SIEMENS

Outdoor Metal Clad Switchgear

5kV and 15kV

Instructions
Installation
Assembly
OGM & SGM
SG 3258-OD

THIS EQUIPMENT CONTAINS HAZARDOUS VOLTAGES. SEVERE PERSONAL INJURY OR PROPERTY DAMAGE CAN RESULT IF SAFETY INSTRUCTIONS ARE NOT FOLLOWED. ONLY QUALIFIED PERSONNEL SHOULD WORK ON OR AROUND THIS EQUIPMENT AFTER BECOMING THOROUGHLY FAMILIAR WITH ALL WARNINGS, SAFETY NOTICES, AND MAINTENANCE PROCEDURES CONTAINED HEREIN. THE SUCCESSFUL AND SAFE OPERATION OF THIS EQUIPMENT IS DEPENDENT UPON PROPER HANDLING, INSTALLATION, OPERATION AND MAINTENANCE.

Qualified Person

For the purpose of this manual and on product labels, a qualified person is one who is familiar with the installation, construction and operation of the equipment and the hazards involved. In addition, he has the following qualifications:

a. Is trained and authorized to energize, de-energize, clear, ground and tag circuits and equipment in accordance with established safety practices.

b. Is trained in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses or face shields, flash clothing, etc., in accordance with established safety practices.

Signal Words

Distinctive signal words (DANGER, WARNING, CAUTION) are used in this instruction book and on product labels to indicate degrees of hazard that may be encountered by the user. These signal words are defined below.

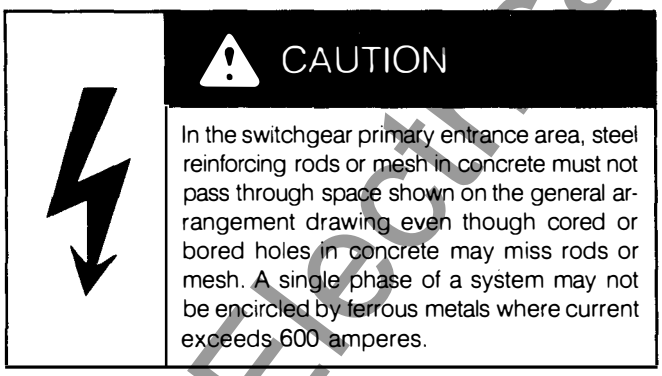
Field Service Operation

Siemens Energy & Automation, Inc. can provide competent, well-trained Field Service Representatives to provide technical guidance and advisory assistance for the installation, overhaul, repair and maintenance of Siemens Energy & Automation, Inc. equipment, processes and systems. Contact regional service centers, sales offices or factory for details.

Foundation

Extreme care should be taken in the layout of foundation or floor. Refer to the general arrangement drawing for exact location of anchor bolts, area for secondary and primary conduits, other limitations and instructions. After the switchgear has been lowered to foundation a conduit nipple may be screwed into coupling.

Floors, sills, piers or pilings, whichever type of foundation is used, must have a smooth level surface and be in the same plane. The surface of the foundation must not protrude above the grouted sills or bed plates at any point. Grouted sills or bed plates must be set true and level and in the same plane to each other. Care and accuracy at this point will simplify or eliminate shimming when the switchgear is installed. Foundations must be sufficiently strong to support the weight of the cubicles and circuit breakers plus the impact loading of the circuit breakers (equal to the weight of each circuit breaker). Outdoor switchgear groups which have been assembled on 4" x 6" (101.6 x 152.4 mm) channels must be supported along these channels with the maximum span between support points not exceeding 6' (1828mm). If pilings are used, the diameter of these pilings is to be determined by the customer for proper loading. However, they must not be less than 12" (350mm) for sufficient contact with the beam, allowing space for shipping splits must be supported and taken into consideration when the foundation is constructed.



All sill channels, bed plates, shims and anchoring hardware are furnished by the customer unless covered by the contract.

Erecting Cubicles

The proper erection method depends on whether the units are shipped as one complete group or in two or more sections. In any case, the general arrangement drawing will indicate the shipping groups and their location within the line-up. Units are assembled and wired in accordance with the arrangement

Before setting and erecting the cubicles determine the correct locations of each shipping group on the general arrangement drawings. Sweep the mounting surface to remove all dirt and debris.

Conventional Outdoor Switchgear

In conventional outdoor arrangements the switchgear, as received, is true and in correct position relative to the support beams. The beams are a permanent part of the switchgear and are not to be loosened or moved from position

Verify the anchor bolt locations in the concrete and all points shown in the general arrangement plan view. Sweep the foundation to make certain it is free of pebbles and other debris. Check the general arrangement drawing for positioning of the switchgear and sequence of installation if arrangement consists of more than one shipping group.

1. Remove nuts from all anchor bolts, remove caps from all secondary conduit stubs, and remove covers from the secondary openings in the cubicle floor plates.

   The arrangements may consist of a single complete shipping group or may be broken down into a number of shipping groups as in a long line-up. Refer to the general arrangement drawing for instructions as to which shipping group should be installed first, and in what sequence the remaining groups are to be installed. Move the first group into position as dimensioned on the general arrangement drawing.

2. The switchgear equipment as shipped was accurately aligned on level steel plates at the factory. This care insures proper operation and fit of mating parts. Supporting surfaces for the switchgear's 6" (152 mm) base must be level and in the same plane within .06" (1.6mm). If concrete, grouted channels, pier support plates, etc. do not meet this requirement, or if there is any projection higher than the support points in line with the base, shims must be installed in the following manner to provide equivalent true surface for switchgear support. 5kV and 15kV outdoor switchgear groups which have been assembled on a 6" base must be supported along this base with the maximum span between support points not exceeding 3' (76.2mm). If shims are required use 4" (100mm) square strips placed between the bottom of the base and foundation, in the anchor bolt area where they will be clamped firmly in place.

3. Add clamp washers and nuts to anchor bolts and tighten securely.
4. Check all breaker cubicles for free movement of the shutters.

5. Move the next group into position. The front edge of the cubicle base should be on line with those of the previously installed groups. Make certain that the end of the group being installed is tightly against the previous installation. Repeat steps 3, 4 and 5 and install all shipping ship hardware.

Shelter-Clad Switchgear

Anchoring & Leveling

In Shelter-Clad arrangements the switchgear, as received, is true and in correct position relative to its support beams. The formed floor sections are a permanent part of the switchgear, and are not to be loosened or moved from position.

Verify the anchor bolt locations in the concrete and all points shown in the general arrangement plan view. Sweep the foundation to make certain it is free of pebbles and other debris. Check the general arrangement drawing for positioning of the switchgear and sequence of installation if arrangement consists of more than one shipping group.

Single aisle Shelter-Clad cubicles are shipped with the aisle wall covering the breaker drawout compartment. This wall may be removed before moving the switchgear into position on its foundation, if conduit clearances are in doubt, or if aisle is to be assembled immediately after leveling.

1. Remove seal material at top of wall.
2. Unbolt, remove, and scrap the 1¼" plate and 1¼" angle.
3. Support wall with crane or other means (Figure approximately 125 lb (57kg) per unit) and remove the two angles at each end of the group which hold the aisle wall in place. These angles can now be scrapped. Carefully lay aisle wall aside until needed for aisle assembly.
4. Remove nuts from all anchor bolts, remove caps from all secondary conduit stubs, and remove corners from secodary openings in cubicle floor plates.

   The arrangement may consist of a single complete shipping group, or may be broken down into a number of shipping sections as in a long line-up. Refer to the general arrangement drawing for instructions as to which shipping group should be installed first, and in what sequence the remaininng groups are to be installed. Move the first group into position as dimensioned on the general arrangement drawing.
5. The switchgear equipment, as received, was accurately aligned on level steel bed plates at the factory. This care insures proper operation and fit of mating parts. Supporting surfaces for the switchgear's 6" (152mm) base must be level and in the same plane with .06" (1.6mm). If concrete, grouted channels, pier support plates, etc. do not meet this requirement, or if there is any projection higher than the support points in line with the base, shims must be installed in the following manner to provide an equivalent true surface for switchgear support. 5kV and 15kV outdoor switchgear groups which have been assembled on a 6" (152mm) base must be supported along this base with the maximum span between support points not exceeding 3' (76.2mm). If shims are required use 4" (100mm) square strips placed between the bottom of the base and foundation, in the anchor bolt area where they will be clamped firmly in place.
6. Add clamp washers and nuts to anchor bolts and tighten securely.
7. Check all breaker cubicles for free movement of the shutters.
8. Move the next group into position. The front edge of the cubicle base should be in line with those of the previously installed group. This will insure a good fit with the aisle floor plates. Make certain that the end of the group being installed is tightly against the previous installation. Repeat steps 5, 6 and 7 and install all shipping split hardware.

Single Aisle

(Refer to Figure 1)

Table 1 lists the standard components supplied for single aisle Shelter-Clad outdoor switchgear. The item numbers in the table are used in all instructions pertaining to this procedure. Assemble as follows:

1. Temporarily support the aisle wall assembly in its permanent position as shown in the general arrangement drawing.
2. Put roof covers in place to help top of aisle wall in place. Do not tighten hardware.
3. Align the ends of the aisle wall, aisle channel and switchgear. Place floor plate in position between the switchgear and the wall. Install each set next to the end position between the switchgear and the wall. With floor plate set tightly against the switchgear floor plates, bolt floor plates in position. Tighten anchor bolts to secure channel locations.
4. With roof cover hardware loose, plumb front wall and tighten attaching hardware.
5. Install all floor plates.
6. Caulk aisle walls.
* 7. Set door assemblies in place. On the left hand side bolt the door to the aisle wall and to the side plate of the cubicle.
8. Put all roof covers in place and bolt to the adjoining roof cover with .38 hardware.
9. Set roof channels over roof cover joints. Bolt to clips welded to roof with retainer nuts.
10. Drill cable cover to suit conduit installation. Bolt the cover in place.
11. Mount aisle conduit, switches, receptacle and wire to the junction box at each end unit. See conduit arrangement.
12. If equipment consists of more than one shipping group, caulk each vertical shipping split at the back of the switchgear with metal filler provided.

Common Aisle

(Refer to Figure 2)

Table 2 lists the standard components supplied for common aisle Shelter-Clad outdoor switchgear. The item numbers in the table are used in all instructions pertaining to this procedure. Assemble as follows:

1. Install all floor plates.
2. Caulk at joints.
3. Not Required.
* 4. Raise door assemblies into place. Bolt doors to side plates of cubicles.
5. Mount aisle conduit, switches, receptacle and wire to junction boxes. See conduit arrangement.
6. Place roof decks in position and fasten with the bolts provided.
7. Fasten roof decks together with .38 hardware.
8. Set channel-shaped covers over the joints of roof decks and bolt to clips welded to roof with retainer nuts.
9. Tighten all bolts to complete assembly.
10. Drill cable cover to suit conduit. Bolt the cover in place.
11. If equipment consists of more than one shipping group, caulk all vertical shipping splits at back of switchgear with metal filler provided.

NOTE

Place lift truck for upper cell breakers within aisle enclosure before assembly of last door assembly. The lift truck is wider and higher than hinged aisle door opening which prevents convenient entrance of lift truck with door assemblies in place.

Single Aisle With Work Space (5kV & 15kV)

(Refer to Figure 3)

Assemble as follows:

1. Mount aisle end plate at the end opposite the work space.
2. Move aisle wall to its permanent location as indicated on the general arrangement drawing.
3. Mount the end plate and proceed.
4. Put the workspace floor plate base in position as indicated.
5. Assemble aisle walls. See general arrangement drawing for location of special panels for fans, etc. Apply caulking at the joints of the wall sections.
6. Bolt plates together, then to the switchgear unit.
7. Caulk at joints.
8. Install end plate and attach.
9. Install aisle floor plates in the same arrangement as that for single aisle layouts.
10. Install roof support from cubicle to end of work space.
11. Put all roof decks in place and bolt to the top of the end plate and to the roof support. Leave hardware finger tight until step 13 is complete.
12. Fasten roof decks together with .38 hardware.
13. Mount trim angle. Tighten bolts.
14. Set roof channels over roof deck joints, bolt to clips welded to roof with retainer nuts.
15. Mount aisle conduit, switches, receptacle and wire junction boxes. Mount and connect lights per wiring diagram. See conduit arrangement.
16. If equipment consists of more than one shipping group, caulk each certicle shipping split at back of switchgear with metal filler provided.

NOTE

Place lift truck for upper cell breakers within aisle enclosure before assembly of last door assembly. The lift truck is wider and higher than hinged aisle door opening which prevents convenient entrance of lift truck with door assemblies in place.

Expanding Length of Existing Shelter-Clad Switchgear By Addition of Units

The new extended foundation, be it slab, pier or pilings, must be constructed in the same careful manner as described under "installation."

The new foundation must be level and in the same plane as the existing foundation.

Certain items will be removed from the existing installation as described in the following instructions. Remove these items carefully and store them for re-mounting in the expanded set up.

⚠ DANGER

HIGH VOLTAGE PRESENT

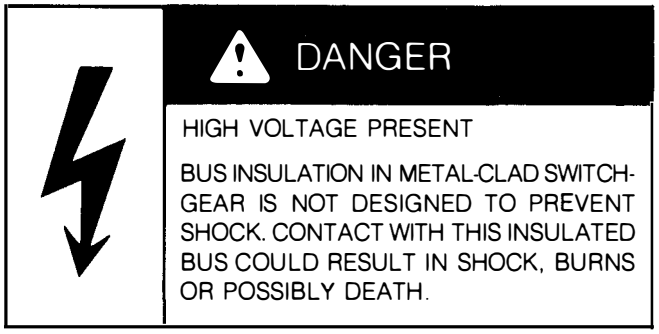
Do not work on energized equipment. Unauthorized personnel should not be permitted near energized equipment.

Plan the time for maintenance with operating personnel so that the switchgear can be de-energized and safely grounded.

Failure to observe these precautions may result in serious burns or electrical shock causing serious personal injury, death, and/or property damage.

NOTE

Switchgear assemblies are enclosed on all sides and top with sheet metal. Access into the enclosure is provided by doors or removable covers. Although the bus and connections are insulated in metal-clad switchgear assemblies, it is a coordinated insulation system; insulation plus air or creep distance equals a given insulation level.



1. Remove the channel-shaped covers over roof joints from both aisle and switchgear unit.
2. Remove the trim angle from the outer edge of the roof deck.
3. Remove the back plates to provide access to the hardware securing the end cover. Remove the end cover with associated parts and save for later installation.
4. Disconnect aisle conduit.
5. Remove all hardware securing the side plate to the switch-gear frame and hardware securing aisle end plate to the aisle wall. It may be necessary to tap a knife blade down the vertical seam between the aisle wall and the end plate to cut the caulking. Remove the entire sections from both the switchgear and aisle.
6. The line-up is now ready for installation of the new unit or units. If the foundation was carefully constructed there should be no problems with line-up of the base or matching the level of existing equipment.
7. With new units in true alignment with existing and properly leveled, bolt units together with .50" hardware provided.
8. Run aisle wiring from the terminal block in the existing end unit, through the barrier and header to the junction box area.
9. Mount other parts removed from the existing equipment and caulk all external seams with metal filler.
10. Make all electrical connections as instructed in instruction manual.
11. Caulk each vertical split at back of switchgear between the existing equipment and the new addition with metal filler. Replace bus compartment barriers and install back plates.

Expanding The Length Of Existing Conventional Outdoor Switchgear

Expanding the length of existing conventional outdoor switch-gear by field addition of units should be handled in the same manner as Shelter-Clad switchgear with the exception that there is not a shelter aisle with which to be concerned. Follow the instructions given under EXPANDING THE LENGTH OF EXISTING SHELTER-CLAD SWITCHGEAR BY ADDITION OF UNITS. However, note that only roof channels, bus compartment barriers and end plates need to be removed on conventional switchgear.

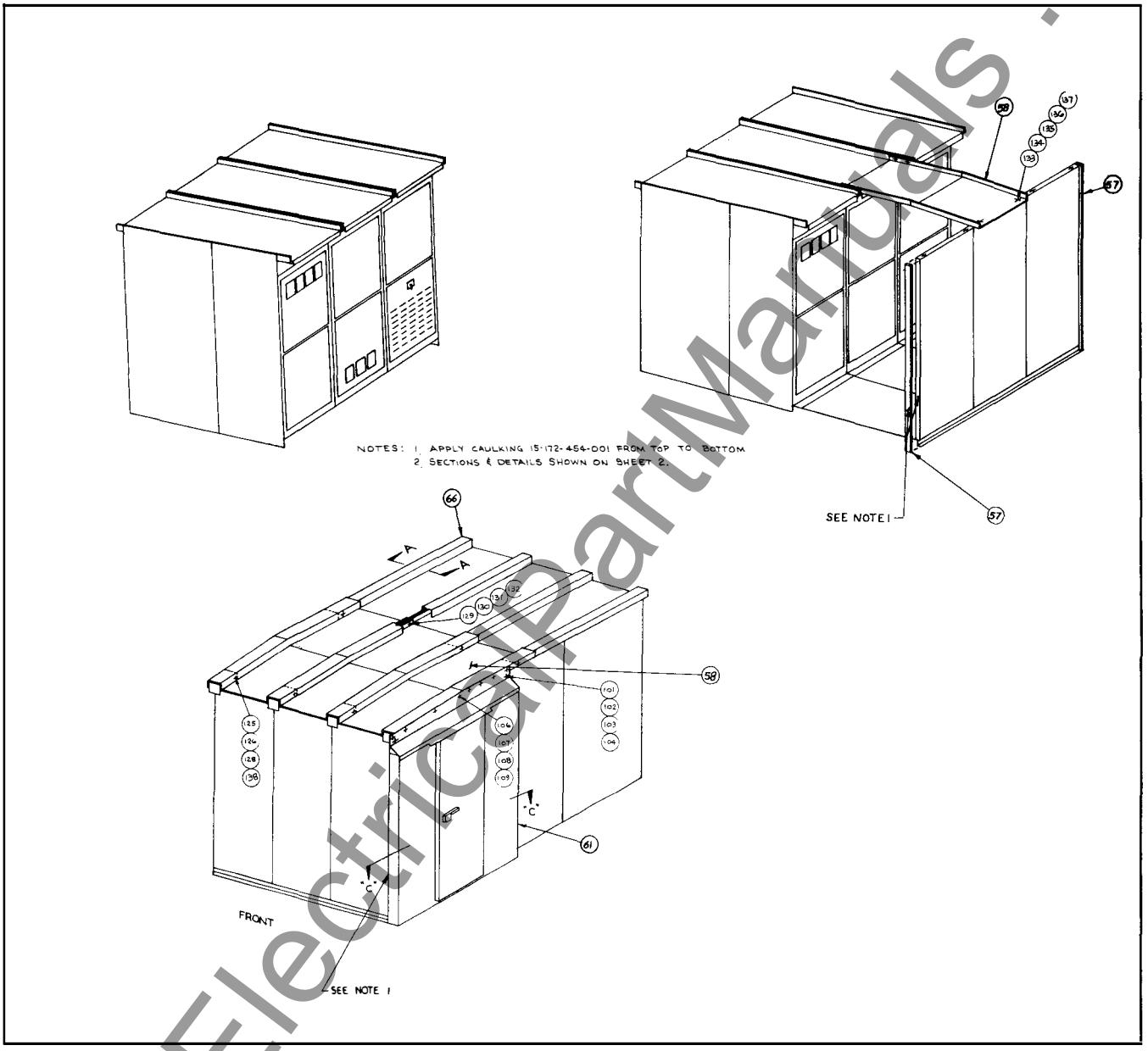


Figure 1. Single Aisle (SGM) Field Assembly

Table 1

Item No.	Part Name	Part Number
54	Aisle Floor Assembly	18-748-411-501
57	Aisle Wall Spacer	18-658-130-048
58	Aisle Roof	18-808-034-501
60	Aisle Roof Spacer	18-658-106-037
61	Housing Assembly 6"	18-483-740-501
63	Aisle Roof Trim Angle	18-740-698-124
64	Aisle Roof Cap	18-740-698-119
65	Aisle Roof End Cap	18-740-698-118
66	Equipment Roof Cap	18-741-143-501
101-113	Aisle End Hardware	18-658-583-823
125-138	Aisle Roof & Floor Hdw.	18-658-583-824

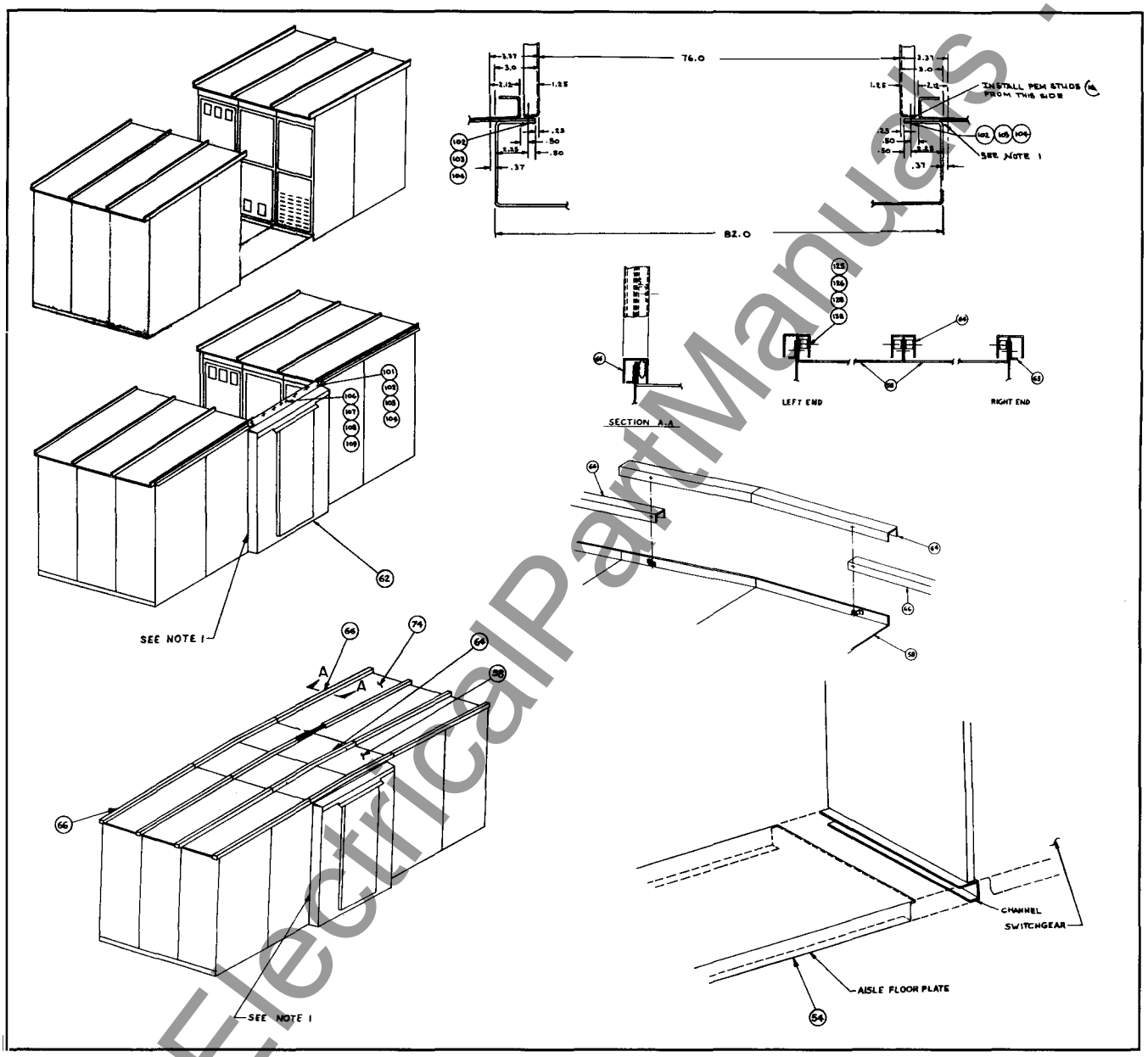


Figure 2. Common Aisle (SGM) Field Assembly

Table 2

Item No.	Part Name	Part Number
54	Aisle Floor Assembly	18-748-412-501
58	Aisle Roof	18-808-034-501
62	Housing Assembly 6"	18-483-740-501
63	Aisle Roof Trim Angle	18-740-698-124
64	Aisle Roof Cap	18-740-698-119
66	Equipment Roof Cap	18-741-143-501
101-113	Aisle End Hardware	18-658-583-823
125-138	Aisle Roof & Floor Hdw. ...	18-658-583-824

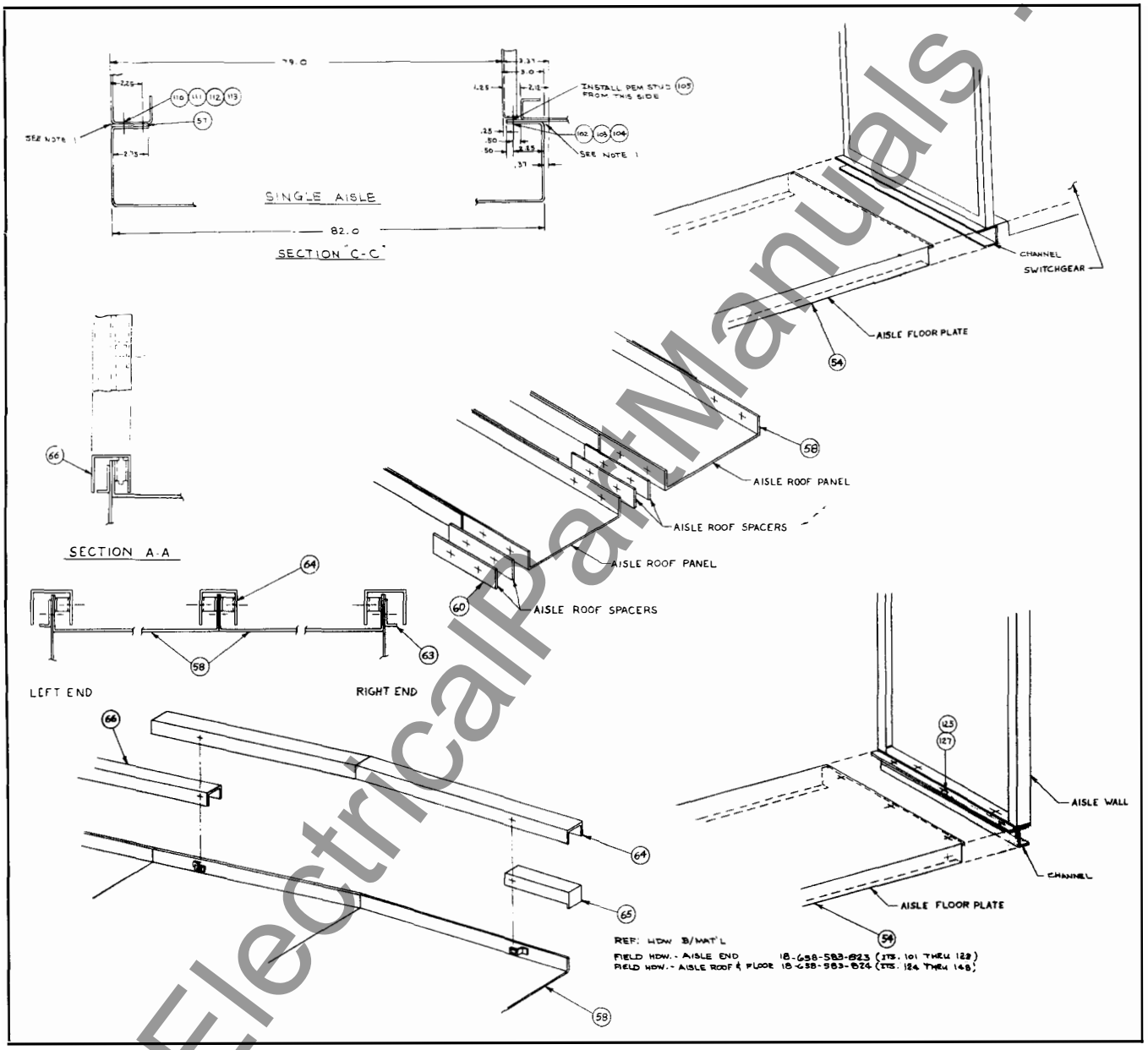


Figure 2. Common Aisle (SGM) Field Assembly (Cont.)

Table 2

Item No.	Part Name	Part Number
54	Aisle Floor Assembly	18-748-412-501
58	Aisle Roof	18-808-034-501
62	Housing Assembly 6"	18-483-740-501
63	Aisle Roof Trim Angle	18-740-698-124
64	Aisle Roof Cap	18-740-698-119
66	Equipment Roof Cap	18-741-143-501
101-113	Aisle End Hardware	18-658-583-823
125-138	Aisle Roof & Floor Hdw.	18-658-583-824

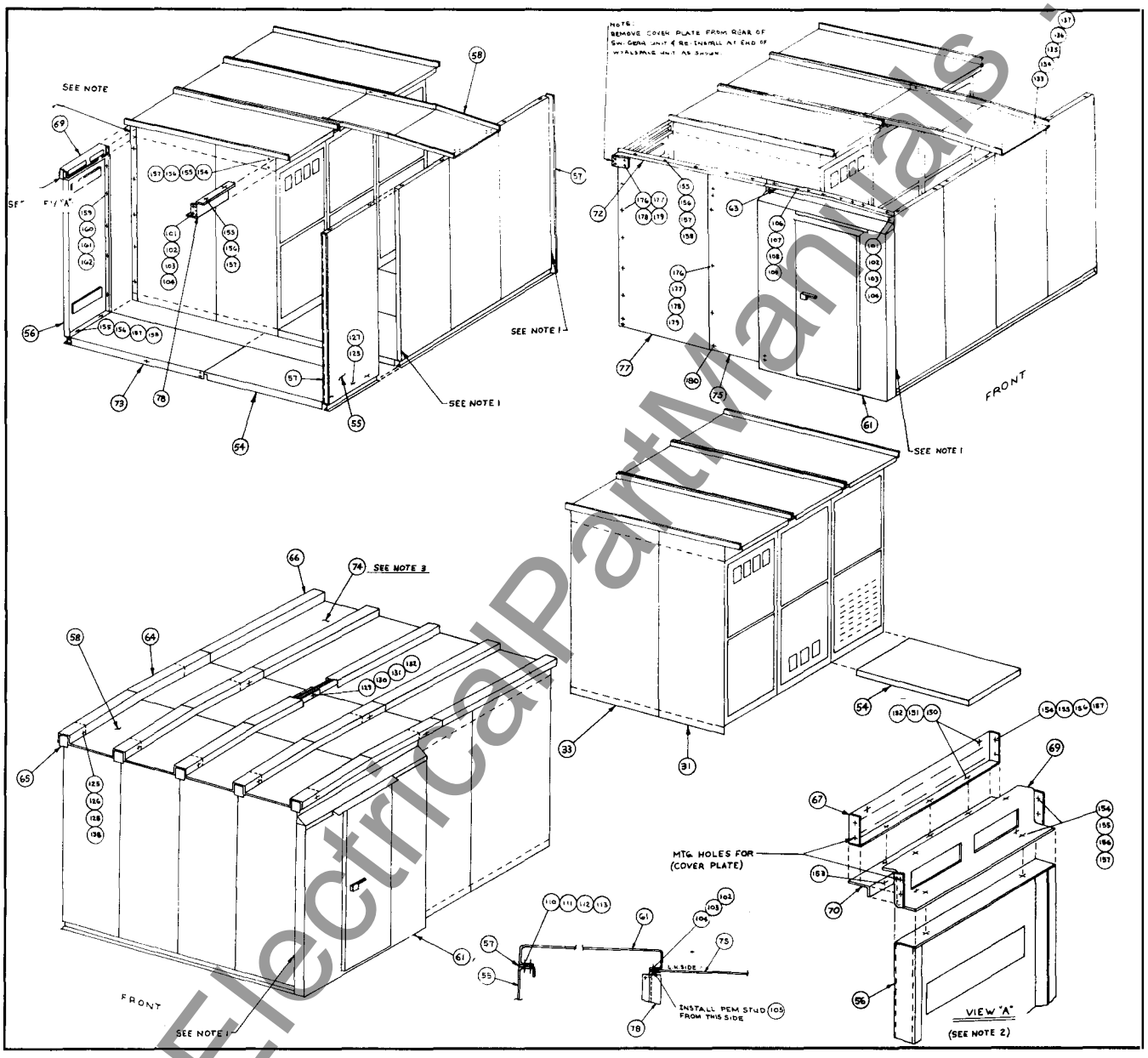


Figure 3. Single Aisle With Workspace Field Assembly

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