



SERVICE REQUIREMENTS COMMERCIAL & INDUSTRIAL CUSTOMERS

A. GENERAL

This document addresses the electrical service requirements for Commercial and Industrial business developments. These businesses will be classified with one of the following energy service categories:

- Small General Service for developments whose monthly demand will not exceed 50 kW.
- Medium General Service for developments whose monthly demand will be greater than 50 kW but less than or equal to 300 kW.
- Large General Service for developments whose monthly demand will be greater than 301 kW but less than or equal to 1000 kW.
- Small industrial for developments whose monthly demand will be greater than 1001 kW but less than or equal to 5000 kW.
- Large Industrial for developments whose monthly demand will be over 5000 kW.

The service termination method will depend upon load information supplied by the customer to Energy Services. The City Electrical Engineer will determine service classification and the termination method.

B. TERMINATION METHODS

1. For an underground power service, the customer will be allowed to run the service entrance cables to the Utility's padmount transformer, provided the following criteria is met. The number of customer owned cables cannot greater than 6 conductors per phase nor can any of the individual conductors be sized larger than 500 kcm. The Utility will make the terminations of the customer cable to the connectors in the secondary compartment of the transformer.
2. For an overhead power service, the City will provide the service drop to the customer weatherhead, and make connections to the customer's service entrance cable. The Utility has limitations on the number of service cables and the length these cables can be run. Contact Energy Services for more information regarding an overhead delivery.

Either of the service delivery methods has limitations that are based on the anticipated customer load.

3. For single-phase service a EUSERC 328B equipment mounting base in a sealable 24"x36"x11", NEMA 3R, CT cabinet is required. For three-phase service a EUSERC 329B equipment-mounting base in a hinged, sealable, 36"x48"x11", NEMA 3R CT cabinet, is required. Note that all equipment bases (328B & 329B) must be rated for 800 amps continuous power when calculated demands over 400 amps are encountered. Contact the City Utility for usage of EUSERC 328A and 329A CT mounting bases. If the number of customer service entrance cables or service cables exceeds the capacity of the mounting base a EUSERC 317 or 318 cabinet with a pull section meeting EUSERC 343, 347 will be required. Contact Energy Services for more information.
4. The CT cabinet requirement may be waived if the City engineer determines that additional customers cannot be (or are not) served from the same utility transformer. When the CT

enclosure is waived, the CTs will be installed in the padmount transformer secondary compartment when the service is underground and installed on the utility service cable when the service is overhead.

5. Single-phase loads greater than 600 amps will be by special permission of the City of Richland's Chief Electrical Engineer.
6. For three phase loads greater than 800 amps, only an underground service delivery method is permitted, except for larger industrial loads, which may be allowed other delivery means. Underground service will be with customer owned cables meeting the City's limitations. When the limitations can't be met, a padmounted "secondary bus enclosure" or an outdoor EUSERC (Electric Utility Service Equipment Requirement Committee) termination cabinet must be used. See section 3 for the secondary bus enclosure requirements. Consult with the City for approval after selecting a EUSERC outdoor termination cabinet design.

C. SECONDARY BUS ENCLOSURE

For loads greater than 801 amps, the delivery will be with an underground service run, and overhead only by special permission. The customer must bring the service conductors to the Utility's point of service. The point of service will be either the transformer secondary terminals or bus bar in either a secondary bus enclosure or an approved outdoor switchboard service section. Consult with the City Electrical Engineer for usage. The secondary bus enclosure or outdoor switchboard service section must be installed on a customer provided secondary vault and pad. The City requires (6) to (8)-5" Sch 40 PVC conduits, to be provided by the customer, between the Utility transformer vault and the secondary vault.

Approved manufacturers for the secondary bus enclosure are Shallbetter, and Erickson Electrical Equipment. Manufacturer catalog sheets are attached showing drawings of approved materials. Any other manufacturer's enclosure or switchgear will need to be approved before being installed.

Vendors can be contacted at:

Shallbetter products:
Powergrid Solutions, Inc.
3100 West 7th Street, Suite 500
Fort Worth, TX 76107
(817)810-0095

Erickson Electrical Equipment:
475 Bonnie Lane
Elk Grove Village, IL
(847) 640-7701 business, (847) 6400565 fax

D. VAULT AND PAD FOR UTILITY PADMOUNT TRANSFORMER

The customer is to provide and install the pad and vault for the City utility padmounted transformer. The City Engineer will provide information as to the specific vault and pad to be installed. Approved manufactures for the transformer vault and pad are 'Utility Vault', 'Hanson Pipe and Products' and H2Precast. The City must approve vaults and pads from any other manufacturer prior to their use.

Vendors can be contacted at:

H2 Pre-Cast Inc,
4919 Contractors Drive
E. Wenatchee, WA 98802
(509)844-6644 Phone (509)884-4567 Fax

Old Castle Precast
North 922 Camahan Rd.
Spokane Valley, WA 99212
(509)536-3304

Reese Concrete Products
1606 S. Ely St.
Kennewick, WA 99337

E. GROUNDING

This section applies only when delivery is provided with underground power. The customer is to coordinate with the City to have the grounding system installed by the City's representative during placement of the padmount transformer vault. The representative will provide all material for grounding.

F. METERING

- When customer's load is 200 amps or less self-contained metering is to be utilized.
- When customer's load is between 201-800 amps single or multi-phase, a CT cabinet is required.
- CT single phase Loads greater than 600 amps will be by special permission of the City of Richland Chief Electrical Engineer.
- For underground service, the customer supplies meter base, conduit and service cable runs to the City of Richland pad mount transformer or secondary enclosure. For overhead service, the customer is to supply the meter base, service entrance riser, weatherhead, and service entrance cables.
- For Multi-phase loads greater than 800 amps, only an underground service delivery method is permitted, except for larger industrial loads, which may be allowed other delivery means.

1. Self-Contained Metering

- Single phase and multiphase meter bases shall have bypass links and an isolation point
- The customer or contractor shall supply all self-contained meter bases.

2. CT Metering

- For all CT installations up to 2000 amps the City of Richland shall provide the CTs with the exception of Shallbetter or equivalent cabinets. For Shallbetter cabinets the customer is to provide the CTs.
- For a meter base that will be used with CT installations, the contractor is to obtain a prewired 13 terminal meter base from the City of Richland Electrical Meter Shop at cost.

3. Installation Methods

- The meter base shall be installed on either side of the building or in a freestanding pedestal.
- For CT meter installations, a freestanding pedestal drawing is attached
- The centerline of all meter bases must be placed between 5 ft. and 6ft. above final grade level.
- Self-contained meter bases are generally installed on the side of a building.
- For CT installations the customer must supply either 1" IMC or galvanized rigid steel conduit between the meter pedestal and the utility transformer. PVC conduit is not acceptable.
- The metering conduit between the metering base and the location of the CTs cannot be longer than 30 feet and cannot contain more than 270 degrees in bends.
- All meter bases are to be installed at a location that is readily accessible at any time by utility personnel.
- Multipack meter bases shall be labeled at meter base and at panel. The meter base tag shall be a phenolic tag. The panel tag must be, at minimum, a durable sticker

G. CONTACTS

For specific information, regarding any of the requirements listed above contact the City of Richland Energy Services at (509) 942-7403.

H. MATERIAL ACCEPTABILITY, MANUFACTURER AND CATALOG INFORMATION

- SECONDARY TERMINATION ENCLOSURE (CT MOUNT, CABINET or ENCLOSURE)

Loading 225-800 Amps Single Phase:

- ▶ EUSERC 328B mount in a sealable 24"x36"x11" NEMA3R Cabinet

Loading 225-800 Amps Three Phase:

- ▶ EUSERC 329B mount in a sealable 36"x48"x11" hinged NEMA 3R Cabinet
- ▶ SHALLBETTER Model# STEI-xx60-34-AL-GA-WO-yyyy, where xx is the current rating codes and yyyy is for special design features. Contact Energy Services for specific model information.

- SECONDARY TERMINATION ENCLOSURE VAULT 801+ Amps

- ▶ Reese Concrete Products VB-554R
- ▶ Old Castle Precast Model 504-LA

- SECONDARY TERMINATION ENCLOSURE PAD, 801+ Amps

- ▶ Reese Concrete Products Model E3-3642 w/out steel hatch
- ▶ Old Castle Precast Model 55-332P, w/out steel hatch

- GROUNDING MATERIAL REQUIREMENTS

- ▶ (2) - 5/8"x8' copper clad ground rods and connectors
- ▶ (40ft) - #2 SDBC ground wire encircling vault, connected to ground rods and terminating 10 ft inside vault
- ▶ All connections (except at ground rods) will be Exothermic weld

- TRANSFORMER VAULT

75 – 500 kVA

- ▶ Reese Concrete Products Model VB-554R

- ▶ Old Castle Precast Model 504-LA
- ▶ H2 Pre-cast Model 554

750 THRU 2500 kVA

- ▶ Old Castle Precast Model 774-LA
- ▶ H2 Pre-cast Model 774

- TRANSFORMER PAD

75 – 500 kVA

- ▶ 7'X7'X6" with 15"X48" access hole, 12" offset
- ▶ Old Castle Precast Model 77-1548
- ▶ H2 Pre-cast Model 77-1548

750, 1000, 1500 kVA

- ▶ 8'X8'x8" with 14"X56" access hole, 12" offset
- ▶ Old Castle Precast Model 88-1456
- ▶ H2 Pre-cast Model 88-1456

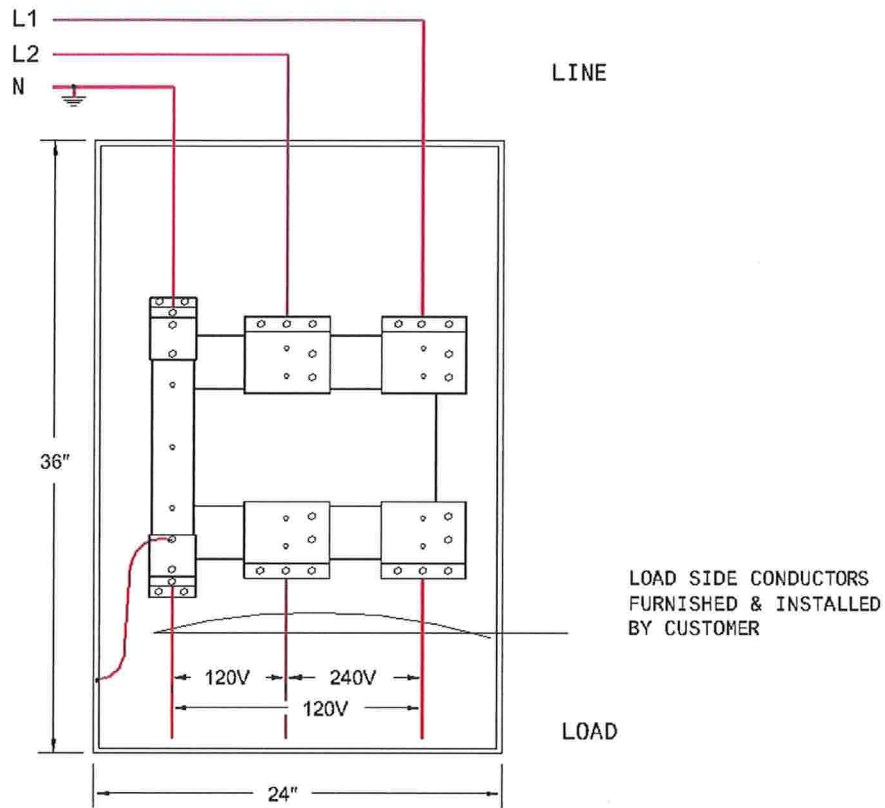
2000, 2500 kVA

- ▶ 8'X9"x8" with 14"x60" access hole on 8' side, 12" offset
- ▶ Old Castle Precast Model 89-1460
- ▶ H2 Pre-cast Model 89-1460

WIRING SHOWN SCHEMATICALLY.

FOR UG DELIVERY LINE SIDE CONDUCTORS ENTER FROM BOTTOM OF CABINET.

FOR OH DELIVERY LINE SIDE CONDUCTORS ENTER FROM TOP OF CABINET.



NOTES

1. CURRENT TRANSFORMER (CT) CABINET, CT MOUNTING BASE (EUSERC 328B) AND METERING CIRCUIT CONDUIT SHALL BE SUPPLIED & INSTALLED BY THE CUSTOMER'S CONTRACTOR.
2. MINIMUM SIZE CT CABINET IS 24" x 36" x 11", NEMA 3R RATED.
3. CT MOUNTING RACK TO BE UL RATED FOR 50,000 AIC.
4. METERING CONDUIT SHALL BE 1" DIAMETER GALVANIZED RIGID STEEL OR IMC, AND SHALL BE LIMITED TO 30 FT OF LENGTH WITH NO MORE THAN 3 BENDS TOTALING 270 DEGREES. CITY APPROVAL WILL BE REQUIRED FOR LONGER LENGTHS OF CONDUIT OR FOR ADDITIONAL BENDS, IN WHICH CASE THE CONDUIT SIZE WILL BE SPECIFIED BY THE CITY. NO CONDULETS OR JUNCTION BOXES ARE ALLOWED IN THE METERING CONDUIT RUN.
5. NEUTRAL LUG SHALL BE BONDED TO CT COMPARTMENT.
6. GROUND CT SECONDARIES TO NEAREST SYSTEM NEUTRAL CONNECTION. GROUND AT ONE POINT ONLY.
7. CONTRACTOR IS RESPONSIBLE FOR TERMINATING LOAD CONDUCTORS ONTO CT MOUNTING BASE.
8. CT'S WILL BE PROVIDED AND INSTALLED BY CITY PERSONNEL.

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APPRD. BY:

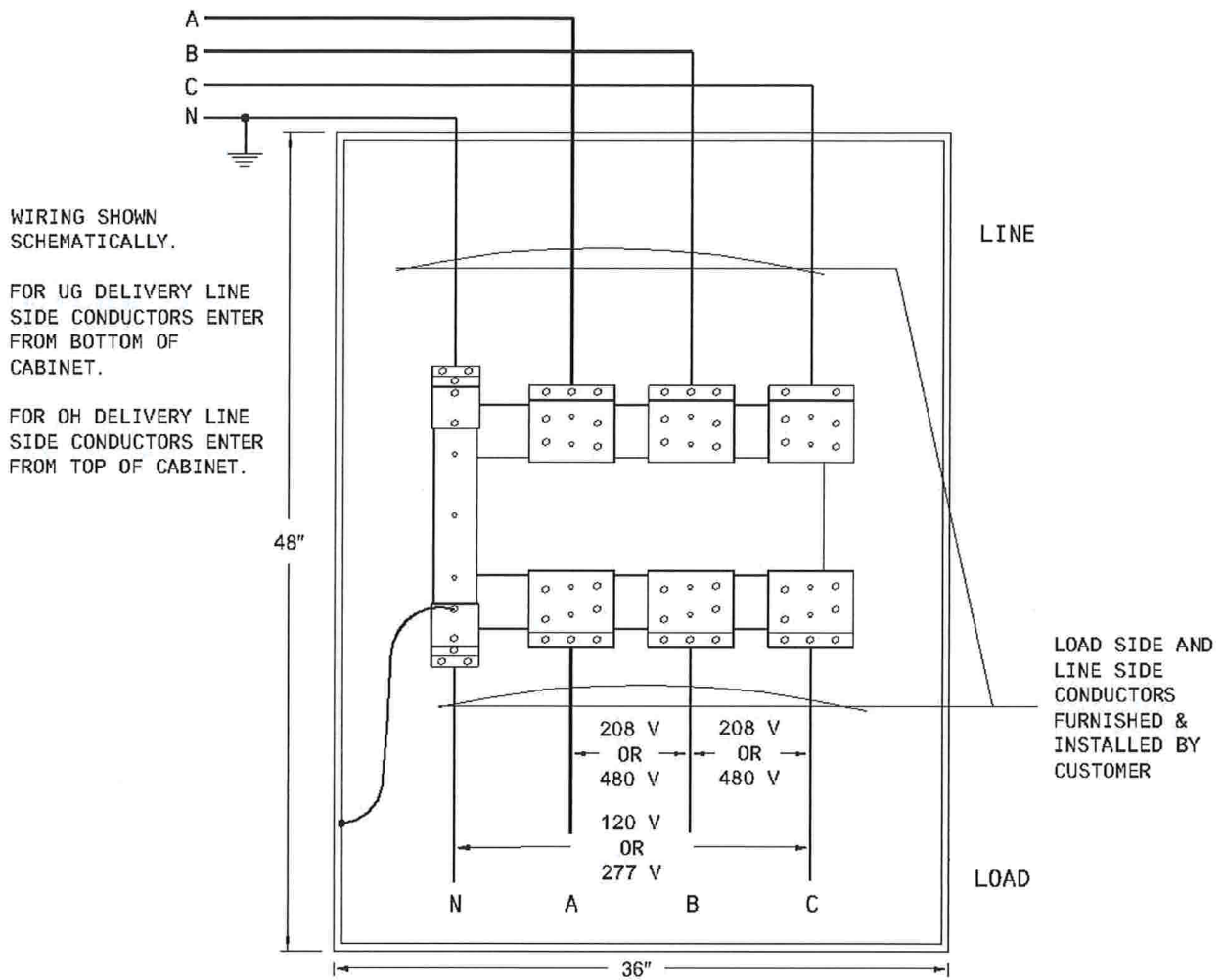
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**METERING CABINET
CURRENT TRANSFORMERS (C.T.)
1Ø, 3-WIRE, 201-800 AMPS**

ENERGY SERVICES

020304

**M328B
SHT. 1 OF 1**




NOTES

1. CURRENT TRANSFORMER (CT) CABINET, CT MOUNTING BASE (EUSERC 329B) AND METERING CIRCUIT CONDUIT SHALL BE SUPPLIED & INSTALLED BY THE CUSTOMER'S CONTRACTOR.
2. MINIMUM SIZE CT CABINET IS 36" x 48" x 11", NEMA 3R RATED. A HINGED COVER IS REQUIRED.
3. CT MOUNTING RACK TO BE UL RATED FOR 50,000 AIC.
4. METERING CONDUIT SHALL BE 1" DIAMETER GALVANIZED RIGID STEEL OR IMC, AND SHALL BE LIMITED TO 30 FT OF LENGTH WITH NO MORE THAN 3 BENDS TOTALING 270 DEGREES. CITY APPROVAL WILL BE REQUIRED FOR LONGER LENGTHS OF CONDUIT OR FOR ADDITIONAL BENDS, IN WHICH CASE THE CONDUIT SIZE WILL BE SPECIFIED BY THE CITY. NO CONDULETS OR JUNCTION BOXES ARE ALLOWED IN THE METERING CONDUIT RUN.
5. NEUTRAL LUG SHALL BE BONDED TO CT COMPARTMENT.
6. GROUND CT SECONDARIES TO NEAREST SYSTEM NEUTRAL CONNECTION. GROUND AT ONE POINT ONLY.
7. CONTRACTOR IS RESPONSIBLE FOR TERMINATING CONDUCTORS ONTO CT MOUNTING BASE.
8. CT'S WILL BE PROVIDED AND INSTALLED BY CITY PERSONNEL.

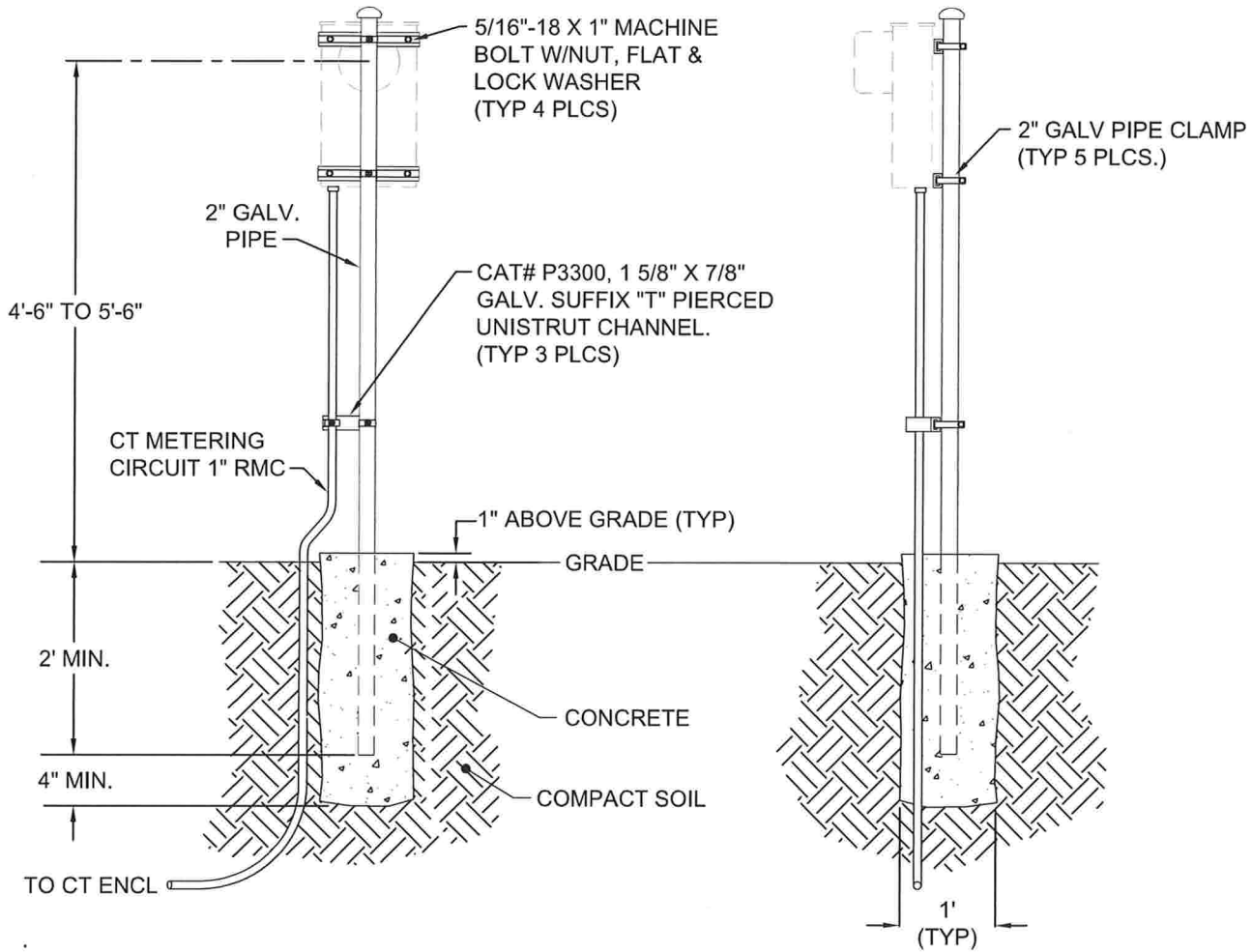
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**METERING CABINET
CURRENT TRANSFORMERS (C.T.)
3Ø, 4-WIRE, 201-800 AMPS**

	ENERGY SERVICES
	020304 M329B SHT: 1 OF 1

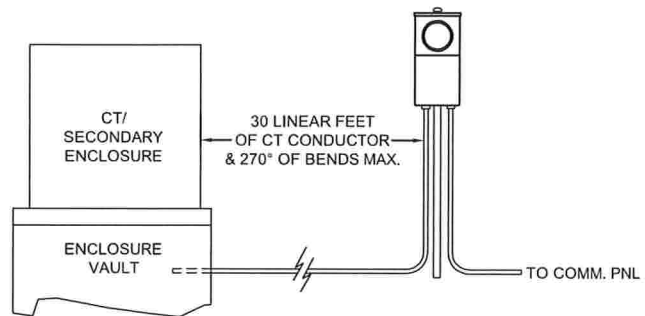
REAR VIEW

SIDE VIEW



NOTES:

1. CUSTOMER PROVIDES EXCAVATION, CONCRETE, CONDUIT, METER PEDESTAL AND INSTALLS CITY PROVIDED METER BASE.
2. PEDESTAL TO BE INSTALLED PLUMB AND SET IN CONCRETE TO INSURE A RIGID INSTALLATION.
3. GALVANIZED RIGID METAL CONDUIT (RMC) SYSTEM MUST BE SECURELY GROUNDED AT CT LOCATION & METERBASE.



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REV #:

CONSTRUCTION GUIDELINE
CT METER PEDESTAL
WITH COMMUNICATION CIRCUIT

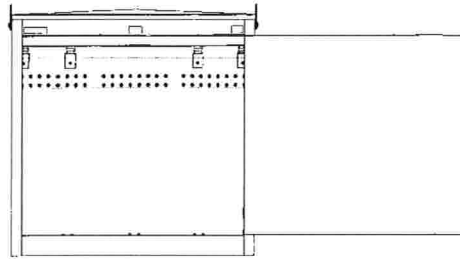
R ENERGY SERVICES

9/18/20

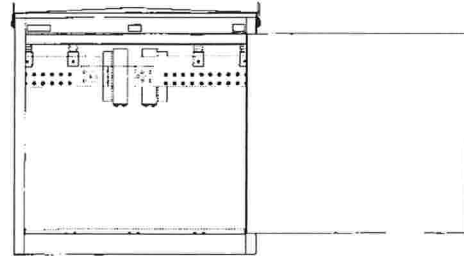
GDMTR-C
SHT: 1 OF 1

CABLE TERMINATING GEAR

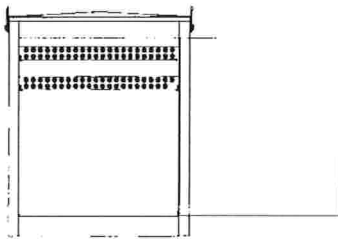
Models STEN, STEI, STEC1, STEC2, STMV.



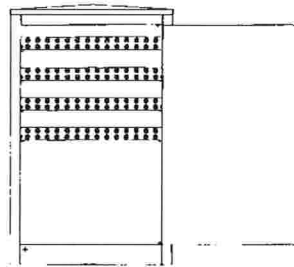
STEN
FRONT VIEW EXPOSED



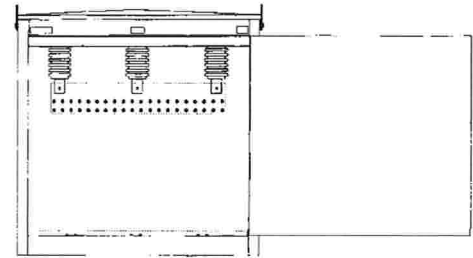
STEI
FRONT VIEW EXPOSED



STEC1
FRONT VIEW EXPOSED



STEC2
FRONT VIEW EXPOSED



STMV
FRONT VIEW EXPOSED

Application:

Shallbetter, Inc. Cable Terminating Gear is constructed in accordance with the latest applicable industry standards and the governing local and/or National Electrical Code requirements.

The Shallbetter line of Cable Terminating Gear is intended for use as a junction point between transformer secondaries and switchgear or as a split point for feeding multi-services.

For complete specifications, please contact your authorized Shallbetter factory representative.



2050 South Oakwood Road
Oshkosh, WI 54904-6308

920.232.8888 (Phone)
920.232.8977 (Fax)

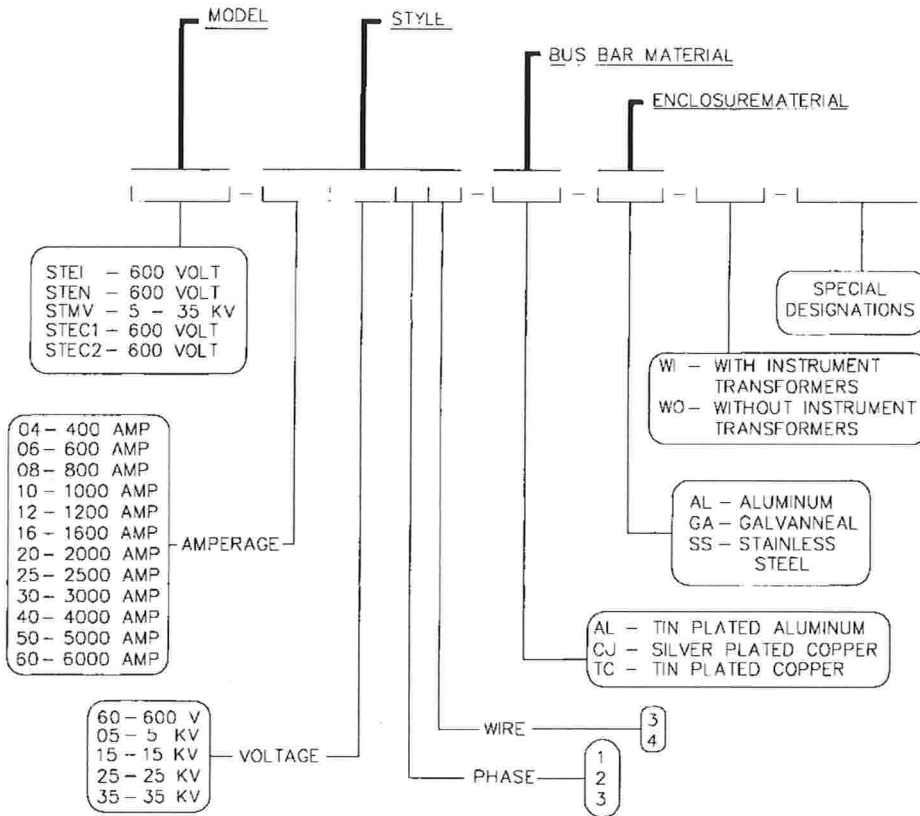
www.shallbetter.com
sbi@shallbetter.com

4.2.1

CABLE TERMINATING GEAR

Models STEN, STEI, STEC1, STEC2, STMV, 600 Volt./5-35 kV.

Catalog Number Selection Sheet. To be used in conjunction with Factory Check Sheet.



EXAMPLE: STEN-126034-CU-GA-WO XXXX

PADMOUNT, TERMINATION ENCLOSURE, 1200 AMP, 600 VOLT, 3 PHASE, 4 WIRE,
WITH SILVER PLATED COPPER BUS BAR, WITHOUT INSTRUMENT TRANSFORMERS,
CONSTRUCTED OF GALVANNEAL STEEL.



2050 South Oakwood Road
Oshkosh, WI 54904-6308

920.232.8888 (Phone)
920.232.8977 (Fax)

www.shallbetter.com
sbi@shallbetter.com

4.2.2

CABLE TERMINATING GEAR

Models STEN/STEI, STEC1/STEC2, 600 Volt./5-35 kV.

Factory Check Sheet. To be used in conjunction with Catalog Number Selection Sheet.

RATINGS:

Nominal System Voltage
Maximum Design Voltage
Basic Insulation Level (BIL)

- ____ / ____ kV
 600 Volt, 10 kV BIL
 15 kV, 95 kV BIL
 25 kV, 125 kV BIL
 35 kV, 150 kV BIL
 Other: ____ kV, ____ kV BIL

Continuous Current

- 200 amp
 400 amp
 600 amp
 1000 amp
 1200 amp
 1600 amp
 2000 amp
 2500 amp
 3000 amp
 4000 amp
 5000 amp
 6000 amp

ENCLOSURE:

Material:

- A60 Galvanneal Steel
 304L Stainless Steel
 5052-H32 Aluminum

Bus Material:

- Aluminum, Tin Plated, (0 - 3,000 amp only)
 Copper, Silver Plated

Paint Finish:

- Green Munsell No., 7GY 3.29/1.5
 Gray (ANSI 70). Munsell No., 5BG 7.0/0.4
 Gray (ANSI 61). Munsell No., 8.3G 6.10/0.54
 Other: _____

3-Point Latch Type:

- Penta-Head Bolt and shielded padlockable shackle, Shallbetter #70155. Manufactured to meet or exceed A.N.S.I. C57.12.28 for Padmount Equipment Enclosure Integrity.
 Hex-Head Bolt and shielded padlockable shackle, Shallbetter #70156
 Padlocking Handle, Shallbetter #70153

Instrumental transformers, (Model STEI only):

- Current Transformers: Manufacturer: _____, Model: _____, Type: _____, kV: _____, Ratio: _____.
 Potential Transformers: Manufacturer: _____, Model: _____, Type: _____, kV: _____, Ratio: _____.

Meter Socket, (Model STEI only): Manufacturer: _____, Model: _____, Type: _____.

Meter, (Model STEI only): Manufacturer: _____, Model: _____, Type: _____.

Connectors: Manufacturer: _____, Model: _____, Type: _____, Wire range: _____.

Threaded Inserts on Bus Bar.

Ground Bus.

Louvers for enclosure ventilation.

Insulating "No-Drip" Compound. Applied to the inside surface of the enclosure roof to prevent condensation.

Base Undercoating. Applied to the bottom 2" of the enclosure.

REA Deadfront Barriers. Barriers inside the enclosure door for each compartment, secured by recessed penta-head bolt.

Note: Replaces compartment barriers, (Model STMV).

Specials:



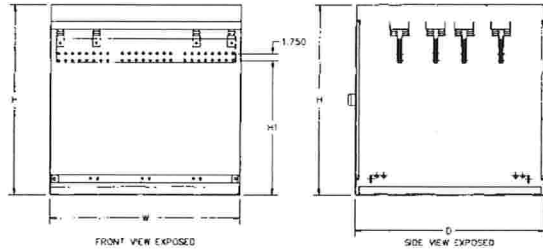
2050 South Oakwood Road
Oshkosh, WI 54904-6308

920.232.8888 (Phone)
920.232.8977 (Fax)

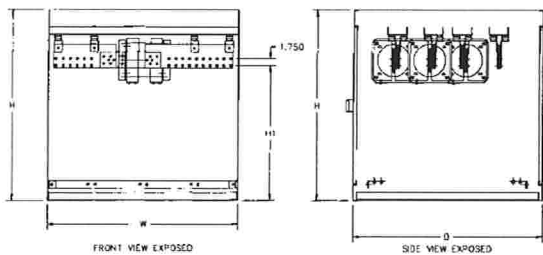
www.shallbetter.com
sbi@shallbetter.com

CABLE TERMINATING GEAR

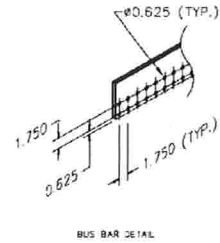
Models STEN/STEI, Padmounted, 600 Volt.
Single and Three Phase, 400-6000 Ampere.



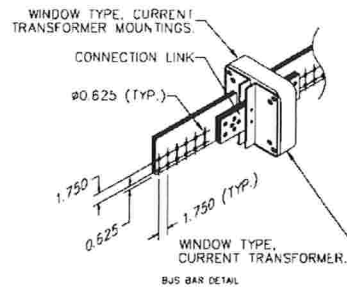
STYLE STEN



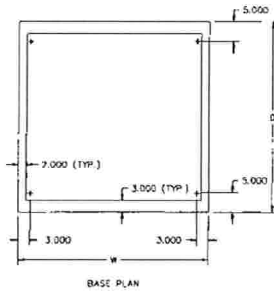
STYLE STEI



BUS BAR DETAIL



BUS BAR DETAIL



BASE PLAN



U.L. LISTED.

STYLE	AMPERAGE	H	W	D	H1	H2	WGT
STEN-0406	400-600	48	48	48	33	4.25	375 LB
STEN-0812	800-1200						425 LB
STEN-1620	1600-2000						475 LB
STEN-2530	2500-3000						525 LB
STFI-0406	400-600	48	48	48	33	4.25	390 LB
STFI-0812	800-1200						440 LB
STFI-1620	1600-2000						490 LB
STFI-2530	2500-3000						540 LB

- For options including meter sockets, meters and factory wiring, consult factory.
- For special configurations and sizes, consult factory.



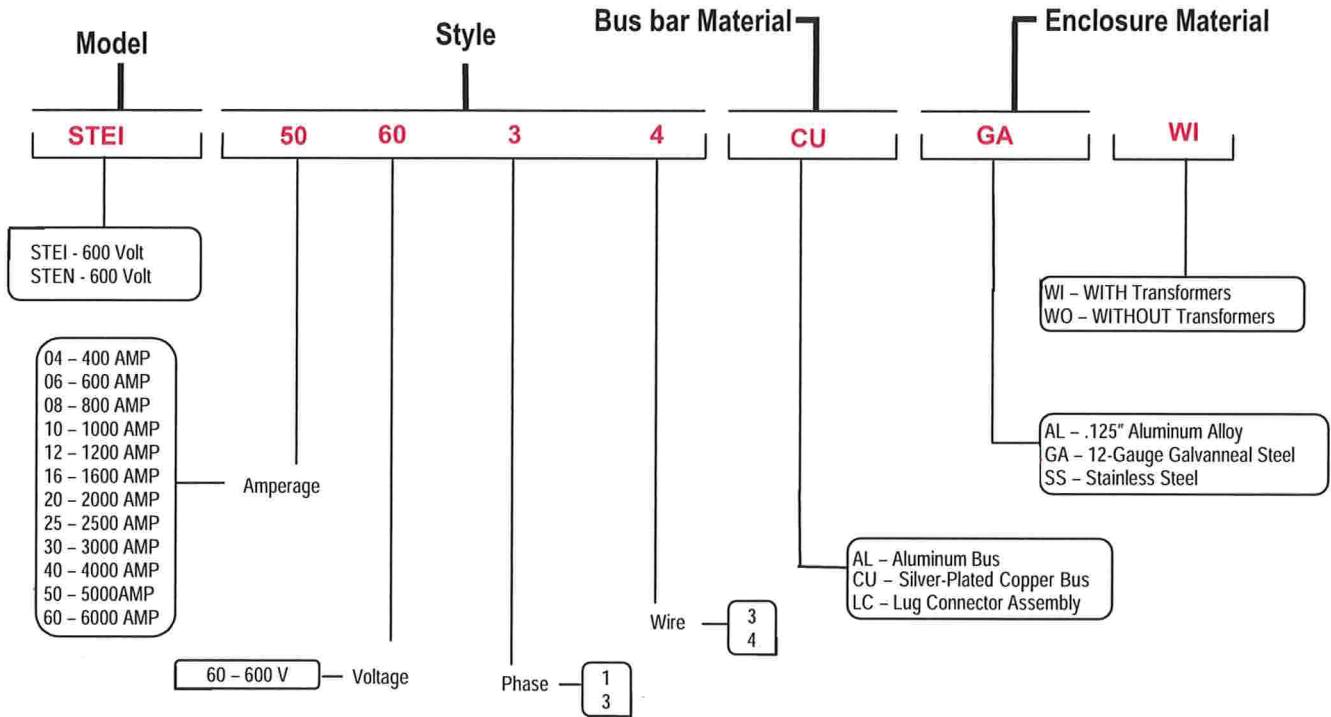
2050 South Oakwood Road
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920.232.8888 (Phone)
920.232.8977 (Fax)

www.shallbetter.com
sbi@shallbetter.com



Catalog Selection Guide



Factory Check Sheet

Paint Finish:

- Green. Munsell No., 7GY 3.29/1.5
- Gray (ANSI 70). Munsell No., 8.3G 7.0/0.4
- Gray (ANSI 61). Munsell No., 8.3G 6.10/0.54
- Other: _____

3-Point Latch Type:

- Penta-Head Bolt and shielded padlockable shackle, Shallbetter #70155. Manufactured to meet or exceed A.N.S.I. C57.12.28 for Padmount Equipment Enclosure Integrity.
- Hex-Head Bolt and shielded padlockable shackle, Shallbetter #70156
- Padlocking Handle, Shallbetter #70153

Instrumental Transformers, (Model STEI only):

Current Transformers: Manufacturer: _____, Model: _____, Type: _____, kV: _____, Ratio: _____

Meter Socket, (Model STEI only): Manufacturer: _____, Model: _____, Type: _____.

Meter, (Model STEI only): Manufacturer: _____, Model: _____, Type: _____.

Connectors: Manufacturer: _____, Model: _____, Type: _____.

Threaded Inserts on Bus Bar.

Ground Bus.

Louvers for enclosure ventilation.

Insulation "No-Drip" Compound. Applied to the inside surface of the enclosure roof to prevent condensation.

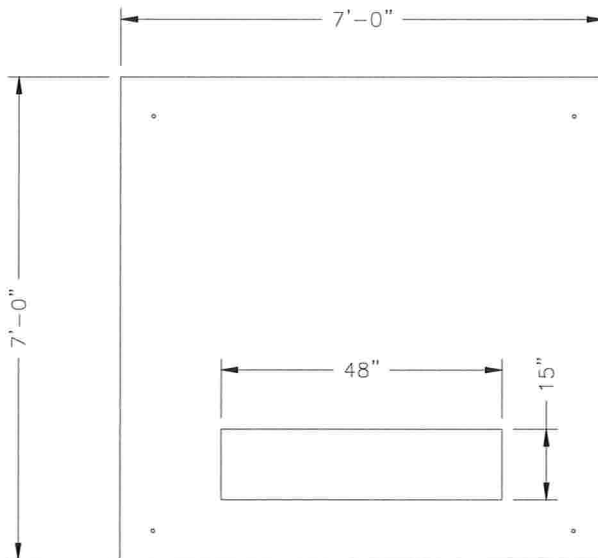
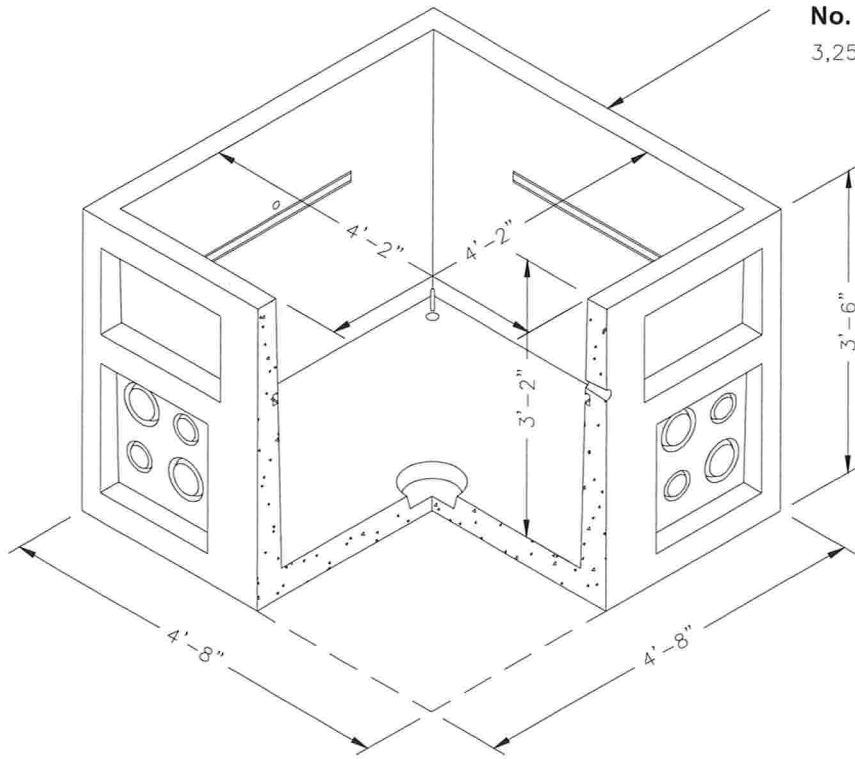
Base Undercoating. Applied to the bottom 2" of the enclosure.

REA Deadfront Barriers. Barriers inside the enclosure door for each compartment, secured by recessed penta-head bolt.
Note: Replaces compartment barriers.

Specials:



VAULT
No. 504-BL
 3,250 lbs.



VAULT COVER
No. 77-1548

TRANSFORMER SIZES 75-500 kVA

MODIFIED UTILITY VAULT DWG 010UEE504LAB.DWG



P.O. BOX 588, Auburn, Washington 98071-0588
 Phone: 253-839-3500 Fax: 253-735-4201

504-LA

FILE NAME:

ISSUE DATE: APRIL, 2001

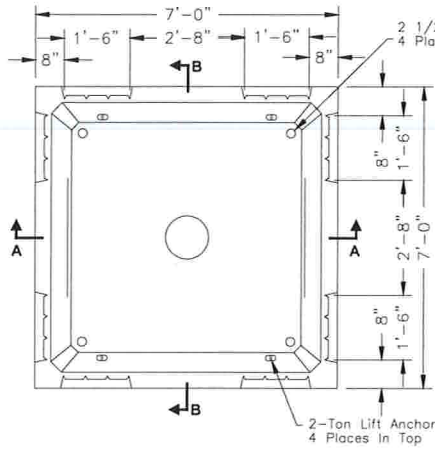
www.oldcastleprecast.com

504 VAULT
77-1548

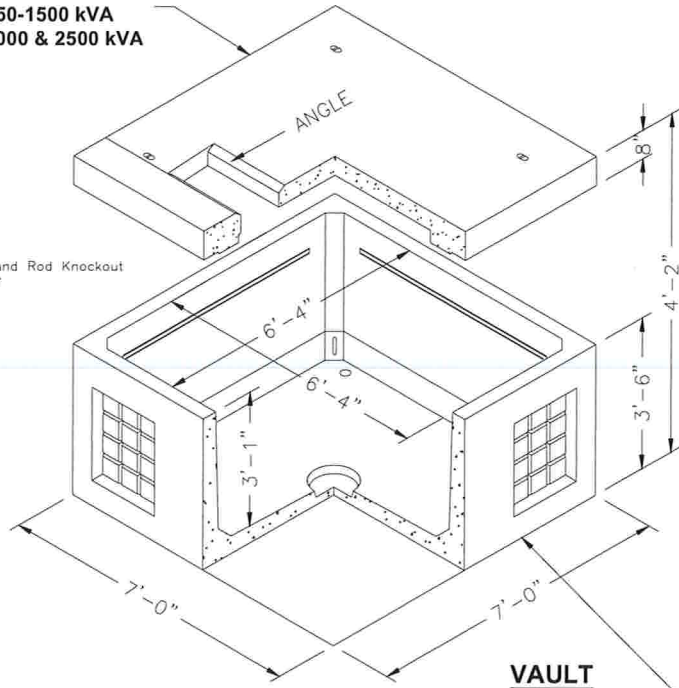
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COVER

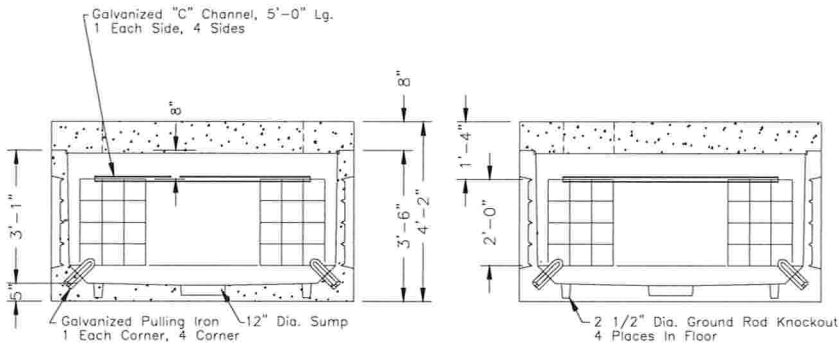
No. 88-1456 for 750-1500 kVA
 No. 89-1460 for 2000 & 2500 kVA



PLAN VIEW



VAULT
 No. 774-LA
 6,900 lbs.



SECTION AA

SECTION BB

TRANSFORMER SIZES 750-2500 kVA

MODIFIED UV DWG: D010UEE774LAB.DWG



P.O. BOX 588, Auburn, Washington 98071-0588
 Phone: 253-839-3500 Fax: 253-735-4201

774-LA

FILE NAME: --

ISSUE DATE: MAY, 2001

www.oldcastleprecast.com

**774 VAULT
 3 PHASE PADS**

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Revision	Date	Description	Author
0		Original Document	Engineering
1	01/21/2020	Updated by Meter Shop	Engineering