Replace Rooftop HVAC & Refurbish Emergency Generator
Missouri Lottery Headquarters Building
Jefferson City, Missouri

SIEBENECK ENGINEERING LLC
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
(573) 353-7115
siebengineer@gmail.com
Missouri State Certificate of Authority
#E-2016021605

OWNER:	STATE OF MISSOURI MICHAEL L. PARSON, GOVERNOR	DESIGNER:	SIEBENECK ENGINEERING
	DEPARTMENT OF REVENUE, STATE LOTTERY COMMISSION	PROJECT NUMBER:	N2001-01
PROJECT MANAGEMENT:	OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION	SITE NUMBER: ASSET NUMBER:	8611 8611951002

SHEET NUMBER:

G-001

June 5, 2020

GENERAL DEMOLITION NOTES

1 COORDINATE WITH EXISTING SYSTEMS WHICH SHALL REMAIN IN OPERATION DURING DEMOLITION AND CONSTRUCTION PHASES. INSTALL TEMPORARY CAPS AT TERMINATION POINTS OF EXISTING DUCTWORK TO REMAIN DURING DEMOLITION PHASES.

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.

GENERAL CONSTRUCTION NOTES

1 FABRICATION, INSTALLATION AND TESTING OF ALL SYSTEMS SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE, NATIONAL ELECTRIC CODE, ALL STATE AND LOCAL CODES, AND ALL MANUFACTURER INSTALLATION GUIDELINES. CODE SHALL BE THE LATEST ADOPTED BY THE AUTHORITY HAVING JURISDICTION.

2 PROVIDE A MINIMUM OF 48 HOURS NOTICE TO THE OWNER FOR WORK THAT WILL TAKE PLACE IN OCCUPIED SPACES OR BEFORE ANY DISRUPTION OF UTILITIES. REFERENCE SECTION 011000 FOR WORK SEQUENCE REQUIREMENTS.

3 ALL METALLIC AND FLEXIBLE DUCTS SHALL BE CONSTRUCTED AND INSTALLED AS SPECIFIED IN THE IMC AND SMACNA HVAC DUCT CONSTRUCTION STANDARDS.

4 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. DESIGN INSULATION THICKNESS IS 1.5 INCH.

5 TEST ALL EQUIPMENT FOR PROPER OPERATION. PROVIDE OPERATION MANUALS AND AS-BUILT DRAWINGS TO OWNER WITHIN 45 DAYS OF SYSTEM ACCEPTANCE.

6 CERTIFIED TESTING, ADJUSTING, AND BALANCING CONTRACTOR SHALL TEST AND BALANCE ALL SYSTEMS TO SPECIFIED VALUES AND PREPARE A BALANCE REPORT. REPORT SHALL BE SENT TO THE ENGINEER FOR APPROVAL PRIOR TO FINAL COMPLETION. BALANCE DAMPERS ARE REQUIRED ON ALL SUPPLY AIR DEVICES. IF DEVICE DOES NOT HAVE DAMPER MOUNTED IN NECK PER DEVICE SCHEDULE, PROVIDE DAMPER BD-1 AT BRANCH TAKE-OFF IN ACCESSIBLE LOCATION. REFERENCE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

7 GUARANTEE ALL WORKMANSHIP AND MATERIALS FOR A MINIMUM OF ONE YEAR FROM FINAL ACCEPTANCE UNLESS OTHERWISE STATED IN CONSTRUCTION SPECIFICATIONS.

8 ROOF IS CURRENTLY UNDER WARRANTY. COORDINATE WITH ROOF MANUFACTURER TO ENSURE ROOF WARRANTY REMAINS IN EFFECT.

9 IF ANY MECHANICAL EQUIPMENT SPECIFIED IN THE DRAWINGS IS SUBSTITUTED BY THE CONTRACTOR, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE EQUIPMENT'S ELECTRICAL PROTECTION PER THE MANUFACTURER'S NAMEPLATE.

FIRE SAFETY CONSTRUCTION NOTES

1 GENERAL: FIRE SAFETY DURING CONSTRUCTION SHALL COMPLY WITH OSHA 1910.252, OSHA 1926.352, AND NFPA 51B.

2 FIRE WATCH: MAINTAIN FIRE WATCH WHEN REQUIRED BY THE BUILDING OFFICIAL AND PER OSHA 1910.252(A)(2)(III) AND WHEN FIRE PROTECTION SYSTEMS ARE SHUTDOWN FOR ALTERATIONS. FIRE WATCH SHALL REMAIN IN EFFECT UNTIL ALL WELDING OR CUTTING IS COMPLETED. FIRE WATCH SHALL ALSO REMAIN IN EFFECT UNTIL EXISTING FIRE PROTECTION SYSTEMS ARE RETURNED TO SERVICE AND AS ALLOWED BY THE BUILDING OFFICIAL.

3 GUARDS: GUARDS SHALL BE USED PER OSHA 1910.252(A)(1)(II) DURING ALL WELDING AND CUTTING.

4 FIRE WATCHERS SHALL HAVE FIRE EXTINGUISHING EQUIPMENT READILY AVAILABLE AND BE TRAINED IN IT'S USE AND SHALL FULLY COMPLY WITH OSHA 1910.252(A)(2)(III)(B).

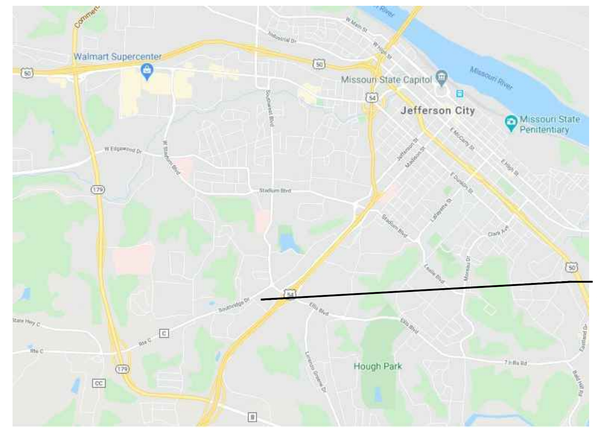
BASIS OF DESIGN

2015 INTERNATIONAL MECHANICAL CODE

2014 NATIONAL ELECTRICAL CODE

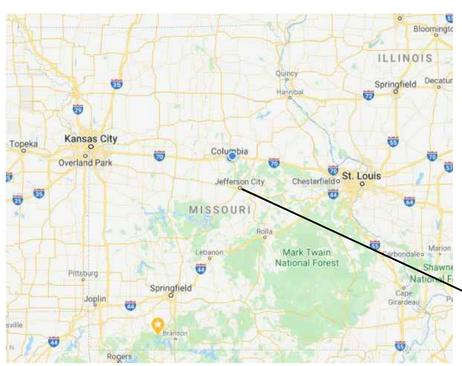
SHEET INDEX

1	G-001	COVER SHEET
2	G-002	GENERAL NOTES AND DRAWING INDEX
3	S-101	ROOF FRAME AT RTU-10
4	M-101	MECHANICAL HVAC DEMOLITION PLAN
5	M-102	MECHANICAL HVAC EAST ROOF DEMOLITION PLAN
6	M-103	MECHANICAL HVAC CONSTRUCTION PLAN
7	M-104	MECHANICAL HVAC EAST ROOF CONSTRUCTION PLAN
8	M-501	MECHANICAL CONTROLS AND SEQUENCE OF OPERATION
9	M-601	MECHANICAL SCHEDULES AND DETAILS
10	E-101	ELECTRICAL POWER PLAN
11	E-102	ELECTRICAL EAST ROOF DEMOLITION PLAN
12	E-103	ELECTRICAL EAST ROOF CONSTRUCTION PLAN
13	E-601	ELECTRICAL PANEL SCHEDULES



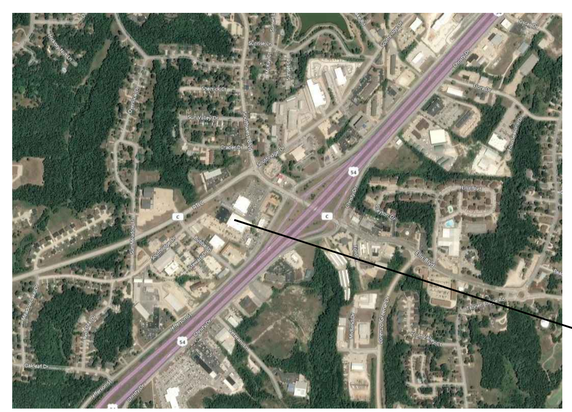
MISSOURI LOTTERY HEADQUARTERS

NORTH 2 VICINITY MAP
SCALE: NONE



JEFFERSON CITY, MISSOURI

NORTH 1 STATE OF MISSOURI PROJECT SITE LOCATION MAP
SCALE: NONE



MISSOURI LOTTERY HEADQUARTERS

NORTH 3 BUILDING LOCATION MAP
NO SCALE

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

STATE OF MISSOURI
TRACIE L. SIEBENECK
NUMBER PE-2013019114
PROFESSIONAL ENGINEER
5-5-2020

SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
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siebengineer@gmail.com
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OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT, DESIGN AND CONSTRUCTION
DEPARTMENT OF REVENUE, STATE LOTTERY COMMISSION

REPLACE ROOFTOP HVAC & REFURBISH EMERGENCY GENERATOR
MISSOURI LOTTERY HEADQUARTERS BUILDING
1823 SOUTHRIDGE DR.
JEFFERSON CITY, MO

PROJECT # N2001-01
SITE# 8611
ASSET# 8611951002

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: 06/05/2020

CAD DWG FILE: MLH-G.dwg
DRAWN BY: TLS/MDS
CHECKED BY: TLS
DESIGNED BY: TLS

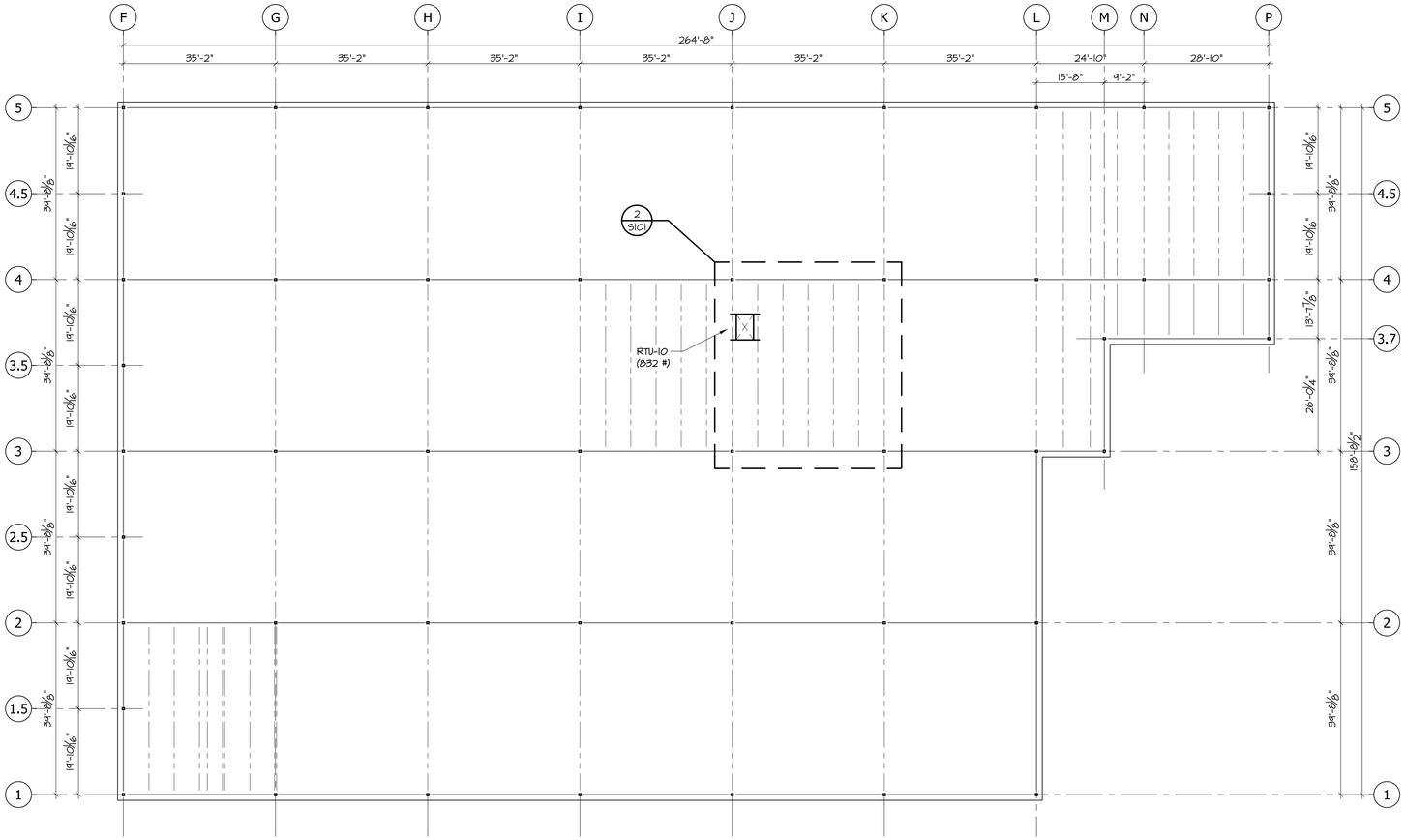
SHEET TITLE:

GENERAL NOTES AND DRAWING INDEX

SHEET NUMBER:

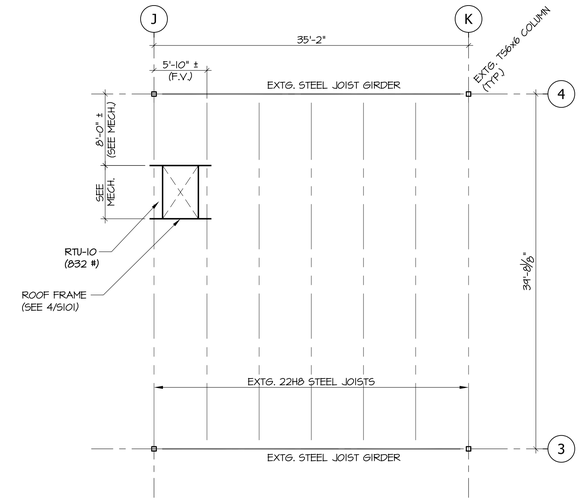
G-002

2 OF 13 SHEETS
06/05/2020



NORTH

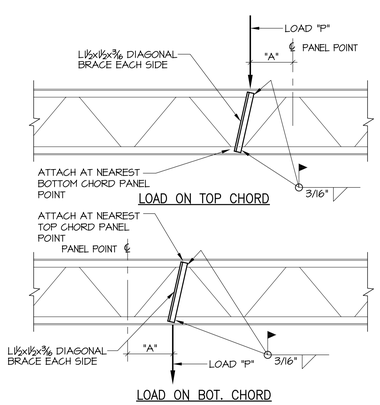
1 S101 ROOF FRAMING PLAN
SCALE: 1/16" = 1'-0"



2 S101 ENLARGED ROOF FRAMING PLAN AT RTU-10
SCALE: 1/8" = 1'-0"

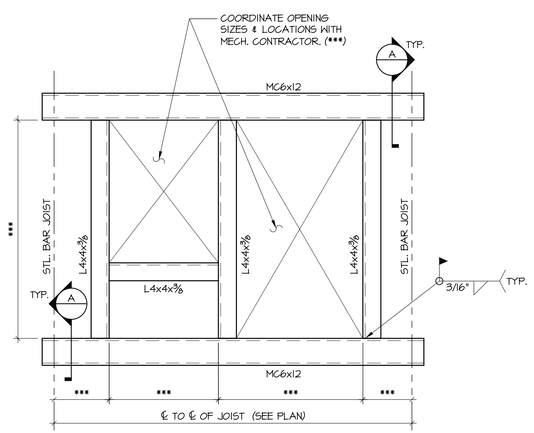
GENERAL NOTES:

1. LOCATE NEW ROOF FRAME AS SHOWN ON THIS PLAN AND WHERE INDICATED BY THE MECHANICAL DRAWINGS TO ALLOW PROPER INSTALLATION OF NEW PRE-FABRICATED ROOF CURB AND NEW ROOF-TOP-UNIT (RTU).
2. FIELD WELD NEW ROOF FRAME TO THE EXISTING STEEL JOISTS AS SHOWN ON DETAIL 4/S101. DO NOT OVERHEAT THE EXISTING JOISTS DURING FIELD WELDING.
3. WHERE CONCENTRATED LOADS OCCUR ON STEEL JOISTS, INSTALL DIAGONAL BRACES AS REQUIRED PER 3/S101.
4. REFERENCE THE MECHANICAL DRAWINGS FOR ROOF CURB DETAILS.
5. MATERIAL SPECIFICATIONS:
   - 5.1. CHANNEL & ANGLE — ASTM A36
   - 5.2. WELDS — E70XX
   - 5.3. STEEL PREP — SSPC-SP6 OR SSPC-SP3
   - 5.4. PAINT — FABRICATOR'S STD. RED PRIMER
6. DESIGN REFERENCES USED:
   - 6.1. BUILDING CODE: — IBC2015 & ASCE/SEI 7-10
   - 6.2. STEEL: — AISC 14TH EDITION; AISC 360-10
7. MECHANICAL CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH CONSTRUCTION.
8. THE EXISTING BUILDING STRUCTURE HAS BEEN EVALUATED BASED ON THE RTU WEIGHT SHOWN ON THIS DRAWING. IF AN ALTERNATE RTU IS SUBSTITUTED THAT IS HEAVIER THAN THE WEIGHT SHOWN, NOTIFY THE STRUCTURAL ENGINEER IMMEDIATELY. THE MAXIMUM RTU WEIGHT SHOWN INCLUDES THE BASE UNIT, ALL ACCESSORIES, AND CURB WEIGHT PER THE MECHANICAL ENGINEER.
9. " F.V. " = FIELD VERIFY
10. ROOF FRAMING INFORMATION SHOWN ON THIS SHEET IS TAKEN FROM THE ORIGINAL STRUCTURAL DRAWINGS DATED 6/20/1986. SEE THE ORIGINAL STRUCTURAL DRAWINGS FOR ADDITIONAL INFORMATION AS REQUIRED.
11. ALL STEEL WORK TO BE COMPLETED BY A QUALIFIED STEEL FABRICATOR & STEEL ERECTOR WITH A MINIMUM OF 10 YEARS SIMILAR EXPERIENCE.
12. REFERENCE THE FIRE SAFETY CONSTRUCTION NOTES ON SHEET G-002 FOR APPLICABLE FIRE SAFETY INSTRUCTIONS REQUIRED DURING COMPLETION OF ALL WORK INDICATED ON THIS SHEET.

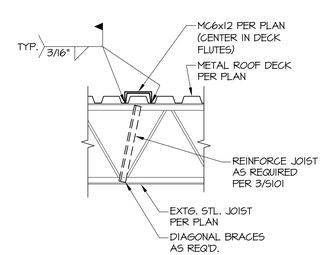


NOTES:
1. INSTALL DIAGONAL BRACE EACH SIDE AT CONCENTRATED LOAD WHEN "A" IS GREATER THAN 3".
2. "P" = CONCENTRATED LOAD. (BRACES REQUIRED FOR P > 100 LBS.)
3. PROVIDE DIAGONAL BRACE AT LOCATION OF CONCENTRATED LOADS SUCH AS MECHANICAL ROOF-TOP-UNITS, SUSPENDED MECHANICAL UNITS, HEAVY PIPES, AND ANY OTHER CONCENTRATED LOADS WHERE LOCATED PER THE MECHANICAL ENGINEER.

3 S101 TYP. JOIST REINFORCING DETAIL
SCALE: 3/4" = 1'-0"



4 S101 ROOF FRAME DETAIL
SCALE: 3/4" = 1'-0"



SECTION "A"

TAYLOR STRUCTURAL ENGINEERING, LLC
3100 Brown Station Rd., Suite A
Columbia, MO 65202
(573) 886-0833
tse.engrs@gmail.com
MO C.O.A.#: E-2009025546

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

STATE OF MISSOURI
TIMOTHY DALE TAYLOR
NUMBER PE-2008002219
PROFESSIONAL ENGINEER
6/5/2020

SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
(573) 353-7115
siebengineer@gmail.com
Missouri State Certificate of Authority
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DEPARTMENT OF REVENUE,
STATE LOTTERY COMMISSION

REPLACE ROOFTOP
HVAC & REFURBISH
EMERGENCY
GENERATOR
MISSOURI LOTTERY
HEADQUARTERS
BUILDING
1823 SOUTHRIDGE DR.
JEFFERSON CITY, MO

PROJECT # N2001-01
SITE # 8611
FACILITY # 8611951002

REVISION:
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REVISION:
DATE:
ISSUE DATE: 06/05/2020

CAD DWG FILE: S101
DRAWN BY: TDT
CHECKED BY: TDT
DESIGNED BY: TDT

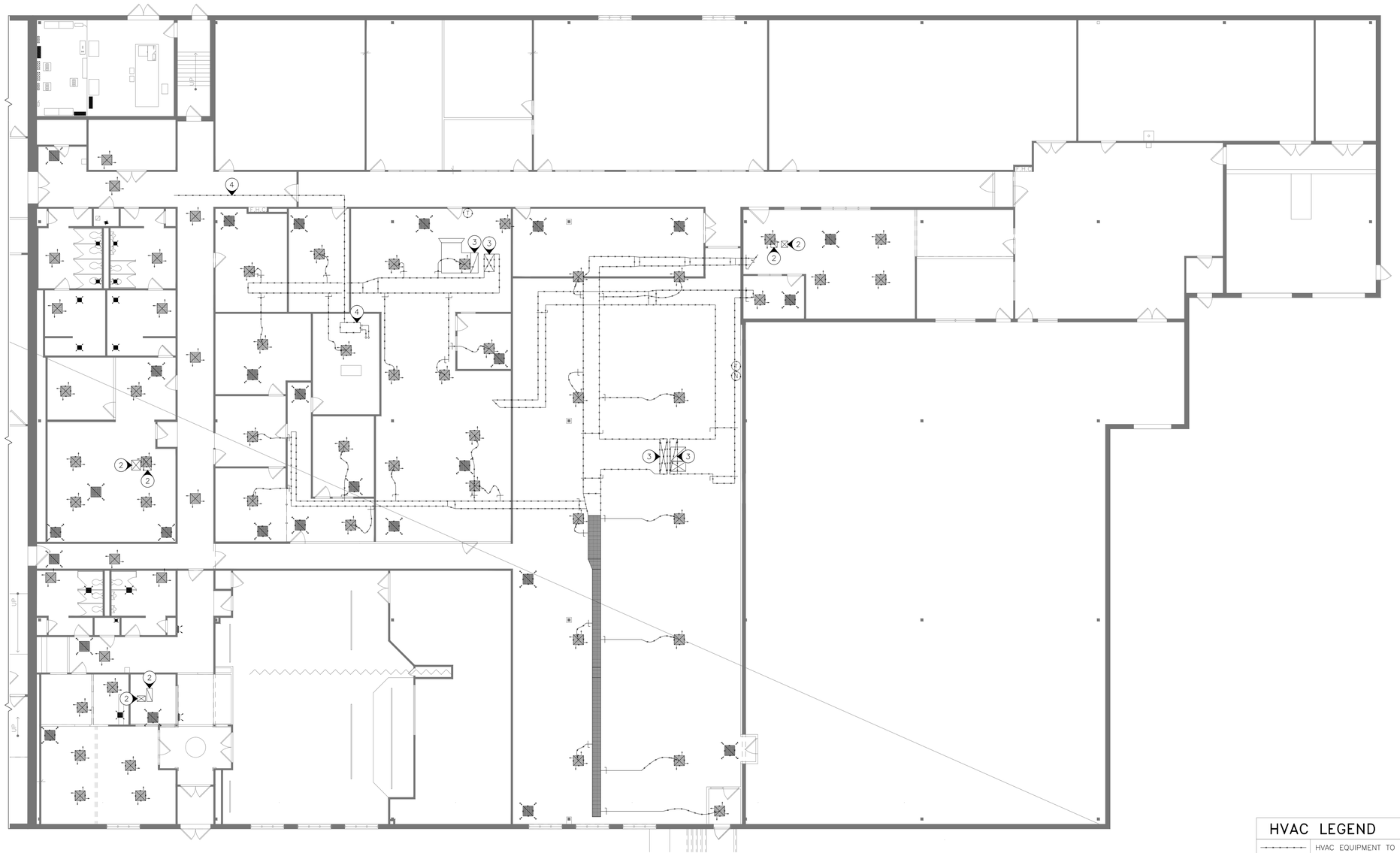
SHEET TITLE:
ROOF FRAME
AT RTU-10

SHEET NUMBER:
S-101

3 OF 13 SHEETS
06/05/2020

DEMOLITION NOTES

1. REFERENCE SHEET G-002 FOR GENERAL DEMOLITION NOTES.
2. RTU-1, RTU-2, AND RTU-10: DUCT SHALL REMAIN FOR USE IN NEW CONSTRUCTION. REMOVE AND DISPOSE OF AIR DEVICES AS MARKED ON PLANS. SOME AIR DEVICES SHALL REMAIN FOR USE IN NEW CONSTRUCTION. PROVIDE TRANSITIONS TO CONNECT EXISTING DUCT TO NEW ROOFTOP UNITS.
3. RTU-4 AND RTU-6: REMOVE AND DISPOSE OF ALL SUPPLY AND RETURN AIR DEVICES ASSOCIATED WITH EACH RTU. REMOVE DUCT AS MARKED ON PLANS. SOME DUCT SHALL REMAIN FOR USE IN NEW CONSTRUCTION. PROVIDE TRANSITION TO CONNECT RTU-4 EXISTING RETURN DUCT TO NEW RTU-4.
4. REMOVE AND DISPOSE OF AIR CONDITIONING UNIT (ACU) AND ALL ASSOCIATED SUPPORTS. REMOVE AND DISPOSE OF REFRIGERANT PIPE BETWEEN INDOOR UNIT AND OUTDOOR UNIT. REMOVE AND DISPOSE OF CONDENSATE DRAIN FROM UNIT TO INDIRECT DISCHARGE LOCATION. COORDINATE WITH ROOF MANUFACTURER TO REPAIR ANY PENETRATION IN ROOF. COORDINATE WITH ELECTRICAL CONTRACTOR TO DISCONNECT POWER.
5. REMOVE CEILING GRID AND TILE AS NEEDED TO PERFORM THE WORK. REPLACE ANY DAMAGED MATERIAL WITH GRID AND TILE EQUAL TO EXISTING. GRID NOT SHOWN FOR CLARITY. REFERENCE SHEET M-102 FOR GRID.



1 MECHANICAL HVAC DEMOLITION PLAN
SCALE: 3/32"=1'-0"

HVAC LEGEND

-·-·-·-	HVAC EQUIPMENT TO BE REMOVED
———	EXISTING HVAC EQUIPMENT TO REMAIN

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

STATE OF MISSOURI
TRACIE L. SIEBENECK
NUMBER PE-2013019114
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5-5-2020

SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
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JEFFERSON CITY, MO

PROJECT #	N2001-01
SITE#	8611
ASSET#	8611951002

REVISION:
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ISSUE DATE: 06/05/2020

CAD DWG FILE: MLH-M.dwg
DRAWN BY: TLS
CHECKED BY: TLS
DESIGNED BY: TLS

SHEET TITLE:

MECHANICAL
HVAC
DEMOLITION PLAN

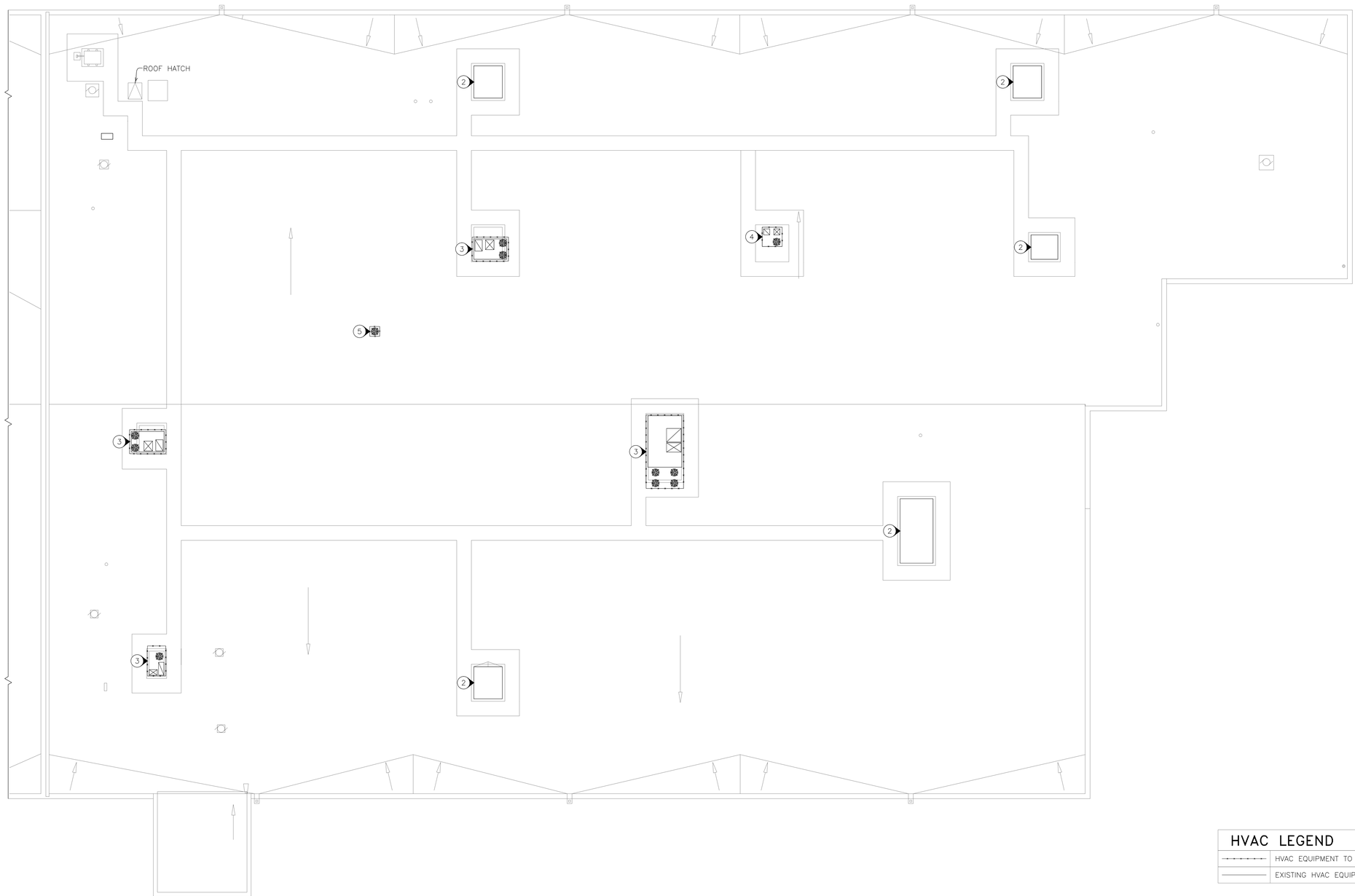
SHEET NUMBER:

M-101

4 OF 13 SHEETS
06/05/2020

NOTES

1. REFERENCE SHEET G-002 FOR GENERAL DEMOLITION NOTES.
2. EXISTING ROOFTOP UNIT TO REMAIN.
3. REMOVE AND DISPOSE OF ROOFTOP UNIT AND ROOF CURB TRANSITION. ROOF CURB TO REMAIN FOR USE IN NEW CONSTRUCTION. COORDINATE WITH ELECTRICAL CONTRACTOR TO DISCONNECT POWER.
4. REMOVE AND DISPOSE OF ROOFTOP UNIT AND ROOF CURB. COORDINATE WITH ELECTRICAL CONTRACTOR TO DISCONNECT POWER.
5. REMOVE AND DISPOSE OF CONDENSING UNIT (CU) AND ALL ASSOCIATED SUPPORTS. REMOVE REFRIGERANT PIPE BETWEEN CU AND INDOOR UNIT. COORDINATE WITH ROOF MANUFACTURER TO REPAIR ANY PENETRATION IN ROOF. COORDINATE WITH ELECTRICAL CONTRACTOR TO DISCONNECT POWER.



1 MECHANICAL HVAC EAST ROOF DEMOLITION PLAN
SCALE: 3/32"=1'-0"

HVAC LEGEND	
-·-·-·-·-	HVAC EQUIPMENT TO BE REMOVED
———	EXISTING HVAC EQUIPMENT TO REMAIN

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

STATE OF MISSOURI
TRACIE L. SIEBENECK
NUMBER PE-2013019114
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PROFESSIONAL ENGINEER

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8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
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JEFFERSON CITY, MO

PROJECT #	N2001-01
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ASSET#	8611951002

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ISSUE DATE: 06/05/2020

CAD DWG FILE: MLH-M.dwg
DRAWN BY: TLS
CHECKED BY: TLS
DESIGNED BY: TLS

SHEET TITLE:

MECHANICAL
HVAC EAST ROOF
DEMOLITION PLAN

SHEET NUMBER:

M-102

5 OF 13 SHEETS
06/05/2020

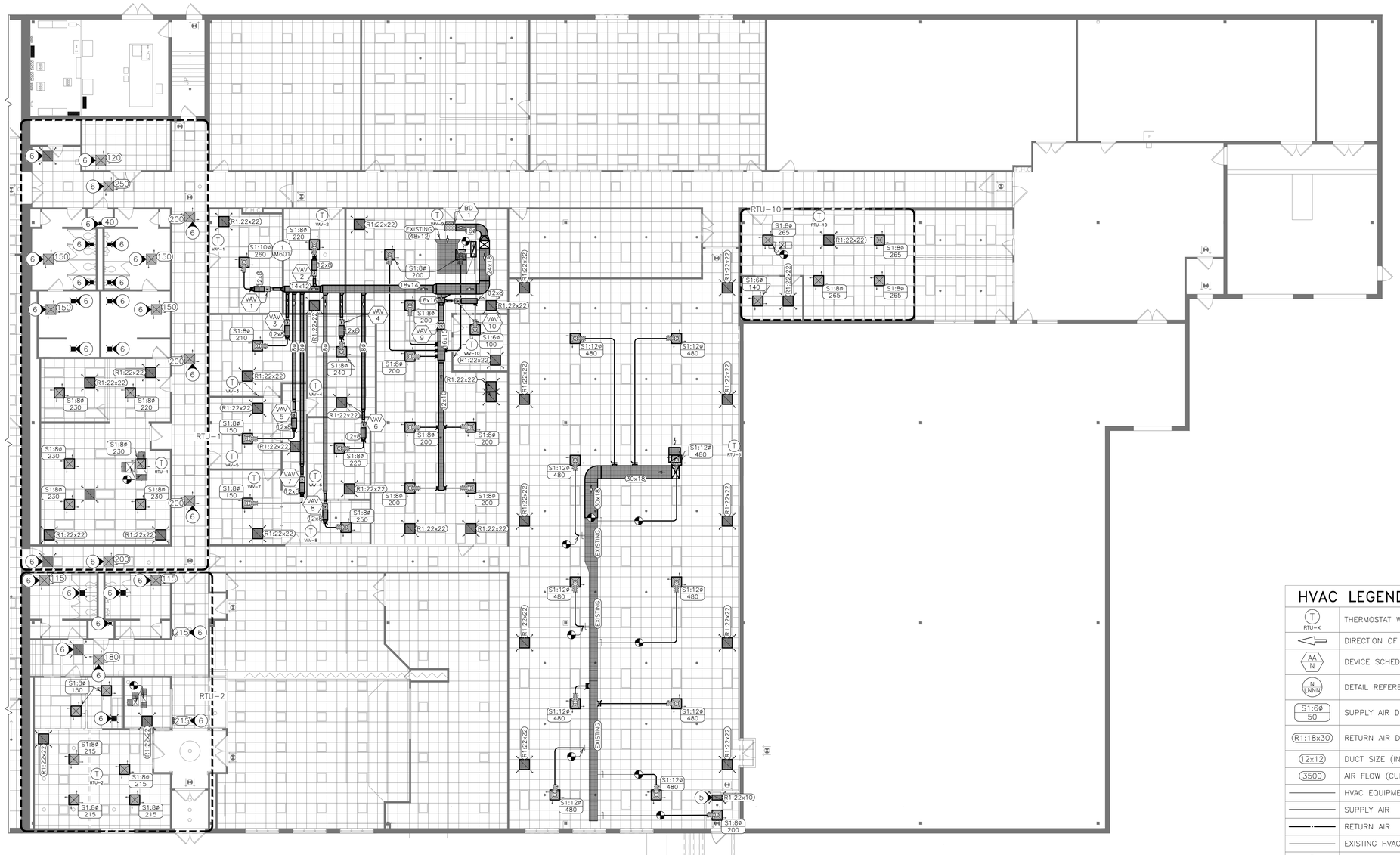
NOTES

1. REFERENCE SHEET G-002 FOR GENERAL CONSTRUCTION NOTES.
2. ALL DUCTWORK WITH TWO DIMENSION <WxD> INDICATES RECTANGULAR DUCT. ALL <Dø> INDICATES ROUND DUCT. DIMENSIONS ARE INCHES MEASURED INSIDE. DUCT JOINTS SHALL BE CONNECTED USING DUCTMATE '25'/'35'/'45' DUCT CONNECTOR OR EQUAL. 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.
3. ALL INSULATION SHALL MEET THE ASTM E 84 FLAME/SMOKE SPREAD INDEX OF 25/50 MAXIMUM. DUCT SEAMS SHALL BE SEALED. VALUES LISTED BELOW ARE INSTALLED VALUES.
   - SUPPLY: EXTERNAL INSULATION; 1.5 INCH THICK WITH MINIMUM THERMAL CONDUCTANCE OF 0.25 BTU/HR/SF/°F (R6) WITH VAPOR BARRIER.
   - RETURN DUCT: INTERNAL INSULATION; 1.5 INCH LINACOUSTIC RC BY JOHNS MANVILLE OR EQUAL. REFERENCE PROJECT MANUAL FOR APPROVED MANUFACTURERS.
4. 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.

(5) PROVIDE GRID CROSS BAR FOR 1/2 SIZE RETURN GRILLE.

(6) EXISTING AIR DEVICE TO REMAIN. BALANCE SUPPLY AIR DEVICE TO AIRFLOW RATE AS SPECIFIED.

7. PROVIDE VARIABLE AIR VOLUME TERMINAL UNITS (VAV) WITH INLET DUCT EQUAL TO VAV INLET SIZE. INLET DUCT LENGTH SHALL BE 3 TIMES THE INLET DUCT DIAMETER. PROVIDE HIGH EFFICIENCY TAKEOFF TO VAV TERMINALS.



1 MECHANICAL HVAC CONSTRUCTION PLAN
SCALE: 3/32"=1'-0"

HVAC LEGEND

(T) RTU-X	THERMOSTAT WITH EQUIPMENT LABEL
	DIRECTION OF FLOW
(AA N)	DEVICE SCHEDULE TAG
(N LNNN)	DETAIL REFERENCE, NUMBER/SHEET
S1:6ø 50	SUPPLY AIR DEVICE: SIZE (INCHES)/CFM
R1:18x30	RETURN AIR DEVICE: SIZE (INCHES)
12x12	DUCT SIZE (INCHES)
3500	AIR FLOW (CUBIC FEET PER MINUTE)
	HVAC EQUIPMENT
	SUPPLY AIR
	RETURN AIR
	EXISTING HVAC EQUIPMENT TO REMAIN
	CONNECTION TO EXISTING EQUIPMENT

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8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
(573) 353-7115
siebengineer@gmail.com
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CHECKED BY: TLS
DESIGNED BY: TLS

SHEET TITLE:

MECHANICAL
HVAC
CONSTRUCTION PLAN

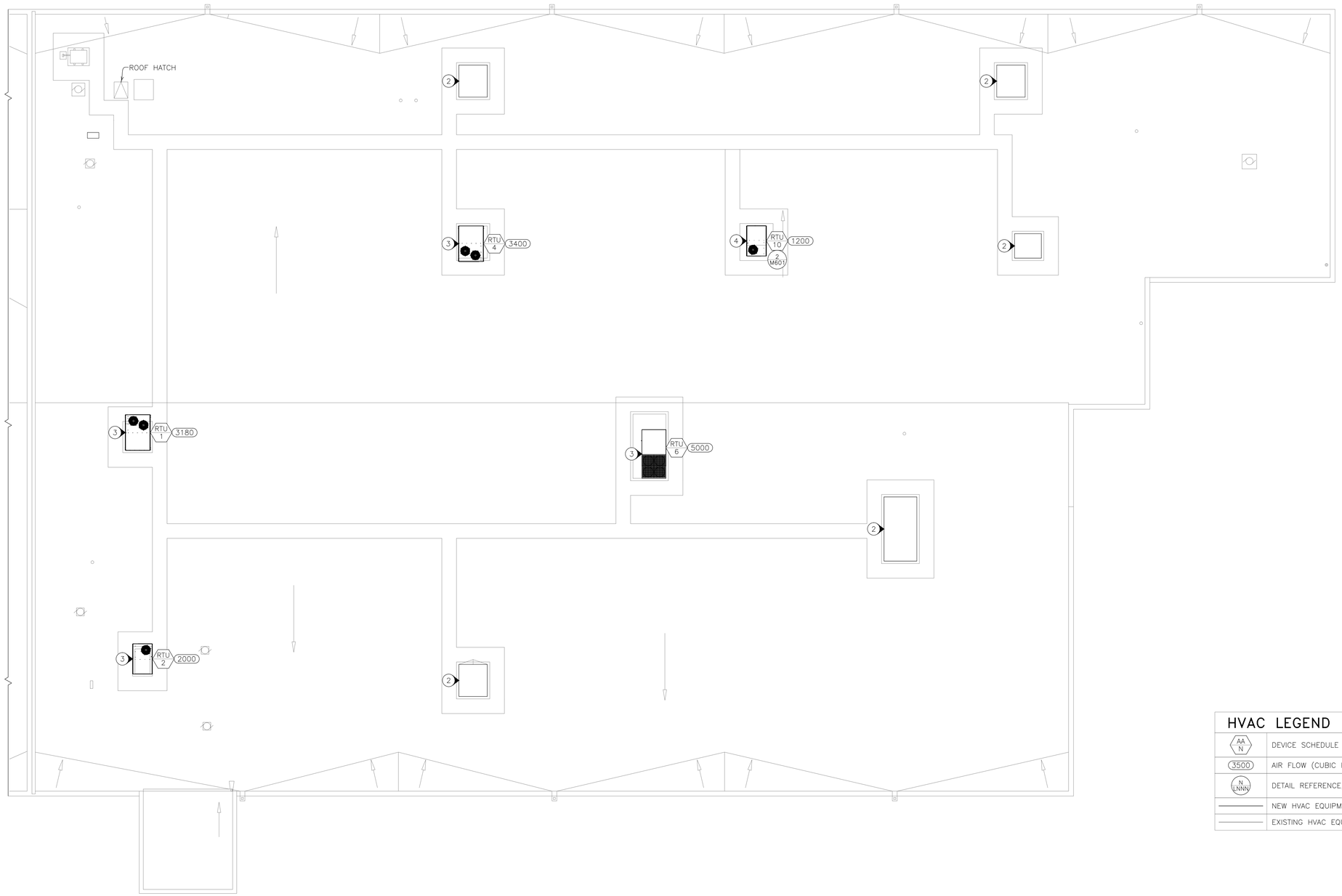
SHEET NUMBER:

M-103

6 OF 13 SHEETS
06/05/2020

NOTES

1. REFERENCE SHEET G-002 FOR GENERAL DEMOLITION NOTES.
2. EXISTING ROOFTOP UNIT TO REMAIN.
3. USE EXISTING ROOF CURB AND FIELD MEASURE TO DETERMINE DIMENSIONS OF REQUIRED TRANSITION TO NEW ROOFTOP UNIT.
4. PROVIDE NEW INSULATED ROOF CURB. COORDINATE WITH ROOF MANUFACTURER TO PROVIDE REQUIRED FLASHING AND TO MAINTAIN ROOF WARRANTY. REFERENCE STRUCTURAL PLANS FOR ADDITIONAL STRUCTURAL SUPPORT REQUIREMENTS.
5. PROVIDE A TRAPPED CONDENSATE DRAIN PIPE FOR NEW ROOFTOP UNITS. SIZE PER MANUFACTURER'S INSTRUCTIONS.



1 MECHANICAL HVAC EAST ROOF CONSTRUCTION PLAN
SCALE: 3/32"=1'-0"

HVAC LEGEND

AA N	DEVICE SCHEDULE TAG
3500	AIR FLOW (CUBIC FEET PER MINUTE)
N LNNN	DETAIL REFERENCE, NUMBER/SHEET
———	NEW HVAC EQUIPMENT
———	EXISTING HVAC EQUIPMENT TO REMAIN

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

STATE OF MISSOURI
TRACIE L. SIEBENECK
NUMBER PE-2013019114
5-5-2020
PROFESSIONAL ENGINEER

SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
(573) 353-7115
siebengineer@gmail.com
Missouri State Certificate of Authority
#E-2016021605

OFFICE OF
ADMINISTRATION
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MANAGEMENT,
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STATE LOTTERY COMMISSION

REPLACE ROOFTOP
HVAC & REFURBISH
EMERGENCY
GENERATOR
MISSOURI LOTTERY
HEADQUARTERS
BUILDING
1823 SOUTHRIDGE DR.
JEFFERSON CITY, MO

PROJECT #	N2001-01
SITE#	8611
ASSET#	8611951002

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:
ISSUE DATE: 06/05/2020

CAD DWG FILE: MLH-M.dwg
DRAWN BY: TLS
CHECKED BY: TLS
DESIGNED BY: TLS

SHEET TITLE:

MECHANICAL
HVAC EAST ROOF
CONSTRUCTION PLAN

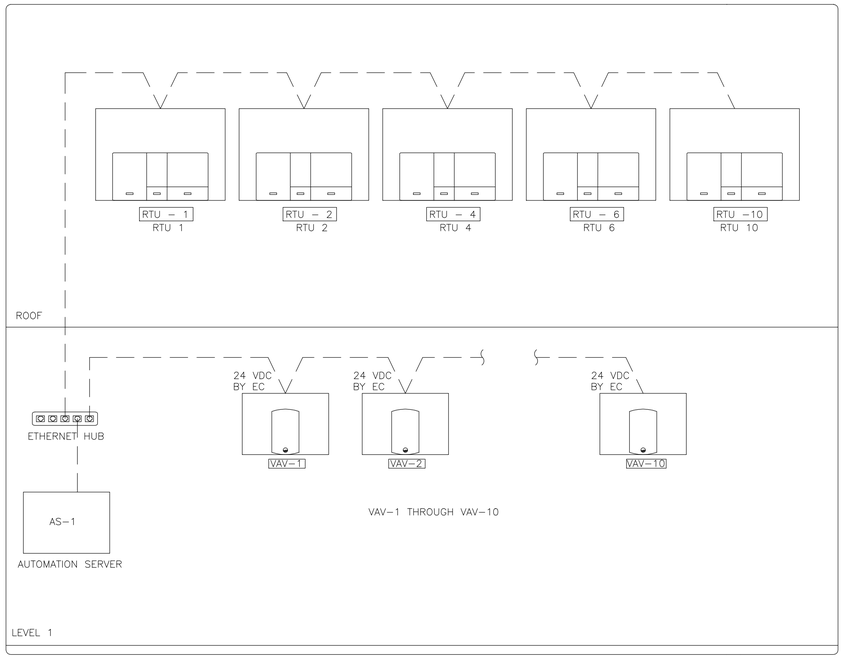
SHEET NUMBER:

M-104

CONTROL NOTES

1 THE EXISTING BUILDING AUTOMATION SYSTEM IS BY SCHNEIDER ELECTRIC. COORDINATE ALL CONTROLS WORK WITH C&C GROUP. CONTACT INFORMATION:
BRIAN SCHEPERS, VP GENERAL MANAGER CENTRAL MISSOURI
(573) 632-4247
BSCHEPERS@C-CGROUP.COM

2 PROVIDE ROOM TEMPERATURE SENSORS WITH LCD DISPLAY, SETPOINT ADJUSTMENT, AND OCCUPANCY OVERRIDE. LABEL ALL SENSORS WITH PERMANENT TYPE WRITTEN NAMEPLATE MARKED WITH EQUIPMENT SERVED.



1 CONTROL WIRING DIAGRAM
NO SCALE

ROOFTOP UNIT SEQUENCE OF OPERATION

BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER MORNING WARM-UP / PRE-COOL, OCCUPIED / UNOCCUPIED AND HEAT / COOL MODES. IF BAS COMMUNICATION IS LOST WITH THE BAS THE CONTROLLER SHALL OPERATE USING DEFAULT MODES AND SETPOINTS.

OCCUPIED MODE:
DURING OCCUPIED PERIODS, THE SUPPLY FAN SHALL RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER SHALL OPEN TO MAINTAIN MINIMUM VENTILATION REQUIREMENTS. THE HEAT PUMP SHALL STAGE TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. IF ECONOMIZING IS ENABLED THE OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN THE CURRENT DISCHARGE AIR TEMPERATURE SETPOINT. RTU-4 ONLY: THE BYPASS DAMPER SHALL MODULATE TO MAINTAIN THE CURRENT DUCT STATIC PRESSURE SETPOINT (ADJ.)

UNOCCUPIED MODE:
WHEN THE SPACE TEMPERATURE IS BELOW THE UNOCCUPIED HEATING SETPOINT OF 60.0° F (ADJ.) THE SUPPLY FAN SHALL START, THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED AND THE HEAT SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE RISES ABOVE THE UNOCCUPIED HEATING SETPOINT OF 60.0° F (ADJ.) PLUS THE UNOCCUPIED DIFFERENTIAL OF 4.0° F (ADJ.) THE SUPPLY FAN SHALL STOP AND THE HEAT SHALL BE DISABLED. WHEN THE SPACE TEMPERATURE IS ABOVE THE UNOCCUPIED COOLING SETPOINT OF 85.0° F (ADJ.) THE SUPPLY FAN SHALL START, THE OUTSIDE AIR DAMPER SHALL OPEN IF ECONOMIZING IS ENABLED AND REMAIN CLOSED IF ECONOMIZING IS DISABLED AND THE DX COOLING SHALL BE ENABLED. WHEN THE SPACE TEMPERATURE FALLS BELOW THE UNOCCUPIED COOLING SETPOINT OF 85.0° F (ADJ.) MINUS THE UNOCCUPIED DIFFERENTIAL OF 4.0° F (ADJ.) THE SUPPLY FAN SHALL STOP, THE DX COOLING SHALL BE DISABLED AND THE OUTSIDE AIR DAMPER SHALL CLOSE.

OPTIMAL START:
THE BAS SHALL MONITOR THE SCHEDULED OCCUPIED TIME, OCCUPIED SPACE SETPOINTS AND SPACE TEMPERATURE TO CALCULATE WHEN THE OPTIMAL START OCCURS.

MORNING WARM-UP MODE:
DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS BELOW THE OCCUPIED HEATING SETPOINT A MORNING WARM-UP MODE SHALL BE ACTIVATED. WHEN MORNING WARM-UP IS INITIATED THE UNIT SHALL ENABLE THE HEATING AND SUPPLY FAN. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED. WHEN THE AVERAGE SPACE TEMPERATURE REACHES THE OCCUPIED HEATING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

PRE-COOL MODE:
DURING OPTIMAL START, IF THE AVERAGE SPACE TEMPERATURE IS ABOVE THE OCCUPIED COOLING SETPOINT, PRE-COOL MODE SHALL BE ACTIVATED. WHEN PRE-COOL IS INITIATED THE UNIT SHALL ENABLE THE FAN AND COOLING OR ECONOMIZER. THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, UNLESS ECONOMIZING. WHEN THE AVERAGE SPACE TEMPERATURE REACHES OCCUPIED COOLING SETPOINT (ADJ.), THE UNIT SHALL TRANSITION TO THE OCCUPIED MODE.

OCCUPIED OVERRIDE:
THE BAS SHALL MONITOR THE STATUS OF THE PUSH BUTTON OVERRIDE BUTTON OF THE SPACE TEMPERATURE SENSORS. WHEN AN OCCUPIED BYPASS REQUEST IS RECEIVED FROM A SPACE SENSOR, THE UNIT SHALL TRANSITION FROM ITS CURRENT OCCUPANCY MODE TO OCCUPIED BYPASS MODE AND THE UNIT SHALL MAINTAIN THE SPACE TEMPERATURE TO THE OCCUPIED SETPOINTS (ADJ.). THE TIME PERIOD OF THE OVERRIDE SHALL BE ADJUSTABLE FROM THE FRONT END GRAPHICS.

ECONOMIZER:
THE SUPPLY AIR SENSOR SHALL MEASURE THE DRY BULB TEMPERATURE OF THE AIR LEAVING THE EVAPORATOR COIL. WHEN ECONOMIZING IS ENABLED AND THE UNIT IS OPERATING IN THE COOLING MODE, THE ECONOMIZER DAMPER SHALL BE MODULATED BETWEEN ITS MINIMUM POSITION AND 100% TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SETPOINT. THE ECONOMIZER DAMPER SHALL MODULATE TOWARD MINIMUM POSITION IN THE EVENT THE DISCHARGE AIR TEMPERATURE FALLS BELOW THE DISCHARGE LOW LIMIT TEMPERATURE SETPOINT. COMPRESSORS SHALL BE DELAYED FROM OPERATING UNTIL THE ECONOMIZER HAS OPENED TO 100%.

COMPARATIVE ENTHALPY:
OUTSIDE AIR (OA) ENTHALPY SHALL BE COMPARED WITH RETURN AIR (RA) ENTHALPY POINT. THE ECONOMIZER SHALL ENABLE WHEN OA ENTHALPY IS LESS THAN RA ENTHALPY - 3.0 BTU/LB. THE ECONOMIZER SHALL DISABLE WHEN OA ENTHALPY IS GREATER THAN RA ENTHALPY OR OUTSIDE AIR DRY BULB TEMPERATURE IS ABOVE 60°.

SUPPLY FAN:
THE SUPPLY FAN SHALL BE ENABLED WHILE IN THE OCCUPIED MODE AND CYCLED ON DURING THE UNOCCUPIED MODE. A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FAN. IF THE SWITCH DOES NOT OPEN WITHIN 40 SECONDS AFTER A REQUEST FOR FAN OPERATION A FAN FAILURE ALARM SHALL BE ANNUNCIATED AT THE BAS, THE UNIT SHALL STOP, REQUIRING A MANUAL RESET.

RTU-4 ONLY: SUPPLY DUCT STATIC PRESSURE CONTROL:
THE UNIT CONTROLLER SHALL MODULATE THE BYPASS DAMPER OUTPUT AS REQUIRED TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT.

FILTER STATUS:
A DIFFERENTIAL PRESSURE SWITCH SHALL MONITOR THE DIFFERENTIAL PRESSURE ACROSS THE FILTER WHEN THE FAN IS RUNNING. IF THE SWITCH CLOSES FOR 2 MINUTES AFTER A REQUEST FOR FAN OPERATION A DIRTY FILTER ALARM SHALL BE ANNUNCIATED AT THE BAS.

DEHUMIDIFICATION:
FACTORY INSTALLED RAWAL APR SHALL MODULATE SYSTEM CAPACITY BY ADJUSTING REFRIGERANT FLOW BASED ON RETURN AIR ENTHALPY. HOT GAS REHEAT OR VARIABLE SPEED COMPRESSORS ARE ALSO ACCEPTABLE METHODS OF PROVIDING DEHUMIDIFICATION.

VAV UNIT SEQUENCE OF OPERATION (RTU-4 ONLY)

BUILDING AUTOMATION SYSTEM INTERFACE:
THE BUILDING AUTOMATION SYSTEM (BAS) SHALL SEND THE CONTROLLER OCCUPIED AND UNOCCUPIED COMMANDS. THE BAS MAY ALSO SEND A HEAT/COOL MODE, PRIORITY SHUTDOWN COMMANDS, SPACE TEMPERATURE AND/OR SPACE TEMPERATURE SETPOINT. IF COMMUNICATION IS LOST WITH THE BAS, THE VAV CONTROLLER SHALL OPERATE USING ITS LOCAL SETPOINTS.

OCCUPANCY MODE:
THE OCCUPANCY MODE SHALL BE COMMUNICATED OR HARDWIRED TO THE CONTROLLER VIA A VIRTUAL INPUT. VALID OCCUPANCY MODES FOR THE UNIT SHALL BE:

OCCUPIED:
NORMAL OPERATING MODE FOR OCCUPIED SPACES OR DAYTIME OPERATION. WHEN THE UNIT IS IN THE OCCUPIED MODE THE VAV SHALL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE OCCUPIED HEATING OR COOLING SETPOINT. APPLICABLE VENTILATION AND AIRFLOW SETPOINTS SHALL BE ENFORCED. THE OCCUPIED MODE SHALL BE THE DEFAULT MODE OF THE VAV.

UNOCCUPIED:
NORMAL OPERATING MODE FOR UNOCCUPIED SPACES OR NIGHTTIME OPERATION. WHEN THE UNIT IS IN UNOCCUPIED MODE THE VAV CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE AT THE STORED UNOCCUPIED HEATING OR COOLING SETPOINT REGARDLESS OF THE PRESENCE OF A HARDWIRED OR COMMUNICATED SETPOINT. WHEN THE SPACE TEMPERATURE EXCEEDS THE ACTIVE UNOCCUPIED SETPOINT THE VAV SHALL MODULATE FULLY CLOSED.

OCCUPIED OVERRIDE:
MODE USED TO TEMPORARILY PLACE THE UNIT INTO THE OCCUPIED OPERATION. TENANTS SHALL BE ABLE TO OVERRIDE THE UNOCCUPIED MODE FROM THE SPACE SENSOR. THE OVERRIDE SHALL LAST FOR A MAXIMUM OF 4 HOURS (ADJ.). THE TENANTS SHALL BE ABLE TO CANCEL THE OVERRIDE FROM THE SPACE SENSOR AT ANY TIME. DURING THE OVERRIDE THE UNIT SHALL OPERATE IN OCCUPIED MODE.

HEAT/COOL MODE:
HEATING MODE IMPLIES THE PRIMARY AIR TEMPERATURE IS HOT. COOLING MODE IMPLIES THE PRIMARY AIR TEMPERATURE IS COLD.

HEAT/COOL SETPOINT:
THE SPACE TEMPERATURE SETPOINT SHALL BE DETERMINED EITHER BY A LOCAL SETPOINT, THE VAV DEFAULT SETPOINT, OR A COMMUNICATED VALUE. THE VAV SHALL USE THE LOCALLY STORED DEFAULT SETPOINTS WHEN NEITHER A LOCAL SETPOINT NOR COMMUNICATED SETPOINT IS PRESENT. IF BOTH A LOCAL SETPOINT AND COMMUNICATED SETPOINT EXIST, THE VAV SHALL USE THE COMMUNICATED VALUE.

COOLING MODE:
WHEN THE UNIT IS IN COOLING MODE, THE VAV CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE COOLING SETPOINT BY MODULATING THE AIRFLOW BETWEEN THE ACTIVE COOLING MINIMUM AIRFLOW SETPOINT TO THE MAXIMUM COOLING AIRFLOW SETPOINT. BASED ON THE VAV CONTROLLER OCCUPANCY MODE, THE ACTIVE COOLING SETPOINT SHALL BE ONE OF THE FOLLOWING:

OCCUPIED COOLING SETPOINT: 74.0° F
UNOCCUPIED COOLING SETPOINT 85.0° F
OCCUPIED STANDBY COOLING SETPOINT 78.0° F
OCCUPIED MIN COOLING AIRFLOW SETPOINT: SEE VAV SCHEDULE
OCCUPIED MAX COOLING AIRFLOW SETPOINT: SEE VAV SCHEDULE

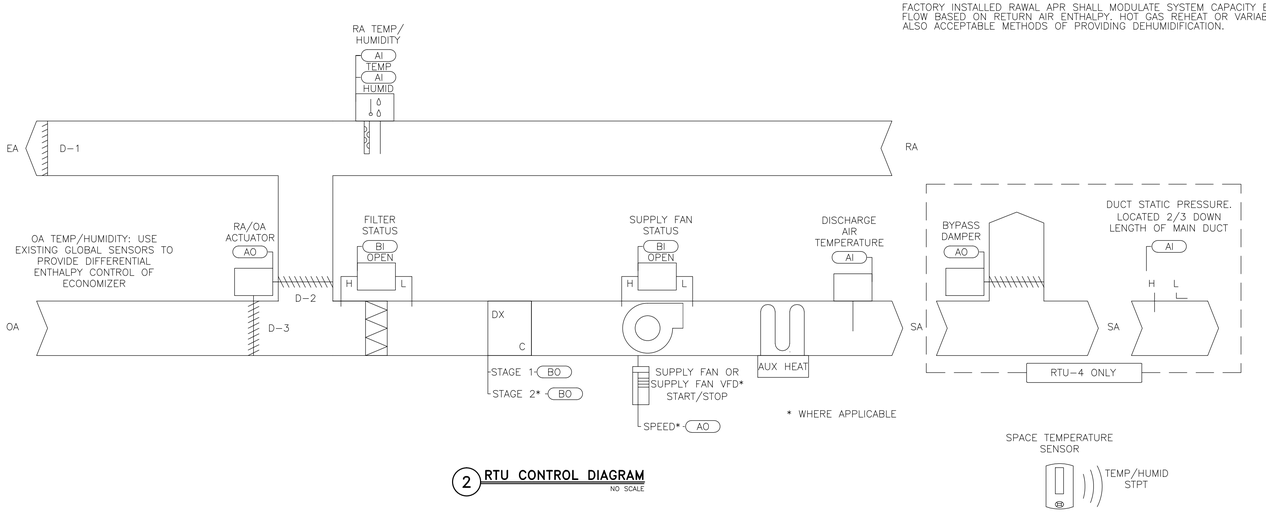
THE VAV SHALL USE THE MEASURED SPACE TEMPERATURE AND THE ACTIVE COOLING SETPOINT TO DETERMINE THE REQUESTED COOLING CAPACITY OF THE UNIT. THE OUTPUTS WILL BE CONTROLLED BASED ON THE UNIT CONFIGURATION AND THE REQUESTED COOLING CAPACITY.

HEATING MODE:
WHEN THE UNIT IS IN HEATING MODE, THE VAV CONTROLLER SHALL MAINTAIN THE SPACE TEMPERATURE AT THE ACTIVE HEATING SETPOINT BY MODULATING THE AIRFLOW BETWEEN THE ACTIVE HEATING MINIMUM AIRFLOW SETPOINT TO THE MAXIMUM HEATING AIRFLOW SETPOINT. BASED ON THE VAV CONTROLLER OCCUPANCY MODE, THE ACTIVE HEATING SETPOINT SHALL BE ONE OF THE FOLLOWING:

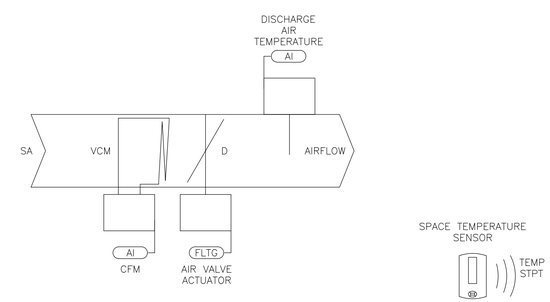
OCCUPIED HEATING SETPOINT: 71.0° F
UNOCCUPIED HEATING SETPOINT: 60.0° F
OCCUPIED STANDBY HEATING SETPOINT: 67.0° F
OCCUPIED MIN HEATING AIRFLOW SETPOINT: SEE VAV SCHEDULE
OCCUPIED MAX HEATING AIRFLOW SETPOINT: SEE VAV SCHEDULE

THE VAV CONTROLLER SHALL USE THE MEASURED SPACE TEMPERATURE AND THE ACTIVE HEATING SETPOINT TO DETERMINE THE REQUESTED HEATING CAPACITY OF THE UNIT. THE OUTPUTS WILL BE CONTROLLED BASED ON THE UNIT CONFIGURATION AND THE REQUESTED HEATING CAPACITY.

SPACE SENSOR FAILURE:
IF THERE IS A FAULT WITH THE OPERATION OF THE ZONE SENSOR AN ALARM SHALL BE ANNUNCIATED AT THE BAS.



2 RTU CONTROL DIAGRAM
NO SCALE



3 TYPICAL VAV CONTROL DIAGRAM
NO SCALE

CONTROL DIAGRAM NOTES:
EC: ELECTRICAL CONTRACTOR
SA: SUPPLY AIR
OA: OUTDOOR AIR
RA: RETURN AIR
EA: EXHAUST AIR
D: DAMPER
VCM: VENTILATION CONTROL MODULE

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

STATE OF MISSOURI
TRACIE L. SIEBENECK
NUMBER PE-2013019114
14-5-2020
PROFESSIONAL ENGINEER

SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
(573) 353-7115
siebengineer@gmail.com
Missouri State Certificate of Authority
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REPLACE ROOFTOP
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1823 SOUTHRIDGE DR.
JEFFERSON CITY, MO

PROJECT # N2001-01
SITE# 8611
ASSET# 8611951002

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ISSUE DATE: 06/05/2020

CAD DWG FILE: MLH-M.dwg
DRAWN BY: TLS
CHECKED BY: TLS
DESIGNED BY: TLS

SHEET TITLE:
MECHANICAL CONTROLS AND SEQUENCE OF OPERATION

SHEET NUMBER:
M-501

GENERAL SCHEDULE NOTES

1 MANUFACTURER'S REFERENCED IN SCHEDULES ARE BASIS OF DESIGN. REFER TO SPECIFICATIONS FOR ADDITIONAL APPROVED MANUFACTURERS.

ROOFTOP UNIT SCHEDULE

TAG	MFG/MODEL	DESCRIPTION	NET COOLING CAPACITY	HEATING CAPACITY AND EFFICIENCY	SUPPLY/OUTSIDE AIRFLOW	ELECTRICAL REQUIREMENTS	WEIGHT	NOTES
RTU 1	JOHNSON CONTROLS XXE08A4	7.5 TON 15.1 IEER 11.5 EER	TC: 86.5 MBh SC: 63.3 MBh EA: 77/64° F	47°F: 84 MBh;3.5 COP 17°F: 49 MBh;2.25 COP AUX HEAT: 16.5 KW	SUPPLY: 3180 CFM ESP: 0.6 IN WG OA: 375 CFM	460V 3 PHASE 47.2 MCA 50 MOP	1081 LBS	1,2 3,4 5,6
RTU 2	JOHNSON CONTROLS XQE05A4	4 TON 14.5 SEER 12.25 EER	TC: 53.6 MBh SC: 39.1 MBh EA: 77/64° F	47°F:46.7 MBh;3.5 COP 17°F:26.4 MBh;2.25 COP AUX HEAT: 6 KW	SUPPLY: 2000 CFM ESP: 0.6 IN WG OA: 200 CFM	460V 3 PHASE 22.9 MCA 25 MOP	677 LBS	1,2 3,4 6
RTU 4	JOHNSON CONTROLS XXE09A4	8.5 TON 14.4 IEER 11.8 EER	TC: 90.5 MBh SC: 78.5 MBh EA: 77/64° F	47°F: 94 MBh;3.35 COP 17°F: 57 MBh;2.25 COP AUX HEAT: 16.5 KW	SUPPLY: 3400 CFM ESP: 0.8 IN WG OA: 320 CFM	460V 3 PHASE 47.4 MCA 50 MOP	1130 LBS	1,2 3,4 5,6
RTU 6	JOHNSON CONTROLS J12XPE18R4	12.5 TON 13.5 IEER 10.6 EER	TC: 142.6 MBh SC: 110.2 MBh EA: 77/64° F	47°F:135 MBh;3.2 COP 17°F:90 MBh;2.05 COP AUX HEAT: 18 KW	SUPPLY: 5000 CFM ESP: 0.6 IN WG OA: 390 CFM	460V 3 PHASE 67.6 MCA 70 MOP	1530 LBS	1,2 3,4 5,6
RTU 10	JOHNSON CONTROLS XQE05A2	4 TON 14.5 SEER 12.25 EER	TC: 45.9 MBh SC: 30.7 MBh EA: 78/65° F	47°F:46.7 MBh;3.5 COP 17°F:26.4 MBh;2 COP AUX HEAT: 4.9 KW	SUPPLY: 1200 CFM ESP: 0.6 IN WG OA: 200 CFM	208V 3 PHASE 45.9 MCA 50 MOP	677 LBS	1,2 3,4 7

NOTES	
1	EQUIPMENT MUST MEET OR EXCEED REQUIREMENTS OF ASHRAE 90.1–2013. CONSULT ENGINEER IF WEIGHT IS GREATER THAN SPECIFIED.
2	PROVIDE FACTORY MOUNTED DISCONNECT, POWERED CONVENIENCE OUTLET, ECONOMIZER WITH BAROMETRIC RELIEF, LOW AMBIENT CONTROLS, RETURN AIR SMOKE DETECTOR, HAIL GUARDS
3	PROVIDE CONTROLS REQUIRED TO REDUCE COOLING/HEATING CAPACITY TO MATCH SPACE LOAD SUCH AS RAWAL VALVE OR VARIABLE SPEED COMPRESSOR
4	PROVIDE WITH TERMINAL STRIP. CONTROLS CONTRACTOR SHALL PROVIDE ALL CONTROL COMPONENTS. FACTORY BACnet CONTROLLERS SHALL NOT BE PROVIDED.
5	PROVIDE VARIABLE SPEED SUPPLY FAN TO ADJUST FAN SPEED BASED ON COMPRESSOR STAGE
6	USE EXISTING ROOF CURB. FIELD MEASURE TO PROVIDE ROOF CURB TRANSITION AS NEEDED
7	PROVIDE INSULATED ROOF CURB. CONSULT ENGINEER IF WEIGHT IS GREATER THAN 155 POUNDS.

VARIABLE AIR VOLUME TERMINAL UNIT SCHEDULE

TAG	MFG/MODEL	INLET SIZE	ELECTRIC HEAT	MAXIMUM AIRFLOW	MINIMUM AIRFLOW	NOTES
VAV 1	PRICE SDV5	6 INCH	NONE	260 CFM	80 CFM	1 2
VAV 2	PRICE SDV5	6 INCH	NONE	220 CFM	65 CFM	1 2
VAV 3	PRICE SDV5	6 INCH	NONE	210 CFM	65 CFM	1 2
VAV 4	PRICE SDV5	6 INCH	NONE	240 CFM	72 CFM	1 2
VAV 5	PRICE SDV5	6 INCH	NONE	150 CFM	50 CFM	1 2
VAV 6	PRICE SDV5	6 INCH	NONE	220 CFM	65 CFM	1 2
VAV 7	PRICE SDV5	6 INCH	NONE	150 CFM	50 CFM	1 2
VAV 8	PRICE SDV5	6 INCH	NONE	250 CFM	75 CFM	1 2
VAV 9	PRICE SDV5	12 INCH	NONE	1600 CFM	480 CFM	1 2
VAV 10	PRICE SDV5	4 INCH	NONE	100 CFM	50 CFM	1 2

NOTES	
1	PROVIDE FACTORY MOUNTED MULTI–POINT PRIMARY AIRFLOW SENSOR; FACTORY INSULATED WITH MINIMUM R2.1
2	CONTROLS CONTRACTOR SHALL PROVIDE PRESSURE–INDEPENDENT, BACnet CONTROLLER AND ACTUATOR

AIR DEVICE SCHEDULE

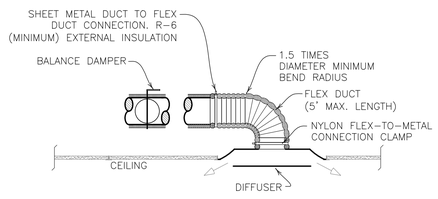
TAG	MODEL	DESC.	STYLE	REMARK	NOTES
S1	SPD	SUPPLY	STEEL, WHITE, SQUARE PLAQUE DIFFUSER	RADIAL PATTERN; 24x24 MODULE; 24x24 FACE LAY–IN MOUNT	1 2
R1	PDDR	RETURN	STEEL, WHITE PERFORATED GRILLE	FLUSH FACE; 24x24 MODULE; 24x24 FACE LAY–IN MOUNT	1 3

NOTES	
1	MANUFACTURER: PRICE, SEE PLAN FOR SIZE
2	PROVIDE VOLUME CONTROL DAMPER D–1 AT BRANCH TAKE OFF TO DIFFUSER. SEE DAMPER SCHEDULE.
3	PROVIDE LIGHT SHIELD TO MINIMIZE SIGHTLINES INTO CEILING SPACE FOR PLENUM RETURN

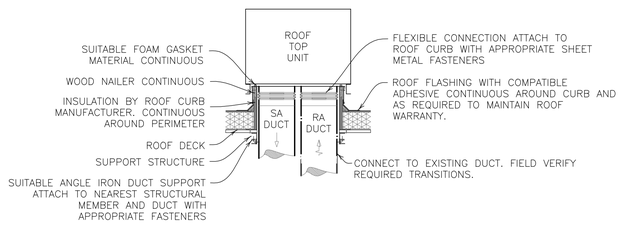
DAMPER SCHEDULE

TAG	MFG/MODEL	DIMENSIONS	DESCRIPTION	SPECIFICATION	NOTES
D 1	POTTORFF CD–10R	SEE PLANS FOR DUCT SIZE	BALANCE DAMPER ROUND	6 INCH WIDE, 22 GA GALVANIZED STEEL FRAME; SINGLE 22 GA GALVANIZED BLADE WITH CONTROL SHAFT & MANUAL LOCKING QUADRANT	1
BD 1	PRICE RDV5000	UNIT SIZE: 16	BYPASS DAMPER ROUND	22 GA ZINC COATED STEEL HOUSING; SINGLE 18 GA GALVANIZED DAMPER WITH POSITION INDICATOR; MULTI–PORT DIFF PRESSURE SENSOR +/–5% ACCURACY	2

NOTES	
1	PROVIDE QUADRANT STANDOFF BRACKET FOR 1.5 INCH INSULATION
2	PROVIDE NEMA 1 CONTROLS ENCLOSURE. CONTROLS PROVIDED BY CONTROLS CONTRACTOR.



1 TYPICAL BRANCH DUCT AND DIFFUSER
NO SCALE



2 RTU–10 MOUNTING DETAIL
SCALE: NONE

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SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
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REPLACE ROOFTOP HVAC & REFURBISH EMERGENCY GENERATOR
MISSOURI LOTTERY HEADQUARTERS BUILDING
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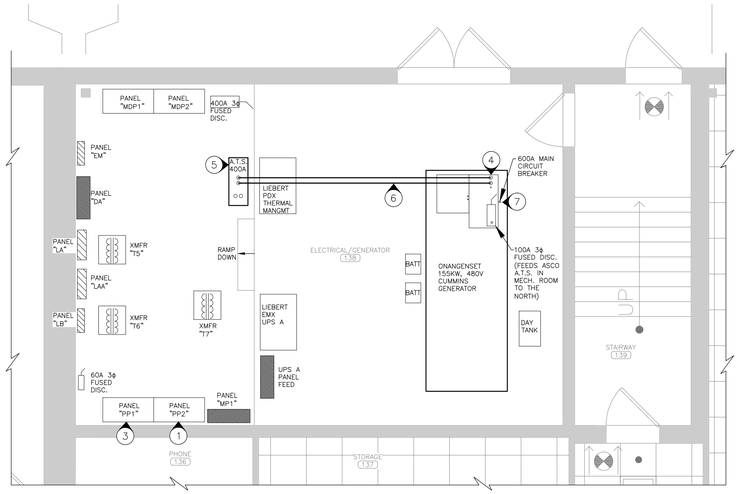
DESIGNED BY: TLS

SHEET TITLE:
MECHANICAL SCHEDULES AND DETAILS

SHEET NUMBER:
M-601

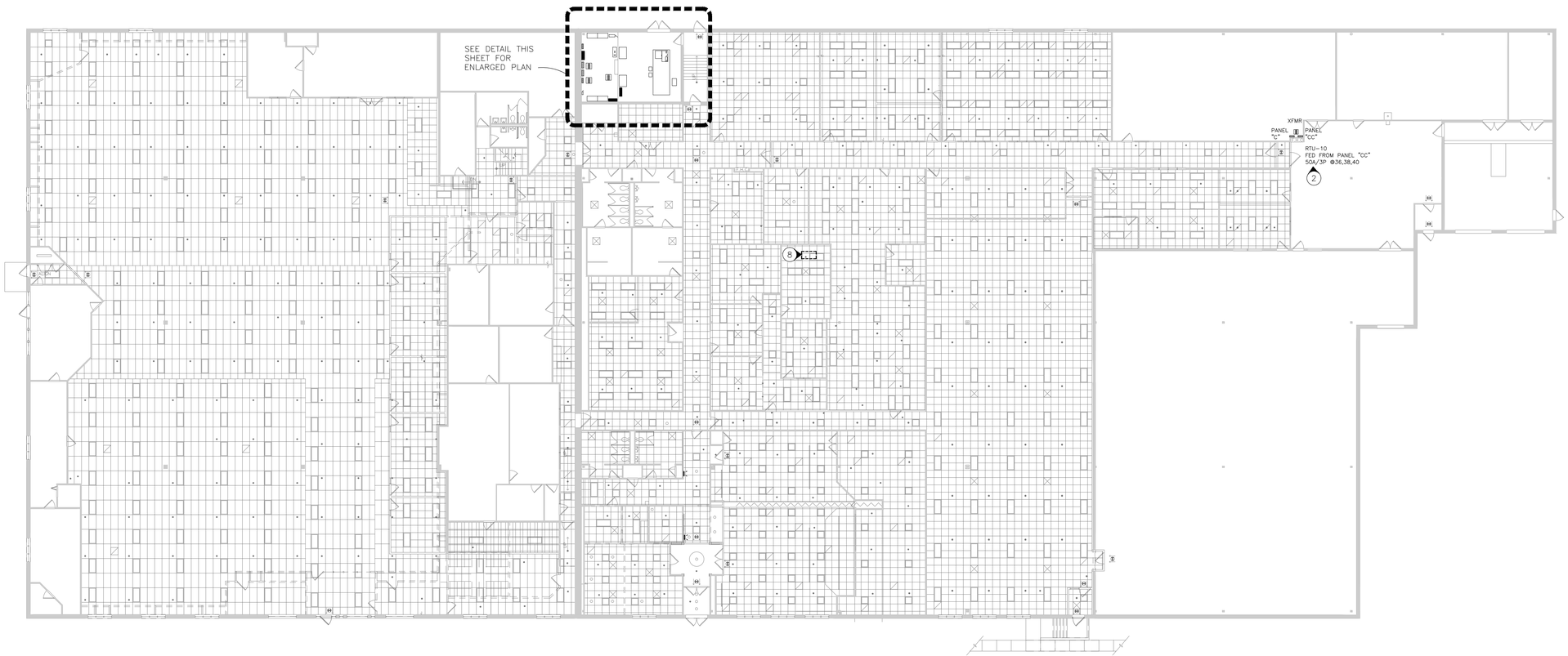


NORTH 1 MAIN LEVEL ENLARGED MECHANICAL/ELECTRICAL ROOM POWER PLAN
SCALE: 1/4"=1'-0"

NOTES

(N) INDICATES KEYED NOTES

1. 480V, 3P PANEL THAT FEEDS EXISTING HVAC RTU 1, 2, AND 6 ARE FROM THIS PANEL. COORDINATE WITH MECHANICAL CONTRACTOR ON SCHEDULING THESE UNITS TO BE REPLACED. ELC SHALL ENSURE FUSED BUCKET IS OFF BEFORE CONSTRUCTION. CONTRACTOR TO FOLLOW OSHA 1910.147 App A, TYPICAL MINIMAL LOCKOUT PROCEDURES, WHILE TEMPORARILY DISCONNECTING AND RECONNECTING LOADS'
2. 208V, 3P PANEL FEEDS EXISTING RTU 10. COORDINATE WITH MECHANICAL CONTRACTOR ON SCHEDULING THIS UNIT TO BE REPLACED. ELC SHALL ENSURE CIRCUIT BREAKER IS OFF AND MARKED AS LOCKED OUT.
3. 480V, 3P PANEL THAT FEEDS EXISTING HVAC RTU 4 IS FROM THIS PANEL. COORDINATE WITH MECHANICAL CONTRACTOR ON SCHEDULING THESE UNITS TO BE REPLACED. ELC SHALL ENSURE FUSED BUCKET IS OFF AND MARKED AS LOCKED OUT.
4. EXISTING 2" CONDUITS FOR FEEDERS TO EXISTING CATERPILLAR A.T.S.
5. REPLACE EXISTING CATERPILLAR 400A, 480V, 3P, 3W AUTOMATIC TRANSFER SWITCH WITH NEW ASCO SERIES 300 A.T.S. (E300 C 3 400 N 1X C)–400A, 480V, 3 PHASE, 4 WIRE OR EQUAL. RECONNECT TO ALL EXISTING EQUIPMENT. COORDINATE WITH OWNER.
6. REMOVE WIRE CONNECTING EXISTING 400A CATERPILLAR A.T.S. WITH GENERATOR. RUN 2 SETS OF ((3) 1/0 CU THHN, (1) #1 CU THHN AND (1) #6 CU GND) IN THE (2) EXISTING 2" CONDUITS FROM GENERATOR TO NEW ATS.
7. UNIT IS CAPABLE TO PRODUCING 233 AMPS AT 480 VOLTS. ELC TO ADJUST EXISTING 600A MAIN BREAKER AT GENERATOR TO APPROPRIATE TRIP SETTING. CONTRACTOR TO REFURBISH EXISTING GENERATOR. REFURBISH SHALL INCLUDE REPLACEMENT OF ALL BELTS, HOSES AND VIBRATION ISOLATORS.
8. DISCONNECT POWER TO THIS AIR CONDITIONING UNIT (ACU). REMOVE CONDUIT WIRE AND ALL ASSOCIATED ELECTRICAL EQUIPMENT BACK TO THE ELECTRICAL PANEL. IF AIR CONDITIONER IS THE ONLY EQUIPMENT ON THE CIRCUIT MARK BREAKER AS SPARE IN PANEL SCHEDULE. COORDINATE WITH MECHANICAL.



NORTH 2 ELECTRICAL POWER PLAN
SCALE: 1/16"=1'-0"

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

STATE OF MISSOURI
TRACIE L. SIEBENECK
NUMBER PE-2013019114
6-5-2020
PROFESSIONAL ENGINEER

SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
(573) 353-7115
siebengineer@gmail.com
Missouri State Certificate of Authority
#E-2016021605

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EMERGENCY
GENERATOR
MISSOURI LOTTERY
HEADQUARTERS
BUILDING
1823 SOUTHRIDGE DR.
JEFFERSON CITY, MO

PROJECT # N2001-01
SITE# 8611
ASSET# 8611951002

REVISION:
DATE:
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DATE:
ISSUE DATE: 06/05/2020

CAD DWG FILE: MLH-e.dwg
DRAWN BY: MDS
CHECKED BY: JLD
DESIGNED BY: MDS

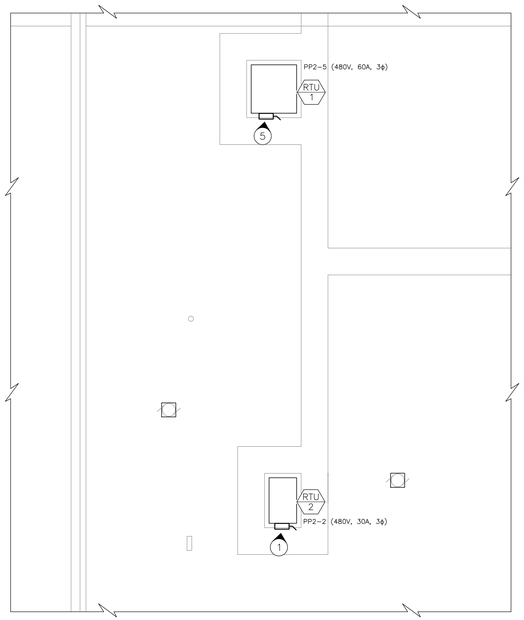
SHEET TITLE:

ELECTRICAL
POWER
PLAN

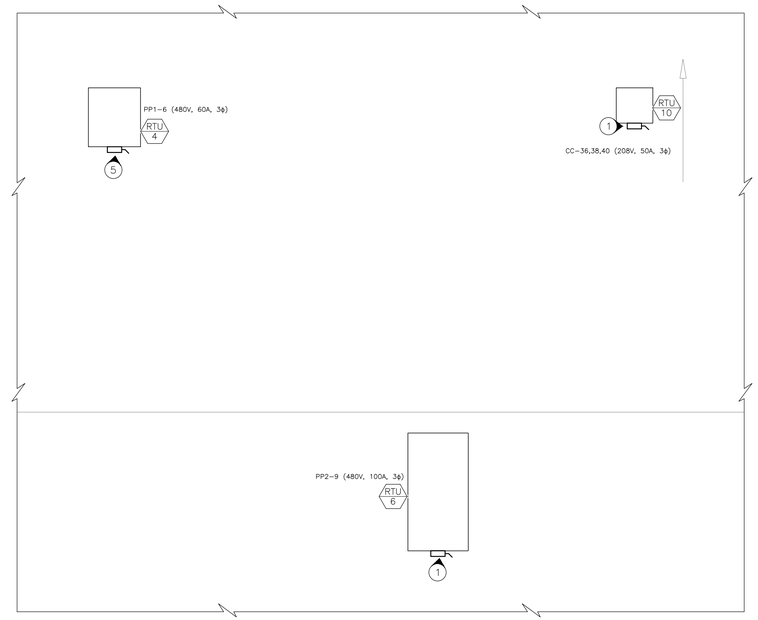
SHEET NUMBER:

E-101

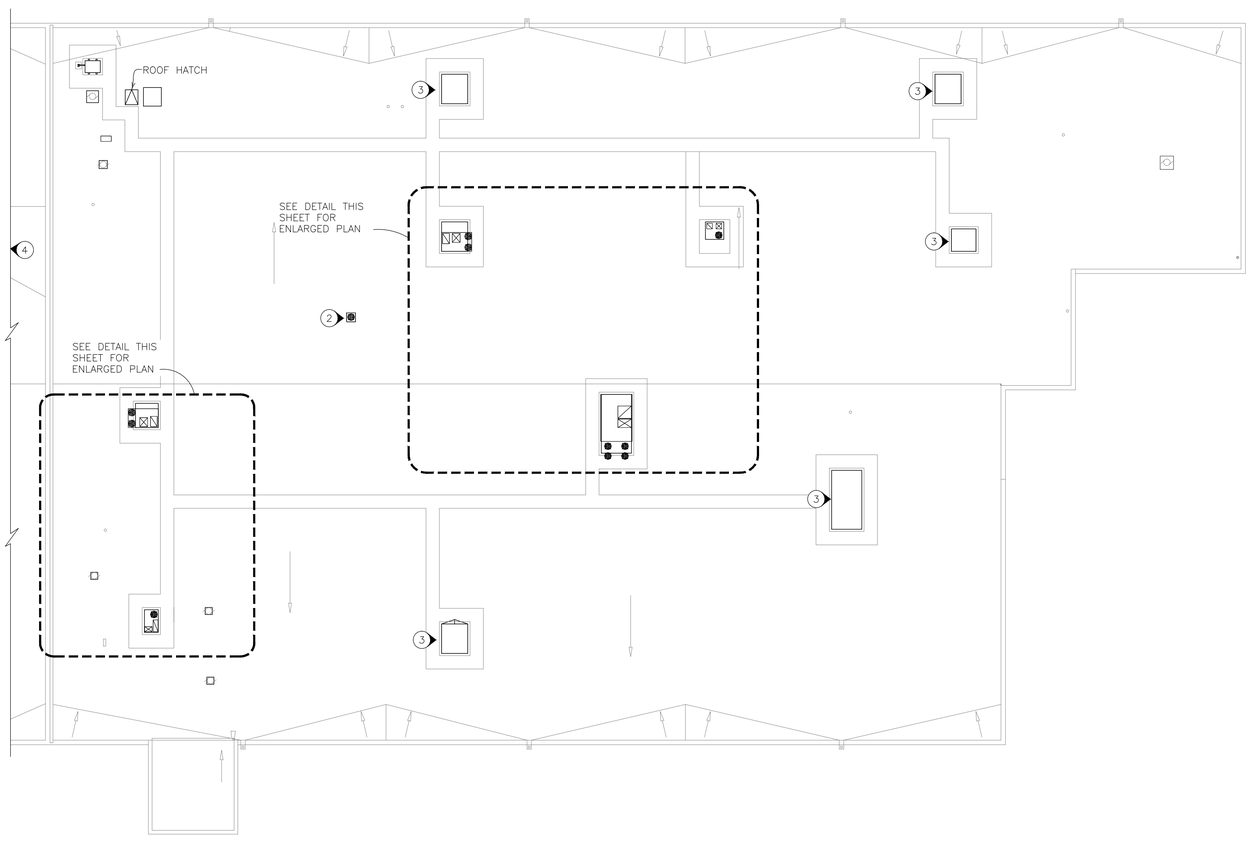
10 OF 13 SHEETS
06/05/2020



1 PARTIAL ROOF ENLARGED ELECTRICAL DEMOLITION PLAN
SCALE: 1/16"=1'-0"



2 PARTIAL ROOF ENLARGED ELECTRICAL DEMOLITION PLAN
SCALE: 1/16"=1'-0"



3 EAST ROOF ELECTRICAL DEMOLITION PLAN
SCALE: 1/16"=1'-0"

NOTES

(N) INDICATES KEYED NOTES

1. ELECTRICAL CONTRACTOR (ELC) TO REMOVE POWER TO THIS UNIT'S DISCONNECT. REMOVE DISCONNECT. EXISTING ELECTRICAL CIRCUITING IS SHOWN NEXT TO THE UNIT. COORDINATE WITH MECHANICAL CONTRACTOR ON SCHEDULING. UNITS WILL BE REPLACED WITH SIMILAR SIZED UNITS WITH NEW (FACTORY PROVIDED) DISCONNECTS. REFERENCE SHEET E-103.
2. DISCONNECT POWER TO THIS CONDENSING UNIT FOR (ACU)-REFERENCE MECHANICAL SHEETS. REMOVE CONDUIT, WIRE AND ALL ASSOCIATED ELECTRICAL EQUIPMENT BACK TO THE ELECTRICAL PANEL. IF CONDENSING UNIT IS THE ONLY EQUIPMENT ON THE CIRCUIT, MARK BREAKER AS SPARE IN PANEL SCHEDULE. COORDINATE WITH MECHANICAL CONTRACTOR FOR SCHEDULING. COORDINATE WITH GENERAL CONTRACTOR TO SEAL ROOF.
3. EXISTING ROOFTOP HVAC UNIT TO REMAIN AS IS.
4. NO WORK ON THIS PORTION OF THE ROOF.
5. ELECTRICAL CONTRACTOR (ELC) TO REMOVE POWER TO THIS UNIT'S DISCONNECT. EXISTING ELECTRICAL CIRCUITING IS SHOWN NEXT TO THE UNIT. IF EXISTING WIRE IS COPPER AND IS #8 THEN WIRE MAY BE REUSED FOR NEW UNIT WITH SLIGHTLY LARGER ELECTRICAL LOAD. IF WIRE IS NOT #8 OR LARGER, ELC TO REMOVE EXISTING CONDUCTORS BACK TO THE PANEL. IF EXISTING CONDUIT IS 3/4" EMT THEN ELC MAY REUSE EXISTING CONDUIT PROVIDED IT IS INSTALLED PER THE 2014 NEC. REFERENCE SHEET E-103. COORDINATE WITH EXISTING ELECTRICAL CONFIGURATION.

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

STATE OF MISSOURI
TRACIE L. SIEBENECK
NUMBER PE-2013019114
6-5-20
PROFESSIONAL ENGINEER

SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
(573) 353-7115
siebengineer@gmail.com
Missouri State Certificate of Authority
#E-2016021605

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JEFFERSON CITY, MO

PROJECT #	N2001-01
SITE#	8611
ASSET#	8611951002

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DATE:
ISSUE DATE: 06/05/2020

CAD DWG FILE: MLH-e.dwg
DRAWN BY: MDS
CHECKED BY: JLD
DESIGNED BY: MDS

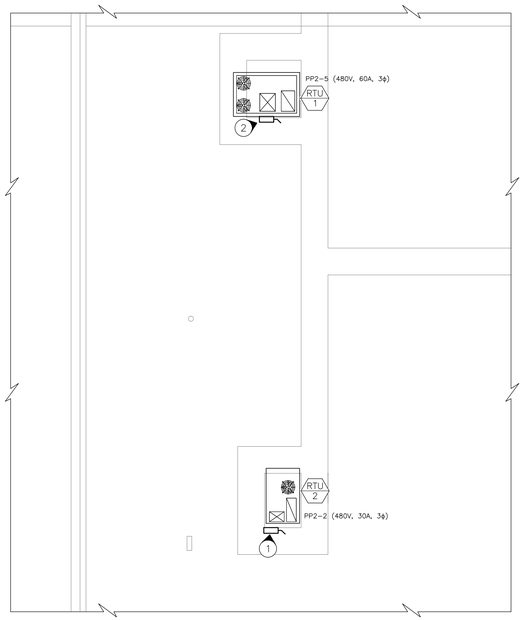
SHEET TITLE:

ELECTRICAL
EAST ROOF
DEMOLITION PLAN

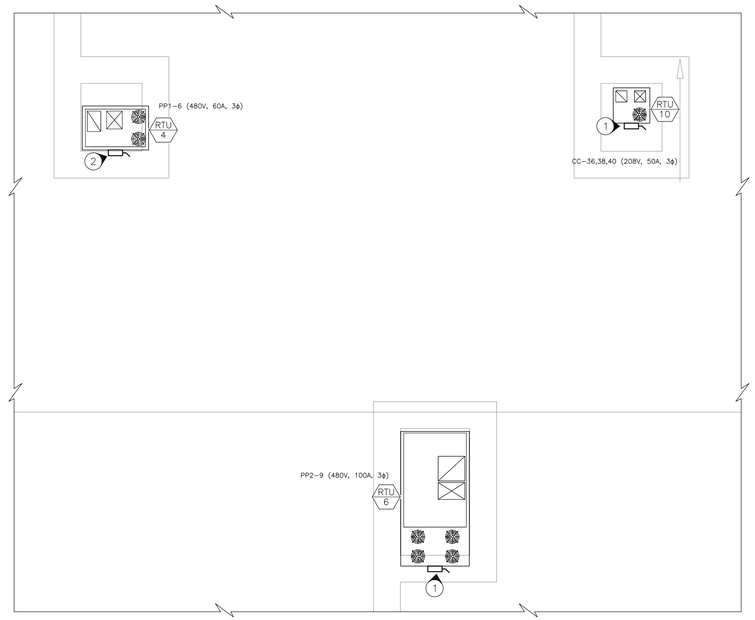
SHEET NUMBER:

E-102

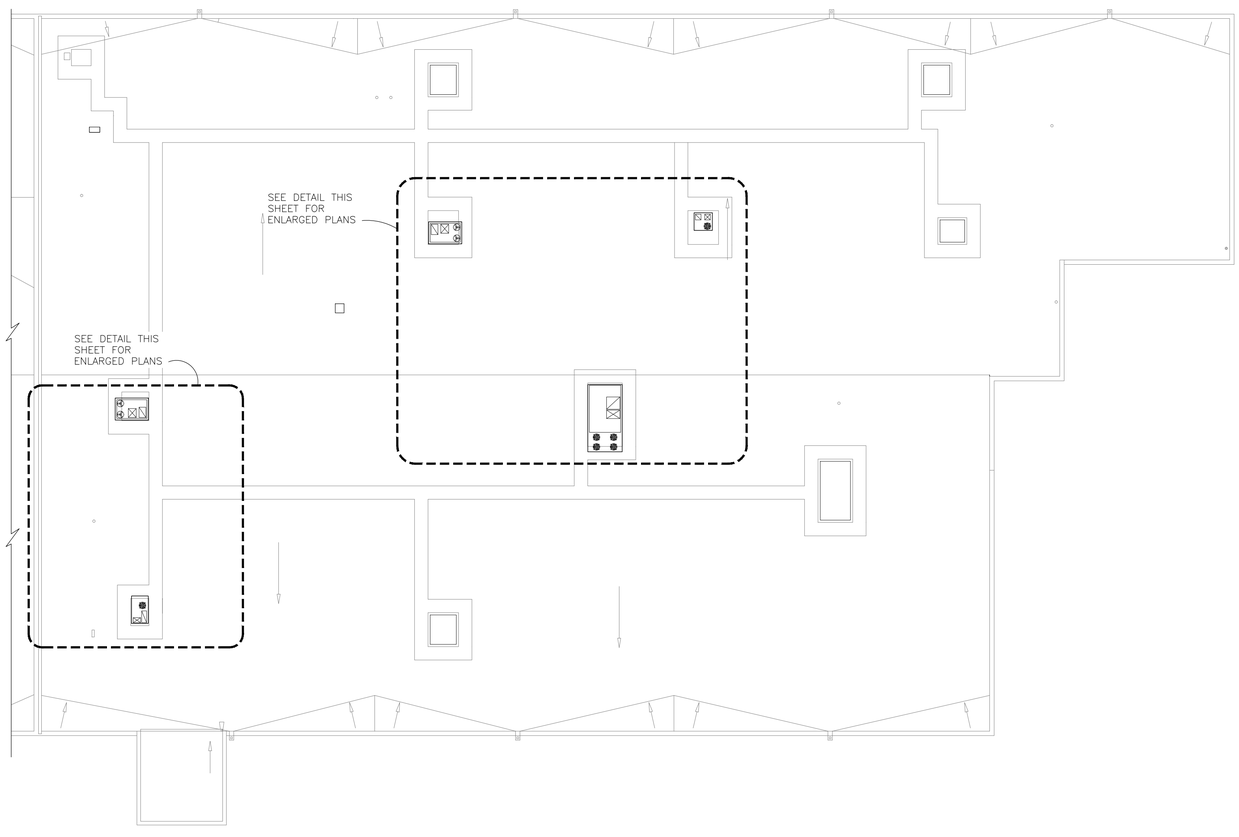
06/05/2020



1 PARTIAL ROOF ENLARGED ELECTRICAL CONSTRUCTION PLAN
SCALE: 1/16"=1'-0"



2 PARTIAL ROOF ENLARGED ELECTRICAL CONSTRUCTION PLAN
SCALE: 1/16"=1'-0"



3 ROOF ELECTRICAL PLAN
SCALE: 1/16"=1'-0"

NOTES

N INDICATES KEYED NOTES

1. ELECTRICAL CONTRACTOR (ELC) TO CONNECT POWER TO THIS UNIT'S FACTORY PROVIDED DISCONNECT AND CONVENIENCE OUTLET. CIRCUITING IS SHOWN NEXT TO THE UNIT. UNIT HAS SAME ELECTRICAL REQUIREMENTS AS OLD UNIT. REUSE EXISTING CONDUCTORS, CONDUIT AND FUSES. EXTEND AS NEEDED PER NEC REQUIREMENTS.

2. ELECTRICAL CONTRACTOR (ELC) TO CONNECT POWER TO THIS UNIT'S FACTORY PROVIDED DISCONNECT AND CONVENIENCE OUTLET. CIRCUITING IS SHOWN NEXT TO THE UNIT. UNIT HAS A LARGER ELECTRICAL REQUIREMENT THAN OLD UNIT. ELC IS TO REPLACE THE EXISTING 45 AMP FUSES IN ELECTRICAL PANEL AND RUN (3) #8 CU THHN, (1) #10 CU THHN AND (1) #10 CU THHN GND IN (1) 3/4" EMT CONDUIT. IF EXISTING CONDUIT IS 3/4" EMT THEN ELC MAY REUSE EXISTING CONDUIT PROVIDED IT IS INSTALLED PER THE 2014 NEC. COORDINATE WITH EXISTING ELECTRICAL CONFIGURATION.

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GOVERNOR

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NUMBER PE-2013019114
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SIEBENECK ENGINEERING
8115 DEER HAVEN COURT
JEFFERSON CITY, MO 65101
(573) 353-7115
siebengineer@gmail.com
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CAD DWG FILE: MLH-e.dwg
DRAWN BY: MDS
CHECKED BY: JLD
DESIGNED BY: MDS

SHEET TITLE:

ELECTRICAL
EAST ROOF
CONSTRUCTION PLAN

SHEET NUMBER:

E-103

12 OF 13 SHEETS
06/05/2020

GENERAL NOTES

1 ELECTRICAL CONTRACTOR TO UPSIZE FUSES AS SHOWN IN BOLD.

EXISTING PANEL

PANEL DESIGNATION: **PP1**												
VOLTAGE: **480V 3 PHASE 3 WIRE**	PANEL LOCATION: **ELECTRICAL/GENERATOR 138**						TOTAL VOLTAMPS THIS PANEL			0		
MAINS: **600 A** _ CB X MLO	MOUNTING: _ FLUSH X SURFACE				PANEL SPACES: **10**		TOTAL CONNECTED LOAD (AMPS)			0		
	CONNECTED LOAD				CKT.	CONNECTED LOAD						
CIRCUIT DESIGNATION	WIRE	TRIP	A	B	C	NO.	A	B	C	TRIP	WIRE	CIRCUIT DESIGNATION
ROOF TOP UNIT #8		100A/3P				1				30A/3P		SPARE
LIEBERT CONDENSOR MECH RM2		30A/3P				2 3				30A/3P		UNIT HEATER #2
UNIT HEATER #3		30A/3P				4 5				60A/3P		ROOF TOP UNIT #3
ROOF TOP UNIT #4		45A/3P				6 7				60A/3P		LIEBERT A/C MECH RM2 (WIRE IS OLD FEED TO RTU#8)
ROOF TOP UNIT #9		60A/3P				8 9				200A/3P		ROOF TOP UNIT #7
			0				0			PHASE A	0	
				0				0		PHASE B	0	
					0				0	PHASE C	0	

EXISTING PANEL WITH NEW LOAD FOR RTU-4 SHOWN BOLD

PANEL DESIGNATION: **PP1**												
VOLTAGE: **480V 3 PHASE 3 WIRE**	PANEL LOCATION: **ELECTRICAL/GENERATOR 138**						TOTAL VOLTAMPS THIS PANEL			26436		
MAINS: **600 A** _ CB X MLO	MOUNTING: _ FLUSH X SURFACE				PANEL SPACES: **10**		TOTAL CONNECTED LOAD (AMPS)			73		
	CONNECTED LOAD				CKT.	CONNECTED LOAD						
CIRCUIT DESIGNATION	WIRE	TRIP	A	B	C	NO.	A	B	C	TRIP	WIRE	CIRCUIT DESIGNATION
ROOF TOP UNIT #8		100A/3P				1				30A/3P		SPARE
LIEBERT CONDENSOR MECH RM2		30A/3P				2 3				30A/3P		UNIT HEATER #2
UNIT HEATER #3		30A/3P				4 5				60A/3P		ROOF TOP UNIT #3
ROOF TOP UNIT #4	**#8** **#8** **#8**	**50A/3P**	**8812**	**8812**	**8812**	6 7				60A/3P		LIEBERT A/C MECH RM2 (WIRE IS OLD FEED TO RTU#8)
ROOF TOP UNIT #9		60A/3P				8 9				200A/3P		ROOF TOP UNIT #7
			8812				0			PHASE A	8812	
				8812				0		PHASE B	8812	
					8812				0	PHASE C	8812	

EXISTING PANEL

PANEL DESIGNATION: **PP2**												
VOLTAGE: **480V 3 PHASE 3 WIRE**	PANEL LOCATION: **ELECTRICAL/GENERATOR 138**						TOTAL VOLTAMPS THIS PANEL			0		
MAINS: **600 A** _ CB X MLO	MOUNTING: _ FLUSH X SURFACE				PANEL SPACES: **10**		TOTAL CONNECTED LOAD (AMPS)			0		
	CONNECTED LOAD				CKT.	CONNECTED LOAD						
CIRCUIT DESIGNATION	WIRE	TRIP	A	B	C	NO.	A	B	C	TRIP	WIRE	CIRCUIT DESIGNATION
ON LINE #2 LIEBERT		100A/3P				1				30A/3P		COND. UNIT
ROOF TOP UNIT #2		25A/3P				2 3				30A/3P		WATER HEATER "A"
WATER HEATER "B"		30A/3P				4 5				45A/3P		ROOF TOP UNIT #1
TRANSFORMER "T6"		60A/3P				6 7				60A/3P		EXTRA G TECH BACK UP
ROOF TOP UNIT #5		60A/3P				8 9				100A/3P		ROOF TOP UNIT #6 (FUSED AT 100 AMPS)
			0				0			PHASE A	0	
				0				0		PHASE B	0	
					0				0	PHASE C	0	

EXISTING PANEL WITH NEW LOAD FOR RTU-1 SHOWN BOLD

PANEL DESIGNATION: **PP2**												
VOLTAGE: **480V 3 PHASE 3 WIRE**	PANEL LOCATION: **ELECTRICAL/GENERATOR 138**						TOTAL VOLTAMPS THIS PANEL			26436		
MAINS: **600 A** _ CB X MLO	MOUNTING: _ FLUSH X SURFACE				PANEL SPACES: **10**		TOTAL CONNECTED LOAD (AMPS)			73		
	CONNECTED LOAD				CKT.	CONNECTED LOAD						
CIRCUIT DESIGNATION	WIRE	TRIP	A	B	C	NO.	A	B	C	TRIP	WIRE	CIRCUIT DESIGNATION
ON LINE #2 LIEBERT		100A/3P				1				30A/3P		COND. UNIT
ROOF TOP UNIT #2		25A/3P				2 3				30A/3P		WATER HEATER "A"
WATER HEATER "B"		30A/3P				4 5	**8812** **8812**	**8812** **8812**		**50A/3P**	**#8** **#8**	ROOF TOP UNIT #1
TRANSFORMER "T6"		60A/3P				6 7				60A/3P		EXTRA G TECH BACK UP
ROOF TOP UNIT #5		60A/3P				8 9				100A/3P		ROOF TOP UNIT #6 (FUSED AT 100 AMPS)
			0				8812			PHASE A	8812	
				0				8812		PHASE B	8812	
					0				8812	PHASE C	8812	

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SHEET TITLE:

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PANEL
SCHEDULES

SHEET NUMBER:

E-601

13 OF 13 SHEETS
06/05/2020