A. ELECTRIC SERVICE - GENERAL

1. The type of service available at any particular location should be determined by inquiry at Redding Electric Utility. (REU)
2. Alternating current service will be regularly supplied at a frequency of approximately 60 hertz (cycles per second).
3. In areas where a certain standard secondary voltage is presently being served to one or more existing customers, new customers applying for service in such areas may be required to receive the same standard voltage supplied to existing customers.
4. Service to a customer is normally established at one service point, through one meter, and at one voltage class. Other arrangements for service at multiple points, or for services at more than one voltage class, are permitted only where feasible; with the approval of REU and any other authority having jurisdiction.
5. REU will not allow the electric meter to be installed in a hazardous area. In hazardous-type areas, as determined by REU, the customer will be required to provide and install metering facilities and master control equipment away from the hazardous area.

B. SERVICE DELIVERY VOLTAGES

1. Following are the standard service voltages normally available (in volts), although not all of them are or can be made available at each service delivery point.

<table>
<thead>
<tr>
<th>DISTRIBUTION VOLTAGES</th>
<th>TRANSMISSION VOLTAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE - PHASE SECONDARY</td>
<td>THREE - PHASE SECONDARY</td>
</tr>
<tr>
<td>120/240, 3 - WIRE (600 AMPS MAX)</td>
<td>240/120, 4 - WIRE **</td>
</tr>
<tr>
<td>120/208, 3 - WIRE (200 AMPS MAX) *</td>
<td>208/120, 4 - WIRE (2,000 AMPS MAX)</td>
</tr>
<tr>
<td>480/277, 4 - WIRE (3,000 AMPS MAX)</td>
<td></td>
</tr>
</tbody>
</table>

* REU will no longer supply 120/208 V, single-phase service to residential structures or buildings unless an existing 120/208 V secondary system is established near the location where the requested service would be supplied and has sufficient kVA capacity.

** Utilized only for existing installation and subject to REU approval.

2. All voltages referred to in this section are nominal service voltages at the delivery point. REU facilities are designed and operated to provide sustained service voltage at the service delivery point, but the voltage at a particular service delivery point, at a particular time, will vary within the operating range limits established in Section C.
3. The point of delivery and point of metering will normally be at the same voltage and within close proximity to each other.

C. VOLTAGE AND FREQUENCY CONTROL

1. CUSTOMER SERVICE VOLTAGE

a. Under all normal load/operating conditions, REU's distribution circuits will be operated in accordance with American National Standard C84.1 so as to maintain secondary service voltage levels to customers within the service voltage ranges specified below:
b. Exceptions to Voltage Limits

Voltage may be outside the limits specified when the variations:
1. Arise from the temporary action of the elements.
2. Are infrequent momentary fluctuations of a short duration.
3. Arise from service interruptions and system emergencies.
4. Arise from temporary separation of parts of the system from the main system.
5. Are from causes beyond the control of REU.

c. It must be recognized that, because of conditions beyond the control of REU, the customer, or both, there will be infrequent and limited periods when sustained voltages outside of the service voltage range will occur. Utilization equipment may not operate satisfactorily under these conditions, and protective devices may operate to protect the equipment.

d. The sustained service delivery voltages are subject to minor momentary and transient voltage excursions which may occur in the normal operation of REU's system. Subject to the limitations of C.1.a. above, the voltage balance between phases will normally be maintained by REU as close as practicable to 3 percent maximum deviation from the average voltage between the three phases.

e. When the operation of the customer's equipment requires unusually stable voltage regulation or other stringent voltage control beyond that supplied by REU in the normal operation of its system, the applicant, at his own expense, is responsible for installation, owning, operating, and maintaining any special or auxiliary equipment on the load side of the service delivery point as deemed necessary by the applicant.

f. The customer shall be responsible for designing and operating his service facilities between the service delivery point and the utilization equipment to maintain proper utilization voltage at the line terminals of the utilization equipment.

2. CUSTOMER UTILIZATION VOLTAGES

a. All customer-owned utilization equipment must be designed and rated in accordance with the following utilization voltages specified by the American National Standard C84.1 if customer equipment is to give fully satisfactory performance.

<table>
<thead>
<tr>
<th>NOMINAL UTILIZATION VOLTAGE</th>
<th>MINIMUM UTILIZATION VOLTAGE</th>
<th>MAXIMUM UTILIZATION VOLTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>110</td>
<td>125</td>
</tr>
<tr>
<td>208</td>
<td>191</td>
<td>216</td>
</tr>
<tr>
<td>240</td>
<td>220</td>
<td>250</td>
</tr>
<tr>
<td>277</td>
<td>254</td>
<td>289</td>
</tr>
<tr>
<td>480</td>
<td>440</td>
<td>500</td>
</tr>
</tbody>
</table>
b. The difference between service and utilization voltages are allowances for voltage drop in customer wiring.

c. Minimum utilization voltages from American National Standard C84.1 are shown for customer information only as REU has no control over voltage drop in customer's wiring.

d. The minimum utilization voltages shown in 2.a. above, apply for circuits supplying lighting loads. The minimum secondary utilization voltages specified by American National Standard C84.1 for circuits not supplying lighting loads are 90 percent of nominal voltages (108 volts on 120-volt base) for normal service.

e. Motors used on 208 volt systems should be rated 200 volts or (for small single-phase motors) 115 volts. Motors rated 230 volts will not perform satisfactorily on these systems and should not be used. Motors rated 220 volts are no longer standard, but many of them were installed on existing 208 volt systems on the assumption that the utilization voltage would not be less than 187 volts (90 percent of 208 volts).

3. FREQUENCY

a. REU will exercise reasonable diligence and care to regulate and maintain its frequency within reasonable limits but does not guarantee same.

D. GENERAL LOAD LIMITATIONS

1. SINGLE-PHASE SERVICE

a. Single-phase service normally will be three-wire 120/240 volts where the size of any single motor does not exceed 7.5 horsepower. For any single-phase service, the maximum demand as determined by REU is limited to the capability of a 100kVA transformer unless otherwise approved by REU. If the load requires a transformer installation in excess of 100kVA, the service will normally be three-phase.

b. In locations where REU maintains a 120/208 volt secondary system, 3-wire, single-phase service normally shall be limited to that which can be supplied by a main switch or service entrance rating of 200 amperes. Single-phase loads in these locations in excess of that which can be supplied by a 200 ampere main switch or service entrance rating normally will be supplied with a 208Y/120 volt, three-phase, 4-wire service.

2. THREE-PHASE SERVICE (1,000 VOLTS OR LESS)

All three-phase services in this voltage range will be four (4) wire. The service conductor neutral must be connected to the main panel neutral lug.

a. Secondary service normally available from overhead primary distribution systems (this may require the installation of underground primary to supply a transformer at ground level).

<table>
<thead>
<tr>
<th>NOMINAL VOLTAGE</th>
<th>MINIMUM LOAD NORMALLY REQUIRED</th>
<th>MAXIMUM DEMAND LOAD NORMALLY PERMITTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>208Y/120</td>
<td>DEMAND LOAD JUSTIFIES A</td>
<td>1,000KVA</td>
</tr>
<tr>
<td></td>
<td>75KVA TRANSFORMER</td>
<td></td>
</tr>
<tr>
<td>240/120 (DELTA)</td>
<td>7.5HP, 3-PHASE CONNECTED</td>
<td>500KVA</td>
</tr>
<tr>
<td>480Y/277</td>
<td>DEMAND LOAD JUSTIFIES A</td>
<td>1,500KVA</td>
</tr>
<tr>
<td></td>
<td>75KVA TRANSFORMER</td>
<td></td>
</tr>
</tbody>
</table>
b. Secondary service from underground primary distribution system:

<table>
<thead>
<tr>
<th>NOMINAL VOLTAGE</th>
<th>MINIMUM LOAD NORMALLY REQUIRED</th>
<th>MAXIMUM DEMAND LOAD NORMALLY PERMITTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>208Y/120</td>
<td>DEMAND LOAD JUSTIFIES A 75KVA TRANSFORMER</td>
<td>1,000KVA</td>
</tr>
<tr>
<td>480Y/277</td>
<td>DEMAND LOAD JUSTIFIES A 75KVA TRANSFORMER</td>
<td>1,500KVA</td>
</tr>
</tbody>
</table>

c. Where three-phase service is supplied, REU reserves the right to use single-phase transformers connected open-delta or closed-delta, or three-phase transformers.

d. A four-wire delta circuit as used in this section is defined to mean a four-wire, three-phase circuit and a three-wire, single-phase circuit are combined and served through a single electric service meter. The customer or his contractor must verify the availability of this type of service in advance of commencement of electrical work preparatory to such an installation.

e. Three-phase service will be supplied on request for installations aggregating less than the minimums listed where existing three-phase transformer capacity exists and is available. Single motors larger than 7.5 hp must be served three-phase.

f. The maximum allowable size for any one motor served at 208 volts, three-phase is thirty (30) hp. The maximum size allowable for any one motor served at 240 volts, three-phase is fifty (50) hp.

g. For metering requirements, see CORCS 550-552.

3. THREE-PHASE SERVICE (OVER 1,000 VOLTS)

a. Applicants with demand loads in excess of 1,500 kVA may be required to take delivery at 12,000 volts. 12,000 volts is the standard primary distribution voltage which may be available without transformation from existing primary distribution lines.

b. Applicants with demand loads of 3,000 kVA may be required to take delivery at the 115,000 volt transmission voltage and provide their own substation facilities. The availability of transmission voltage shall be determined by REU.

4. LOAD BALANCE

a. The applicant must balance his demand load as nearly as practicable between the two sides of a three-wire, single-phase service and between all phases of a three-phase service. The difference in amperes between any two phases at the customer's peak load should not be greater than 10 percent or 50 amperes (at the service delivery voltage), whichever is greater; except that the difference between the load on the lighting phase of a four-wire delta service and the load on the power phase may be more these limits. It will be the responsibility of the customer to keep his demand load balanced within these limits.

E. PROTECTIVE DEVICES

1. It shall be the applicant's responsibility to equip his three-phase motor installations with appropriate protective devices, or use motors with inherent features, to completely disconnect each such motor from its power supply, giving particular consideration to the following:
a. Protection in each set of phase conductors to prevent damage due to overheating in the event of overload.

b. Protection to prevent automatic restarting of motors or motor-driven machinery which has been subjected to a service interruption and, because of the nature of the machinery itself or the product it handles, cannot safely resume operation automatically.

c. Open-phase protection to prevent damage due to overheating in the event of loss of voltage on one phase.

d. Reverse-phase protection where appropriate to prevent uncontrolled reversal of motor rotation in the event of accidental phase reversal. (Appropriate installations would include, but are not limited to, motors driving elevators, hoists, tramways, cranes, pumps, conveyors, etc.)

2. The available short-circuit current varies from one location to another, and also depends on the ultimate design characteristics of REU's supply and service facilities. The customer shall consult REU for the ultimate maximum short-circuit current at each service termination point.

3. Any customer-owned emergency standby or other generation equipment that can be operated to supply power to facilities that are also designed to be supplied from REU's system shall be controlled with suitable protective devices by the applicant to prevent parallel operation with REU's system in a fail-safe manner, such as the use of a double-throw switch to disconnect all conductors, except where there is a written agreement or service contract with REU permitting such parallel operation.

F. INTERFERENCE WITH SERVICE

1. GENERAL

a. REU reserves the right to refuse to serve new loads or to continue to supply existing loads of a size or character that may be detrimental to REU's electric operations or to the service of its customers. Any customer who operates or plans to operate any equipment such as, but not limited to, pumps, welders, saw mill apparatus, furnaces, compressors or other equipment where the use of electricity is intermittent, causes intolerable voltage fluctuations, or otherwise causes intolerable service interference, must reasonably limit such interference or restrict the use of such equipment upon request by REU. The customer is required either to provide and pay for whatever corrective measures are necessary to limit the interference to a level established by REU as reasonable, or avoid the use of such equipment, whether or not the equipment has previously caused interference.

2. HARMFUL WAVE FORM

a. Customers shall not operate equipment that superimposes a current of any frequency or wave form upon REU's electric system, or draws current from REU's electric system of a harmful wave form, which causes interference with REU's operations, or the service to other customers, or inductive interference to communication facilities.

3. CUSTOMER'S RESPONSIBILITY

a. Any customer causing service interference to others must diligently pursue and take timely corrective action after being given notice and a reasonable time to do so by REU. If the customer does not take timely corrective action, or continues to operate the equipment causing
the interference without restriction or limit, REU may, without liability, after giving written notice to the customer, discontinue electric service until a suitable permanent solution is provided by the customer and it is operational.

4. MOTOR STARTING CURRENT LIMITATIONS

a. All electric motors operated within REU shall have adequate running over-current protection. Three-phase motors shall have over-current protection on all three phases.
b. The starting of motors shall be controlled by the customer as necessary to avoid causing voltage fluctuations that will be detrimental to the operation of REU's distribution or transmission system, or to the service of any of REU's customers.
c. If the starting current for a single motor installation exceeds the value listed in Table 1, and the resulting voltage disturbance causes or is expected to cause detrimental service to others, reduced voltage starters or other suitable means must be employed, at the customer's expense, to limit the voltage fluctuations to a tolerable level.
d. The starting current shall be considered to be the current defined in Note 2 of Table 1. At its option, REU may determine the starting current of a motor by test, using a stop ammeter with not more than 15 percent overswing, or an oscillograph, disregarding the value shown for the first ten cycles after energizing the motor.
e. In the case of room and unitary air conditioners, heat pumps or other complete unit equipment on which the nameplate rating is expressed in kVA input and not in hp output, the nameplate kVA input rating shall be considered to be the hp rating for use of Table 1. If the nameplate does not show kVA input, then it may be determined for single-phase motors by taking the product of the running input line current in amperes times the input voltage rating divided by 1000. For three-phase motors, multiply this product by the square root of three (1.73).
f. The starting current values in Table 1 apply only to the installation of a single motor. Starters may be omitted on the smaller motors of a group installation when their omission will not result in a starting current in excess of the allowable starting current of the largest motor of the group. Where motors start simultaneously, they will be treated as a single unit equal to the sum of their individual starting current.
g. REU may limit the maximum size and type of any motor that may be operated at any specific location on its electric system to that which will not be detrimental to REU's electric system operations or to the service of its customers, as determined by REU.
h. Where the design or operation of the customer's motor is such that unequal starting currents flow in REU's service conductors, the largest starting current in any one set of phase conductors shall be considered the motor starting current.
i. For installations of a motors where the equipment is started automatically by means of float, pressure, or thermostat devices, such as with pumps or wind machines for frost protection, irrigation pumps or other similar installations, REU may require the customer to install, at his own expense and in accordance with REU's operating requirements, suitable present time-delay devices to stagger the automatic connection of load to the supply system and to prevent simultaneous start-up for any reason.
j. REU reserves the right to refuse to supply electrical loads of a character that, in the sole opinion of REU, may seriously impair service to any Customer. In case of hoists or elevator motors, welders, furnaces, compressors and other installations of like character where the use of electricity is intermittent or subject to violent fluctuations, REU may require the Customer to provide, at his own expense, suitable equipment to reasonably limit such fluctuations.
### TABLE 1

**NORMAL MAXIMUM ALLOWABLE MOTOR STARTING CURRENTS**

**ALTERNATING CURRENT MOTORS**

<table>
<thead>
<tr>
<th>SINGLE-PHASE VOLTAGE MOTOR RATING (SERVICE VOLTAGE)</th>
<th>THREE-PHASE VOLTAGE MOTOR RATING (SERVICE VOLTAGE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RATED HP OUTPUT</td>
<td>230V (240V) AMPS</td>
</tr>
<tr>
<td>1/2</td>
<td>20</td>
</tr>
<tr>
<td>3/4 or 1</td>
<td>27</td>
</tr>
<tr>
<td>1 1/2</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>60</td>
</tr>
<tr>
<td>5</td>
<td>100</td>
</tr>
<tr>
<td>7.5</td>
<td>110</td>
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<tr>
<td>10</td>
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<td>15</td>
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<td>20</td>
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<td>30</td>
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<td>40</td>
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<td>50</td>
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<tr>
<td>60</td>
<td>--</td>
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<tr>
<td>75</td>
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<tr>
<td>100</td>
<td>--</td>
</tr>
<tr>
<td>125</td>
<td>--</td>
</tr>
<tr>
<td>150</td>
<td>--</td>
</tr>
<tr>
<td>200 AND ABOVE</td>
<td>--</td>
</tr>
</tbody>
</table>

### TABLE 1 NOTES:

1. See Section F.4 for details on the use of this table.
2. Motor starting current is defined as the steady state current taken from the supply line with the motor rotor or rotors locked, with all other power consuming components, including a current-reducing starter, if used, connected in the starting position, and with rated voltage and frequency applied.
3. The normal operating capacity rating of any motor or other device may be determined from the nameplate rating. Where the original nameplate has not been removed or altered, the manufacturer's published rating may be used or the rating determined by test at the expense of the customer.
1. The Developer/Customer shall perform all trenching and backfill per City of Redding Public Works Construction Standards pages 507, 521, and 620 through 624.20.
2. The Developer/Customer shall furnish and install (unless otherwise shown) all conduits for services, secondary and 4" primary conduits. Below grade conduits shall meet the requirements of Standard 521. For new primary express feeders, REU will normally furnish any required 6" conduits (excluding secondary or service) for the Developer's/Customer's installation. The Developer/Customer shall be required to transport the 6" conduit to the job site from the REU storage location. The customer/developer shall be responsible for 6" conduit required for relocations and undergrounding of existing REU facilities.
3. Bell ends shall be placed on all conduit terminations. Bell ends shall be of the same type material as conduit to which they are attached (i.e., D.B., Sch. 40, Sch. 80).
4. All conduits installed by the Developer/Customer shall be cleaned by using brushes and/or swabs.
5. All 4" conduit runs less than 600' long without conductors shall have a minimum 1250lb polyester MULETAPE®, or equal (especially designed for that purpose) pull line provided and installed by the customer/developer. All 6" conduit and 4" conduit runs greater than 600' without conductors shall have a minimum 2500lb polyester MULETAPE® or equal pull line provided and installed by customer/developer.
6. Conduit system is for future use as well as initial cable installation; therefore, Developer/Customer shall use all care required during pulling cable to insure that conduit is not damaged.
7. All conduit sweeps shall be PVC Schedule 40. All conduit riser bends shall be PVC Schedule 80, or equal, per Standard 547. Conduit sweeps or bends shall not be cut or otherwise modified. All joints shall be glued per manufacturer's specification and provide a water tight fit.
8. Developer/Customer shall furnish and install all low voltage (0-600V) cable. Cable shall be XLPE insulated, NEC type "U.S.E.-2" Aluminum per Standard 510, unless otherwise specified.
9. Developer/Customer shall coil 3' of cable in each splice enclosure with ends protected by plastic caps taped secure to the cable. All cable will be spliced by REU except at the service entrance (note item 16 below).
10. All service conductors shall be terminated by the Developer/Customer at his service entrance. All service conductors shall be terminated by the Developer/Customer at his service entrance.
11. Conduit runs shall be limited to not more than 3-90° bends, or a combination of angles with not more than 270° deflection throughout the conduit run unless shown otherwise on REU approved plans.
12. All conduit and wire sizing will be by the Electric Utility Engineering staff.
13. There shall be no splices in low voltage (600V) wire except in REU approved splice enclosures.
14. All new panels over 200 amp rating shall be served by an underground service (City ordinance).
15. Developer/Customer shall furnish, install, own and maintain conduit 2' feet from his outer building line to his terminating facility.
16. All service conductors shall be terminated by the Developer/Customer at his service entrance panel. All terminations will be by 2-hole NEMA pad compression lugs except for 200 amp and smaller residential panels. Service conductors larger than 4/0 must use 2-hole NEMA pad compression lugs. All connections will be properly torqued and installed to manufacturer's specifications. Approved corrosion inhibitor will be applied on wire ends at all connections.
17. Replacement or enlargement of low voltage wire and conduit due to relocation or increased load shall be the responsibility of the Developer/Customer.
18. REU will determine all points of service. Service points normally shall provide minimum cable lengths and provide accessibility for operations and maintenance.
19. The neutral conductor of low voltage (600V) tri-plex cable shall be insulated with a yellow pigmented XLPE compound for easy identification. Single conductor cable used as neutral without yellow marking (pigmented) shall be identified at each splicing point by approved white electrical tape.
20. The Developer/Customer shall provide all necessary easements for electric supply facilities as required by REU.
21. Developer/Customer shall be responsible to locate and properly place electric utility facilities within utility easements and public right of way.
22. Developer/Customer shall furnish and install street light base, conduit, standard, arm, luminaire, and conductor per Standards 554, 555, and 556.
23. It is the responsibility of the Developer/Customer to set all primary boxes so that the box lid is at the same elevation as the lowest final elevation of the adjacent sidewalk, top of curb or pavement edge (existing, proposed, or future). All secondary boxes will be set at the same elevation and slope of the adjacent sidewalk, curb or pavement.
24. All conduit and substructures to be used by REU must be inspected prior to backfilling. Failure to obtain an inspection will require the installer to expose any or all of the buried facilities for an inspection. Call 224-4390, 48 hrs prior to backfilling, to schedule an inspection by the Electric Utility Inspector.
25. All utility padmount transformers and switchgear equipment shall be located within 8' of a paved driveable access.
26. Groundwater/stormwater intrusion and migration in any trench is the responsibility of the customer and/or his trenching agent for the life of facilities placed in the trench.
27. Electric meter service panels must meet Electric Utility Service Equipment Requirements Committee (EUSERC) standards accepted by REU.
GENERAL NOTES:

1.) The information provided on this drawing is intended to advise customers of the minimum requirements for customer-owned service poles for temporary overhead electric service.

2.) Inspection and approval of the installed pole by the city building department is required before service can be connected.

3.) When single phase service larger than 100 amps or three phase service is desired, consult Redding Electric Utility (REU).

4.) The use of temporary service poles shall be restricted to installation of a temporary nature such as building construction, temporary sales locations, or other uses requiring electric services for one year or less.

5.) Address numbers shall be provided and attached to the meter enclosure as shown. The numbers shall be a minimum of 2” in height and posted in a manner that will be visible from the street.

6.) Service lengths greater than 50’ or crossing a road must first be engineered. Consult with REU.

SERVICE POLE INSTALLATION

7.) Temporary service poles shall be furnished and installed by the customer. The minimum length shall be 22’, with 4’ embedded in the ground. A longer pole may be necessary to provide the required clearance from ground.

8.) A temporary wood service pole may be rectangular or circular in cross section and shall be solid (not laminated). Rectangular poles shall have a minimum cross section of 6”x6” nominal. Circular poles shall be class 6. Preservative treated wood poles.

9.) The butt of the temporary wood service pole shall be at a minimum, painted with creosote or any other approved preservatives where in contact with the earth.

10.) Conductors to service poles shall have a minimum vertical clearance to ground of 16’ (when crossing utility lines, roads, railroad tracks, buildings or other obstructions, consult REU).

11.) The customer shall furnish, install and maintain the service entrance wiring and service equipment beyond the point of attachment to REU service wires.

12.) The neutral conductor of 2 wire 120 volt and 3 wire 120/240 volt (or 120/208v) services shall be securely connected to the neutral terminal of the meter socket and extended through to the service entrance disconnect. It shall be continuous (without splice) from the service head to the service entrance switch.

13.) At least 18” of the service entrance conductors shall be provided outside the service head.

SERVICE ENTRANCE AND LOAD SIDE CONDUIT

14.) All conduit installed on the pole shall be 1.5” - 2.5” diameter schedule 80 PVC. PVC plastic conduit is not to be covered. The conduit shall be fastened to the pole at intervals not greater than 3’ on centers.

GROUNDING

15.) The path to ground from circuits, equipment and conductor enclosures shall be permanent and continuous. All metallic enclosures and conduit enclosing service entrance conductors shall be connected to the common ground.

16.) A continuous grounding conductor shall be extended from the neutral terminal of the disconnect to a grounding electrode. The ground conductor shall be No. 8 AWG copper for No. 2 copper (1/0 AL) or smaller service entrance conductors and No. 6 AWG for No. 1 or 1/0 copper (2/0 or 3/0 AL) service entrance conductors. The ground conductor shall be protected against mechanical damage by rigid steel conduit, flexible cable or armor cladding connected to the grounding by means of an approved conduit grounding hub and clamp. The grounding electrode must be above finish grade or otherwise readily accessible for inspections.

17.) Acceptable materials for the grounding electrode for the service pole shall be either a 1/2 " diameter copper clad rod, 5/8" diameter steel rod or a 3/4" diameter galvanized iron pipe. The electrode shall be installed such that a minimum of 8’ is in contact with the soil.
GENERAL NOTES:
1. The information provided on this drawing is intended to advise customers of the minimum requirements for customer owned service poles for permanent overhead service.
2. Since permanent customer owned service poles may have to be climbed by REU lineman they are subject to compliance with the requirements of General Order 95 "Rules for Overhead Electric Line Construction" of the California Public Utilities Commission.
3. Inspection and approval of the installed pole by the City Building Department is required before service can be connected.
4. When single phase service larger than 100 amps or 3 phase service is desired, consult with REU.
5. Permanent service poles shall be used when it is estimated that the installation will remain for a period of more than one year and no substantial building exists for the mounting of the meter enclosure.
6. Address numbers shall be provided and attached to the meter enclosure as shown. The numbers shall be a minimum of 2" in height and posted in a manner that will be visible from the street.
7. Lighting, signs ropes and any similar equipment shall not be attached to the service pole.
8. Service lengths greater than 100' or crossing a road must be engineered. Consult with REU.

SERVICE POLE INSTALLATION:
9. Permanent service poles shall be furnished and installed by the customer.
10. The minimum length shall be 25' with 4'-6" embedded in the ground. A longer pole may be necessary to provide the required clearance from the ground or other obstructions whether on the customer's property or not.
11. Permanent service poles must be circular in cross section. A minimum class 6 (class 5 if phone or CATV attached) and full length preservative treated. See Table 2 for approved preservative treatments.
12. Permanent service pole shall be located so that vertical clearances as shown on sheet 3 can be obtained.
13. The service pole shall not be located less than 10' nor more than 100' from the surface of the REU pole, or within 10' of the vertical plane of a REU overhead line conductor.
14. Customer's service pole must be guyed against the pull of the service drop by one of the anchor guy methods shown on sheet 3.

VERTICAL CLEARANCE FOR SERVICE POLE:
15. Conductors to the service poles shall maintain vertical clearances as specified on sheet 3. If service drop must cross utility lines, roads, railroads tracks or other obstructions consult with REU.

SERVICE ENTRANCE CONDUCTORS AND CONDUIT:
16. The customer shall furnish, install and maintain the service entrance wiring and service equipment beyond the point of attachment to REU service wires.
17. A minimum of 18" of service entrance conductors shall be provided outside the service head.
18. Service riser conduit shall be 1.5" - 2.5" diameter schedule 80 PVC. PVC plastic conduit is not to be covered and shall be fastened to the pole at intervals not to exceed 3'.
NOTE 1: Customer's equipment shall not be installed in climbing space.

TABLE 1: POLE SETTING DEPTHS

<table>
<thead>
<tr>
<th>POLE LENGTH (FT.)</th>
<th>DEPTH (FT.) IN FIRM SOIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>4 1/2</td>
</tr>
<tr>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>35</td>
<td>5</td>
</tr>
<tr>
<td>40</td>
<td>5 1/2</td>
</tr>
</tbody>
</table>

TABLE 2: APPROVED SERVICE POLE TREATMENTS

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>OIL PENTA</th>
<th>CCA</th>
<th>Cu NAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>WESTERN RED CEDAR</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DOUGLAS FIR</td>
<td>X</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

OIL PENTA = Pentachlorophenol  
CCA = Chromated Copper Arsenate  
Cu NAP = Copper Napthenate

All poles shall be full length treated except that Western Red Cedar may be butt treated with oil Pentachlorophenol.

All poles shall be treated in accordance with the American Wood Preserver's Association (AWPA) and American National Standards Institute (ANSI) requirements.
REU POLE

10' MINIMUM - 100' MAXIMUM
(SEE NOTE 13 SHT. 1)

CLEARANCE FOR SERVICE POLES

1/2" X 6' GALVANIZED STEEL ANCHOR ROD.
(MINIMUM SIZE)

6" APPROX.

8" MIN. DIA. X 4’ LONG TREATED LOG.

FIGURE 1
LOG ANCHOR

1/2" X 6' GALVANIZED STEEL ANCHOR ROD.
(MINIMUM SIZE)

6" APPROX.

6" MINIMUM DIA. STEEL ANCHOR

FIGURE 2
STEEL ANCHOR

NOTES:
1. The minimum anchor depth in the soil is 4 feet.

REDRAWN

PERMANENT OVERHEAD ELECTRIC SERVICE
CUSTOMER-OWNED SERVICE POLE

REDding Electric Utility
NOTES:

1. Overhead electric service termination facility and meter shall be attached to the wall facing and nearest the point of service as determined by REU.

2. The meter location shall be accessible for inspection, reading, and testing.

3. If a preferred location is not practicable, consult REU.

4. If there is any doubt as to point of service contact REU.

5. All services over 100' requires REU approval.

6. If building side wall is less than 5' from property line this area cannot be used for a meter location.

7. For underground services see drawing CS101.
SERVICE DROP CLEARANCES

These service clearances apply to new installations and reconstruction work.

1) Above building roofs, platforms or projections accessible to pedestrian traffic (access to the roof gained by doors to the roof or attached ladders, and by not having to climb over or remove obstacles) maintain:
   A. A 10 foot radial clearance on conductors that do not exceed 150 volts to ground
   B. A 12 foot radial clearance on conductors more than 150 volts but does not exceed 300 volts to ground
   C. A 15 foot clearance on conductors more than 300 volts to ground

Clearances in all the cases above shall be from the closest point between the roof, platform, or projection and the service conductor, including the drip loop and shall extend 3’ past the edge of the roof, platform or projection. There shall be no exceptions to this rule.

2) Above building roofs, platform or projection not accessible to pedestrian traffic. An 8 foot vertical clearance must be maintained between the closest point of the service and the roof including the drip loop. The 8 foot vertical clearance must also be maintained 3 feet past the edge of roof.

   Exceptions - where the voltage between conductors does not exceed 300 volts and;
   A. When the roof has a slope of 4” in 12” (4 to 12) or greater, the 8’ clearance may be reduced to 3 feet.
   B. Over the overhanging portion of the roof only, the 8’ (or 3’) clearance may be reduced to 18” as long as the service conductor crosses no more than 4’ of any portion of the roof, platform or projection. The service conductor must also be terminated on a periscope type service entrance.

3) From signs, chimneys, radio and television antennas, tanks and other nonbuilding or nonbridge structures maintain 3’ radial clearance.

4) Swimming pools;
   A. Above the water level and the ground level within 10’ of the pool or equipment (diving boards, grand stands, etc.); maintain at least 22.5’ radial clearance (25’ for open wire services).
   B. Above any elevation higher than ground level of diving boards, grand stands, etc.; maintain at least 16’ radial clearance, for all service types.

REFERENCES: National Electric Code or CPUC GO.95, which ever is more restrictive.
SERVICE DROP CLEARANCES

PERISCOPE TYPE ATTACHMENT (PREFERRED)

PERISCOPE TYPE ATTACHMENT (ALTERNATIVE)

PERISCOPE TYPE ATTACHMENT WITH BRACING

NEW DRAWING

CONSULT UTILITY WHEN SERVICE MAST EXCEEDS 6'.

EITHER PUSH OR PULL BRACING MAY BE USED SEE STD. 505.00

WALL NEAREST AND FACING REU LINES

THIS TYPE OF INSTALLATION TO BE USED WHERE NECESSARY TO AVOID THE HAZARD OF SERVICE CONDUCTORS CROSSING OVER ROOF AREA.

SEE STD 505.50 FOR METER SPACE REQUIREMENTS
CITY OF REDDING
BUILDING DIVISION

SUBJECT:
BRACING SERVICE MASTS

BACKGROUND

The National Electric Code, Section 230-28, states, "Where a service mast is used for the support of service drop conductors, it shall be of adequate strength or be supported by braces or guys to withstand safely the strain imposed by the service drop".

The code does not specify at what height bracing or guys are to be required. In the past, there has been confusion as to when bracing or guys are required.

POLICY

All service masts will be rigid metal conduit. Bracing shall be as per the following:

1. 100 amp service: #2 aluminum, 1-1/4" conduit, supported when mast exceeds 24" in height.
   #4 copper, 1-1/4" conduit, supported when mast exceeds 24" in height.

2. 125 amp service: #1/0 aluminum, 1-1/2" conduit, supported when mast exceeds 36" in height.
   #2 copper, 1-1/4" conduit supported when mast exceeds 24" in height.

3. 150 amp service: #2/0 aluminum, 1-1/2" conduit, supported when mast exceeds 36" in height.
   #1 copper, 1-1/2" conduit, supported when mast exceeds 36" in height.

4. 200 amp service: #4/0 aluminum, 2" conduit, supported when mast exceeds 54" in height.
   #2/0 copper, 1-1/2" conduit, supported when mast exceeds 36" in height.

Couplings shall not be allowed above roof lines. On un-braced masts, couplings shall not be allowed below roof lines for a distance equal to the unsupported height.

For surface-mounted services, the mast shall be supported at the roof line by approved mechanical means or by the hole in the sheathing, if tight fitting.

APPROVED BY:

BUILDING OFFICIAL
7/24/08

REDRAWN
METER WORKING SPACE:
Working space in front of the meter permits access to the metering installation and provides working safety for personnel. A working space entirely on the property of the customer is required in front of all meters.

1. The working space is to be kept clear and unobstructed at all times. Landscaping, structures or stored material shall not intrude into the working space.
2. When meters or metering equipment are placed in cabinet enclosures, the clear working space shall extend from the outer face of the cabinet.
3. If the working space is exposed to vehicles or other hazards, barrier posts are required. See sheet 2 of 2 for barrier post placement and installation details.
4. The depth of the clear working space shall be 36" minimum for services rated 150 Volts or less to ground. When the service is rated in excess of 150 Volts to ground, the depth shall be as required by applicable electrical codes or as dictated by the physical design and arrangement of the metering cubicles.
5. When meter projects into a walkway, additional space, barrier posts or other means may be required to minimize the possibility of someone running into or bumping the meter.

**NOTES:**
To allow cabinet door to open fully (90° or more), the 30" minimum width dimension of the meter working space shall be increased as necessary.

*If the working space is indoors.
1. Caution must be taken when installing barrier posts so that they do not make contact with any underground utilities.
2. A welded cap may be used in lieu of concrete cap.
3. Use 4" steel pipe, (not galvanized) with a minimum wall thickness of 0.188". The pipe shall be primed and painted white.
4. Distance maybe increased to accommodate larger services.
5. Barrier posts to be supplied and installed by customer.
GENERAL NOTES:

1. The information shown on this drawing is intended to advise customers of the minimum requirements for customer owned service poles for temporary underground electric service. These requirements have been established by the State of California and REU in the interest of safety to the public and workers. REU can not establish service to poles which do not meet these minimum requirements. Maintenance of customer service poles in conformity with these requirements is the sole responsibility of the customer.

2. Inspection and approval is required before service can be connected.

3. When single phase service larger than 100 amps or three phase service is desired, consult REU.

4. The use of temporary service poles shall be restricted to installation of a temporary nature such as building construction, temporary sales locations, or other uses requiring electric service for one year or less. Temporary service poles shall be furnished and installed by the customer. If the temporary service is to be established at the permanent meter location, consult REU.

5. Temporary power poles will not be located in the shaded area of FIGURE 1. In no case shall the pole be located closer than 3’ from the box.

6. Address number shall be attached to meter pedestal as shown. Minimum 2” numbers are required.

GROUNDING:

The grounding system shall conform to the minimum grounding requirements of the Electrical Safety Orders as follows:

1. The path to ground from circuits, equipment and conductor enclosures shall be permanent and continuous. All metallic enclosures and conduit enclosing service entrance conductors shall be connected to the common ground.

2. A continuous grounding conductor shall be extended from the neutral terminal of the service switch to a grounding electrode. The ground conductor shall be No. 8 AWG copper minimum for No. 2 AWG copper (or aluminum equivalent) or smaller service entrance conductors and No. 6 AWG copper for No. 1 or 1/0 AWG copper (or aluminum equivalent) service entrance conductors. The ground conductor shall be protected against mechanical injury by rigid steel conduit or armor cladding connected to the grounding electrode by means of an approved conduit grounding hub and clamp or approved armor grounding hub and clamp. The connection to the grounding electrode must be above ground or otherwise readily accessible for inspections.

3. A metallic underground water piping system, either local or supplying a community, shall always be used as a grounding electrode where such piping system is available. If the buried portions of the metallic piping system is less than 10 feet in length (including well castings bonded to the piping system) or there is a probability that the piping system may be disconnected, it shall be supplemented by one or more of the following electrodes driven 8 ft. into the ground: (1) Galvanized pipe not smaller than 3/4” inside diameter; (2) Copper clad steel or non-ferrous rod not smaller than 1/2” diameter; (3) Iron (or steel) rod not smaller than 5/8” diameter.
FIGURE 1

NO TEMPORARY POLES WITHIN THIS AREA

BACK OF SIDEWALK

FIGURE 2

CAUTION: NON-METALIC WATER PIPE IS NOT SUITABLE FOR USE AS A GROUNDING ELECTRODE.

REU SECONDARY PULL BOX LOCATED BY REU

CUSTOMER/CONTRACTOR SHALL PROVIDE A MINIMUM OF 48" OF CONDUCTOR BEYOND END OF CONDUIT SO REU CAN COMPLETE CONNECTIONS.

CUSTOMER SHALL INSTALL CONDUIT AND CABLE AS REQ'D BY CODE. (FOR EASE IN TRANSPORTING, FLEX CONDUIT MAY BE USED)

REU SECONDARY PULL BOX LOCATED BY REU

IF TEMPORARY OVERHEAD POLE, SHALL CONFORM TO G.O.95 REQUIREMENTS

WEATHER-PROOF COMBINATION METER AND CIRCUIT BREAKER OR SWITCH-FUSE ENCLOSURE

RIGID CONDUIT STEEL OR SCH.80

ORIGINAL GROUND

GROUND WIRE

GROUND ROD

4x6 POST

WEATHER-PROOF OUTLETS

SEALABLE CONDUIT

ADDRESS NO.

CONDUIT SWEEP SCH.40

18" MIN.

5' MIN.

6'3" MAX.

506.01 DES/REV DATE ASSISTANT DIRECTOR - DISTRIBUTION REVISED DWG. NO.

TEMPORARY UNDERGROUND ELECTRIC SERVICE

REDDING ELECTRIC UTILITY

BRR/RLH 06/01/85 03/21/12 CS0100
1. Underground electric service termination facility and meter shall be attached to the wall facing and nearest the point of service as determined by REU when subdivision was developed.
2. The meter location shall be accessible for inspection, reading, and testing.
3. If a preferred location is not practicable, consult REU.
4. If there is any doubt as to point of service contact REU.
5. Refer to Std. 526.00 (CS1112) for utility trench layout across front of lot.
6. There shall be no splices in the service wire except at point of service. All services over 100' require REU approval.
7. For underground service the customer shall coil 3' of wire in the pullbox at the point of service for future splicing by REU. If pole is point of service, consult REU for length of wire to be coiled on pole future splicing by REU. See Std. 547.00 (CS1210).
8. If building side wall is less than 5' from property line this area cannot be used for a meter location.
9. For overhead services see Std. 504.00 (CS2007).
IF THE BOTTOM OF THE CUSTOMER'S MAIN SWITCH IS BELOW THE LEVEL OF THE GROUND AROUND REU'S SERVICE BOX (SEE NOTE 5 AND STD. 507.10 (CS0120))

BUILDING WALL
CUSTOMER'S MAIN SWITCH

FINAL GRADE
NOTE 3 & 4
NOTE 3 & 4
SEE NOTE 1

FIGURE 1
(NOTES, SEE SHEET 3 OF 5)

INSTALL CONDUIT ON EVEN SLOPING GRADE

FIGURE 2A
SEE NOTES 2 & 3
24" MIN.
WIDTH AS REQUIRED
SAND SHADE
12" MIN.
6" MIN.
4" SAND BEDDING

2" MIN.

FIGURE 2B
SEE NOTES 2 & 3
24" MIN.
SAND SHADE
6" MIN.
OPT. GAS LOCATION
12" MIN.
4" SAND BEDDING

2" MIN.

FIGURE 2
TYPICAL SERVICE TRENCH DESIGN
(NOTES, SEE SHEET 3 OF 5)

G - Gas Pipe
S - Electric Services in Conduit
T - Telephone Service
C - Cable Television Service

REDING ELECTRIC UTILITY
UNDERGROUND SINGLE FAMILY RESIDENTIAL SERVICE TRENCH DETAIL
REVISED FIGURES
ELECTRIC CONSTRUCTION STANDARD

REVD/REV DATE ELECTRIC MANAGER - ENGINEERING REVISED DWG. NO.
JCR 01/01/85 01/05/18 CS0101
CUSTOMER SHALL FURNISH AND INSTALL AT HIS/HER EXPENSE:

1. Service lateral conduit and sweeps from point of service to terminating facility. Conduit size shall be based on ampere capacity of bus or service equipment, whichever is greater. See Sheet 4
2. Backfill and compaction to meet REU requirements. Shade all utilities with 6" of sand cover.
3. Depth and separation shown are minimums. Variances may be required if larger diameter facilities are to be installed. Gas facilities shall conform to provisions of C.P.U.C. G.O. 112C and electric facilities to provisions of C.P.U.C. G.O. 128.
4. Electric service conduit shall meet the requirements of Std. 521.00 (CS1010). All sweeps shall be PVC schedule 40, all riser sweeps and/or conduit installed above 24" in depth shall be PVC schedule 80.
5. If the bottom of the customer's main switch is at a lower elevation than the ground around the service splice box, water migration towards customer termination facilities will exist. It shall be the customer's responsibility to install duct seal and a customer owned intermediate splice box to prevent water intrusion. REU assumes no responsibility for water intrusion, see Std. 507.10 (CS0120).
6. A water service is not allowed in a joint trench with a gas service. If gas is not in the service trench, contact all other occupants of the trench to establish the allowance of a water service in the joint service trench.
7. Ground water/storm water intrusion and migration in any trench is the responsibility of the customer and/or his/her trenching agent for the life of the facilities placed in the trench.
RIGID CONDUIT
STEEL OR SCH.80
BUILDING
FOUNDATION

SEE
SHEET 5
OUTER
BUILDING
WALL

RIGID CONDUIT
STEEL OR SCH.80
BUILDING
FOUNDATION

SEE
SHEET 5
OUTER
BUILDING
WALL

FIGURE 3
RECESSED MOUNTED
SERVICE TERMINATION ENCLOSURE

FIGURE 4
SURFACE MOUNTED
SERVICE TERMINATION ENCLOSURE

TABLE 1:

<table>
<thead>
<tr>
<th>CUSTOMER INSTALLED SERVICE EQUIPMENT OR BUS CAPACITY</th>
<th>CUSTOMER FURNISHED &amp; INSTALLED SERVICE LATERAL CONDUIT (NOTE 8)</th>
<th>CUSTOMER FURNISHED &amp; INSTALLED SERVICE WIRE FOR 3 WIRE SERVICE (NOTE 8 &amp; 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-100 AMPS</td>
<td>3&quot; PREFERRED - 2&quot; MIN</td>
<td>* 1/0 TRIPLEX</td>
</tr>
<tr>
<td>101-300 AMPS</td>
<td>3&quot; PREFERRED - 2&quot; MIN</td>
<td>* 4/0 TRIPLEX</td>
</tr>
<tr>
<td>301-320 AMPS</td>
<td>3&quot; MIN</td>
<td>* 350 TRIPLEX</td>
</tr>
</tbody>
</table>

NOTES:
1. All conduit installed shall meet the requirements of Std. 521.00 (CS1010).
2. All sweeps shall be PVC schedule 80 or equal.
3. Verify meter and service location with REU before installation.
4. Customer shall furnish, install own and maintain conduit 2' from their outer building line to their terminating facility.
5. Service lateral conduit specified in Table 1 is limited to not more than 3-90° bends, or a combination of angles with not more than 270° deflection through the service run unless shown otherwise on REU approved plans.
6. All service wire shall be XLP insulated N.E.C. type "U.S.E." Aluminum, Std. 510.00 (CS0200). All exposed cable ends shall be protected by plastic caps and taped secure to the cable.
7. * Verify with REU for wire size on 120/208V single phase service.
8. All service lateral conduits installed in subdivisions, constructed after December 1, 2017, shall be 3" minimum.
FIGURE 5
TYPICAL UG SERVICE TERMINATION ENCLOSURE
COMBINATION METER SOCKET PANEL
(Residential 0-200 Amp.)

TABLE 2:

<table>
<thead>
<tr>
<th>MAXIMUM CAPACITY</th>
<th>&quot;W&quot; MIN. DIM.</th>
<th>&quot;X&quot; MIN. DIM.</th>
<th>&quot;Y&quot; MIN. DIM.</th>
</tr>
</thead>
<tbody>
<tr>
<td>125A</td>
<td>7&quot;</td>
<td>8&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>200A</td>
<td>7&quot;</td>
<td>11&quot;</td>
<td>5 1/2&quot;</td>
</tr>
</tbody>
</table>

FIGURE 6
TYPICAL SERVICE TERMINATION ENCLOSURE COMBINATION METER SOCKET PANEL FOR CLASS 320 METER
(Residential 120/240v, 201-320 Amp. Service)
4-Jaw Meter Socket Only. No Bolt on Panel Accepted.

NOTES:
1. Conductors to class 320 meter panels shall be terminated with compression lugs with Nema pads shown in Figure 6. See Sheet 3 for wire sizes applicable to subject panels.
2. Replacement or enlargement of service lateral conduits and conductors due to relocation or increased load will be accomplished by the customer. The conduit that is on, within or under the building, will be owned, maintained, and replaced by the applicant.
3. Where the applicant's terminating facilities are appreciably lower in elevation than at the street end, both ends of the conduit will be sealed in order to avoid the possibility of a static head of water against the Duxseal at the lower end of the conduit run.

FIGURE 7
METER POST FOR SERVICE TO A MOBILE HOME
(0 through 200 amps)
SEALING INSTRUCTIONS:

1. Clean cables and duct with Type CD cleaning wipe (Polywater Cat. #CD-1).
2. Create a foam dam by wrapping foam strip around cable so that it fills the space between the cable and duct. Foam strips will also slow any existing water flow. Cut foam to size as necessary. Using the positioning rod, push foam (5 to 7 inches) into duct (FIGURE 1).

3. Using the same method, wrap second foam strip around cable. Push second foam strip into the duct until the edge is flush with the duct entrance (FIGURE 1).
4. Remove foam base cartridge from pouch. Note: Do not remove cartridge from protective foil until ready to use.
5. Put on impermeable gloves and eye protection. Holding cartridge upright, slide off metal clip and remove nut and plug (plug can be saved for re-use cartridge). Attach mixing nozzle and tighten nut back into place.
6. Position cartridge in Ratchet Application Tool (Polywater Cat. #FST-TOOL). Dispense and discard the first liquid to run through the nozzle (about 1 squirt with the application tool). This initial material will not be well mixed.

7. Insert mixing nozzle into top of foam dam so that tip extends into space between foam strips (FIGURE 1). Inject desired amount of foam sealant (See Table 1). Rapid injection will produce better mixing. Sealant will expand fully in 2 to 5 minutes.

8. Secure foam dam to the edge of duct for 1 minute as sealant expands.

9. Remove cartridge with the static mixer attached. Sealant may seep between the crevices of the foam dam as it expands.

10. Sealant will harden (set) in 10 to 15 minutes.

11. After sealant has set, the top of the foam dam may be pulled down slightly to see whether the sealant has expanded enough to fill the entire void. There should be no air pockets visible. If the foam sealant has not completely filled the duct, attach a new mixing nozzle and inject sealant directly into the void area.

12. Clean up: Cartridge can be re-used for several weeks after initial use. Remove mixing nozzle and visually ensure that orifices are not blocked. Seal with replacement plug and nut. When ready to use, remove end cap assembly and check to make sure orifices are void of any hardened sealant. Attach a new, un-used mixing nozzle, tighten nut and insert used cartridge into ratchet application tool.

13. Dispose of material in accordance with local, state and federal regulations.

TABLE 1:

<table>
<thead>
<tr>
<th>DUCT SIZE O.D. INCHES</th>
<th>APPROXIMATE QUANTITY LIQUID FOAM SEALANT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 SQUIRTS</td>
</tr>
<tr>
<td>3</td>
<td>4 SQUIRTS</td>
</tr>
<tr>
<td>4</td>
<td>7 SQUIRTS</td>
</tr>
<tr>
<td>5</td>
<td>10 SQUIRTS</td>
</tr>
</tbody>
</table>

* Each squirt is a full compression with the application tool. There are approximately 10 squirts per cartridge. These quantities are a starting point only. Actual required quanity will vary.

** Polywater Sealing System is an approved method. Other manufacturers may be used with prior approval of REU's inspector.

POLYWATER CATALOG INFORMATION

<table>
<thead>
<tr>
<th>CATALOG NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FST-180-KIT</td>
<td>1 - 6 oz. CARTRIDGE (CAT#FST-180)</td>
</tr>
<tr>
<td></td>
<td>2 - 24&quot; FOAM DAMMING STRIPS (CAT#FST-DAM)</td>
</tr>
<tr>
<td></td>
<td>3 - MIXING NOZZLES</td>
</tr>
<tr>
<td></td>
<td>1 - PAIR DISPOSABLE GLOVES</td>
</tr>
<tr>
<td></td>
<td>1 - POSITIONING ROD FOR FOAM DAM</td>
</tr>
<tr>
<td></td>
<td>1 - PRE-TREATED WIPE (CAT#CD-1)</td>
</tr>
<tr>
<td></td>
<td>1 - RESEALABLE CAP</td>
</tr>
<tr>
<td></td>
<td>1 - INSTRUCTION SHEET</td>
</tr>
<tr>
<td>FST-180</td>
<td>1 - 6 oz. CARTRIDGE WITH 3 MIXING NOZZLES</td>
</tr>
<tr>
<td>FST-TOOL</td>
<td>1 - RATCHET APPLICATION TOOL</td>
</tr>
<tr>
<td>FST-DAM</td>
<td>1 - 24&quot; FOAM DAMMING STRIP</td>
</tr>
<tr>
<td>CD-1</td>
<td>1 - CONDUIT PRE-TREATING WIPE</td>
</tr>
</tbody>
</table>

REDRAWN
**GENERAL NOTES:**

1. This standard applies to 100 amp and 200 amp underground service distribution pedestals utilized for commercial services such as, but not limited to, stoplights, irrigation systems, and streetlights.

2. Pedestals mounted directly atop a concrete foundation are preferred over those buried directly into the ground with a concrete slab poured around them. The latter have direct contact with the earth resulting in corrosion and shortened life.

3. Test bypass facilities are required in all non residential services except signboards, irrigation contacts, and general service panels for apartments.

4. Lever bypass are not acceptable on commercial pedestals.

5. All commercial pedestals require a single main disconnect on the load side of the meter.

6. See Sheet 2 for placement of pedestal and conduit notes.
PLACEMENT OF PEDESTAL:

1. Electric meter pedestals placed behind or in front of sidewalks shall in all instances be placed so that no portion of the pedestal including the electric meter, when installed, is closer than 2’ from a vertical plane extending up from the closest edge of the sidewalk.
2. Electric meter pedestals placed behind curbs shall in all instances be placed so that no portion of the pedestal including the electric meter, when installed, is closer than 3’ from a vertical plane extending up from the backside of the curb when located along a straight road section and 6’ from a vertical plane extending up from the backside of the curb when located along a curved road section.
3. A 30” wide by 36” deep area must remain clear of all vegetation and obstructions directly in front of the meter pedestal to provide adequate working space.

CONDUITS:

1. Service conduits entering the underground service pedestal shall not be visible externally or exposed to sunlight. All service conduits shall enter the pedestal directly and internally at or below the ground level of the pedestal.
2. Where the applicant’s terminating facilities are appreciably lower in elevation than the opposite end of the conduit run, both ends of the conduit will be sealed in order to avoid the possibility of a static head of water against the Duxseal at the lower end of the conduit run.
I. CONNECTING NON-UTILITY POWER SOURCES TO UTILITY SERVICES:

A. The legislature of the state of California intended, by enacting the California Health and Safety Code, Chapter 415, to prevent electricity generated by permanent or portable electric generators from back feeding into a utility's electrical distribution system and also to protect the customer's generator from substantial damage due to out of synchronization closing. In addition, CCR Title 8, Section 2320.9 states:

B. "No electrical power source, permanent or temporary, shall be connected to a premises wiring system, or parts of such a system, unless positive means are used to prevent the transmission of electricity beyond the premises wiring system, or beyond any intentionally segregated parts of such a system."

Exception: When an interconnection has been authorized by the servicing utility.

C. A "positive means" is interpreted as a device which, by its use or operation, interrupts or prevents the flow of current to or from the electrical system and which provides the device operator or user a visual or other definite indication of the existing condition or state of the electrical system.

II. GENERATORS NOT PERMANENTLY CONNECTED (Temporary Connections):

A. Any portable electric generator shall be connected as described in the California Health and Safety Code, Section 119075(b), which states:

B. "Any portable electric generator that is capable of being connected temporarily to a customer's electrical system, that is normally supplied by an electrical corporation or state or public agency, shall be connected only after opening the customer's electrical system from that of the electrical corporation or state or local agency."

C. This applies to any generator connected as a temporary (i.e. non-routine, non-scheduled) or emergency source of power. Any portable electric generator used periodically as a source of power on an as needed or scheduled basis, for example to provide backup for equipment maintenance, shall be connected as described below.

III. GENERATORS CONNECTED PERMANENTLY OR PERIODICALLY:

A. Generators connected permanently or periodically to an electrical service and used on a planned, routine, or scheduled basis, but not operating in parallel with REU's system are to be connected as described in the California Health and Safety Code, Section 119075(c), which states:

B. "Any electrical generator, other than a generator designed to run in parallel with the system of the servicing utility and approved by that utility, that is capable of being permanently connected to a customer's electrical system shall be connected only by means of a double throw "break-before-make" switch so as to isolate the customer's electrical system from that of the electrical corporation or state or local agency."

C. The switch may be either a manual or automatic transfer switch that is listed for the application by any nationally recognized testing laboratory (see UL Standard 1008 or UL Standard 98). The switch may be an integral part of either the generator assembly or service facilities. UL rating shall apply to the entire switch and not individual components.

IV. PROTECTIVE DEVICES:

A. Any non REU owned emergency standby or other generation equipment that can be operated to supply power to facilities that are also designed to be supplied from REU's system shall be controlled with suitable protective devices by the applicant to prevent parallel operation with REU's system in a failsafe manner, such as the use of a double throw switch (see FIGURE 1) to disconnect all conductors, except where there is a written agreement of service contract with REU permitting such parallel operation.
V. WARNING STATEMENT AND LABELS FOR INTERCONNECTED SERVICES:

A. California Health and Safety Code, Section 119080(a) requires:
   “Every manufacturer of a portable or permanent electrical generator that is capable of being connected
either permanently or temporarily to a commercial, industrial or residential structure's electrical system
shall include a warning statement in the generator's instruction manual and a legible warning label on
the generator which states the requirement of Section 119075 and explains the electrical hazards of
backfeed into a utility's distribution system. The same warning information shall be included in all
advertisements offering portable electrical generators.”

B. California Health and Safety Code, Section 119080(b), requires:
   "No person or public agency shall sell or rent to another person or public agency, or offer for sale or
rent to another person or public agency, a portable electrical generator unless the legible warning label
is on a visible surface of the generator.”

VI. VIOLATION:

A. California Health and Safety Code, Section 119090, provides that violation of the requirements of
Sections 119075 to 119085, inclusive, "Electrical Hazards," is a misdemeanor offense, subject to a
fine of not more than five hundred dollars ($500) or not more than six (6) months imprisonment.

![Diagram of electrical system]

* SWITCH CANNOT ALLOW CONNECTION OF
GENERATOR TO NON-CRITICAL LOAD.
(REQUIRES VERIFICATION BY REU)

FIGURE 1
CUSTOMER EMERGENCY STANDBY GENERATION
OPERATED SEPARATE FROM THE UTILITY SYSTEM

NOTES:

1. At no time during customer generation shall critical loads be connected to non-critical loads.
PURPOSE AND SCOPE:
This drawing shows REU's acceptable methods to be used by residential and non-residential (200 amp or less main service switch) customers when converting existing 2 wire or 3 wire overhead services to underground.

GENERAL INFORMATION:
A typical overhead service conversion is illustrated in Figure 1, Sheet 2. It is the customer's responsibility to provide all trenching, furnish, supply and install all conduit and service conductors. Various surface mount and semi flush meter socket installations (illustrated in Figure 2, Sheet 3 thru Figure 6, Sheet 4) are for use when converting an overhead service to underground. The service option selected by the customer shall comply with all City of Redding building codes and ordinances. The customer shall furnish, install, own and maintain termination facilities on or within the building being served.
Local ordinances may include requirements in addition to those shown on this drawing. Consult the City of Redding inspection authorities for these requirements. Permits and final inspections must be obtained and completed before REU will establish service and set the meter.
When a service larger than 200 amps is desired, the customer shall consult with REU.

SERVICE CONDUIT AND TERMINATION REQUIREMENTS:
1. The customer shall contact REU for service arrangements and service location. The customer shall provide and install, in addition to termination facilities, all equipment required to modify the service entrance when changing from overhead to underground.
2. The customer shall perform all trenching and backfill per City of Redding Construction Standard Drawing (Page 620) and REU Drawing CS0101, Sheet 2 applicable and CS0200. If the trench is used jointly with other utilities increased electric cable depth may be required.
3. The customer shall furnish and install all conduits and service conductors as shown in Figure 1, Sheet 2. Consult REU for conduit size and service conductor size. Conduit shall meet the requirements of CS1010. Service cable (low voltage 600V) shall be XPL insulated N.E.C. type "U.S.E." Aluminum.
4. Bell ends shall be placed on all conduit terminations. Bell ends shall be of the same type material as conduit to which they are attached (i.e., D.B., Sch. 40, Sch. 80).
5. All conduits installed by the customer shall be cleaned by using brushes and/or swabs.
6. All conduits without conductors shall have a minimum 1250lb. polyester MULETAPE®, or an equal (especially designed for that purpose) pull line provided and installed by the customer.
7. All conduit sweeps shall be PVC Schedule 40. All conduit riser bends shall be PVC Schedule 80, or equal, per REU Drawing CS1210. Conduit sweeps or bends shall not be cut or otherwise modified. All joints shall be glued per manufacturer's specification and provide a water tight fit.
8. Customer shall coil 3' of cable in each splice enclosure with ends protected by plastic caps taped securely to the cable. All cable will be spliced by REU except at the service entrance (see note 12 below).
9. Conduit runs shall be limited to not more than 3 - 90° bends, or a combination of angles with not more than 270° deflection throughout the conduit run unless shown otherwise on REU approved plans.
10. There shall be no splices in low voltage (600V) wire except in REU approved splice enclosures.
11. Customer shall furnish, install own and maintain conduit 2' from their outer building line to their terminating facility.
12. All service conductors shall be terminated by the customer at their service termination point and entrance panel. All terminations will be by NEMA pad compression lugs except for 200 amp and smaller residential panels. Service conductors larger than 4/0 must use NEMA pad compression lugs. All connections will be properly torqued and installed to manufacturer's specifications. Approved corrosion inhibitor will be applied on wire ends at all connections.
13. The neutral conductors of low voltage (600V) triplex cable shall be insulated with a yellow pigmented XLP compound for easy identification. Single conductor cable used as neutral without yellow marking (pigmented) shall be identified at each splicing point by approved white electrical tape.
SERVICE CONDUIT AND TERMINATION REQUIREMENTS (cont.)

14. All conduit and substructures to be used by REU must be inspected prior to backfilling. Failure to obtain an inspection will require the installer to expose any or all of the buried facilities for an inspection. Call 224-4390, 48 hrs prior to backfilling, to schedule an inspection by a REU inspector.

15. Groundwater/stormwater intrusion and migration in any trench is the responsibility of the customer and/or his/her trenching agent for the life of the facilities placed in the trench.

16. Pull termination box as specified in Table 1, item 6, is for service conductors up to 4/0 kcmil cable. For larger cable contact REU.

17. The customer's service termination point is identified in Figures 1 thru 7, Sheets 2 thru 4.

18. Item 3 in Figure 3, Sheet 3 and Figure 4, Sheet 4, may be used only if the service conductor is 1/0 AL XLP insulated N.E.C. type "U.S.E." or smaller.

19. In accordance with the National Electric Code and the City of Redding building codes the customer shall be responsible for bonding and grounding all exposed non current carrying metal parts.

20. The electric meter will be furnished and installed by REU.

REFERENCES:

REU Construction Standards:
- CS0101 - Underground Single Family Residential Service Meter Location
- CS0200 - 600V Secondary and Service Conductors
- CS1010 - Underground Conduit Without Concrete Encasement

City of Redding Public Works Construction Standards:
- Page 620 - Joint Utility Trench Details

FIGURE 1
TYPICAL SERVICE CONVERSION
TABLE 1: DESCRIPTION OF ITEMS TO BE FURNISHED AND INSTALLED BY CUSTOMER

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>METER ADAPTER, BYPASS SERVICE TYPE, EKSTROM INDUSTRIES NO. 722-B (175A). SPECIFY LEFT, RIGHT OR BOTTOM HUB.</td>
</tr>
<tr>
<td>2</td>
<td>COMBINATION SERVICE METER AND BREAKER PANEL, RATING AS REQUIRED.</td>
</tr>
<tr>
<td>3</td>
<td>PULL TERMINATION BOX, 8&quot;X 12&quot;X 4&quot;, RAIN-TIGHT, CIRCLE A-W NO. R-9007A OR EQUIV.</td>
</tr>
<tr>
<td>4</td>
<td>CONDUIT, SIZE AND TYPE SUBJECT TO LOCAL CODES.</td>
</tr>
<tr>
<td>5</td>
<td>HUB TO BE CLOSED AND MADE TAMPER PROOF.</td>
</tr>
<tr>
<td>6</td>
<td>PULL TERMINATION BOX, 12&quot;X 26&quot;X 6&quot;, RAIN-TIGHT, CIRCLE A-W CAT. #R-90008, OR EQUIV.</td>
</tr>
</tbody>
</table>

NOTE: (see figure)

A. Size and type subject to REU requirements. See CS0101, Sheet 4.
NOTE A.  Size and type subject to REU requirements. See CS0101, Sht 4.

FIGURE 4
SEMI-FLUSH METER SOCKET

FIGURE 5
SEMI-FLUSH METER SOCKET

FIGURE 6
2-WIRE OR A-BASE METER CONNECTION

NOTE: 
A. Size and type subject to REU requirements. See CS0101, Sht 4.
MINIMUM SPECIFICATIONS FOR UNDERGROUND SECONDARY AND SERVICE CONDUCTORS

TABLE 1

<table>
<thead>
<tr>
<th>CONDUCTOR SIZE</th>
<th>INSULATION THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWG OR KCMIL</td>
<td>MILS</td>
</tr>
<tr>
<td>12-10</td>
<td>45</td>
</tr>
<tr>
<td>8-2</td>
<td>60</td>
</tr>
<tr>
<td>1-4/0</td>
<td>80</td>
</tr>
<tr>
<td>213-500</td>
<td>95</td>
</tr>
<tr>
<td>501-1000</td>
<td>110</td>
</tr>
</tbody>
</table>

OUTER COVER: MOISTURE RESISTANT NONMETALLIC APPLICATION: DRY AND WET LOCATIONS

NOTES:

1. All 600 volt secondary and service conductors supplied by customer/contractor shall be stranded aluminum Type USE-2/RHW-2 with XLPE insulated, unless otherwise noted on the Work Order Drawing(s).
2. All cable shall be stamped with both terms "USE-2" and "RHW-2" and meet all specifications of TABLE 1 above.
3. Cables stamped with the following markings are acceptable:

   "AL USE-2/RHW-2"
   "AL USE-2 or RHW-2"

   In addition, cable may contain markings "XLP" or "XLPE". If "XLP" or "XLPE" is not marked on the cable, XLPE insulation must be verified via manufacturer's product data sheet and purchase invoices.
4. All requirements above shall be met in order to be connected REU's electrical system.
### TERMINAL CONNECTORS

#### TABLE 1 TERMINAL CONNECTORS (ALUMINUM CABLE-TO-FLAT BAR) (FOR CIRCUITS 600V OR LOWER)

<table>
<thead>
<tr>
<th>CABLE SIZE OR AWG</th>
<th>DIMENSIONS (INCHES)</th>
<th>APPROVED FOR PURCHASE</th>
<th>C.O.R. STOCK CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>C **</td>
<td>L **</td>
<td>O.D.</td>
</tr>
<tr>
<td>4</td>
<td>1.24</td>
<td>1.25</td>
<td>.25</td>
</tr>
<tr>
<td>2</td>
<td>1.10</td>
<td>.91</td>
<td>5.62</td>
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<tr>
<td>1/0</td>
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<td>.91</td>
<td>5.62</td>
</tr>
<tr>
<td>2/0</td>
<td>1.60</td>
<td>1.25</td>
<td>5.43</td>
</tr>
<tr>
<td>4/0</td>
<td>1.60</td>
<td>1.25</td>
<td>5.75</td>
</tr>
<tr>
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<tr>
<td>350</td>
<td>1.91</td>
<td>1.62</td>
<td>6.84</td>
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<td>500</td>
<td>2.62</td>
<td>1.62</td>
<td>6.78</td>
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<tr>
<td>700/750</td>
<td>2.65</td>
<td>1.62</td>
<td>8.22</td>
</tr>
<tr>
<td>1000</td>
<td>2.97</td>
<td>1.62</td>
<td>8.88</td>
</tr>
<tr>
<td>350 **</td>
<td>1.91</td>
<td>1.62</td>
<td>6.84</td>
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<tr>
<td>500 **</td>
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<td>1.62</td>
<td>6.78</td>
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<tr>
<td>700/750 **</td>
<td>2.65</td>
<td>1.62</td>
<td>8.22</td>
</tr>
<tr>
<td>1000 **</td>
<td>2.97</td>
<td>1.62</td>
<td>8.88</td>
</tr>
</tbody>
</table>

All connectors are designed to fit side by side on a standard NEMA Spade terminal.

* These connectors shall be capable of being stacked on any straight terminal of equal or larger size. (Up to and including 1000 kcmil).

** These dimensions may vary slightly among the various suppliers.

Note: Type 2 connectors are not to be used on padmount transformers or URD connectors shown on standard DWG. CS815.

Material: Aluminum Alloy, Tubular or Cast.

Finish: Tin.

**P/W CONSTRUCTION STANDARD**

**CONNECTORS FOR 600V INSULATED CABLES**
I. SCOPE: HIGH VOLTAGE METERING AND SERVICE EQUIPMENT (12,000 VOLTS)

The following specifications and requirements apply to revenue metering compartments and protective device equipment of indoor and outdoor metal-clad switchgear in 12,000 volt installations.

II. SWITCHGEAR:

A. GENERAL

1. DRAWING APPROVAL - The manufacturer shall submit copies of their design drawings to Redding Electric Utility (REU) as required for high-voltage metering and protection equipment prior to fabrication. Such drawings shall indicate the customer’s name, the job address, the contact address and the telephone number of the manufacturer's representative.

2. WORKING SPACE - Switchboards shall in every case be installed with at least 6 feet of clear and level working space in front, rear and side of any section that supports or provides access to metering or testing equipment, or to a service cable termination. Because access is required to both the front and rear of the switchgear, a walkway at least 2 feet wide shall be provided around at least one end of the switchgear. If the switchgear is mounted on an elevated pad, the maximum meter height must be maintained from the clear and level working space.

3. UTILITY COMPARTMENT LABELING - Compartments of the metering enclosure shall be permanently labeled with machine engraved laminated phenolic (or equal) tags. Quarter-inch white letters and numbers on red colored material which is readily visible and mechanically attached to the face of the following designated compartments:
   a. Utility voltage transformer compartment.
   b. Utility voltage transformer fuse compartment.
   c. Utility current transformer compartment.
   d. Utility service termination compartment.
   e. Utility metering panel.

4. SAFETY GROUNDING PROVISIONS - Bare ground bus 4 inches above and below the current transformers shall be provided to permit application of serving agency safety grounds. As an alternate, a grounding knob may be provided on the line and load side of the bus at each current transformer locations.

5. METERING PANEL - Meter panel and hinges are to be designed to adequately support a 25 pound load applied at the unsupported end with 1/8 inch maximum sag when open. A #4 AWG flexible braided bond wire shall be installed across the hinges.

6. BASIC IMPULSE LEVEL - Basic Impulse Level (B.I.L.) for the metering enclosure shall not be less than 95kV. The metering cubicle shall be labeled with B.I.L. rating.

7. VENTILATION OPENING - A ventilation opening (slot or lover), shall be protected by one or more baffles, barriers, or other obstructions with dimensions and locations so that any wire, or similar material, will be deflected two times after it is inserted at any possible angle, through the ventilation hold or mesh. One deflection shall be at least 90 degrees from the direction of travel. In addition, if the minor dimension of a ventilation opening is larger than 1/4 inch, it shall be protected by a screen having a minor dimension no larger than 1/4 inch.
8. REAR DOOR ACCESS TO METERING CUBICLE - Working clearances at the customer's job site may determine if the the manufacturer is to furnish either a single or double full height hinged rear door access. In addition to provisions for a three point locking mechanism with hardware for attachment of utility furnished padlock, each door shall, when closed, be secured in place with the standard "stud and wing-nut assembly" for sealing. All external doors shall, when open, be equipped with a device to hold doors 90 degrees or more.

9. WEATHERPROOFING AND LOCKING - Enclosure sketches shall show equipment with weatherproof doors. The meter panel shall be hinged on the side opposite that of the outer door on weatherproof units to permit 90 degree opening with the meters and test facilities in place. The weatherproof doors may be omitted if the equipment is located indoors. If the outer door is omitted, the meter panel must be lockable. The front weatherproof door shall be a single door equipped with a latch-type handle to accommodate the REU padlock.

10. CT AND VT INSTALLATIONS - Current transformers and voltage transformers, meter testing facilities, and all normal secondary wiring from the transformers to the meters will normally be furnished and installed by REU except as noted otherwise.

B. BUS BARS AND CONDUCTORS

1. APPROVED BUS MATERIAL - Only copper or EUSERC approved plated aluminum bus shall be used in the metering enclosure. Aluminum bus shall be identified with the plating process where the service cables are terminated and the current transformers are mounted. Note: At any time, REU may require certification and supporting documentation of manufacturing process to meet electroplating thickness requirements.

2. BUS DIMENSIONS AND SPACING - Maximum bus size shall be 3/8 inch by 4 inches. Minimum bus size shall be 1/4 inch by 2 inches. Bus sizes outside of these limits require special engineering and consultation with REU.

3. PASSING THROUGH COMPARTMENTS WALLS - Where cable buses pass through compartment walls, through-the-wall bushings with full voltage rating of the switchboard must be used.

4. PHASE AND NEUTRAL TAPS - Bused through-wall insulators for phase and neutral voltage transformer taps are to be furnished with lugs on the voltage transformer side. Cable or bus conductor may be furnished for the tap to the fuse carriage and to the voltage transformer compartment maintaining bare bus clearance.

C. TERMINATIONS

SERVICE CABLE TERMINATIONS - For service cable terminations, one landing position (*) shall be provided for each phase. All bolts shall be secured in place and provided with nuts, flat washers, and pressure maintaining spring washers. All parts must be plated to prevent corrosion. REU will make termination connections.

(*) Two 1/2 inch steel bolts on 1 3/4 inch vertical centers extending 2 inches minimum to 2 inches maximum from mounting surface.

D. INSTRUMENT TRANSFORMER MOUNTING BASES AND BUS LINKS

Voltage transformer and current transformer mounting bases are to be provided by the manufacturer.

1. VOLTAGE TRANSFORMERS - Locate the front or leading set of voltage transformer mounting holes 9 inches from the voltage transformer compartment door.
2. CURRENT TRANSFORMER AND BUS LINK - Bus drilling and spacing shall accommodate up to 800 ampere current transformers of the proper voltage insulation class. Current transformer center phase position shall be bused straight through for three phase, three wire service voltage installations. This bus shall consist of a removable link dimensioned the same as the current transformer bars on the metered phases.

3. PHASE AND NEUTRAL TAPS FOR FUSES AND VT'S - Lugs for voltage transformer phase and neutral connections shall be provided in the voltage transformer compartment.

4. FUSE SPECIFICATIONS - Voltage transformer fuses will normally be furnished and installed by REU. The manufacturer shall provide mounting clips for indoor current limiting fuses with mounting clip separation and fuse ferrule diameter appropriate for the voltage rating of the equipment provided.

III. METERING COMPARTMENT WITH DISCONNECT FOR VT:

A. VOLTAGE TRANSFORMER DISCONNECT REQUIREMENTS

1. Kirk Key interlocking is required between the voltage transformer disconnect and the voltage transformer compartment door so that, for personal safety, the voltage transformer compartment cannot be entered until all of the following conditions are met:
   a. The disconnect is fully and visibly open.
   b. When the voltage transformer disconnect is fully open, the disconnect blades must ground automatically.
   c. The disconnect is locked open with a key interlock system.

2. The interlock system must prevent closing of the disconnect without first closing and locking the voltage transformer compartment.

3. Primary contacts for the voltage disconnect shall be of the blade and jaw design or equivalent to assure continued adequate contact. Wiping contact pressure contact is not acceptable.

4. Operating handle or lever of the voltage transformer disconnect switch shall be pad lockable in the closed position.

B. ALTERNATE METER PANEL LOCATION

As an alternate, the meter panel may be mounted in front of the CT/Tremination compartment provided that when the meter panel is opened the compartment is fully isolated by a removable or hinged barrier.

IV. PROTECTION:

A. The customer shall provide a protection system of adequate fault interrupting capability which coordinates electrically with existing REU protection. The customer shall provide REU a one-line diagram of the high voltage service equipment showing all relay and metering equipment.

B. A main breaker with phase and ground relays is required if the customer demand is 2000 KVA or above. At REU's option, a breaker may be required for lesser demands to ensure coordination with REU's protective devices.

C. When breaker protection is provided, the customer shall inform REU of; the breaker manufacturer, type, size, the breaker current transformer ratio, and the relay manufacturer, types and settings. The relay settings information should include the tap, time dial, instantaneous trip current values, etc. The relay setting and breaker rating must be approved by REU before service is energized.
IV. PROTECTION (Continued):

D. When a service disconnect with fused protection is allowed by REU, the customer will inform REU of the fuse manufacturer, type and size. The fuse size and rating must be approved by REU before the customer's service is energized.

V. AUXILIARY EQUIPMENT (CUSTOMER OWNED):

A. Current transformers used exclusively for tripping the service and meter main breaker may be installed on the supply side of service breaker.

B. Voltage transformers used exclusively for voltage indication and relaying may be installed on the supply side of the service breaker.

C. When an electrically operated main service breaker is operated by alternating current, a control transformer for such power and for heating, lighting and other incidental use within the switchboard may be installed in the switchboard, connected to the service breaker. AC power may be used only for manual breaker control. Tripping power must be available from an independent service such as DC or capacitor trip.

For additional requirements, see the following REU references:

CS5035 - Transformer Rated Meters - Diagram of Connections
DS0160 - Primary Service Guildlines
CS2060 - Overhead Primary Service - 12,000 Volt Service
Resolution 97-83 - Electric Utility Service Policy
12,000 VOLT METER ENCLOSURE

NO-LOAD VOLTAGE TRANSFORMER DISCONNECT

1-1/4" VT & CT SECONDARY CONDUITS SHALL BE LOCATED ON THE SAME SIDE AS METER PANEL HINGES.

WIRING SPACE

90° MINIMUM OPENING

90° MINIMUM OPENING

TOP VIEW

SIDE VIEW

REDRAWN

UNDERGROUND PRIMARY SERVICE 12000 VOLTS
SERVICES CABLE TERMINATION PULL SECTION
MINIMUM BARE BUS CLEARANCES 15kV CLASS; 6" PHASE TO GROUND & 7-1/2" PHASE TO PHASE.

NOTES:
1. Consult REU for number, size and location of service conduits required.
2. REU will make termination connections.
3. Metering sequence shall be metering-main.
4. Required clear working space in front of the removable enclosing panels shall be 6 feet.
5. The removable enclosing panels shall each be sealable, provided with two lifting handles and limited to a maximum size of 9 square feet.
6. Furnish and install one piece of unistrut p1000 (or equivalent) channel as shown, for each set of cables.
7. B.I.L. for the pull section shall be not less than 95kV.
NOTES:

1. The panel shall be constructed of 12 gauge (min.) steel and furnished with meter sockets, sealing rings, slotted openings, a removable plate for installation of a secondary test switch and a cover plate. Slotted openings and removable plate edges shall be smooth to prevent damage to meter wiring.

2. The removable plate shall be attached to the rear of the panel with screws that do not protrude through the face of the panel.

3. Meter sockets shall be designed for back connection.

4. Hinges shall be readily interchangeable, right or left, on the panel and permit the panel to open to 90-degrees with meter and test facilities in place. Clevis or removable pin type hinges shall be removable from top.

   The panel shall support 25-pound load applied at the unsupported end when fully opened with a maximum sag of 1/8 inch.

   The panel shall have a handle attached to both sides.

   All securing and sealing screws on panel shall be captive. Stud and wing nuts shall be sealable when used.
ALL HOLES 10-32 TAP, EXCEPT AS NOTED.

CURRENT TRANSFORMER MOUNTING BASE

P1008 3/8-16 NUT, 6 PER CHANNEL. (TYP.)

P1000 UNISTRUT CHANNEL, OR EQUIVALENT. (TYP.)

ADJUSTABLE

13" MAX. - 5" MIN.

TOP VIEW OF CABINET (Ref.)

SIDE VIEW

VOLTAGE TRANSFORMER MOUNTING RAIL DETAIL

UNDERGROUND PRIMARY SERVICE 12000 VOLTS
NOTE:
External 1 amp fuse shall be used to protect PT.
(Equivalent to GE Type EJ-1
Size 1E Cat.#9F608HH001).

INDOOR UNFUSED 15KV CLASS PT's

<table>
<thead>
<tr>
<th>INSULATION CLASS KV</th>
<th>UNFUSED</th>
<th>MAXIMUM OVERALL DIMENSIONS</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>15.0</td>
<td>9.5</td>
<td>13.75</td>
</tr>
</tbody>
</table>

*Unless otherwise indicated tolerance, plus or minus 1/16 inch.

INDOOR PRIMARY METERING INSTRUMENT TRANSFORMER

MANUFACTURER | CAT. NUMBER | TYPE |
---------------|-------------|------|
ABB            | 7525A66G05  | VIZ-11|
GE             | 765X121001  | JVM-5C|

INSULATION, RATIO, VOLTAGE, AND BIL DATA

<table>
<thead>
<tr>
<th>INSULATION CLASS, KV</th>
<th>MARKED RATIO</th>
<th>PRIMARY VOLTAGE RATING, VOLTS</th>
<th>kV BIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.0 INDOOR ONLY</td>
<td>60:1</td>
<td>7200</td>
<td>110</td>
</tr>
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</table>
INDOOR 15KV CLASS CT's

ALL DIMENSIONS SHOWN ARE IN INCHES

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>TYPE</th>
<th>BIL</th>
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<tbody>
<tr>
<td>GE</td>
<td>JKM-5(C)</td>
<td>110KV</td>
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<td>ABB</td>
<td>KIR-11</td>
<td>110KV</td>
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DIMENSIONS -- INCHES * FOR CT'S 5-800A

<table>
<thead>
<tr>
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<th>B</th>
<th>C (MAXIMUM)</th>
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<td>22</td>
<td>9</td>
<td>10-1/2</td>
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</table>

* Unless otherwise indicated tolerance, plus or minus 1/16 inch.
INDOOR FUSED 15KV CLASS PT's

ALL DIMENSIONS SHOWN ARE IN INCHES

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<thead>
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</tr>
<tr>
<td></td>
<td>MAXIMUM OVERALL DIMENSIONS</td>
</tr>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>15.0</td>
<td>9.5</td>
</tr>
</tbody>
</table>

* Unless otherwise indicated tolerance, plus or minus 1/16 inch.

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>CAT. NUMBER</th>
<th>TYPE</th>
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<tbody>
<tr>
<td>ABB</td>
<td>7525A67G05</td>
<td>VIZ-11</td>
</tr>
<tr>
<td>GE</td>
<td>765X121047</td>
<td>JVM-5C</td>
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INSULATION, RATIO, VOLTAGE, AND BIL DATA

<table>
<thead>
<tr>
<th>INSULATION CLASS, KV</th>
<th>MARKED RATIO</th>
<th>PRIMARY VOLTAGE RATING, VOLTS</th>
<th>kV BIL</th>
</tr>
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<tbody>
<tr>
<td>15.0 INDOOR ONLY</td>
<td>60:1</td>
<td>7200</td>
<td>110</td>
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</tbody>
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REDRAWN

ELECTRIC CONSTRUCTION STANDARD

INDOOR PRIMARY METERING INSTRUMENT TRANSFORMERS

DES/REV  DATE  ASSISTANT DIRECTOR - DISTRIBUTION  REVISED  DWG. NO.
APD/RLH  06/03/03  05/09/12  CS5070
**FIGURE 1 - CLEARANCE FROM DRIVEWAY**

- **ATTACHED S/W**
  - PADMOUNT EQUIPMENT
  - PRIVATE DRIVEWAY
  - SIDEWALK
  - APPROACH
  - POLE
- **DETACHED S/W**
  - TOP VERTICAL CURB
  - ALTERNATE UTILITY BOX LOCATION

STREETLIGHT STANDARDS, UTILITY POLES, GUY WIRES, UTILITY BOXES, AND PADMOUNT EQUIPMENT SHALL BE LOCATED NO CLOSER THAN 5' FROM A DRIVEWAY.

**FIGURE 2 - PADMOUNT CLEARANCE FROM BUILDINGS**

<table>
<thead>
<tr>
<th>BUILDING SURFACE, EAVES, BALCONY, ETC.</th>
<th>CLEARANCE (NOTE 5)</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>NON-COMBUSTIBLE 25-2500KVA XFMR.</td>
<td>3'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMBUSTIBLE 25-2500KVA XFMR.</td>
<td>10'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1Ø Padmount XFMR.</td>
<td>20'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3Ø Padmount XFMR.</td>
<td>30'</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

REFERENCE: G.O.128

**NOTES:**
1. Non-combustible material includes brick, clay, concrete, steel, and stone having a one hour fire resistive rating. Stucco is excluded.
2. Vertical clearance space above pad and clear zone must remain unobstructed for hoisting equipment on and off pad.
3. If roof overhang does not meet minimum clearances as specified in above, the minimum horizontal clearance from end of roof overhang to the nearest edge of the pad shall not be less than 3'. If the overhang clearances are met, the pad-mounted equipment may be placed under the overhang and clearance will be measured from building wall.
4. Customer is responsible for protection of equipment by suitable barriers per REU Dwg. CS0011. If deemed necessary by REDDING ELECTRIC UTILITY.
5. Drainage of the area surrounding the transformer must be away from any building.
6. Clearances to building surfaces meet or exceed G.O.128 clearance requirements.
If transformer is installed in alcove side clearance must be increased to 5’ minimum.

Doors of transformers or switchgear must face away from building walls or other barriers to allow for safe working practices. If doors must face wall, allow 8’ minimum clearance for working area.

**FIGURE 3 - PADMOUNT WORK AREA CLEARANCE**

**FIGURE 4 - WORK AREA CLEARANCE FOR DUAL 3Ø PADS**

**NOTES:**

1) Doors of transformers or switchgear must face away from building walls or other barriers to allow for safe working practices. If doors must face wall, allow 8’ minimum clearance for the working area.

2) The gate of a fence or enclosure may be within the 8’ working clearance while the gates are closed (must maintain the 3’ min. clearance), but while the gates are open the 8’ min. working clearance must remain unobstructed.
FIGURE 5 - SUBSURFACE EQUIPMENT WORK AREA CLEARANCE

- Subsurface equipment clearance diagram with dimensions and notes.

FIGURE 6 - SUBSURFACE EQUIPMENT ON SLOPED TERRAIN

1. If the subsurface equipment is exposed to vehicular traffic, bollards shall be installed to protect it from such vehicular traffic.
2. Retaining walls shall be provided when REU determines it is necessary to protect equipment against landslides, drainage wash, drifting sands, etc. The applicant is responsible for the installation and maintenance of the retaining walls. The retaining wall shall be designed to provide a barrier of sufficient strength and of suitable construction as to provide adequate protection and working space around the equipment. The retaining wall shall meet all local building codes and have adequate compaction. (See CS-0020 for details)

NOTES:

SHEET 3 OF 3

EQUIPMENT CLEARANCES
WHERE ELECTRIC EQUIPMENT IS TO BE LOCATED IN AN AREA SUBJECT TO VEHICULAR TRAFFIC, BOLLARDS SHALL BE FURNISHED AND INSTALLED BY THE CUSTOMER IN ACCORDANCE WITH THIS STANDARD.

NOTES:
1. "D" and the distance between bollard posts shall be not exceed 42". When exposed area exceeds this distance, an intermediate post shall be added.
2. "M" shall be a minimum of 2 feet.
3. "C" is listed below per specific transformer sizes (kva): 25 to 1000kva = 42" minimum 1000 to 2500kva = 47" minimum

ALL BOLLARDS WITHIN HOT STICK WORK AREA SHALL BE REMOVABLE

REMOVABLE BOLLARD (SEE SHEET 2)
### Notes:

1. The installer shall contact Underground Service Alert (USA) at (811) at least two days prior to planned excavation.
2. A welded cap may be used in lieu of concrete cap.
3. The bollard shall be primed and painted white (not galvanized).
NOTES:
1. Above pad may be precast or in place. If poured in place omit Item 3.
2. See drawing CS0010 for pad clearances.
3. See drawing CS0011 for pad barrier protection.
4. All soil will be compacted under and around the pad by jetting and/or wacker to a minimum of 90% relative density.
5. Customer installed.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>DESCRIPTION UPD-1P</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>6 CUF. FT.</td>
<td>CONCRETE, CLASS &quot;A&quot;, 5 1/2 SACK MIX</td>
</tr>
<tr>
<td>2</td>
<td>13.4 LBS</td>
<td>REINFORCING RODS, SEE TABLE ABOVE</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>THREADED INSERTS FOR 1/2&quot; LIFTING BOLTS.</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>TRANSFORMER PAD</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>2E BOX EXTENSION</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>3/4&quot;x 12' GROUND ROD</td>
</tr>
</tbody>
</table>

REINFORCING IRON

<table>
<thead>
<tr>
<th>TYPE NO.</th>
<th>REQ'D</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>4</td>
<td>1/2&quot; X 3'-6&quot;</td>
</tr>
<tr>
<td>R2</td>
<td>2</td>
<td>1/2&quot; X 4'-0&quot;</td>
</tr>
<tr>
<td>R3</td>
<td>2</td>
<td>1/2&quot; X 2'-7&quot;</td>
</tr>
</tbody>
</table>

WEIGHT
893#
NOTES:

1. All soil will be compacted under and around the pad by jetting and/or wacker to a minimum of 90% relative density.
2. See drawing CS0330 for pad detail.
3. See drawing CS0010 for pad clearances.
4. See drawing CS0011 for pad barrier protection.
5. Cook 2E box extension (17"x 30") or equal/approved by REU.
6. Appropriate excavation depth shall be provided such that standard 36" radius 90° bends may be installed as shown. Conduit bends shall be cut or otherwise modified.
7. Customer installed.
NOTES:
1. Above pad may be precast or poured in place. If poured in place omit item 3.
2. Prior to pouring pad, have REU inspect conduit location.
3. See drawing CS0010 for pad clearances.
4. See drawing CS0011 for pad barrier protection.
5. All soil will be compacted under and around the pad by jetting and/or wacker to a minimum of 90% relative density.
6. Boxes may be required remote from pad to accommodate additional services; difficult pulls; or, as specified by a REU distribution planner and/or inspector.
7. Customer installed.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
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<td>17 CU. FT.</td>
<td>CONCRETE, CLASS &quot;A&quot;, 5 1/2 SACK MIX</td>
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<tr>
<td>2</td>
<td>27.5 LBS</td>
<td>REINFORCING RODS, SEE TABLE ABOVE</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>THREADED COIL OR FERRULE INSERTS BY DAYTON, RISS, SUPERIOR OR EQUAL</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>TRANSFORMER / CAPACITOR PAD</td>
<td>E8.06</td>
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<tr>
<td>5</td>
<td>1</td>
<td>3/4&quot;x12&quot; GROUND ROD</td>
<td>E384.01</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>4E SECONDARY BOX</td>
<td>E8.04</td>
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REINFORCING IRON

<table>
<thead>
<tr>
<th>TYPE NO.</th>
<th>REQ'D</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>5</td>
<td>1/2&quot; X 5'-10&quot;</td>
</tr>
<tr>
<td>R2</td>
<td>2</td>
<td>1/2&quot; X 5'-10&quot;</td>
</tr>
<tr>
<td>R3</td>
<td>4</td>
<td>1/2&quot; X 3'-11&quot;</td>
</tr>
</tbody>
</table>
1. All soil will be compacted under and around the pad by jetting and/or wacker to a minimum of 90% relative density.
2. See drawing CS0331 for pad detail.
3. See drawing CS0010 for pad clearances.
4. See drawing CS0011 for pad barrier protection.
5. Concrete 4E boxes shall be per Drawing CS1110 or as approved by REU.
6. Appropriate excavation depth shall be provided such that standard 36" radius 90° bends may be installed as shown. Conduit bends shall be cut or otherwise modified.
7. Customer installed.
3/4" X 12' GROUND ROD (AT LEAST 8' IN CONTACT WITH EARTH)

NOTES:
1. See DWG. CS0330 for pad details.
2. See DWG. CS1110 for pull box details.
3. Ground rod to be flush with the top of the transformer pad.
4. See DWG. CS0373 for cable routing.
5. Size and number as specified.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>DESCRIPTION</th>
<th>UPD-1P</th>
<th>COR CODE</th>
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<tr>
<td>1</td>
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<td>TRANSFORMER PAD</td>
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<td>E8.05</td>
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<tr>
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<td>2</td>
<td>2E BOX EXTENSION</td>
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<td>E8.01</td>
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<tr>
<td>3</td>
<td>2</td>
<td>3/4&quot;x 12' GROUND ROD</td>
<td></td>
<td>E384.01</td>
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</tbody>
</table>

PAD AND CONDUIT ARRANGEMENT FOR PAD MOUNTED TRANSFORMERS IN OPEN DELTA CONFIGURATION
GENERAL NOTES:

1. The purpose of this drawing is to provide a guide for determining space requirements and illustrate recommended layouts to accommodate padmounted transformer and associated equipment when installed in a dry vault located inside or adjacent to a customer's building. The vault is provided by the Developer/Customer.

2. A dry vault in one which:
   A. Is located at ground level, or
   B. Is located below ground level, and,
      1. Is completely contained within the building's foundation.
      2. Is so designed that flood water entry is prevented.
      3. Has sufficient gravity drainage to prevent water retention.

3. When designing a new vault, consideration should be given to providing adequate room for possible future requirements. Enlarging a vault is very costly and sometimes impractical.

4. Eight feet of clear level space must be provided in front of the transformer cabinet, in order that the transformer can be safely operated and maintained with live line tools.

5. Ventilation design must conform to the requirements set forth in REU Drawing DS450. The location of the vent shafts may be adjusted to meet local conditions. Cross ventilation must always be maintained.


7. The enclosure itself shall conform to all applicable State and Local codes.

8. It is required to have access to a vault via an entrance which would be accessible to authorized REU personnel at all times (i.e. from parking lot, loading ramp, street, etc.). The vault shall also be accessible to standard REU equipment.

9. All customer vaults shall be designed with adequate security to permit entrance only to REU personnel.

10. All walls, ceiling and floors shall be constructed of non-combustable material.

11. Transformer pad (REU Drawing CS0330 or CS0331) shall be an integral part of the vault floor.

12. Lighting and outlet circuits shall be supplied from the customers side of metering (load side).
DIMENSIONS
A & B = REFER TO CS0330 OR CS0331 AND USE PAD SIZE
C = 42"
D = 96"
E = DIMENSION "A" PLUS 12" MINIMUM
F = 12’ MINIMUM
G = 10’ MINIMUM

LEGEND
- PULLING EYE CAPABLE OF PULLING 20,000 LBS.
- LIFTING EYE CAPABLE OF LIFTING 40,000 LBS.
- 120 VOLT OUTLET AND SWITCH
- LIGHTING

REDAWN

INSTALLATION OF THREE PHASE PADMOUNTED TRANSFORMER, GROUND LEVEL OR DRY VAULTS
ITEM | QUANTITY | DESCRIPTION PSPD-72 | COR CODE
--- | --- | --- | ---
1 | 10 CU. FT. | CONCRETE, CLASS “A”, 5 1/2 SACK MIX | E8.07
2 | 21 LBS. | REINFORCING RODS, SEE TABLE ABOVE | 
3 | 1 | THREADED COIL OR FERRULE INSERTS BY DAYTON, RISS, SUPERIOR OR EQUAL | 
4 | 1 | 2E BOX EXTENSION | E8.01
5 | 1 | 3E BOX EXTENSION | E8.02
6 | 1 | 3/4"x 12' GROUND ROD | E384.01

REINFORCING IRON SCHEDULE

<table>
<thead>
<tr>
<th>TYPE</th>
<th>No. REQ’D</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| R1 | 2 | 1/2" x 1'-11"
| R2 | 7 | 1/2" x 3'-6"
| R3 | 2 | 1/2" x 3'-11"
| R4 | 2 | 1/2" x 2'-1"
| R5 | 2 | 1/2" x 0'-8"

NOTES:
1. Customer Installed.
NOTES:
1. All soil will be compacted under and around the pad by jetting and/or wacker to a minimum of 90% relative density.
2. Cook 3E box extension (24"x36") or equal/approved by REU.
3. Cook 2E box extension (17"x30") or equal/approved by REU.
4. Excavation for boxes shall be prepared with 3" to 6" compacted 3/4" gravel road base.
5. S&C PME 5 switchgear or equal, or AB Chance 3 switchgear or equal.
6. Appropriate excavation depth shall be provided such that standard 4"x36" or 6"x48" radius 90° bends may be installed as shown. Conduit bends shall not be cut or otherwise modified.
7. Customer installed.
26" x 66 1/2" x 3/16"
DIAMOND PLATE COVER
LABELED "R.E.U. HIGH VOLTAGE"
SEE NOTE 4 SHT. 4
(2 PIECE)

FACE OF ACCESS OPENING
TO BE FLUSH WITH
INSIDE OF BOX

60" x 67" ACCESS
OPENING

HOLD DOWN ASSEMBLY.
COURSE THREAD PENTA-
HEAD BOLTS

1/2" x 2" SLOT FOR
LID REMOVAL
(2 PER PLATE)

2" x 2" x 1/4"
ANGLE FRAME
(GALVANIZED STEEL)

RECESSED PULLING IRON
(4 TOTAL)

GROUND (BOTH WALLS)
PER CS428 SH. 2 &
NOTE #9 SH. 4 &
SEE DETAIL "A" SHT. 2

8'-9"

50"

4 1/2"

6"

6"'

6'-9"

8'-9"

12" Ø DROP SUMP

SEE SHEET 2 OF 4 FOR
KNOCK OUT & TERMINATORS ON
SIDE WALLS

REDRAWN

ELECTRIC CONSTRUCTION STANDARD

600 AMP PADMOUNT SWITCHGEAR
SWITCH VAULT DETAILS

REDDING ELECTRIC UTILITY

DESI:REV DATE ASSISTANT DIRECTOR - DISTRIBUTION REVISED DWG. NO.
CEP/RLH 09/27/07
CS0428 02/01/12
6" THICK CONC. WALLS

INWESCO 5/8" COPPER GROUND INSERT WITH 1" SQUARE BRASS BAR.

6" MIN. CONTINUOUS WELDS BOTH SIDES.

1/2" REBAR, WELD SOLID TO CAGE AT A MIN. OF TWO INTERSECTIONS.

DETAIL "A"

SEE DETAIL "A"

44" ID

96" ID

72" ID

12" DIA. SUMP
4" DEEP

16-5/8"

6" CONDUIT TERMINATORS TYPICAL BOTH LONG WALLS

4" CONDUIT TERMINATORS TYPICAL BOTH LONG WALLS

GROUND ROD LOCATION TYPICAL BOTH LONG WALLS. SEE NOTE 9 ON SHT. 4.

CONCRETE SWITCH VAULT DIMENSIONS

NOTES:

1. All sections of a splice box must be permanently marked with the delivery date.
CLEARANCE AREA

ALLOWABLE CONDUIT ENTRANCE AREA, CONTACT REU INSPECTOR FOR EXACT LOCATION.

CLEARANCE AREA

3' MIN.

8' MIN.

SIDE PARALLEL WITH SIDEWALK

SWITCH SIDE

FUSE SIDE

VAULT COVER

BACK EDGE OF SIDEWALK

PLAN VIEW

PADMOUNT SWITCH

SET SWITCH VAULT 2" ABOVE FINAL GRADE

40' TYPICAL

FINAL GRADE

ELEVATION

REDRAWN

ELECTRIC CONSTRUCTION STANDARD

600 AMP PADMOUNT SWITCHGEAR SWITCH VAULT DETAILS

REDDING ELECTRIC UTILITY

DES/REV DATE ASSISTANT DIRECTOR - DISTRIBUTION REVISED DWG. NO.
CEP/RLH 09/27/07 02/01/12 CS0428
NOTES:

1. See drawing CS1114 for lid bolt down details. (Detail “A” and “E”).
2. Designed for pedestrian traffic loading.
3. Manufacturer shall paint/stencil correct weight and catalog number on each box.
4. Cover shall be labeled “R.E.U. HIGH VOLTAGE”.
5. The excavation shall allow for the overall height of vault to be set two inches above final grade, and 3 - 6 inches of compacted 3/4” gravel.
6. The bedding materials shall consist of 3/4” gravel under vault.
7. Backfill shall consist of good compactible material such as pea gravel, sand, or clean earth fill so that no voids remain between vault and native soil around excavation. Backfill shall be compacted in lifts from the bottom to the top to attain 90% relative compaction.
8. All excavation, installation, and backfill is the responsibility of the customer and/or contractor.
9. Both ground rods shall be welded into one continuous run of bare or zinc galvanized or other electrically conductive coated steel reinforced bars or rods of not less than twenty (20) feet in length and 1/2” (12.7mm) in diameter which is encased by at least 2” (50.8mm) of concrete. This continuous run may be part of the reinforcing cage except the 20’ must be within the floor area only.
2 - 3/4" X 12' GRND. ROD TO BE FLUSH WITH THE CAPACITOR PAD. (AT LEAST 8' IN CONTACT WITH EARTH)

LOCATION OF 4" CONDUIT SEE NOTE 2

4E SECONDARY BOX W/10" EXTENSION (INSTALL BOX ON TOP OF EXTENSION)

NOTES:
1. Above pad may be precast or poured in place. If poured in place omit item 3.
2. Prior to pouring pad, have REU inspect conduit location.
3. See sheet 3 for pad clearances.
4. See drawing CS0011 for pad barrier protection.
5. All soil will be compacted under and around the pad by jetting and/or wacker to a minimum of 90% relative density.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>DESCRIPTION UPD-CAP</th>
<th>COR CODE</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>17 CU. FT.</td>
<td>CONCRETE, CLASS &quot;A&quot;, 5 1/2 SACK MIX</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>27.5 LBS</td>
<td>REINFORCING RODS, SEE TABLE ABOVE</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>THREADED COIL OR FERRULE INSERTS BY DAYTON, RISS, SUPERIOR OR EQUAL</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>TRANSFORMER / CAPACITOR PAD</td>
<td>E8.06</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>3/4&quot; X 12' GROUND ROD</td>
<td>E384.01</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>4E SECONDARY BOX</td>
<td>E8.04</td>
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REINFORCING IRON

<table>
<thead>
<tr>
<th>TYPE NO.</th>
<th>REQ'D</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>5</td>
<td>1/2&quot; X 5'-10&quot;</td>
</tr>
<tr>
<td>R2</td>
<td>2</td>
<td>1/2&quot; X 5'-10&quot;</td>
</tr>
<tr>
<td>R3</td>
<td>4</td>
<td>1/2&quot; X 3'-11&quot;</td>
</tr>
<tr>
<td>R4</td>
<td>1</td>
<td>1/2&quot; X 2'-5&quot;</td>
</tr>
</tbody>
</table>
NOTES:

1. All soil will be compacted under and around the pad by jetting and/or wacker to a minimum of 90% relative density.
2. See drawing CS0500 for pad detail.
3. See drawing CS0500 for pad clearances.
4. See drawing CS0011 for pad barrier protection.
5. Concrete 4E boxes shall be per Drawing CS1110 or as approved by REU.
6. Appropriate excavation depth shall be provided such that standard 36” radius 90° bends may be installed as shown. Conduit bends shall be cut or otherwise modified.
SAND REQUIREMENTS FOR BACKFILL IN ELECTRIC UTILITY TRENCHING

The following is Redding Electric Utility’s standard for sand used in electric utility trenching.

1. All electric conduits shall have a minimum of 4” sand bedding after compaction to 95%.
2. All electric conduits shall have a minimum of 6” sand covering or shading after compaction to 95%.

Sand bedding and covering for electric conduits shall consist of natural sand, manufactured sand, or a combination of both, and shall conform to the physical properties listed below.

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>TEST METHOD</th>
<th>SPECIFICATION REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic Impurities</td>
<td>ASTM C-40</td>
<td>Supernatant shall not be darker than Plate 3 when compared to standard Gardinar Color Series</td>
</tr>
<tr>
<td>Sand Equivalent</td>
<td>ASTM D-2419</td>
<td>Equal to or greater than 20</td>
</tr>
<tr>
<td>Compaction Characteristics</td>
<td>ASTM D-1557</td>
<td>Relative compaction of 95% or greater</td>
</tr>
<tr>
<td>Gradation</td>
<td>ASTM C-136 &amp; ASTM C-117</td>
<td>Sieve Size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. 4 (4.75mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. 8 (2.36mm)</td>
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<tr>
<td></td>
<td></td>
<td>No. 16 (1.18mm)</td>
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<tr>
<td></td>
<td></td>
<td>No. 30 (600um)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. 50 (300um)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No. 100 (150um)</td>
</tr>
</tbody>
</table>

Optimum water content shall provide 95% compaction or greater prior to placement into a trench.
GENERAL NOTES:

1) This standard covers underground distribution conduits without concrete encasement. In some cases exposure to "Dig-ins" and other hazards will require concrete encasement of conduit.

2) When conduit is installed by the Developer / Customer (including service conduits) the following conduit and fittings are acceptable alternatives meeting the NEMA Std. for direct burial or concrete encasement.

3) a) TC2: PVC Schedule 40 OR Schedule 80 UL approved 90°C conduit and so marked.
   b) TC6/TC8: PVC Type DB-120 approved 90°C conduit and so marked.
   c) TC3: PVC Schedule 40 UL approved fittings and accessories.

CAUTION:

1) Because these conduits have different inside diameters, the percent fill for the same size cable will vary with conduit type.

2) It is the conduit installers responsibility to provide the proper fitting to make acceptable transitions from conduits being installed to any other conduit to which they are to be joined. NOTE: This transition may involve changes in both conduit type and size. If equal diameters conduits of different wall thickness are to be joined, the inside edge of the spigot end must be chamfered.

3) All conduits not terminated in enclosures shall have rigid caps. All conduits terminated in boxes shall have end bell fittings and be fitted with a properly sized temporary poly plug.

4) 4" and 6" conduits are to be used for Primary Distribution circuits. 5" conduit is limited to large commercial services with REU prior approval. 4" conduit is to be used for Secondary and Services. 3" conduit is limited to single phase residential services with service equipment or bus capacity of 201 to 400 amps only. The use of 2" conduit is limited to Street Light circuits and Services.

5) The following method shall be used in vulnerable locations or where unprotected PVC conduit is not permitted:
   a) Protect non-metallic conduit with a 3 inch minimum concrete encasement.
   b) Use galvanized rigid steel conduit.

6) Every effort should be made to construct a straight, water tight conduit line.

7) All conduits shall be proven free and clear of dirt, rocks, etc., by means of mandrel, wire brush, etc. A 1250lb. polyester MULTAPE®, or equivalent pull line shall be installed in all 4" conduit runs less than 600' in length. All 6" conduit and 4" conduit runs greater than 600' shall have minimum 2500lb. MULETAPE®, or equivalent installed.

8) Ground water / storm water intrusion and migration in any trench is the responsibility of the customer and / or his trenching agent for the life of the facilities placed in the trench.
ENCLOSURE SIDE WALL

END BELL INSTALLATION IN FIELD

KNOCKOUT

END BELL PREFABRICATED

DETAIL OF END BELL INSTALLED IN KNOCKOUT

TRENCH REQUIREMENTS

BACKFILL PER PAGE 620.00

SAND PER PAGE 520.80

3" SEE NOTE (b)

COVER REQUIREMENTS

P - PRIMARY, 36" MIN.
S - SECONDARY, 24" MIN.
L - STREET LIGHT, 24" MIN.

INSTALLATION NOTES:

(a) Field conditions may require a minimum depth greater than shown.
(b) Substation feeders and other primary circuits require special consideration and generally require additional separation and backfill. Contact Electric Utility Engineering.
(c) Sharp turns, bands, and other irregularities in the conduit shall be avoided.
(d) Before tamping in area of plastic conduit, apply at least six inches of backfill over top of sand shading to avoid breakage of conduits. Final backfill may then be placed and compacted to finish grade.
(e) Refer to State of California, Department of Industrial Relations "Trench Construction Safety Orders" for trench construction requirements. These orders are issued by the Department of Occupational Safety and Health.
(f) The use of a joint trench containing power conduits, telephone conduits, gas, etc., is usually less costly than use of a separate trench for each. Gas company, Cable TV, and telephone company representatives should be consulted to determine if a joint trench is feasible prior to making final layout of the conduit system. The installation of a street light system should be considered at the same time as the power and telephone, since installation at a later date would be much more costly. For joint trench, refer to page 620.00 and do not use this standard.
RIGID STEEL CONDUIT AND FITTINGS

TABLE 1. RIGID STEEL CONDUIT

<table>
<thead>
<tr>
<th>SIZE (IN.)</th>
<th>DIMENSIONS (IN.)</th>
<th>WEIGHT (LBS.)</th>
<th>C.O.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.375, 2.063</td>
<td>0.146</td>
<td>33</td>
</tr>
<tr>
<td>4</td>
<td>4.500, 4.050</td>
<td>0.225</td>
<td>98</td>
</tr>
<tr>
<td>5</td>
<td>5.563, 5.073</td>
<td>0.245</td>
<td>134</td>
</tr>
<tr>
<td>6</td>
<td>6.625, 6.093</td>
<td>0.286</td>
<td>177</td>
</tr>
</tbody>
</table>

* Weight for one 10ft. length including one standard coupling furnished with each length.

TABLE 2. STANDARD STEEL COUPLING

<table>
<thead>
<tr>
<th>SIZE (IN.)</th>
<th>DIM. (IN.)</th>
<th>C.O.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.73, 2.18</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5.00, 3.50</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6.29, 3.75</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>7.39, 4.00</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 3. 90° STEEL CONDUIT BENDS

<table>
<thead>
<tr>
<th>SIZE (IN.)</th>
<th>DEGREES</th>
<th>DIMENSIONS (IN.)</th>
<th>C.O.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>90°</td>
<td>18, 6.25</td>
<td>40</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>11.00</td>
<td>78</td>
</tr>
<tr>
<td>5</td>
<td>36</td>
<td>11.25</td>
<td>79</td>
</tr>
<tr>
<td>6</td>
<td>36</td>
<td>15.25</td>
<td>87</td>
</tr>
</tbody>
</table>

▲ Both ends threaded.

NOTES:
A) Rigid steel conduit shall be saw-cut only. Welding or flame-cutting shall not be permitted.
B) Inside edges of saw cuts shall be reamed to remove all sharp edges and burrs.
C) Repairs made to damaged galvanizing due to conduit bending shall be made in accordance with ASTM A780 - Practice for Repair of Damage and Uncoated Areas of Hot-Dip Galvanized Coatings.
PLASTIC CONDUIT AND FITTINGS

TABLE 4. RIGID PVC
CONDUIT APPROVED FOR PURCHASE
Conduit shall be rated for direct burial or concrete encasement

<table>
<thead>
<tr>
<th>APPROVED MANUFACTURERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CARLON</td>
</tr>
<tr>
<td>ALLIED</td>
</tr>
<tr>
<td>WESTERN PLASTICS</td>
</tr>
<tr>
<td>PW PIPE</td>
</tr>
</tbody>
</table>

TABLE 5. CONDUIT DIMENSIONS (IN.)

<table>
<thead>
<tr>
<th>CONDUIT SIZE (INCHES)</th>
<th>APPROX. C.O.R.</th>
<th>C.O.R. STOCK CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2.375</td>
<td>E381.02</td>
</tr>
<tr>
<td>3</td>
<td>3.500</td>
<td>E381.03</td>
</tr>
<tr>
<td>4</td>
<td>4.500</td>
<td>E381.08</td>
</tr>
<tr>
<td>5</td>
<td>5.563</td>
<td>E381.05</td>
</tr>
<tr>
<td>6</td>
<td>6.625</td>
<td>E381.10</td>
</tr>
</tbody>
</table>

TABLE 6. COUPLINGS
See sheet 7 for special application of 5° coupling

<table>
<thead>
<tr>
<th>STANDARD COUPLING</th>
<th>5° ANGLE COUPLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>STANDARD COUPLING</td>
<td>5° ANGLE COUPLING</td>
</tr>
</tbody>
</table>

TABLE 7. ADAPTER (PLASTIC TO STEEL CONDUIT)

<table>
<thead>
<tr>
<th>CONDUIT SIZE (IN.)</th>
<th>C.O.R. STOCK CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 8. SWEDGE REDUCER
Requires a standard coupling at each end to install.

<table>
<thead>
<tr>
<th>REDUCER SIZE (Inches)</th>
<th>DIMENSIONS</th>
<th>C.O.R. STOCK CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 x 4</td>
<td>5.563</td>
<td>4.500</td>
</tr>
<tr>
<td>6 x 5</td>
<td>6.625</td>
<td>5.563</td>
</tr>
</tbody>
</table>

NOTE:
For exact dimensions of various conduit types, refer to the manufacturer's data sheets or the NEC-Chapter 9 Table 5.

UPDATED TABLES & STANDARD COUPLING
ELECTRIC CONSTRUCTION STANDARD
UNDERGROUND CONDUIT WITHOUT CONCRETE ENCASEMENT

REU
Redding Electric Utility

DES/REV DATE ASSISTANT DIRECTOR - DISTRIBUTION REVISED DWG. NO.
RO/TAM 11/03/92 John Doe 03/08/17 4 CS1010
PLASTIC CONDUIT AND FITTINGS (Cont'd)

TABLE 9. CONDUIT CAPS

<table>
<thead>
<tr>
<th>CONDUIT SIZE (IN.)</th>
<th>RIGID CAP</th>
<th>TEMP. POLY PLUG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C.O.R. STOCK CODE</td>
<td>C.O.R. STOCK CODE</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rigid Cap for semi-permanent use.
Temporary Cap will fit conduit, coupling, or bell end.

TABLE 10. END BELL

<table>
<thead>
<tr>
<th>CONDUIT SIZE (IN.)</th>
<th>C.O.R. STOCK CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>E380.04</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>E380.05</td>
</tr>
</tbody>
</table>

TABLE 11. CONDUIT BENDS

<table>
<thead>
<tr>
<th>CONDUIT SIZE (IN.)</th>
<th>DEGREE BEND</th>
<th>DIMENSIONS (IN.)</th>
<th>C.O.R. STOCK CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>R</td>
<td>G</td>
</tr>
<tr>
<td>2</td>
<td>90°</td>
<td>24</td>
<td>2.25</td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>24</td>
<td>24.4</td>
</tr>
<tr>
<td>3</td>
<td>90°</td>
<td>48</td>
<td>3.25</td>
</tr>
<tr>
<td></td>
<td>90°</td>
<td>36</td>
<td>55.5</td>
</tr>
<tr>
<td></td>
<td>90°</td>
<td>24</td>
<td>37.7</td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>13</td>
<td>10.2</td>
</tr>
<tr>
<td></td>
<td>22.5°</td>
<td>13</td>
<td>5.1</td>
</tr>
<tr>
<td>4</td>
<td>90°</td>
<td>48</td>
<td>3.875</td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>36</td>
<td>36.0</td>
</tr>
<tr>
<td></td>
<td>22.5°</td>
<td>36</td>
<td>21.9</td>
</tr>
<tr>
<td>5</td>
<td>90°</td>
<td>48</td>
<td>3.875</td>
</tr>
<tr>
<td></td>
<td>90°</td>
<td>36</td>
<td>56.5</td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>24</td>
<td>18.9</td>
</tr>
<tr>
<td></td>
<td>22.5°</td>
<td>24</td>
<td>11.4</td>
</tr>
<tr>
<td>6</td>
<td>90°</td>
<td>48</td>
<td>5.5</td>
</tr>
<tr>
<td></td>
<td>45°</td>
<td>36</td>
<td>39.3</td>
</tr>
<tr>
<td></td>
<td>22.5°</td>
<td>36</td>
<td>25.1</td>
</tr>
</tbody>
</table>

UPDATED END BELL

ELECTRIC CONSTRUCTION STANDARD

UNDERGROUND CONDUIT
WITHOUT CONCRETE ENCASEMENT

Redding Electric Utility
PLASTIC CONDUIT AND FITTINGS (Cont'd)

APPLICATION:

1) Plastic conduit shall be sawcut with a fine-toothed blade resulting in square cut ends. All burrs shall be removed and inside edges of sawcut ends shall be chamfered.

2) Apply a thin, uniform coating of cement to the outside spigot end of the conduit to the depth setting mark. Avoid excess use of cement to prevent the formation of a bead of cement on the interior shoulder of the joint since, when hardened, the bead can cause cable damage during installation. Immediately after applying the coat of cement to the conduit, insert the conduit into the fitting socket until it bottoms at the fitting shoulder. Turn the conduit 1/4 turn during insertion to distribute the cement evenly. Hold the conduit in place for about one minute to prevent backing out. Wipe excess cement away from the outside of the joint. Weather conditions may vary the time of curing. When using adhesive in confined areas, adequate ventilation must be provided.

3) Backfill containing large rock, paving material, cinders, large or sharp angular substance or corrosive material shall not be placed in excavation where such material may damage conduit, prevent adequate compaction, or contribute to corrosion of the conduit.

| TABLE 11. SOLVENT CEMENT FOR USE WITH PLASTIC CONDUITS |
|---------------------------------|-----------------|-----------------|-----------------|
| APPLICATION | QUANTITY | APPROVED FOR PURCHASE | C.O.R. STOCK CODE |
| PVC TO PVC | QUART | CARLON VC9962 | E380.01 |
| PVC TO PVC | QUART | CANTEX 7210603 | |
APPLICATION OF 5° COUPLING FOR LONG RADIUS BENDS

EXAMPLE:
Radius of Bend (R) = 60 Ft.
Angle of Bend (θ) = 45°

From Table 13, the nearest value to 60 ft. radius is 57'-6".
Length of Conduit = 5 ft.

From Table 14, for 45° angle,
No. of Couplings Required = 9
No. of Conduit Lengths Required = 8

---

TABLE 13.

<table>
<thead>
<tr>
<th>APPROX. RADIUS OF BEND</th>
<th>LENGTH OF EACH CONDUIT (Ft.) (Using 5° Bend at Coupling)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11'-6&quot;</td>
<td>1</td>
</tr>
<tr>
<td>17'-3&quot;</td>
<td>1.5</td>
</tr>
<tr>
<td>23'-0&quot;</td>
<td>2</td>
</tr>
<tr>
<td>28'-9&quot;</td>
<td>2.5</td>
</tr>
<tr>
<td>34'-9&quot;</td>
<td>3</td>
</tr>
<tr>
<td>40'-3&quot;</td>
<td>3.5</td>
</tr>
<tr>
<td>45'-0&quot;</td>
<td>4</td>
</tr>
<tr>
<td>51'-9&quot;</td>
<td>4.5</td>
</tr>
<tr>
<td>57'-6&quot;</td>
<td>5</td>
</tr>
<tr>
<td>69'-0&quot;</td>
<td>6</td>
</tr>
<tr>
<td>80'-6&quot;</td>
<td>7</td>
</tr>
<tr>
<td>82'-0&quot;</td>
<td>8</td>
</tr>
</tbody>
</table>

TABLE 14.

<table>
<thead>
<tr>
<th>ANGLE OF BEND (θ)</th>
<th>NUMBER OF COUPLINGS AND CONDUIT LENGTHS REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>15°</td>
<td>3 2</td>
</tr>
<tr>
<td>30°</td>
<td>6 5</td>
</tr>
<tr>
<td>45°</td>
<td>9 6</td>
</tr>
<tr>
<td>60°</td>
<td>12 11</td>
</tr>
<tr>
<td>75°</td>
<td>15 14</td>
</tr>
<tr>
<td>90°</td>
<td>18 17</td>
</tr>
</tbody>
</table>

Note: *See Table 6, Sheet 4.*
MINIMUM ALLOWABLE CONDUIT DEVIATIONS

**NATURAL BEND - SEE CS1010; TABLE 4**

<table>
<thead>
<tr>
<th>CONDUIT SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>4.7</td>
<td>6.7</td>
<td>7.8</td>
<td>8.9</td>
<td>9.7</td>
</tr>
<tr>
<td>4&quot;</td>
<td>8.2</td>
<td>11.7</td>
<td>14.2</td>
<td>16.0</td>
<td>17.9</td>
</tr>
<tr>
<td>6&quot;</td>
<td>15.6</td>
<td>22.0</td>
<td>27.0</td>
<td>30.6</td>
<td>35.0</td>
</tr>
</tbody>
</table>

**45° BENDS - SEE CS1010; TABLE 11**

<table>
<thead>
<tr>
<th>CONDUIT SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>----</td>
<td>3.7</td>
<td>4.7</td>
<td>5.7</td>
<td>6.7</td>
</tr>
<tr>
<td>4&quot;</td>
<td>----</td>
<td>4.5</td>
<td>5.5</td>
<td>6.5</td>
<td>7.5</td>
</tr>
<tr>
<td>6&quot;</td>
<td>----</td>
<td>4.5</td>
<td>5.5</td>
<td>6.5</td>
<td>7.5</td>
</tr>
</tbody>
</table>

**22.5° BENDS - SEE CS1010; TABLE 11**

<table>
<thead>
<tr>
<th>CONDUIT SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>3.6</td>
<td>6.0</td>
<td>8.4</td>
<td>10.9</td>
<td>13.3</td>
</tr>
<tr>
<td>6&quot;</td>
<td>3.6</td>
<td>6.0</td>
<td>8.4</td>
<td>10.9</td>
<td>13.3</td>
</tr>
</tbody>
</table>
INSTALLATION OF BOXES IN SPECIAL FINISH SIDEWALKS:

Frequently special surface sidewalks (brick, tile, terrazzo, etc.) are installed. For boxes 3'x5' and smaller the box and standard cover shall be installed 2" below final grade and the customer shall furnish and install the special finish cover as illustrated in Figure A.

The requirements for this cover are as follows:
1. No single section cover shall exceed 125lbs.
2. Provisions for removal shall be provided as shown in Detail A.
3. The special finish cover shall be identified by the letter "E" to indicate the location of the splice box.
4. This type of installation should be avoided in full traffic locations.
5. CAUTION: Cover design allows for maximum of 1/2" deflection under 8000lb. wheel load.
### TABLE 1:

**PULL BOX BODY**

(17" X 30" BOX SHOWN)

<table>
<thead>
<tr>
<th>BOX SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>2E</td>
<td>33 1/4</td>
<td>36 3/4</td>
<td>13 1/4</td>
<td>6 3/4</td>
<td>30 3/4</td>
<td>17 3/4</td>
<td>1 1/2</td>
<td>20 1/4</td>
<td>23 3/4</td>
<td>4 5/8</td>
</tr>
<tr>
<td>3E</td>
<td>39 1/8</td>
<td>42 1/8</td>
<td>15 9/16</td>
<td>9 3/4</td>
<td>35 7/8</td>
<td>24 1/4</td>
<td>5 1/8</td>
<td>27 1/2</td>
<td>30 1/2</td>
<td>8 3/4</td>
</tr>
</tbody>
</table>

**NOTES:**

1. All lids and covers shall be furnished with hold-down bolts.
2. Non-concrete boxes and lids shall not be placed in any area subject to vehicular traffic.
3. 2E and 3E lids and cover shall be imprinted with "R.E.U.". 4E lids and covers shall be imprinted with "R.E.U. HIGH VOLTAGE".
4. Non-concrete boxes shall be from suppliers whose boxes meet the dimension and requirements of Note 5. Prior to acceptance of a box, REU must have received an independent consultants report by a licensed state of California civil or structural engineer showing the box and lid design meets the required specifications and standards. The report shall bear the stamp of the registered engineer.
5. Boxes and lids shall meet or exceed the requirements of the latest issue of the Western Underground Committee Guide 3.6/02/0588. Strength requirements based on 10,400lbs. (8,000lbs. plus 30% for impact) per wheel, 10"x10" wheel load area.
6. Knockouts are not required for REU boxes.
TABLE 3: DIMENSIONS (INCHES) FOR COVER

<table>
<thead>
<tr>
<th>BOX SIZE</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
<th>LID WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2E</td>
<td>30 1/2</td>
<td>30 1/4</td>
<td>17 1/2</td>
<td>17 1/4</td>
<td>13 1/4</td>
<td>6 3/4</td>
<td>1 3/8</td>
<td>2 8</td>
<td>90lbs.</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 4: APPROVED NON-CONCRETE BOX SUPPLIERS

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>CAT. NO.</th>
<th>BOX</th>
<th>LID</th>
<th>2E</th>
<th>3E</th>
<th>4E</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUAZITE CORP.</td>
<td>PG1730CA00</td>
<td>X</td>
<td>X</td>
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<tr>
<td></td>
<td>PG1730BA18</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>PG2436CA00</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>PG2436BA18</td>
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<tr>
<td></td>
<td>PG3048CS00</td>
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<tr>
<td></td>
<td>PG3048BA18</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHRISTY CONCRETE (OLDCASTLE)</td>
<td>FL 36BOX12</td>
<td>X</td>
<td>X</td>
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<tr>
<td></td>
<td>FL 36BOX18</td>
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<td>X</td>
<td></td>
<td></td>
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<td></td>
<td>FL 36T</td>
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<td></td>
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<td>CDR SYSTEMS</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>A12-2436-18</td>
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<td>X</td>
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<td></td>
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</table>
## TABLE 2:

<table>
<thead>
<tr>
<th>BOX SIZE</th>
<th>A</th>
<th>B</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>2E</td>
<td>35 3/4</td>
<td>37 1/4</td>
<td>36 1/2</td>
<td>23 1/2</td>
<td>22 3/4</td>
<td>24 1/4</td>
<td>4 1/2</td>
</tr>
<tr>
<td>3E</td>
<td>41 1/8</td>
<td>42 5/8</td>
<td>41 7/8</td>
<td>30 1/4</td>
<td>29 1/2</td>
<td>31</td>
<td>8 5/8</td>
</tr>
</tbody>
</table>

### 8" EXTENSION

**SECTION X-X**

**SECTION Y-Y**

**DETAIL B**

**TYPICAL MOUNTING DETAIL**

**ALL KNOCKOUTS ARE OPTIONAL**

SEE NOTE 6, SHT 1

SEE DETAIL B
NOTES:
1. Lids shall be one-piece and be furnished with hold-down bolts.
2. 2E and 3E lids shall be imprinted with "REU". 4E lids shall be imprinted with "REU HIGH VOLTAGE"
3. Boxes and lids shall be concrete and be constructed to the approximate dimensions listed below.
4. Pull boxes in locations subject to vehicular traffic shall be traffic rated per sheet 2.

<table>
<thead>
<tr>
<th>BOX NO.</th>
<th>DIMENSIONS (IN INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>2E</td>
<td>17</td>
</tr>
<tr>
<td>3E</td>
<td>24</td>
</tr>
<tr>
<td>4E</td>
<td>30</td>
</tr>
</tbody>
</table>
NOTES:

1. Provide CHRISTY B2436 box, B2436-52JH cover, and B2436x12 extension manufactured by Oldcastle Enclosures unless prior written approval has been obtained from the engineering division of REU.
2. Where box extensions are used, concrete shall extend to the full depth of the excavation.
3. Builder shall obtain inspection by REU prior to placing concrete.
4. Lids shall be hot-dipped galvanized or have an epoxy-coated non-skid sand finish.
5. Concrete for collar shall comply with greenbook class 560-B-3250.
6. Reinforcing steel for collar shall comply with ASTM A615 GR 40 or 60.
CONDUIT TERMINATION AREA SHALL BE WITHIN 12" MAX. FROM END OF SUBSTRUCTURE.

NOTES:

1.) All conduits shall be grouped within 12" of the street side of the secondary box. (See Detail "A")

2.) Service conduit stubs shall be installed by the developer and shall extend at least (3') three feet into parcel being served. The end of the service conduit stub must clear all equipment pads by at least (2') two feet. The builder shall complete the service conduit run from the conduit stub to the service panel.

3.) Prior to the date of this construction standard, service conduits were not stubbed to parcels as a practice, therefore stubs may not always be present on all existing parcels. Where stubs are not present the builder shall complete the service conduit run from a secondary box to the service panel.

4.) For conduit sizes see plans, specification or other applicable construction standards.

5.) All conduits shall be extended a minimum of 3" and a maximum of 5" above the bottom of the box.

6.) Service conduits installed by the owner/builder shall rise in the secondary box immediately adjacent to secondary conduits as shown.

7.) Conduit sweeps shall not be cut or otherwise modified.
EXTEND THRU 2" KNOCK-OUT TO EXISTING GUTTER & DAYLIGHT.

2-20 AMP 1P CIRCUIT BREAKERS AND DUPLEX GROUNDING TYPE RECEPTACLE. SEE SPECIAL CONDITIONS OF SPECIFICATION FOR MORE INFORMATION.

CHECK VALVE HYDROMATIC #HCV-125 NON-SLAM.

LIGHT FIXTURE FOR VAULT.

2" P.V.C. SCHEDULE 40 PIPING FOR PUMP DISCHARGE.

6" COMPACTED 1/2" TO 3/4" RIVER RUN GRAVEL BEDDING.

24" CONCRETE T&G TILE, 30" LONG WITH 4" SLAB IN BOTTOM AND GALV. GRATING COVER WITH CENTER HOLE FOR POWER CONNECTION AND DISCHARGE PIPING.

SUMP PUMP ALL BRONZE 40 G.P.M. @ 15' HEAD, 1/3 H.P. 120 VOLT, WITH BUILT IN LEVEL SWITCH. HYDROMATIC SP-33AB.
DETAIL "A"
BOLT DOWN BRACKET - BOX

DETAIL "C"
IDENTIFICATION PLATE

DETAIL "D"
ADJUSTMENT BOLT SUPPORT BRACKET

DETAIL "B"
GRADE ADJUSTING FEATURE

DETAIL "B" - ALTERNATE
GRADE ADJUSTING FEATURE

DETAIL "E"
BOLT DOWN FEATURE - COVER

TYPICAL ELECTRIC SPLICE BOX
AND VAULT DETAILS

REDRAWN
3' x 5' SPLICE BOX &
4' x 6'-6'', 4' x 8' & 6' x 12'
ELECTRICAL VAULT

GROUND ROD
CONTINUOUS WELDMENT
BOTH SIDES
REBAR

SIDE VIEW

GROUND ROD
CONTINUOUS WELDMENT
BOTH SIDES
REBAR

FRONT VIEW

MOUNTING DETAIL

GROUND ROD DETAIL
5/8"Ø x 16" COPPER COATED STEEL

REBAR ATTACHMENT DETAIL

NOTE:
Both ground rods shall be welded to one continuous run of
bare or zinc galvanized or other electrically conductive
coated steel reinforcing bars or rods of not less than
twenty (20) feet in length and 1/2" (12.7mm) in diameter
which is encased by at least 2" (50.8) of concrete. This
continuous run may be part of the reinforcing cage within
the floor area only.
NOTES:

1. The splice box shall be precast with dimensions as shown. Design strength shall meet or exceed the latest edition of ASTM C857 designation A-16 for (AASHTO DESIGNATION HS 20-44) based on 16,000lbs per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.

2. Two 5/8" ground rods shall be provided in the splice box per REU Drawing CS1115.

3. The excavation shall allow for the overall assembled height of the splice box plus added height of risers, manhole casting, frames, covers, and bedding materials. A minimum clearance of 6" around the side walls of the splice box is required for ease of installation. It shall be the contractors responsibility to verify excavation requirement with the vendor supplying the vault for each specific location.

4. The bedding materials shall consist of 3" to 6" of mechanically compacted Caltrans 3/4" Class 2 aggregate per City of Redding Construction Standard Page 100.00.

5. The precast splice box shall be assembled by lowering each section into the excavation. The base section is lowered first, set level, firmly positioned and mastic sealant installed before placing intermediate and top sections. Care shall be taken to insure that the seal surfaces are clean and that the gasket material is properly placed.

6. Backfill shall consist of 3/4" Caltrans Class 2 aggregate. Backfilling shall not commence until splice box is completely assembled. Backfilling shall be installed in 12" maximum lifts and mechanically compacted to 90% relative compaction. Alternatively, slurry backfill per Page 611.00 may be used with no compaction required.

7. All grouting of risers, covers, conduits or specified sections of splice boxes shall be the responsibility of the customer and/or contractor.

8. See REU Drawing CS1114 for splice box construction and installation details.

9. Pull irons shall be designed for 20,000 lbs. Ultimate, with a safety factor of two. (40,000 lbs.)

10. All extensions shall be provided with four lifting eyes or other approved lifting means. Each lifting attachment point shall be capable of lifting the total extension weight plus 150%.

11. All sections of a splice box shall be permanently marked with delivery date.
SUPPORT BRACKET
SEE DETAIL "D"
DWG. CS1114

IDENTIFICATION PLATE
SEE DETAIL "C"
DWG. CS1114

REMovable beams
("I" BEAMS SHOWN FOR REFERENCE ONLY)

COVER BOLT DOWN
(TYP) SEE DETAIL "E"
DWG. CS1114

2-HOLES 9/16" DIA.
2-CorNERS
SEE DETAIL "C"
DWG. CS1114

GRADE ADJUSTING
BOLT, 4-CorNERS,
SEE DETAIL "B"
DWG. CS1114

SEE DETAIL "A" DWG. CS1114

SECTION X-X
FRAME ASSEMBLY

NOTES:

1. This cover shall only be used with REU approval in a full traffic area.

2. The frame and cover assembly shall meet dimension requirements as shown and design strength shall meet or exceed the latest edition of ASTM C 857 designation A-16 (AASHTO DESIGNATION HS 20-40) based on 16,000lbs. per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.

3. Covers shall be installed within an adjustable frame which shall have a minimum of three inches of adjustment. All steel shall be galvanized as per the latest revision of ASTM Spec. A-123, or shall be an epoxy non-skid sand finish.

4. Identification plate (one) shall be supplied and state "HIGH VOLTAGE" "R.E.U.". See Detail "C" on Drawing CS1114.

5. All grouting of risers, covers, conduits or specific sections of splice box shall be the responsibility of the customer and/or contractor. Grout used between frame and splice box shall be suitable for full traffic loads and consistent with ASTM C 857 designation A-16 loading and shall be allowed to cure 24 hours before any load is applied. See Drawing CS1116 for 3'x5' splice box.

6. See Drawing CS1114 for construction and installation details.

7. All sections of a splice box must be permanently marked with the delivery date.

8. Removable beams shall have a 1" diameter hole in each end for lifting.
NOTES:

1. The splice box shall be poured in place or precast with dimensions as shown. Design strength shall meet or exceed the latest edition of ASTM C857 designation A-16 for (AASHTO DESIGNATION HS 20-44) based on 16,000lbs per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.

2. Two 5/8" ground rods shall be provided in the splice box per REU Drawing CS1115.

3. The excavation shall allow for the overall assembled height of the splice box plus added height of risers, manhole casting, frames, covers, and bedding materials. A minimum clearance of 6" around the side walls of the splice box is required for ease of installation. It shall be the contractors responsibility to verify excavation requirement with the vendor supplying the vault for each specific location.

4. The bedding materials shall consist of 3" to 6" of mechanically compacted Caltrans 3/4" Class 2 aggregate per City of Redding Construction Standard Page 100.00.

5. The precast splice box shall be assembled by lowering each section into the excavation. The base section is lowered first, set level, firmly positioned and mastic sealant installed before placing intermediate and top sections. Care shall be taken to insure that the seal surfaces are clean and that the gasket material is properly placed.

6. Backfill shall consist of 3/4" Caltrans Class 2 aggregate. Backfilling shall not commence until splice box is completely assembled. Backfilling shall be installed in 12" maximum lifts and mechanically compacted to 90% relative compaction. Alternatively, slurry backfill per Page 611.00 may be used with no compaction required.

7. All grouting of risers, covers, conduits or specified sections of splice boxes shall be the responsibility of the customer and/or contractor.

8. See REU Drawing CS1114 for splice box construction and installation details.

9. Pull irons shall be designed for 20,000 lbs. Ultimate, with a safety factor of two. (40,000 lbs.)

10. All extensions shall be provided with four lifting eyes or other approved lifting means. Each lifting attachment point shall be capable of lifting the total extension weight plus 150%.

11. All sections of a splice box shall be permanently marked with delivery date.
NOTES:
1. The frame and cover assembly shall meet dimension requirements as shown and design strength shall meet or exceed the latest edition of ASTM C 857 designation A-16 (AASHTO DESIGNATION HS 20-40) based on 16,000lbs. per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.
2. Covers shall be installed within an adjustable frame which shall have a minum of three inches of adjustment. All steel shall be galvanized as per the latest revision of ASTM Spec. A-123, or shall be an epoxy non-skid sand finish.
3. Identification plate (one) shall be supplied and state "HIGH VOLTAGE" "R.E.U.". See Detail "C" on Drawing CS1114.
4. All grouting of risers, covers, conduits or specific sections of splice box shall be the responsibility of the customer and/or contractor. Grout used between frame and splice box shall be suitable for full traffic loads and consistent with ASTM C 857 designation A-16 loading and shall be allowed to cure 24 hours before any load is applied. See Drawing CS1118 for 4'-0" x 6'-6" electrical vault.
5. See Drawing CS1114 for construction and installation details.
6. All sections of a splice box must be permanently marked with the delivery date.
7. Removable beams shall have a 1" diameter hole in each end for lifting.
NOTES:

1. The splice box shall be poured in place or precast with dimensions as shown. Design strength shall meet or exceed the latest edition of ASTM C857 designation A-16 for (AASHTO DESIGNATION HS 20-44) based on 16,000lbs per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.

2. Two 5/8" ground rods shall be provided in the splice box per REU Drawing CS1115.

3. The excavation shall allow for the overall assembled height of the splice box plus added height of risers, manhole casting, frames, covers, and bedding materials. A minimum clearance of 6" around the side walls of the splice box is required for ease of installation. It shall be the contractors responsibility to verify excavation requirement with the vendor supplying the vault for each specific location.

4. The bedding materials shall consist of 3" to 6" of mechanically compacted Caltrans 3/4" Class 2 aggregate per City of Redding Construction Standard Page 100.00.

5. The precast splice box shall be assembled by lowering each section into the excavation. The base section is lowered first, set level, firmly positioned and mastic sealant installed before placing intermediate and top sections. Care shall be taken to insure that the seal surfaces are clean and that the gasket material is properly placed.

6. Backfill shall consist of 3/4" Caltrans Class 2 aggregate. Backfilling shall not commence until splice box is completely assembled. Backfilling shall be installed in 12" maximum lifts and mechanically compacted to 90% relative compaction. Alternatively, slurry backfill per Page 611.00 may be used with no compaction required.

7. All grouting of risers, covers, conduits or specified sections of splice boxes shall be the responsibility of the customer and/or contractor.

8. See REU Drawing CS1114 for splice box construction and installation details.

9. Pull irons shall be designed for 20,000 lbs. Ultimate, with a safety factor of two. (40,000 lbs.)

10. All extensions shall be provided with four lifting eyes or other approved lifting means. Each lifting attachment point shall be capable of lifting the total extension weight plus 150%.

11. All sections of a splice box shall be permanently marked with delivery date.
NOTES:

1. This cover shall be used with REU approval in a traffic area.
2. The frame and cover assembly shall meet dimension requirements as shown and design strength shall meet or exceed the latest edition of ASTM C 857 designation A-16 (AASHTO DESIGNATION HS 20-40) based on 16,000lbs. per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.
3. Covers shall be installed within an adjustable frame which shall have a minimum of three inches of adjustment. All steel shall be galvanized as per the latest revision of ASTM Spec. A-123, or shall be an epoxy non-skid sand finish.
4. Identification plate (one) shall be supplied and state "HIGH VOLTAGE" "R.E.U.". See Detail "C" on Drawing CS1114.
5. All grouting of risers, covers, conduits or specific sections of splice box shall be the responsibility of the customer and/or contractor. Grout used between frame and splice box shall be suitable for full traffic loads and consistent with ASTM C 857 designation A-16 loading and shall be allowed to cure 24 hours before any load is applied. See Drawing CS1120 and CS1122 for primary electric vaults.
6. See Drawing CS1114 for construction and installation details.
7. All sections of a splice box must be permanently marked with the delivery date.
8. Removable beams shall have a 1" diameter hole in each end for lifting.
NOTES:

1. The splice box shall be poured in place or precast with dimensions as shown. Design strength shall meet or exceed the latest edition of ASTM C857 designation A-16 for (AASHTO DESIGNATION HS 20-44) based on 16,000 lbs per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.

2. Two 5/8" ground rods shall be provided in the splice box per REU Drawing CS1115.

3. The excavation shall allow for the overall assembled height of the splice box plus added height of risers, manhole casting, frames, covers, and bedding materials. A minimum clearance of 6" around the side walls of the splice box is required for ease of installation. It shall be the contractor's responsibility to verify excavation requirement with the vendor supplying the vault for each specific location.

4. The bedding materials shall consist of 3" to 6" of mechanically compacted Caltrans 3/4" Class 2 aggregate per City of Redding Construction Standard Page 100.00.

5. The precast splice box shall be assembled by lowering each section into the excavation. The base section is lowered first, set level, firmly positioned and mastic sealant installed before placing intermediate and top sections. Care shall be taken to ensure that the seal surfaces are clean and that the gasket material is properly placed.

6. Backfill shall consist of 3/4" Caltrans Class 2 aggregate. Backfilling shall not commence until splice box is completely assembled. Backfilling shall be installed in 12" maximum lifts and mechanically compacted to 90% relative compaction. Alternatively, slurry backfill per Page 611.00 may be used with no compaction required.

7. All grouting of risers, covers, conduits or specified sections of splice boxes shall be the responsibility of the customer and/or contractor.

8. See REU Drawing CS1114 for splice box construction and installation details.

9. Pull irons shall be designed for 20,000 lbs. Ultimate, with a safety factor of two. (40,000 lbs.)

10. All extensions shall be provided with four lifting eyes or other approved lifting means. Each lifting attachment point shall be capable of lifting the total extension weight plus 150%.

11. All sections of a splice box shall be permanently marked with delivery date.
NOTES:

1. The splice box shall be poured in place or precast with dimensions as shown. Design strength shall meet or exceed the latest edition of ASTM C657 designation A-16 for (AASHTO DESIGNATION HS 20-44) based on 16,000lbs per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.

2. Two 5/8" ground rods shall be provided in the splice box per REU Drawing CS1115.

3. The excavation shall allow for the overall assembled height of the splice box plus added height of risers, manhole casting, frames, covers, and bedding materials. A minimum clearance of 6" around the side walls of the splice box is required for ease of installation. It shall be the contractors responsibility to verify excavation requirement with the vendor supplying the vault for each specific location.

4. The bedding materials shall consist of 3" to 6" of mechanically compacted Caltrans 3/4" Class 2 aggregate per City of Redding Construction Standard Page 100.00.

5. The precast splice box shall be assembled by lowering each section into the excavation. The base section is lowered first, set level, firmly positioned and mastic sealant installed before placing intermediate and top sections. Care shall be taken to insure that the seal surfaces are clean and that the gasket material is properly placed.

6. Backfill shall consist of 3/4" Caltrans Class 2 aggregate. Backfilling shall not commence until splice box is completely assembled. Backfilling shall be installed in 12" maximum lifts and mechanically compacted to 90% relative compaction. Alternatively, slurry backfill per Page 611.00 may be used with no compaction required.

7. All grouting of risers, covers, conduits or specified sections of splice boxes shall be the responsibility of the customer and/or contractor.

8. Pull irons shall be designed for 20,000 lbs. Ultimate, with a safety factor of two. (40,000 lbs.)

9. All extensions shall be provided with four lifting eyes or other approved lifting means. Each lifting attachment point shall be capable of lifting the total extension weight plus 150%.

10. All sections of a splice box shall be permanently marked with delivery date.
NOTES:

1. The frame and cover assembly shall meet dimension requirements as shown and design strength shall meet or exceed the latest edition of ASTM C 857 designation A-16 (AASHTO DESIGNATION HS 20-40) based on 16,000lbs. per wheel, 10"x20" wheel load area and increased 30% for an impact factor. Proof of specification compliance shall be the responsibility of the contractor and/or vendor.

2. Cover shall be labeled "R.E.U." "HIGH VOLTAGE".

3. All grouting shall be the responsibility of the customer and/or contractor. Grout used between frame and vault, grade rings, or cone shall be suitable for full traffic loads and consistent with ASTM C 857 designation A-16 loading and shall be allowed to cure 24 hours before any load is applied. Adjustable studs shall be wrapped with felt paper to grouting for easy future use.

4. Adjustable studs shall have slotted heads for installing into inserts.

5. Plastic mastic sealant shall be installed in all joints. Care shall be taken to insure that the seal surfaces are clean and that the gasket material is in place properly.

6. See Drawing CS1120 for 4'-6"x8'-6" and CS1122 for 6'-0"x12'-0" electrical vault details.
1. The frame and cover assembly shall meet dimension requirements as shown and design strength shall meet or exceed the latest edition of ASTM C-857 (AASHTO H10 Standards) based on 8000 lbs. per wheel, 10'x10' wheel load area. Proof of specification compliance shall be responsibility of the contractor and/or vendor.

2. Covers shall be installed within an adjustable frame which shall have a minimum of three inches of adjustment. All steel shall be galvanized as per the latest revision of ASTM Spec. A-123, or shall be an epoxy non-skid sand finish.

3. All covers shall have four locations for nameplates. One shall be supplied and state: "HIGH VOLTAGE" "R.E.U."

4. All grouting of risers, covers, conduits or specific sections of splice box shall be the responsibility of the customer and/or contractor. Grout used between frame and splice box shall be suitable for full traffic loads and consistent with ASTM C-857 designation A-16 loading and shall be allowed to cure 24 hours before any load is applied. See drawing CS1116 for 3x5 splice box.

5. All sections of a splice box must be permanently marked with the delivery date.

6. For use in sidewalks, paved and unpaved pedestrian areas, and any other area subject to occasional vehicle traffic.

7. All covers shall be torsion assist and have a R.E.U. approved skid resistant surface, hold open latches, Camlock bolt-down, and clear opening.
1. The frame and cover assembly shall meet dimension requirements as shown and design strength shall meet or exceed the latest edition of ASTM C-857 (AASHTO H10 Standards) based on 8000 lbs. per wheel, 10"x10" wheel load area. Proof of specification compliance shall be responsibility of the contractor and/or vendor.

2. Covers shall be installed within an adjustable frame which shall have a minimum of three inches of adjustment. All steel shall be galvanized as per the latest revision of ASTM Spec. A-123, or shall be an epoxy non-skid sand finish.

3. All covers shall have four locations for nameplates. One shall be supplied and state; "HIGH VOLTAGE" "R.E.U."

4. All grouting of risers, covers, conduits or specific sections of splice box shall be the responsibility of the customer and/or contractor. Grout used between frame and splice box shall be suitable for full traffic loads and consistent with ASTM C-857 designation A-16 loading and shall be allowed to cure 24 hours before any load is applied. See drawing CS1120 for 4'-6"x8'-6" primary electrical vault.

5. All sections of a splice box must be permanently marked with the delivery date.

6. For use in sidewalks, paved and unpaved pedestrian areas, and any other area subject to occasional vehicle traffic.

7. All covers shall be torsion assist and have a R.E.U. approved skid resistant surface, hold open latches, Camlock bolt-down, and clear opening.
SKID RESISTANT SURFACE

CAMLOCK BOLT-DOWN

HOLD OPEN LATCH AND TORSION ASSIST.

ISOMETRIC VIEW

INSIDE LEVELING BOLTS (4-PLACES)

SEE DETAIL "B" THIS PAGE

DETAIL A
GRADE ADJUSTING FEATURE

DETAIL B
ADJUSTMENT BOLT SUPPORT BRACKET

ALUMINUM QUICK RELEASE COVER ASSEMBLY
INCIDENTAL TRAFFIC 4'-6"x8'-6" ELECTRICAL PRIMARY VAULT

REDDING ELECTRIC UTILITY
ELECTRIC CONSTRUCTION STANDARD

DRAWN RLH/JCR 09/27/07
REVISION 11/29/07
DRAWING NUMBER 541.01

ADD LABELS TO ISOMETRIC VIEW AND UPDATED CAD STANDARDS
22"x 64"x 1/4" DIAMOND PLATE COVER
(COVER TO BE FLUSH WITH TOP OF CONCRETE PAD)
LABELED "R.E.U. HIGH VOLTAGE"

HOLD DOWN ASSEMBLY,
COURSE THREAD PENTA-HEAD BOLTS (TOTAL OF 4)

2"x 2"x 1/4" ANGLE FRAME
(GALVANIZED STEEL)

52"x 12" ACCESS OPENING

PAD WILL OVERHANG
3X5 VAULT BY 3 1/2" ON THE BACK, 1 1/2" ON THE SIDES AND 1 1/2" ON THE FRONT

8" 12" 4" 8" 4"

18"x 60" ACCESS OPENING

* FACES OF ACCESS OPENING TO BE FLUSH WITH INSIDE OF BOX.

PAD FOR 200A SECTIONALIZING ENCLOSURE
(TO BE PLACED ON TOP OF A STANDARD 3'X5' VAULT - SEE CS1116)
<table>
<thead>
<tr>
<th>ITEM</th>
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<td>4</td>
<td>1</td>
<td>WIND STOP</td>
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<td>5</td>
<td>1</td>
<td>PENTA BOLT</td>
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<td>6</td>
<td>6</td>
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</tr>
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<td>7</td>
<td>2</td>
<td>1/2 FLAT WASHER</td>
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<td>8</td>
<td>1</td>
<td>1/2 - 13x1 HEX HD CAP</td>
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<td>9</td>
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<td>1/2 SPRING</td>
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<tr>
<td>10</td>
<td>1</td>
<td>1/2 ONE WAY WASHER</td>
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<td>11</td>
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<td>13</td>
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<td>14</td>
<td>1</td>
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<td>15</td>
<td>2</td>
<td>CARRIAGE BOLT 1/4 - 20</td>
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<tr>
<td>16</td>
<td>2</td>
<td>WHIZ LOCK NUT 1/4 - 20</td>
</tr>
</tbody>
</table>

**SECTONALIZING CABINET**

**MANUFACTURER**
MAYSTEEL

**PART NO.**
CC360-22TH *

* TO GET 3 - 4 WAY J-BARS INSTALLED BY MAYSTEEL ADD 3 COOPER POWER SYTEM PART #LJ215C4U TO THE ORDER.

**NOTE:**
1. ENCLOSURE SHALL BE FABRICATED FROM 12 GAUGE STEEL. MUNSELL GREEN POWDER COAT.
NOTES:

1. All conduits entering or exiting a vault shall have a straight section that is perpendicular to the outside wall of the vault. Preferably the straight section of conduit will be 10’ in length. If the location prohibits a full 10’, the length maybe reduced - But under no circumstances shall the straight section of conduit be less than 1’ in length as measured from the outside wall of the vault.

2. Conduits shall not cross or switch positions in the trench between vaults.

SECTION "A"
POLE RISER DETAIL

STANDARD DUTY SCH. 40 PVC
(Use 8' Above Ground)

<table>
<thead>
<tr>
<th>STOCK CODE</th>
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<td>59213N</td>
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<td>E381.94</td>
<td>59215N*</td>
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<td>E381.96</td>
<td>59216N*</td>
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HEAVY DUTY SCH. 80 PVC
(Use Below 8' on Pole)

<table>
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<td>E381.14</td>
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BACKUP PLATE
(Use First Section on Pole)

<table>
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<td>E381.98</td>
<td>59116</td>
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DUCT TO RISER FITTING/ADAPTOR

<table>
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<tr>
<td>E939NLX</td>
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<td>4x3</td>
</tr>
<tr>
<td>E939PN</td>
<td></td>
<td>5x4</td>
</tr>
<tr>
<td>E380.02</td>
<td>E939RP</td>
<td>6x5</td>
</tr>
<tr>
<td>E380.03</td>
<td>E939N (4x3)</td>
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STRAP SUPPLIERS

<table>
<thead>
<tr>
<th>STOCK CODE</th>
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<tr>
<td></td>
<td>477-6</td>
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</table>

* NOTE: ADEQUATE STRENGTH FOR USE BELOW 8' ON POLE
CONCRETE GRAVITY WALL - (CGW)
FOR USE IN LANDSCAPED AREAS ONLY. SEE SHEET 3 FOR DETAILED REQUIREMENTS AND NOTES.

SEGMENTAL RETAINING WALL - (SRW)
FOR USE IN LANDSCAPED OR NATIVE SITE MATERIAL AREAS. SEE SHEETS 6 AND 7 FOR GENERAL DESCRIPTION, REQUIREMENTS AND NOTES.

CONCRETE MASONRY RETAINING WALL - (CMW)
FOR USE WHERE SURROUNDED BY NATIVE SITE MATERIAL. SEE SHEETS 4 AND 5 FOR DETAILED REQUIREMENTS AND NOTES.

NOTES:
1. The walls depicted by this standard are to be used for Redding Electric Utility (REU) facilities only! These walls may only be used in areas which will have no temporary or permanent surcharge loads within 5' of the wall resulting from vehicles, equipment or structures. There must also be no geological or water/drainage condition which would present a hazard to the wall or its backfill.
2. Should any permanent safety barrier, i.e. raling, fence, etc., be necessary for protection of the public, such barriers shall be the responsibility of the developer.
CLEARANCE REQUIREMENTS

EARTH RETAINING WALL.

CLEARANCE DIMENSIONS

<table>
<thead>
<tr>
<th>ELECTRICAL FEATURE</th>
<th>SEE REU STANDARD</th>
<th>W APPROX.</th>
<th>X MIN.</th>
<th>Y MIN.</th>
<th>Z MIN.</th>
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</thead>
<tbody>
<tr>
<td>1O PAD MOUNTED TRANSFORMER</td>
<td>CS330</td>
<td>4'-0&quot;</td>
<td>5'</td>
<td>3'</td>
<td>14'-0&quot;</td>
</tr>
<tr>
<td>3O PAD MOUNTED TRANSFORMER</td>
<td>CS331</td>
<td>6'-4&quot;</td>
<td>5'</td>
<td>3'</td>
<td>16'-4&quot;</td>
</tr>
<tr>
<td>600A-200A PAD MOUNTED SWITCH, PME-5</td>
<td>CS430</td>
<td>6'-0&quot;</td>
<td>8'</td>
<td>3'</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>600A-200A VAULT MOUNTED SWITCH, PME-9 and PME-11</td>
<td>CS431</td>
<td>5'-7&quot;</td>
<td>8'</td>
<td>3'</td>
<td>21'-7&quot;</td>
</tr>
<tr>
<td>PAD MOUNTED CAPACITOR BANK</td>
<td>CS500</td>
<td>6'-4&quot;</td>
<td>3'</td>
<td>8'</td>
<td>12'-4&quot;</td>
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<tr>
<td>3x5&quot; PRIMARY SPLICE BOX</td>
<td>CS1116</td>
<td>6'-0&quot;</td>
<td>3'</td>
<td>3'</td>
<td>12'-0&quot;</td>
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<tr>
<td>4x6'-6&quot; ELECTRICAL VAULT</td>
<td>CS1118</td>
<td>7'-6&quot;</td>
<td>3'</td>
<td>3'</td>
<td>13'-6&quot;</td>
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<tr>
<td>4x8'-6&quot; ELECTRICAL VAULT</td>
<td>CS1121</td>
<td>9'-6&quot;</td>
<td>3'</td>
<td>3'</td>
<td>15'-6&quot;</td>
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<td>6x12&quot; ELECTRICAL VAULT</td>
<td>CS1122</td>
<td>13'-0&quot;</td>
<td>3'</td>
<td>3'</td>
<td>19'-0&quot;</td>
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</table>

NOTES:
1. Obtain approval from a REU Distribution Planner prior to any retaining structure work, for wall type, location, operation or special clearance requirement.
2. Also, check with a REU Distribution Planner for different or additional dimensions if one of the following conditions exists:
   A. Multiple electrical features to be placed at one location.
   B. Different directional layout to that indicated in plan view above.
LEVEL BACKFILL FOR 5 FEET BEHIND WALL, (TYP.). NO OTHER STRUCTURE OR VEHICLE ALLOWED IN THIS AREA.

TYPE 1

3/4" CHAMFER BOTH SIDES, (TYP.)

12" TYP.

A TYP.

B TYP.

C TYP.

SEE NOTE 4, (TYP.)

TYPE 2

4 #4 CONT.

2" TYP.

#4 @ 24" O.C.

TYPE 3

1 CUBIC FT./FT. COURSE GRAVEL FILTER (MIVAFIN SERIES OR EQUAL). SEE NOTE 3.

CONCRETE GRAVITY WALL (CGW)

TYPICAL CROSS SECTIONS

WALL DIMENSIONS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>A HEIGHT</th>
<th>B MIN.</th>
<th>C MIN.</th>
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<td>15&quot;</td>
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<td>16-1/2&quot;</td>
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<td>2</td>
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<td>18&quot;</td>
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<tr>
<td>3</td>
<td>27&quot;</td>
<td>15&quot;</td>
<td>19-1/2&quot;</td>
</tr>
<tr>
<td>3</td>
<td>30&quot;</td>
<td>16&quot;</td>
<td>21&quot;</td>
</tr>
</tbody>
</table>

NOTES:
1. Reinforcement to be continuous through corners at sidewalls.
2. All reinforcement laps to be 24 inches minimum.
3. Furnish back wall drain all walls where natural or irrigation water accumulations would occur.
   Typical for all wall sections.
4. Concrete shall be class 560-C-3250, and shall be placed against undisturbed earth.
5. All materials/contraction processes shall conform to the applicable sections of the latest edition of
   the "Standards Specifications for Public Works Construction".

EARTH RETAINING STRUCTURES
CONCRETE MASONRY RETAINING WALL (CMW)

TYPICAL CROSS SECTION

NOTES:

1. See Sheet 5 for notes.
NOTES:

1. Remove all debris, rocks, roots, etc. by rake and contour/finish grade area to blend into surrounding land form and to also provide a good seed bed. Plant (between September 15 and October 30) all disturbed areas exterior to the retaining structure with the following seed mix blend using an application rate of 0.10lbs./100 square feet:
   - 30% Blando Brome
   - 25% Wimmera Rye Grass
   - 30% Hikon Rose Clover
   - 15% Cebtral California Wildflower Mix

   Fertilize seeded area with 16-20-0 fertilizer at the rate of 1lb./100 square feet. Cover planted area with a 2 to 3 inch thick layer of hand-strewn hay or straw.

2. Dowel bars to match 24 inch on center positions of vertical reinforcing steel and have a lap of at least 24 inches. Alternately, vertical reinforcement may be continuous from footing to wall top and avoid lap entirely but only if accurately placed in footing.

3. Place vertical steel 2 inches from backfill face of block.

4. Vertical steel to be in each corner cell and end cell of a return wall.

5. Furnish bond beam units for bottom course block and cut 3 inch deep notch for horizontal bar in top course.

6. All horizontal bars to be continuous or lapped 24 inches minimum.

7. All block cells to be 100% consolidated, grout-filled. Use pencil vibrator to achieve consolidation.

8. CMU to be "Basalite" split faced, color D390, Dixon Plant or other approved color.

9. Course aggregate for drainage pocket shall be clean crushed rock ranging in size from 3/8" to 1 1/2".

10. Concrete for footing/key shall be Class 560-C-3250.

11. All wall materials/construction processes shall conform to the applicable sections of the latest edition of the "Standards Specifications for Public Works Construction".
SEGMENTAL RETAINING WALL (SRW)

TYPICAL CROSS SECTION

NOTES:

1. No installation may exceed the maximum height recommended by the wall manufacturer. In addition, any wall proposed to exceed 48 inches in height will be required to demonstrate that capability with an engineered design and other supporting documentation.

2. Segmental retaining walls (SRW), which exceed the limits described in note 1, shall have their drawings, details, specifications and calculations submitted and approved by the Development Services Department prior to construction.

3. The dimensions and details for this type of wall are the responsibility of the wall manufacturer and/or the developers engineer.

SLOPE BEHIND WALL NOT TO EXCEED 6 HORIZ. TO 1 VERT., FOR A DISTANCE NOT LESS THAN THE OVERALL HEIGHT OF WALL

ORIGINAL GRADE NOT TO EXCEED A SLOPE OF 2 HORIZ. TO 1 VERT.

CONSTRUCT INTERCEPT DRAINAGE SWALE IF TERRAIN SLOPES TOWARD WALL.
DESCRIPTION:
Segmental Retaining Walls (SRW) are retaining walls that rely primarily on mass (weight) for stability. The system consists of concrete masonry units placed without the use of mortar (dry stacked), and relies on a combination of mechanical interlock and mass to prevent overturning and sliding. The units may also be used in combination with horizontal layers of soil reinforcement which extend into the backfill to increase the effective weight of the gravity mass and allow for taller wall construction. Reinforced soil is typically a compacted structure fill behind the SRW which contains a horizontal soil reinforcement material and engineered backfill. A variety of geosynthetic and steel soil reinforcement systems are available.

DESIGN FLEXIBILITY:
The SRW system is composed of units whose size and weight make it possible to construct walls in difficult locations. Curves and other unique layouts can often be easily accommodated. SRWs have the ability to function equally well in large-scale applications as well as smaller landscape projects. Since SRW units are available in a variety of sizes, shapes, textures and colors, SRWs can provide developers and contractors with both an attractive and a structurally sound wall.

SPECIAL REQUIREMENTS:
SRW systems shall be designed by a California licensed Architect, Civil Engineer or Structural Engineer when:

1. Wall height exceeds 48 inches.
2. Structures will be surcharged.
3. Walls will be subject to loads.
4. Walls will be founded on weak soils or other poor foundation material.
5. The nature of the site or other design conditions requires special considerations.

CONSTRUCTION:
The success of any SRW installation depends on complete and accurate information, careful planning and scheduling, the use of specific materials, proper construction procedures and inspection. It is essential to have the retaining wall location approved by a REU Distribution Planner to assure adequate clearance to the electrical equipment for the REU field operations staff. The proposed finish grades shown on the drawings shall be verified to ensure the planned heights are in agreement with the topographic information from the project grading plan. The developer/contractor shall coordinate the delivery and storage of materials, at the site, to ensure access to the work site and availability of materials, during the project. Materials delivered to the project shall be accompanied by the manufacturer's certification that the materials meet or exceed the product's specified minimum requirements.

SRW construction often occurs in the following sequence:

1. Excavation and leveling of the pad area for construction.
2. Setting, leveling, backfilling and compacting a stable base for the SRW.
3. Placement and backfilling of SRW units in succeeding courses.
4. Placement, tensioning and backfilling of soil reinforcements, when required.
5. Compaction of backfill to the specified density.
6. Capping the SRW and finish grade.

As with any structure used to retain soil, careful attention must be paid to the materials, compaction equipment and procedures used during construction. When compacting soil within 4 feet of the front face of a wall, compaction tools shall be limited to hand operated equipment (preferably a gasoline powered plate compactor). A reinforced soil mass can typically be compacted with walk behind, self propelled soil compaction equipment.
1. Bolt-on residential meters are not accepted for new services.
2. All new three phase services shall be grounded - 4 wire.
3. Clamped or bolted connectors in metering equipment enclosures shall be permitted, including the neutral connection.
4. Test bypass facilities are required in all nonresidential services except sign boards, temporary services, irrigation controls, general, service panels for apartments, and other non-critical low usage loads at REU's discretion.
5. Lever bypasses are not acceptable on commercial panels.
6. Split bus main breakers are acceptable for residential use provided that the main breakers are installed in close proximity to each other and are clearly labeled.
7. All commercial panels require a single main disconnect on the load side of each meter.
GENERAL METERING REQUIREMENTS:

1. EUSERC, Electric Utility Service Equipment Requirements Committee, is an organization comprised of utility representatives from the western section of the United States that work to promote the standardization of electric service requirements and the design and engineering of metering and service equipment. All metering and service equipment approved for use in the areas served by Redding Electric Utility (REU) shall be built to the requirements developed by EUSERC. Approved metering and service equipment is available to customers and contractors through electrical wholesale distributors.

2. All electric service panels shall meet EUSERC requirements. Purchase or installation of any equipment that does not conform to EUSERC requirements is done at the developer's risk. Any electrical service panels that do not comply with EUSERC will be required to have field modifications completed or be replaced at the developer's expense.

3. REU shall not approve an electric meter installation within a hazardous area, as defined in the latest edition of the California Electric Code adopted by the City of Redding.

4. REU electric meters shall be accessible to REU employees 24 hours a day. Meter sockets shall be installed on an exterior wall of the building to be served. The meter socket may be installed in a recess on the exterior wall; but in such case, it shall be installed in the center of a space not less than fourteen inches square. In all cases, the meter socket rim shall project out from the exterior wall surface not less than three-fourths inch. Reference the Residential or Commercial Section of this standard for additional specifications.

5. If the Service Entrance Panel is rated in excess of 200 amperes the electrical energy provided shall be measured by a CT. The CT shall be connected ahead of the Disconnecting Means in a metal cabinet approved by REU, which is free of all incidental wiring. The only exception to this requirement will be for single residential or small commercial units where a class 320 meter will be allowed.

RESIDENTIAL METER REQUIREMENTS

SERVICE VOLTAGES

1. The following table outlines the residential service voltages that Redding Electric Utility can serve and the corresponding meter socket requirements for each. See Standard 550.00 for meter connection diagrams for 320 amps or less.

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<thead>
<tr>
<th>TYPE OF SERVICE</th>
<th>NUMBER OF CLIPS</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>SELF CONTAINED</td>
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<tr>
<td></td>
<td>TRANSFORMER</td>
</tr>
<tr>
<td>METER SOCKETS</td>
<td>RATED SOCKETS</td>
</tr>
<tr>
<td>&lt;=320 AMPS</td>
<td>&gt;320 AMPS*</td>
</tr>
<tr>
<td>1 PHASE, 3 WIRE, 120/240 VOLT</td>
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<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

*Consult utility when installing service >320 amps
SERVICES 320 AMPS AND BELOW

(For Residential Service >320amps, reference the Commercial Meter Requirements)

1. Electric meters and service disconnects shall be directly outside and accessible at all times. Refer to Standard 504.00 (OH) or 507.00(UG) for preferred electric meter locations. Main Disconnects, (main breakers) shall be installed on the load side and in close proximity to the electric service meter.

2. All electrical service meters installed without current transformers shall be located no more than 75 inches, and not less than 48 inches, above the ground on exterior installations. 3’ of clear level working space shall be provided for all meter installations. See Standard 505.50 for additional meter panel clearance requirements.

3. A self-contained meter is capable of carrying the total current and voltage of the electric service supplied to the customer. This type of meter is connected directly to the service entrance conductors when it is plugged into the meter sockets.

4. Sockets for use with self-contained meters are available in two pre-approved ratings. When connected to properly sized service entrance conductors, the approved standard-duty socket has a nominal capacity of 100 amperes, and the approved heavy-duty sockets have a nominal capacity of 200. For extra heavy-duty sockets rated at 320 amperes, contact the utility for approval before installation.

5. All self-contained meter sockets shall be supplied by the contractor and connected to the service entrance conductors by the contractor.

6. Meter sockets shall be equipped with terminals of sufficient size to permit the connection of service entrance conductors without removing any strands of wire. Service panels greater than 200 amps will require 2-hole NEMA pad compression lugs.

7. Test bypass facilities are not required on residential services or other non-critical low usage loads at REU’s discretion.

8. The self-contained meter is furnished and installed by Redding Electric Utility. The customer is responsible to provide and install a EUSERC approved enclosure.
COMMERCIAL METERING REQUIREMENTS (0-600 VOLTS)

Consult Redding Electric Utility for services greater than 480 volts.

SERVICE VOLTAGES

The following table outlines the service voltages that Redding Electric can serve and the corresponding meter socket requirements for each.

<table>
<thead>
<tr>
<th>TYPE OF SERVICE</th>
<th>NUMBER OF CLIPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELF CONTAINED METER SOCKETS</td>
<td>TRANSFORMER RATED SOCKETS</td>
</tr>
<tr>
<td>1 PHASE, 3 WIRE, 120/240 VOLT &lt;321 Amps</td>
<td>4</td>
</tr>
<tr>
<td>1 PHASE, 3 WIRE, 120/240 VOLT &gt;320 Amps</td>
<td>N/A</td>
</tr>
<tr>
<td>1 PHASE, 3 WIRE, 120/208 VOLT &lt;201 Amps</td>
<td>5</td>
</tr>
<tr>
<td>3 PHASE, 4 WIRE, 120/208 VOLT WYE</td>
<td>7</td>
</tr>
<tr>
<td>3 PHASE, 4 WIRE, 120/240 VOLT DELTA*</td>
<td>7</td>
</tr>
<tr>
<td>3 PHASE, 4 WIRE, 277/480 VOLT WYE</td>
<td>7</td>
</tr>
</tbody>
</table>

*Non-standard voltage. Contact Redding Electric for availability.

GENERAL METERING REQUIREMENTS

1. All electric service panels shall meet the Redding Electric Utility approved sections of the EUSERC requirements. The list of acceptable panels can be found at www.euserc.com under “Acceptability Pages” on the “Redding Electric, City of” page. Purchase or installation of any equipment that does not conform to EUSERC requirements is done at the developer’s risk. Any electrical service panels that do not comply with EUSERC will be required to have field modifications completed or be replaced at the developer’s expense.

Electric service panel drawings are recommended to be submitted for review prior to purchase and installation. The project developer can submit two (2) copies of the panel manufacturer’s drawings to REU. One copy will be returned to the sender with approval or corrections as needed.

Send submittals to:

Service Planning
Redding Electric Utility
3611 Avtech Pkwy.
Redding, Ca 96049-6071
Telephone: (530) 339-7300

2. All electric meters and Main Disconnects shall be accessible by the utility 24 hours a day, 7 days a week. Fences, gates, alarms, security guards or other means that prohibit direct accessibility are a violation of this requirement. Meeting of this requirement can be accomplished by one of the following means:
   a. Locate the metering service panel on the outside of the building. If the metering service panel is located behind a lockable gate, the developer will be required to provide a key to the gate.
   b. Locate meter Remote to an outside wall location acceptable to REU. Maximum length of run for meter...
wiring is limited to 50 feet. Refer to Standard 552.00 for details on remote metering installation.

c. Locate the metering service panel inside of an un-alarmed electrical service room with an un-alarmed door that opens directly to the outside. The developer will be required to provide a key to the electrical service room for meter reading and inspections. If this room is located behind a lockable gate, item 2a will apply. The words "ELECTRIC/Mechanical EQUIPMENT ROOM - NO STORAGE ALLOWED" shall be clearly marked on the outside face of the equipment room door.

d. If the equipment room has an access door for entering into any other part of the building, the metering shall be remote as stated in item 2b above and all doors shall be marked as stated in item 2c above.

e. Equipment rooms that contain multi-meters shall conform to item 2c above.

f. A hard surface pathway must be provided to all metering equipment. This can be accomplished by a concrete or asphalt path or by firmly placed stepping-stones. All landscaping near the pathway shall be designed and installed to not inhibit this pathway at maturity.

3. In all multiple-occupancy structures and in commercial or industrial electrical service installations, the service disconnects shall be installed on the load side of each meter at the meter location, in a common, Readily Accessible location with all other service disconnects. When over six meters are present, a master disconnect, which disconnects all meters, shall be installed on the source side of the meters. This requirement for the master disconnect is in addition to the individual disconnects on the load side of each meter.

4. Meters shall be located not more than 75 inches and not less than 48 inches above the ground or standing surface when installed outdoors. When installed in a cabinet or indoors in a meter room, the minimum height may be reduced to 36 inches. The meter height is measured to the meter axis (centerline).

3' of clear level working space shall be provided from the face of the meter panel in all meter configurations. If doors are used to provide the 3' working space clearance, they must be able to be secured in the open position.

5. Marking of all meters and disconnects shall be required as follows:

a. Where the installation requires more than one meter for service to the premises, each meter panel and service disconnect it feeds shall be permanently marked (NOT PAINTED) by the customer to properly identify the portion of the premises being served. This includes, but is not limited to: residences, offices, retail stores, or any combination of the above.

b. When adding a new meter to an existing service location, all meters and service disconnect(s) they feed shall be identified to properly indicate the portion of the premises being served.

c. Each main service disconnect shall be permanently marked (NOT PAINTED) by the customer to properly identify the street address and the building number (if applicable).

d. If there is more than one main service disconnect for a building, each main service disconnect shall have a tag that clearly references the location of the other main disconnect(s) for that building.

e. The identifying marking for meters and disconnects shall be impressed into or raised from a tag of plastic laminate, aluminum, brass or other approved non-ferrous metal with 1/4 inch minimum letters. The impressions shall be deep or raised enough to prevent it from being obscured by subsequent painting of the service sections. The tag shall be attached to a non-removable area of the panel with a high strength, epoxy adhesive, rated with a drying time of not less than five (5) minutes. Other types of adhesives WILL NOT be acceptable. The tag shall not be able to be removed without the use of hand tools. If the main breakers are NOT installed directly adjacent to the meters, BOTH the meter and the main breaker shall be identified with individual tags.
EXAMPLE:

1/4 MIN.  
SUITE 102

f. Additional markings are required when two or more suites are occupied by one tenant. An example would be if suites 101 and 102 were occupied by one tenant, "tags", as described above, would be required at the meter and at the disconnects indicating suites 101 and 102 are served by both meters and disconnects for suites 101 and 102.

EXAMPLE:

1/4 MIN.  
SUITE 101 OF 101 & 102

1/4 MIN.  
SUITE 102 OF 101 & 102

SERVICES 200 AMPS AND BELOW

1. A self-contained meter is capable of carrying the total current and voltage of the electric service supplied to the customer. This type of meter is connected directly to the service entrance conductors when it is plugged into the meter sockets.

2. Sockets for use with self-contained meters are available in two approved ratings. When connected to properly sized service entrance conductors, the approved standard-duty socket has a nominal capacity of 100 amperes, and the approved heavy-duty socket has a nominal capacity of 200 amperes.

3. All self-contained meter sockets shall be supplied by the contractor and connected to the service entrance conductors by the contractor. See Standard 550.00 meter digrams for self-contained sockets.

4. Meter sockets shall be equipped with terminals of sufficient size to permit the connection of service entrance conductors without removing any strands of wire.

7. Test bypass facilities are required on all non-residential services except for sign boards, temporary services, irrigation controls, and other non-critical low usage loads at REU's discretion.

8. The self-contained meter is furnished and installed by Redding Electric Utility. The customer is responsible to provide and install a EUSERC approved enclosure.
SERVICES GREATER THAN 320 AMPS

1. When the electrical supply needs of the customer exceed the 320 ampere capacity of the self-contained meter and its heavy duty socket, current transformers (C.T.) which are connected to the service entrance conductors must be used. A transformer rated meter is installed to measure the energy delivered to the customer. A current transformer capacity multiplier is applied to the billing register on the meter. The current transformers and the meters are furnished and installed by REU.

2. The transformer rated meter, when inserted into its socket, is wired to the current transformer. The current transformers are located in the enclosure behind the meter and test switch panel cover(s).

3. An approved C.T. rated meter socket and enclosure are used with transformer rated meters. The meter sockets and enclosures are furnished and installed by the customer.

4. The current transformers, test switches, wiring, and meter are furnished, installed, and connected by Redding Electric Utility.

MULTI-METERS TO THE SAME PREMISE

Purpose: To establish specific policies and procedures for customers who wish to combine two or more existing spaces for a single customer use without the requirement to remove multiple meters and install a single meter to serve a single customer facilities.

1. Customers requesting combination of suites or units, using more than one meter, must take out the appropriate building permits with the City of Redding Building Department and are subject to all applicable codes, regulations, etc. The review of plans will be the same as any other tenant improvement.

2. Customers who have taken over space(s) that were originally designed to be occupied by multiple separately metered Customers will be allowed to utilize two or more meters as long as the configuration of the Service Entrance Panel is not being modified. Allowing this type of installation does not preclude REU from combining the usages from the multiple meters into one electrical bill. Network access charges will still apply to each of the meters.

3. Building Inspectors will require the assistance of the customer and/or his contractor to open the apartments or suites at the time of inspection in order to verify that each meter socket actually serves the apartment or suites indicated by the marking tag.

4. Identification of the meters and disconnect serving each suite or unit must be in accordance with item 5 under General Metering Requirements, Sheet 3.
I. PURPOSE
This Standard provides the minimum standards for locating residential and commercial remote meters.

II. DEFINITIONS:
A. REMOTE METER - Metering equipment physically separated from it's associated loadcenter(s). In the case of current transformer (C.T.) rated equipment, the remote meter distance shall be a minimum of 10 inches, and a maximum of 50 feet away from the C.T. compartment. The Customer shall supply and install 1-1/4" inch minimum diameter conduit with a maximum of three 90 degree bends utilizing no condulets between the remote meter location and the C.T. compartment.

B. SAFETY SOCKET - Meter Sockets with test by-pass facilities for self contained meters or test switch for transformer rated meters.

III. GENERAL:
When requiring remote meters, all locations shall conform to Construction Standard CS101 for acceptable locations. The following figures show typical remote meter applications. See CS5075 for remote metering requirements for equipment rooms.

**FIGURE 1**
(RESIDENTIAL REMOTE APPLICATION)

**FIGURE 2**
(COMMERCIAL REMOTE APPLICATION)
REU will accept the following combinations of Meter - Mains, Termination Cabinets, and Bypass Devices when used in remote commercial applications:

**FIGURE 3**
BUSED SAFETY SOCKET METER BOX FOR SELF-CONTAINED METERING (0-200 AMPERES)

**FIGURE 4**
SEPARATE CURRENT TRANSFORMER CABINET AND METER BOX WITH U.G. SERVICE TERMINATION PULLBOX (201-400 AMPERES)

**FIGURE 5**
SEPARATE BUSED CURRENT TRANSFORMER CABINET AND METER BOX WITH U.G. SERVICE TERMINATION PULLBOX (401-800 AMPERES)

**FIGURE 6**
OVERHEAD FED SEPARATE CURRENT TRANSFORMER CABINET AND METER BOX (201-400 AMPERES)
NOTES:

1. Test/By-pass facilities that are bused or wired to the meter socket jaws or terminals permit REU to By-pass the customers load while de-energizing the socket.

2. The power leg of a 120/240V, 3 phase, 4 wire delta service shall be identified (Orange).

3. The customer shall furnish compression lugs and connect his service entrance conductors to the line and load sides of the current transformer mounting base.
SINGLE ARM POLE

DOUBLE ARM POLE

LIGHT STANDARD:
Tapered aluminum standard shall be designed to withstand 85 m.p.h. wind speed, and exposure Category C in accordance with AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signs. Each light standard shall include: 2" tubular support arm 6' reach, 25' or 35' fixture height, anchor bolts covers, shaft cap, and a 4" x 6.5" hand hole with flush mount cover located 90° from arm centerline. (See sketch).

APPROVED FOR PURCHASE:

<table>
<thead>
<tr>
<th>POLE HT.</th>
<th>DESCRIPTION</th>
<th>HAPCO</th>
<th>LEXINGTON (SEE NOTE 6)</th>
<th>HUBBELL</th>
<th>UNION METAL</th>
<th>REU STOCK #</th>
</tr>
</thead>
<tbody>
<tr>
<td>25'</td>
<td>SINGLE ARM POLE (25')</td>
<td>21-295</td>
<td>2208 - 4070T4 W/1MA0632B40 ARMS</td>
<td>RTA04-100</td>
<td></td>
<td>E690.19</td>
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<tr>
<td>25'</td>
<td>DOUBLE ARM POLE (25')</td>
<td>22-295</td>
<td>2208 - 4580T4 W/2MA0632B45 ARMS</td>
<td>RTA16-100</td>
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<td>E690.22</td>
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<tr>
<td>35'</td>
<td>SINGLE ARM POLE (35')</td>
<td>21-865</td>
<td>3208 - 4580T4 W/1MA0632B45 ARMS</td>
<td>RTA10-100</td>
<td></td>
<td>E690.36</td>
</tr>
<tr>
<td>35'</td>
<td>DOUBLE ARM POLE (35')</td>
<td>22-865</td>
<td>3208 - 4580T4 W/2MA0632B45 ARMS</td>
<td>RTA22-100</td>
<td></td>
<td>E690.35</td>
</tr>
</tbody>
</table>

NOTE: Associated material i.e., arm, bolts covers, anchor bolts, etc., may be specified separately.

NOTES:
1. Wire from luminaire to base shall be nonmetallic sheathed cable type UF-B, 3 #14 (2 #14 + #14G) copper, 600 volt insulated.
2. Wire from base to point of service shall be 2 #6 + #6G, aluminum, type USE-2 (See Public Works Standard Page 510), or as indicated on the drawings.
3. REU will make connections at base of light pole and any applicable supply-side splicing locations.
4. Must state single or double arms on order.
5. Customer shall furnish and install mechanical ground lug and make connection of ground wire from luminaire.

LOOKING INTO HANDHOLE

ADDED GROUNDING
1/4" X 20 STUD FOR GROUNDING CONTINUITY POINT (LOCATED OPPOSITE AND LINED UP WITH HANDHOLE MID-POINT)

HANDHOLE COVER

BOLT COVER

HEAVY HEX NUT/WASHER

HEAVY HEX NUT WASHER

NON-SHRINK, HIGH STRENGTH, NON-METALLIC GROUT (1" MIN., 2" MAX.)

ANCHOR BOLT

FOOTING PER PUBLIC WORKS STANDARD PAGE 556.00

BASE ASSEMBLY

SLOTS OR HOLES IN BASE PLATE SHALL ACCOMMODATE BOLT SIZE AND PLACEMENT SHOWN ON PUBLIC WORKS STANDARD PAGE 556.00

BASE PLATE

NOTES:

1. Bottom surface of aluminum base plate shall be painted with one coat of TT-P-645B zinc-molybdate primer or bituminous paint and allow to dry prior to installation.

2. Anchor bolts, nuts, and washers shall comply with REU drawing ES2499.
TYPICAL LUMINAIRE

REQUIRED FEATURES:
- RATED CORRELATED COLOR TEMPERATURE OF 4000K
- COLOR RENDERING INDEX (CRI) OF NO LESS THAN 70
- PASSIVE THERMAL MANAGEMENT
- AMBIENT OPERATING TEMPERATURE RANGE OF -40°C TO +40°C
- TOOLLESS ACCESS TO ELECTRICAL COMPARTMENT WITH STAINLESS STEEL LATCHES
- VIBRATION MEETS ANSI 136.31 - LEVEL 2
- GREY FINISH
- 1 ½" TO 2" SLIPFITTER
- EFFECTIVE PROJECTED AREA OF .75 TO 1 SQUARE FOOT
- WEIGHT OF 14 TO 30 LBS.
- 7 PIN ANSI 136.41 (PCR7) PHOTO ELECTRIC RECEPTACLE
- VOLTAGE RANGE OF 120-277
- LED DIMMABLE DRIVER
- PREWIRED USING MODULAR CONNECTIONS
- MINIMUM WARRANTY OF 10 YEARS
- BUG RATINGS THAT MEET THE FOLLOWING ACCORDING TO LED SIZE
  - SMALL - B1 U0 G1
  - MEDIUM - B2 U0 G2
  - LARGE - B3 U0 G3

TABLE 1:

<table>
<thead>
<tr>
<th>SIZE</th>
<th>HPS WATTAGE L.E.D. REPLACES</th>
<th>LEOTEK</th>
<th>REU STOCK NO.</th>
<th>L.E.D. WATTAGE</th>
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</thead>
<tbody>
<tr>
<td>SMALL</td>
<td>70,100</td>
<td>GC1-20F-MV-NW-2-GY-530-PCR7-WL</td>
<td>E-690.02</td>
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<td>MEDIUM</td>
<td>150</td>
<td>GC1-30F-MV-NW-2-GY-750-PCR7-WL</td>
<td>E-690.04</td>
<td>74</td>
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<td>LARGE</td>
<td>250</td>
<td>GC1-60F-MV-NW-2-GY-530-PCR7-WL</td>
<td>E-690.06</td>
<td>101</td>
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<tr>
<td>XTRA LARGE</td>
<td>400</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES:

1. Catalog numbers listed in Table 1, 2 and 3 are intended to assist in ordering, but do not relieve the customer/contractor/developer of responsibility to supply luminaires and photocells which comply with the features listed.
2. The photocell shall be installed with sensor facing north.
3. See Sheet 3, Table 3, for approved photocells & features for L.E.D. lights.
1. This photocell is for high pressure sodium and mercury vapor lights only. It should not be used on L.E.D. lights.

2. All Redding Electric Utility (REU) maintained street and night lights will be individually controlled by means of a electric control device (photocell).

3. All photocell covers will be ultraviolet resistant.

4. All photocells will have an eight (8) year warranty against manufacturing defects.

5. All photocells will have a voltage rating of 105 through 305 volts.

6. All photocells will be a three prong twist lock type.

7. Photo control power consumption shall not exceed one watt.

PHOTOCELL FOR HIGH PRESSURE SODIUM AND MERCURY VAPOR LIGHTS

TABLE 2:

<table>
<thead>
<tr>
<th>PHOTOCELLS APPROVED FOR PURCHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>REU STOCK NO.</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>E-690.84</td>
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</tbody>
</table>

NOTES:
PHOTOCELL

TABLE 3:

<table>
<thead>
<tr>
<th>PHOTOCELLS APPROVED FOR PURCHASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>REU STOCK NO.</td>
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<tr>
<td>E-690.80</td>
</tr>
</tbody>
</table>

NOTES:

1. This photocell is for L.E.D. lights only. It should not be used on high pressure sodium or mercury vapor lights.
2. All Redding Electric Utility (REU) maintained street and night lights will be individually controlled by means of an electric control device (photocell).
3. All photocell covers shall have double-wall thickness and be a longlife polymer with extra UV inhibitor.
4. All photocells will have a twelve (12) year warranty against manufacturing defects.
5. All photocells will have a voltage rating of 105 through 305 volts.
6. All photocells will be a three prong twist lock type capable of fitting all "approved for purchase" luminaires listed on sheet one (1) of this drawing.
7. Photo control power consumption shall not exceed one watt.
8. Manufactures wishing to be placed on the "approved for purchase" list must meet all the above requirements. A REU engineer must also approve the proposed photocell as being equal to or better than the already approved units.

LONG LIFE PHOTOCELL FOR L.E.D. LIGHTS
**FACE OF CURB**

**BACK OF CURB**

**11" DIA. BOLT CIRCLE (TYP.)**

**2" DIA. CONDUIT, PVC-DB-TC-6, OR EQUAL**

**ALIGN ANCHOR BOLTS WITH BACK OF CURB (TYP.)**

**24" DIA. CONC. FOUNDATION BELOW SIDEWALK**

**SIDEWALK (CASE 1)**

**SIDEWALKS 6 FEET AND WIDER**

**SIDEWALK**

**BACK OF SIDEWALK**

**24" DIA. CONDUIT, PER PAGE 521.04**

**24" DIA. CONC. FOUNDATION**

**CASE 2**

**BEHIND SIDEWALK AND IN GREENWAY**

**TOP OF FOOTING = TOP OF SIDEWALK ELEVATION**

**1" DIA. X 36" LONG ANCHOR BOLTS (TYP. OF 4)**

**4" BOLT PROJECTION (CASE 2)**

**EXPOSED FOOTING TOP (CASE 2) PROVIDE RADIUSED EDGE**

**2#4 TIES W/ IN TOP 5" OF FOOTING**

**#4 CIRCULAR TIES W/ 18" LAP @ 10" OC**

**8#5 VERT. @ EQUAL SPACING**

**HDPE OR SONOTUBE FORM (SEE NOTE 4)**

**3" CLR.**

**2" CLR.**

**FOUNDATION SECTION**

**NOTE:**

1. Concrete shall comply with greenbook class 560-C-3250.
2. Reinforcing shall comply with ASTM A615 GR 40.
4. Foundations shall be formed unless cast in a 24" diameter drilled hole. Form shall be removed prior to backfilling.
5. Backfill shall be Class 2 base mechanically compacted to 90%.
6. Where deco base is used, increase top of footing diameter as required.
NOTES:

1. The contractor shall be responsible for properly locating the conduit sweep such that the bolt placement will allow proper street light placement at installation.
2. Use of this footing option requires placement of 2E pull box within 20' of footing.
3. See Sheet 1 for material and compaction requirements.
SCOPE:
This Construction Standard provides for the installation of decorative street light standards in existing developments that initially used Option 1 in the obsolete Standard CS5129.

APPLICATION:
This Construction Standard is not available for system wide application. This standard addresses the following specific subdivisions which have already utilized this type of pole, arm and luminaire.

1.) The Villages at Shasta View Gardens
2.) Bel Air Estates
3.) Hope Lane Subdivision

Only these subdivisions may utilize this type of pole, arm and luminaire for new construction. For all other subdivisions appropriate options can be found in Construction Standard CS5128.

PROJECT REQUIREMENTS:
REPLACEMENT PARTS - With any project, the developer shall provide a minimum of replacement parts in the form of two fixtures and one pole and arm for every 40 standards in the project with a minimum of two fixtures and one pole and arm per project.

WARRANTY - All decorative lighting components and workmanship are to be warranted for one year.
ARM:
LUMEC CATALOG #
CN1-1A-RNA-OV-RC-SC1TXPC20210

LUMINAIRE:
LUMEC CATALOG #
RN20-70-HPSTHB3-GL-QTA/240-SC1TX/PC20210

POLE:
HAPCO CATALOG #B15882
5" DIA. FLUTED EXTRUDED ALUM. TUBE .188" WALL
ALLOY 6063-T6
FINISH: SPECIAL TEXTURED COLOR TO BE: (SC1TX),
APPLICATION OF A POLYESTER POWDER COAT PAINT
(4 MILS/100 MICRONS). THE CHEMICAL COMPOSITION
PROVIDES A HIGHLY DURABLE UV AND SALT SPRAY
RESISTANT FINISH IN ACCORDANCE TO THE ASTM-B117-73
STANDARD AND HUMIDITY PROOF IN ACCORDANCE TO
THE ASTM-D2247-68 STANDARD.
COLOR: PROTECH # 20210 CITY OF REDDING GREEN
( Z SERIES TEXTURE ) OR APPROVED EQUAL.

CAST ALUMINUM DECORATIVE BASE (12500)
ALLOY 356-T6 WITH DOOR AND STAINLESS
STEEL SCREWS.
GROUND LUG SHALL BE INSIDE
BASE OPPOSITE DOOR.

BASE:
SEE REU CONSTRUCTION STANDARD CS5112.
(4) 1"- 8NC GALVANIZED STEEL ANCHOR BOLTS,
AASHTO M314-90 GRADE 55, 10" OF
THREADED END GALVANIZED PER ASTM A153.
(8) 1"- 8NC GALVANIZED STEEL HEX NUTS
(4) 1" GALVANIZED STEEL LOCK WASHERS
(8) 1" GALVANIZED STEEL FLAT WASHERS

OPTION A:
OPTION A IS AVAILABLE ONLY FOR
STREETS CLASSIFIED AS RESIDENTIAL-
LOCAL OR COMMERCIAL-LOCAL.

REDRAWN

ELECTRIC CONSTRUCTION STANDARD

RETROFIT DECORATIVE STANDARDS & LUMINAIRES
(FOR USE IN SPECIFIED EXISTING SUBDIVISIONS ONLY)

REDDING ELECTRIC UTILITY

DES/REV DATE ASSISTANT DIRECTOR - DISTRIBUTION REVISED DWG. NO.
TGS/RLH 07/21/09

CS5127
ARM:
LUMEC CATALOG #
CN1-2-RNA-OV-RC-SC1TXPC20210

LUMINAIRE:
LUMEC CATALOG #
RN20-70-HPSTHB3-GL-QTA/240-HS-SC1TX/PC20210

POLE:
HAPCO CATALOG #B15882
5" DIA. FLUTED EXTRUDED ALUM. TUBE .188" WALL
ALLOY 6063-T6
FINISH: SPECIAL TEXTURED COLOR TO BE: (SC1TX),
APPLICATION OF A POLYESTER POWDER COAT PAINT
(4 MILS/100 MICRONS). THE CHEMICAL COMPOSITION
PROVIDES A HIGHLY DURABLE UV AND SALT SPRAY
RESISTANT FINISH IN ACCORDANCE TO THE ASTM-B117-73
STANDARD AND HUMIDITY PROOF IN ACCORDANCE TO
THE ASTM-D2247-68 STANDARD.
COLOR: PROTECH # 20210 CITY OF REDDING GREEN
(Z SERIES TEXTURE) OR APPROVED EQUAL.

CAST ALUMINUM DECORATIVE BASE (12500)
ALLOY 356-T6 WITH DOOR AND STAINLESS
STEEL SCREWS.

GROUND LUG SHALL BE INSIDE
BASE OPPOSITE DOOR.

BASE:
SEE REU CONSTRUCTION STANDARD CS5112.
(4) 1"-8NC GALVANIZED STEEL ANCHOR BOLTS,
AASHTO M314-90 GRADE 55, 10" OF
THREADED END GALVANIZED PER ASTM A153.
(8) 1"-8NC GALVANIZED STEEL HEX NUTS
(4) 1" GALVANIZED STEEL LOCK WASHERS
(8) 1" GALVANIZED STEEL FLAT WASHERS

OPTION B:
OPTION B IS AVAILABLE ONLY FOR
STREETS CLASSIFIED AS RESIDENTIAL-
LOCAL OR COMMERCIAL-LOCAL.
I. SCOPE:
This construction standard provides for the installation of Decorative Street Light Standards as an option to the Cobra Head Standard most often installed in the City of Redding. This standard outlines various construction criteria considered in order to provide a safe, efficient, dependable and maintainable street light system which is aesthetically pleasing.

II. APPLICATION:
New projects typically go through a Planning Review Process where the City of Redding Planning and Street Divisions will define the need for roadway lighting along streets adjacent to and within new subdivisions and/or developments through "Conditions of Approval". Some projects do not go through this formal Planning process. In these cases if the Customer/Developer desires decorative lighting for their project they shall contact the Redding Electric Utility (REU) Distribution Planner early in the project's development to review whether the use of decorative roadway lighting is appropriate and feasible. This contact should be made early on in the project's planning stages. Discussions with the Planning and Streets divisions will most likely be required as well.

Once it has been determined that decorative lighting will be utilized the REU Distribution Planner will determine the layout and electrical service requirements for roadway lighting by utilizing the design criteria in this standard.

III. SELECTION PROCESS:
Following this Selection Process, which should take place early in the project design process, will aid in appropriate product selection for the specific project. This process will provide identification of catalog numbers for ordering the material required for the option chosen.

A. Once Road Classifications have been defined, contact an REU Distribution Planner to assist in defining which Decorative Lighting Options are available for the project.

B. The REU Distribution Planner will assist in identifying spacing requirements for each road classification and the option chosen.

C. The Customer/Developer can investigate and evaluate costs and make their final choice as to which option they choose to use. The Planning Department may have requirements as to which option shall be used.

D. Once the choice has been made, the appropriate REU Distribution Planner will prepare the design for the overall project. This process is generally completed with the Electric Utility Design which defines electric service to the project. If a different option is chosen after this design has been completed there will be additional charges for the re-engineering.

IV. PROJECT REQUIREMENTS:
A. REPLACEMENT PARTS - The developer shall provide a replacement parts in the form of two fixtures and one pole and arm for every 40 light standards in the project with a minimum of two fixtures and one pole and arm per project.

B. WARRANTY - All decorative lighting components and workmanship are to be warranted for one year.
POLE:

5" DIA. FLUTED EXTRUDED ALUM. TUBE .125" WALL ALLOY 6063-T6
FINISH: SPECIAL TEXTURED COLOR TO BE: (SC1TX)
APPLICATION OF A POLYESTER POWDER COAT PAINT
(4 MILS/100 MICRONS). THE CHEMICAL COMPOSITION
PROVIDES A HIGHLY DURABLE UV AND SALT SPRAY
RESISTANT FINISH IN ACCORDANCE TO THE ASTM-B117-73
STANDARD AND HUMIDITY PROOF IN ACCORDANCE TO
THE ASTM-D2247-68 STANDARD.
COLOR: PROTECH # 20210 CITY OF REDDING GREEN
(Z SERIES TEXTURE) OR APPROVED EQUAL.

CAST ALUMINUM DECORATIVE BASE (12500)
ALLOY 356-T6 WITH DOOR AND STAINLESS
STEEL SCREWS.

GROUND LUG SHALL BE INSIDE
BASE OPPOSITE DOOR.

OPTION A:
OPTION A IS AVAILABLE ONLY FOR
STREETS CLASSIFIED AS RESIDENTIAL-
LOCAL OR COMMERCIAL-LOCAL.

NOTE:
See REU Construction Standard CS5112
for street light footing details.
POLE:
5" DIA. FLUTED EXTRUDED ALUM. TUBE .188" WALL ALLOY 6063-T6
FINISH: SPECIAL TEXTURED COLOR TO BE: (SC1TX).
APPLICATION OF A POLYESTER POWDER COAT PAINT
(4 MILS/100 MICRONS). THE CHEMICAL COMPOSITION
PROVIDES A HIGHLY DURABLE UV AND SALT SPRAY
RESISTANT FINISH IN ACCORDANCE TO THE ASTM-B117-73
STANDARD AND HUMIDITY PROOF IN ACCORDANCE TO
THE ASTM-D2247-68 STANDARD.
COLOR: PROTECH # 20210 CITY OF REDDING GREEN
( Z SERIES TEXTURE ) OR APPROVED EQUAL.

NOTE:
See REU Construction Standard CS5112
for street light footing details.

OPTION B:
OPTION B IS AVAILABLE ONLY FOR
STREETS CLASSIFIED AS RESIDENTIAL-
LOCAL OR COMMERCIAL-LOCAL.

CAST ALUMINUM DECORATIVE BASE (12500)
ALLOY 356-T6 WITH DOOR AND STAINLESS
STEEL SCREWS.

GROUND LUG SHALL BE INSIDE
BASE OPPOSITE DOOR.
ARM:
Shall be made from 6061-T6 aluminum tubing, 2 3/8 in. (60mm) outside diameter, mechanically assembled.

DECORATIVE ELEMENT:
Made of cast 356 aluminum, welded.

ADAPTER:
Made of cast 356 aluminum, mechanically assembled.

CENTRAL ADAPTER:
Made of a 4" schedule 40 aluminum tubing, 4 1/2" (114mm) outside diameter having a 0.237" wall thickness, mechanically fastened to the pole by the means of two 1/2" thru-bolts and two sets of two set-screws at 120°.

BRACKET OPTIONS:
RC twist lock type photocell receptacle.

WIRING:
Gauge (#14) TEW wires, 6" (152mm) minimum exceeding the bracket.

POLE:
Shaft heat treated to - T6 Temper. Pole assemblies are designed per 1994 AASHTO criteria (excluding section 7) for an 80 mph wind area with a 1.3 gust factor and a maximum luminaire size and arm size of 11.0 sq. ft. E.P.A. & 140lbs. and an equivalent banner size of 7 sq. ft. centered at 16.5 ft. above grade.

BANNER:
Banner size of 2'-6" x 5'-0" equivalent to 7 ft.2 EPA each w/ Bannerflex arms.

FINISH:
Special textured color to be - (SC1TX). Application of a polyester powder coat paint. (4 mil/100 microns). The chemical composition provides a highly durable UV and salt spray resistant finish in accordance to the ASTM-B117-73 standard and humidity proof in accordance to the ASTM-D2247-68 standard.

COLOR:
Protech #20210 City of Redding Green (Z series texture) or approved equal.

NOTE:
See REU Construction Standard CS5112 for street light footing details.
POLE:
Shaft heat treated to - T6 Temper. Pole assemblies are
designed per 1994 AASHTO criteria (excluding section 7)
for an 80 mph wind area with a 1.3 gust factor and a
maximum luminaire size and arm size of 11.0 sq. ft. E.P.A.
& 140lbs. and an equivalent banner size of 7 sq. ft. centered
at 16.5 ft. above grade.

BANNER:
Twin banner sizes of 2'-6" x 5'-0" equivalent to 7 ft.2
EPA each w/ Bannerflex arms.

FINISH:
Special textured color to be - (SC1TX). Application
of a polyester powder coat paint. (4 mil/100
microns). The chemical composition provides a
highly durable UV and salt spray resistant finish in
accordance to the ASTM-B117-73 standard and
humidity proof in accordance to the
ASTM-D2247-68 standard.

COLOR:
Protech #20210 City of Redding Green (Z series texture) or
approved equal.

NOTE:
See REU Construction Standard CS5112
for street light footing details.

OPTION D:
OPTION D IS AVAILABLE ONLY FOR STREETS
CLASSIFIED AS MAJOR ARTERIAL EXPRESSWAY

OPTION E:
OPTION E IS AVAILABLE ONLY FOR STREETS
CLASSIFIED AS RESIDENTIAL/COMMERCIAL
COLLECTOR, MINOR ARTERIAL INTERMEDIATE
ARTERIAL AND MAJOR ARTERIAL/EXPRESSWAY
DESCRIPTION OF COMPONENTS:

FINIAL - Decorative cast 356 aluminum, mechanically assembled.

HOOD - (GL). One-piece, seamless, pressure-molded colorless borosilicate glass globe having internal prisms with smooth external self-cleaning surface, permanently assembled to the globe.

GUARD - In a round shape, this guard is made of four cast aluminum 356 decorative arms and one decorative ring. The guard is welded to the fitter.

GLOBE - (GL). One-piece, seamless, pressure moulded colorless borosilicate glass globe having internal glare softening vertical ribs with smooth external self-cleaning surface. The globe is permanently sealed onto the access-mechanism.

LAMP - 70 Watt High Pressure Sodium (ANSI Code S62), 55 Volt, ED 23 1/2 bulb, mogul base.

LAMP - 100 Watt High Pressure Sodium (ANSI Code S54), 55 Volt, ED 18 bulb, mogul base.

OPTICAL SYSTEM - (DSH3). Type III, (asymmetrical), non-cutoff distribution with less than 2.5% total uplight. Smartseal Optical System, composed of bright-anodized aluminum hydroformed reflector, permanently assembled on vertical ribbed glass globe. Weatherproof IP66 rating, complete with internal (HS) house side shield.

BALLAST - High power factor of 90%, primary voltage 120/208/240/277 volts, connected to 240 volts. Lamp starting capacity - 40F (-40C) degrees. Assembled on a unitized removable with quick disconnect plug.

ACCESS-MECHANISM - A cast A360.1 aluminum technical ring with latch and hinge. The mechanism shall offer tool free access to the inside of the luminaire. The photoelectric cell can be independently oriented from the optical system. An embedded memory-retentive gasket shall ensure weather tight seal.

FITTER - Cast aluminum A360.1 c/w 4 set screws 3/8-16 UNC. Fits on a 4” (102mm) outside diameter by 4” (102mm) long tenon.

LUMINAIRE OPTIONS - (RC). Receptacle for a twist lock photoelectric cell of shorting cap.

WIRING - Gauge (#14) TEW wires, 6” (152mm) minimum exceeding from luminaire.

HARDWARE - All exposed screws will be in stainless steel. All seeds and sealing devices are made and/or lined with EDPM and/or silicone.

FINISH - Special textured color to be - (SC1TX), application of a powder coat paint. (4 mils/100 microns). The chemical composition provides a highly durable UV and salt spray resistant finish in accordance to the ASTM-B117-73 standard and humidity proof in accordance to the ASTM-D2247-68 standards.

COLOR - Protech #20210 City of Redding Green (Z series textured) or approved equal.

CAST COMPONENTS - All cast components contain 0.2% copper or less.
DESCRIPTION OF COMPONENTS:

HOOD - Die cast A360.1 aluminum dome, mechanically assembled on the luminaire.
LENS - Clear tempered glass curved lens, mechanically assembled on the lower part of the technical ring with brackets.
HOUSING - In a cylindrical shape, this housing is made of cast 356 aluminum, complete with a weatherproof door giving a tool free access to the ballast, mechanically assembled.
LAMP - 100 Watt High Pressure Sodium (ANSI Code S54), 55 Volt, ED 18 bulb, mogul base.
LAMP - 150 Watt High Pressure Sodium (ANSI Code S55), 55 Volt, ED 23 1/2 bulb, mogul base.
BALLAST - High power factor of 90%, primary voltage 120/208/240/277 volts, connected to 240 volts. Lamp starting capacity - 40F (-40C) degrees. Assembled on a unitized removable with quick disconnect plug.
ACCESS-MECHANISM - A cast A360.1 aluminum technical ring with latch and hinge c/w a cast-in reflector. The mechanism shall offer tool free access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofing.
WIRING - Gauge (#14) TEW wires, 6” (152mm) minimum exceeding from luminaire.
HARDWARE - All exposed screws will be in stainless steel. All seals and sealing devices are made and/or lined with EDPM and/or silicone.
FINISH - Special textured color to be - (SC1TX), application of a polyester powder coat paint. (4 mils/100 microns). The chemical composition provides a highly durable UV and salt spray resistant finish in accordance to the ASTM-B117-73 standard and humidity proof in accordance to the ASTM-D2247-68 standards.
COLOR - Protech #20210 City of Redding Green (Z series textured) or approved equal.
DESCRIPTION OF COMPONENTS:

HOOD - Die cast A360.1 aluminum dome, mechanically assembled on the luminaire.

GLOBE - One-piece, seamless, injected-molded borosilicate glass globe having an inner primatic surface complete with a semi-prismatic house side shield and external glare softening prisms. The globe is mechanically assembled on the access-mechanism.

HOUSING - In a round shape, this housing is made of gravity die cast 356 aluminum, complete with a weatherproof door giving a tool free access to the ballast, mechanically assembled.

LAMP - 70 Watt High Pressure Sodium (ANSI Code S62), 55 Volt, ED 23 1/2 bulb, mogul base.

LAMP - 100 Watt High Pressure Sodium (ANSI Code S54), 55 Volt, ED 23 1/2 bulb, mogul base.


LAMP - 250 Watt High Pressure Sodium (ANSI Code S50), 55 Volt, ED 18 bulb, mogul base.

OPTICAL SYSTEM - I.E.S. Type III hyper-extensive (asymmetrical) lamp in a vertical position. Smartsel System, composed of bright-anodized aluminum hydroformed reflector, permanently assembled on a refractor globe. This system shall a Weathertightness IP66 rating. This tool free assembly is removable from the technical ring, complete with a house side shield.

BALLAST - High power factor of 90%, primary voltage 120/208/240/277 volts, connected to 240 volts. Lamp starting capacity - 40F (-40C) degrees. Assembled on a unitized removable with quick disconnect plug.

ACCESS-MECHANISM - A gravity die cast 356 aluminum frame with latch and hinge. The mechanism shall offer tool free access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofing.

ADAPTER - Made of cast 356 aluminum, mechanically assembled to the bracket. This adapter shall fit on a 1.66” (42mm) to 2.38” (60mm) outside diameter bracket arm tubing that slip fits 6.5” 165mm) long inside the adapter.

LUMINAIRE OPTIONS - Photoelectric Cell, Twistlock Type c/w receptacle.

WIRING - Luminaire wiring is done using a terminal block located inside the housing.

HARDWARE - All exposed screws will be in stainless steel. All seals and sealing devices are made and/or lined with EDPM and/or silicone.

FINISH - Special textured color to be - (SC1TX), application of a polyester powder coat paint. (4 mils/100 microns). The chemical composition provides a highly durable UV and salt spray resistant finish in accordance to the ASTM-B117-73 standard and humidity proof in accordance to the ASTM-D2247-68 standards.

COLOR - Protech #20210 City of Redding Green (Z series textured) or approved equal.
MATERIAL: CAST ALUMINUM ALLOY 356
EST. WEIGHT: 22.1 LBS
MATERIAL THICKNESS: 0.2"

TWO PIECE DECORATIVE BASE COVER

DOOR OPENING

HANDHOLE

LEVELING NUT

GROUTING PLATE

ELEVATION

19 3/4" DIA.

1/4" X 1 1/2" ALUM. BAR

SEE DETAIL "A"

8" DIA.

1 1/8" DIA.

1/2"

11" DIA.

MATERIAL: 1/4" THICK ALUMINUM PLATE

DETAIL "A"

PLATE

THIS DECORATIVE BASE AND GROUTING PLATE
IS USED FOR OPTIONS C, D & E

SHEET 9 OF 10
### POLES ARMS AND BASES

<table>
<thead>
<tr>
<th>OPTION</th>
<th>STYLE</th>
<th>MANUFACTURER</th>
<th>POLE &amp; ARM</th>
<th>GROUTING PLATE</th>
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<tr>
<td>A</td>
<td>ACORN</td>
<td>HAPCO</td>
<td>Pole</td>
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<td>Arm</td>
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<td>HAPCO</td>
<td>Pole</td>
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<td>E</td>
<td>TEARDROP</td>
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<td>Arm</td>
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### LUMINAIRES

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<th>OPTION</th>
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<th>MANUFACTURER</th>
<th>WATTAGE</th>
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<td>S56C2-70HPS-GL-DH3-QTA/240-SFX-FN2-HS-RC-SC1TX/PC20210</td>
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<td>LUMEC</td>
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<td>S56C2-100HPS-GL-DH3-QTA/240-SFX-FN2-HS-RC-SC1TX/PC20210</td>
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<td>C</td>
<td>DOMUS</td>
<td>LUMEC</td>
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### HIGH PRESSURE SODIUM LAMP TABLE

All HPS Lamps supplied shall be Clear and meet or exceed the values in this Lamp Table.

<table>
<thead>
<tr>
<th>WATTAGE</th>
<th>INITIAL LAMP LUMANS</th>
<th>AVERAGE RATED LIFE</th>
<th>LAMP LUMEN DEPRECIATION</th>
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<tr>
<td>70</td>
<td>6,300</td>
<td>24,000 Hrs.</td>
<td>.88</td>
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<tr>
<td>100</td>
<td>9,500</td>
<td>24,000 Hrs.</td>
<td>.88</td>
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<tr>
<td>150</td>
<td>15,800</td>
<td>24,000 Hrs.</td>
<td>.88</td>
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<tr>
<td>200</td>
<td>22,000</td>
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<td>.90</td>
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<tr>
<td>250</td>
<td>28,000</td>
<td>24,000 Hrs.</td>
<td>.91</td>
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<tr>
<td>400</td>
<td>50,000</td>
<td>24,000 Hrs.</td>
<td>.89</td>
</tr>
</tbody>
</table>
NOTES:

1. A permit from the Development Services Director must be issued prior to any banner being installed on a decorative pole. Banners will only be installed at the approved locations indicated on the plan submitted with the banner application.

2. All banners shall be delivered to Redding Electric Utility, 20055 Viking Way, Building No. 2, Redding CA 96003 five (5) business days prior to installation of the banner pursuant to the permit.

3. One single banner may be hung on decorative streetlight poles with one luminaire. Banners will not be allowed on any decorative streetlight poles with two luminaires.

4. Banners may be installed on decorative streetlight poles at the following locations:
   - Parkview Avenue between State Route 273 and State Street.
   - Bechelli Lane north of South Bonnyview Road.
   - Cypress Avenue between Athens Avenue and State Route 273.
   - Churn Creek Road south of Arizona Street.
   - Hilltop Drive between Hwy 44 on-ramp and E. Cypress Avenue.
   - North Market Street, Miracle Mile (Cal-Trans Right of Way)

5. Banners must be two and a half (2.5) feet wide and five (5) feet long.

6. The banner will be mounted on the back side of the decorative streetlight pole with the top of the banner at a height of approximately eighteen (18) feet.

7. All banner brackets shall be Kalamzoo Banner Works BannerFlex Metro with Airow 30" Primium Arms or approved equal.

8. All banner brackets on decorative streetlight poles will be installed using stainless band clamps.

9. All banner brackets and band clamps shall be powder coated to match the decorative streetlight pole.

10. When banner brackets are not being utilized to display a banner, the arm casting shall be removed with the pole main casting and band clamps left on the pole.

11. Banners shall be removed within thirty (30) days after the date of installation unless an extension of time specifically approved the Development Services Director.
BANNERS ARE NOT ALLOWED ON SIGNAL POLES.

NOTE:

= STREETLIGHT

(BLUE SHIELD)

SACRAMENTO RIVER

S. BONNYVIEW DR.

NOTE:

fr = STREETLIGHT
NOTE:

PARKS DEPARTMENT

BANNERS ARE NOT ALLOWED ON SIGNAL POLES.

.stub = STREETLIGHT

S. MARKET ST. (HWY 273)

H31308

ANGELO AVE

H31307

FAVRETTO AVE

J31221

GRAPE ST.

J31220

PARKVIEW AVE

J31221

J31222

LELAND AVE

J31207

STATE ST.

J31207

J31203

AKASHO AVE

J31205

J31204

J31201

J31203

J31209

J31207

CITY HALL

LIBRARY

GRASS FIELD

UPDATED CAD STANDARDS AND PAGE NUMBERING

ELECTRIC CONSTRUCTION STANDARD

DECORATIVE STREETLIGHT BANNER SPECIFICATIONS

RLH/JCR 07/13/07

REU Redding Electric Utility

DES/REV DATE ASSISTANT DIRECTOR DISTRIBUTION REVISED Dwg. No.

06/28/16 A

CS5161
CITY HALL

BANNERS ARE NOT ALLOWED ON SIGNAL POLES.

CAR WASH

STREETLIGHT

BANNERS ARE NOT ALLOWED ON DECORATIVE STREETLIGHTS IN MEDIAN OF CYPRESS AVENUE DUE TO WIND LOADING CONSTRAINTS.

NOTE:

= STREETLIGHT

DECORATIVE STREETLIGHT BANNER SPECIFICATIONS
NOTE:

= STREETLIGHT

UPDATED CAD STANDARDS & PAGE NUMBERING

DECORATIVE STREETLIGHT BANNER SPECIFICATIONS

REU
Redding Electric Utility

DES/REV DATE ASSISTANT DIRECTOR - DISTRIBUTION REVISED DWG. NO.
RLH/JCR 07/13/07 06/28/16 3 CS5161
BANNERS ARE NOT ALLOWED ON SIGNAL POLES.

NOTE:

⊙ = STREETLIGHT
BANNERS ARE NOT ALLOWED ON SIGNAL POLES.

NOTE:

\[ \Rightarrow = \text{STREETLIGHT} \]
NOTES:

1. Redding Electric Utility (REU) will make connections at fuses and any applicable source side splicing location.

2. Contractor shall make all other splicing within lighting pole and fixture.

3. Wire from photo cell receptacle and arm to base of pole shall be nonmetallic-sheathed cable (Romex) type NM or NMC, number 14-2 or 14-3 copper 600 volt insulated.

4. All wire within nonmetallic-sheath (Romex) shall be 600 volt THW, THHN or equal.

5. Wire from base to point of service will be 2-#6 aluminum 600 volt XLP insulated NEC type use, or as specified.

6. #14 copper stranded wire shall be 600 volt insulated SFF-2 150°C fixture.
NOTES:

1. This application is to be used for electronic metering measuring KILOWATT & KVAR's.
2. P.T.'s shall have a 60:1 ratio (i.e. 7200V-120V) 0.3% accuracy at 200 voltamp burden and shall be fused on the high voltage side.
3. C.T.'s shall have a ratio to be specified by REU engineering with a 1.5 thermal rating factor and a 0.3% accuracy at B=0.5 OHMS (i.e. 3 B0.5).
I. PURPOSE:
The purpose of this drawing is to provide information necessary for design, manufacture, and construction of a high voltage service of 12,000 volts to Redding Electric Utility (REU) customers.

II. APPLICATION:
The following specifications and requirements are geared towards a new installation. This guideline may, however, be applied to an existing service rebuild or upgrade in which case some specifications or requirements may change as determined by REU staff.

III. ENGINEERING SPECIFICATIONS:
A. Each switchboard for a high voltage service will be considered as being specifically engineered for each location. Service will be supplied at 12,000 volts, three phase, three wire, from a solidly grounded wye source.
B. REU staff will complete job specific engineering specifications and drawings for each high voltage service installation. These specifications will be based on the Application for Service, load date, plans and other information as submitted by the customer.
C. The customer installation shall comply with all applicable rules of the National Electric Code, Utility Service Entrance Requirements (US ERC). REU standards, and other governing codes and ordinances.

IV. PROTECTIVE DEVICES:
A. It shall be the customer's responsibility to furnish and install such protective devices with ratings that are necessary to interrupt the available fault current at the service location and that coordinate properly with REU protective devices to avoid exposing other REU customers to unnecessary service interruptions. The customer shall also keep in good and safe condition, at the customers own risk and expense, all appropriate protective devices of any kind or character which may be required to properly protect the customer's facilities. REU shall not be responsible for any loss or damage occasioned or caused by the negligence, or wrongful act of the customer or of any his agents, employees or licensees in omitting, installing, maintaining, using, operating or interfering with any such protective devices.
B. It shall be the customer's responsibility to complete a relay coordination and fault study and submit this study to the REU staff for review and approval prior to the purchase of relays and/or other pertinent protective gear. The available short circuit current varies from one location to another and will, therefore, be provided by REU along with other engineering specifications as discussed in Item III - B.
C. Customer relay settings or protective device curves shall coordinate with the settings at the appropriate REU source side protective device. The REU source side protection device will be a circuit breaker or a REU line protective device (recloser, fuse, etc.).
D. When the customer provides a circuit breaker or recloser as the interrupting device, then phase and ground overcurrent protection shall consist of a microprocessor based multifunctional protective relay with a minimum of three single phase overcurrent elements and one ground overcurrent element. A second, back-up, microprocessor based relay is also required using a different calculation method. Both relays shall have time and instantaneous trips with targets and have provisions for injecting current for testing. All relays shall have 5 amp continuous current rating. All relays shall be utility grade and will typically be required to be of an extremely inverse characteristic. Automatic reclosing of the customer's interrupting device will not normally be permitted, but will be reviewed on a case by case basis. The instantaneous overcurrent settings shall typically be set as low as possible but above transformer inrush and cold load pickup.
IV. PROTECTIVE DEVICES: (Continued)

E. The service switch, breaker, or protective device shall be located on the load side of the metering equipment.

F. The circuit breaker or recloser shall be tripped by an external trip signal supplied through a DC battery (shunt trip), and the protective relays shall be powered by the same DC battery. The battery voltage shall be monitored and provide a customer monitored alarm when a low voltage condition exists.

G. Any non-utility owned emergency standby generation equipment that can be operated to supply power to the customer's facilities that are also designated to be supplied from the utility's system shall be controlled with suitable protective devices by the applicant to prevent parallel operation with the utility's system in a fail safe manner, such as the use of a double throw switch to disconnect all conductors except where there is a written agreement of service contract with the utility permitting such parallel operation.

V. UTILITY CABLE TERMINATION SECTION:

A. Every switchboard to which high voltage (12,000 volts) service is to be supplied by REU shall be equipped with a fully enclosed service cable terminating pull section. Space shall be provided for the support and connection of the service cables to a bussed section which has standard NEMA drillings for termination lugs with two holed tongues. REU will specify the number of cables which will be pulled and terminated. REU will furnish the termination lugs.

B. REU will normally install the cable from its facilities to the cable terminating pull section. When REU installs the cables, stress cones will be made up by REU on the high voltage cables in the terminating pull section.

C. The height of the cable terminating lugs shall be 48” minimum to 72” maximum such as to permit the make up of stress cones, cable forming and connection.

D. The service cable terminating pull section shall be equipped with hinged, full opening, sealable, access door with padlock provisions, and when opened shall provide full access for REU crews to install, repair, or maintain cable terminations.

VI. METERING:

A. The customer shall be responsible to supply and install an approved metering panel or cubicle which shall have appropriate ventilation, must be lockable, and weatherproof.

B. Current transformers, voltage transformers, meters, test switches, phase shifting devices, and normal wiring from transformers to the meters will normally be furnished and installed by REU except as noted otherwise.

VII. TESTING:

A. Current transformers shall be ratio tested by Primary Injection.

B. Individual relays shall be secondary panel tested by applying the appropriate currents. The relays shall be tested prior to energization and every three years. The test reports shall be submitted to REU every three years. REU shall be notified of the date and time of the tests so the tests can be witnessed if desired. The relays must be tested at their specified settings to verify the following:

1. Minimum pickup or the minimum operating point at which the relay picks up for the time delay and instantaneous units.

2. Time delays at two, five, and ten times pickup.
VII. TESTING: (Continued)

3. The relays must be tested to meet the following tolerances:
   - Current/Voltage Pickup: +/- 10%
   - Time: +/- 10%

4. Trip test to see if the relays actually trip the proper breaker.

C. Megger at 2500VDC all primary equipment:
   1. Transformers connected to primary bus winding-to-winding and each winding-to-ground.
   2. Circuit breakers in the following manner:
      - Breaker open - each pole-to-ground, pole 1-2, pole 3-4 and pole 5-6.
      - Breaker closed - pole 1 - ground, pole 3 - ground, pole 5 - ground, pole 1-2, pole 3-4, pole 5-6.
      - All busses and cables phase-to-phase and phase-to-ground.

D. Circuit Breakers: Test shall be performed on site according to manufacturer's recommendations prior to energization. Copies of these test reports shall be sent to REU. These same tests shall performed every six years. Breaker shall also be exercised every year.

E. Post Energized Tests: When first energized, confirm all secondary currents and voltages are what they should be and verify proper phase rotation.

VIII. MANUFACTURER'S DRAWINGS FOR APPROVAL:

The designer or manufacturer of the high voltage switchboard for the customer's service, shall submit four copies of a drawing of the service cable terminating section, the main breaker or switch, and the metering cubicle to REU prior to fabrication. One copy will be returned to the sender with approval or corrections as needed.

NOTE: Until approval is achieved, re-submittal incorporating any corrections or comments shall be required.

For additional requirement, see the following REU references:
CS5035 and CS5036 - Transformer Rated Meters - Diagram of Connections
CS0160 - Underground Primary Service - 12,000 Volts
CS2060 - Overhead Primary Service - 12,000 Volts
Resolution 97-83 - Electric Utility Service Policy
GENERAL NOTES

I. SCOPE:
   A. This drawing specifies the construction standards necessary to provide Primary Service to customers utilizing a pole metering installation of outdoor type instrument transformers mounted on a prefabricated aluminum bracket.
   B. The pole shall be supplied, installed, owned, and maintained by the customer.
   C. Redding Electric Utility (REU) will furnish and install the overhead conductor feed, deadend crossarm assembly, all pole top primary metering outdoor type instrument transformers, and meters as required.
   D. REU source side disconnect to be placed at the closest REU owned pole at customer expense.

II. LOCATION OF PRIMARY METERING INSTALLATION:
   A. Metering transformers will be located on a REU approved 45' Class 2 treated pole. This pole shall be provided and maintained by the customer.
   B. Orient current and voltage transformers on bracket so that polarized primary terminal leads can be connected to incoming line without interference.

III. METER ENCLOSURES:
   The customer shall furnish a suitable location for the REU meters. It may be installed on metering pole located on the customer's property. It should be located so that lead wires from the instrument transformers to the meter will be as short as practicable and under no circumstances longer than 50 feet in order to avoid impairment of meter accuracy.

IV. GROUNDING:
   A. The customer shall furnish and install a meter enclosure ground in accordance with the California Electric Code and with City and County Ordinances.
   B. Minimum size ground wire for the meter enclosure shall be No. 6 AWG copper and shall be fastened securely to an approved grounding electrode. When installed on a pole, the meter enclosure ground wire shall be protected against mechanical injury by rigid steel conduit, or connected to the ground electrode by means of an approved conduit grounding clamp.
   C. The connection of the meter enclosure ground wire to the grounding electrode must be above ground or otherwise readily accessible for inspection.

V. COVERING FOR METER WIRING ON POLE:
   The customer shall furnish and install a 1 1/4" PVC conduit for meter wiring from the meter enclosure to the 8 ft. level on the metering pole. The customer shall furnish and REU will install the necessary materials to cover the meter wiring above the 8 ft. level on the metering pole.

VI. POTENTIAL TRANSFORMER FUSING:
   A. Fusing of the potential transformers for outdoor primary metering shall be in accordance with the following:
      1. Service from distribution feeder - When customer tap is fused, consideration may be given to deleting potential transformer fuses.
      2. Service from substation buses - Fuse potential transformers.

VII. CURRENT TRANSFORMER SIZING:
   CT Ratio is dependent upon customer's present and future loads, consult with engineer for ratio determination.
VIII. PRIMARY PROTECTION DEVICES:
   A. Refer to Primary Service Guidelines Drawing DS0160 for engineering and protective device specifications.
   B. The customer's primary protective device shall be located within 50 feet of the primary metering pole.

IX. TESTING & COMMISSIONING:
   Refer to Primary Service Guidelines Drawing DS0160.

X. ADDITIONAL REQUIREMENTS:
   A. Use CS5036 Transformer Rated Meters - Diagrams of Connections.
   C. DS0160 Primary Service Guidelines.

CURRENT TRANSFORMER (OUTDOOR TYPE)
60 HZ, THERMAL RATING FACTOR = 1.5

<table>
<thead>
<tr>
<th>RATED VOLATGE</th>
<th>FULL WAVE IMPULSE</th>
<th>MANUFACTURER / CAT NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>15KV</td>
<td>110KV</td>
<td>ASSOC. ENGR. / BB-15-829</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ELECTRO-MAG / CO3-110</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G.E. / JKW - 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SANGAMO / M10 - 1505</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ABB CORP / KOR - 11</td>
</tr>
</tbody>
</table>

VOLTAGE TRANSFORMERS (OUTDOOR TYPE)
60 HZ, THERMAL RATING 1500 VA @ 30°C

<table>
<thead>
<tr>
<th>RATED VOLATGE L-L</th>
<th>PRIMARY VOLTAGE RATING L-N</th>
<th>FULL WAVE IMPULSE</th>
<th>MANUFACTURER / CAT NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>12KV</td>
<td>7.2KV</td>
<td>110KV</td>
<td>ELECTRO-MAG / PO5-110</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>G.E. / JWV - 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ABB / VOG - 11</td>
</tr>
</tbody>
</table>

**110KV BIL; 60 Hertz;
Primary Voltage = 7.2kv;
Ratio = 60:1
Thermal Rating 1500VA @30 C
Accuracy = 0.3% @ 200VA

SCHEMATIC DIAGRAM
SEE NOTE (1.1.)

OVERHEAD PRIMARY SERVICE METERING
## MATERIAL LIST

### MATERIAL TO BE FURNISHED AND INSTALLED BY REU

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>OH FEED QTY</th>
<th>UG FEED QTY</th>
<th>REU STOCK #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Transformer, current, outdoor type, rating as required</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Transformer, potential, outdoor type, rating as required</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Double DE arm assembly (assembly No. 12DD3H3H or 12DD3H3L)</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Single tangent arm assembly (assembly No. 12B3H3L)</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Bushing mounted fuses (bail clips) for potential transformers</td>
<td>3</td>
<td>3</td>
<td>E240.01</td>
</tr>
<tr>
<td>6</td>
<td>Fuse, bushing mounted, 15KV, 1 Amp, as required</td>
<td>3</td>
<td>3</td>
<td>E240.03</td>
</tr>
<tr>
<td>7</td>
<td>Lead wire, connectors, as required (15KV class, 1 Amp per CS5035) (as required)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Wire, metering, No. 10, 600V</td>
<td>240'</td>
<td>240'</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Junction box, type LR, PVC, 1-1/4&quot;, female, slip fit</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>REU disconnect to be placed on REU pole at customer's expense</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Tubing, flexible from J-box to elbows to CT's &amp; PT's</td>
<td>30'</td>
<td>30'</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Sign, High Voltage</td>
<td>3</td>
<td>3</td>
<td>E313.13</td>
</tr>
<tr>
<td>13</td>
<td>Meter, as required</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Test switch</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Bracket, for instrument transformers (Aluma-Form cat. #PMM-6)</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Bolt, 3/4&quot; x length as required, with sq. washer, spring washer, nut</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Cover, insulating bolt</td>
<td>2</td>
<td>2</td>
<td>E541.11</td>
</tr>
<tr>
<td>18</td>
<td>Parallel groove clamp, (size as required)</td>
<td>3</td>
<td>3</td>
<td>E 20.48</td>
</tr>
<tr>
<td>19</td>
<td>Eye nut, dead end insulator &amp; wire deadend (size as required)</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### MATERIAL TO BE FURNISHED AND INSTALLED BY CUSTOMER

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>OH FEED QTY</th>
<th>UG FEED QTY</th>
<th>REU STOCK #</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Parallel groove clamp equivalent to REU item #18 (size as required)</td>
<td>3</td>
<td>0</td>
<td>E 20.48</td>
</tr>
<tr>
<td>21</td>
<td>Pole, wood, fully treated, and REU inspected, 45&quot; class 2</td>
<td>1</td>
<td>1</td>
<td>E540.45</td>
</tr>
<tr>
<td>22</td>
<td>Guy material, (as required)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Termination, pothead 3M Quick Term II #2/0, (use if riser is 200A)</td>
<td>0</td>
<td>3</td>
<td>E806.19</td>
</tr>
<tr>
<td>24</td>
<td>Riser assembly (see CS1222)</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Moulding, 4&quot; Sch. 40, (use if riser is 200A)</td>
<td>0</td>
<td>1</td>
<td>E381.94</td>
</tr>
<tr>
<td>26</td>
<td>Backup plate, 4&quot; Sch. 40, (use if riser is 200A)</td>
<td>0</td>
<td>1</td>
<td>E381.97</td>
</tr>
<tr>
<td>27</td>
<td>Moulding, hardwood 1&quot;</td>
<td>0</td>
<td>1</td>
<td>E382.10</td>
</tr>
<tr>
<td>28</td>
<td>Weatherproof meter enclosure</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Conduit, PVC, 1-1/4&quot; Sch. 80, gray</td>
<td>30</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Bend, PVC, 1-1/4&quot;, 22.5 deg., slip fit, Sch. 80, gray (as needed)</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Coupling, PVC, 1-1/4&quot;, slip fit</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Adaptor, female, PVC, 1-1/4&quot;, thread to slip fit</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Clamp, PVC, 1-1/4&quot;</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Strap, pipe, galvanized, or hanger iron, galvanized</td>
<td>14</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Wire, ground, PT neutral, #6 min. bare copper</td>
<td>16</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Conduit, rigid steel, 1/2&quot;, galvanized</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Conduit fitting, threaded, 1/2&quot;</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Ground rod clamp</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Conduit grounding hub</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Rod, ground, 3/4&quot; X 10'-0&quot; copper covered steel rod</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Pole mounted equipment grounding (CS2900)</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
OVERHEAD PRIMARY SERVICE METERING
CUSTOMER RECEIVING AN OVERHEAD FEED

ELECTRIC CONSTRUCTION STANDARD

REDRAWN

METER ENCLOSURE SHALL NOT BE INSTALLED IN CLIMBING SPACE

METE ENCLOSURE GROUND

BRACKET MOUNTING BOLT

PAGE 577.04
12M3H3H

SHEET 5 OF 7

REDDING ELECTRIC UTILITY

DES/REV DATE ASSISTANT DIRECTOR - DISTRIBUTION REVISED DWG. NO.
JVE/JHY 10/27/95 02/13/13 CS2060
EXISTING MISCELLANEOUS:

- SOLELY OWNED POLE W/RISER
- LIGHT W/STANDARD
- DOWN GUY
- SIDEWALK GUY
- SERVICE STUB W/CAP
- SERVICE
- CAPACITOR
- CAPACITOR CONTROLLER
- PRIMARY METER
- ELECTRONIC MARKER
- REGULATOR
- CONDUIT CAP
- JOINT POLE W/RISER
- PADMOUNT CAPACITOR

NEW CONSTRUCTION DRAWINGS
(SYMBOLS FOR EXISTING FACILITIES)
NO COMMERCIAL OR POLITICAL ADVERTISING WILL BE PERMITTED ON BANNERS

DELIVER BANNERS TO:
CITY OF REDDING ELECTRIC UTILITY
20055 VIKING WAY, BUILDING NO. 2

STREET BANNER SPECIFICATIONS

BN/RLH 11/24/97

REINFORCE CORNERS WITH EXTRA FABRIC AND STITCHING

REINFORCE CORNERS WITH EXTRA FABRIC AND STITCHING

NO. 5 SPUR GROMMETS ON ALL FOUR CORNERS 1 1/4" (31mm) FROM TOP AND BOTTOM TO CENTER OF HOLE.

PLACE NO. 5 SPUR GROMMETS 1 1/4" (31mm) FROM TOP EDGE OF BANNER TO CENTER OF HOLE. SPACE ADDITIONAL GROMMETS AT 36" (914mm) INTERVALS ALONG TOP OF BANNER.

HEM TO BE CANVAS OR 16 OZ. REINFORCED VINYL AND DOUBLE-STITCHED.

AIR HOLES:
Spaced at 36" (914mm) intervals.
To be staggered as shown on drawing.
Air holes to be no less than 6" (152mm) from edge of banner.
To be cut along dotted line (see Detail "B")

BANNER:
Required length: 30' (9144mm).
Required height: 36" (914mm).
Construction material: 10 oz. white duck canvas or 16 oz. reinforced vinyl.
Must not exceed 35 pounds when painted.
Lettering to be 8" (203mm) minimum height.
Message to consist of no more than 90 letters, numbers, punctuation and spaces.
Banners shall not contain private advertising whether in text or logo format. However, brief text, and/or logos identifying the applicant's local agency (city or county) are allowed.
The telephone number of the nonprofit organizations may be included.

NYLON WEBBING OR ROPE:
Standard 1" (25mm) nylon webbing strap Min. tensile strength 600 lbs. approximately 6' (1829mm) extending from all four corners.
Minimum - Standard 1/4" (6mm) twisted polypropylene Min. tensile strength 600 lbs. (no knots). Extend rope a minimum of 6' (1829mm) all four corners.

CONSTRUCTION:
Top, bottom and sides to have sewn hems.
Nylon webbing to be encased in hem.
Corners to be reinforced.
Water-base paint recommended for canvas.
1. Template for anchor bolts to have holes that are 1/16" diameter larger than diameter of anchor bolts.
2. Template to be made out of 3/16" inch thick (minimum) steel plate.
3. Acceptable anchor bolt material: ASTM F1554 Grade 36
   ASTM F1554 Grade 55
   ASTM A307 Grade A or B
4. Anchor bolts and nuts shall be hot-dipped galvanized after fabrication in accordance with ASTM A153.
5. Threads of nuts shall be chased after galvanizing and be lubricated with blue-colored lubricant prior to assembly.
METHOD A

1. Method A is for REFERENCE ONLY. Method A was used where 25 ohms or less ground resistance was achieved by measurement. See G.O. 95-21.2.
2. Ground rods shall be separated by 6 ft. minimum in any direction.
3. Rods can be driven at an angle of 45° outward if the 6 ft distance is unattainable. However the top of the ground rods still need to be separated by approximately 2 feet.
4. All grounding devices have to be driven in native soil.
5. Install moulding to 8 feet above the finished grade.

METHOD B

METHOD C

MATERIAL LIST

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
<th>CODE No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GROUND ROD, 5/8&quot; X 8' COPPERWELD</td>
<td>2</td>
<td>E384.02</td>
</tr>
<tr>
<td>2</td>
<td>GROUND ROD CLAMP</td>
<td>2</td>
<td>E383.01</td>
</tr>
<tr>
<td>3</td>
<td>OAK MOULDING 1&quot; X 8'</td>
<td>1</td>
<td>E382.10</td>
</tr>
<tr>
<td>4</td>
<td>GALVANIZED STAPE WITH DRIVE STOP PROTECTIVE PAD</td>
<td>30</td>
<td>E312.26</td>
</tr>
<tr>
<td>5</td>
<td>MOULDING STAPLE</td>
<td>5</td>
<td>E312.28</td>
</tr>
<tr>
<td>6</td>
<td>SOUTHWIRE #4 PPC-PGW (PROOF POSITIVE COPPER PROTECTED GROUND WIRE)</td>
<td>60 FT.</td>
<td>E175.26</td>
</tr>
</tbody>
</table>

NOTE:

1. Method A is for REFERENCE ONLY. Method A was used where 25 ohms or less ground resistance was achieved by measurement. See G.O. 95-21.2.
2. Ground rods shall be separated by 6 ft. minimum in any direction.
3. Rods can be driven at an angle of 45° outward if the 6 ft distance is unattainable. However the top of the ground rods still need to be separated by approximately 2 feet.
4. All grounding devices have to be driven in native soil.
5. Install moulding to 8 feet above the finished grade.