

SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD				E50351			
SUBJECT BREAKER/CELL CODE PLATE INTERLOCKING SCHEME						PAGE 1 OF 3			
<p>Two High Metal Clad Switchgear and Breakers, both the FG-2 and the VAD-2, are mechanically interlocked to prevent the insertion of breakers into cells for which they are not rated.</p> <p>Due to the physical differences in the current carrying parts, breakers with higher continuous current ratings cannot be placed into cells with lower continuous current ratings, and vice versa, even though the breaker interrupting capabilities may be the same. In a like manner, breakers with different interrupting capabilities cannot be inserted into the same physical cells, due to the interlocking scheme. The result is that the interlocking scheme for each "continuous current/interrupting capability" combination for breakers and cells is unique for their particular combination of levels of required performance.</p> <p>The interlocking is accomplished by inserting two pins in the code block which is welded to the floor of the breaker cell. When viewed from the front of the cell, the code block is located on the left hand side of the floor, between the breaker guide rail and the breaker grounding rail. There are seven holes in the block for various pin combinations. The three pin locations to the left of the cell are for continuous current rating, while the four to the right are for interrupting capability level.</p> <p>A steel plate is mounted underneath the breaker between the guide rail and the ground shoe (on the left side of the breaker). This plate is used to code the breaker for various continuous current and interrupting capability combinations, each of which would match a combination of pins in the code block of the cell floor. If the two notches on the plate match the two pin locations on the floor, the breaker may be connected and operated in that cell. If they do not match, the breaker cannot be physically connected in that cell.</p> <p>While this interlocking provides protection against physically inserting a breaker into a higher rated cell, circuit breaker control voltages must be checked for motor, closing, and tripping circuits, on a breaker by breaker basis to insure that the voltages required by the breaker are matched by the cell.</p>									
REV.	DATE	BY	REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
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SUBJECT BREAKER/CELL CODE PLATE INTERLOCKING SCHEME

PAGE 2 OF 3

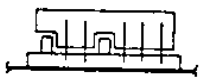
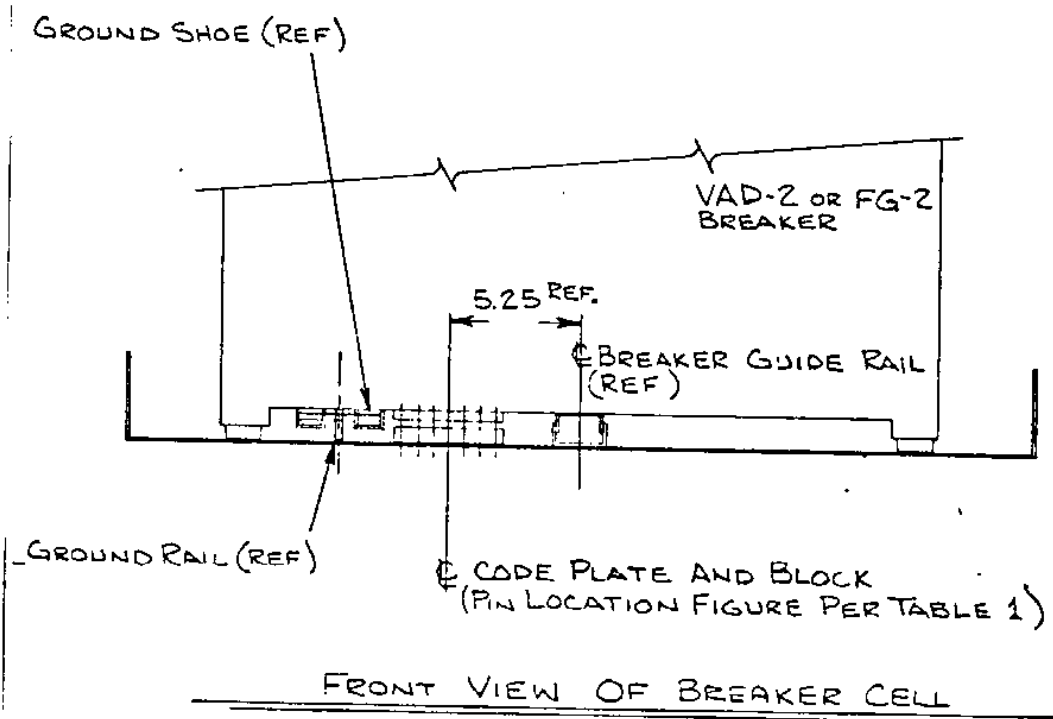


FIG. 1

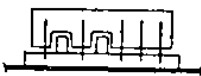


FIG. 2



FIG. 3

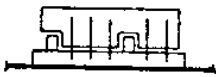


FIG. 4



FIG. 5



FIG. 6

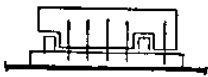


FIG. 7

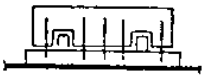


FIG. 8



FIG. 9



FIG. 10



FIG. 11

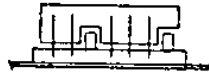


FIG. 12

ALL FIGURES SHOWN FROM  
FRONT OF CELL

REPLACES STANDARD

DATED

PREPARED BY

DATE

APPROVED BY

DATE

EFFECTIVE


John Ramma

8/30/85

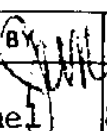
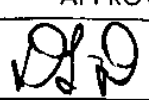
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SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD		E50351			
SUBJECT BREAKER/CELL CODE PLATE INTERLOCKING SCHEME				PAGE 3 OF 3			
TYPE		CATALOG NO.		FIGURE			
FG-2		FG-2-05007-12		4			
		FG-2-05015-12		4			
		FG-2-05015-20		5			
		FG-2-05015-30		6			
		FG-2-05025-12		1			
		FG-2-05025-20		2			
		FG-2-05025-30		3			
		FG-2-05035-12		10			
		FG-2-05035-20		11			
		FG-2-05035-30		12			
		FG-2-08025-12		1			
		FG-2-08025-20		2			
		FG-2-08050-12		7			
		FG-2-08050-20		8			
		FG-2-08050-30		9			
		FG-2-15050-12		4			
		FG-2-15050-20		5			
		FG-2-15050-30		6			
		FG-2-15075-12		7			
		FG-2-15075-20		8			
		FG-2-15075-30		9			
		FG-2-15100-12		10			
		FG-2-15100-20		11			
		FG-2-15100-30		12			
VAD-2		VAD-2-05007-12		4			
		VAD-2-05015-12		4			
		VAD-2-05015-20		5			
		VAD-2-05015-30		6			
		VAD-2-05025-12		1			
		VAD-2-05025-20		2			
		VAD-2-05025-30		3			
		VAD-2-05035-12		10			
		VAD-2-05035-20		11			
		VAD-2-05035-30		12			
		VAD-2-08025-12		1			
		VAD-2-08025-20		2			
		VAD-2-08050-12		7			
		VAD-2-08050-20		8			
		VAD-2-08050-30		9			
		VAD-2-15050-12		4			
		VAD-2-15050-20		5			
		VAD-2-15050-30		6			
		VAD-2-15075-12		7			
		VAD-2-15075-20		8			
		VAD-2-15075-30		9			
		VAD-2-15100-12		10			
		VAD-2-15100-20		11			
		VAD-2-15100-30		12			
TABLE 1							
REPLACES STANDARD		DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
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<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING    STANDARD</b>	<b>E50427</b>																								
SUBJECT    TWO HIGH METAL CLAD SWITCHGEAR WEIGHTS		PAGE 1    OF    1																								
<table border="1" style="margin: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 40%;">VERTICAL SECTION TYPE</th> <th style="width: 20%;">MAIN BUS RATING (amp.)</th> <th style="width: 40%;">WEIGHT (lbs)</th> </tr> </thead> <tbody> <tr> <td rowspan="3">BRKR/ /BRKR</td> <td>1200</td> <td>2700</td> </tr> <tr> <td>2000</td> <td>2800</td> </tr> <tr> <td>3000</td> <td>2900</td> </tr> <tr> <td rowspan="3">BRKR/ /AUX or AUX/ /BRKR</td> <td>1200</td> <td>2900</td> </tr> <tr> <td>2000</td> <td>3000</td> </tr> <tr> <td>3000</td> <td>3100</td> </tr> <tr> <td rowspan="3">AUX/ /AUX</td> <td>1200</td> <td>3100</td> </tr> <tr> <td>2000</td> <td>3200</td> </tr> <tr> <td>3000</td> <td>3300</td> </tr> </tbody> </table> <div style="margin-top: 20px;"> <p><b>NOTES:</b></p> <p>1) Each breaker compartment includes only standard equipment-no lightning arresters, potheads, zero sequence CT's, etc. are included. Standard control components such as overcurrent relays, control switch, ammeter with switch and pilot lights are included.</p> <p>2) For each empty auxiliary compartment (A,B,C,orD) deduct 250 lbs.</p> </div>			VERTICAL SECTION TYPE	MAIN BUS RATING (amp.)	WEIGHT (lbs)	BRKR/ /BRKR	1200	2700	2000	2800	3000	2900	BRKR/ /AUX or AUX/ /BRKR	1200	2900	2000	3000	3000	3100	AUX/ /AUX	1200	3100	2000	3200	3000	3300
VERTICAL SECTION TYPE	MAIN BUS RATING (amp.)	WEIGHT (lbs)																								
BRKR/ /BRKR	1200	2700																								
	2000	2800																								
	3000	2900																								
BRKR/ /AUX or AUX/ /BRKR	1200	2900																								
	2000	3000																								
	3000	3100																								
AUX/ /AUX	1200	3100																								
	2000	3200																								
	3000	3300																								
REPLACES STANDARD	DATED	PREPARED BY																								
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<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING    STANDARD</b>	<b>E50428</b>				
SUBJECT TWO HIGH METAL CLAD SWITCHGEAR LIFTING INSTRUCTIONS		PAGE 1    OF    2				
<div style="display: flex;"> <div style="flex: 1; min-width: 300px;"> <p>Two High Metal Clad Switchgear may be lifted in one bay or two bay sections. It is not recommended that more than two vertical sections be lifted at one time. Lifting is accomplished by attaching steel cables or chains at the four corners of the equipment to be lifted. See Figure 1. The hoist or crane used to lift the switchgear should be of a rating high enough to safely lift the switchgear. For switchgear weights, see Engineering Standard E50427.</p> <p>It is not recommended to lift the switchgear with VAD-2 or FG-2 circuit breakers installed. Before lifting, insure that all panels are firmly attached in position and that all doors, PT drawers, etc. are firmly anchored so that shifting during equipment lifting is avoided. Due to the various configurations of metal clad switchgear available, the front-to-back center of gravity of the equipment varies. Figure 1 shows the approximate center of gravity for the switchgear. When attaching lifting chains, the lengths should be adjusted so that the switchgear will essentially be level when it is lifted.</p> </div> <div style="flex: 1; min-width: 300px;"></div> </div>						
REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
		 John Ramme	8/30/85		9/12/85	

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<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING    STANDARD</b>	<b>E 50428</b>
SUBJECT    TWO HIGH METAL CLAD SWITCHGEAR LIFTING INSTRUCTIONS		PAGE 2    OF 2

FIGURE 1

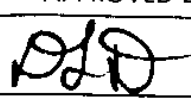
REPLACES STANDARD	DATED	PREPARED BY <i>John Rammel</i>	DATE	APPROVED BY	DATE	EFFECTIVE
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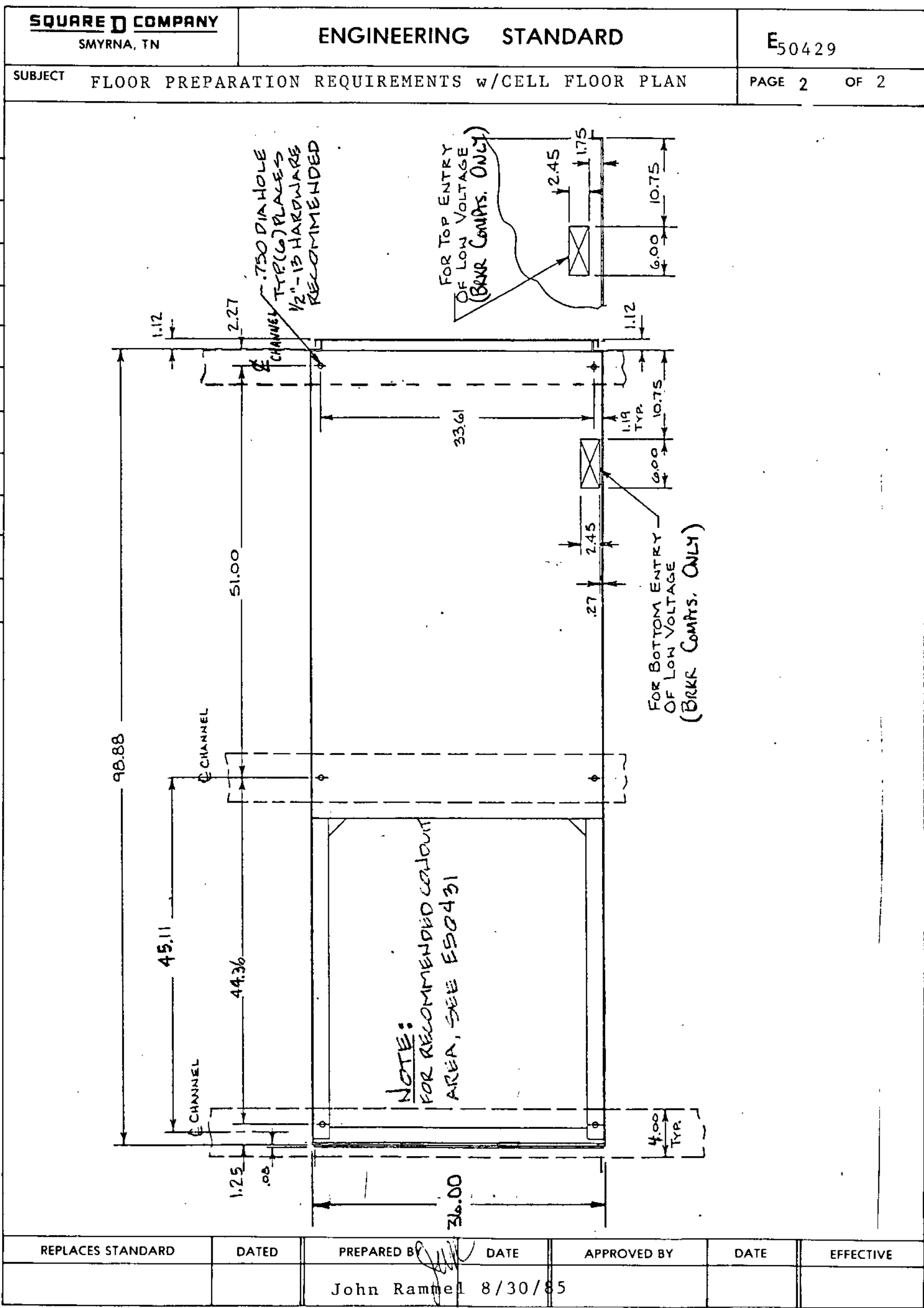
<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING STANDARD</b>	<b>E 50429</b>
SUBJECT FLOOR PREPARATION REQUIREMENTS w/CELL FLOOR PLAN		PAGE 1 OF 2

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BY	JWR									

During the preparation of the switchgear installation site, good floor preparation is necessary to minimize installation problems. It insures the proper and reliable operation of the switchgear, including metering, relaying, and other mechanical parts and assemblies. In addition, flatness of the floor surface allows smooth operation of the shutters, proper alignment of the breaker connections, ease in bolting the shipping sections together during installation, and the free operation of the circuit breaker when moving it into or out of a cell. A flat surface also insures the interchangeability of breakers from cell to cell.

It is recommended that the switchgear be installed on a concrete pad leveled within + .06 inch in any square yard. It is also recommended that steel channels be installed in the pad for anchoring the switchgear. The pad must be capable of supporting the switchgear weight. The total weight of a complete assembly with breakers will depend on the number of cells and breakers. Approximate weights of cells and breakers are given in Engineering Standards E50051, E50226, and E50427. The breaker does not transmit impact-load on closing or interrupting so this should not be considered. Actual switchgear and circuit breaker dead weight is all that need be considered.

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SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD		E 50450											
SUBJECT CLASS 8198 TRANSITION BAY ASSEMBLY - 2 HIGH SWITCHGEAR				PAGE 1 OF 2											
<div>I. PURPOSE To document the standard design for the transition bay from the 2 high switchgear to the medium voltage motor starter Class 8198.</div> <div>II. APPLICABLE TO Sales, Marketing, and Order Engineering</div> <div>III. PROCEDURE This transition bay connects the main bus of the 2-high switchgear to the main bus of the Class 8198 medium voltage motor control centers. The front of the two gears do line-up. The transition bay can also be used to connect a line-up of "back to back" starters.  The following assemblies are available, no "special" factory order parts are required.<table><tr><th>Assembly</th><th>Description</th></tr><tr><td>46002-405-50</td><td>Transition Bay, 1200A, Left Hand Assembly</td></tr><tr><td>46002-405-51</td><td>Transition Bay, 1200A, Right Hand Assembly</td></tr><tr><td>46002-406-50</td><td>Transition Bay, 2000A, Left Hand Assembly</td></tr><tr><td>46002-406-51</td><td>Transition Bay, 2000A, Right Hand Assembly</td></tr></table></div> <div>IV. DESIGN FEATURES <ul style="list-style-type: none"><li>- Structure is bolted assembly using 11ga sheetmetal panels</li><li>- Finish is ANSI 49 gray</li><li>- Busses are .25" x 4" and .38" x 3" silverplated copper</li><li>- Ground bus is .25" x 2" silverplated copper</li></ul></div>						Assembly	Description	46002-405-50	Transition Bay, 1200A, Left Hand Assembly	46002-405-51	Transition Bay, 1200A, Right Hand Assembly	46002-406-50	Transition Bay, 2000A, Left Hand Assembly	46002-406-51	Transition Bay, 2000A, Right Hand Assembly
Assembly	Description														
46002-405-50	Transition Bay, 1200A, Left Hand Assembly														
46002-405-51	Transition Bay, 1200A, Right Hand Assembly														
46002-406-50	Transition Bay, 2000A, Left Hand Assembly														
46002-406-51	Transition Bay, 2000A, Right Hand Assembly														
REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE									
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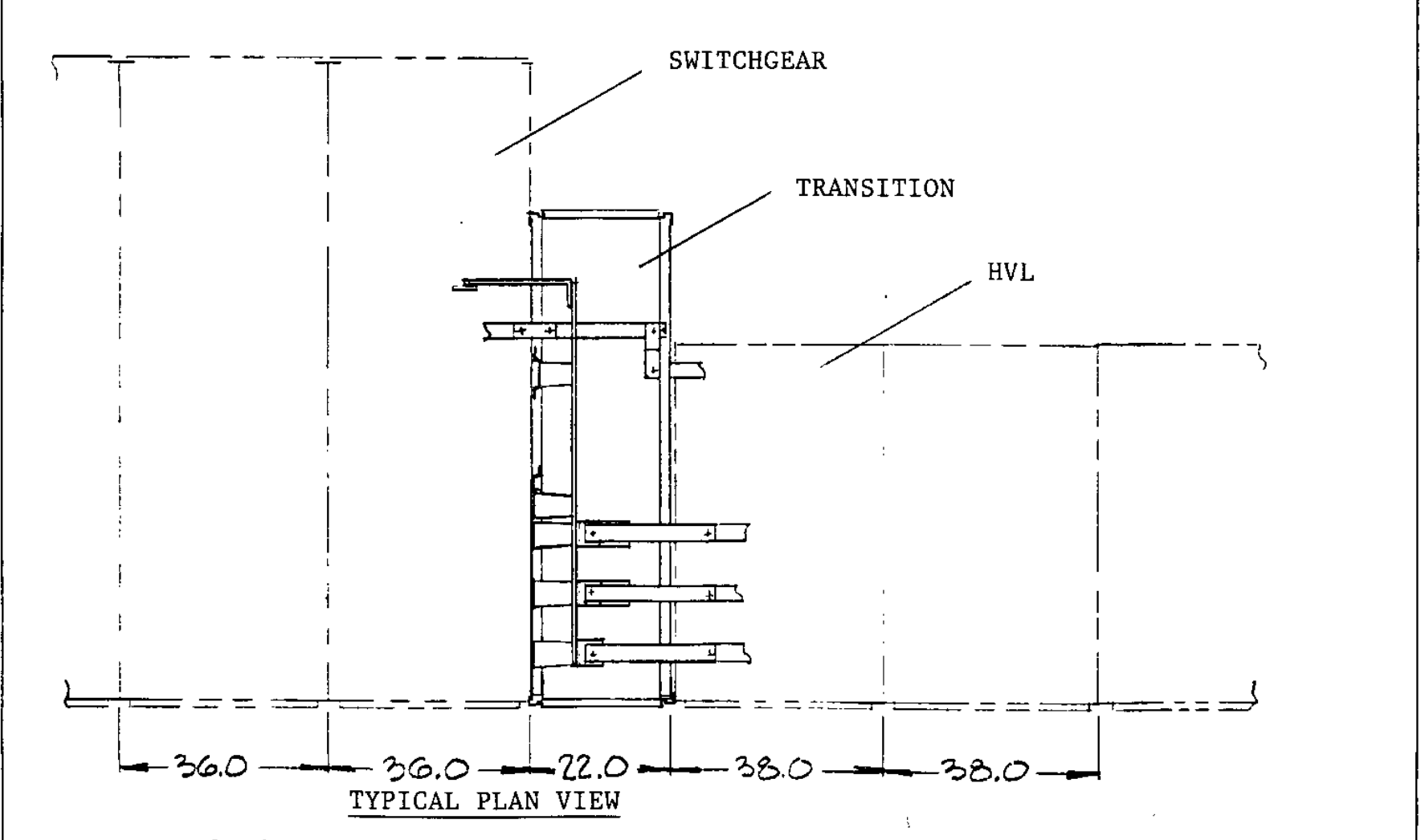
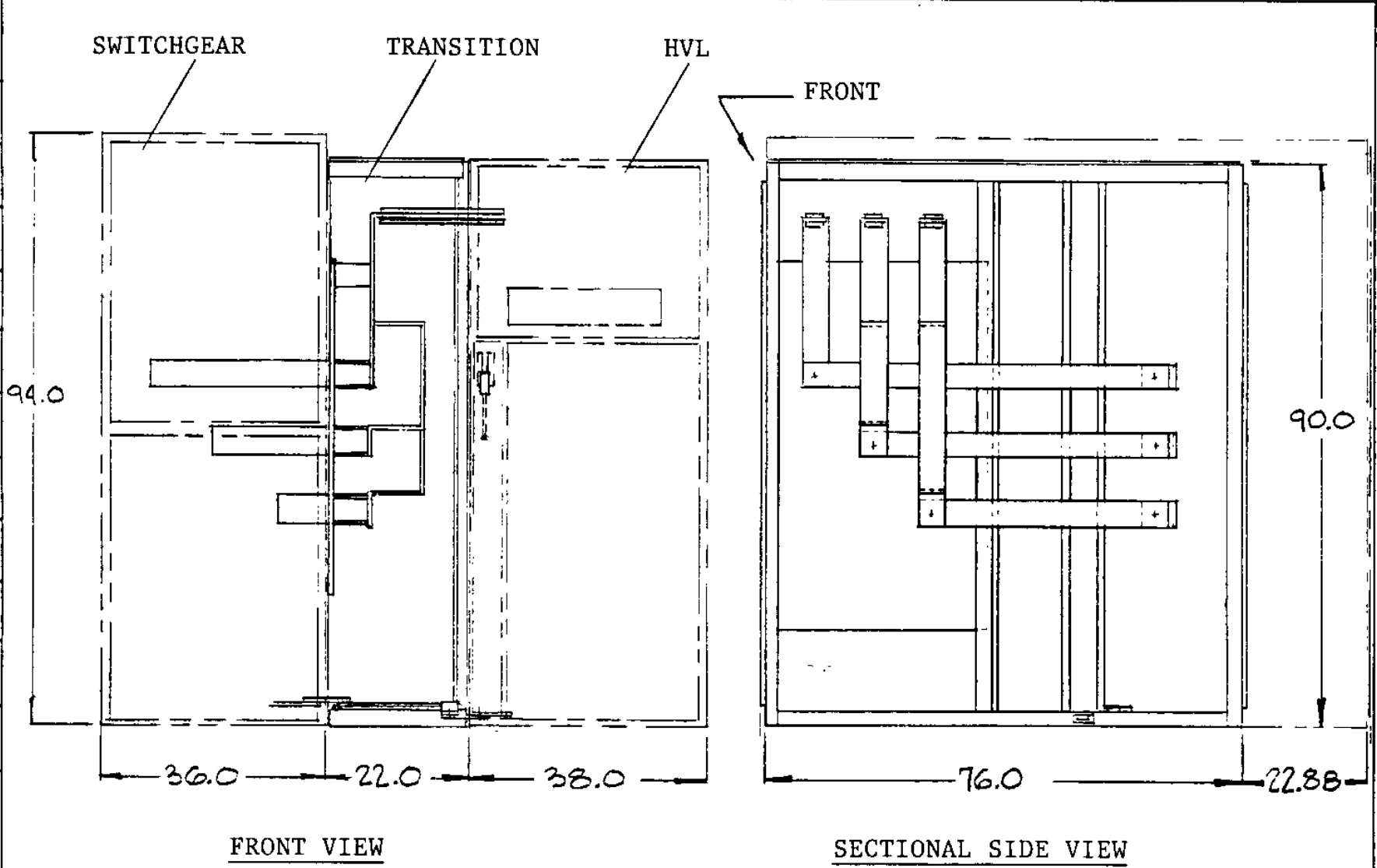
SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD			E 50450	
SUBJECT CLASS 8198 TRANSITION BAY ASSEMBLY ~ 2 HIGH SWITCHGEAR					PAGE 2 OF 2	
V. OUTLINE DIMENSIONS						
<div><div>SWITCHGEAR</div><div>TRANSITION</div><div>MOTOR STARTER</div><div>FRONT</div><div>SECTIONAL SIDE VIEW</div><div>FRONT VIEW</div><div>TYPICAL PLAN VIEW</div></div>						
<div><div>REPLACES STANDARD</div><div>DATED</div><div>PREPARED BY</div><div>DATE</div><div>APPROVED BY</div><div>DATE</div><div>EFFECTIVE</div></div>						

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SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD		E50451							
SUBJECT HVL TRANSITION BAY - 2 HIGH SWITCHGEAR				PAGE 1 OF 2							
<div>I. PURPOSE To document the standard design for the transition bay from the 2 high switchgear to the 5 &amp; 15kV load break (HVL) switchgear.</div> <div>II. APPLICABLE TO Sales, Marketing, and Order Engineering</div> <div>III. PROCEDURE This transition bay connects the main bus of the 2 high switchgear to the main bus of the 5 &amp; 15kV load break (HVL) switchgear. The front of the two gears do line up. Both assemblies can be used for left hand or right hand lineup.  The following assemblies are available, no special order parts are required.<table><tr><th>Assembly</th><th>Description</th></tr><tr><td>46001-758-50</td><td>Transition Bay, HVL to two or more bays of switchgear</td></tr><tr><td>46001-758-51</td><td>Transition Bay, HVL to single bay switchgear</td></tr></table></div> <div>IV. DESIGN FEATURES - Structure is bolted assembly using 11 ga. sheetmetal panels - Finish is ANSI 49 gray - Busses are .25 xx 4.0 single phase and .25 x 2.5 two per phase copper - Ground bus is .25 x 2.0</div>						Assembly	Description	46001-758-50	Transition Bay, HVL to two or more bays of switchgear	46001-758-51	Transition Bay, HVL to single bay switchgear
Assembly	Description										
46001-758-50	Transition Bay, HVL to two or more bays of switchgear										
46001-758-51	Transition Bay, HVL to single bay switchgear										
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		<i>[Signature]</i>	5/16/86								

<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING STANDARD</b>	<b>E 50451</b>
SUBJECT HVL TRANSITION BAY - 2 HIGH SWITCHGEAR		PAGE 2 OF 2

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		B. BARRETT	5/16/20			

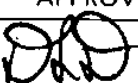
<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING    STANDARD</b>	E50502
SUBJECT    CURRENT TRANSFORMER INSTALLATION		PAGE    1    OF    3

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Current transformers are used for relaying and metering schemes in Two-High Metal Clad Switchgear. Model 190 and Model 191 current transformers are used with this switchgear and were specifically designed for this equipment. Application data for the Model 190 and Model 191 current transformers can be found in Engineering Standard E50676.


The current transformers are located and installed at the rear of the breaker cell. They are mounted behind the shutters, around the porcelain bells, and can be installed on both the line and load side of the breaker. They are secured in position at three corners by 1/2"-13 hardware. The fourth corner of the current transformer is where the secondary connections are made. When installed on the upper bells of the cell, the secondary connections are located at the top left corner of the transformer. When installed on the lower bells, the secondary connections are located at the bottom right corner of the transformer. The transformers may be installed with the polarity markings in either direction. Wiring access and the orientation of the secondaries remains the same.

In most cases, up to two transformers may be installed on each bell. Model 190 transformers can be installed two per bell with the exception of Models 190-500 (50:5), 190-750 (75:5), and 190-101 (100:5), which are limited to one per bell. Model 191 transformers can be installed two per bell except Models 191-301 (300:5), 191-122 (1200:5), 191-122MR (1200:5MR), 191-201 (200:5), 191-401 (400:5), and 191-151 (150:5), which are limited to one per bell. In some cases, Models 191-301, 191-122, and 191-122MR may be mounted on the same bell with another current transformer, but the other transformer cannot be greater than 3.00" thick. Maximum thickness for any combination of current transformers mounted on any one bell is 6.50". Current transformer thicknesses are given in Tables 1 and 2 of Engineering Standard E50676. Due to the various sizes of the transformers and the possibilities of mounting them with the polarity in either of two directions, spacers are sometimes required when mounting to prevent the overstressing of the mounting tabs. These may be required between the two current transformers and/or between the rearmost transformer and the mounting angle. Figure 1 and Table 1 show spacer requirements and a typical mounting arrangement using the spacers. Spacers are made of 1/2" PVC electrical conduit.

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SUBJECT CURRENT TRANSFORMER INSTALLATION						PAGE 2 OF 3																																																																																																																																																																			
<table><tr><td colspan="2">CT Thickness and Polarity Facing Front of Breaker Cell</td><td colspan="2">Spacer Thickness Required (Inches)</td><td colspan="2">Spacer Part Number 46002-213-XX *</td></tr><tr><td>FRONT CT</td><td>REAR CT</td><td>LOCATION A</td><td>LOCATION B</td><td>LOCATION A</td><td>LOCATION B</td></tr><tr><td>NONE</td><td>2.25-H1,H2</td><td>NONE</td><td>NONE</td><td>--</td><td>--</td></tr><tr><td>NONE</td><td>3.25-H1,H2</td><td>NONE</td><td>NONE</td><td>--</td><td>--</td></tr><tr><td>NONE</td><td>3.50-H1</td><td>NONE</td><td>.25</td><td>--</td><td>-01</td></tr><tr><td>NONE</td><td>3.50-H2</td><td>NONE</td><td>NONE</td><td>--</td><td>--</td></tr><tr><td>NONE</td><td>4.62-H1</td><td>NONE</td><td>.25,1.12</td><td>--</td><td>-01,-02</td></tr><tr><td>NONE</td><td>4.62-H2</td><td>NONE</td><td>NONE</td><td>--</td><td>--</td></tr><tr><td>NONE</td><td>6.50-H1</td><td>NONE</td><td>1.12,2.12</td><td>--</td><td>-02,-03</td></tr><tr><td>NONE</td><td>6.50-H2</td><td>NONE</td><td>NONE</td><td>--</td><td>--</td></tr><tr><td>2.25-H1</td><td>2.25-H1</td><td>1.12</td><td>NONE</td><td>-02</td><td>--</td></tr><tr><td>2.25-H1</td><td>2.25-H2</td><td>NONE</td><td>NONE</td><td>--</td><td>--</td></tr><tr><td>2.25-H2</td><td>2.25-H1</td><td>2.12</td><td>NONE</td><td>-03</td><td>--</td></tr><tr><td>2.25-H2</td><td>2.25-H2</td><td>1.12</td><td>NONE</td><td>-02</td><td>--</td></tr><tr><td>2.25-H1</td><td>3.25-H1,H2</td><td>1.12</td><td>NONE</td><td>-02</td><td>--</td></tr><tr><td>2.25-H2</td><td>3.25-H1,H2</td><td>2.12</td><td>NONE</td><td>-03</td><td>--</td></tr><tr><td>2.25-H1</td><td>3.50-H1</td><td>1.12</td><td>.25</td><td>-02</td><td>-01</td></tr><tr><td>2.25-H1</td><td>3.50-H2</td><td>.25,1.12</td><td>NONE</td><td>-01,-02</td><td>--</td></tr><tr><td>2.25-H2</td><td>3.50-H1</td><td>2.12</td><td>.25</td><td>-03</td><td>-01</td></tr><tr><td>2.25-H2</td><td>3.50-H2</td><td>.25,2.12</td><td>NONE</td><td>-01,-03</td><td>--</td></tr><tr><td>3.25-H1,H2</td><td>2.25-H1</td><td>2.12</td><td>NONE</td><td>-03</td><td>--</td></tr><tr><td>3.25-H1,H2</td><td>2.25-H2</td><td>1.12</td><td>NONE</td><td>-02</td><td>--</td></tr><tr><td>3.25-H1,H2</td><td>3.25-H1,H2</td><td>2.12</td><td>NONE</td><td>-03</td><td>--</td></tr><tr><td>3.50-H1</td><td>2.25-H1</td><td>.25,2.12</td><td>NONE</td><td>-01,-03</td><td>--</td></tr><tr><td>3.50-H1</td><td>2.25-H2</td><td>.25,1.12</td><td>NONE</td><td>-01,-02</td><td>--</td></tr><tr><td>3.50-H2</td><td>2.25-H1</td><td>2.12</td><td>NONE</td><td>-03</td><td>--</td></tr><tr><td>3.50-H2</td><td>2.25-H2</td><td>1.12</td><td>NONE</td><td>-02</td><td>--</td></tr></table>								CT Thickness and Polarity Facing Front of Breaker Cell		Spacer Thickness Required (Inches)		Spacer Part Number 46002-213-XX *		FRONT CT	REAR CT	LOCATION A	LOCATION B	LOCATION A	LOCATION B	NONE	2.25-H1,H2	NONE	NONE	--	--	NONE	3.25-H1,H2	NONE	NONE	--	--	NONE	3.50-H1	NONE	.25	--	-01	NONE	3.50-H2	NONE	NONE	--	--	NONE	4.62-H1	NONE	.25,1.12	--	-01,-02	NONE	4.62-H2	NONE	NONE	--	--	NONE	6.50-H1	NONE	1.12,2.12	--	-02,-03	NONE	6.50-H2	NONE	NONE	--	--	2.25-H1	2.25-H1	1.12	NONE	-02	--	2.25-H1	2.25-H2	NONE	NONE	--	--	2.25-H2	2.25-H1	2.12	NONE	-03	--	2.25-H2	2.25-H2	1.12	NONE	-02	--	2.25-H1	3.25-H1,H2	1.12	NONE	-02	--	2.25-H2	3.25-H1,H2	2.12	NONE	-03	--	2.25-H1	3.50-H1	1.12	.25	-02	-01	2.25-H1	3.50-H2	.25,1.12	NONE	-01,-02	--	2.25-H2	3.50-H1	2.12	.25	-03	-01	2.25-H2	3.50-H2	.25,2.12	NONE	-01,-03	--	3.25-H1,H2	2.25-H1	2.12	NONE	-03	--	3.25-H1,H2	2.25-H2	1.12	NONE	-02	--	3.25-H1,H2	3.25-H1,H2	2.12	NONE	-03	--	3.50-H1	2.25-H1	.25,2.12	NONE	-01,-03	--	3.50-H1	2.25-H2	.25,1.12	NONE	-01,-02	--	3.50-H2	2.25-H1	2.12	NONE	-03	--	3.50-H2	2.25-H2	1.12	NONE	-02	--
CT Thickness and Polarity Facing Front of Breaker Cell		Spacer Thickness Required (Inches)		Spacer Part Number 46002-213-XX *																																																																																																																																																																					
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SUBJECT CURRENT TRANSFORMER INSTALLATION					PAGE 3 OF 3																															
<div><div><div>REV.</div><div>DATE</div><div>BY</div></div><table><tr><td>A</td><td></td><td></td></tr><tr><td>B</td><td></td><td></td></tr><tr><td>C</td><td></td><td></td></tr><tr><td>D</td><td></td><td></td></tr><tr><td>E</td><td></td><td></td></tr><tr><td>F</td><td></td><td></td></tr><tr><td>G</td><td></td><td></td></tr><tr><td>H</td><td></td><td></td></tr><tr><td>K</td><td></td><td></td></tr><tr><td>L</td><td></td><td></td></tr></table></div> <div><p>FRONT OF CELL</p><p>EXAMPLE SHOWN IS: FRONT CT - 190-122; HI TO REAR REAR CT - 191-122; HI TO FRONT</p><p>SPACERS REQUIRED: (FOR 2 CT'S SHOWN ONLY) A - (3) 2.12" LONG B - (3) .25" LONG</p><p>BELL (REF)</p><p>RIGHT SIDE VIEW OF TOP ROW OF CT'S</p><p>FIGURE 1</p><p>BELL BARRIER (REF)</p><p>Diagram labels: FRONT CT, REAR CT, H1, H2, BELL BARRIER (REF), A TYP., B TYP.</p></div>							A			B			C			D			E			F			G			H			K			L		
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SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD		E 50507					
SUBJECT TWO HIGH METAL CLAD SWITCHGEAR MOC SWITCH ASSEMBLY				PAGE 1 OF 2					
<p>Mechanism operated contact (MOC) Switch Assemblies are usually required on switchgear containing two mains, a tie and an automatic transfer scheme. The purpose of the MOC Switch Assembly is to provide additional auxiliary contacts which function the same as the auxiliary contacts inside the breaker. As with breaker mounted auxiliary contacts, there are two types: "a" contacts which are open when the breaker is open, and "b" contacts which are closed when the breaker is open. When the breaker is closed, the "a" contacts are closed and the "b" contacts are open.</p> <p>The contact assemblies may be supplied with either 5, 9, or 12 contacts. The 5 contact version has 3 "a" contacts and 2 "b" contacts, the 9 contact version has 5 "a" contacts and 4 "b" contacts, and the 12 contact version has 6 "a" contacts and 6 "b" contacts. If other combinations of contacts are required, the standard contacts may be converted from "a"'s to "b"'s and vice versa as required. See Engineering Standard E50128 for conversion details, timing adjustments, and contact ratings. On the 5,9, and 12 contact blocks, one "a" contact with long cams provides early make-late break operation. On the 9 and 12 contact blocks, a "b" contact with long cams provides late break-early make operation. See Figure 1 for location of contacts.</p> <p>The MOC Switch Assembly is mounted on the right side of the breaker cell. The linkage assemblies which operate the contacts are mounted along the right wall of the cell. The contact block is mounted at the top of the cell on the front horizontal channel. The linkages are activated by a roller mounted on the right side of the breaker. The MOC contacts are operated when the breaker is closed or opened in either the test or connected position. When the breaker is removed from the cell, the contacts are in the "breaker open" mode.</p> <p>If this option is required in a breaker cell, the MOC assembly must be called out on the bill of material for the order. The assembly number is 46001-010-50. In addition, the proper contact block (part number shown in Figure 1) must also be called out.</p> <p>For breaker mounted MOC roller information, see Engineering Standard E50076 and E50251 for FG-2 and VAD-2 breakers respectively.</p>									
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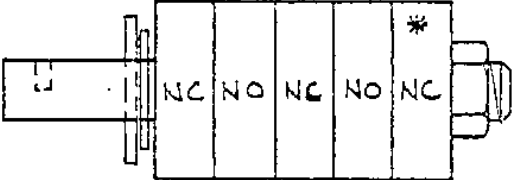
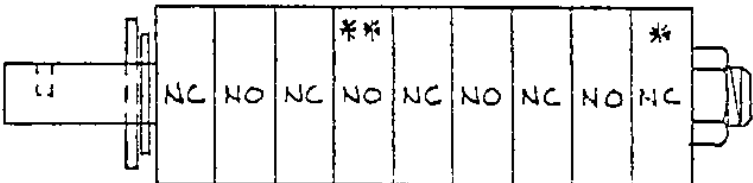
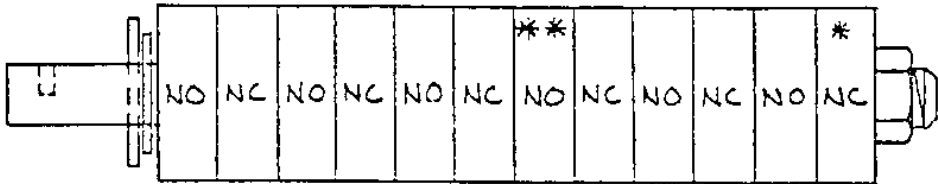


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SUBJECT TWO HIGH METAL CLAD SWITCHGEAR MOC SWITCH ASSEMBLY					PAGE 2 OF 2																																		
<table><tr><td>REV.</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td><td>F</td><td>G</td><td>H</td><td>K</td><td>L</td></tr><tr><td>DATE</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>BY</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>							REV.	A	B	C	D	E	F	G	H	K	L	DATE											BY										
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<p>* EARLY MAKE - LATE BREAK CONTACT</p> <p>** LATE BREAK - EARLY MAKE CONTACT</p> <p>FIGURE 1</p>																																							
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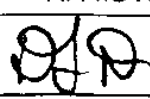
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SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD		E50508		
SUBJECT TWO HIGH METAL CLAD SWITCHGEAR TOC SWITCH ASSEMBLY				PAGE 1 OF 2		
<p>Truck operated contact (TOC) switch assemblies are usually required on switchgear containing two mains, a tie and an automatic transfer scheme. The purpose of the TOC switch assembly is to indicate to the control circuitry whether the breaker is in the connected position or the test/disconnected (or removed) position. The contacts change mode when the breaker is moved from the test/disconnect position to the connected position, and vice versa.</p> <p>There are two types of contacts: normally open (N.O.) and normally closed (N.C.). The normally open contacts are open and the normally closed contacts are closed when the breaker is in the test/disconnected position or removed from the cell. When the breaker is connected, normally open contacts are closed and normally closed contacts are open.</p> <p>The contact assemblies may be supplied with either 5,9, or 12 contacts. The 5 contact version has 3 normally closed and 2 normally open contacts, the 9 contact version has 5 normally closed and 4 normally open contacts and the 12 contact version has 6 normally closed and 6 normally open contacts. If other combinations of contacts are required, the standard contacts may be converted from normally open to normally closed and vice versa as required. See Engineering Standard E50128 for conversion details as well as contact ratings.</p> <p>On the 5, 9, and 12 contact blocks, one contact with long cams provides late break-early make operation. On the 9 and 12 contact blocks, an additional contact with long cams provides an early make-late break operation. See Figure 1 for locations of contacts.</p> <p>The TOC switch assembly is mounted on the left side of the breaker cell. The linkage assemblies which operate the contacts are mounted along the left wall of the cell. The contact block is mounted at the top of the cell on the front horizontal channel. The linkages are activated by a cam plate mounted on the left side of the breaker. The contacts change mode as the breaker is racked in and out of the cell. The following sequence describes contact mode as the breaker is moved from the test to the connected position. Total breaker travel in this sequence is ten inches.</p> <ol style="list-style-type: none"><li>1. During the first 1/4" of movement, the contacts do not change mode.</li><li>2. During the next 1 7/8" of movement, the contacts begin rotating until they are in the "transition" position. In "transition", all standard contacts are open, and the long cam contacts are closed.</li><li>3. During the next 5 3/4" of movement, the contacts remain in "transition".</li><li>4. During the next 1 7/8" of movement, the contacts begin to rotate into the connected position mode.</li><li>5. During the last 1/4" of movement, the contacts remain in the connected position mode.</li></ol>						
REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
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<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING STANDARD</b>	<b>E 50508</b>				
SUBJECT TWO HIGH METAL CLAD SWITCHGEAR TOC SWITCH ASSEMBLY		PAGE 2 OF 2				
<p>For racking the breaker out of the cell, reverse this breaker travel sequence.</p> <p>If this option is required in a breaker cell, the TOC assembly must be called out on the bill of material for the order. The assembly number is 46001-007-50. In addition, the proper contact block (part numbers shown in Figure 1) must be called out.</p> <p>For breaker cam plate information, see Engineering Standard E50077 and E50252 for FG-2 and VAD-2 breakers respectively.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;">  <p>5 CONTACT BLOCK 44065-038-50</p> </div> <div style="text-align: center;">  <p>9 CONTACT BLOCK 44065-038-51</p> </div> <div style="text-align: center;">  <p>12 CONTACT BLOCK 44065-038-52</p> </div> </div> <p style="margin-top: 20px;"><u>SHOWN WITH BREAKER IN TEST POSITION</u></p> <div style="text-align: center; margin-top: 20px;"> <p>* LATE BREAK - EARLY MAKE CONTACT</p> <p>** EARLY MAKE - LATE BREAK CONTACT</p> </div> <p style="text-align: center; margin-top: 40px; font-size: 1.2em;">FIGURE 1</p>						
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SUBJECT MODEL 190 AND 191 CURRENT TRANSFORMERS				PAGE 1 OF 5																					
<p>Current transformers which have been designed for the Two High Metal Clad Switchgear are the Model 190 and Model 191, both of which are supplied by Electromagnetics Industries. Refer to Figure 1 for dimensional data. Model 190 current transformers are available in single ratios from 50:5A through 4000:5A, and in multi-ratio versions from 600:5A through 3000:5A. Relaying and metering accuracy data for Model 190 transformers can be found in Table 1.</p> <p>Model 191 current transformers are higher accuracy current transformers and are available in single ratios from 150:5A through 3000:5A and in multi-ratio versions from 600:5A through 3000:5A. Relaying and metering accuracy data for Model 191 transformers can be found in Table 2.</p> <p>NOTE: When working with the multi-ratio models, the relaying and metering accuracy data in Tables 1 and 2 refer to the full winding only.</p> <p>Refer to the manufacturer's catalog sheet for excitation curve data.</p> <p>Additional technical data, namely phase angle curves and ratio correction factor curves, can be found in Engineering Test Report # M-9-841115, located in the Engineering Manager's office.</p> <p>Both models are manufactured with Clearwater's EIK-50 Thermosetting Rubber. The insulation materials encapsulate the CT core and coil assembly completely through a molding process. The electrical and mechanical properties of the cured system are shown below:</p> <table><tr><td>Power Factor (@ 60 Hz and 20°C)</td><td>0.1209</td></tr><tr><td>Dielectric Strength</td><td>500 v/mil</td></tr><tr><td>Dielectric Constant</td><td>4.9 @ 25°C</td></tr><tr><td>Insulation Classification</td><td>Class A (105°C)</td></tr><tr><td>Hardness (durometer D)</td><td>66</td></tr><tr><td>Tensile Strength (@ 25°C)</td><td>1300 psi</td></tr><tr><td>Elongation (@ 25°C)</td><td>65%</td></tr><tr><td>Specific Gravity</td><td>1.58</td></tr><tr><td>Glass Transition Temperature</td><td>-56°C</td></tr><tr><td>Thermocycling</td><td>-58°F to 185°F*</td></tr></table> <p>* No effect on CT performance and no deterioration in material.</p> <p>For chemical resistance data, see Product Data Bulletin EIP-18 dated March 1983, filed with Engineering Test Report # M-9-841115.</p>						Power Factor (@ 60 Hz and 20°C)	0.1209	Dielectric Strength	500 v/mil	Dielectric Constant	4.9 @ 25°C	Insulation Classification	Class A (105°C)	Hardness (durometer D)	66	Tensile Strength (@ 25°C)	1300 psi	Elongation (@ 25°C)	65%	Specific Gravity	1.58	Glass Transition Temperature	-56°C	Thermocycling	-58°F to 185°F*
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Dielectric Strength	500 v/mil																								
Dielectric Constant	4.9 @ 25°C																								
Insulation Classification	Class A (105°C)																								
Hardness (durometer D)	66																								
Tensile Strength (@ 25°C)	1300 psi																								
Elongation (@ 25°C)	65%																								
Specific Gravity	1.58																								
Glass Transition Temperature	-56°C																								
Thermocycling	-58°F to 185°F*																								
REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE																			
		John Ramme	8/30/85		9/12/85																				

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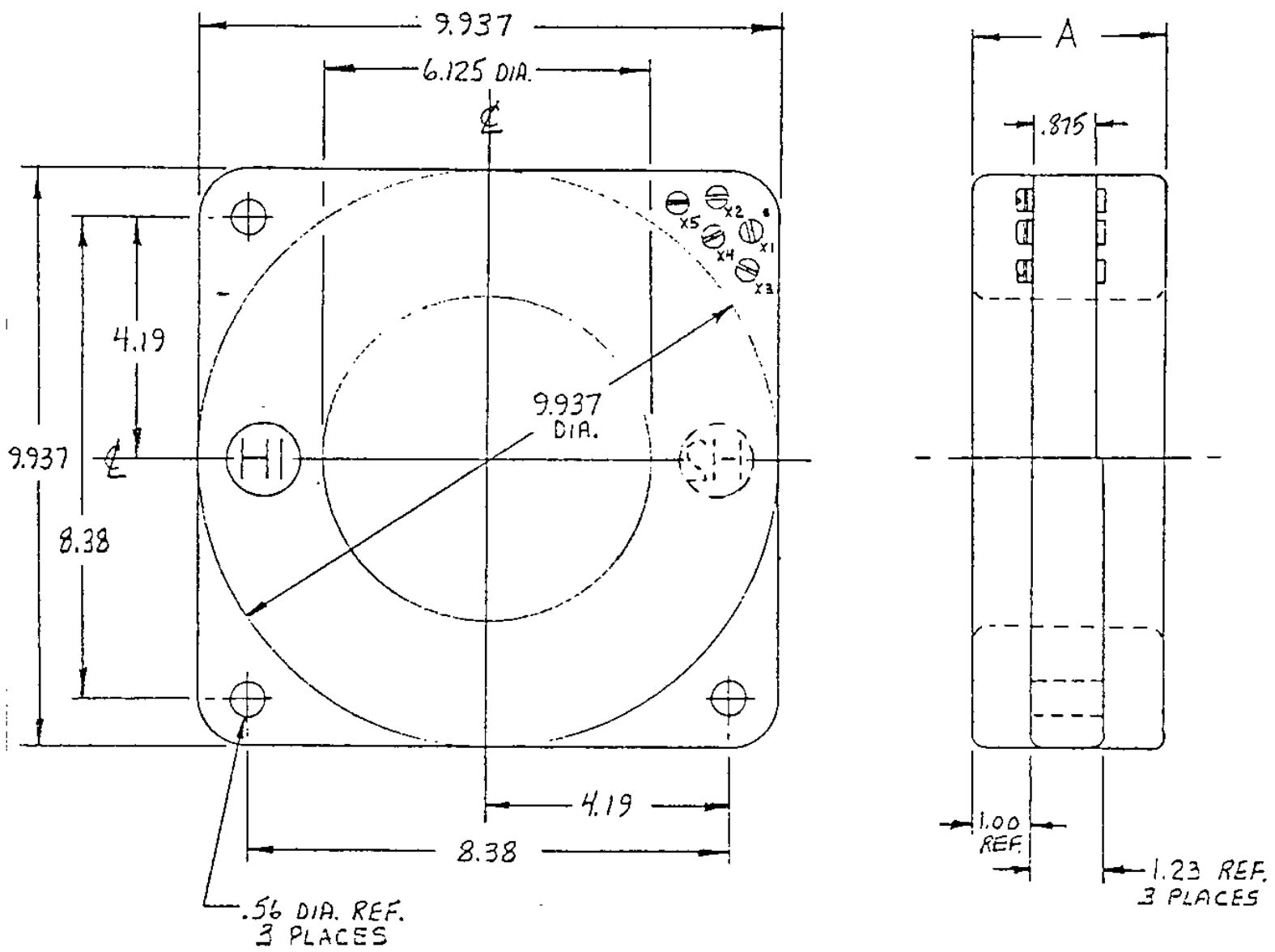


FIGURE 1

NOTES

- 1. X3, X4, & X5 ON MULTI-RATIO MODELS ONLY.
- 2. SECONDARY POLARITY MARKS AND TERMINAL MARKINGS ON BOTH SIDES OF TRANSFORMER.
- 3. CONTINUOUS CURRENT THERMAL RATING FACTOR
  - a) 1.33 UP TO 2000:5 A.
  - b) 1.0 AT 3000:5 A. & 4000:5 A.

REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
		John Ramme	8/30/85			

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<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING STANDARD</b>	<b>E50676</b>
SUBJECT MODEL 190 AND 191 CURRENT TRANSFORMERS		PAGE 3 OF 5

CATALOG NUMBER	RATING	METERING ACCURACY CLASS			RELAY ACCURACY CLASS	DIM.A (SEE FIG 1)	WT. (lbs)
		B0.1	B0.5	B2.0			
190-500	50:5	③2.4	---	---	C10	4.62	42.0
190-750	75:5	1.2	---	---	②C20	4.62	42.5
190-101	100:5	1.2	---	---	②C20	4.62	37.0
190-151	150:5	0.6	2.4	---	C20	3.25	30.0
190-201	200:5	0.6	2.4	---	C20	2.25	21.0
190-301	300:5	0.6	②1.2	②2.4	C20	3.25	30.0
190-401	400:5	0.3	②0.6	2.4	C50	3.25	30.0
190-601	600:5	0.3	0.3	②1.2	C50	2.25	19.0
190-801	800:5	0.3	0.3	②0.6	C50	2.25	17.5
190-102	①1000:5	①0.3	①0.3	①0.6	①C50	2.25	16.0
190-122	1200:5	0.3	0.3	0.3	C100	2.25	18.0
190-152	1500:5	0.3	0.3	0.3	C100	2.25	16.3
190-202	2000:5	0.3	0.3	0.3	C100	2.25	15.3
190-302	3000:5	0.3	0.3	0.3	C100	2.25	15.0
190-402	4000:5	0.3	0.3	0.3	C100	2.25	13.5
190-601MR	600:5MR	0.3	0.3	②1.2	C50	2.25	19.5
190-122MR	1200:5MR	0.3	0.3	0.3	C100	2.25	18.5
190-202MR	2000:5MR	0.3	0.3	0.3	C100	2.25	15.5
190-302MR	3000:5MR	0.3	0.3	0.3	C100	2.25	15.5

- ① NOT an ANSI Rating
- ② Exceeds requirements of ANSI C37.20.2-19XX
- ③ Does not meet requirements of ANSI C37.20.2-19XX

MODEL 190 CURRENT TRANSFORMER

TABLE 1

REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
		John Ramme	8/30/85			

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<b>SQUARE D COMPANY</b> SMYRNA, TN		<b>ENGINEERING STANDARD</b>				<b>E 50676</b>																																																																																																																				
SUBJECT MODEL 190 AND 191 CURRENT TRANSFORMERS						PAGE 4 OF 5																																																																																																																				
<table border="1"> <thead> <tr> <th rowspan="2">CATALOG NUMBER</th> <th rowspan="2">RATING</th> <th colspan="3">METERING ACCURACY CLASS</th> <th rowspan="2">RELAY<sup>①</sup> ACCURACY CLASS</th> <th rowspan="2">DIM.A (SEE FIG 1)</th> <th rowspan="2">WT. (lbs)</th> </tr> <tr> <th>B0.1</th> <th>B0.5</th> <th>B2.0</th> </tr> </thead> <tbody> <tr> <td>191-151</td> <td>150:5</td> <td>0.6</td> <td>②1.2</td> <td>--</td> <td>C50</td> <td>6.50</td> <td>61.0</td> </tr> <tr> <td>191-201</td> <td>200:5</td> <td>0.6</td> <td>②1.2</td> <td>--</td> <td>C50</td> <td>4.62</td> <td>41.0</td> </tr> <tr> <td>191-301</td> <td>300:5</td> <td>②0.3</td> <td>②0.6</td> <td>②2.4</td> <td>C50</td> <td>3.50</td> <td>33.0</td> </tr> <tr> <td>191-401</td> <td>400:5</td> <td>0.3</td> <td>②0.3</td> <td>②0.6</td> <td>C100</td> <td>4.62</td> <td>39.3</td> </tr> <tr> <td>191-601</td> <td>600:5</td> <td>0.3</td> <td>0.3</td> <td>②0.6</td> <td>C100</td> <td>3.25</td> <td>29.0</td> </tr> <tr> <td>191-801</td> <td>800:5</td> <td>0.3</td> <td>0.3</td> <td>②0.6</td> <td>C100</td> <td>3.25</td> <td>25.5</td> </tr> <tr> <td>191-122</td> <td>1200:5</td> <td>0.3</td> <td>0.3</td> <td>0.3</td> <td>C200</td> <td>3.50</td> <td>28.5</td> </tr> <tr> <td>191-202</td> <td>2000:5</td> <td>0.3</td> <td>0.3</td> <td>0.3</td> <td>C200</td> <td>3.25</td> <td>23.5</td> </tr> <tr> <td>191-302</td> <td>3000:5</td> <td>0.3</td> <td>0.3</td> <td>0.3</td> <td>C200</td> <td>3.25</td> <td>21.0</td> </tr> <tr> <td>191-601MR</td> <td>600:5MR</td> <td>0.3</td> <td>0.3</td> <td>②0.6</td> <td>C100</td> <td>3.25</td> <td>29.0</td> </tr> <tr> <td>191-122MR</td> <td>1200:5MR</td> <td>0.3</td> <td>0.3</td> <td>0.3</td> <td>C200</td> <td>3.50</td> <td>29.0</td> </tr> <tr> <td>191-202MR</td> <td>2000:5MR</td> <td>0.3</td> <td>0.3</td> <td>0.3</td> <td>C200</td> <td>3.25</td> <td>23.5</td> </tr> <tr> <td>191-302MR</td> <td>3000:5MR</td> <td>0.3</td> <td>0.3</td> <td>0.3</td> <td>C200</td> <td>3.25</td> <td>21.3</td> </tr> </tbody> </table>								CATALOG NUMBER	RATING	METERING ACCURACY CLASS			RELAY <sup>①</sup> ACCURACY CLASS	DIM.A (SEE FIG 1)	WT. (lbs)	B0.1	B0.5	B2.0	191-151	150:5	0.6	②1.2	--	C50	6.50	61.0	191-201	200:5	0.6	②1.2	--	C50	4.62	41.0	191-301	300:5	②0.3	②0.6	②2.4	C50	3.50	33.0	191-401	400:5	0.3	②0.3	②0.6	C100	4.62	39.3	191-601	600:5	0.3	0.3	②0.6	C100	3.25	29.0	191-801	800:5	0.3	0.3	②0.6	C100	3.25	25.5	191-122	1200:5	0.3	0.3	0.3	C200	3.50	28.5	191-202	2000:5	0.3	0.3	0.3	C200	3.25	23.5	191-302	3000:5	0.3	0.3	0.3	C200	3.25	21.0	191-601MR	600:5MR	0.3	0.3	②0.6	C100	3.25	29.0	191-122MR	1200:5MR	0.3	0.3	0.3	C200	3.50	29.0	191-202MR	2000:5MR	0.3	0.3	0.3	C200	3.25	23.5	191-302MR	3000:5MR	0.3	0.3	0.3	C200	3.25	21.3
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SUBJECT MODEL 190 AND 191 CURRENT TRANSFORMERS				PAGE 5 OF 5																																																																																
<p>Accuracies higher than those available as standard on the Model 191 transformers are available through special order. These special current transformers can be manufactured using existing tooling. Case thicknesses and relaying accuracies available are shown in Table 3. For further technical information on the special accuracies listed, contact the Engineering Department at Electromagnetics Industries.</p> <table><tr><th rowspan="2">Current Transformer Ratio</th><th colspan="4">Relay Accuracy w/Case Thickness of:</th></tr><tr><th>3.25"</th><th>3.50"</th><th>4.62"</th><th>6.50"</th></tr><tr><td>50:5</td><td>---</td><td>---</td><td>---</td><td>C20</td></tr><tr><td>300:5</td><td>---</td><td>---</td><td>---</td><td>C100</td></tr><tr><td>600:5</td><td>---</td><td>---</td><td>---</td><td>C200</td></tr><tr><td>800:5</td><td>---</td><td>---</td><td>C200</td><td>---</td></tr><tr><td>1000:5</td><td>C100</td><td>C200</td><td>---</td><td>C400</td></tr><tr><td>1200:5</td><td>---</td><td>---</td><td>---</td><td>C400</td></tr><tr><td>1500:5</td><td>C200</td><td>---</td><td>---</td><td>C400</td></tr><tr><td>2000:5</td><td>---</td><td>---</td><td>C400</td><td>---</td></tr><tr><td>3000:5</td><td>---</td><td>C400</td><td>---</td><td>C800</td></tr><tr><td>4000:5</td><td>C200</td><td>---</td><td>C400</td><td>C800</td></tr><tr><td>600:5MR</td><td>---</td><td>---</td><td>---</td><td>C200</td></tr><tr><td>1200:5MR</td><td>---</td><td>---</td><td>---</td><td>C400</td></tr><tr><td>2000:5MR</td><td>---</td><td>---</td><td>C400</td><td>---</td></tr><tr><td>3000:5MR</td><td>---</td><td>C400</td><td>---</td><td>C800</td></tr></table>						Current Transformer Ratio	Relay Accuracy w/Case Thickness of:				3.25"	3.50"	4.62"	6.50"	50:5	---	---	---	C20	300:5	---	---	---	C100	600:5	---	---	---	C200	800:5	---	---	C200	---	1000:5	C100	C200	---	C400	1200:5	---	---	---	C400	1500:5	C200	---	---	C400	2000:5	---	---	C400	---	3000:5	---	C400	---	C800	4000:5	C200	---	C400	C800	600:5MR	---	---	---	C200	1200:5MR	---	---	---	C400	2000:5MR	---	---	C400	---	3000:5MR	---	C400	---	C800
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<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING STANDARD</b>	<b>E 50677</b>
SUBJECT WIRING COMPONENTS AND METHODS		PAGE 1 OF 3

PURPOSE

To standardize the methods and components used in wiring two-high metal clad switchgear.

APPLICABLE TO

Order Engineering, Marketing and Shop personnel involved in wiring/assembling two-high metal clad switchgear.

PROCEDURE

The individual procedures under each category are to be followed as close as is practical. Deviations are to be limited to specific customer requirements for which exceptions could not be obtained.

NOTE: For specific catalog numbers, part numbers and descriptions on various electrical components used in two-high metal-clad, see Engineering Standard E50678.

CONTROL WIRE

All control wire used in metal clad switchgear is stranded and per Engineering Standard E50678, minimum size used is #14 AWG.

POWER CABLE (except Customer Power Cables)

All power cable used in metal clad switchgear is per Engineering Standard E50678. Low voltage power conductors are sized based on load requirements, overcurrent protection and the NEC. The normal low voltage power conductor used is #4 AWG - 600V. The normal high voltage power conductor used is #4 - 15kV.

TERMINAL BLOCKS

Terminal blocks for control wire #22 AWG to #8 AWG are 600 volt rated, have solderless box lugs and are Square D Class 9080-GR-6.

Terminal blocks for control wire larger than #8 AWG are 600 volt rated and depending upon the number of wires, are either Square D Class 9080-GC-6 or Square D Power Distribution blocks.

As an option, terminal blocks which accept ring or spade lugs (wire sizes #10 AWG and smaller) are available. If this option is selected, Square D Class 9080-KCB-1 terminal blocks rated 600 volts are used.

All terminal blocks (where possible) are marked to correspond with the wiring diagrams.

REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
				<i>J. King</i>	5-1-86	

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<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING STANDARD</b>	<b>E 50677</b>
SUBJECT      WIRING COMPONENTS AND METHODS		PAGE 2      OF 3

FUSE BLOCKS & FUSES

Fuse blocks in low voltage circuits requiring disconnects (ANSI device #8) are 2-pole, pullout style, class H, fuse blocks. For fuse ratings up to and including 30A(9/16" x 2"), Square D type SK9660 is used. For fuse ratings greater than 30A but less than or equal to 60A (13/16" x 3"), Square D type SK9661 is used.

Fuse blocks for other types of low voltage circuits (eg: V.T. secondary fuses) use 13/32" x 1 1/2" midget fuses and are installed in Square D Class 9080-KH-1 track mounted fuse blocks.

CONTROL WIRE LUGS

Control wire lugs are used on all devices equipped with terminals suitable for lugs only. Control wire lugs are ring tongue or slip-on crimp lugs as manufactured by AMP Special Industries.

WIRE MARKERS

Wires are marked in accordance with the wiring diagrams. Slip-on or sleeve type wire markers are used where possible.

SHIPPING SPLITS

Wire sizes #10 and smaller, when passing through shipping splits, will normally utilize a terminal block with a separable connector to facilitate equipment breakdown and field installation.

Wire sizes greater than #10 will normally utilize terminal blocks only.

LABELS/NAMEPLATES/LEGEND PLATES

Devices inside the inst. comp't. are numerically identified to correspond with the wiring diagram (see Fig. 1). If a device has an ANSI designation as well, this will appear on the label as well as the wiring diagram device number (see Fig. 2).

Both types of labels are adhesive backed cloth material.




Figure 1


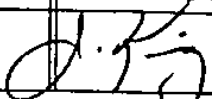


Figure 2

Door mounted devices are identified on the backside with the above labels.

As standard, the red and green pilot lights mounted directly above the respective breaker control switch will not have legend plates unless the following option is requested. Other pilot lights (if present) will be labeled as to their function as standard.

REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
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<b>SQUARE D COMPANY</b> SMYRNA, TN	<b>ENGINEERING STANDARD</b>	<b>E 50677</b>
SUBJECT     WIRING COMPONENTS AND METHODS		PAGE   3     OF   3

As an option, door mounted components can be identified on the front with a nameplate. Components which have their function already labeled on the device or is obvious as to the devices' function (eg: Ammeters & Switches, Voltmeters & Switches, breaker control switches, etc.) will not be labeled on the front unless specified by the customer.

SPACE HEATERS    (Refer to applicable Engineering Standard for preferred space heater schemes.)

As standard, heaters are not provided with protective screens nor are they available due to limited mounting space.

1.    Indoor Switchgear

Space heaters for indoor switchgear are available as an option. The heaters for each vertical section are fused but do not include a thermostat.

Thermostatically controlled space heaters are also available as an option.

2.    Outdoor Switchgear

Space heaters for outdoor switchgear are provided as standard. The heaters for each vertical section are fused but do not include a thermostat.

Thermostatically controlled strip heaters in outdoor switchgear is not recommended and should be avoided.

GROUND LUGS

Two single clamp lugs per lineup (one in each end bay of the lineup) size #6 Sol-350 mcm for equipment rated 2000 amps and less, and size 1/0 Sol-500 mcm for equipment rated 3000 amp is provided as standard. These lugs are suitable for copper conductors only.

Additional ground lugs are available if required as an option and must be specified. Select from Engineering Standard E50678.

CABLE LUGS

NEMA 4-hole lug pads are provided as standard for application of the customers' lugs.

Double clamp lugs or compression lugs are available as an option and sizes and type must be specified. Select from Engineering Standard E50678.

REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	DATE	EFFECTIVE
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SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD		E 50901									
SUBJECT		OUTDOOR NON-WALKIN - 2 HIGH METAL CLAD SWITCHGEAR		PAGE 1 OF 4									
I. PURPOSE		To document the Outdoor Non-Walkin NEMA 3R design											
II. APPLICABLE TO		Marketing and Order Engineering											
III. PROCEDURE		This standard lists and describes all assemblies and subassemblies which are required for fabrication and assembly of the Outdoor Non-Walkin design.											
3.1 Non Walkin Assemblies & Subassemblies													
Dwg. No.		Description											
46001-832-50		Non Walk-In Bay Assembly - One Assembly required per indoor structure - Includes: front frame, rear frame, roof, roof support front door, rear panels											
46001-836-50		Base Assembly 1 Bay											
46001-836-51		Base Assembly 2 Bays											
46001-836-52		Base Assembly 3 Bays											
46001-836-53		Base Assembly 4 Bays											
		- Base is welded and undercoated											
		- Includes: cable entrance cover plate, lifting lug, hold down lugs											
		- One base required per shipping section											
46001-834-50		Left hand side panel assembly											
46001-834-51		Right hand side panel assembly											
		- One assembly each required for each line up											
		- Includes: End panels covering complete gear											
46001-833-50		Intermediate Bay Assembly											
		- Number of bays minus one required per line up											
		- Includes roof caps and hardware to connect bays											
46001-855-50		Inner door											
		- One for each breaker and instrument compartment if required											
		Specify cutouts for factory orders as required											
46001-835-50		Stay hinge for R.H. end bay upper inner door											
46001-835-51		Stay hinge for R.H. end bay lower inner door											
46001-835-51		Stay hinge for R.H. end bay upper and lower inner door											
		- Stay hinge is bolted to R. H. end panel for inner doors in the R. H. bay											
REPLACES STANDARD		DATED		PREPARED BY		DATE		APPROVED BY		DATE		EFFECTIVE	
				PL		11/31/86		DRD		5/24/86		5/24/86	

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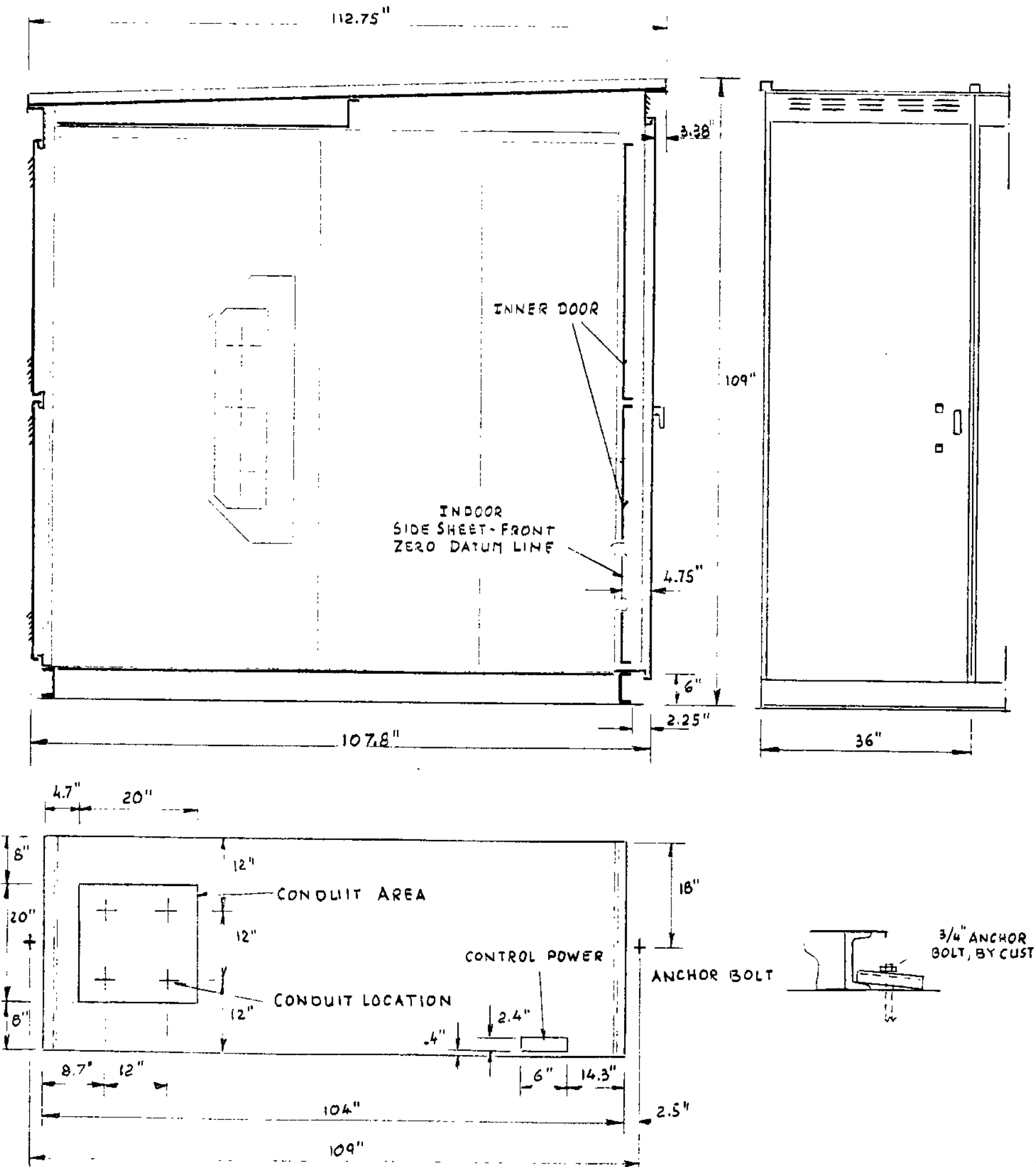
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SQUARE D COMPANY SMYRNA, TN		ENGINEERING STANDARD		E 50901	
SUBJECT OUTDOOR NON-WALKIN - 2 HIGH METAL CLAD SWITCHGEAR				PAGE 2 OF 4	
3.2 Indoor Switchgear Unit					
The non-walkin enclosure bolts on to the indoor assemblies and all standard indoor bays can be utilized with the following exceptions:					
a. The following top sheets and rear covers have to be deleted from the sheetmetal assemblies 46001-324-50 to 65 for 1200A and 2000A bays					
2 - 46001-013-01 Rear Cover					
2 - 80003-600-01 Rear Cover Handle					
1 - 46001-227-01 Roof Rear					
b. The PT & CPT Drawout Front Panel is too wide and has to be replaced for use with this non-walkin design.					
P.T./CPT Assembly		Order New Panel		Credit Standard Panel	
PT, Comp't A&C 46002-284-50,51,54,55,58,59		46002-368-50		46002-297-01	
PT, Comp't B&D 46002-284-52,53,56,57,60,61		46002-368-51		46002-300-01	
CPT, Comp't A&C 46002-285-50,51		46002-368-52		46002-296-01	
CPT, Comp't B&D 46002-285-52,53		46002-368-53		46002-298-01	
Fuse, Comp't A 46002-290-50,51,54,55		46002-369-54		46002-307-01	
Fuse, Comp't D 46002-290-52,53,56,57		46002-369-55		46002-308-01	
New panel assembly includes latches and brackets to hold drawout unit in place.					
3.3 Design Features					
- Enclosures can be shipped in sections of 1,2,3,or 4 bays. Select base assembly accordingly					
- Exterior walls are galvanealed steel, painted ANSI 49 Gray					
- Base is a welded frame made from 6"-13# steel channels and 7ga formed channels					
- Base is undercoated wit DURAX One Coat Rust Inhibitor					
- Front door has three point latch and padlock provisions					
- Rear panels, two per bay, are hinged and have padlock provisions					
- Removable 12 ga cover plates over conduit area are provided					
- Future add-ons can be installed by simply removing the end panels					
- Standard Indoor Lift truck can be used					
REPLACES STANDARD	DATED	PREPARED BY	DATE	APPROVED BY	EFFECTIVE
		PLA	11/31/86		

SUBJECT OUTDOOR NON-WALKIN - 2-HIGH METAL CLAD SWITCHGEAR

PAGE 3 OF 4

3.4 Outline Dimensions and Foundation



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