

SCOPE OF WORK

Installation of TCMR Generator and ATS

EMBASSY DJIBOUTI

1 PROJECT DESCRIPTION

- 1.1 This project work is to install a 150KW Residential Generator (generator provided by USG) at the Temporary Chief of Mission Residence (TCMR) of the US Embassy Djibouti per this scope of work provided by the U.S. Embassy.
- 1.2 The project work includes:
 - 1.2.1 Form and pour a generator pad according to this scope of work and the attached drawings.
 - 1.2.2 Install the generator (provided by USG). Contractor will relocate the generator from the Service CAC area of the U.S. Embassy to its final location at the TCMR including all lifting and rigging necessary.
 - 1.2.3 Install the Automatic Transfer Switch (ATS provided by USG) per this scope of work and the attached drawings.
 - 1.2.4 Provide and install a non-fused disconnect switch prior to the new ATS before extending the incoming service to the new ATS location.
 - 1.2.5 Provide and install all new cabling to extend the incoming service and the generator into the new ATS.
- 1.3 Area of Project:
 - 1.3.1 The area of the project for the TCMR Generator and ATS installation will be at the rear of the TCMR, outside the rear fence, for the generator, and just inside the fence for the ATS.

2 SCOPE

2.1 PRIOR TO IMPLEMENTATION

- 2.1.1 Submit to the CO and/or COR within 5 days of Notice to Proceed, document submittal package that includes:
 - 2.1.1.1 A list of all employees who will be working on this project including full name (as shown on ID), ID number, and ID type (passport, Djiboutian ID, etc).
 - 2.1.1.2 A list of all major equipment (trucks, cranes, etc) to be used on this project.
- 2.1.2 Submit a schedule for performance of the work. Work will be completed within 45 days of notice to proceed.

2.2 IMPLEMENTATION

- 2.2.1 Surface Preparation
 - 2.2.1.1 Remove the existing quartz aggregate and any concrete or stone foundations and dispose.

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- 2.2.1.2 Excavate a minimum of 150mm per attached drawings and dispose of all excavation overburden.
- 2.2.1.3 Compact subgrade 95%.
- 2.2.1.4 If compaction does not reach 95%, an additional 150mm of excavation must be made and 150mm (4-6") of crushed gravel must be installed as base for concrete.
- 2.2.2 Concrete Work
 - 2.2.2.1 Concrete work and materials shall conform to ACI-301 and ACI-318 (latest edition)
 - 2.2.2.2 Concrete shall develop 25Mpa compressive strength @ 28 days.
 - 2.2.2.3 Reinforcing steel shall be new deformed billet steel and shall conform to ASTM A-615/615M Grade 420. Details and lap splices per ACI-315 and ACI-318 (latest edition).
 - 2.2.2.4 Concrete form work shall be used and concrete shall be placed in a manner that will prevent segregation of concrete materials and the infiltration of soil and/or water into the mix.
 - 2.2.2.5 Provide 50mm minimum clear cover for rebar at the side of the pad.
 - 2.2.2.6 Top of slab will be minimum 75mm above surrounding grade.
 - 2.2.2.7 Surface will be a light broom finish.
 - 2.2.2.8 All slab edges will be chamfer corner (25mm x 25mm)
- 2.2.3 Concrete Design
 - 2.2.3.1 Slab thickness is 230mm (10 inches) per attached drawing G4.
 - 2.2.3.2 Use #4 rebar (13mm) @ 200mm (8") O.C. for reinforcement.
- 2.2.4 Electrical Installation:
 - 2.2.4.1 Electrical cable shall match existing size from extension termination box to ATS shall match existing.
 - 2.2.4.2 All new electrical cable shall be THHN Type (90degC rated).
 - 2.2.4.3 Electrical cable from generator to ATS and ATS to distribution panel shall meet US National Electric Code for protection devices on the generator.
 - 2.2.4.4 Provide and install all ground and electrical conductors per drawings.

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2.2.4.4.1 The generator chassis will be grounded via a single cable to the ATS ground bus. Cable size per U.S. National Electric Code table 250.66 and Section 230.40.

2.2.4.4.2 In variance to the drawings, a triade of qty (3) 3-meter copper clad ground rods will be used as the single point of ground from the ATS. Ground rod separation will be a minimum of 1 meter and ground will have less than 15 ohms resistance per USNEC.

2.2.4.4.3 The neutral will be bonded to the ground in only one point, at the ATS.

2.2.4.5 All current carrying conductors to be in schedule 80 PVC conduit or Liquidtite flexible conduit.

2.3 AFTER IMPLEMENTATION

2.3.1 Level and clean area around slab.

2.3.2 Provide 1 year installation warranty for cracking and spauling.

3 POINTS OF CONTACT

3.1 **CONTRACTING OFFICER:** The Contracting Officer (CO) shall be the Embassy General Services Officer

3.2 **CONTRACTING OFFICER REPRESENTATIVE (COR)** shall be the Embassy Facility Manager

4 PROPOSAL SUBMITTAL: proposal shall be submitted to GSO, U.S. Embassy Djibouti (DjiboutiProcurement@state.gov) .

END SOW



United States Department of State
Office of Overseas Buildings Operations
Washington, D.C.

STANDARD RESIDENTIAL
GENERATOR
INSTALLATION DETAILS

Drawing Title

STANDARD
GENERATOR PAD
DETAILS - 111KVA
TO 200KVA

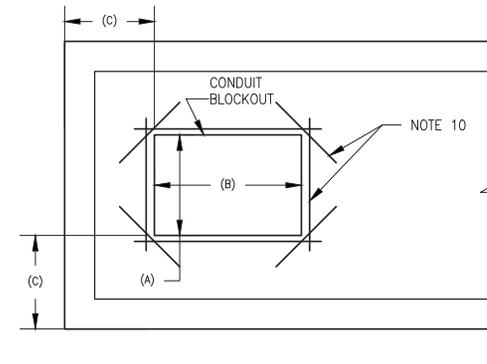
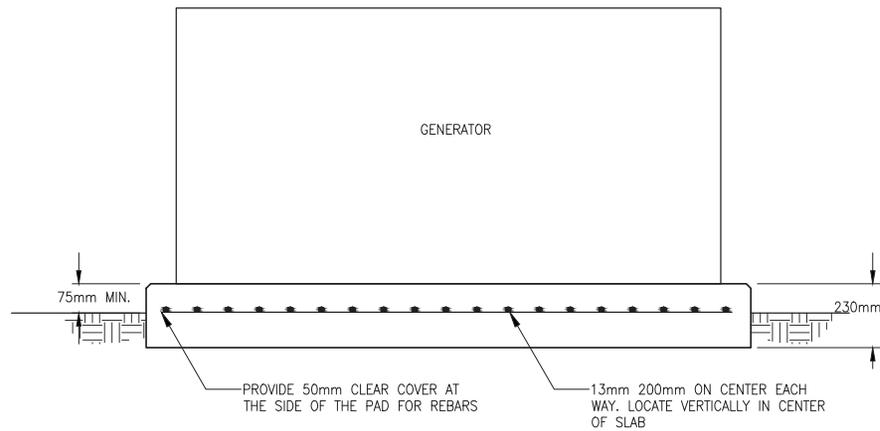
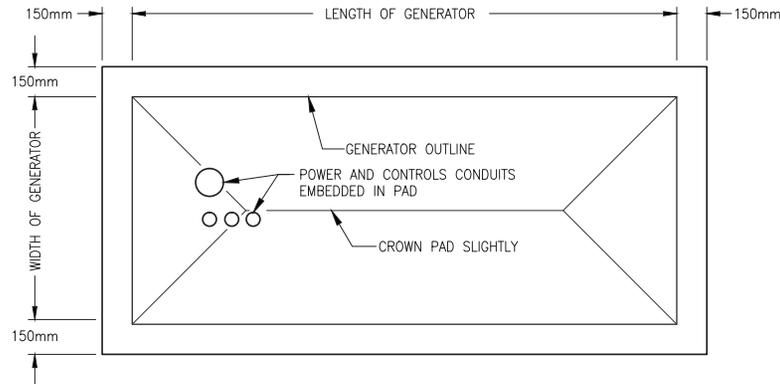
Sheet Number

G4

Date:
9/17/13

NOTES

1. ALL CONCRETE SHALL BE NORMAL WEIGHT AND SHALL ATTAIN THE MINIMUM 28-DAY COMPRESSIVE STRENGTHS OF 25MPa AND 0.45 MAXIMUM W/C RATIOS AND CEMENTITIOUS MATERIALS CONTENT.
2. PROVIDE CLEAR DISTANCE TO OUTERMOST REINFORCING AS FOLLOWS:
CONCRETE CAST AGAINST AND EXPOSED TO EARTH - 75mm
CONCRETE EXPOSED TO EARTH OR WEATHER - 50mm
3. REINFORCING STEEL SHALL BE NEW DEFORMED BILLET STEEL CONFORMING TO A615/615M GRADE 420.
4. SOIL TO BE COMPACTED TO 95% OF ORIGINAL DENSITY. SOIL SHALL BE TREATED TO PROVIDE 100 KPa LOAD BEARING CAPACITY.
5. INSTALL GENERATOR ANCHOR BOLTS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
6. CHAMFER ALL EXPOSED EDGES.
7. FOR GRADE CROSS-SLOPES, THICKEN THE DOWNHILL END OF THE PAD AS REQUIRED TO MAINTAIN THE EMBEDMENT BELOW GRADE SHOWN IN THE DETAIL.
8. PROVIDE FLEXIBLE CONDUIT FROM THE SLAB PENETRATION TO THE GENERATOR CONNECTION BOX. PROVIDE MINIMUM 150mm SLACK CONDUCTORS AT EACH TERMINATION TO ALLOW FOR MOVEMENT IN CASE OF SEISMIC OR OTHER EVENTS.
9. WHERE CONDUIT BLOCKOUTS ARE PROVIDED IN PAD. LOCATE OPENING PER MANUFACTURER'S RECOMMENDATIONS AND CENTER WITHIN THE WIDTH OF THE PAD. THE OPENING SHALL BE (A) NO WIDER THAN 1/3 OF THE PAD WIDTH, (B) NO LONGER THAN 1/2 THE WIDTH OF THE PAD, AND (C) THE OPENING SHALL BE NO CLOSER TO THE END OF THE PAD THAN 1/3 THE WIDTH OF THE PAD OR 300mm.
10. WHERE CONDUIT BLOCKOUTS ARE PROVIDED IN PAD PROVIDE 13mm X 600mm CORNER BARS AS SHOWN. PROVIDE ADDITIONAL 13mm BARS ON EACH SIDE OF THE OPENING AND TIE TO THE BARS CUT FOR THE OPENING. EXTEND BARS ON EACH SIDE A MINIMUM OF 250mm BEYOND THE OPENING AT EACH END. ALL BARS PROVIDED FOR OPENING SHALL BE A MINIMUM OF 50mm FROM THE EDGE OF THE OPENING.
11. GROUND GENERATOR PER LARGE GENERATOR GROUNDING DETAIL ON SHEET G8.



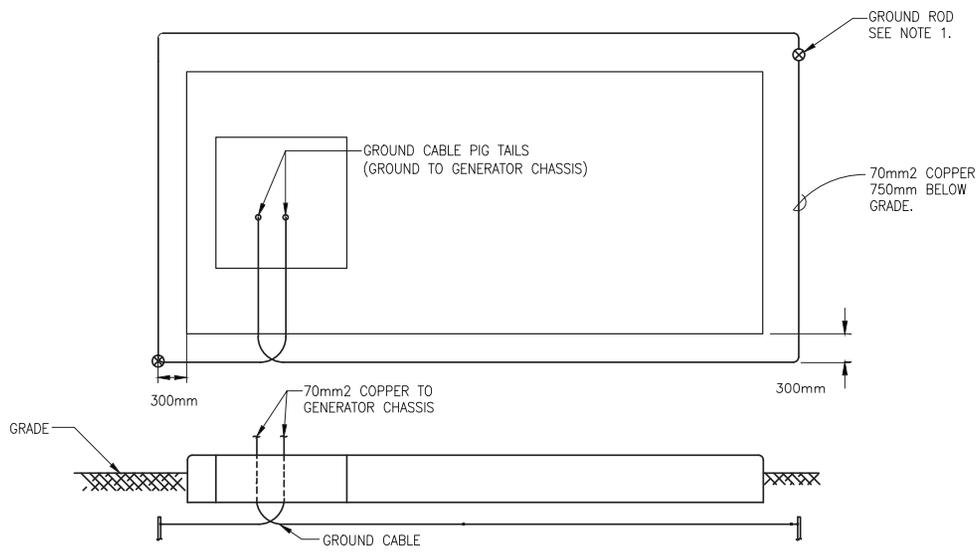
1
G4

111KVA TO 200KVA
GENERATOR PAD DETAIL
SCALE: NTS



United States Department of State
OFFICE OF OVERSEAS BUILDINGS OPERATIONS
Washington, D.C.

STANDARD RESIDENTIAL
GENERATOR
INSTALLATION DETAILS



- NOTES
1. GROUND ROD - 19mm X 3050mm COPPER CLAD STEEL GROUND ROD.

1
G8

LARGE MULTI-RESIDENCE
GENERATOR GROUNDING DETAIL

SCALE: NTS

Drawing Title

LARGE
MULTI-RESIDENCE
GENERATOR
GROUNDING DETAIL

Sheet Number

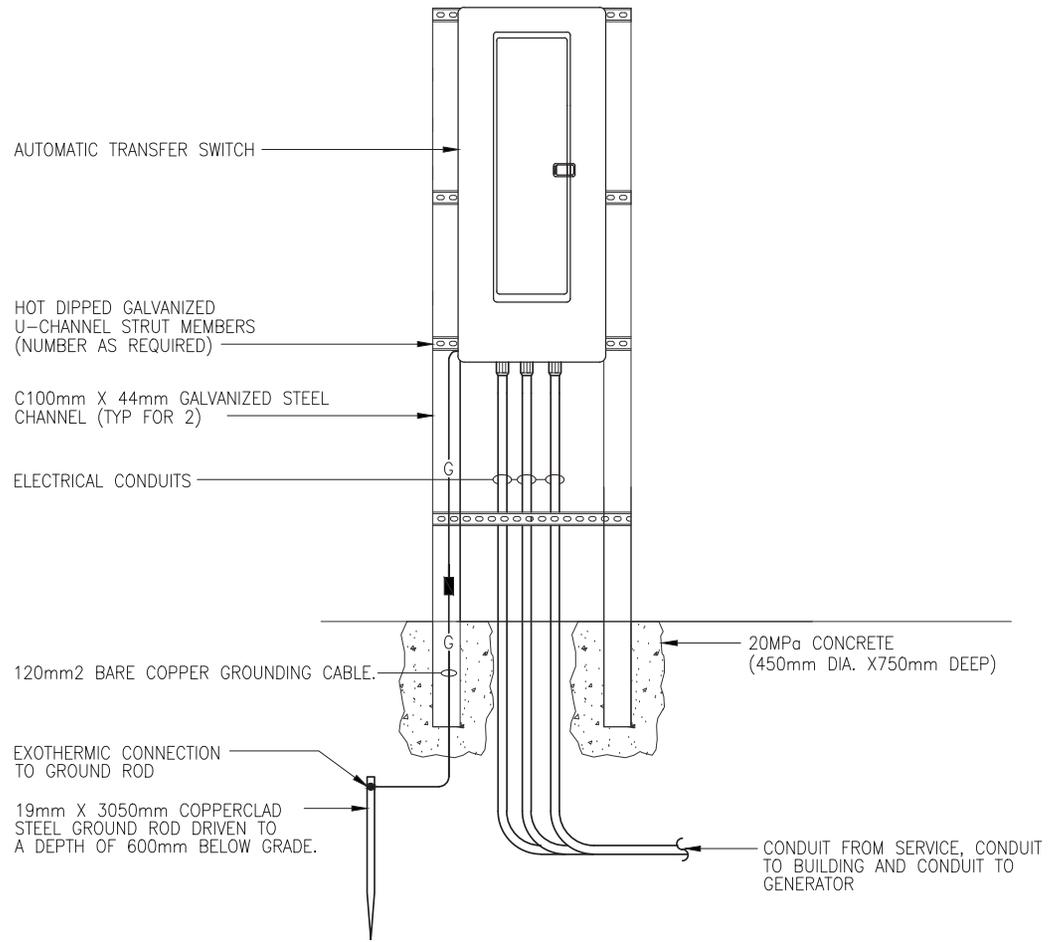
G8

Date:
9/17/13



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STANDARD RESIDENTIAL
GENERATOR
INSTALLATION DETAILS



**FREESTANDING
ATS SUPPORT DETAIL**

1
G9

SCALE: NOT TO SCALE

Drawing Title

**FREESTANDING
ATS SUPPORT
DETAIL**

Sheet Number

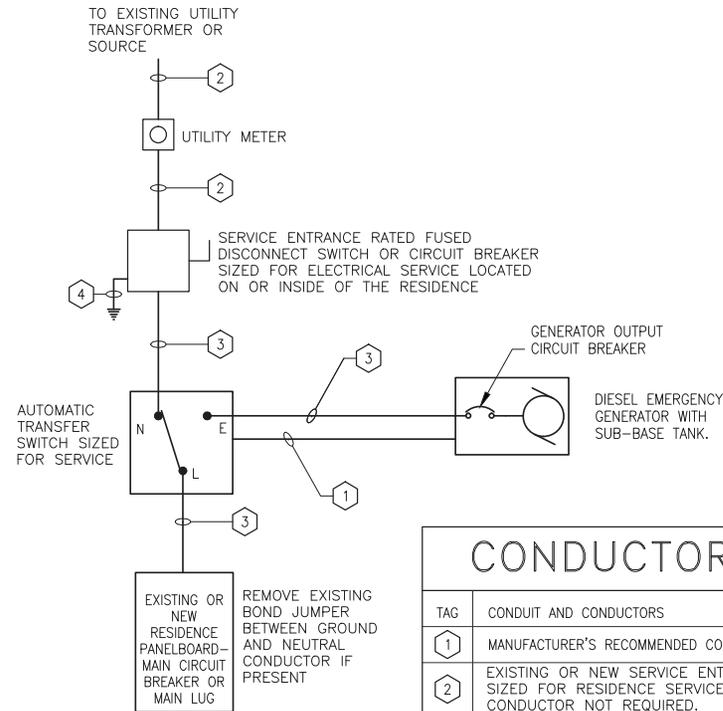
G9

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STANDARD RESIDENTIAL
GENERATOR
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CONDUCTOR SCHEDULE

TAG	CONDUIT AND CONDUCTORS
1	MANUFACTURER'S RECOMMENDED CONDUIT AND CONTROL CONDUCTORS
2	EXISTING OR NEW SERVICE ENTRANCE CONDUIT AND CONDUCTORS SIZED FOR RESIDENCE SERVICE DISCONNECT AMPS. GROUND CONDUCTOR NOT REQUIRED.
3	CONDUIT AND CONDUCTORS SIZED FOR RESIDENCE SERVICE DISCONNECT AMPS. PROVIDE WITH GROUND CONDUCTOR.
4	PROVIDE GROUND CONDUCTOR AND GROUNDING ELECTRODES PER NOTES ON SHEET G12.

1
G10 ELECTRICAL ONE-LINE DIAGRAM
SCALE: NO SCALE

Drawing Title

TYPICAL
ELECTRICAL
ONE-LINE
DIAGRAM—SINGLE
RESIDENCE

Sheet Number

G10

Date:
9/17/13



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STANDARD RESIDENTIAL
GENERATOR
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Drawing Title

TYPICAL
GENERATOR
CLEARANCE
REQUIREMENTS
AND MATERIAL
SPECIFICATIONS

Sheet Number

G13

Date:
9/17/13

TYPICAL MATERIAL SPECIFICATIONS FOR GENERATOR DISTRIBUTION SYSTEMS:

EXHAUST FLUE PIPING:
STEEL PIPE, ASTM A 53, TYPE S OR E, GRADE B, SCHEDULE 40, BLACK STEEL WITH WELDED OR FLANGED JOINTS.

EXHAUST FLUE FITTINGS:
WROUGHT CARBON STEEL FITTINGS, SCHEDULE 40, CONFORMING TO ASTM A 234/A 234M AND ASME/ANSI B16.9

EXHAUST FLUE PIPE AND SILENCER INSULATION:
CALCIUM SILICATE, ASTM C 533, TYPE L, PREFORMED PIPE AND EQUIPMENT SECTIONS OF NONCOMBUSTIBLE, INORGANIC, HYDROUS CALCIUM SILICATE WITH A NON-ASBESTOS FIBROUS REINFORCEMENT WITH JACKET RATED FOR 650° C, 100mm THICK MINIMUM.

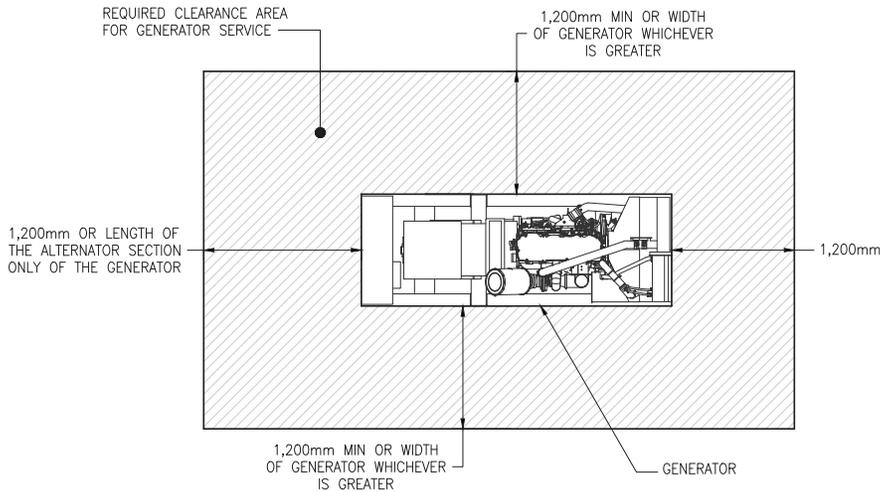
DUCTWORK AND FITTINGS:
GALVANIZED SHEET METAL, ASTM A 653/A 653M AND HAVING A G90 / Z275 COATING DESIGNATION, LOCK-FORMING QUALITY. CONSTRUCTED IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTION STANDARDS FOR DUCT PRESSURE CLASS OF 500 Pa, SEAL CLASS C.

FLEXIBLE CONNECTOR (AIRSIDE, INDOOR APPLICATIONS):
GLASS FABRIC COATED WITH SILICONE RUBBER, 540 g/SQ M WITH A TENSILE STRENGTH OF 50 N/mm IN THE WARP AND 32 N/mm IN THE FILLING. RATED FOR AN OPERATING RANGE OF -55 TO 260 DEG C.

EXHAUST BELLOWS:
MULTI-PLY, ASTM A240 STAINLESS STEEL, RATED FOR 100 kPa AT 675° C WITH FLANGED CONNECTIONS.

DIESEL FUEL PIPING:
STEEL PIPE, ASTM A 53, TYPE S OR E, GRADE B, SCHEDULE 40, BLACK STEEL WITH WELDED OR FLANGED JOINTS FOR ABOVE GROUND PIPING GREATER THAN 50mm AND THREADED FOR PIPING 50mm AND LESS.

DIESEL FUEL FITTINGS:
WROUGHT CARBON STEEL WEDLING FITTINGS: SCHEDULE 40, CONFORMING TO ASTM A 234/A 234M AND ASME/ANSI B16.9.
MALLEABLE IRON THREADED FITTINGS: ASME B16.3, CLASS 150, STANDARD PATTERN



NOTES

1. PROVIDE GENERATOR ROOM ACCESS FOR THE LARGEST GENERATOR COMPONENT TO BE REMOVED. LARGEST COMPONENT IS TYPICALLY THE DIESEL ENGINE.
2. ACCESS SHALL BE PROVIDED THRU A PERMANENT OPENING IN THE GENERATOR ROOM.
3. PROVIDE ADDITIONAL CLEARANCE SPACE FOR OTHER GENERATOR COMPONENTS SUCH AS TRANSFER SWITCHES, BATTERIES, ETC.
4. DO NOT UTILIZE GENERATOR ROOM FOR STORAGE OF ANY TYPE.
5. CLEARANCES NOTED ON THIS SHEET ARE THE MINIMUM REQUIREMENTS FOR MAINTENANCE OF A TYPICAL GENERATOR.
6. REFER TO THE MANUFACTURERS INSTALLATION SHEET FOR THE ACTUAL GENERATOR TO BE INSTALLED FOR ADDITIONAL CLEARANCE REQUIREMENTS.
7. GENERATOR EXHAUST SHALL DISCHARGE A MINIMUM OF 10'-0" FROM ANY BUILDING OPENING.

1 TYPICAL GENERATOR CLEARANCE REQUIREMENTS
G13 SCALE: NONE