REPLACE GENERATOR & AUTOMATIC TRANSFER SWITCH HIGGINSVILLE HABILITATION CENTER HIGGINSVILLE, MISSOURI

INDEX OF DRAWINGS

G-001 COVER SHEET C-101 SITE PLAN

E-001 ELECTRICAL LEGEND AND NOTES E-101 ELECTRICAL PLAN GENERATOR

E-501 ELECTRICAL DETAILS

E-601 ELECTRICAL ONE LINE DIAGRAM



VOSB ** **

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

APPLICABLE CODES/DESIGN CONSIDERATIONS

INTERNATIONAL BUILDING CODE (IBC) 2021 Ashraf 901 - 2019 Energy Standard for buil

ASHRAE 90.1 - 2019 ENERGY STANDARD FOR BUILDINGS NATIONAL ELECTRIC CODE (NEC) 2020

OWNER: STATE OF MISSOURI

MICHAEL L. PARSON, GOVERNOR

OFFICE OF ADMINISTRATION, DIVISION OF FACILITIES MANAGEMENT DESIGN AND

CONSTRUCTION

PROJECT STATE OF MISSOURI

MANAGEMENT: OFFICE OF ADMINISTRATION, DIVISION OF

FACILITIES MANAGEMENT DESIGN AND

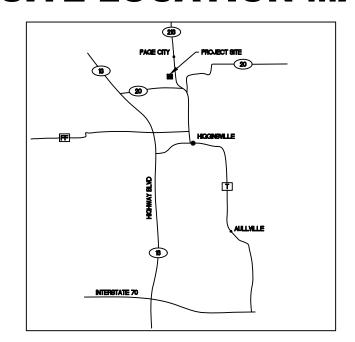
CONSTRUCTION

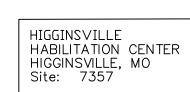
DESIGNER: CROSSED SWORDS ENGINEERING

PROJECT NUMBER: M2317-01 SITE NUMBER: 7357

ASSET NUMBERS: MULTIPLE ASSETS

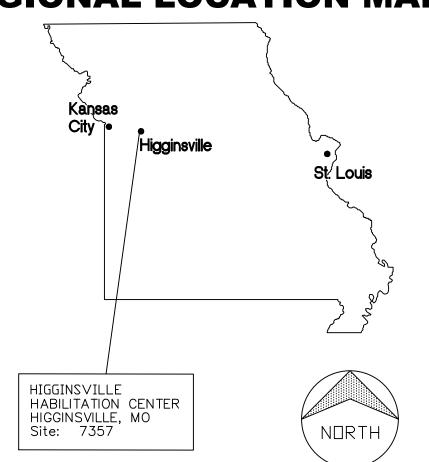
SITE LOCATION MAP





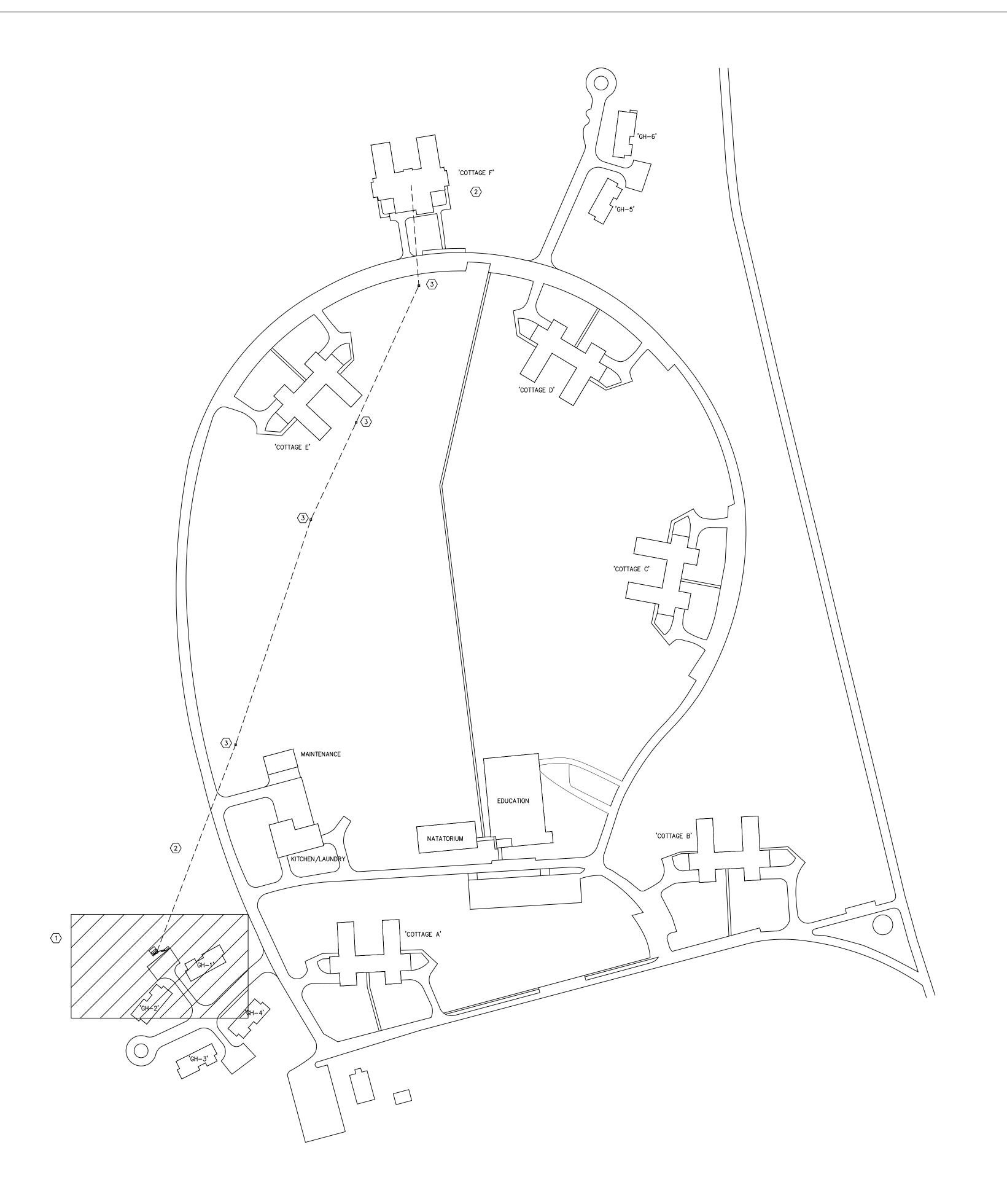






SHEET NUMBER:

1 OF 6 SHEETS JUNE 30, 2023



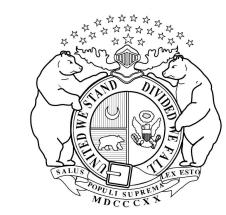
<u>PLAN NOTES</u>

- REPLACE GENERATOR & AUTOMATIC TRANSFER SWITCH. THE GENERATOR PROVIDES STANDBY POWER TO THE 4 GROUP HOME COTTAGES IN THE VICINITY OF THE GENERATOR. SEE ELECTRICAL DRAWING E-101.
- REPLACE UNDER GROUND ANNUNCIATOR CABLE THAT PROVIDES CONTROL SIGNAL TO AUTOMATIC CONTROLS IN COTTAGE F. APPROXIMATE LENGTH 1800 FEET HORIZONTAL DISTANCE. REMOVE AND REPLACE EXISTING ANNUNCIATOR PANEL IN COTTAGE F.
- 3 PULL BOX LOCATIONS (LATITUDE, LONGITUDE) FOR ANNUNCIATOR CABLE ROUTING.
 1. 39.100941, -93.728967
 2. 39.102224, -93.728677
 3. 39.103064, -93.728786
 4. 39.103596, -93.728289

GENERATOR LOCATION; 39.009590, -93.729067 TRANSFORMER LOCATION; 39.099605, -93.728973

PROJECT CONSTRUCTION AREAS

STATE OF MISSOURI MICHAEL L. PARSON GOVERNOR



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT DESIGN AND CONSTRUCTION





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CONSULTANTS

REPLACE
GENERATOR &
AUTOMATIC
TRANSFER SWITCH

HIGGINSVILLE HABILITATION CENTER HIGGINSVILLE, MISSOURI

PROJECT # M2317-01 SITE # 7357 ASSET # VARIOUS

REVISION:
DATE:
REVISION:
DATE:
REVISION:
DATE:

ISSUE DATE: 6/30/2022

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

SHEET TITLE:
SITE PLAN

SHEET NUMBER:

SHEET 2 OF 6





GENERAL ELECTRICAL NOTES

BASE BID AND ALTERNATES

- 1. EMERGENCY/STANDBY GENERATOR SYSTEM SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC).
- 2. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS'S LISTING AND INSTALLATION INSTRUCTIONS, AND THE RELEVANT CODES AS SPECIFIED BY THE AUTHORITY HAVING JURISDICTION'S (AHJ) APPLICABLE CODES.
- 3. THE UTILITY INTERCONNECTION MUST BE APPROVED AND SYSTEM INSPECTED PRIOR TO OPERATION
- 4. ALL EQUIPMENT SHALL BE UL CERTIFIED.

- 1. BASE BID. DEMOLITION AND REPLACEMENT OF THE 125 KW GENERATOR AND AUTOMATIC TRANSFER SWITCH. REPLACE ANNUNCIATOR CABLE FROM GENERATOR TO COTTAGE F. PROVIDE ALL CABLES AND CONDUITS AS INDICATED ON DRAWINGS.
- 2. ALTERNATE NO. 1: DEMOLITION AND REPLACEMENT OF THE EXISTING SAFETY SWITCHES THAT ARE LOCATED ON THE CONCRETE PAD STRUCTURAL FRAMEWORK THAT PROTECT THE ELECTRICAL SERVICE TO THE GENERATOR AND GROUP HOMES. SEE DRAWING E-501 ELECTRICAL DETAIL DRAWING.

| ABBREVIATIONS | | SYMBOLS LEGEND | SITE INFORMATION | CONSTRUCTION GENERAL NOTES |
|---|---|---|---|---|
| A AC AFCI AHJ AIC ATS AWG CB-# BLDG DC DWG EMT GFCI GFP GND GEC IBC | AMPERE ALTERNATING CURRENT ARC-FAULT CIRCUIT INTERRUPTER AUTHORITY HAVING JURISDICTION AMERAGE INTERRUPTION CAPACITY AUTOMATIC TRANSFER SWITCH AMERICAN WIRE GAUGE CIRCUIT BREAKER BUILDING DIRECT CURRENT DRAWING ELECTRICAL METALLIC TUBE GROUND FAULT CIRCUIT INTERRUPTER GROUND FAULT PROTECTION GROUND GROUNDING ELECTRODE CONDUCTOR INTERNATIONAL BUILDING CODE | ELECTRICAL BREAKER ELECTRICAL DISCONNECT SWITCH ELECTRICAL FUSE ELECTRICAL FUSED DISCONNECT SWITCH METER SYSTEM OR EQUIPMENT GROUND CONDUIT DOWN CONTINUATION OF CONDUIT DC/AC INVERTER | UTILITY COMPANY: HIGGINSVILLE MUNICIPAL UTILITIES CALL NUMBER TO DISCONNECT FROM UTILITY: 660-564-2106 | ALL ELECTRICAL WORK SHALL BE PERFORMED BY A QUALIFIED LICENSED ELECTRICIAN AND/OR APPRENTICES WORKING UNDER THE DIRECT SUPERVISION OF THE LICENSED CONTRACTOR. ALL WORK CARRIED OUT SHALL COMPLY WITH THE SPECIFICATIONS, APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS. PRIOR TO COMMENCEMENT OF ANY WORK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES NOTED AMONG SITE CONDITIONS, MANUFACTURER RECOMMENDATIONS, OR AUTHORITY HAVING JURISDICTION. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER OF RECORD A WRITTEN "RFI" (REQUEST FOR INFORMATION) PROPOSING AN ALTERNATIVE OR SEEKING CLARIFICATION. THE CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, ACCESSORIES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS |
| IFC KW MCB MDP MLO MTS N NEC | INTERNATIONAL FIRE CODE KILOWATT MAIN CIRCUIT BREAKER MAIN DISTRIBUTION PANEL MAIN LUG ONLY MANUAL TRANSFER SWITCH NEUTRAL NATIONAL ELECTRICAL CODE | POWER TRANSFORMER CONNECTED CONDUCTOR | | SPECIFICALLY STATED OTHERWISE. 8. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION. 9. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION. ALL DEBRIS AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER PER SPECIFICATIONS. 10. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES NOT PART OF THE SCOPE OF WORK AS IDENTIFIED IN THESE PLANS. |
| NTS OC OCPD P PH POC PV RMC SC TYP UL V W XFMR | NOT TO SCALE ON CENTER OVERCURRENT PROTECTION DEVICE POLE PHASE POINT OF CONNECTION PHOTOVOLTAIC RIGID METALLIC CONDUIT SOURCE CIRCUIT TYPICAL UNDERWRITERS LABORATORY VOLT OR VOLTAGE WATT TRANSFORMER | APPLICABLE CODES NATIONAL ELECTRIC CODE (NEC), 2017 INTERNATIONAL BUILDING CODE (IBC), 2018 INTERNATIONAL FIRE CODE (IFC), 2018 | | |

STATE OF MISSOURI MICHAEL L. PARSON GOVERNOR



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT DESIGN AND CONSTRUCTION





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CONSULTANTS

REPLACE GENERATOR & AUTOMATIC TRANSFER SWITCH

HIGGINSVILLE HABILITATION CENTER HIGGINSVILLE, MISSOURI

PROJECT # M2317-01 SITE # 7357

SITE # ASSET #

| REVISION: | |
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| DATE: | |
| REVISION: | |
| DATE: | |
| REVISION: | |
| DATE: | |
| ISSUE DATE: | 6/30/2022 |

CAD DWG FILE:E-001.DWG

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

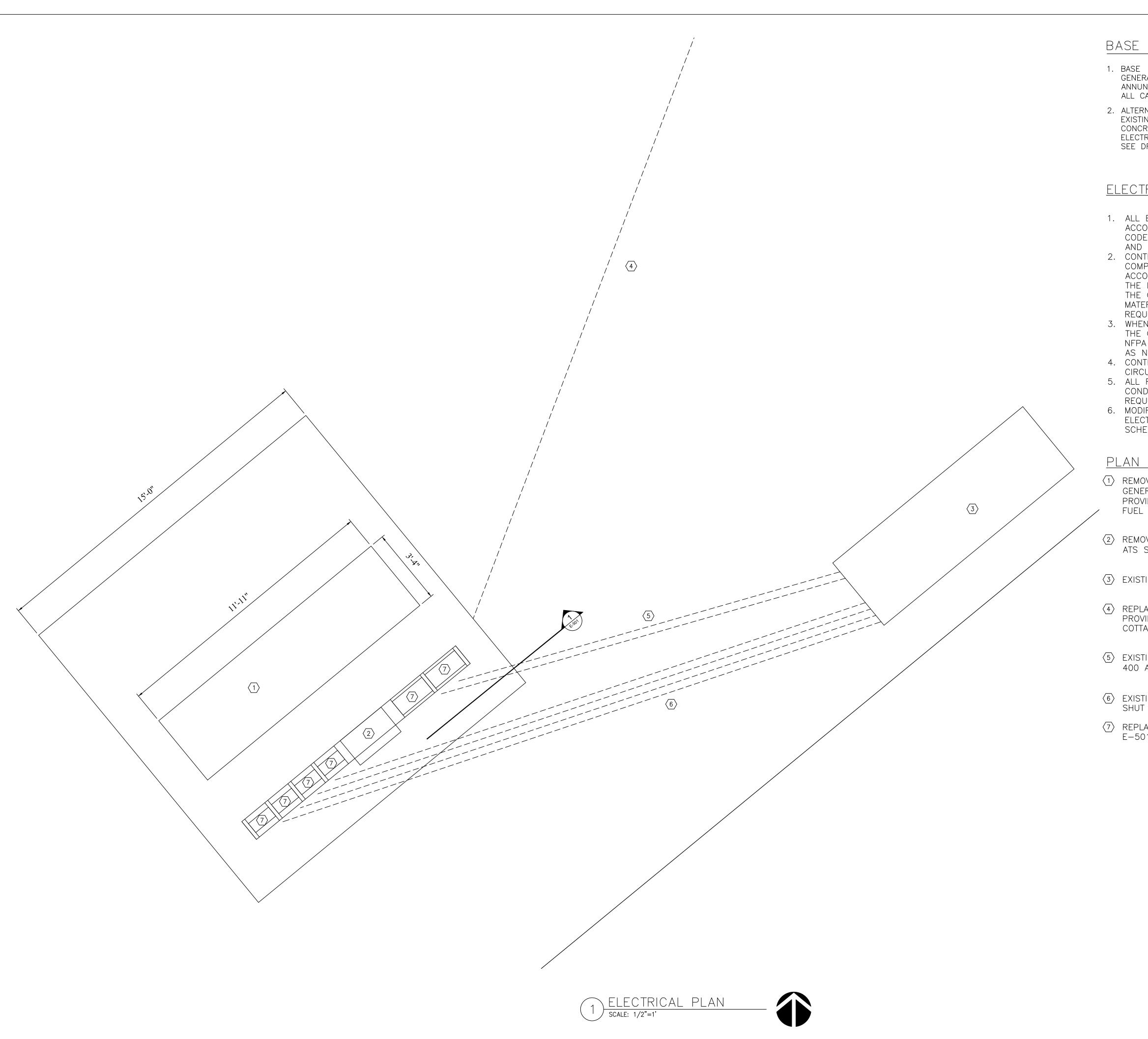
SHEET TITLE:

ELECTRICAL LEGEND AND NOTES

SHEET NUMBER:

E-00

SHEET 3 OF 6 6/30/2023



BASE BID AND ALTERNATES

- 1. BASE BID. DEMOLITION AND REPLACEMENT OF THE 125 KW GENERATOR AND AUTOMATIC TRANSFER SWITCH. REPLACE ANNUNCIATOR CABLE FROM GENERATOR TO COTTAGE F. PROVIDE ALL CABLES AND CONDUITS AS INDICATED ON DRAWINGS.
- 2. ALTERNATE NO. 1: DEMOLITION AND REPLACEMENT OF THE EXISTING SAFETY SWITCHES THAT ARE LOCATED ON THE CONCRETE PAD STRUCTURAL FRAMEWORK THAT PROTECT THE ELECTRICAL SERVICE TO THE GENERATOR AND GROUP HOMES. SEE DRAWING E-501 ELECTRICAL DETAIL DRAWING.

ELECTRICAL GENERAL NOTES

- 1. ALL ELECTRICAL WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH NFPA 70, NATIONAL ELECTRICAL CODE AS ADOPTED BY MO AND ALL SUPPLEMENTARY STATE AND LOCAL REQUIREMENTS.
- 2. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEMS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND THE INTENT REPRESENTED ON THE DRAWINGS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO FURNISH ALL LABOR. MATERIAL, EQUIPMENT, AND SERVICES NECESSARY OR REQUIRED.
- 3. WHEN CIRCUITS ARE COMBINED IN A COMMON RACEWAY, THE CONDUCTORS SHALL BE DERATED AS REQUIRED BY NFPA 70, AND WIRE SIZES INCREASED BY THE CONTRACTOR AS NECESSARY.
- 4. CONTRACTOR SHALL INCREASE WIRE SIZES BASED ON CIRCUIT LENGTHS AS REQUIRED.
- 5. ALL RACEWAY SHALL HAVE SEPARATE GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NFPA 70 REQUIREMENTS.
- 6. MODIFY ELECTRICAL COMPONENTS AS REQUIRED FOR NEW ELECTRICAL EQUIPMENT CONNECTIONS. REFER TO EQUIPMENT SCHEDULES FOR SPECIFIC ELECTRICAL INFORMATION.

PLAN NOTES

- (1) REMOVE AND REPLACE EXISTING GENERATOR. NEW GENERATOR SHALL PROVIDE 125 KW 400A 208/3PH POWER. PROVIDE GENERATOR WITH INTEGRAL BASE MOUNTED DIESEL FUEL TANK 1055 GALLON CAPACITY.
- (2) REMOVE AND REPLACE AUTOMATIC TRANSFER SWITCH. NEW ATS SWITCH SHALL BE RATED FOR 400A 208/3PH.
- (3) EXISTING TRANSFORMER/JUNCTION BOX
- 4 REPLACE UNDER GROUND ANNUNCIATOR CABLE THAT PROVIDES CONTROL SIGNAL TO AUTOMATIC CONTROLS IN COTTAGE F.
- (5) EXISTING 2 X 4" UG CONDUITS FROM TRANSFORMER TO 400 AMP SAFETY SHUT OFFS.
- \bigcirc EXISTING 4 X 2 $\frac{1}{2}$ " UG CONDUITS FROM 200 AMP SAFETY SHUT OFFS FOR GROUP HOMES TO JUNCTION BOX.
- 7 REPLACE EXISTING SAFETY SHUT OFFS. SEE DRAWING

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



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT DESIGN AND CONSTRUCTION





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CONSULTANTS

REPLACE GENERATOR & AUTOMATIC TRANSFER SWITCH

HIGGINSVILLE HABILITATION CENTER HIGGINSVILLE, MISSOURI

PROJECT # M2317-01 SITE# 7357 ASSET # VARIOUS

| REVISION: | |
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| DATE: | |
| ISSUE DATE: | 6/30/2022 |

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

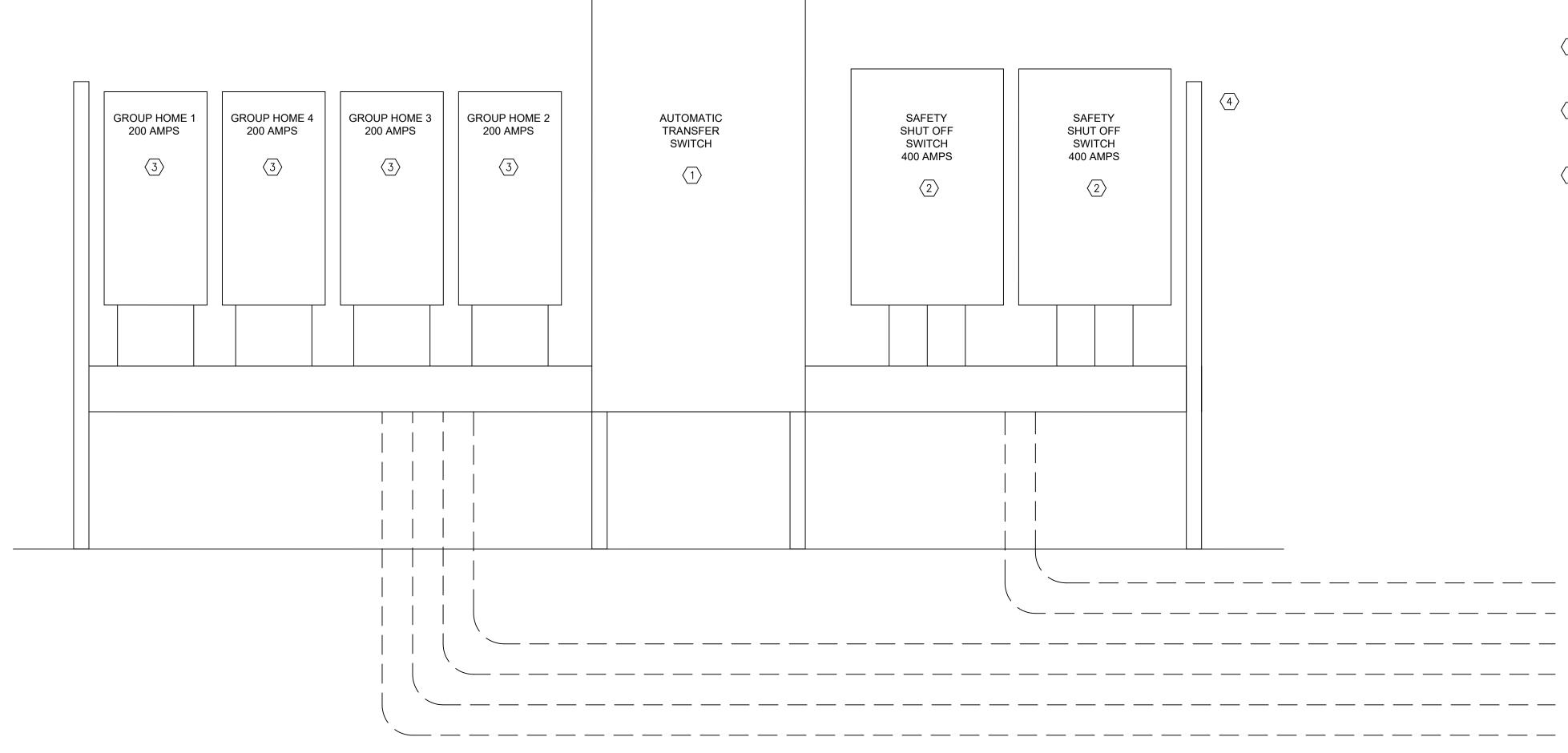
SHEET TITLE: **ELECTRICAL PLAN GENERATOR**

SHEET NUMBER: E-101

SHEET 4 OF 6

BASE BID AND ALTERNATES

- 1. BASE BID. DEMOLITION AND REPLACEMENT OF THE 125 KW GENERATOR AND AUTOMATIC TRANSFER SWITCH. REPLACE ANNUNCIATOR CABLE FROM GENERATOR TO COTTAGE F. PROVIDE ALL CABLES AND CONDUITS AS INDICATED ON DRAWINGS.
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ELECTRICAL GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH NFPA 70, NATIONAL ELECTRICAL CODE AS ADOPTED BY MO AND ALL SUPPLEMENTARY STATE

AND LOCAL REQUIREMENTS.

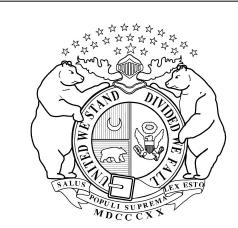
2. CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF COMPLETE AND FUNCTIONAL ELECTRICAL SYSTEMS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND THE INTENT REPRESENTED ON THE DRAWINGS. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO FURNISH ALL LABOR, MATERIAL, EQUIPMENT, AND SERVICES NECESSARY OR REQUIRED.

- 3. WHEN CIRCUITS ARE COMBINED IN A COMMON RACEWAY, THE CONDUCTORS SHALL BE DERATED AS REQUIRED BY NFPA 70, AND WIRE SIZES INCREASED BY THE CONTRACTOR AS NECESSARY.
- 4. CONTRACTOR SHALL INCREASE WIRE SIZES BASED ON CIRCUIT LENGTHS AS REQUIRED.
- 5. ALL RACEWAY SHALL HAVE SEPARATE GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH NFPA 70 REQUIREMENTS.
- 6. MODIFY ELECTRICAL COMPONENTS AS REQUIRED FOR NEW ELECTRICAL EQUIPMENT CONNECTIONS. REFER TO EQUIPMENT SCHEDULES FOR SPECIFIC ELECTRICAL INFORMATION.

PLAN NOTES

- (1) REMOVE AND REPLACE AUTOMATIC TRANSFER SWITCH. NEW ATS SWITCH SHALL BE RATED FOR 400A 208/3PH.
- (2) REPLACE EXISTING 208V, 3PH, 400 AMP SAFETY SHUT OFF. REUSE EXISTING STEEL FRAME FOR MOUNTING AND SUPPORT.
- $\langle 3 \rangle$ REPLACE EXISTING 208V, 3PH, 200 AMP SAFETY SHUT OFF. REUSE EXISTING STEEL FRAME FOR MOUNTING AND
- (4) CLEAN AND PAINT STEEL FRAMEWORK. COLOR TO MATCH EXISTING CONDITIONS.

TO/FROM TRANSFORMER STATE OF MISSOURI MICHAEL L. PARSON **GOVERNOR**



OFFICE OF ADMINISTRATION DIVISION OF FACILITIES MANAGEMENT DESIGN AND CONSTRUCTION





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HIGGINSVILLE HABILITATION HIGGINSVILLE, MISSOURI

PROJECT # M2317-01 SITE# 7357

| REVISION: | |
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| DATE: | |
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| DATE: REVISION: | |
| DATE: | |
| ISSUE DATE: | 6/30/2022 |

ASSET#

CAD DWG FILE: E-501. DWG DRAWN BY: $\overline{\mathsf{RFS}}$ CHECKED BY: JWC

DESIGNED BY: RFS SHEET TITLE:

ELECTRICAL DETAILS

SHEET NUMBER:

SHEET 5 OF 6

1 ATS AND SAFETY SHUT OFF SECTION VIEW

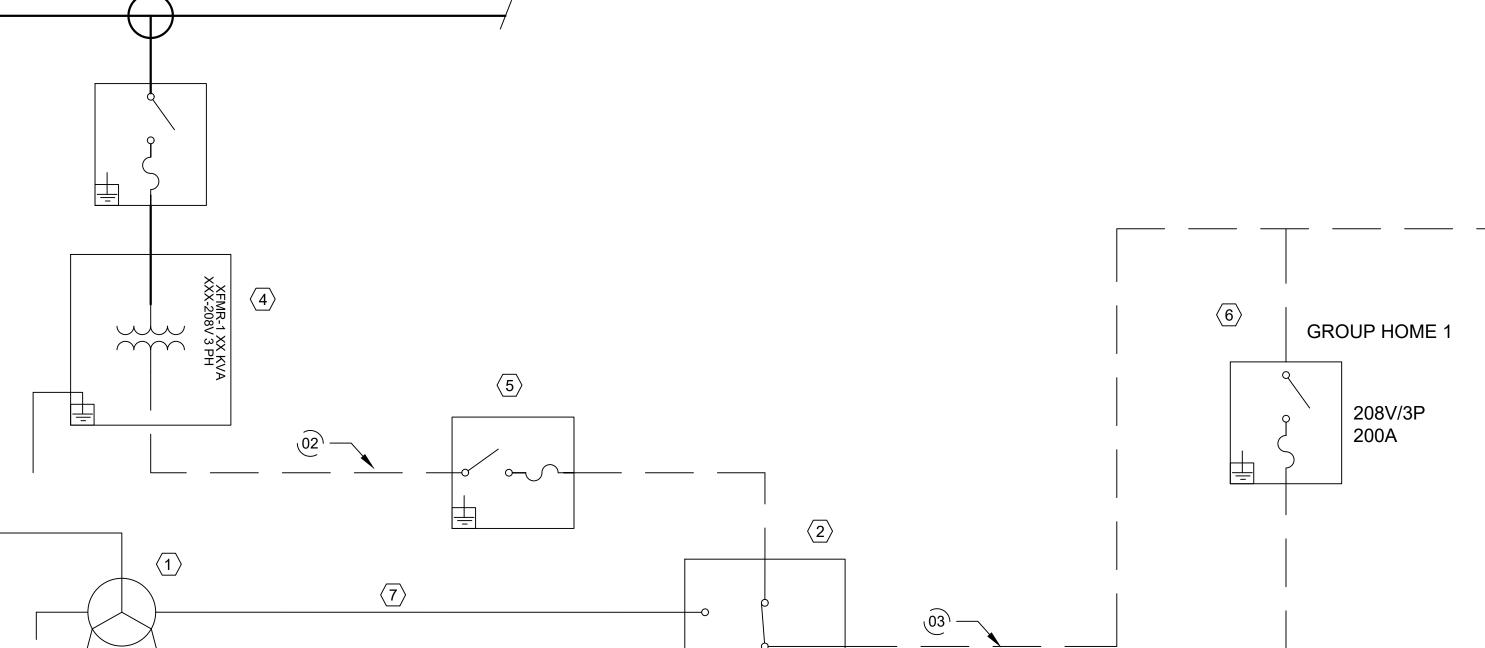
1 NOT TO SCALE

SHEET NOTES

- 1. REPLACE EXISTING GENERATOR AND ATS, CONDUIT AND CABLES AS REQUIRED.
- 2. SEE ELECTRICAL SPECIFICATIONS FOR ADDITIONAL EQUIPMENT INFORMATION.

EXISTING ELECTRICAL UTILITY SERVICE

GENERATOR

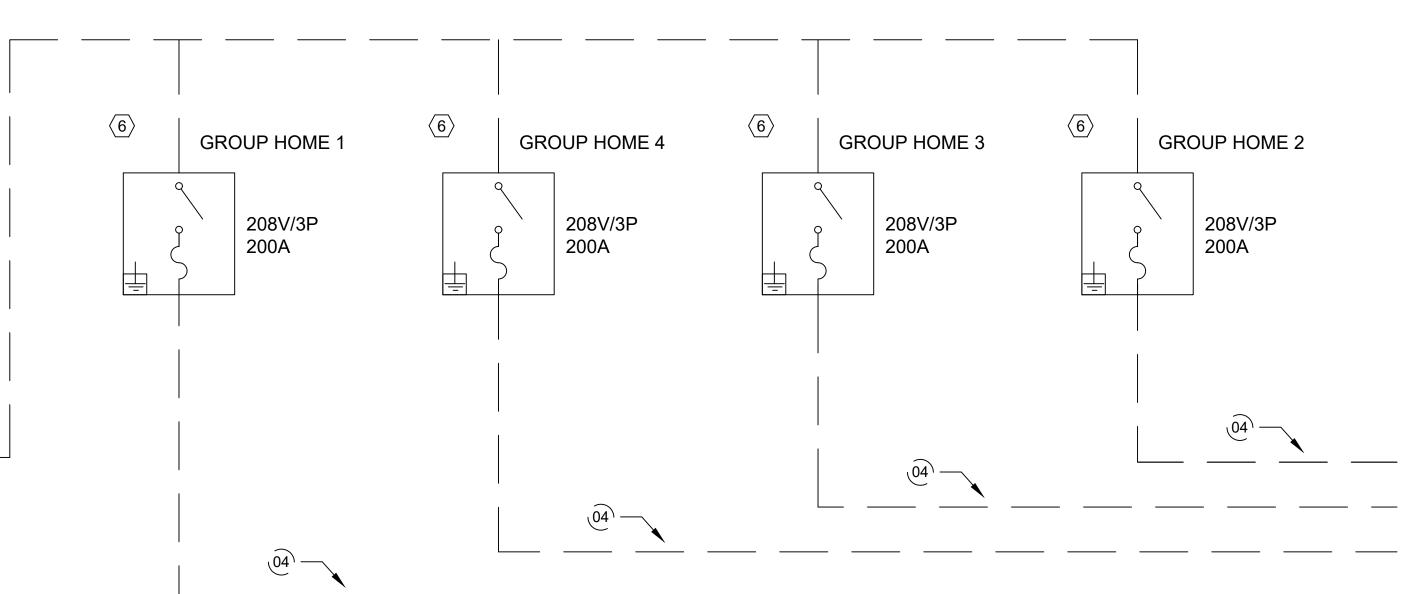


AUTOMATIC TRANSFER SWITCH

HIGGINSVILLE HABILITATION CENTER GENERATOR AND ATS REPLACMENT - 125 KW GENERATOR

BASE BID AND ALTERNATES

- 1. BASE BID. DEMOLITION AND REPLACEMENT OF THE 125 KW GENERATOR AND AUTOMATIC TRANSFER SWITCH. REPLACE ANNUNCIATOR CABLE FROM GENERATOR TO COTTAGE F. PROVIDE ALL CABLES AND CONDUITS AS INDICATED ON DRAWINGS.
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TO EXISTING GROUP HOME ELECTRICAL PANELS

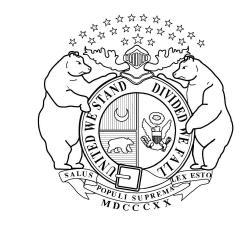
NEW UG ANNUNCIATOR CABLE TO CONTROL SYSTEM COTTAGE F

| (#) | | EQUIPMENT LIST - BASIS OF DESIGN |
|-----|-----|--|
| ID | QTY | DESCRIPTION |
| 1 | 1 | NEW GENERATOR - 125KW 208V/3 PHASE 400 AMPS WITH DIESEL FUEL TANK 1055 GAL BASE MOUNTED. CUMMINS C125D6D OR APPROVED EQUAL. SEE SPECIFICATIONS |
| 2 | 1 | NEW AUTOMATIC TRANSFER SWITCH 208V/3PH RATED AT 400 AMPS. MODEL OTEC400 OR APPROVED EQUAL. NEMA 3R FOR OUTDOOR INSTALLATION |
| 3 | 1 | EXISTING GROUND ROD, SYSTEM, VERIFY. |
| 4 | 1 | EXISTING TRANSFORMER, XXXV-208V, 3 PHASE. |
| 5 | 1 | ALTERNATE 1. NEW DISCONNECT 208V/3PH 400 AMP WITH FUSEABLE LINK |
| 6 | 1 | ALTERNATE 1. NEW DISCONNECT 208V/3PH 200 AMP WITH FUSEABLE LINK |
| 7 | 1 | NEW ATS TO GENERATOR CONTROL SIGNAL CONDUCTOR AND CONDUIT. |

| # WIRE AND CONDUIT SCHEDULE | | | | | |
|-----------------------------|------------------|-------|---------|--------------------------|-----------------------|
| ID | CONDUCTOR | EGC | CONDUIT | CONDUCTORS IN CONDUIT | TEMPERATURE RATING |
| 01 | 750 KCMIL THWN-2 | 2 AWG | 4" | 5 | 75C |
| 02 | 750 KCMIL THWN-2 | 2 AWG | 4" | 5 | 75C |
| 03 | 750 KCMIL THWN-2 | 2 AWG | 4" | 5 | 75C |
| 04 | 300 KCMIL THWN-2 | 6 AWG | 2 1/2" | 5 | 75C |

- 1. ALL POWER CONDUCTORS AND CONDUIT ARE EXISTING. VERIFY SIZES. ALL CONDUIT TO BE PER SPECIFICATIONS UNLESS OTHERWISE REQUIRED BY LOCAL AHJ.
- 2. ALL CONDUIT SIZES ARE BASED ON MINIMUM PER NEC CODE REQUIREMENTS.
- 3. WIRE AMPACITY IS BASED ON NUMBER OF WIRES PER CONDUIT. IF CONDUITS ARE INSTALLED DIFFERENTLY THAN SHOWN, WIRE SIZES MAY BE AFFECTED.

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CAD DWG FILE: E-601.DWG
DRAWN BY: RFS
CHECKED BY: JWC
DESIGNED BY: RFS

SHEET TITLE:

ELECTRICAL
ONE LINE DIAGRAM

SHEET NUMBER:

E-60'

SHEET 6 OF 6 6/30/2023