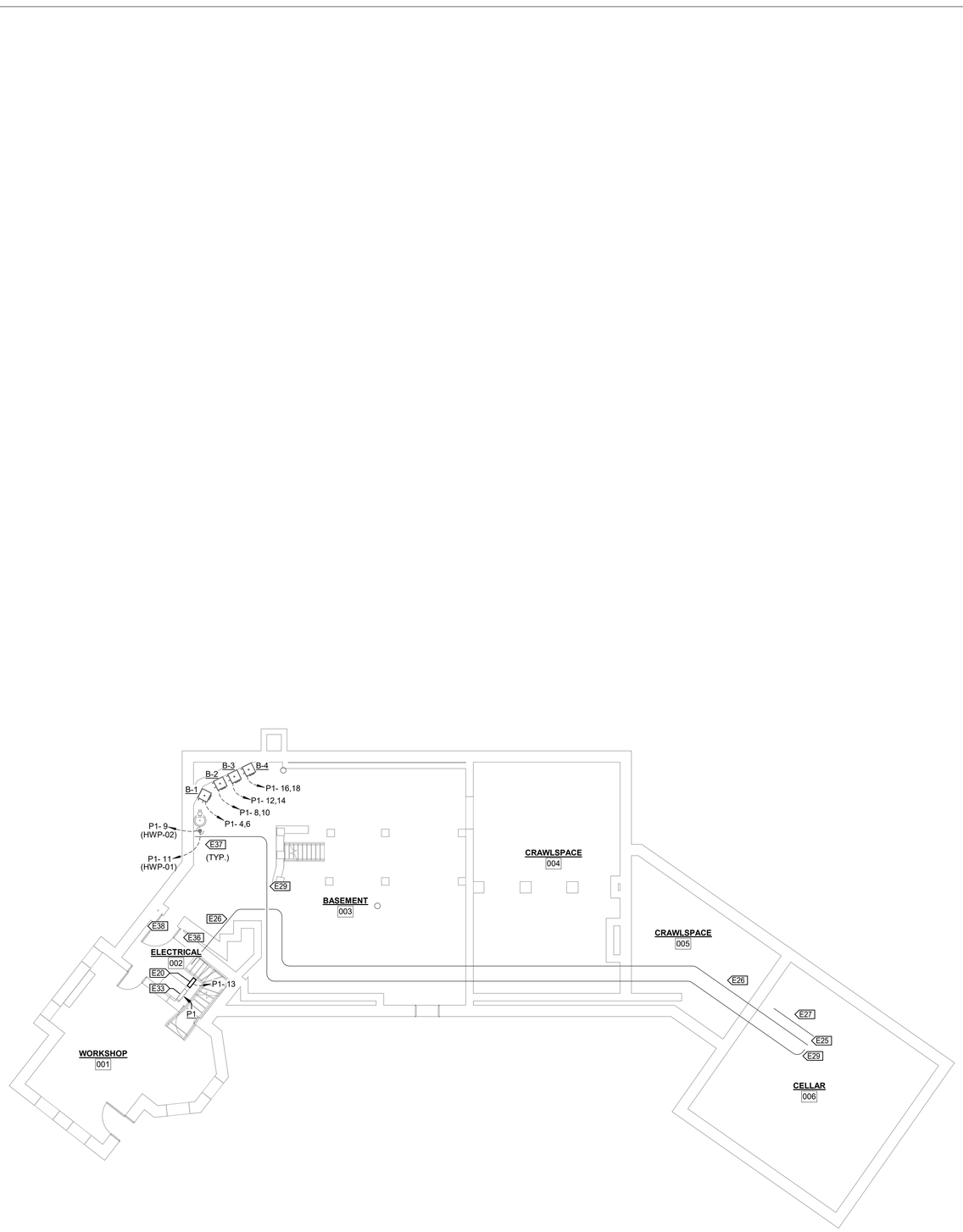
SEPTEMBER 9, 2024

## KEYNOTE LEGEND

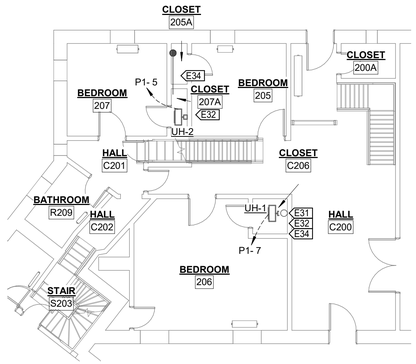
| VALUE | DESCRIPTION |
|---|---|
| E20 | PROVIDE AND INSTALL NEW LIGHTING CONTROL PANEL, CONTACTOR, AND POWER PACK IN EXISTING ELECTRICAL ROOM. INTERCEPT LIGHTING CIRCUITS AND REROUTE THROUGH CONTROL PANEL. INTERCEPT FEEDER TO PANEL P2 IN CENTRAL BUILDING AND REROUTE THROUGH NEW CONTACTOR. PROVIDE AND INSTALL NEW 15-1 BREAKER IN EXISTING 42 SPACE PANEL TO POWER CONTROL PANEL AND CONTACTOR. REFER TO ONE-LINE DIAGRAM. |
| E21 | PROVIDE AND INSTALL NEW POWER PACKS IN AREA WITH EXISTING PANEL. INTERCEPT LIGHTING CIRCUITS AND REROUTE THROUGH POWER PACKS. REFER TO ONE-LINE DIAGRAM. |
| E22 | PROVIDE AND INSTALL NEW LOW VOLTAGE SWITCH ADJACENT TO EXISTING SECURITY CONTROL PANEL TO CONTROL NON-ESSENTIAL ELECTRICAL LOADS. |
| E23 | ROUTE (1) CAT5 CABLE IN 1/2 INCH SURFACE MOUNTED EMT FROM BELOW UP CLOSET WALL TO CEILING, THROUGH WALL, HIGH ACROSS WALL ABOVE DOOR, AND DOWN TO SWITCH. PAINT CONDUIT TO MATCH WALL. |
| E24 | ROUTE (1) CAT5 CABLE IN 1/2 INCH SURFACE CONDUIT FROM CELLAR BELOW UP ALONG WALL OF MECHANICAL ROOM AND INTO CLOSET ABOVE. |
| E25 | ROUTE (2) CAT5 CABLES FROM AREA WITH EXISTING PANEL IN STAIR WALL UP TO ATTIC AND DOWN EXISTING CHASE INTO CELLAR. |
| E26 | ROUTE (1) CAT5 CABLE IN 1/2 INCH SURFACE CONDUIT FROM CHASE ABOVE THROUGH NEW FOUNDATION WALL PENETRATION INTO CRAWLSPACE, THROUGH CRAWLSPACE, THROUGH NEW FOUNDATION WALL PENETRATION FROM CRAWLSPACE INTO BASEMENT, AND INTO ELECTRICAL ROOM ADJACENT TO EXISTING CONDUITS. |
| E27 | (1) CAT5 CABLE FROM CELLAR INTO MECHANICAL ROOM. |
| E28 | PROVIDE AND INSTALL NEW 1/2 INCH CONDUIT WITH PULL STRING AND BUSHING ON OPEN END FROM NEAR EXISTING SECURITY PANEL DOWN INTO CELLAR BELOW. |
| E29 | ROUTE 1/2 INCH CONDUIT WITH PULL STRING FROM CELLAR THROUGH NEW WALL PENETRATION INTO CRAWLSPACE, THROUGH CRAWLSPACE, THROUGH NEW WALL PENETRATION INTO BASEMENT, AND TO BOILER CONTROLLER. |
| E30 | ROUTE 3/4 INCH CONDUIT UP THROUGH CEILING FOR UNIT HEATER POWER. PAINT TO MATCH WALL AND CONCEAL BY LOCATING CLOSE TO LARGER, INSULATED HYDRONIC PIPING. |
| E31 | ROUTE 1/2 INCH CONDUIT UP THROUGH CEILING FOR UNIT HEATER POWER. PAINT TO MATCH WALL AND CONCEAL BY LOCATING CLOSE TO LARGER, INSULATED HYDRONIC PIPING. |
| E32 | POWER UNIT HEATER AND CONTROL VALVE THROUGH NEW DOOR SWITCH, COOPER #WD1664 OR APPROVED EQUAL. REFER TO WIRING DIAGRAM. |
| E33 | PROVIDE AND INSTALL (5) NEW 15-1 BREAKERS FOR UNIT HEATERS AND PUMPS AND (4) NEW 15-2 BREAKERS FOR BOILERS IN EXISTING 42 SPACE PANEL. |
| E34 | ROUTE CONDUIT DOWN THROUGH NEW HOLE IN FLOOR. |
| E36 | ROUTE NEW POWER CIRCUIT CONDUITS FROM ELECTRICAL ROOM TO BASEMENT THROUGH GAP BETWEEN TOP OF ELECTRICAL ROOM AND FLOOR STRUCTURE ABOVE. |
| E37 | PROVIDE AND INSTALL A TOGGLE SWITCH DISCONNECT AT NEW MECHANICAL EQUIPMENT UNDER 20 AMPS. |
| E38 | PROVIDE AND INSTALL AN EMERGENCY BOILER SHUTDOWN BUTTON MOUNTED IN THE NORTH CORNER OF ELECTRICAL ROOM JUST SOUTH OF NARROW PASSAGE. |




6 THIRD FLOOR POWER PLAN - HEATERS
1/8" = 1'-0"




1 BASEMENT POWER PLAN
1/8" = 1'-0"




5 SECOND FLOOR POWER PLAN - HEATERS
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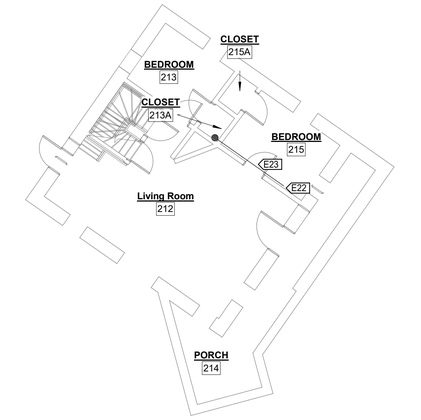
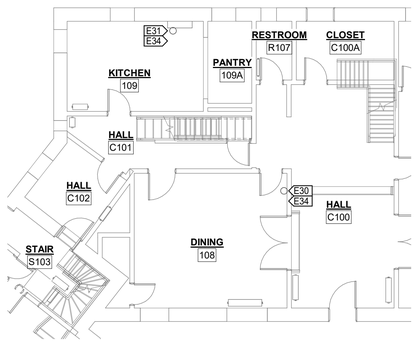



3 SECOND FLOOR POWER PLAN - CONTROLS
1/8" = 1'-0"




4 FIRST FLOOR POWER PLAN - HEATERS
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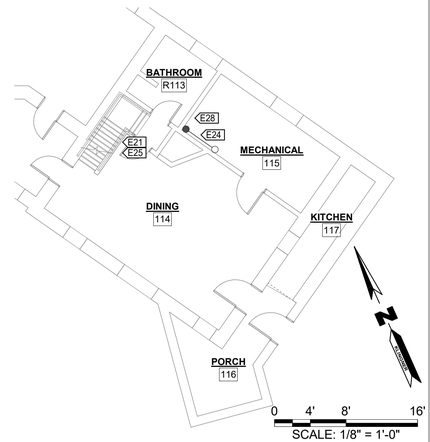


2 FIRST FLOOR POWER PLAN - CONTROLS
1/8" = 1'-0"

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MISSOURI STATE CERTIFICATE OF AUTHORITY #000866

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT,
DESIGN AND CONSTRUCTION

INSTALL NEW HEATING UNIT

BOTHWELL LODGE STATE HISTORIC SITE

19349 BOTHWELL STATE PARK RD
SEDALIA, MO 65301

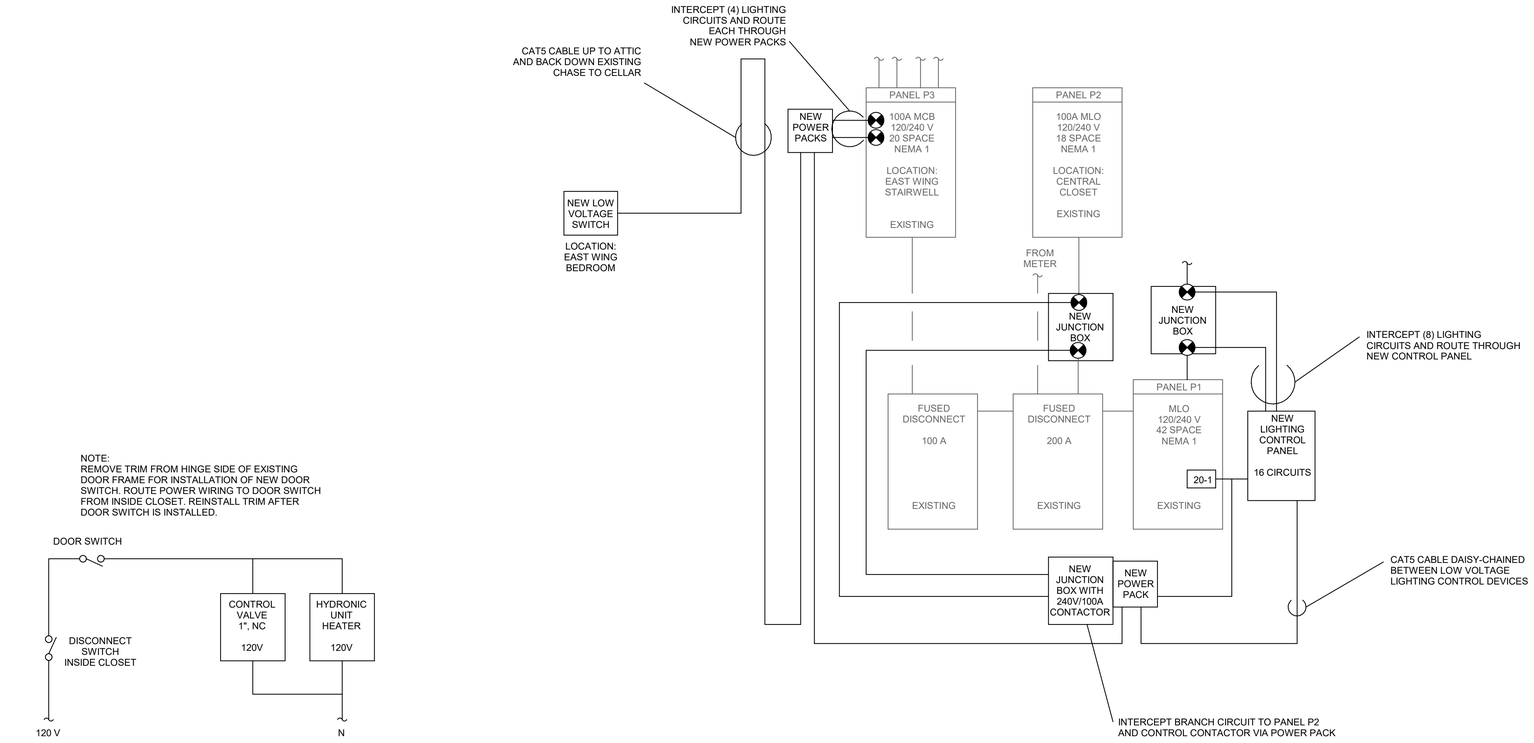
PROJECT # X233101
SITE # 5303
ASSET # 7815303002

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE:09/09/2024

CAD DWG FILE:
DRAWING BY: RMS
CHECKED BY: SFD
DESIGNED BY: RMS

SHEET TITLE:
ELECTRICAL PLANS

SHEET NUMBER:
E100
SHEET 11 OF 12
SEPTEMBER 9, 2024




1 POWER AND LIGHTING CONTROL ONE-LINE DIAGRAM DETAIL
NTS

NOTE:
REMOVE TRIM FROM HINGE SIDE OF EXISTING DOOR FRAME FOR INSTALLATION OF NEW DOOR SWITCH. ROUTE POWER WIRING TO DOOR SWITCH FROM INSIDE CLOSET. REINSTALL TRIM AFTER DOOR SWITCH IS INSTALLED.




2 UNIT HEATER POWER DETAIL
NTS

**STATE OF MISSOURI**
**MICHAEL L. PARSON, GOVERNOR**

STATE OF MISSOURI
RYAN M. STONECIPHER
2024-09-09
NUMBER PE-2013000634
PROFESSIONAL ENGINEER

**RYAN M. STONECIPHER**
**MO # PE-2013000634**

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SHEET TITLE:

**ELECTRICAL DETAILS AND SCHEDULES**

SHEET NUMBER:

# E600

SHEET 12 OF 12

SEPTEMBER 9, 2024