

# ELECTRIC METERING COMMERCIAL & INDUSTRIAL

## 1.0 INDEX

- 1.0 INDEX
- 2.0 SCOPE
- 3.0 GENERAL REQUIREMENTS
- 4.0 METER LOCATIONS
- 5.0 UNDERGROUND TERMINATIONS
- 6.0 METERING TRANSFORMER ENCLOSURES
- 7.0 SINGLE CUSTOMER METER INSTALLATIONS
- 8.0 MULTIPLE METER INSTALLATIONS, 2-6 METERS, 7+ METERS
- 9.0 COMMERCIAL/ INDUSTRIAL, 100 & 200 AMP SERVICE PEDESTALS

## 2.0 SCOPE

This standard provides detailed information for installation of electrical metering (0-600 volts) in Commercial and Industrial (C/I) applications.

## 3.0 GENERAL REQUIREMENTS

### 3.1 Type of Service

Electric service to C/I customers depends upon the load, applicable rate schedule, and area voltages.

### 3.2 NVE Consultation

It is important the customer consult NVE prior to the purchase of equipment for fault duty requirement of equipment. *All C/I metering installations above 200 Amps must be approved in writing by NVE, prior to installation by submitting two (2) sets of drawings to: NVE Electric Metering Dept. (R90EM), P.O. BOX 10100, Reno, NV. 89520-0024.*

### 3.3 General Codes

All meter sockets and enclosures shall be Underwriter's Laboratory listed. All installations and equipment shall comply with the latest requirements of the Electric Utility Service Equipment Requirements Committee (EUSERC), as adopted by NVE.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 1 of 26

## 4.0 METER LOCATIONS

### 4.1 Basic Location Requirements

See NVE Standard, GM0001M, Electric Metering-General, for details.

### 4.2 Typical Location

*Meter locations are preferred on an exterior 'ground-level' floor wall* or other permanent structure nearest NVE's distribution facilities. See GM0001M, Section 6.0 for options and details.

### 4.3 Multiple meter Installations

Multiple occupancy buildings will have the meters grouped at one location. **One** NVE underground service will generally be run to a building.

### 4.4 Service Disconnect Locations

Meters may be located at a point other than adjacent to the service disconnecting means. In accordance with applicable codes, the disconnect should be located outside the building being served.

### 4.5 Metering Transformers

Transformer rated meters and associated metering transformers are installed adjacent to each other. NVE may approve installations with a maximum separation of 50 circuit feet to assure accessibility or prevent inaccurate meter measurements. When separation of the meter and metering transformers is allowed, the customer shall provide clearances and working space for both the meter and metering transformer assembly. The customer shall supply and install conduit for the meter Wiring and the metering transformers. The conduit, minimum diameter of 1-1/2", shall be limited to two 90° bends. Conduits, junction boxes or similar fittings are **not** allowed.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:	Revision: 9		Page 2 of 26
JL	MB	DA	4/14			

## 5.0 UNDERGROUND TERMINATIONS

### 5.1 Service Termination Facilities

Service termination facilities shall be specifically designed to receive NVE's underground service lateral conductors as a single cable entry. Enclosures designed for a combination of overhead and underground entry are acceptable as long as they meet NVE requirement for underground feed.

### 5.2 Cable Termination Lugs

Line cable termination lugs (crimp to flat) will be provided by NVE. Panels 400A and under may utilize 'set-screw' type terminations. One NEMA 2 hole spade will be provided for each 400 amps of panel capacity Socket enclosures designed for service up to 200 amps shall have separate service termination lugs independently mounted from the socket jaw support. Service termination space in enclosures with ratings over 200 amps with multiple meter sockets shall accommodate compression type lugs. All bussing or cable conductors beyond the terminating lugs shall be provided by the customer. Bus stubs or bussing in the service terminating space used for terminating the utility service shall have mounting bolts/spades in accordance with NEMA standards. The service cable termination lugs shall be compatible with the size and type of service being installed. The termination lugs for the neutral and each of the phase conductors shall be rigidly and permanently affixed in the service termination space and all properly grouped at one location. If the neutral is insulated from the enclosure, a bonding screw or jumper shall be provided. Terminating lugs shall be mounted with a minimum of 1-1/2" clear work space between two adjacent uninsulated line lugs of different voltage, any in-between uninsulated line lugs and grounded metal. For equipment above 400 amps, the horizontal spacing may be reduced if insulated barriers are used or if a 1-1/2" radial separation is maintained.

### 5.3 Service Terminations Enclosures

Wire-ways in the service termination space designed for terminating the utility service lateral shall be clearly identified for such use. Termination shall be made in the service termination enclosure or in a specifically designed space of a removable and sealable access plate.

### 5.4 Cable Layout

The layout or design of the service termination enclosure must allow adequate space for service cable bending. Knockouts in the cable wire-ways should be positioned to minimize service cable bending. Minimum bend radius of secondary service cables = 8 X "outside diameter" and primary cables = 12X "outside diameter".

### 5.5 Sealing

The termination enclosure, socket enclosure, and test bypass block section shall be sealable and isolated from other enclosure sections which are accessible to the customer.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:	Revision: 9		Page 3 of 26
JL	MB	DA	4/14			

**5.6 Labeling**

The manufacturer's rating label shall show (a) whether the socket enclosure is designed for overhead service entry, underground service entry, or both, (b) termination lugs are designed for both copper and aluminum conductors, and (c) the wire size range of the lugs.

**5.7 Clearance**

The minimum distance between the point of entry of the underground service conductors into the socket enclosure and the bottom of the hot bus terminating lugs shall be 8" for sockets up to 125 amps, and 11" for sockets rated 126 to 200 amps.

**6.0 METERING TRANSFORMER ENCLOSURES****6.1 Definition**

A metering transformer installation consists of current transformers and potential transformers mounted in a metal cabinet with a watt-hour meter and its accompanying manual "test-bypass" facilities. **Automatic and lever style by-pass facilities are not approved.** A separate mounting device may be provided for the meter.

**6.2 Customer Responsibility**

The customer shall furnish and install a metal cabinet for enclosure of the metering transformers. The enclosures short circuit duty rating will match or exceed the given fault duty.

**6.3 Enclosure Covers**

All covers must have a hinged door. All covers shall have a caution sign with the label "**DO NOT BREAK SEALS - NO FUSES INSIDE**".

**6.4 Locations**

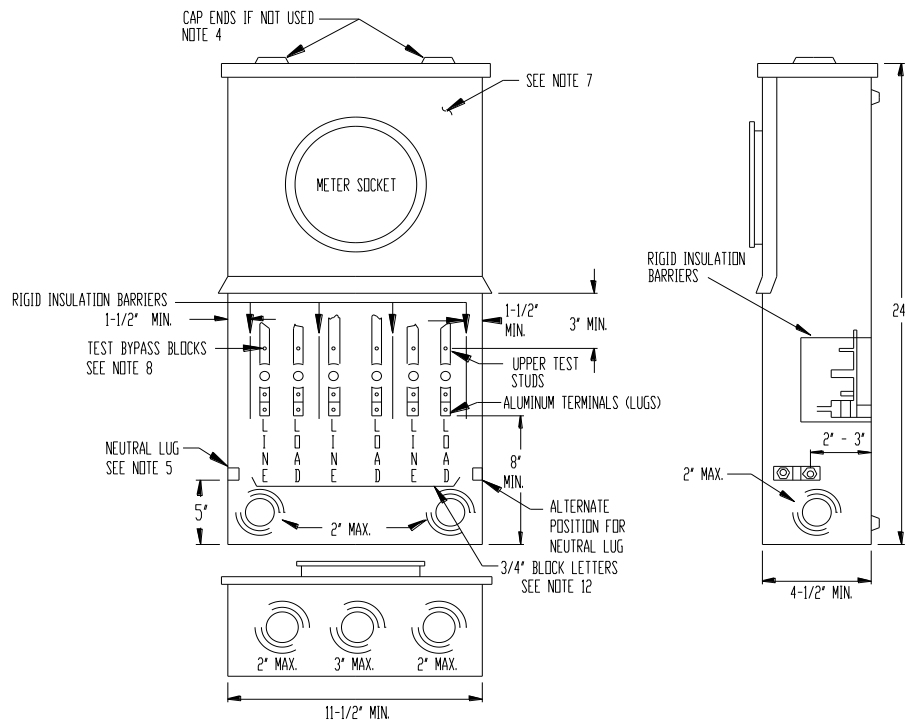
Metering transformer cabinets may be mounted either indoors or outdoors provided outdoor installations are rain tight. Cabinets may be mounted vertically provided that the cables shall enter and leave the cabinet in such a manner that NVE can conveniently install and connect the current transformers.

**7.0 SINGLE CUSTOMER METER INSTALLATIONS****7.1 Single Customer, 0 - 200 Amp, Overhead and Underground**

The customer shall furnish, install and maintain an approved meter socket with a NVE approved "manual test-bypass" facilities (*only exception is a 100 amp panel that is exclusively for night time lighting load*) to permit NVE to bypass and de-energize the meter socket for all commercial three phase and single phase services.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:	Revision: 9		Page 4 of 26
JL	MB	DA	4/14			

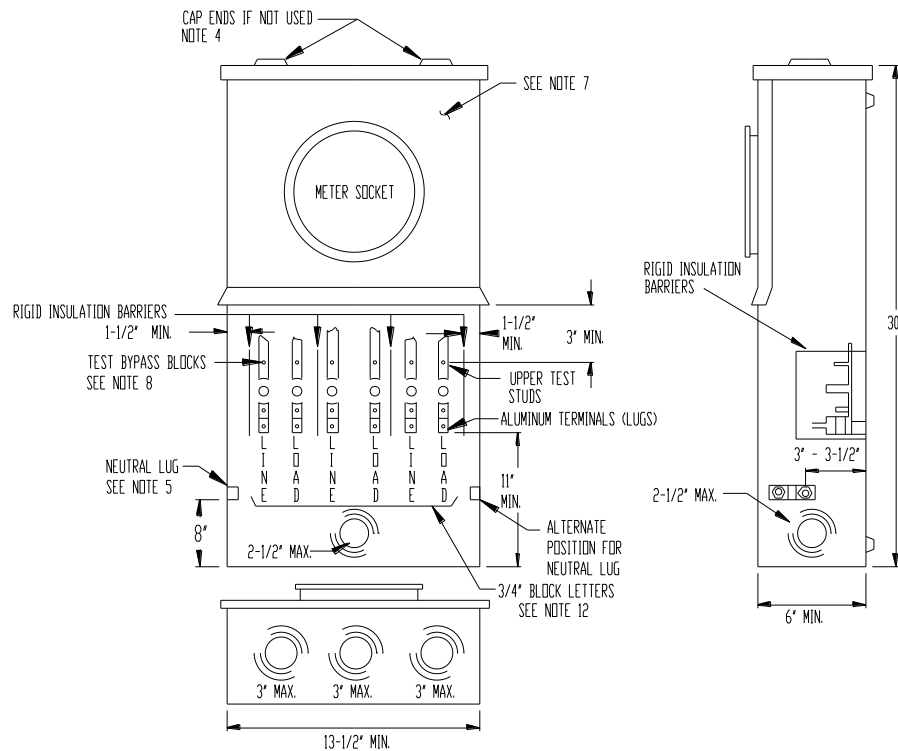
## 7.2 0 - 125 Amp, Panel Details

**NOTES:**

1. This device shall be used for commercial / industrial, and may be used for multi-family residential (not separately metered) and other types of occupancies.
2. This device may be used as a combination terminating, pull, and meter socket box for an underground service.
3. Aluminum bodied lugs for #6 through 1/0 wire.
4. Hubs capped off if used for underground feed.
5. Insulated bondable vertical lay-in, double neutral lug with 1/0 wire capacity, mounted on either sidewall.
6. Test-bypass block shall be bussed or wired to socket jaws or terminals which permit NVE to bypass and de-energize the meter socket.
7. All section panels shall be independently removable. Upper panel shall be non-removable when meter is in place. Meter socket shall be mounted on support and attached to upper panel. Lower panel shall be sealable and permanently labeled:  
**"DO NOT BREAK SEALS - NO FUSES INSIDE"**.
8. Test-bypass block detail on drawing Page 7.
9. For 3 phase 4 wire, connect 7th jaw to body of neutral lug with #8 copper wire.
10. Reference only (not for new construction): 3 phase 4 wire delta, identify right hand test-bypass block (2 poles) as power leg.
11. Decals on inside back of enclosure in 3/4" minimum block letter labeling.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 5 of 26

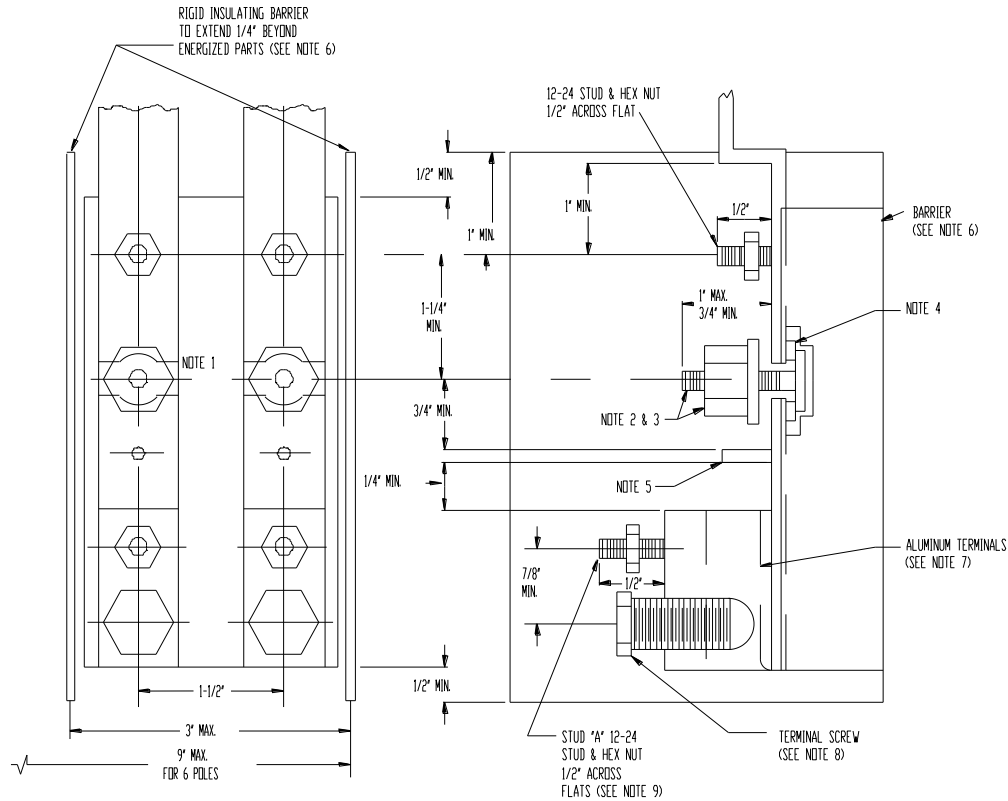
## 7.3 126 - 200 Amp, Panel Details

**NOTES:**

1. This device shall be used for commercial / industrial, and may be used for multi-family residential (not separately metered) and other types of occupancies.
2. This device may be used as a combination terminating, pull, and meter socket box for an underground service.
3. Aluminum bodied lugs for 1/0 through 250 kcm wire.
4. Hubs capped off if used for underground feed.
5. Insulated bondable vertical lay-in, double neutral lug with 250 kcm wire capacity, mounted on either sidewall.
6. Test-bypass blocks shall be bussed or wired to socket jaws or terminals which permit NVE to bypass and de-energize the meter socket.
7. All section panels shall be independently removable. Upper panel shall be non-removable when meter is in place. Meter socket shall be mounted on support and attached to upper panel. Lower panel shall be sealable and permanently labeled: **"DO NOT BREAK SEALS - NO FUSES INSIDE"**.
8. **Test-bypass block** detail on drawing Page 7.
9. For 3 phase 4 wire, connect 7th jaw to body of neutral lug with #8 copper wire.
10. Reference only (not for new construction) 3 phase 4 wire delta, identify right hand test-bypass block (2 poles) as power leg.
11. Decals on inside back of enclosure in 3/4" minimum block letter labeling.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 6 of 26

**TEST BYPASS BLOCK DETAIL**



**NOTES:**

1. Strike distance between upper and lower bus sections shall not be less than 1/4" when circuit-closing nut is backed off.
2. Circuit-closing nut shall be a hex nut 5/8" across flats with plated copper washer attached and have threads counter-bored at bottom to facilitate reinstallation. Bolt head shall be secured in place to prevent turning and back out.
3. The circuit-closing nut and bolt assembly shall maintain the applied contact pressure between the plated copper washer and the bus members of the test-bypass block.
4. Insulating washer shall be made from dimensionally stable, non-tracking material and shall provide a minimum 1/8" creep distance between the bolt and the bus sections. Bus sections shall be plated.
5. Wire stops shall extend to center of terminal opening or beyond.
6. Rigid insulating barriers shall project at least 1/4" beyond any energized parts when the maximum wire size is installed.
7. Lugs shall be aluminum, and sized for the panel Amp rating. The opening shall extend through the terminal body and, if wire hole is round, shall be chamfered as necessary to facilitate installation of the largest size wire.

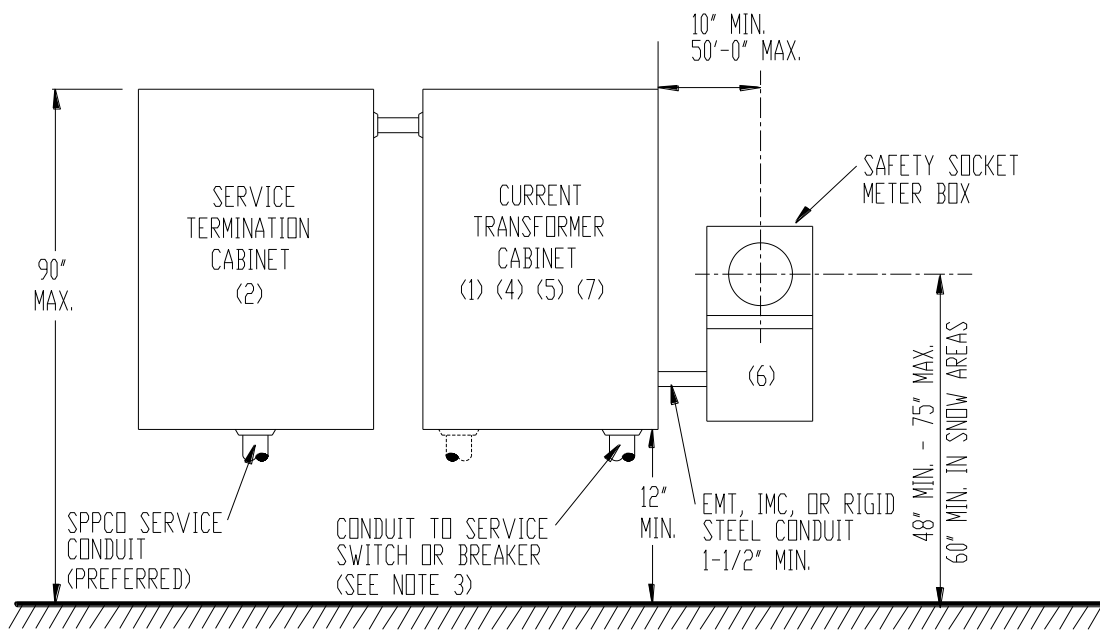
				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		<b>CM0001M</b>
				<b>ELECTRIC METERING COMMERCIAL &amp; INDUSTRIAL</b>		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 7 of 26

8. The terminal screw may be of the Allen type (3/16" across flats for 100 amp, 5/16" across flats for 200 amp). If stud "A" is a part of the terminal screw, the terminal screw shall be 5/8" hex across flats.
9. Stud "A" shall be located in the clear area between the terminating lug and the circuit-closing nut, and may be positioned on the terminal body, on the terminal screw, on the bus member, or incorporated as part of the wire stop.
10. All designs must receive approval of the EUSERC Standards Committees prior to production.

**7.4 Underground Service, 201 - 400 Amperes, Current Transformer Metering.**


For a single underground C/I service which is to be metered using current transformers the customer shall furnish, install and maintain a separate termination cabinet, current transformer cabinet and safety socket meter box as shown below.

For overhead service see Section 7.6.



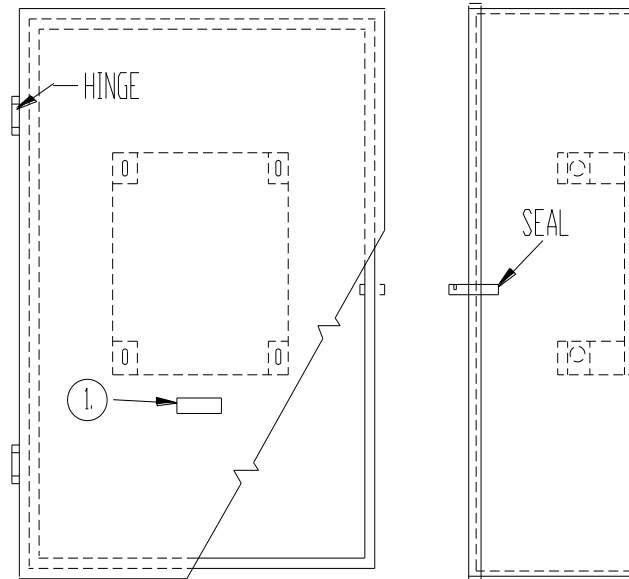
**NOTES:**

1. Fault duty must match or exceed panel rating.
2. **NVE will pull and terminate its service conductors directly to the bottom termination facilities in the service termination cabinet. It shall be the customer's responsibility to provide the tie between the termination cabinet and the CT cabinet and the load side of the termination cabinet.**
3. The customer's service conductors shall normally exit the current transformer cabinet at and within two inches of the bottom corner.
4. The customer shall furnish lugs and connect his service entrance conductors to the load side of the current transformer mounting base.
5. For dimensions of **current transformer cabinet**, see **Page 9**.
6. For dimensions of **safety socket meter box**, see **Page 15**.
7. For three-phase four wire service, a mounting bracket for three CT's is required.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		<b>CM0001M</b>
				<b>ELECTRIC METERING COMMERCIAL &amp; INDUSTRIAL</b>		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 8 of 26



**CURRENT TRANSFORMER (CT) CABINET: 201 - 400 AMP**



**FAULT RATING MUST MATCH OR EXCEED PANEL RATING**

FIGURE 1 HINGED, FLANGED COVER

① CAUTION SIGN

DO NOT BREAK SEAL  
NO FUSES INSIDE

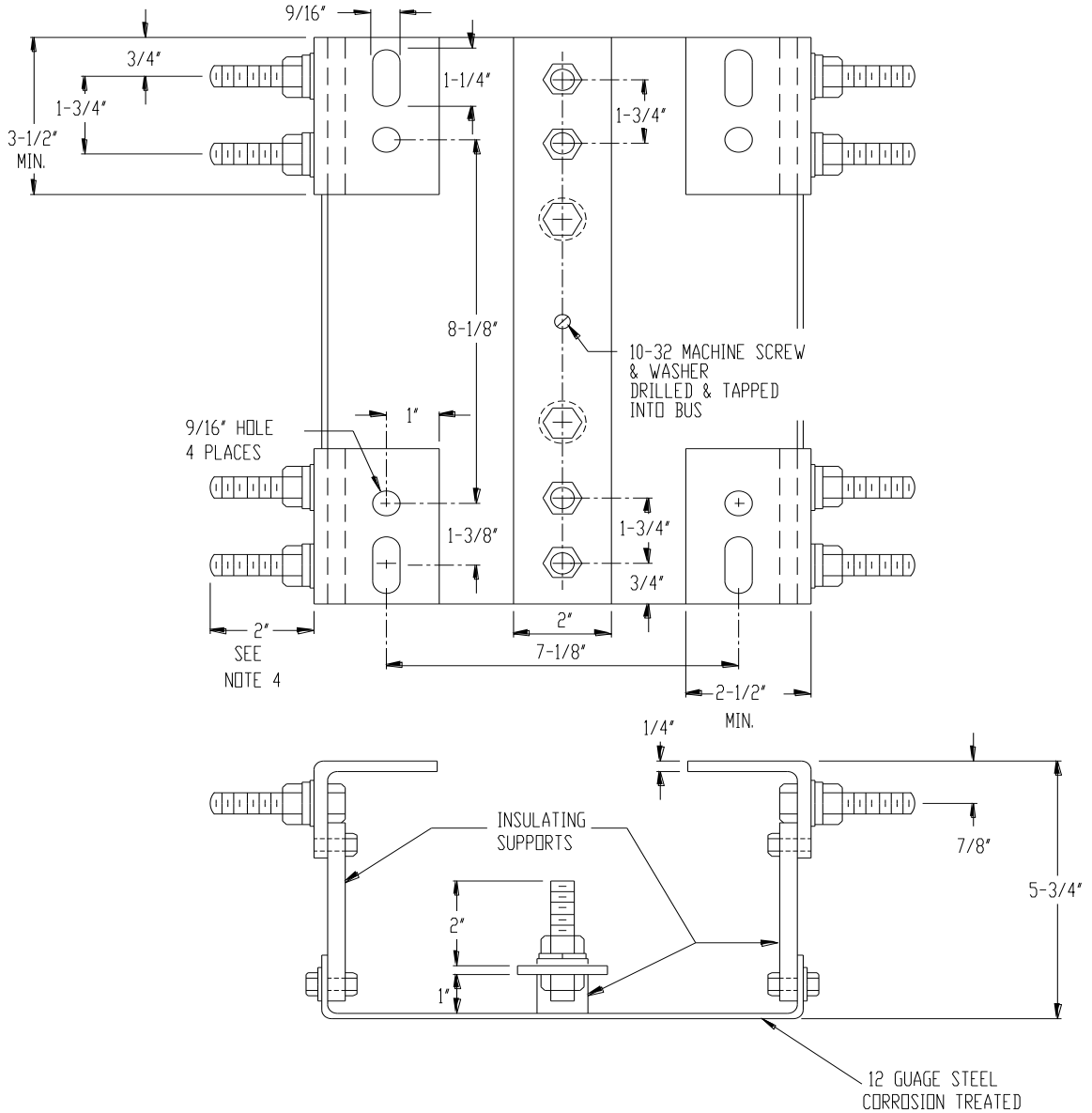
TYPE OF SERVICE	MIN. CABINET SIZE	MOUNTING BASE
4 WIRE	30" W x 36" H x 11" D	3 CT BASE

**NOTES:**

1. Cover shall be sealable.
2. Customer shall furnish lugs and connect cable to current transformer mounting base for load side only.
3. **Current transformer cabinet shall not be used as a splicing chamber.**
4. When exposed to weather, cabinet shall be raintight.
5. Grounding lug shall be provided and secured to CT cabinet.
6. See Pages 10 and 11 for CT mounting bracket.

 <b>NVEnergy™</b>	VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD	<b>CM0001M</b>								
	<b>ELECTRIC METERING COMMERCIAL &amp; INDUSTRIAL</b>									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Drawn:</td> <td style="width: 25%;">Eng:</td> <td style="width: 25%;">Appr:</td> <td style="width: 25%;">Date:</td> </tr> <tr> <td>JL</td> <td>MB</td> <td>DA</td> <td>4/14</td> </tr> </table>	Drawn:	Eng:	Appr:	Date:	JL	MB	DA	4/14		Revision: 9 Page 9 of 26
Drawn:	Eng:	Appr:	Date:							
JL	MB	DA	4/14							

**CURRENT TRANSFORMER BRACKET (2 CT'S) 201 - 400 AMP**

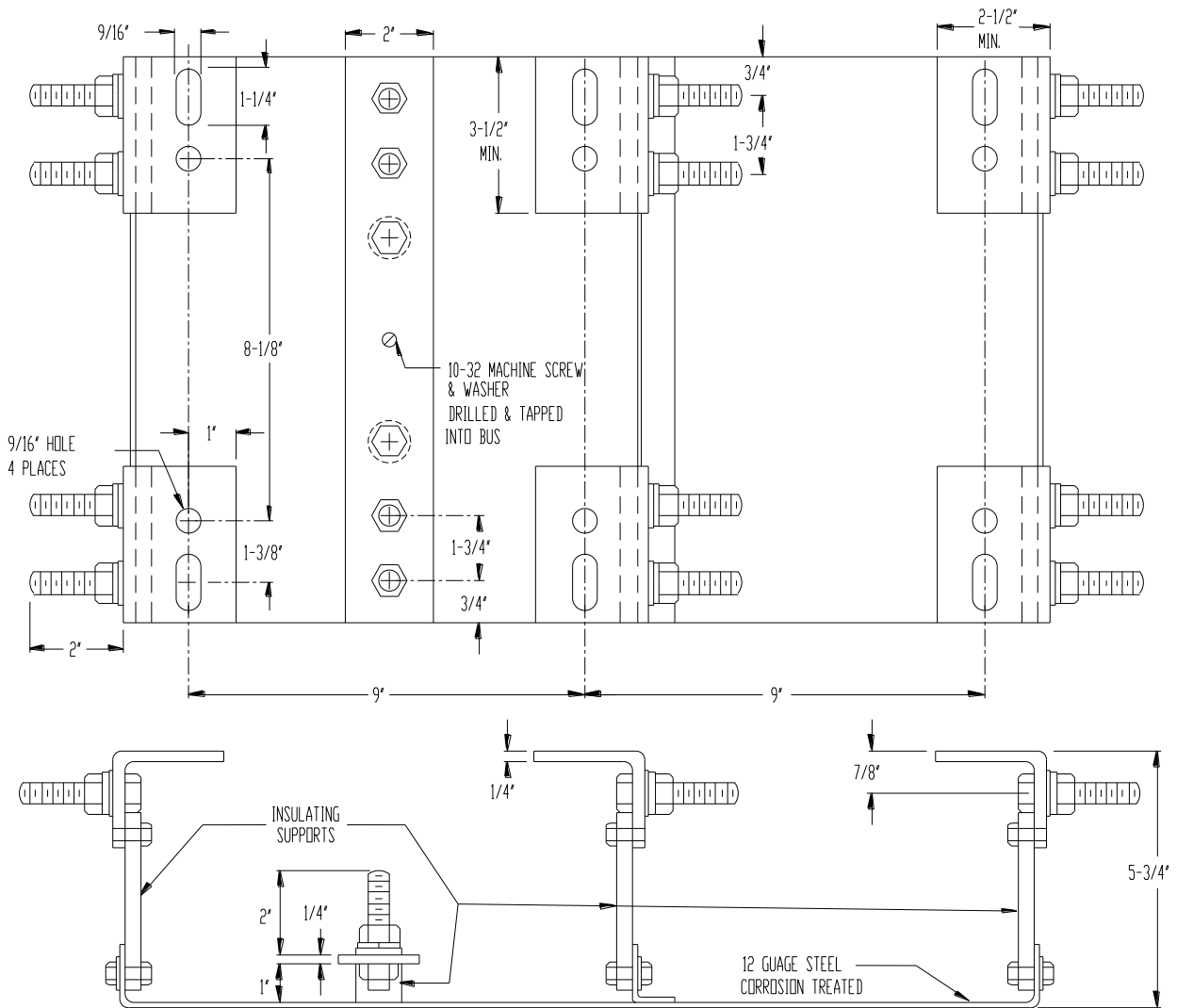


**NOTES:**

1. Fault duty rating must match or exceed panel rating.
2. For application see drawing Page 8.
3. Details shown on end view for left leg and bus assembly apply to all four leg assemblies.
4. 1/2" - 13 UNC x 2", 8 typical, hex nuts, lock washer and flat washer.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 10 of 26

**CURRENT TRANSFORMER BRACKET (3 CT'S) 201 - 400 AMP**



**NOTES:**

1. Fault rating must match or exceed panel rating.
2. For application see drawing Page 8.
3. Details shown on end view for left leg and bus assembly apply to all six leg assemblies.
4. 1/2" - 13 UNC x 2", 12 typical, hex nuts, lock washers and flat washer.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		<b>CM0001M</b>
				<b>ELECTRIC METERING COMMERCIAL &amp; INDUSTRIAL</b>		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 11 of 26

**SERVICE TERMINATION CABINET**

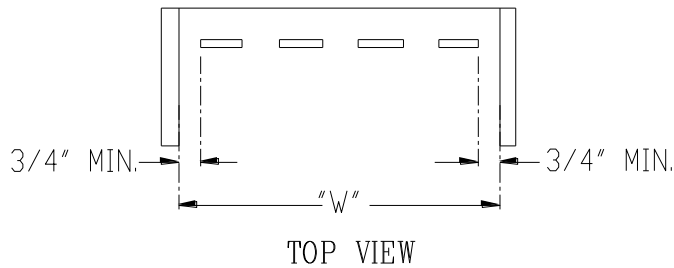
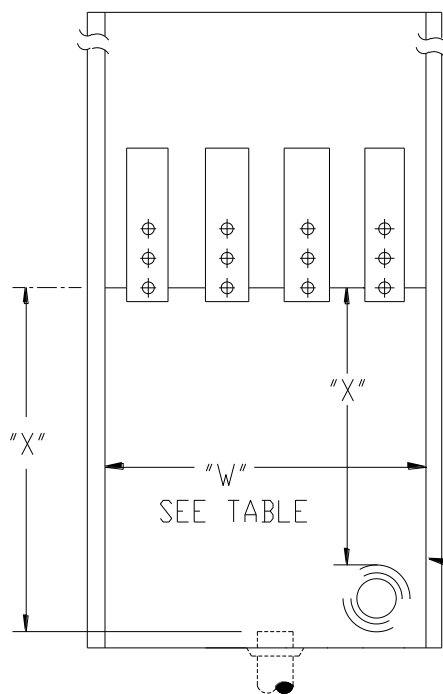
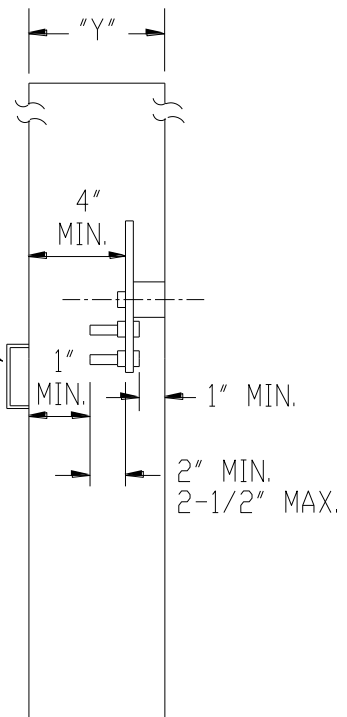


TABLE 1: MINIMUM PULLBOX DIMENSIONS			
SERVICE AMPACITY	W"	Y"	X"
	4-WIRE		
0 - 200	14"	6"	11"
201 - 400	14"	6"	22"
401 - 800	22"	11"	26"
801 - 1200	30"	11"	26"



LIFTING HANDLES  
SEE NOTE 3

SEALING PROVISIONS  
SEE NOTE 3



**NOTES:**

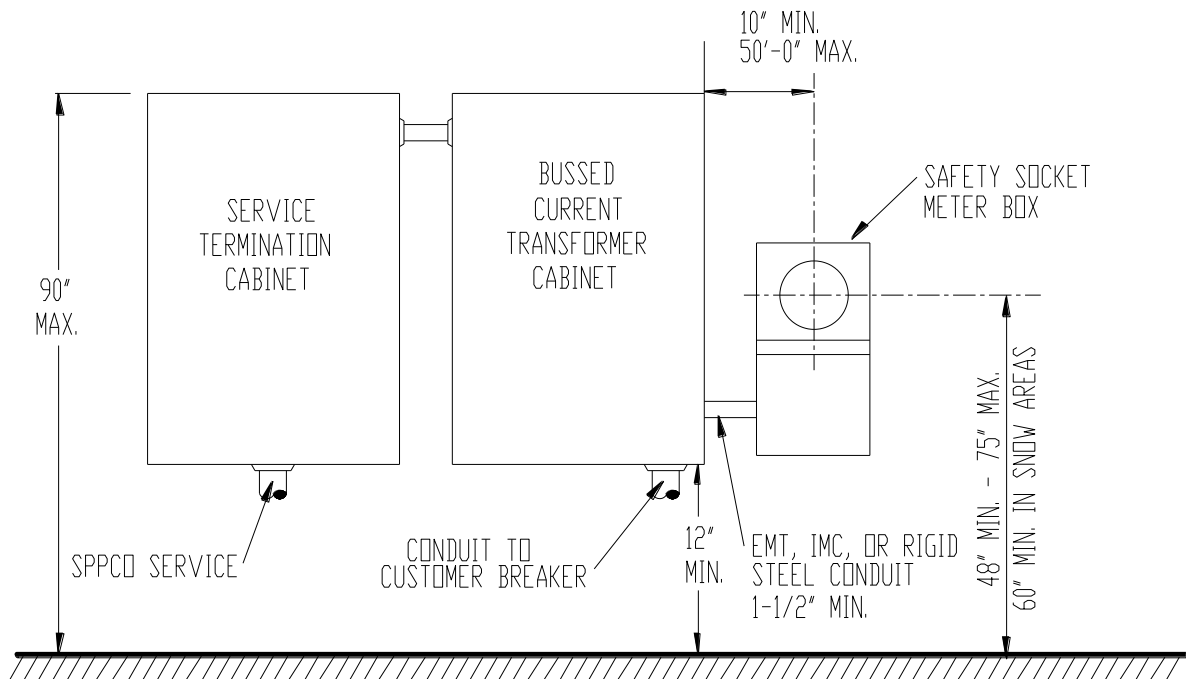
1. Fault duty rating must match or exceed panel rating.
2. **The above minimum dimensions in Table 1, are for the case where the conduit enters the bottom of the pull box and all load conductors exit above the terminals. Where the service conduit enters from the side/back (bottom conduit entrance preferred) of the pull box the "X" dimension shall be taken from the closest portion of the conduit to the nearest termination bolt.**
3. Pull box covers shall be removable, sealable, provided with two lifting handles, and limited to a maximum size of 9 square feet in area. Sealing provisions shall consist of two drilled stud and wing nut assemblies on opposite sides on the panel. All securing screws shall be captive.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 12 of 26

**7.5 Underground service, 401-800 Amperes, Current Transformer Metering.**

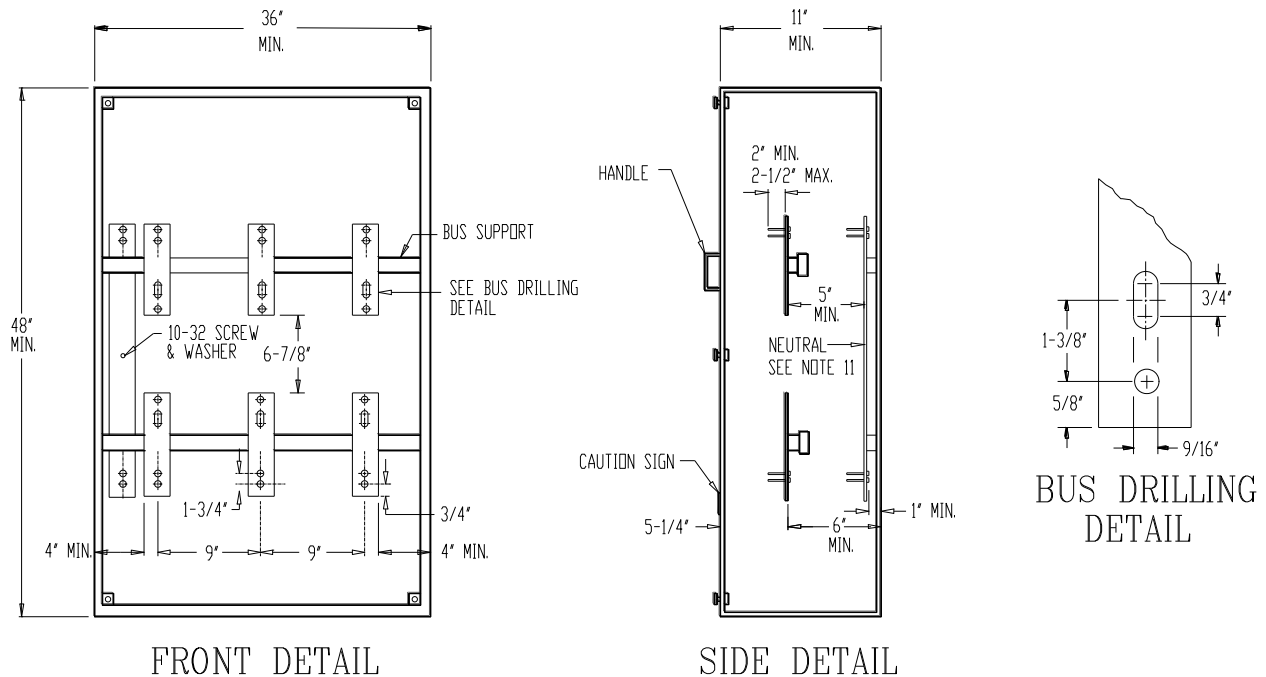
For a single underground commercial or industrial service which is to be metered using current transformers, the customer will furnish, install and maintain a service termination cabinet, current transformer cabinet and safety socket meter box as shown below. For overhead service see Section 7.6.

For compactness of equipment and aesthetics, it may be desirable to consider the installation of a switchboard service section.


**NOTES:**

1. Fault duty rating must match or exceed the panel rating.
2. **NVE will pull and terminate its service conductors directly to the bottom of the termination facilities in the service termination cabinet. It shall be the customer's responsibility to provide the tie between the termination cabinet and the CT cabinet and the load side of the termination cabinet.**
3. The customer's service entrance conductors shall normally enter the service termination cabinet at or within two inches of the bottom and leave the cabinet at or within two inches of the opposite end.
4. The customer shall furnish lugs and connect his service entrance conductors to the load side of the service termination cabinet.
5. For dimensions of **current transformer cabinet**, see **Page 9**. For dimensions of the **service termination cabinet**, see **Page 12**.
6. For dimensions of **safety socket box**, see **Page 15**.
7. For three phase four wire service, bussing for three CT's is required.

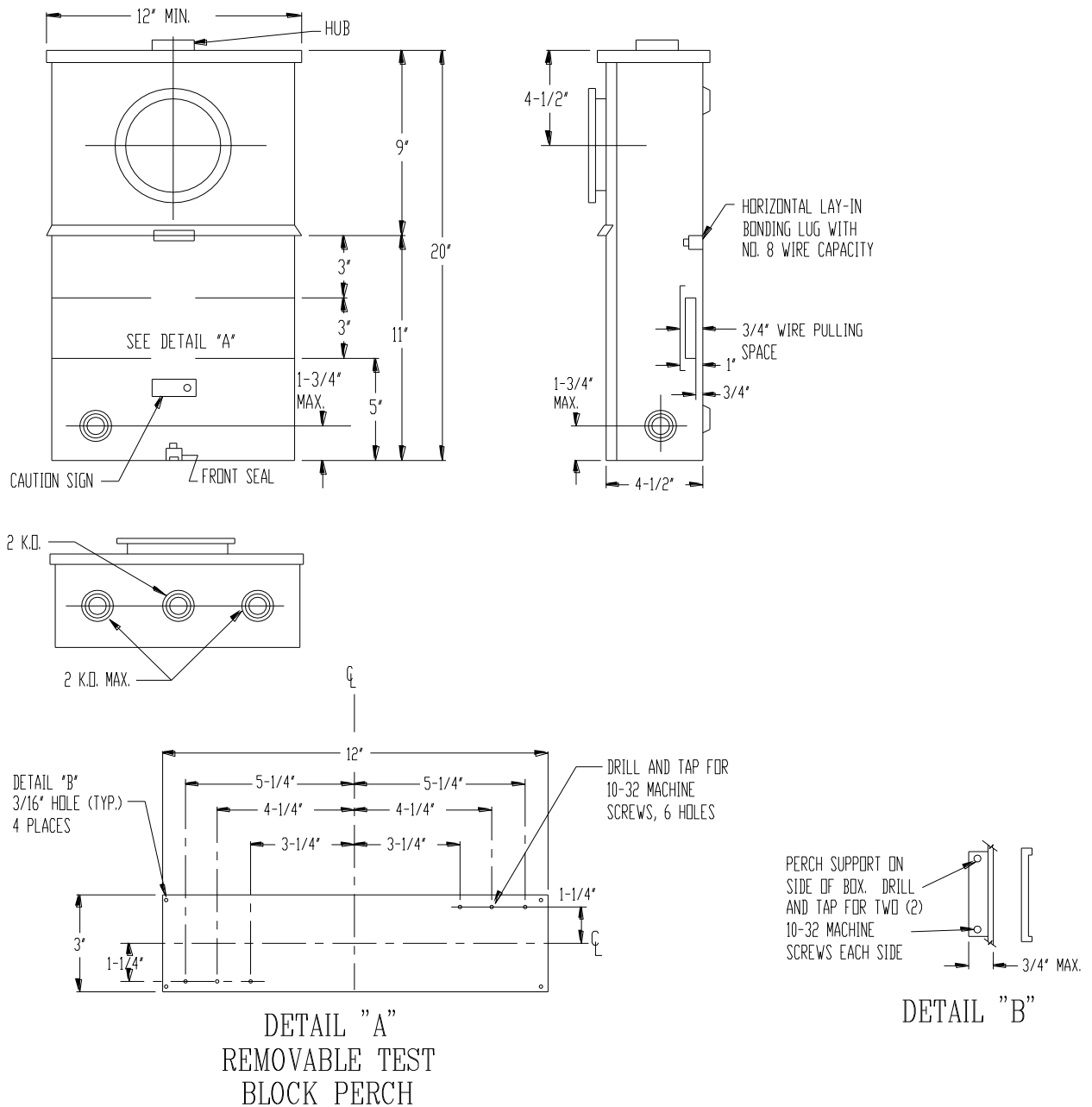
				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 13 of 26

**THREE CURRENT TRANSFORMER CABINET: 401 - 800 AMP****NOTES:**

1. When the service switch exceeds 800 amps, consult NVE.
2. **This cabinet may be used when the service switch or breaker is 800 amps or less.**
3. The Fault duty rating must match or exceed the panel rating.
4. The use of a standard switchboard service section in lieu of metering arrangements using this cabinet may prove to be more economical for the customer and should be investigated.
5. A hinged cover must be used. Clearance must be provided to open the cover when the cabinet is installed.
6. Cover shall be sealable.
7. When exposed to weather, cabinet shall be rain tight.
8. A grounding lug shall be provided, and secured to cabinet.
9. When available space precludes the use of above minimum dimensions, consult NVE.
10. **No bus bar may be more than 4 inches wide.**
11. Neutral may be cable or bus bar and may be located on either side of the cabinet.
12. Current transformer cabinet shall not be used as a splicing chamber.
13. Customer shall furnish lugs and connect cable to load sides of bus stubs. NVE will terminate on lugs for underground service.


				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				<b>ELECTRIC METERING COMMERCIAL &amp; INDUSTRIAL</b>		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 14 of 26

**SAFETY SOCKET METER BOX**



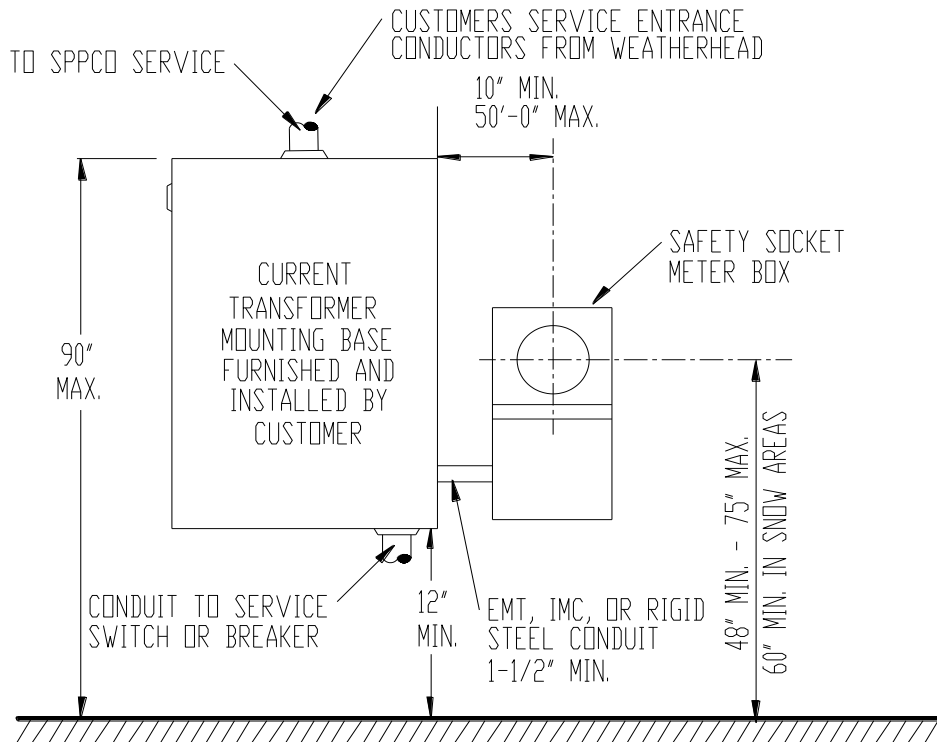
**NOTES:**

1. All section covers shall be independently removable. Upper cover shall be non-removable when meter is in place. Lower cover shall be sealable and permanently labeled: **"DO NOT BREAK SEALS - NO FUSES INSIDE"**

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		<b>CM0001M</b>
				<b>ELECTRIC METERING COMMERCIAL &amp; INDUSTRIAL</b>		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 15 of 26


**7.6 Overhead service, 201 - 600 Amp, Current Transformer Metering.**

For single overhead commercial or industrial service which is to be metered using current transformers, the customer shall furnish, install, own and maintain a separate current transformer cabinet and safety socket meter box and required service entrance conductors, conduit, and weather head to the point of attachment of NVE's overhead service.



**NOTES:**

1. Fault duty rating must match or exceed panel rating.
2. The customer's service entrance conductors shall enter the current transformer cabinet at the top and leave the cabinet at or within two inches of the bottom.
3. The customer shall furnish riser conduit, weather head, lugs and connect his service entrance conductors to the line and load sides of the current transformer mounting base.
4. **The customer's neutral conductor shall be continuous without splice through the current transformer cabinet.**
5. For dimension of the **current transformer cabinet**, see **Page 9**.
6. For dimension of **safety socket box**, see **Page 15**.
7. For three phase four wire service a mounting bracket for three CT's is required.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		<b>CM0001M</b>
				<b>ELECTRIC METERING COMMERCIAL &amp; INDUSTRIAL</b>		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 16 of 26



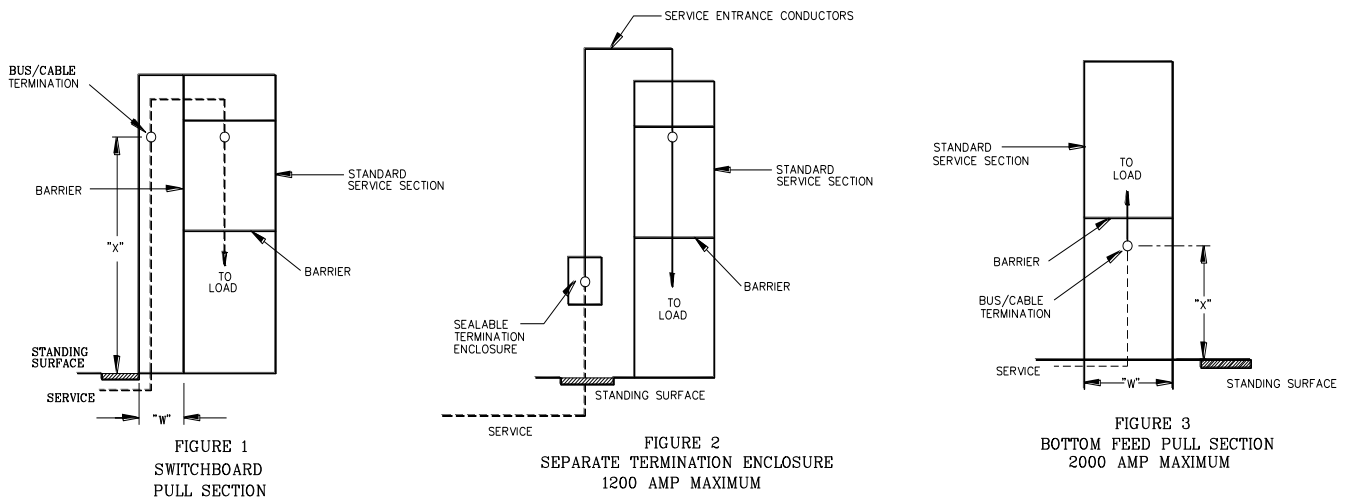
**7.7 Underground service, 201 Amps and above, Current Transformer Metering in Switchboard Service Sections.**

For a single underground C/I service which is terminated in a multi-section manufactured freestanding, self-supporting switchboard, the customer will furnish, install and maintain a switchboard service section with accompanying provisions for the underground service termination. See Section 7.8 for overhead switchboard service.

A switchboard service section is designed and manufactured specifically for terminating the service entrance conductors and housing the metering transformers, meters and associated test equipment, and may include the customer's service switch or breaker.

Typical arrangements of switchboard service sections with provision for a pull box for underground service conductor termination are illustrated below. **For switchboard details, see SB0001M.**

TABLE 2 - MINIMUM PULL SECTION DIMENSIONS 4-WIRE		
SWITCHBOARD RATING (AMPERES)	MINIMUM ACCESS OPENING DIMENSION "W"	TERMINATION HEIGHT "X"
400 - 800	24"	42" MIN. - 72" MAX.
801 - 1200	30"	
1201 - 2000	35"	
2001 - 3000	42"	60" MIN. - 72" MAX.
3001 - 4000	44"	60" MIN. - 72" MAX.



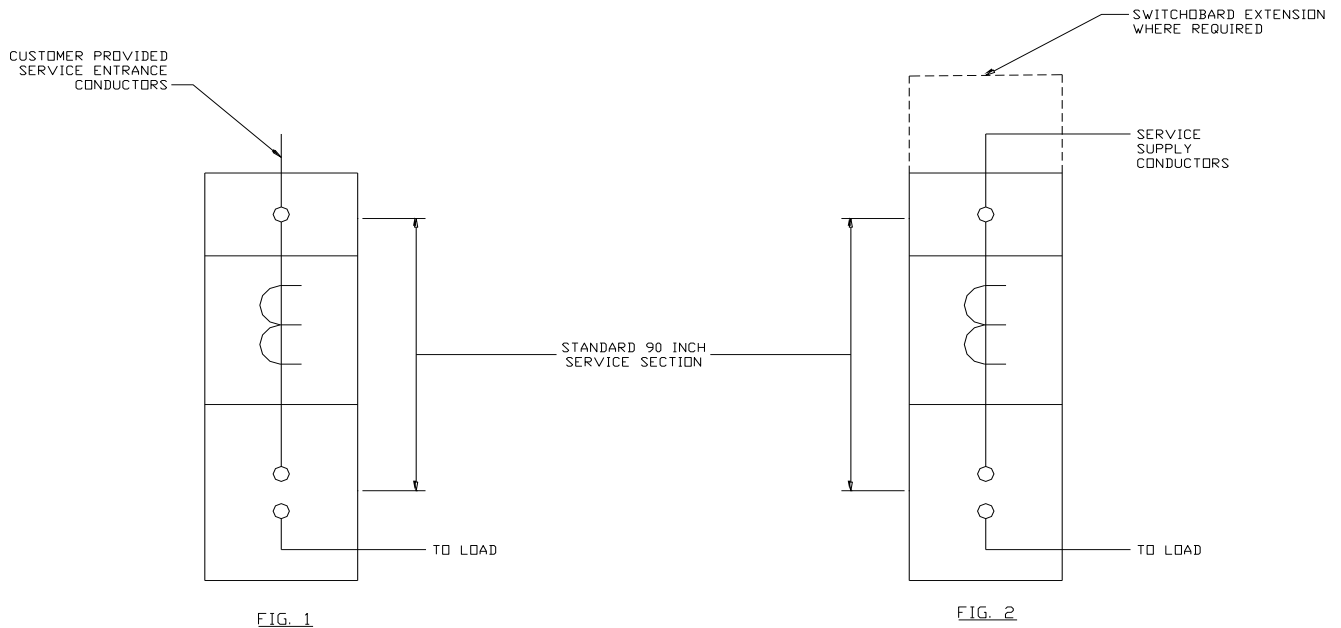
**7.8 Overhead service, 201 Amps and above, Current Transformer Metering in Switchboard Service Sections.**

For a single overhead C/I service which is terminated in a multi-section manufactured freestanding, self-supporting switchboard, the customer will furnish, install and maintain a switchboard service section with accompanying provisions for the above grade (overhead) service termination. See Section 7.7 for underground switchboard service.

A switchboard service section is designed and manufactured specifically for terminating the service entrance conductors and housing the metering transformers, meters and associated test equipment, and may include the customer's service switch or breaker.

Typical arrangements of switchboard service sections with provisions for overhead service conductor terminations are illustrated. **For switchboard details, see SB0001M. See SB0001M, Section 10, Table 2 for dimensions.**

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:	Revision: 9		Page 18 of 26
JL	MB	DA	4/14			



**8.0 MULTIPLE METER INSTALLATIONS: 2-6 METERS; 7+ METERS**

8.1 Group meter installations are required for multi-customer buildings where each occupant has an individual meter. Each individual meter shall be considered as single customer. *Submittal of "shop drawings" is required for all commercial multi-metered installations.*

8.2 The **maximum** number of disconnects is six: (NEC #230-71), *each disconnect (no fuses) shall simultaneously open all poles:* NEC #230-74.

8.3 **Meter Identification** and service disconnect shall clearly identify the location served. Identification is a unit or street number and will be marked by a stamped/engraved metal /plastic identification plate.

8.4 **Customer Service Entrance Conductors** shall extend from NV Energy's service termination point to the line side of each meter socket jaw. NVE is not responsible for the wiring in the customer owned raceway/gutter.

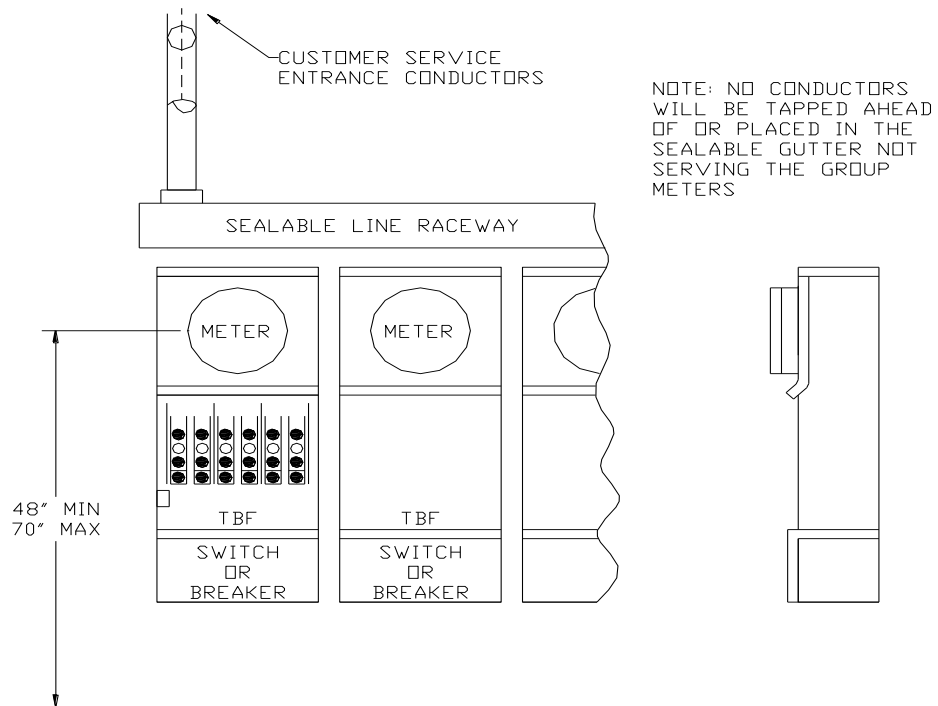
8.5 **Ampacity Rating** of the installation is given by: 2-6 Meters; Ampacity of service termination facility. 7 + Meters; Main service disconnect rating. Fault duty rating must be obtained from NVE.

8.6 **Center line spacing** between meter sockets shall be a minimum:  
7-1/2" Horizontal 8-1/2" Vertical

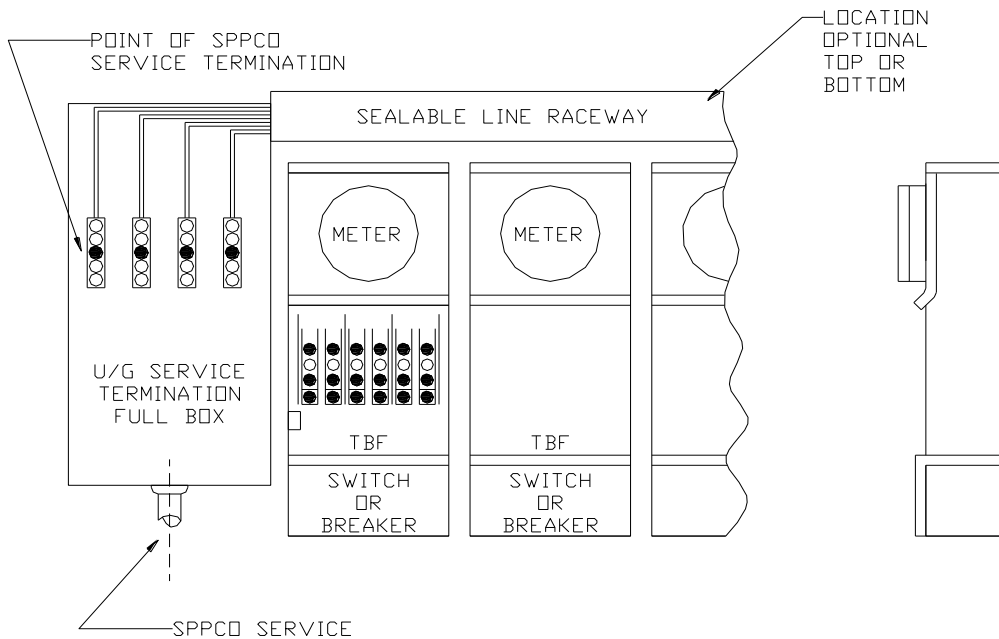
8.7 NVE will provide blank covers for empty sockets.


				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 19 of 26

**8.8 OVERHEAD SERVICE, GROUPED METER INSTALLATION, WITHOUT A MAIN SWITCH (6 METERS MAX.)**

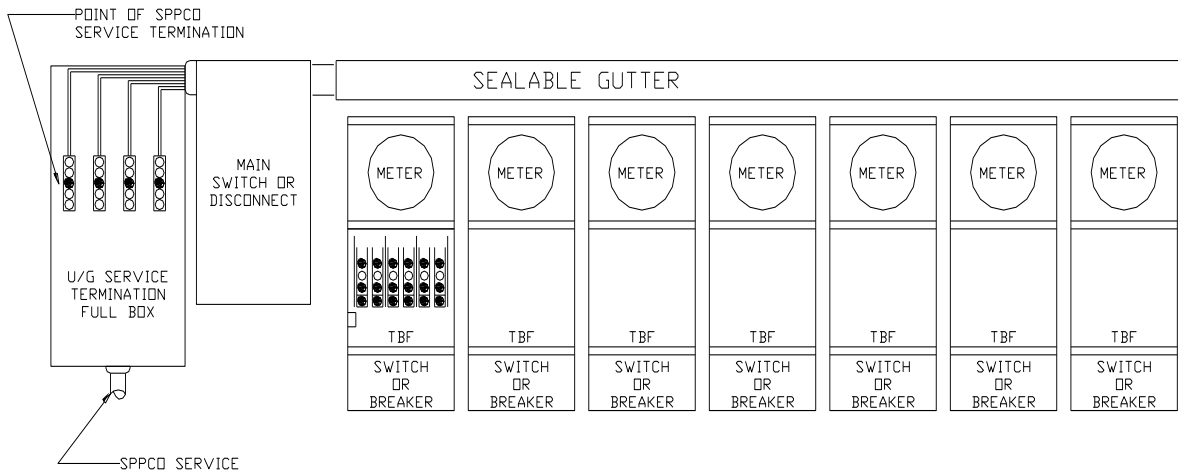


**8.9 UNDERGROUND SERVICE, GROUPED METER INSTALLATION, WITHOUT A MAIN SWITCH (6 METERS MAX.)**

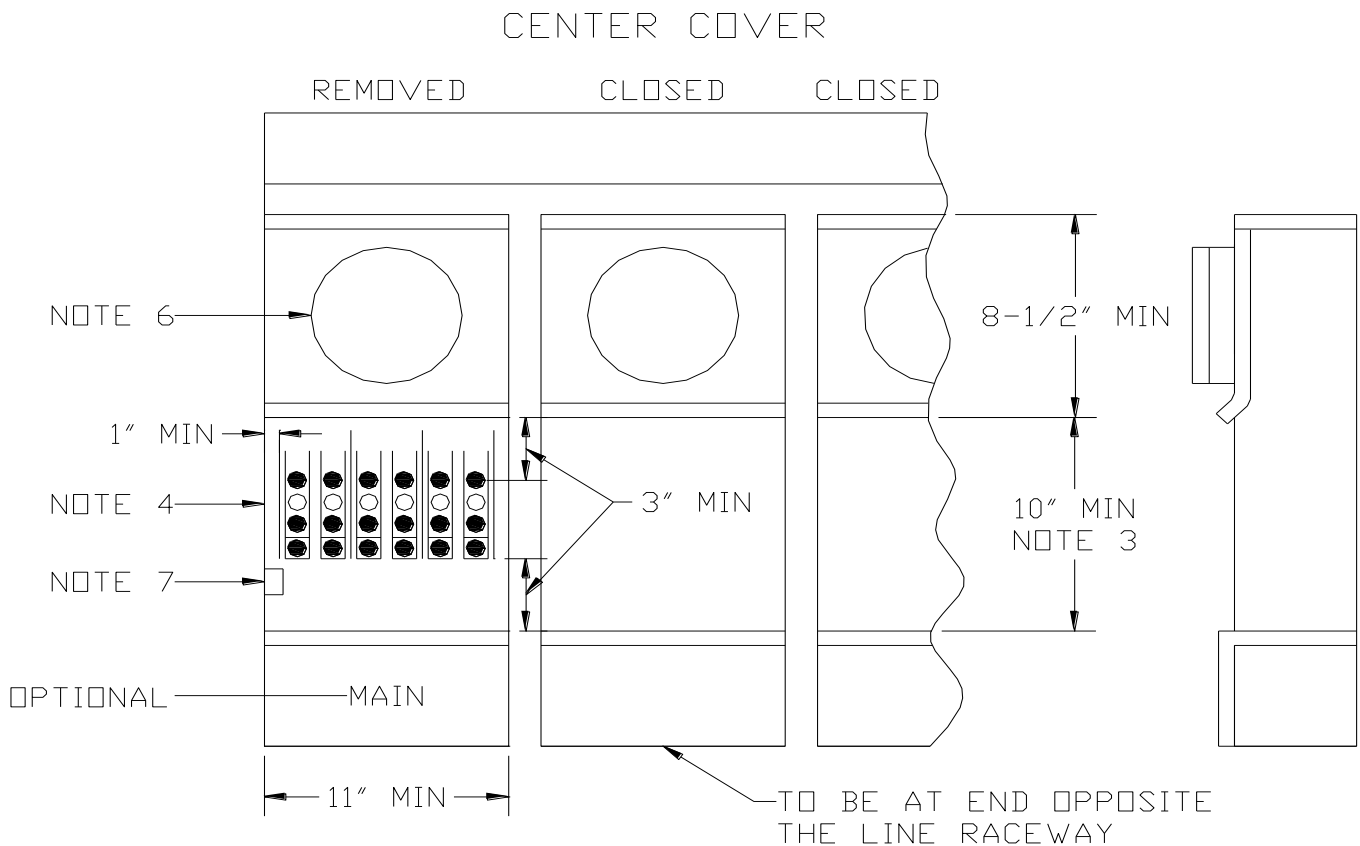


				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:			Revision: 9
JL	MB	DA	4/14			Page 20 of 26

**8.10 GROUPED METER INSTALLATION WITH A MAIN SWITCH**



**8.11 SAFETY SOCKET BOX WITH TEST BY-PASS FACILITIES FOR MULTIPLE SELF CONTAINED METER INSTALLATION**



**NOTES:**

1. This device will be used for multiple commercial and industrial meter installations mounted in a ganged array.
2. Manual "test-bypass" blocks with rigid insulating barriers shall be installed and wired or bussed to a line raceway and also wired or bussed to the meter socket then to the main switch by the manufacturer. Blocks and barriers shall conform to Page 7 requirements with physical arrangement conforming to Pages 5 & 6. Connection sequence is line-load, line-load, line-load from left to right.
3. Minimum access opening to test bypass blocks shall be 11" x 10".
4. Upper test connector stud shall be a minimum of 3" below upper panel.
5. See Metering - General section for meter socket clip requirements.
6. All section covers shall be independently removable. Upper cover shall be non-removable when meter is installed. Meter socket shall be mounted on support and attached to panel. Test bypass cover panel shall be sealable and permanently labeled: "**DO NOT BREAK SEAL - NO FUSES INSIDE**".
7. When a neutral is required for metering or testing, an insulated neutral terminal, mounted on either side, shall be provided behind each test bypass cover panel. The terminal shall be readily accessible when the cover is removed and shall be individually connected to the neutral bus with a minimum of #8 copper wire.
8. 3 phase, 4 wire: Connect 7th jaw to body of neutral lug with #8 copper wire
9. For reference (not for new construction): 3 phase, 4 wire delta , identify right hand test bypass block (2-poles) as power leg.
10. Permanent line-load labels on inside back of enclosure in 3/4" (Min.) high block letters.
11. Minimum depth shall be 4-1/2" for 1 - 100 amps and 6" for 101 - 200 amps.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:	Revision: 9		Page 22 of 26
JL	MB	DA	4/14			

**9.0 COMMERCIAL/ INDUSTRIAL 100 & 200 AMP SERVICE PEDESTALS**

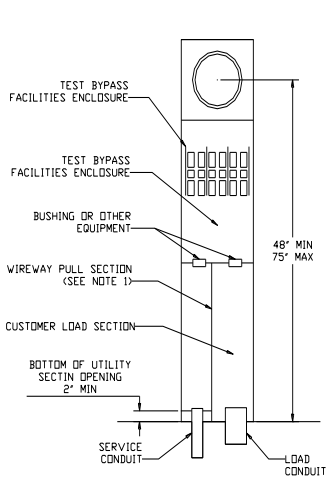


FIG 1. SERVICE PEDESTAL EXPOSED METER TYPE

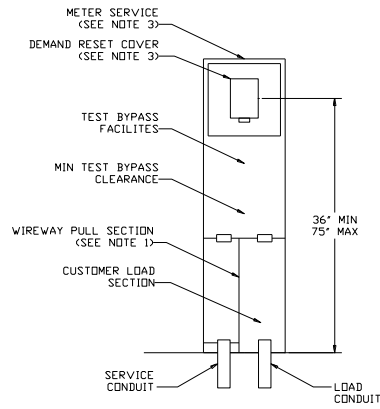
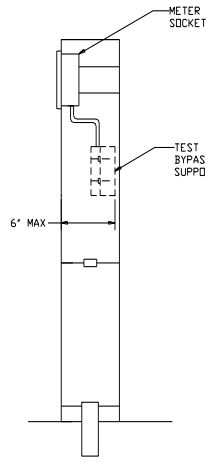


FIG 2A-SERVICE PEDESTAL ENCLOSED METER TYPE

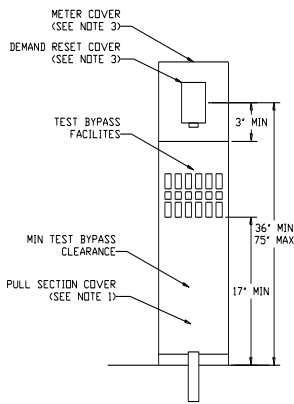
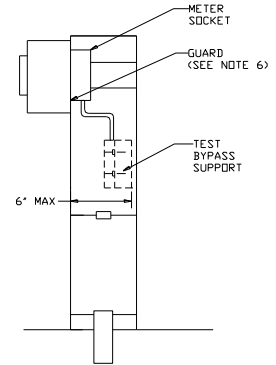


FIG 2B-SERVICE PEDESTAL ENCLOSED METER TYPE

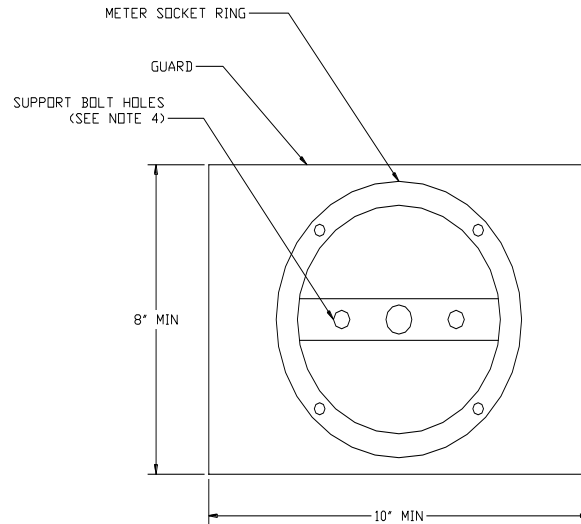
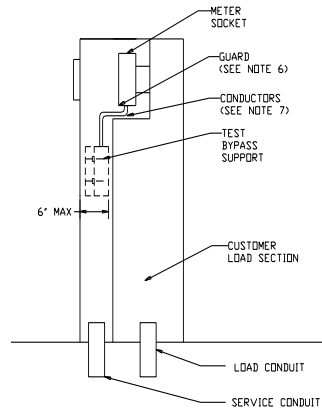


FIG 3-RIGID GUARD

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		<b>CM0001M</b>
				<b>ELECTRIC METERING COMMERCIAL &amp; INDUSTRIAL</b>		
Drawn:	Eng:	Appr:	Date:	Revision: 9		Page 23 of 26
JL	MB	DA	4/14			

**NOTES:**

1. Meter sockets shall be securely attached to the meter socket support by more than one bolt.
2. Meter socket configuration requirements are listed in Electric Metering, General - Standard GM0001M.
3. Wireways shall have minimum dimensions of 5-1/2" wide opening, 18" high and 2-3/4" deep and shall be accessible from the front, side or rear through a removable, sealable, full-length cover. The bottom of all wireways shall have provisions for accepting a minimum 2" conduit. A suitable alternate construction for wireway is a conduit which permits pull and termination of the service conductors directly into the "test-bypass" facilities.
4. Service conductors are to be terminated on the test bypass facilities in all cases.
5. If the meter is enclosed, the enclosing cover (top and front) shall be removable for test and inspection of the meters by NVE. The metering cover shall have a demand reset cover which shall be hinged, lockable and constructed of steel with minimum dimensions of 4-1/2" wide by 6" high.
6. The meter socket shall be provided with a full socket rim for securing the meter in place.
7. When a meter socket panel is not used, a rigid nonconductive or grounded metallic guard shall be mounted behind and attached to the meter socket rim to prevent accidental contact with energized parts.
8. Insulated cable or bus conductor shall be installed between the "test-bypass" facilities and the meter socket.
9. Internal equipment shall be secured in place without screws or nuts on the outer surface of the enclosure that may be loosened from the outside.
10. **Pedestals shall be bolted securely to the pad.**
11. Pedestals shall have openings at their base to permit 2- 3" conduits.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:	Revision: 9		Page 24 of 26
JL	MB	DA	4/14			



**COMMERCIAL/ INDUSTRIAL 100 & 200 AMP  
REAR ENTRY SERVICE PEDISTAL**

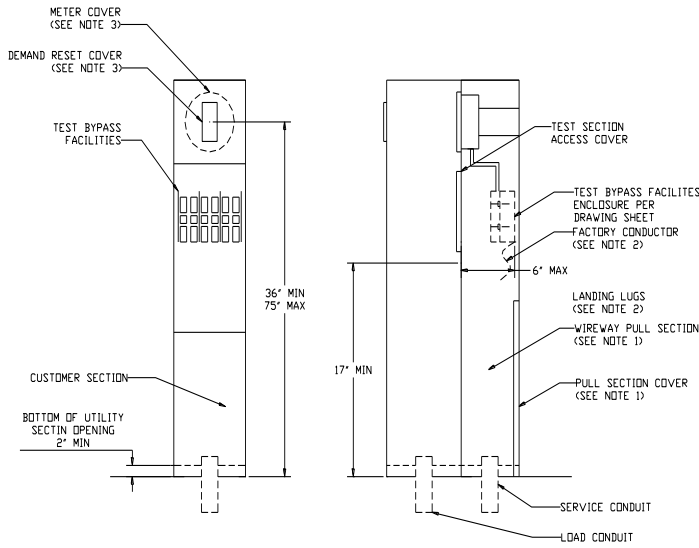


FIG 1. SERVICE PEDISTAL (REAR SERVICE ENTRY)

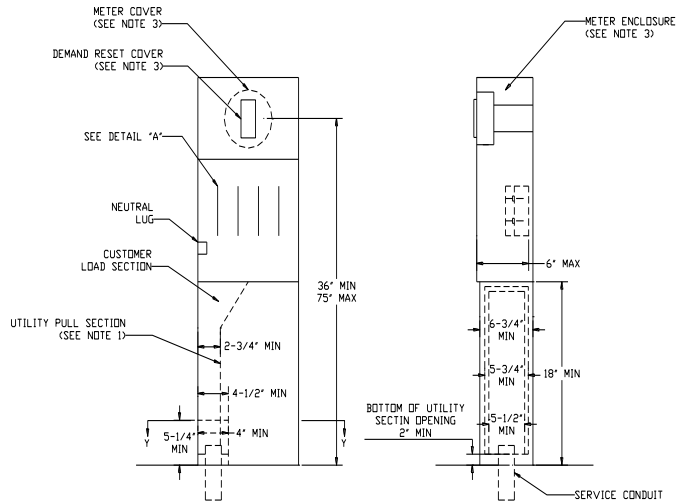
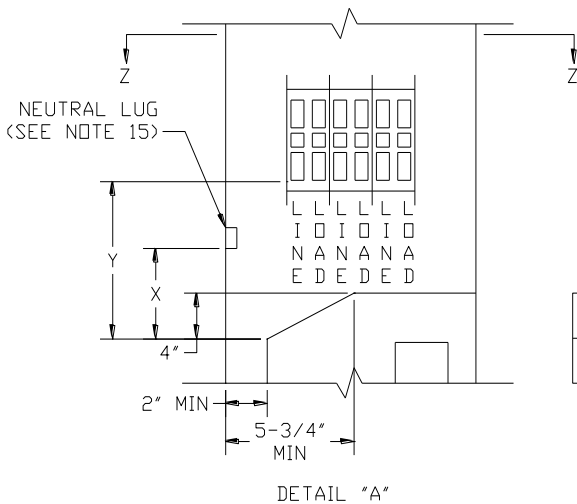
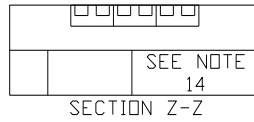


FIG 2. SERVICE PEDISTAL STEP & SWEEP SERVICE ENTRY



DETAIL "A"



SECTION Z-Z

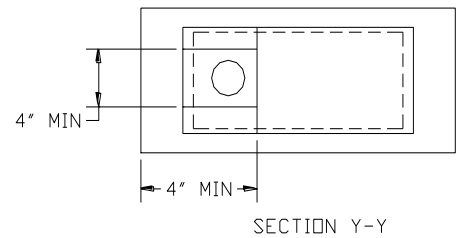


TABLE 1 (SEE DETAIL "A")

DIM	100 AMP	200 AMP
X	5"	5"
Y	8" MIN	11" MIN

**NOTES:**

1. Meter sockets shall be securely attached to the meter socket support by more than one bolt.
2. Meter socket configuration requirements are listed in Electric Metering, General- Standard GM0001M.
3. Wireways shall have minimum dimensions of 5-1/2" wide opening, (9" if containing termination facilities) 18" high and 2-3/4" deep and shall be accessible from the front, side or rear through a removable sealable full-length cover. The bottom of all wireways shall have provisions for accepting a minimum 2" conduit.
4. Service conductors are to be terminated on the test bypass facilities (or landing lugs when provided).
5. If landing lugs are provided, insulated cable or bus shall be installed between the landing lugs and the test bypass facilities (see fig 1).
6. If meter is enclosed, the enclosing cover (top and front) shall be removable for test and inspection of the meters by NVE. The metering cover shall have a demand reset cover which shall be hinged, lockable and constructed of steel with minimum dimensions of 4-1/2" wide by 6" high.
7. The meter socket shall be provided with a full socket rim for securing the meter in place.
8. When a meter socket panel is not used, a rigid nonconductive or rounded metallic guard shall be mounted behind and attached to the meter socket rim to prevent accidental contact with energized parts.
9. Insulated cable or buss conductors shall be installed between the "test-bypass" facilities and the meter socket.
10. Internal equipment shall be secured in place without screws or nuts on the outer surface of the enclosure that may be loosened from the outside.
11. **Pedestals shall be bolted securely to the pad.**
12. Pedestals shall have openings at their base to permit (2) - 3" conduits.
13. Maximum radial distance from the edge of the pull section that is closest to the furthest line terminal shall not be greater than 2-1/2". See detail ZZ.
14. Refer to Page 25 and table 1 for figure 2 "test-bypass" facilities enclosure clearances.

				VOLUME 17 – ENGINEERING & CONSTRUCTION STANDARD		CM0001M
				ELECTRIC METERING COMMERCIAL & INDUSTRIAL		
Drawn:	Eng:	Appr:	Date:	Revision: 9		Page 26 of 26
JL	MB	DA	4/14			