RENOVATE PAINT AND BLAST BOOTHS
AND INSTALL SOLAR ARRAY
IKE SKELETON TRAINING SITE
JEFFERSON CITY, MISSOURI

OWNER:
STATE OF MISSOURI
MIKE PARSON,
GOVERNOR

DEPARTMENT OF PUBLIC SAFETY
OFFICE OF THE ADJUTANT GENERAL
MISSOURI NATIONAL GUARD
FACILITIES DIVISION

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

APPLICABLE CODES:
2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL EXISTING BUILDING CODE
2017 NATIONAL ELECTRICAL CODE
2018 INTERNATIONAL MECHANICAL CODE
2018 INTERNATIONAL PLUMBING CODE
2018 INTERNATIONAL FUEL GAS CODE

DESIGNER:
CASCO DIVERSIFIED CORPORATION
MISSOURI STATE CERTIFICATE OF AUTHORITY #000613 (ENG)
MISSOURI STATE CERTIFICATE OF AUTHORITY #000329 (ARCH)

ADDRESS:
2302 MILITIA DRIVE
JEFFERSON CITY, MO 65101

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V-101 SURVEY FOR REFERENCE ONLY
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A-002 CODE DATA, EGRESS FLOOR PLAN, NOTES & LEGENDS
A-101 DEMO FLOOR PLAN
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A-201 BUILDING ELEVATIONS
A-301 BUILDING SECTIONS & DETAILS
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A-501 WALL SECTIONS AND DETAILS
A-601 PARTITION TYPES AND DETAILS
A-602 ROOM FINISH & DOOR SCHEDULES, NOTES & DETAILS
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E-001 ELECTRICAL SYMBOLS AND LEGEND
E-002 ELECTRICAL SOLAR DETAILS AND SCHEDULES
E-101 ELECTRICAL DEMO PLAN
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SHEET NUMBER:
G-001
1 OF 46 SHEETS
APRIL 22, 2020

VICINITY MAP

ADDRESS:
2302 MILITIA DR, SUITE 100
ST. LOUIS, MO 63110
ARCHITECTS / ENGINEERS
314-821-1100
Ex. Manhole
TC=590.85
FL Out=575.55

Ex. Manhole
TC=579.80
FL(N)=571.25
FL(W)=572.40
FL Out=571.15

Ex. Manhole
TC=578.90
FL IN=570.45
FL Out=570.35

Generator
8" PVC
UFL=592.14
LFL=591.88

8" PVC
UFL=592.14
LFL=591.88

Conc. Headwall
Conc. Headwall
Conc. Drive
Conc. Drive
Conc. Sidewalk
Asph. Parking
Asph. Parking

Conc. Drive
Conc. Sidewalk
Conc. Drive

Area Inlet
TC=590.83
FL In(12" PVC)=587.28
FL Out(18" RCP)=578.23

14"
14"
14"
14"
14"
14"
16"

Birdhouse
Tel. HH
Tel. HH

Conc. Patch
Conc. Patch
Conc. Patch

4" Steel
FL=585.26

Mud/Grease
Interceptor
Wash Hydrant
Wash Hydrant

Grate Inlet
Tied to Grease
Interceptor

Conc. Drive
Conc. Drive
Conc. Drive

Storm MH W/ Grate
TC=589.56
FL OUT=585.16

12" PVC

Conc. Flume
15" HDPE
30" CMP
30" CMP
36" CMP

Junction Box
TC=583.21
FL In(30")=579.31
FL In(15")=578.31
FL Out=576.01

Junction Box
TC=580.29
FL In(30")=575.79
FL In(12")=577.89
FL Out=575.49

Grate Inlet
TC=579.27
FL In(36")=574.00

Approx. 12" Storm
BUILDING DESIGN DATA:
GOVERNING BUILDING CODE: 2018 INTERNATIONAL BUILDING CODE (IBC)

ZONE 5 INCLUDES THOSE WALL ELEMENTS LOCATED WITHIN 8 FEET OF A BUILDING CORNER.

B. SNOW EXPOSURE FACTOR, Ce = 1.0

B. JOISTS, JOIST GIRDERS, BEAMS, COLUMNS, & FOOTINGS

C. SNOW LOAD IMPORTANCE FACTOR, ls = 1.0

MAXIMUM WINDWARD ROOF PRESSURE
-END ZONE **
-INTERIOR ZONE

D1 = 0.322

S

D1

D1

1- S

18.6

10.0

10

10.0

-18.0

50

10.0

-16.9

20

17.1

-18.6

13.4

18.0

13.4

18.0

PRIOR TO THE PLACEMENT OF ANY CONCRETE. THE CONCRETE MIX DESIGNS SHALL INCLUDE ALL REINFORCING STEEL TO BE WELDED SHALL CONFORM TO ASTM A706.

THE "SUBSURFACE INVESTIGATION, ANALYSIS AND GEOTECHNICAL ENGINEERING REPORT" SHALL BE:

5. INSPECTION OF WELDING:

A. GROUT SPACE IS CLEAN. ACI 530.1/ASCE 6/TMS 602:Art. 3.2D

B. MASONRY CEMENT COMPRESSIVE STRENGTH (PSI)

6. ANY DETAIL TITLED AS A TYPICAL DETAIL IS APPLICABLE THROUGHOUT THE DESIGN DRAWINGS.

BOLTS ......................................................................................... A325

STRUCTURAL TUBE .................................................................. A500 (Fy = 46 KSI)

CHANNELS, ANGLES, PLATES, ETC. (UNO) ........................... A36 (Fy = 36 KSI)

THREADED RODS ..................................................................... F1554, A36 OR A307

5. ALL REINFORCED CELLS, ALL CELLS BELOW GRADE AND ALL CELLS BELOW FINISH FLOOR SHALL BE COVERED WITH A MINIMUM OF 3" OF CONCRETE.

6. ANY DETAIL TITLED AS A TYPICAL DETAIL IS APPLICABLE THROUGHOUT THE DESIGN DRAWINGS.

ATTACHMENT OF METAL DECK TO THE SUPPORTING STRUCTURAL MEMBERS SHALL BE PERMITTED IF THE ATOMIC DETAIL IS INDICATED ON THE DRAWINGS. ATTACHMENT OF METAL DECK TO THE SUPPORTING STRUCTURAL MEMBERS SHALL BE PERMITTED IF THE ATOMIC DETAIL IS INDICATED ON THE DRAWINGS.

STATE OF MISSOURI

MARK A. SPALINGER

LICENSE NUMBER: E-27576

04/22/2020

RCK

4/22/20

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES MANAGEMENT
DESIGN & CONSTRUCTION
MISSOURI NATIONAL GUARD

RENOVATE PAINT AND BLAST ROOFS AND INSTALL SOLAR ARRAY
COMBINED SUPPORT MAINTENANCE SHOP (CSSM)
2302 MILITIA DRIVE
COLUMBIA, MISSOURI 65201

PROJECT # 902-01
SITE #: 6380
ASSET #: 8118680017

REV: 1

ISSUED DATE: 08/22/2020

CAD Drawing File: B-01

DESIGNED BY: RCK

SHEET TITLE: STRUCTURAL GENERAL NOTES

SHEET NUMBER: S-001

4 OF 46 SHEETS 04/22/2020
ARCHITECTURAL SITE PLAN

SCALE: 1" = 50'-0"

AREA OF WORK
EXISTING BUILDING - NO WORK

SOLAR FIELD (ADD ATL. #1), SEE ELECTRICAL DRAWINGS

BORE UNDER EXIST. SIDEWALKS FOR INSTALLATION OF NEW CONDUIT TO SOLAR ARRAY

REPLACE CONC. TO MATCH EXIST. C.J. / E.J. PATTERN. SEE 2/A-001

REMOVE EXISTING 7 TREES FOR INSTALLATION OF NEW UNDERGROUND ELECTRICAL CONDUIT, SEE ELECT. DWGS.

EXIST. FENCE TO BE REMOVED AS PART OF ALT. #1

CONTRACTOR STAGING AREA

SOLAR PANELS

CONC. PAVING DETAIL

EXIST. EASEMENT PROVIDE AND INSTALL WEED BARRIER & LANDSCAPE ROCK UNDER ALL SOLAR PANELS, SEE DETL. 1/A-001

BURIED FIBER OPTICS - COORDINATE PANEL INSTALLATION WITH SURVEY DWGS.

ADJUSTABLE HELICAL PIER SOLAR PANEL SUPPORT SYSTEM (IRONRIDGE IS USED AS BASIS OF DESIGN)

MOUNTING BRACKETS / PIERS UTILIZE EXIST. SLOPE FOR PANEL MOUNTING. PIER / SUPPORT SYSTEM TO FOLLOW SOLAR PANEL MANUF. RECOMMENDATIONS.

INSTALL 2" LANDSCAPE ROCK, 3" DEEP, OVER WEED BARRIER ON EXISTING SLOPE, UNDER SUPPORT SYSTEM

SLOPE AWAY FROM BUILDING

SECTION THROUGH SOLAR PANELS

BOLLARD DETAIL

STEEL CAP 9" DIAMETER X 1/2" THICK

CONCRETE PLLT.

CONCRETE FTG.

8" STANDARD STEEL PIPE FILLED WITH CONCRETE, PAINTED YELLOW

NOTE: EXPANSION & CONTROL JOINTS TO ALIGN WITH EXISTING PAVING IN ADDITION TO PERIMETER OF NEW CONC.

SCALE: 1" = 1'-0"

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

SCALE: 1/2" = 1'-0"

BOLLARD DETAIL

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR
CASCO Diversified Corporation
MO Certificate of Authority #000329 Arch.
MO Certificate of Authority #000613 Eng.

BEFORE EXCAVATION CALL: 1-800-DIG-RITE OR mo1call.com
DEMO FLOOR PLAN

GENERAL DEMOLITION NOTES:
1. REFER TO DEMOLITION SPECIFICATIONS FOR ADDITIONAL INFORMATION.
2. REFER TO CLEAR PLANS FOR PROPOSED NEW CONSTRUCTION WORK.
3. ALL EXISTING MECHANICAL, ELECTRICAL, AND PLUMBING, ETC., SUBSTRUCTURES ARE THE OWNER'S RESPONSIBILITY.
4. REFER TO STRUCTURAL, ELECTRICAL, AND MECHANICAL DRAWINGS FOR ADDITIONAL DEMOLITION SCOPE AND REQUIREMENTS.
5. REMOVE ALL EXISTING SITE CONSTRUCTION AND SURPLUS MATERIALS UNLESS NOTED OTHERWISE.

DEMO KEYED NOTES:
1. REMOVE ALL EXISTING EQUIPMENT IN MACHINE ROOM USE FOR ADDITION.
2. REFERENCE TO PLANS IN NEW MACHINE ROOM ADDITION.
3. REMOVE EXISTING TRENCH DRAIN AND GRATES, SEE PLUMBING DWGS FOR LOCATION.
4. REFER TO STRUCTURAL, ELECTRICAL, AND MECHANICAL DRAWINGS FOR ADDITIONAL DEMOLITION SCOPE AND REQUIREMENTS.
5. REMOVE ALL EXISTING MACHINE ROOM CONSTRUCTION, SEE PLAN.

DEMOLITION PHASING:
CONSTRUCTION PHASING OF MANUALS AS TO MINIMIZATION AND KINTERRUPTH OF OPERATIONS OF THE CSAM FACILITIES.

RENOVATE PAINT AND BLAST BOOTHS AND INSTALL SOLAR ARRAY COMBINED SUPPORT MAINTENANCE SHOP (CSMS) 2302 MILITIA DRIVE JEFFERSON CITY, MISSOURI 65101

PROJECT # T1025-01
SITE # 6380
ASSISTANT # 8113800017

REVISION:
REV. 2
REV. 2
REVISION DATE 04/22/2020
CADD TITLE: CR-02-01
DESIGNED BY:
MICHAEL L. PARSON, GOVERNOR
CASCO DIVERSIFIED CORPORATION
MO Certificate of Authority #000329 Arch.
MO Certificate of Authority #000613 Eng.
MICHAEL S. SUNDERMEYER
LICENSE NUMBER: 2014026855 EXPIRATION DATE: 4/22/2020
MICHAEL S. SUNDERMEYER
LICENSE NUMBER: 2014026855 EXPIRATION DATE: 4/22/2020
MICHAEL S. SUNDERMEYER
LICENSE NUMBER: 2014026855
EXPIRATION DATE: 12/31/2020

STATE OF MISSOURI ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT, DESIGN, AND CONSTRUCTION
MISSOURI NATIONAL GUARD

4/22/20
ENLARGED PLUMBING PLAN

EX H, EX CW, EX HW, EX SAN, EX BA

NEW HOT WATER PIPING
NEW SANITARY SEWER
NEW BREATHABLE AIR
NEW SANITARY VENT
EXISTING SANITARY PIPING
EXISTING DOMESTIC COLD WATER
NEW DOMESTIC COLD WATER
NEW WATER (WITH SHUT OFF VALVE)
EXISTING DOMESTIC COLD WATER
EXISTING BREATHABLE AIR
EXISTING SANITARY VENT
EXISTING HOT WATER PIPING
EXISTING DOMESTIC COLD WATER
EXISTING DOMESTIC COLD WATER
EXISTING DOMESTIC COLD WATER
EXISTING DOMESTIC COLD WATER
EXISTING DOMESTIC COLD WATER
ENLARGED PLUMBING PLAN

PLUMBING SYMBOLS LEGEND

ENLARGED PLUMBING PLAN

KEYED NOTES:

A. NEW BLAST BOOTH INSTALLATION.
B. MAKE CONNECTION OF EXISTING GRADE "D" COMPRESSED BREATHING AIR TO NEW CONNECTION POINTS FOR NEW BLAST BOOTH. RELOCATE LINES AS NECESSARY.
C. MAKE CONNECTION OF EXISTING COMPRESSED AIR TO NEW CONNECTION POINTS FOR NEW BLAST BOOTH. RELOCATE LINES AS NECESSARY.
D. PREVIOUS CAPPED CONNECTION OF 2" NATURAL GAS SERVICE TO REMOVED MAKE-UP AIR UNIT SERVING THE REMOVED BLAST BOOTH.
E. 2-1/2" GAS CONNECTION TO EXISTING 3" GAS PIPE. 2-1/2" CONNECTIONS TO MAU-4. LESS THAN 2 PSI GAS PRESSURE (FGC 2015, 402.4(4)). ROOF PENETRATION AS SHOWN. INSTALL GAS TRAIN COMPONENTS AS SHOWN ON DETAIL 1/P-601.
KEYED NOTES:

A. NEW PAINT BOOTH INSTALLATION.
B. CAPPED CONNECTION OF 2" NATURAL GAS SERVICE TO REMOVED MAKE-UP AIR UNIT SERVING THE REMOVED PAINT BOOTH.
C. MAKE CONNECTION OF COMPRESSED AIR TO NEW CONNECTION POINTS FOR NEW BLAST BOOTH. RELOCATE LINES AS NECESSARY
D. 2-1/2" GAS CONNECTION TO EXISTING 4" GAS PIPE. 2-1/2" CONNECTION TO MAU-4. LESS THAN 2 PSI GAS PRESSURE (IFGC 2015 402.4(4)). ROOF PENETRATION AS SHOWN. INSTALL GAS TRAIN COMPONENTS AS SHOWN ON DETAIL 1/P-601.
WATER ISOMETRIC

SANITARY AND VENT ISOMETRIC
KEYED NOTES:
ALL EXHAUST AIR & FILTRATION COMPONENTS OF BLAST BOOTH TO BE INSTALLED BY BLAST BOOTH CONTRACTOR. MAU-4 AND ASSOCIATED COMPONENTS TO BE INSTALLED BY MECHANICAL CONTRACTOR.

EQUIPMENT: BB-1, CS-1, DC-1, DC-2, EF-8, EF-10, EF-12, EF-13, [MAU-4 UNDER G.C. CONTRACT]

EQUIPMENT VENDOR CONTRACTOR IS RESPONSIBLE FOR PROCUREMENT AND INSTALLATION OF THESE UNITS, ASSOCIATED COMPONENTS, ALL DUCTWORK & ROOF FRAMING, WALL FRAMING, AND ALL ROOF STRUCTURAL MODIFICATIONS AS NEEDED TO SUPPORT THESE NEW UNITS. EQUIPMENT VENDOR CONTRACTOR SHALL COMPLY TO KEY NOTE INSTRUCTIONS PERTAINING TO THESE UNITS. REFER TO EQUIPMENT VENDOR DRAWINGS FOR ALL EQUIPMENT SCHEDULES & DETAILS PERTAINING TO THIS LIST OF EQUIPMENT.
ENLARGED PAINT BOOTH MECHANICAL PLAN

KEYED NOTES: ALL WORK SHOWN ON THIS DRAWING IS TO BE ACCOMPLISHED BY THE PAINT BOOTH INSTALLING CONTRACTOR.

1. INSTALL NEW AIR HANDLING UNITS IN LOCATION SHOWN IN PROJECT SHEETS ON FLOOR.
2. INSTALL AIR HANDLING UNIT TO ACCOMPLISH MECHANICAL INSTALLATION REQUIREMENTS APPLYING THE EXISTING ROOF SHEARING AND STRUCTURE SHOWN OR STRUCTURE IS REQUIRED CUTFRAMES ARE MOUNTED ON PIER AT LOCATIONS SHOWED TO ACCOMPLISH SHEARING REQUIREMENTS INSTALL NEW ROOF SHEARING ON EXISTING ROOF SHEARING AND STRUCTURE SHOWN TO BE REQUIRED.
3. INSTALL EXISTING ROOF SHEARING AND STRUCTURE SHOWN OR STRUCTURE IS REQUIRED TO BE MODIFIED AT LOCATIONS SHOWN.
4. LOCATION OF EXISTING AIR HANDLING UNITS MAY BE CHANGED WHERE MODIFICATIONS TO EXISTING SHEARING ARE REQUIRED TO ACCOMPLISH PROJECT REQUIREMENTS.
5. INSTALL NEW AIR HANDLING UNITS TO ACCOMPLISH MECHANICAL INSTALLATION REQUIREMENTS APPLYING THE EXISTING ROOF SHEARING AND STRUCTURE SHOWN OR STRUCTURE IS REQUIRED CUTFRAMES ARE MOUNTED ON PIER AT LOCATIONS SHOWED TO ACCOMPLISH SHEARING REQUIREMENTS INSTALL NEW ROOF SHEARING ON EXISTING ROOF SHEARING AND STRUCTURE SHOWN TO BE REQUIRED.
6. INSTALL ELECTRICAL AND PLUMBING CONNECTIONS TO EXISTING ROOF SHEARING AND STRUCTURE SHOWN OR STRUCTURE IS REQUIRED TO BE MODIFIED AT LOCATIONS SHOWN.
7. INSTALL NEW AIR HANDLING UNITS TO ACCOMPLISH MECHANICAL INSTALLATION REQUIREMENTS APPLYING THE EXISTING ROOF SHEARING AND STRUCTURE SHOWN OR STRUCTURE IS REQUIRED TO BE MODIFIED AT LOCATIONS SHOWN.
8. INSTALL NEW AIR HANDLING UNITS TO ACCOMPLISH MECHANICAL INSTALLATION REQUIREMENTS APPLYING THE EXISTING ROOF SHEARING AND STRUCTURE SHOWN OR STRUCTURE IS REQUIRED TO BE MODIFIED AT LOCATIONS SHOWN.
9. INSTALL NEW AIR HANDLING UNITS TO ACCOMPLISH MECHANICAL INSTALLATION REQUIREMENTS APPLYING THE EXISTING ROOF SHEARING AND STRUCTURE SHOWN OR STRUCTURE IS REQUIRED TO BE MODIFIED AT LOCATIONS SHOWN.
10. INSTALL NEW AIR HANDLING UNITS TO ACCOMPLISH MECHANICAL INSTALLATION REQUIREMENTS APPLYING THE EXISTING ROOF SHEARING AND STRUCTURE SHOWN OR STRUCTURE IS REQUIRED TO BE MODIFIED AT LOCATIONS SHOWN.

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT, DESIGN AND
CONSTRUCTION
MISSOURI NATIONAL
GUARD

RENOVATE PAINT AND BLAST BOOTHS AND INSTALL SOLAR ARRAY
COMBINED SUPPORT MAINTENANCE SHOP (CSMS)
2302 MILITIA DRIVE
JEFFERSON CITY, MISSOURI
65101

PROJECT # T1921-01
SITE # 6300
ASSET # 8158300017

CASCO Diversified Corporation
MO Certificate of Authority #000329 Arch.
MO Certificate of Authority #000613 Eng.
4/23/20

JEFFREY S. TRIEB
License Number: M 2005014634
Expiration Date: 12/31/21

M-403
34 OF 46 SHEETS
04/22/2020

12 Sunnen Drive, Suite 100, St. Louis, MO 63143 T: 314.821.1100
KEYED NOTES:

1. INSTALL NEW MAKE-UP AIR UNIT (MAU-1) IN ACCORDANCE TO MANUFACTURER INSTALLATION INSTRUCTIONS. OUTLET AIR MOUTH OF MAU-1 TO BE LOCATED 15 FEET TO ALLOW (PLANNING AREA). INSTALL UNIT IN A LOCATION WHERE EXISTING ROOF DWELL. MAU-1 AIR SUPPLY AND RETURN AIR DUCTS SHALL BE FULL SIZE TO MAIN UNIT CONNECTION.

2. AIR SHOWER: INSTALL A DRAFT proof SHOWER TO PREVENT THE OCCURRENCE OF壓力时 G机组 CONSTRUCTION STANDARDS AND SHALL USE ONLY DUCT HANGER LOWS FOR STANDARDS.

3. INSTALL WORKSTATION EXHAUST IN INSTALLATION 3 것도 지정되어 보이는 점과 흐름의 설계. COMPLETE EXHAUST SYSTEM PRIOR TO ATTACHMENT TO SUPPLY AIR DUCTWORK.

4. INSTALL INLET AIR DUCTS IN INSTALLATION 3 또한 지정되어 보이는 점과 흐름의 설계. COMPLETE INLET AIR DUCTS PRIOR TO ATTACHMENT TO SUPPLY AIR DUCTWORK.

5. INSTALL LAUNDRY, DRYER VENT DUCTS IN INSTALLATION 3 또한 지정되어 보이는 점과 흐름의 설계. COMPLETE DUCTWORK PRIOR TO INSTALLATION OF UNIT.

6. NOT ALL AIR HANDLING UNITS, EXHAUST DUCTS SHALL BE FULL SIZE TO MAIN EXHAUST SYSTEM.

7. MAU-1 UNIT INSTALLATION DETAILS

8. REMOVE EXISTING SOVENT HOOD AND EXHAUST FAN (EF-13: 450 CFM, 2 HP, 1HP) EXISTING TO REMAIN.

9. 16" DIA VENTILATION EXHAUST (WELD EXHAUST HOOD) TO EXHAUST FAN ON ROOF, (2000 CFM, 2 HP, 3 HP) EXISTING TO REMAIN

10. 90 MBH INFRARED EXISTING TO REMAIN

11. MAU-4 AIR HANDLING UNIT EXISTING TO REMAIN

12. 35 OF 46 SHEETS

13. NORTH WING CENTER CORE SOUTH WING

14. KEY PLAN

15. SCALE: 1/4" = 1'-0"
### ROOFTOP UNIT SCHEDULE (MAU): GAS FIRED HEATING

<table>
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<th>TYPE</th>
<th>MANUFACTURER</th>
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<th>MODEL #</th>
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**ACCESORIES:**
- ELECTRIC MOTOR. 
- ROTATING DAMPERS. 
- IDLE MOTOR. 
- ELECTRONIC CONTROL. 
- POWER SYSTEM INTERLOCK. 
- DELAYED START. 
- INTERLOCK. 
- POWER INTERFACE. 
- CONTROL INTERFACE. 
- DIGITAL PROGRAMMER. 
- LEAVING AIR TEMPERATURE SENSORS. 
- OUTDOOR AIR SENSORS. 
- BACNET INTERFACE. 
- 7-DAY PROGRAMMABLE FUNCTION. 
- LEAVING AIR TEMPERATURE SENSORS. 
- OUTDOOR AIR SENSORS. 
- BACNET INTERFACE. 
- 7-DAY PROGRAMMABLE FUNCTION.
A. GENERAL: THE FOLLOWING DESCRIBES THE SEQUENCE OF OPERATION FOR INDIRECT-FIRED SINGLE ZONE SHAPES USING MODULATED HOT GAS REHEAT AND OCCUPANCY SENSORS TO SATISFY THE OCCUPANCY MODE HEATING REQUIREMENTS.

B. SPACE HEATING UNIT (MAU-2): HEATING MODE

1. REMOTE TEMPERATURE SENSOR (RST) SET TO THE OCCUPANCY MODE TEMPERATURE SETPOINT.
2. UNIT REFRIGERATION SYSTEM SHALL CYCLE PROVIDING COOLING & CONTROLLED DE-HUMIDIFICATION USING LOW EVAP LAT WITH MODULATING BLOWER SPEED.
3. UNIT BLOWER SHALL OPERATE CONTINUOUSLY.
4. UNIT COMPRESSOR(S) SHALL OPERATE CONTINUOUSLY.
5. UNIT DISCHARGE DAMPER SHALL OPEN TO THE MAXIMUM POSITION AND INTERLOCKED EXHAUST FAN(S) SHALL OPERATE CONTINUOUSLY.

C. SPACE HEATING UNIT (MAU-3): OCCUPANCY MODE

1. UNIT REFRIGERATION SYSTEM SHALL CYCLE PROVIDING COOLING & CONTROLLED DE-HUMIDIFICATION USING LOW EVAP LAT WITH MODULATING BLOWER SPEED.
2. UNIT BLOWER SHALL OPERATE CONTINUOUSLY.
3. UNIT COMPRESSOR(S) SHALL OPERATE CONTINUOUSLY.
4. UNIT DISCHARGE DAMPER SHALL OPEN TO THE MAXIMUM POSITION AND INTERLOCKED EXHAUST FAN(S) SHALL OPERATE CONTINUOUSLY.
5. RETURN AIR FROM THE LOCKER ROOM WILL BE TRANSFERRED INTO THE ADJACENT LAUNDRY ROOM FOR RETURN TO MAU-1, AT LOW UNIT BLOWER SPEED.

D. SPACE HEATING UNIT (MAU-4): OCCUPANCY MODE

1. UNIT REFRIGERATION SYSTEM SHALL CYCLE PROVIDING COOLING & CONTROLLED DE-HUMIDIFICATION USING LOW EVAP LAT WITH MODULATING BLOWER SPEED.
2. UNIT BLOWER SHALL OPERATE CONTINUOUSLY.
3. UNIT COMPRESSOR(S) SHALL OPERATE CONTINUOUSLY.
4. UNIT DISCHARGE DAMPER SHALL OPEN TO THE MAXIMUM POSITION AND INTERLOCKED EXHAUST FAN(S) SHALL OPERATE CONTINUOUSLY.

E. SPACE HEATING UNIT (MAU-5): OCCUPANCY MODE

1. UNIT REFRIGERATION SYSTEM SHALL CYCLE PROVIDING COOLING & CONTROLLED DE-HUMIDIFICATION USING LOW EVAP LAT WITH MODULATING BLOWER SPEED.
2. UNIT BLOWER SHALL OPERATE CONTINUOUSLY.
3. UNIT COMPRESSOR(S) SHALL OPERATE CONTINUOUSLY.
4. UNIT DISCHARGE DAMPER SHALL OPEN TO THE MAXIMUM POSITION AND INTERLOCKED EXHAUST FAN(S) SHALL OPERATE CONTINUOUSLY.

F. UNIT REFRIGERATION SYSTEM SHALL CYCLE PROVIDING COOLING & CONTROLLED DE-HUMIDIFICATION USING LOW EVAP LAT WITH MODULATING BLOWER SPEED.

G. UNIT BLOWER SHALL OPERATE CONTINUOUSLY.

H. UNIT COMPRESSOR(S) SHALL OPERATE CONTINUOUSLY.

I. UNIT DISCHARGE DAMPER SHALL OPEN TO THE MAXIMUM POSITION AND INTERLOCKED EXHAUST FAN(S) SHALL OPERATE CONTINUOUSLY.

J. RETURN AIR FROM THE LOCKER ROOM WILL BE TRANSFERRED INTO THE ADJACENT LAUNDRY ROOM FOR RETURN TO MAU-1, AT LOW UNIT BLOWER SPEED.
## Electrical Symbols

### Lighting

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHT</td>
<td>White Light</td>
</tr>
<tr>
<td>RY</td>
<td>Red Light</td>
</tr>
<tr>
<td>YLW</td>
<td>Yellow Light</td>
</tr>
</tbody>
</table>

### Power and Controls

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRANS</td>
<td>Transformer</td>
</tr>
<tr>
<td>DISC</td>
<td>Disconnect Switch</td>
</tr>
</tbody>
</table>

### MISCELLANEOUS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>Switch</td>
</tr>
</tbody>
</table>

### Equipment Sag

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMER ALM</td>
<td>Emergency Alarm</td>
</tr>
</tbody>
</table>

### Abbreviations

- E-001: SHEET NUMBER
- LEGEND: SYMBOLS AND SHEET TITLE
- SAT: DRAWN BY
- NECESSARY FOR NOTIFICATION DEVICES SHOWN ON PLAN. CONTRACTOR SHALL TEST AND DEMONSTRATE NEW WORK.
- FLEX CONDUIT ALLOWED.
- J. ALL CIRCUITRY IN EXPOSED OPEN CEILING SHALL BE IN METAL CONDUIT PAINTED TO MATCH CEILING, ABSOLUTELY NO ROMEX, MC/AC CABLE, OR EQUIPMENT GROUND CONDUCTOR.
- CONTRACTOR'S COST. WHERE THE CONDITION WAS OBVIOUS AND COULD HAVE BEEN DISCOVERED DURING THE SITE VISIT.
- CONTRACTOR TO BE ACQUAINTED WITH ALL AVAILABLE INFORMATION SHALL NOT RELIEVE THE CONTRACTOR OF ANY RESPONSIBILITY UNDERWRITERS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE.
- ADDITIONAL COMPENSATION SHALL NOT BE ALLOWED FOR CONDITIONS INCREASING THE WORK AND THE GENERAL CONDITIONS. CONTRACTOR SHALL HAVE FULL KNOWLEDGE AS TO TRANSPORTATION, DISPOSAL, HANDLING REQUIRED FOR SUCH AN INSTALLATION SHALL BE FURNISHED WHETHER OR NOT SPECIFICALLY SHOWN OR MENTIONED.
- A. ALL BUILDING WIRE SHALL BE 600 VOLTS COPPER, TYPE THWN OR THW, UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS. THE MINIMUM SIZE CONDUCTOR FOR CIRCUIT, POWER AND CONTROL SHALL BE AS NUMERED.
- B. IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS TO PROVIDE A WORKING INSTALLATION IN EVERY DETAIL AND ALL ITEMS NECESSARY TO COMPLETE THE WORK INDICATED ON DRAWINGS.
- C. COMMERCIAL METAL DEVICES THAT WILL HOLD PERMANENTLY SHALL BE USED IN ANCHORING CONDUIT TO MASONRY OR CONCRETE.
- E. ALL BUILDING WIRE SHALL BE OF THE SIZE AND TYPE SHOWN ON THE DRAWINGS.
- F. OVER-CURRENT PROTECTION AND DISCONNECT MEANS SHALL BE INSTALLED ON ALL MOTORS TO COMPLY WITH CODE AND AS REQUIRED FOR CONTRACTORS LACK OF COORDINATION WITH OTHER TRADES, ALL WORK INVOLVED IN RESOLVING THE CONFLICT WILL BE AT THE EXPENSE OF THE CONTRACTOR.
- G. CONDUITS MUST BE RIGID OR INTERMEDIATE METAL CONDUIT (IMC) FROM FINISH FLOOR TO A POINT 5'-0" ABOVE FINISH FLOOR IF THE CEILING. WHERE CONDUIT CANNOT BE CONCEALED ABOVE THE CEILING, CONTRACTOR SHALL NOTIFY OWNER FOR DIRECTION.
- H. CONTRACTOR SHALL PROVIDE ALL POWER DEVICES AS SHOWN ON THE DRAWINGS, IN COMPLIANCE WITH ALL OTHER NOTES SHOWN ON THE DRAWINGS.
- J. NEW PANEL BOARD SHALL BE SQUARE 'D' I-LINE SERIES, EATON, GE, OR SIEMENS. NEW DEVICES IN EXISTING EQUIPMENT SHALL BE BY EQUIVALENTS: LEVITON #ODS10-ID OR LUTRON #MS-B102.
- K. ALL BUILDING WIRE SHALL BE 600 VOLS COPPER, TYPE THWN OR THW, UNLESS SPECIFIED OTHERWISE ON THE DRAWINGS. THE MINIMUM SIZE CONDUCTOR FOR CIRCUIT, POWER AND CONTROL SHALL BE AS NUMERED.
- L. THE WORK SHALL INCLUDE FURNISHING ALL LABOR, MATERIAL, EQUIPMENT AND SERVICES TO CONSTRUCT AND INSTALL THE ELECTRICAL EASE SYSTEMS NECESSARY TO COMPLETE THE WORK INDICATED ON DRAWINGS.
- M. IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS TO PROVIDE A WORKING INSTALLATION IN EVERY DETAIL AND ALL ITEMS NECESSARY TO COMPLETE THE WORK INDICATED ON DRAWINGS.
- N. SAFETY SWITCHES SHALL BE NEMA 3R, HEAVY DUTY, AS MANUFACTURED BY SQUARE 'D', EATON, GE, OR SIEMENS.

## General

A. **GENERAL**

   1. The work shall include furnishing all labor, material, equipment and services to construct and install the electrical ease systems necessary to complete the work indicated on drawings.
   2. It is the intent of these plans and specifications to provide a working installation in every detail and all items necessary for service. Installation shall be in accordance with the NEC, NFPA, UL, ULCC, OSHA and MO Codes.
   3. The installation shall comply with all state requirements, the regulations of the National Board of Fire Underwriters and the latest edition of the National Electrical%.
   4. Before submitting the bid, the contractor shall visit the site and be satisfied as to the nature and location of the work and the general conditions. Contractor shall have full knowledge as to transportation, disposal, handling.
   5. The work shall include furnishing all labor, material, equipment and services to construct and install the electrical ease systems necessary to complete the work indicated on drawings.

## Requirements

A. **REQUIREMENTS**

   1. All building wire shall be 600 VOLS COPPER, TYPE THWN or THW, unless specified otherwise on the drawings. The minimum size conductor for circuit, power and control shall be as numered.
   2. All power equipment shall be compliant with all applicable standards and codes.
   3. Over-current protection and disconnect means shall be installed on all motors to comply with code and as required for contractors lack of coordination with other trades, all work involved in resolving the conflict will be at the expense of the contractor.
   4. All building wire shall be of the size and type shown on the drawings.
   5. Lighting fixtures and electrical devices for use outside the building shall be weatherproof.
   6. All panel boards shall be square ‘D’ I-line series, Eaton, GE, or Siemens.
   7. All devices in existing equipment shall be by equivalents: Leviton #ODS10-ID or Lutron #MS-B102.

## Notes

- **A.** The contractor shall provide all power devices as shown on the drawings, in compliance with all other notes shown on the drawings.
- **B.** New panel board shall be square ‘D’ I-line series, Eaton, GE, or Siemens. New devices in existing equipment shall be by equivalents: Leviton #ODS10-ID or Lutron #MS-B102.
- **C.** Safety switches shall be NEMA 3R, heavy duty, as manufactured by Square ‘D’, Eaton, GE, or Siemens.
- **D.** LED drivers shall comply with all applicable standards and codes.
- **E.** All building wire shall be 600 volts copper, type THWN or THW, unless specified otherwise on the drawings. The minimum size conductor for circuit, power and control shall be as numered.
- **F.** Lighting fixtures and electrical devices for use outside the building shall be weatherproof.
- **G.** Grounding equipment, equipment rated, and local code requirements. All equipment shall contain installed separate ground conductor.
- **H.** All conduit shall be rigid or intermediate metal conduit (IMC) from finish floor to a point 5'-0" above finish floor if the ceiling. Where conduit cannot be concealed above the ceiling, contractor shall notify owner for direction.
- **I.** Contractor shall provide all power devices as shown on the drawings, in compliance with all other notes shown on the drawings.
- **J.** New panel board shall be square ‘D’ I-line series, Eaton, GE, or Siemens. New devices in existing equipment shall be by equivalents: Leviton #ODS10-ID or Lutron #MS-B202.
- **K.** Over-current protection and disconnect means shall be installed on all motors to comply with code and as required for contractors lack of coordination with other trades, all work involved in resolving the conflict will be at the expense of the contractor.
- **L.** All building wire shall be of the size and type shown on the drawings.

## Specifications

- **SPECIFICATIONS**

   1. All building wire shall be 600 volts copper, type THWN or THW, unless specified otherwise on the drawings. The minimum size conductor for circuit, power and control shall be as numered.
   2. Lighting fixtures and electrical devices for use outside the building shall be weatherproof.
   3. Grounding equipment, equipment rated, and local code requirements. All equipment shall contain installed separate ground conductor.
   4. All conduit shall be rigid or intermediate metal conduit (IMC) from finish floor to a point 5'-0" above finish floor if the ceiling. Where conduit cannot be concealed above the ceiling, contractor shall notify owner for direction.
   5. Contractor shall provide all power devices as shown on the drawings, in compliance with all other notes shown on the drawings.
   6. New panel board shall be square ‘D’ I-line series, Eaton, GE, or Siemens. New devices in existing equipment shall be by equivalents: Leviton #ODS10-ID or Lutron #MS-B102.
**String/Inverter Basis of Design**

- Designed by: SAT
- Checked by: SAT
- Project No.: E.E.2
- Date: 04/22/2020
- Issue Date: 04/22/2020

### PV System DC Design
- System shall be designed per the string/inverter basis of design.
- Inverter shall be sized based on the number of strings and modules connected.
- String voltage shall be calculated based on the number of modules connected in parallel.
- Inverter output current shall be calculated based on the number of strings.

### Inverter Ground-Mounting Detail
- Inverters shall be mounted on a concrete slab or footing.
- Inverter shall be connected to the ground system via ground rods.
- Grounding system shall be sized based on the number of inverters.

### Solar One-Line Diagram
- Diagram shall show the connection between the solar panel, inverter, and disconnect switch.
- Electrical components shall be labeled with their respective functions.
- PV array shall be connected to the inverter through a combiner box.

### Voltage Drop Calculations
- Voltage drop shall be calculated based on the current and resistance of the conductors.
- Conductors shall be sized based on the voltage drop calculation.

### Warning Labels
- Warning labels shall be placed on energized components.
- Labels shall contain information on electrical hazards.

### Equipment Specifications
- Inverter:
  - Nominal output power: 360W
  - Max usable input current: 108A
  - Operating voltage range: 200V - 950V
- Modules:
  - Nominal output power: 360W
  - Max output power: 75KW

### Notes
- String/Inverter basis of design should be reviewed and approved by a licensed electrician.
- Inverter ground-work shall be performed by a qualified electrician.
- Circuit breakers shall be sized based on the maximum current.
- Electrical panel shall be sized based on the number of inverters and modules.
NEW UNDERGROUND CONDUIT TO SOLAR ARRAY EXISTING CT CABINET AND DISCONNECT EXISTING AMEREN METER NEW AC SUMMING PANEL NEW AC DISCONNECT EXISTING UTILITY TRANSFORMER NEW UNDERGROUND FEED TO CT CABINET FROM NEW AC DISCONNECT

NOTE: SOLAR PANEL ARRAY TO BE INSTALLED ON GROUND-MOUNTING RACK. OVERALL LAYOUT SUBJECT TO CHANGE BASED ON RACK DIMENSIONS. (TYP)

BEFORE EXCAVATION CALL: 1-800-DIG-RITE OR mo1call.com

ENTIRE SHEET: ALTERNATE #1
KEYED NOTES:
1. DEMOLISH FEEDER FOR EXHAUST FAN F-13 BACK TO PANEL P3-76. LEAVE CIRCUIT BREAKER AS SPARE. SEE 1/E102 FOR LOCATION OF PANEL.
2. DEMOLISH FEEDER FOR JIB CRANE (MONORAIL CRANE) BACK TO MCCE. LEAVE SWITCH AS SPARE. SEE 1/E102 FOR LOCATION OF MOTOR CONTROL CENTER.
3. DEMOLISH FEEDER FOR DRILL PRESS BACK TO PANEL P5-14,16,18. LEAVE CIRCUIT BREAKER AS SPARE. SEE 1/E102 FOR LOCATION OF PANEL.
4. REMOVE EXISTING STRIP FIXTURES AND RE-USE IN NEW MACHINE ROOM. SEE E102 FOR FIXTURE LAYOUT IN NEW MACHINE ROOM.
5. REMOVE 50 AMP, 250V, 1PH, 3 WIRE RECEPTACLE FOR WELDER AND NEMA 6-50R, 60A-2P N.F. DISC. SWITCH.
6. REMOVE EXISTING RECEPTACLE. PROVIDE BLANK COVER FOR BOX.
7. REMOVE EXISTING FLUORESCENT FIXTURE. EXISTING WIRING TO BE RE-USED FOR NEW LED FIXTURES. SEE LIGHTING PLAN E103 FOR FIXTURE TYPE.
8. REMOVE 30A DISCONNECT AND FEEDERS BACK TO THEIR PANEL FOR PAINT BOOTH EXHAUST FAN.
9. ALTERNATE #3: REMOVE ROLL-UP DOOR DISCONNECT SWITCH AND FEEDER.
10. REMOVE WEATHERPROOF RECEPTACLE, BOX, AND FEEDER.
11. ALTERNATE #3: RELOCATE PULL-BOX AND CONDUIT TO ADJACENT WALL. RE-ROUTE CONDUIT AS NECESSARY. SEE SHEET E102 FOR NEW LOCATION.
ELECTRICAL ONE-LINE DIAGRAM

TRANSFORMER SCHEDULE

TRANSFORMER GROUNDING DETAIL

TRANSFORMER INSTALLATION

NEW Transformer INSTALLATION INFORMATION:
- Transformer "TA"
  - Weight: 245lb, 21"W x 37"H x 18"D
  - Provide rubber vibration dampers between rail and channel
  - Support channel: Unistrut P1000 or equal

FLOOR PANEL 'PA'
- Bottom of floor deck
- Transformer installation

3 OF 46 SHEETS

STATE OF MISSOURI
MICHAEL L. PARSON,
GOVERNOR

OFFICE OF ADMINISTRATION
DIVISION OF FACILITIES
MANAGEMENT, DESIGN AND
CONSTRUCTION

CASCO Diversified Corporation
MO Certificate of Authority #000329 Arch.
MO Certificate of Authority #000613 Eng.
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RENOVATE PAINT AND BLAST BOOTHS AND INSTALL SOLAR ARRAY
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COMBINED SUPPORT MAINTENANCE SHOP (CSMS)
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JEFFERSON CITY, MISSOURI
65101