SPECIFICATIONS
FOR
RESIDENTIAL AND
NON-RESIDENTIAL PADMOUNTED
TRANSFORMER INSTALLATIONS
SUPPLEMENTING
GENERAL
SPECIFICATIONS
FOR
ELECTRIC INSTALLATIONS
(BLUE BOOK)

Orange and Rockland Utilities, Inc.
One Blue Hill Plaza
Pearl River, New York 10965

Rockland Electric Company
82 E. Allendale Road
Saddle River, New Jersey 07458

Pike County Light and Power Company
219 1/2 Broad Street
Milford, Pennsylvania 18337

Revision No. 11
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Red Book
These specifications, which protect the mutual interests of the Customer and the Company, will be revised or amended as required in keeping with developments and progress of the industry. The latest revisions should always be used. Additional copies of this booklet and any revisions thereof may be obtained at the Company's Field Offices. Previous editions are outdated and invalid.

This specification (aka Red Book), the General Specifications for Electric Installations (aka Blue Book) and the Electric Meter Approved Equipment List can be found at www.oru.com and clicking on:
- Programs & Services
- Service Installations in drop down box
- Service Installation Specs (left side of page)

Revisions are indicated by vertical marginal rules on the affected pages. In some cases, minor editorial changes are not so indicated.

New Construction Services Field Offices:

All new projects and copies of this book will be coordinated through the New Construction Services Field Offices. Below is a list of their locations:

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<thead>
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<th>Location</th>
<th>Address</th>
<th>Telephone Number</th>
<th>Fax Number</th>
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</thead>
<tbody>
<tr>
<td>Blooming Grove</td>
<td>500 Route 208, Monroe, NY 10950</td>
<td>1 (845) 577-3324</td>
<td>1 (845) 783-5504</td>
</tr>
<tr>
<td>Middletown</td>
<td>71 Dolson Avenue, Middletown, NY 10940</td>
<td>1 (845) 577-3324</td>
<td>1 (845) 342-8939</td>
</tr>
<tr>
<td>Saddle River</td>
<td>82 East Allendale Road, Saddle River, NJ 07458</td>
<td>1 (845) 577-3324</td>
<td>1 (201) 327-4521</td>
</tr>
<tr>
<td>Spring Valley Operations Center</td>
<td>390 West Route 59, Spring Valley, NY 10977</td>
<td>1 (845) 577-3324</td>
<td>1 (845) 577-3319</td>
</tr>
</tbody>
</table>
Call Before You Dig

For your safety and protection, the Utility Notification Service provides details on the location of underground electric wires, gas lines and communication cables. To prevent damage to underground equipment and avoid personal injury or find yourself with an unnecessary repair bill, please call:

Underground Utilities Call Center of New York:

| 811
NY Code 753 requires 2-10 working days notice.

Garden State Underground of New Jersey:

| 811
NJ Code requires 3-10 working days notice.

Pennsylvania One Call:

| 811
Pennsylvania code requires 3-10 working days notice.

Gas Emergencies Call:
1-800-533-5325

High Voltage Proximity Clearances:

If you’re starting work in proximity to overhead high-voltage lines, it’s your responsibility to notify the utility in writing at least five normal working days before the job is scheduled. If the notification is made by regular mail, there must be three extra days notice. All correspondence for Orange and Rockland Utilities, Inc., Rockland Electric Company and Pike County Light & Power Co. should be directed to your New Construction Services Field Office listed on the opposite page.
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**ABBREVIATIONS:**

- UL - Underwriter's Laboratory
- EPR - Ethyl Propylene Rubber

**SYMBOLS:**

- Denotes revision in left margin of text
- Denotes revision in a Figure
SPECIFICATIONS
FOR
RESIDENTIAL AND
NON-RESIDENTIAL
TRANSFORMER INSTALLATIONS

I. INTRODUCTION

This supplement provides specifications for customers* requesting electric service from the Company to be supplied to a single phase or three phase padmounted transformer installation. It applies to a normal installation served by a single underground primary feeder circuit from an overhead line. Installations requiring dual feeders, multiple transformers, primary or secondary switchgear, switching or emergency generators must be referred to the Company's Engineering Department for recommendations and approval. Manufacturer's equipment drawings for installations, not normally covered in this specification, must be submitted to the Company's Engineering Department prior to fabrication or construction. (See Section III of these specifications for details).

Information concerning the service location, route of the primary service lateral and other data applicable to the specific installation will be furnished by the Company's New Construction Services Representative who will obtain technical data from the Engineering and Operating Departments. For this purpose, the customer must furnish four prints of the final site plan with approval by the governmental authorities having jurisdiction, showing underground utilities (drains, sewers, etc.) and roads, either existing or proposed. Also, the customer must provide a drawing showing sufficient detail to locate doors, windows, fire escapes, etc., either existing or proposed, in the area of the requested service location. Specific information
furnished by the Company shall be subject to change if significant changes are made in the design or scheduling of the project by the customer. These requirements do not cover the customer’s complete electrical installation design, but are concerned only with those items in which the customer, his consulting engineer, electrical contractor, equipment manufacturer and the Company have a mutual interest. When supplemental information is required, the customer shall direct all inquiries and correspondence to New Construction Services Representative who is coordinating the installation.

II. DEFINITIONS

1. **Company** means Orange and Rockland Utilities, Inc., and Subsidiaries.

2. **Cost or Expense** shall include all labor, material and other applicable charges, including overheads required for the work to be performed by Company personnel.

3. **Customer** is used to designate either a present or a prospective user of the Company’s electric service.

4. **Electrical Installation** refers to the total electrical wiring and equipment installed on the customer’s premises.

5. **Ground** is a conducting connection between an electric circuit or equipment and earth, or some conducting body which serves in place of the earth.

6. **Hertz** is cycles per second of an alternating current supply.

7. **Line** is a system of poles, wires and equipment, or the equivalent below grade ducts, conduits, cables, etc., used for the distribution of electricity. It may be located above or below ground on/in a street, highway, alley or on a private right-of-way.
8. **Multiple-Occupancy Building** is a structure (including row houses) enclosed within exterior walls of fire walls built, erected, and formed of component structural parts and designed to contain two or more individual dwelling or commercial units for permanent occupancy.

9. **Power Quality** is the concept of powering and grounding sensitive equipment in a manner that is suitable to the operation of that equipment.

10. **Recommended** means desired, but not mandatory.

11. **Service** means the conductors and equipment for delivering energy from the Company’s distribution line to the wiring system of the premises served.

A) **Service drop** refers to that portion of the overhead conductors between the Company’s distribution line and the first point of attachment on the customer’s facilities.

B) **Service entrance conductors from an overhead system** are the conductors between the terminals of the customer’s service equipment and a point, outside the building, where joined by connection to the service drop.

C) **Service entrance conductors from an underground system** are the conductors between the meter and the customer’s service equipment.

D) **Service equipment** is the necessary customer owned equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means to cutoff electric supply. See Figure 12.

E) **Service lateral** is a system of underground conductors and equipment for delivering electricity from the Company’s designated connection point of the distribution line to the first point of connection to the premise wiring.
F) **Service point from an overhead system** is the point of connection between the facilities of the Company and the first point of connection to the premise wiring.

G) **Service point from an underground system** is the point of connection between the service lateral and the first point of connection to the premise wiring.

12. **Shall** is defined as mandatory in nature.

13. **Short-term service** is a service which is recurrent in nature for short periods each time, either periodically each year, intermittently during the year or at other irregular intervals.

14. **Should** is defined as desirable in nature, as contrasted with mandatory.

15. **Temporary service** is a non-recurring service intended to be used for a short time only, such as for construction or exhibit purposes, etc. The temporary facilities will be removed at such time as permanent service is provided or no longer required.

III. **CODES, STANDARDS AND WIRING ADEQUACY**

The customer’s electric service equipment and its installation shall be in accordance with the latest Company Standards for the Installation, the latest edition of the National Electrical Code (N.E.C.), National Electrical Safety Code (N.E.S.C.) and all applicable ordinances and codes. When differences in Company Specifications or Standards or Governmental ordinances or Codes occur, the more stringent requirements shall govern the installation. Any deviation from the preceding must be approved by the Electrical Engineering Department(s) of the Company and other agencies having jurisdiction over the installation.
Responsibility for design and construction in conformance with all codes rests with the owner. If the customer does not follow the above codes and standards, the customer will be expected to make any necessary changes at his expense before service is provided.

IV. APPROVAL AND INSPECTIONS

The customer must submit his plans to the Company before ordering equipment or starting work to insure that the proposed design for the installation conforms to Company requirements. The customer must furnish, for review by the Company, information as follows:

A. Manufacturer's equipment drawings for the installation; showing electrical one-line diagrams and characteristics of protective equipment, when applied; physical arrangement and clearances; and particularly, the installation details for metering transformers.

B. Manufacturer specifications for manual or automatic electrical transfer switches when proposed to be installed.

C. A final approved site plan drawing showing all underground utilities (drains, sewer, gas, electric, etc.) roads and requested service entrance location. Also, a drawing showing sufficient detail to locate doors, window, fire escapes, etc., either existing or proposed in the vicinity of the requested service location.

Fabrication of equipment or project construction should not proceed without approvals from the Company and other agencies having jurisdiction.
The Company requires inspections of the primary service installation. Pre-inspection checklists are included with each specification. At the completion of each portion of the installation, the customer/contractor must fax a copy of each checklist to the number on the bottom of the checklist prior to scheduling any inspections with your New Construction Services Representative. NOTE: for each inspection checklist issued and submitted properly, the Company will perform the initial inspection at no charge. For any re-inspections required for non-compliance or non-completion, a re-inspection fee will be assessed to the responsible party. See your New Construction Services Representative for further details.

In addition to the Company inspections, it is the customer's responsibility to arrange for inspection by the Board of Fire Underwriters' or the authority having jurisdiction. Before service can be provided, the customer will furnish a certificate of satisfactory evidence as to the safe condition of their wiring.

V. SCOPE OF CUSTOMER WORK

The customer shall provide all materials (unless otherwise specified), labor and equipment required for completion of the installation as specified herein and as called for in the drawings or as directed by the Company's authorized engineering representative. The customer shall include items incidental to the work not specifically mentioned herein so as to make the finished work fully complete and satisfactory in every respect.

In general, the customer's work will consist of the following major items and the specific notations with respect to these shall apply.
Installation or construction of the following:

A.  1. Transformer pad
    2. Duct or conduit work
    3. Grounding
    *4. Primary cable installation (including terminations)
    *5. Secondary cable installation (including connections)
    6. Metering

B. Excavation and backfill

C. Grading

* For all residential customers, primary terminations and secondary connections will be completed in the transformer by the Company.

VI. TRANSFORMER PAD LOCATION

The customer shall provide property and necessary rights-of-way (where applicable) on which to construct the transformer foundation. The location should be mutually agreed upon by the Company and the customer. It shall be located between 4'-0" and 10'-0" off an approved drivable surface (e.g., asphalt, concrete, grass-crete pavers, etc). The location shall also be in accordance with the applicable Figure and the following minimum horizontal clearances from other underground facilities:

A.  20' - 0" from any fuel storage facility (above ground included).
B.  10' - 0" from gas meter regulators, water pipes (wells included) and any other liquid filled pressurized pipe.
C.  5' - 0" from non-pressurized pipes (e.g., storm drains, sewer, etc.)
D.  5' - 0" from gas services and communication cables.
SPECIAL NOTE FOR RESIDENTIAL CUSTOMERS: THE TRANSFORMER PAD MUST BE LOCATED BETWEEN 4'-0" AND 10'-0" OF THE ACTUAL DRIVEWAY LEADING TO THE HOUSE OR BARN. THE SHORT SIDE OF THE BOX MUST FACE TOWARDS THE DRIVEWAY.

VII. TRANSFORMER FOUNDATION

The customer shall install, own and maintain the pad foundation for the transformer. It is to be constructed according to the latest Company Standards for the installation.

NOTE: AT TIME OF PAD INSPECTION & IF APPLICABLE, CURBS & BOLLARDS AROUND THE TRANSFORMER PAD AREA MUST BE IN AT TIME OF INSPECTION, AND, WITH OR WITHOUT CURBS OR BOLLARDS, THE PAD SITE MUST BE WITHIN 6" OF FINAL GRADE.

VIII. TRENCH AND CONDUIT WORK

The customer shall furnish, own (unless otherwise specified), install and maintain all duct and conduit associated with the transformer installation in accordance with the applicable Figures. The primary and secondary conduits shall enter the transformer installation as per the applicable Figure. All conduits are to be installed according to the latest N.E.C. and N.E.S.C. requirements. Underground primary conduits shall have a minimum cover as specified in the applicable Figures.

When paralleling water and sewer utilities all underground electric conductors/conduit(s) shall have a minimum horizontal clearance of ten (10) ft. from a water or sewer line and one (1) ft. separation when crossing.
Spare conduits (when applicable) must be capped or plugged and a corrosion-resistant pull line of 200 pounds (minimum) breaking strength shall be installed in conduits until needed. Metallic pull wires are not acceptable.

**Riser Pole Requirements: Where a Customer’s underground service (0 – 34,500 volts) “rises” on a:**

A) Company distribution pole with a DELTA primary circuit voltage (2400 volts or 4800 volts), the customer installed service **riser conduit and 90 degree long radius sweep shall be UL approved non-metallic rigid Schedule 80 PVC conduit.** The Customer is also required to install a UL approved PVC conduit coupling at the top of the conduit riser. Customer installed below grade metallic conduits shall not be closer than twenty-five (25’) feet from the base of the pole.

B) Company distribution pole with a WYE primary circuit voltage (2400/4160 volts or 7620/13200 volts or 19920/34500 volts), the customer installed riser conduit(s) and 90 degree long radius sweep(s) shall be UL approved: rigid galvanized steel conduit, or intermediate metal conduit, or Schedule 80 rigid nonmetallic PVC conduit. The Customer is also required to install a UL approved PVC conduit coupling that will connect to the Company’s Schedule 40 rigid nonmetallic PVC conduit. Also See Note 1 below.

**NOTE 1:** The minimum acceptable radius of a below grade two (2”) inch diameter, 90 degree bend at any “rising” location is 24 inches. All riser conduit bends are to be of the long radius sweep design and must be installed to these specifications.
NOTE 2: The minimum radius of 90 degree bends at the riser pole and transformer pad entries is 36" for 15kV, 48" for 35kV construction and must be installed to these specifications.

NOTE 3: The riser pole conduit must extend up the pole a distance of ten feet (10') above final grade elevation at the base of the pole. The Company will complete the conduit installation on the riser pole.

The remaining conduit between the 90° bend and the transformer installation must be of the same size, be either UL approved rigid galvanized steel conduit (only if the Company's distribution system voltage is of a WYE configuration), UL approved Schedule 40 or 80, color gray, PVC conduit or UL and Company approved fiberglass conduit. Any individual couplings installed in a conduit system must provide a completely smooth surface with no gaps or ridges between the conduits.

The minimum conduit sizes, utilizing the primary cables discussed in Section X of this specification, are as follows:

1. Two inches (2") for one conductor, 15KV construction.
2. Four inches (4") for one conductor, 35KV construction.
3. Four inches (4") for two conductors, 15KV or 35KV construction.
4. Four inches (4") for three conductors, 15KV construction.
5. Six inches (6") for three conductors, 35KV construction.

Secondary conduit size and quality are to be determined by the customer load, site conditions and the latest edition of the N.E.C.

Secondary conduit size and quantities are to be determined by the customer’s load, site conditions and the latest edition of the N.E.C. THE MAXIMUM NUMBER OF CONDUCTORS IN ANY GIVEN CONDUIT SHALL
NOT EXCEED FOUR (4), NO EXCEPTIONS.

IX. GROUNDING

The customer shall furnish, own (unless otherwise specified), install and maintain a ground grid consisting of No. 2/0 AWG bare str., tinned copper with 5/8" x 8'-0" long copperweld ground rods as shown on the applicable Figures. The ground grid installation is to be at 18" below final grade elevation. All below grade UL listed connectors to the ground rods are to be made with a Amp Wrench-Lok connectors, cadwelds or thermoweld process, "Ampact Fired On" connectors or compression connectors that have been approved by the Company's Distribution Engineering Department. Two N.E.C. and N.E.S.C. approved grounding connections shall be provided by the customer to terminate the ground cable pigtails at the transformer grounding pads.

For metallic primary conduits at a riser pole (two maximum), the customer shall provide (unless otherwise specified) and install a No. 2 AWG (minimum) 600 volt insulated copper conductor to the N.E.C. and N.E.S.C. approved conduit grounding clamp(s). Conductor shall be a minimum of five (5) feet long for the Company to make the interconnection to the Company installed ground rod.

For metallic primary transformer pad entrance conduit(s), they shall be grounded in the same manner as the riser pole conduit(s) except the conduit(s) shall be grounded to the transformer ground wire conductor (not a ground rod) with No. 2 AWG 600 volt insulated copper conductor and shall be in accordance with the appropriate Company Standards. N.E.C. and N.E.S.C. approved grounding...
connections shall be provided and installed by the customer to terminate the conduit ground wires at the transformer ground conductor. Grounding of metallic secondary conduit(s), at a transformer pad entrance, shall be made by the customer in the same manner as the primary metallic conduit(s) and be in accordance with the latest edition of the N.E.C., N.E.S.C. and Company Standards.

Any metallic primary or secondary conduits (two maximum) at a riser pole, shall be grounded with a minimum of No. 2 AWG 600 volt insulated copper conductor. The customer shall supply and install approximately five (5) feet of No. 2 AWG bare str. copper to their metallic conduit(s) with N.E.C. approved conduit clamp(s). The Company will complete the connection to the Company installed 5/8" x 8'-0" copperweld ground rod.

When two or more pieces of equipment are installed within 10 Ft. of each other, all ground grids must be bonded together with Company and N.E.C. approved connectors.

X. PRIMARY CABLE

The customer shall furnish, install, own and maintain the primary cable installation, unless the customer qualifies for the Company's 091 Procedure. This applies only to New Jersey customers. See the attached Section XVIII and your New Construction Services Representative for specific details. The customer shall determine the cable length required for the installation, allowing additional cable for equipment such as a riser pole, transformer, junction box, switch pad or manhole.

All primary cables are to be manufactured and tested to meet the latest requirements of Insulated Cable Engineers Associated (ICEA), and Association of
Edison Illuminating Companies (AEIC) No. CS6-87, and appropriate Company specifications for 15KV or 35KV cable.

For 13.2GRY/7.62KV voltage, the primary cable shall be 15KV rated, shielded, 175 mils EPR insulation, have a full concentric neutral and an overall semi-conducting polyethylene jacket, with three (3) equally spaced extruded red stripes. The minimum conductor size, dependant upon the customer's load, is #2 AWG Aluminum. Cable is to be Kerite URD (SPS-HTK), or Okonite Okoguard URD-J, or approved equivalent.

For 34.5/19.9KV voltage, the primary cable shall be 35KV rated, shielded, 345 mils of EPR insulation, have a full concentric neutral and an overall semi-conducting polyethylene jacket, with three (3) equally spaced extruded red stripes. The minimum conductor size, dependant upon the customer's load is #1/0 AWG aluminum. Cable is to be Kerite URD (SPS-HVK), Okonite Okoguard URO-J, or approved equivalent. Any deviation from the above must be approved by the Distribution Engineering Department.

Manufacturer's specifications for proposed cables must be submitted to Orange and Rockland Utilities, Inc., Distribution Engineering Department, for review and written approval prior to purchase and installation to insure compatibility with the Company's distribution system.

All cable ends must be sealed at all times and resealed when cut to prevent contamination of the cable by moisture and dirt. An appropriate heat shrink seal is recommended.
Jacketed concentric neutral primary cable is to be installed direct buried, or in metallic conduit (for Grounded WYE systems only) or in non-metallic PVC conduit according to the latest N.E.C., N.E.S.C. or Company requirements.

For direct buried installations, a 2" sand padding is to be installed below the primary cable and 6" of sand is to be installed above the primary cable installation, the full width of the trench. If required by the N.E.C. or N.E.S.C., a 2" x 12" planking is to be placed on top of the sand padding and centered over the cable. The trench is to be backfilled to grade elevation, as referenced to the applicable Figures.

XI. PRIMARY CABLE TERMINATIONS

The customer shall furnish (unless otherwise specified) all primary cable termination kits designed to fit the installed primary cable system.

The customer shall install the primary cable termination material at the transformer when such work does not come within the Company's Labor Union responsibility. The Company's New Construction Services Representative will inform the customer when this work is the responsibility of the Company.

When service is provided from an underground distribution system, the customer must consult the Company for the proper terminations. Also, it is the customer's responsibility to consult with the Company for the type of equipment designed for the job (for example, live front vs. dead front) so that appropriate material may be obtained to complete the job on schedule.

The termination's at the riser pole or at live front equipment must be outdoor type stress cones.
For 15KV primary cable -
3M Co. Cat. No. 7642-S-2-2 or Company approved equivalent for #2 AWG conductor.

For 35KV primary cable -
3M Co. Cat. No. 5646-1/0 or Company approved equivalent for #1/0 AWG conductor.

The terminations at a dead front padmount transformer or equipment are to be load break type cable terminations. For customer owned equipment, the customer must also furnish primary bushing well inserts that are compatible with the elbow connector.

The terminations at dead front equipment and dead front padmount transformers shall be:

For 15KV primary cable - (*)
Elastimold Loadbreak Elbow, Cat. No. 166LR-A-5220 or Company approved equivalent for #2 AWG conductor;
Elastimold Bushing Well Inserts, Cat. No. 1601A4;
Elastimold Grounded Protective Dead End Cap(s) when required, Cat. No. 160-DRG; or Company approved equivalents.

For 35KV primary cable - (*)
Elastimold Loadbreak Elbow, Cat. No. 376LR-K-240 or Company approved equivalent for #1/0 AWG conductor;
Elastimold Bushing Well Insert, Cat. No. 3701A4; Elastimold Dead End Insulating Cap(s) when required, Cat. No. 370DRG; or Company approved equivalents.

(*) For prevention of dirt and moisture contamination to the cable, cable sealing kits are required to be installed with Elastimold primary cable elbow terminations. 15KV sealing kits for #2 - #2/0 AWG conductor are to be 3M Co. Cat. No. 8452; 35KV sealing kits for #1/0 AWG conductor are to be 3M Co. Cat. No. 8453 or Company approved equivalents.
The terminations and bushing well inserts must be approved by the Company's Distribution Engineering Department for the specific installation.

The Company will install the primary cable termination kits at the Company's connection point; that is, riser pole, junction box, padmount equipment, or manhole. The kits are to be delivered to the appropriate New Construction Services Field Office at least 48 hours prior to the scheduled installation date.

It is the customer's responsibility to properly identify the primary cables on all ends in accordance with the latest issue of the N.E.C.

Upon completion of the primary cable installation for secondary metered customer's, the Company will high potential test each new primary cable. For primary metered customer's, it's the customer's responsibility to have this test performed either by the Company or privately. If done privately, the Company must receive the test results prior to energization. These tests will be conducted from the customer's H.V. terminations at his service point (transformer, main switch equipment, primary meter, etc.) to the Company's connecting point, that is, riser pole, padmount equipment, junction box or manhole. The Company does not assume any responsibility for the cable and/or accessories which fail to pass the test. The Company will not energize the cables until they have passed the above test.

XII. SECONDARY CABLE AND BUS DUCT

The customer shall furnish, install, own and maintain the secondary cable installation. The customer’s cable shall be insulated stranded cable terminated at the transformer with appropriate (N.E.C. approved) compression connectors. For
proper application to transformer terminals see the applicable Figure. The secondary cable installation is to conform to the latest edition of the N.E.C. and N.E.S.C. **NOTE: THE MAXIMUM NUMBER OF CONDUCTORS SHALL NOT EXCEED FOUR (4) PER ANY GIVEN CONDUIT, NO EXCEPTIONS.**

All bolted secondary wire connections to the transformer terminals are to be installed in accordance with the applicable Figure.

Secondary transformer terminals and connectors are to be insulated when electrical clearances are inadequate as determined by the Company's authorized engineering representative. See Section XIV for clearances.

Secondary feeders must include one neutral conductor in each occupied conduit. The Company's padmount transformers are not designed for overhead secondary bus duct construction. If the customer intends to use secondary bus duct on secondary metered Company owned padmount transformers, the secondary service must enter the unit underground within the secondary area limits as defined in the applicable Figure.

The customer may elect to use overhead bus duct on primary metered installations with customer owned padmount transformers. In case of failure of this non-standard transformer, time for restoration of service by the Company, if called upon by the customer, will be extensive. The customer shall be responsible for the equipment design and maintenance of the electrical system.
XIII. METERING

ALL METERING EQUIPMENT SHALL BE INSTALLED OUTDOORS UNLESS PRIOR APPROVAL IS GIVEN BY THE COMPANY.

Secondary Metering 208Y/120V, 240/120V

The customer shall furnish, install, own and maintain a current transformer cabinet* for secondary metered installations. Depending on the service size, the customer or the Company will install the current transformers in the C.T. cabinet and the Company will wire the secondary C.T. connections.

Secondary Metering 480Y/277V

The customer shall furnish, install, own and maintain a current transformer cabinet* and voltage transformer cabinet* according to the applicable Figures.

Depending on the service size, the customer or the Company will install the current transformers in the C.T. cabinet and voltage transformers in the V.T. cabinet.

*Not required for services 200 amperes and below.

The Company will wire the secondary C.T. connections and the primary and secondary connections on the voltage transformers.

The Company will furnish the meter, current transformer(s) and voltage transformer(s) as required for the specific installation. The customer should arrange for a job meeting with the Company Metering Department through his New Construction Services Representative to determine locations, timing, and specific requirements for the metering installation.

NOTE: The customer will supply & install a Company approved meter pan and test block for a current transformer installation.
Primary Metering

When primary metering information is required, the customer should direct all inquiries and correspondence to their New Construction Services Representative.

XIV. CLEARANCES

Electrical Clearances for Primary Voltages

The normal electrical clearances of live parts for service equipment, other than standard manufactured metal-clad switchgear are given in the following tabulation. Normal clearances shall be provided whenever practical.

Insulating barriers shall be provided between live parts and ground and between phases for live conductors and connectors when the tabulated clearances below cannot be obtained. The insulating barrier material shall have thickness and a dielectric value to withstand full phase to phase service voltage and shall have adequate arc, heat and flame resistance as well as adequate physical strength.

<table>
<thead>
<tr>
<th>KV</th>
<th>Normal Phase-to-Ground Clearance</th>
<th>Normal Phase-to-Phase Clearance</th>
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<tr>
<td>5</td>
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<td>5&quot;</td>
</tr>
<tr>
<td>15</td>
<td>7 ½&quot;</td>
<td>13&quot;</td>
</tr>
<tr>
<td>35</td>
<td>20&quot;</td>
<td>35&quot;</td>
</tr>
</tbody>
</table>

Electrical Clearances for Secondary Voltage

0-600V, minimum 2" phase-to-phase or phase-to-ground.

Physical or Safety Clearances

Refer to appropriate codes, regulations and standards including, but not limited to the following: Occupational Safety & Health (OSHA) regulations, latest editions of the
N.E.C., N.E.S.C., High Voltage Proximity Acts and the Company Standards.

XV. ENERGIZATION PROCEDURE

The Company’s Distribution Engineering Department will inspect each transformer upon notification that both the contractor / customer and the Company have completed the installation. Such notification should be initiated by the customer faxing in their Pre-Inspection Checklist and calling their New Construction Services Representative.

If the final transformer inspection is rejected by the Company’s Distribution Engineering Department, the authorized engineering representative will notify the customer’s representative of the corrective action required for approval of the installation. A reinspection of the installation will be conducted upon completion of the corrective action required.

Upon receipt of both the Company approval notice and the Underwriter Inspection Certificate*, the installation will then be scheduled for energization by the Company.

* Certificate of satisfactory evidence as to the safe condition of the wiring from the Authority having jurisdiction.

XVI. BACKFILL AND GRADING

The customer and/or contractor shall assume the responsibility of backfilling and grading the installation. Refer to the applicable Figure(s).
XVII. **SPECIFICATIONS FOR CONCRETE**

A. **Concrete Work**

All concrete construction work shall be in accordance with the recommendation of the American Concrete Institute as stated in their Bulletin ACI 318, latest revision and as specified herein.

**Materials**

1. **Portland Cement:**


2. **Metal Reinforcement:**


C. **Concrete Quality**

   The equipment pads have been designed for concrete having a minimum ultimate comprehensive strength at 28 days of 3000# per square inch, and all concrete, except as otherwise noted or specified, shall be designed to meet or exceed this requirement.

   All concrete exposed to weathering shall have a minimum air content as shown in A.C.I. 318, latest edition, Section 4.2.5.
D. Forms and Details of Construction

Forms for all parts of the specified concrete work shall be so constructed that finished surfaces shall conform to the shape, size and dimensions as specified on the applicable Figure.

All forms are to be constructed and braced so that finished concrete surfaces shall be level, free from bulges, distortions or other variations.

Removal of forms shall be carried out in such a manner as to insure the complete safety and integrity of the structure. In no instance shall the supporting forms be disturbed or removed until the concrete has cured sufficiently to adequately support its own weight and any other expected construction load placed thereon.

E. Concrete Finishing

1. General:

All exposed surfaces shall be smooth and even when completed. Any and all unsightly ridges or lips or exposed concrete shall be removed by tooling and rubbing. All loose stones and holes shall be cleaned out. The surfaces shall then be completely soaked with water (or appropriate liquid) and the defects repaired with concrete such as to provide a smooth, even surface to the satisfaction of the Company's authorized engineering representative.

2. Defective Concrete:

All concrete work not conforming to the preceding; including physical dimension, size and shape; as shown on referenced drawings, out of alignment or level; or showing a defective surface; shall be removed and completely
replaced in a manner meeting with the approval of the Company's authorized engineering representative. Slight imperfections in appearance of the structure may be repaired **ONLY** when the customer has obtained the permission of the Company's authorized engineering representative.

XVIII. **COMPANY PROCEDURE NUMBER O91**

**SUPPLEMENT TO SPECIFICATIONS FOR NON-RESIDENTIAL PADMOUNTED TRANSFORMER INSTALLATIONS TO BE CUSTOMER INSTALLED AND COMPANY OWNED AFTER ACCEPTANCE (FOR NEW JERSEY CUSTOMERS ONLY)**

A. **General**

This section pertains to a customer desiring primary service on their premises to be owned and maintained by the Company after the customer has fulfilled certain requirements and installed their primary service in accordance with the attached specification.

The Company's New Construction Services Representative will explain in detail the requirements for a customer to qualify for this procedure.

The customer shall provide all labor, construction equipment and necessary equipment required for completion of the installation as specified herein or as directed by the Company's Distribution Engineering Department.

The Company will furnish the customer with certain specified materials which is intended to provide service voltage at the secondary terminals of the transformer(s) for secondary metered customers. For primary metered customers, the Company
will provide only certain specific material up to the metering enclosure. These materials will include, where necessary, primary cable*, conduit*, primary cable terminations, and primary switching equipment. The Company supplies ONLY those items listed on the material list separately enclosed with this specification book.

* The Company does not provide exact footage of this material for the proposed construction. The Company does supply sufficient material that will exceed the expected/anticipated requirements.

The Company supplied material may only be obtained by the customer, or his assigned representative, at the designated Company Supply Depot during a normal business week, Monday through Friday, excluding Company holidays, between the hours of 10 a.m. and 2 p.m.

The customer shall provide an easement satisfactory to the Company consistent with Company Real Estate Department requirements before any installation will be authorized. The Company assumes no liability for acts of the customer, or his contractor during the construction of this installation. After successful final inspection, successful passing of the required tests previously stated in Section XI, and energization of the installation, the Company will, at its own expense, operate and maintain the electric service installation up to the line side of the primary meter for a primary metered customer, and to the secondary terminals of the transformer(s) for secondary metered customers.

The Company requires inspections of the primary service installation. Pre-inspection checklists are included with each specification. At the completion of each portion of the installation, the customer/contractor must fax each checklist to the number on the bottom of
the checklist prior to any scheduling any of inspections with your New Construction Services Representative.

In addition to the Company inspections, it is the customer's responsibility to arrange for inspections by the Board of Fire Underwriters' or the Authority having jurisdiction and to obtain and furnish a certificate of satisfactory evidence as to the safe condition of the wiring.

B. Material Requisitions and Returns

Upon notification from the customer's New Construction Services Representative, the customer or his authorized representative shall pick up materials necessary to complete the approved installation. All necessary materials will be provided at the designated Company Supply Depot according to the Material List issued for the installation. The Company will require a signed agreement of material quantities received for the installation.

All material not utilized to complete the project shall be returned to the issuing Company Supply Depot prior to energizing the service. The customer or his authorized representative will be responsible for all material issued to him. The customer shall be billed for any material not returned, as stated herein, or required material replacement other than those due to manufacturer's defects, after the quantities shown on the Material List have been initially issued. Any primary cable required to be returned to the Company must have appropriate cable end seals installed before the Company will accept delivery. Also, only full lengths (un-cut) and undamaged lengths of conduit will be accepted as returned material.

C. Primary Cable

The Company shall provide all primary cable to complete the installation as shown on the approved drawings. The customer shall verify in the field the cable length required for the installation, allowing 50 ft. (per conductor) of excess cable, from final grade level to be properly terminated (by the Company) on the designated riser pole. For other Company designated attachment points, such as, padmount equipment, junction box or manholes, allow
15 ft. (per conductor) of excess cable to be terminated by the Company. Refer to the attached Company drawing and Material List for cable lengths. Primary cable splicing will not be permitted. All primary feeders must be installed in one continuous run unless otherwise specified, as shown on the attached Company drawing.

All cable ends must be sealed at all times and resealed when cut to prevent contamination of the cable by moisture and dirt. Appropriate heat shrink seal(s) will be issued to the customer.

D. **Primary Cable Terminations**

The Company shall furnish all primary cable termination kits designed for use on the primary cable installed. The customer shall install the primary cable termination material at the padmounted equipment, when such work does not come within the Company's Labor Union responsibility. It is the customer's responsibility to consult with the Company for the type of equipment assigned to the job so that appropriate material may be obtained to complete the job on schedule.

The Company will install the primary cable termination kits at the Company's connection point, which may be a riser pole, padmount equipment, junction box or manhole. Upon completion of the primary cable installation, the Company will high potential test the primary cable installation, as discussed in Section XI. The Company does not assume any responsibility for the cable and/or accessories which fail to pass this test due to poor workmanship or mishandling.

If failures of this type occur, the customer shall furnish replacement materials and labor at their own expense to provide a satisfactory installation. The Company will not energize the complete cable system until after they have passed the above test.

E. **Other Requirements**

Refer to previous sections in this specification that pertains to the customer's installation, e.g., transformer foundation, specifications for concrete, grounding, metering, etc.
NOTES:
1. THE PRIMARY CONDUIT AND COMMUNICATION (TELEPHONE, CATV, ETC.) SHALL BE INSTALLED FIRST FOLLOWED BY GAS WHEN APPLICABLE. CONSULT THE APPLICABLE GAS UTILITY FOR THEIR INSTALLATION SPECIFICATIONS.
2. THE STANDARD MINIMUM DEPTHS AND PRIMARY CONDUIT SIZES ARE IN ACCORDANCE WITH THE FOLLOWING VOLTAGE CLASSES:

<table>
<thead>
<tr>
<th>VOLTAGE CLASS</th>
<th>CONDUIT SIZE (# OF PHASES)</th>
<th>DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>5KV DELTA</td>
<td>3&quot; OR 4&quot; (1Ø)</td>
<td>30'</td>
</tr>
<tr>
<td>15KV</td>
<td>2&quot; (1Ø)</td>
<td>30'</td>
</tr>
<tr>
<td>15KV</td>
<td>4&quot; (3Ø)</td>
<td>30'</td>
</tr>
<tr>
<td>35KV</td>
<td>4&quot; (1Ø)</td>
<td>36'</td>
</tr>
<tr>
<td>35KV</td>
<td>6&quot; (3Ø)</td>
<td>36'</td>
</tr>
</tbody>
</table>

3. ELECTRIC, COMMUNICATION AND GAS FACILITIES MUST BE STAKED WHERE REQUIRED TO MAINTAIN THE CLEARANCES STATED IN NOTE #4.
4. THE STANDARD MINIMUM CLEARANCE FOR UNDERGROUND ELECTRIC AND COMMUNICATION FACILITIES SHALL BE TWELVE (12") FROM A GAS LINE. IF NOT PRACTICABLE TO OBTAIN, THE ABSOLUTE MINIMUM SHALL BE SIX (6") AND RANDOMLY STAKED WITH UNTREATED WOOD STAKES.
5. 0-600V ELECTRIC SERVICE INSTALLATION SHALL BE IN ACCORDANCE WITH THE COMPANY'S REQUIREMENTS AND THE N.E.C.
6. NO CUSTOMER OWNED SECONDARY (0-600V) CONDUCTORS OR PRIVATE COMMUNICATION CABLES ARE PERMITTED IN THE TRENCH WHERE A RIGHT-OF-WAY HAS BEEN GRANTED TO THE COMPANY.
7. SAND IS REQUIRED WHEN:
   a. GAS IS PRESENT.
   b. ANY PORTION OF OR ENTIRE TRENCH IN OR ROCK OR SHALE.
   c. THE PRIMARY CABLE(S) ARE DIRECT BURIED. A SPARE CONDUIT IS RECOMMENDED WITH THIS APPLICATION.
8. IF REQUIRED BY THE COMPANY, OR OTHER AUTHORITY HAVING JURISDICTION, CONCRETE ENCAVEMENT OF THE DUCT BANK MAY BE REQUIRED. SEPARATE SPECIFICATIONS WILL BE ISSUED.
NOTES:
1. LEAVE 10' OF EXTRA SLACK PER CABLE (AFTER TERMINATIONS ARE MADE).
2. INSTALL CONDUIT IN SAND PADDING BELOW BOX.
3. INSTALL "ELBOW" TIE WRAP PRIOR TO TWISTING CONCENTRIC NEUTRAL.
   TIGHTEN THE TIE WRAPS WITH ONLY SUFFICIENT TENSION TO HOLD WIRES
   "IN PLACE", DO NOT OVER-TIGHTEN SUCH AS TO CAUSE DAMAGE TO THE
   CABLE BY EMBEDDING THE CONCENTRIC NEUTRAL INTO THE SEMI-CONDUCTING
   JACKET.
4. BOX PAD TO BE INSTALLED ON 6" BED OF SAND. SAND TO EXTEND 4'
   BEYOND PERIMETER OF BOX PAD.
5. INSTALL GRID COORDINATE AND PHASE ID TAGS AS PER INSTRUCTION FROM
   THE COMPANY REPRESENTATIVE.
NOTES AND SPECIFICATIONS:

1. INSTALLATION SHALL BE IN ACCORDANCE WITH:
   A. D&RU, INC. WORKING DRAWINGS AND SPECIFICATIONS FOR:
      1. ELECTRICAL INSTALLATIONS
         2. NON-RESIDENTIAL PAD MOUNTED TRANSFORMER INSTALLATIONS
   B. THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE
   C. ALL APPROPRIATE CODES AND ORDNANCES
   ANY DEVIATION FROM THE PRECEDING MUST BE APPROVED BY THE ELECTRICAL ENGINEERING
   DEPARTMENT OR D&RU, INC. AS WELL AS THE APPROPRIATE AGENCIES HAVING JURISDICTION
   OVER THE INSTALLATION (SEE ITEMS B AND C ABOVE.)

2. RESPONSIBILITY FOR DESIGN AND CONSTRUCTION IN CONFORMANCE WITH ALL CODES RESTS WITH
   THE OWNER.

3. SITE PREPARATION
   A. SOIL BENEATH THE CRUSHED STONE AND SURROUNDING AREA TO BE COMPACTED TO 90% OF
      ORIGINAL DENSITY TO ELIMINATE SHIFTING OF TRANSFORMER AND PAD IF INSTALLATION IS
      LOCATED ON FILLED EARTH.
   B. PROVIDE ADEQUATE WATER DRAINAGE AWAY FROM THE PAD INSTALLATION BY GRADING OR
      DRAIN TILE.
   C. PROVIDE PROTECTION WITH VEHICULAR BUMPER POSTS IF EXPOSED TO VEHICULAR TRAFFIC.
      INSTALLATION MUST CONFORM TO PARAGRAPH 7, SKETCH G.
   D. PROVIDE NECESSARY UNOBSTACLED ACCESS TO D&R OWNED FACILITIES TOGETHER WITH THE
      RIGHT TO REMOVE OBSTRUCTION IF NECESSARY FOR SUCH ACCESS. EASEMENT TO THE
      INSTALLATION MUST BE OBTAINED FROM PROPERTY OWNER.
   E. ANY FENCE OR WALL INSTALLED AROUND THE TRANSFORMER INSTALLATION MUST BE
      INSTALLED IN ACCORDANCE WITH PARAGRAPH NO. 1 AND PARAGRAPH NO. 7 OF THIS
      SPECIFICATION.
   F. CONCRETE TO TEST TO 3000 POUNDS PER SQUARE INCH COMPRESSION AT 28 DAYS WITH
      6 x 6 x 6/6 WIRE MESH AS SHOWN IN FIG. 4.

4. GROUNDING
   A. MINIMUM WIRE SIZE TO BE 2/0 AWG. STR. COPPER BETWEEN TRANSFORMER GROUND PADS AND
      TRANSFORMER GROUND BUS (RODS). GROUND BUS CABLE TO BE BARE STRANDED COPPER IN
      EARTH WITH A DEPTH OF 18' BELOW FINAL GRADE ELEVATION.
   B. METAL ENCLOSURE, PRIMARY AND SECONDARY METAL CONDUITS TO BE GROUNDED WITH
      MINIMUM #2 AWG. BARE STRANDED COPPER.
   C. BOND PRIMARY CONDUITS ON RISER POLE TO D&RU, INC. DRIVEN GROUND ROD(S) WITH A
      MINIMUM OF #2 AWG. STR. COPPER. CUSTOMER TO SUPPLY AND INSTALL CONDUIT GROUND
      CLAMPS, GROUND WIRE AND GROUND ROD CLAMP FOR BONDING GROUND WIRE TO THE D&RU,
      INC. DRIVEN GROUND RODS). (SEE FIG. B).
   D. ALL BELOW GRADE UL LISTED (FOR DIRECT BURIAL USE) SPLICES TO BE BY AN D&R, INC.
      ELECTRICAL ENGINEERING DEPARTMENT APPROVED METHOD AND INSPECTED BY THE COMPANY'S
      ELECTRICAL ENGINEERING DEPARTMENT PRIOR TO BACKFILL. THEY INCLUDE: AMP WRENCH-
      LOK CONNECTORS, CADWELD OR THERMOWELD PROCESS, "IMPACT FIRED ON" CONNECTORS OR
      COMPRESSION CONNECTORS THAT HAVE BEEN APPROVED BY THE COMPANY'S ELECTRICAL
      ENGINEERING DEPARTMENT.
   E. PRIMARY TERMINATIONS TO BE GROUNDED AS PER THE APPROPRIATE COMPANY SPECIFICATIONS
      AND/OR DRAWINGS.
   F. ANY METAL FENCE INSTALLED WITHIN TEN FEET (10 FT.) OF THE TRANSFORMER
      INSTALLATION SHALL BE BONDED TO THE TRANSFORMER GROUND BUS (RODS) WITH #2 AWG.
      BARE STRANDED COPPER WIRE.

5. CABLES AND TERMINATIONS
   A. PRIMARY PHASE CONDUCTORS
      1. PRIMARY CABLE TYPE AND CONSTRUCTION MUST BE SUBMITTED IN WRITING TO THE
         D&RU, INC. ENGINEERING DEPARTMENT FOR REVIEW AND APPROVAL BEFORE PURCHASE AND
         INSTALLATION TO INSURE COMPATABILITY WITH THE COMPANY DISTRIBUTION SYSTEM
         AND EQUIPMENT.
      2. THE MINIMUM PRIMARY CONDUCTOR SIZE FOR 15KV PRIMARY VOLTAGE IS #2 AWG. THE
         MINIMUM PRIMARY CONDUCTOR SIZE FOR 35KV PRIMARY VOLTAGE IS 1/0 AWG. THE
         CONDUCTOR MAY BE EITHER COPPER OR ALUMINUM AS SPECIFIED BY THE LATEST EDITIONS
         OF A.E.I.C. NO. 5 AND THE I.C.E.A.
5. CABLES AND TERMINATIONS (CONTINUED)
   3. JACKETED CONCENTRIC NEUTRAL PRIMARY CABLE WITH A FULL NEUTRAL OR SHIELDED
      JACKETED PRIMARY CABLE WITH A SEPARATE NEUTRAL MUST BE INSTALLED IN
      METALLIC OR PVC SCHEDULE 40 CONDUIT AT A MINIMUM BURIED DEPTH DESCRIBED IN
      FIG. 1.
   B. PRIMARY NEUTRAL CONDUCTORS
      1. PRIMARY NEUTRAL CABLE IS TO BE THE SAME SIZE AS THE PHASE CONDUCTOR AND NO
         SMALLER THAN #2 AWG COPPER FOR 15KV CABLES AND 1/0 AWG COPPER FOR 35KV
         CABLES. PRIMARY NEUTRAL SHALL HAVE 600 VOLT INSULATION.
      2. PRIMARY NEUTRAL MUST BE INSTALLED WITH PHASE CONDUCTORS ON ALL INSTALLATIONS
         AND TERMINATED IN ONE CONTINUOUS RUN. A SEPARATE PRIMARY NEUTRAL IS NOT
         REQUIRED IF THE PRIMARY PHASE CONDUCTORS ARE OF THE JACKETED CONCENTRIC
         NEUTRAL TYPE.
      3. PRIMARY NEUTRAL IS TO TERMINATE ONLY ON THE:
         a. HD BUSHING FOR WYE CONNECTED PRIMARY WINDINGS WITH ‘LIVE FRONT’ DESIGN
            ON 30 UNITS.
         b. XD BUSHING FOR DELTA CONNECTED PRIMARY WINDING WITH ‘LIVE FRONT’ DESIGN
            ON 30 UNITS.
         c. HD-XD BUSHING FOR THREE PHASE PHASE UNITS OF THE ‘DEAD FRONT’ DESIGN.
         d. X2 BUSHING FOR GROUNDED WYE PRIMARY SINGLE PHASE UNITS OF BOTH ‘LIVE
            AND DEAD FRONT’ DESIGNS.
         e. TRANSFORMER GROUND GRID FOR DELTA PRIMARY SINGLE PHASE UNITS OF BOTH
            ‘LIVE AND DEAD FRONT’ DESIGNS.
   4. PRIMARY NEUTRAL TO BE CONNECTED TO GROUND BUS (RODS) WITH 2/0 COPPER.
   C. SECONDARY CONDUCTORS
      1. ALL SECONDARY CABLE TRANSFORMER CONNECTIONS ARE TO BE MADE UTILIZING:
         a. BRONZE BOLTS AND WASHERS ON COPPER TRANSFORMER TERMINALS AND CONNECTORS.
         b. CADMIUM OR DURIUM BOLTS AND WASHERS ON ALUMINUM TRANSFORMER TERMINALS
            AND CONNECTORS.
         c. STAINLESS STEEL BOLTS AND WASHERS TO CONNECTORS RATED AL. OR AL/CU.
      2. SECONDARY NEUTRAL TO BE CONNECTED TO GROUND BUS (RODS) WITH A MINIMUM OF
         2/0 COPPER.
   6. CONDUITS
      A. BELOW GRADE PRIMARY AND SECONDARY CONDUITS AT THE TRANSFORMER LOCATION MAY BE
         NEC APPROVED SCHEDULE 40 PVC FOR DIRECT BURIAL.
      B. PRIMARY CABLE RISER CONDUIT AND SWEEP AT THE RISER POLE MUST BE A MINIMUM OF
         4’ OR 6’ GALVANIZED STEEL. (SEE SECTION VII OF TEXT).
      C. SIZE OF PRIMARY CONDUIT IS TO BE IN ACCORDANCE WITH FIG. 1, NOTE #2.
      D. SECONDARY CONDUITS ARE NOT TO EXTEND BEYOND DIMENSION I OF THE SINGLE
         UNIT 30 TRANSFORMER PAD AS SHOWN ON FIG. 14 MINIMUM SIZE - 2’ ID.
      E. CONDUITS NOT TO EXTEND ABOVE CONCRETE PAD FOR SINGLE UNTIL 30 TRANSFORMERS AS
         SHOWN ON FIG. 4.
   7. CLEARANCES
      A. THE TRANSFORMER INSTALLATION SHALL BE LOCATED AS FAR AS PRACTICAL FROM WINDOWS,
         DOORS, FIRE ESCAPES, ENTRANCES, GAS METERS, GAS REGULATORS, EQUIPMENT, LOADING
         RAMPS, AND VENTILATING DUCTS SO AS NOT TO PRESENT A PHYSICAL OBSTRUCTION. THE
         FOLLOWING ARE MINIMUM HORIZONTAL CLEARANCES BETWEEN:
         1. BACK AND SIDES OF PAD FOR SINGLE UNIT TRANSFORMER INSTALLATIONS AND ANY
            FENCE OR WALL-FOUR FEET (4’). SEE SKETCH A.
         2. BACK AND SIDES OF PAD AND WALL BELOW WINDOWS OR ANY OPENING - TEN FEET (10’).
            SEE SKETCHES A AND B.
         3. SIDES OF PAD AND DOORS, GRADE ELEVATION WINDOWS, OR ACCESS OPENINGS - TEN
            FEET (10’). SEE SKETCH C.
         4. SIDES OF PAD AND GAS METERS, OR GAS REGULATORS - TEN FEET (10’). SEE SKETCH D.
         5. SIDES OF PAD AND EQUIPMENT, AND VENTILATING DUCTS - TEN FEET (10’). SEE
            SKETCH C.
         6. FRONT OF PAD AND ANY FENCE, WALL OR EQUIPMENT - TEN FEET (10’). SEE SKETCH A.
7. **CLEARANCES (CONTINUED)**

7. SIDE OF PAD AND ANY LOADING RAMP - FIFTY FEET (50'). SEE SKETCH E.
8. SIDE OF PAD AND ANY RISER POLE - TEN FEET (10'). SEE SKETCH F.
9. SIDES OF PAD AND ANY COMBUSTIBLE WALL OR OVERHANG - TEN FEET (10').
10. SHRUBBERY SHALL NOT BE INSTALLED IN FRONT OF THE TRANSFORMER AND A
    MINIMUM CLEARANCE OF FOUR FEET (4') AWAY FROM LIMBS ON THE REMAINING
    THREE (3) SIDES.

B. **O&R ENGINEERING DEPARTMENT WILL DETERMINE TRANSFORMER LOCATION WHEN EGRESS IS**
    **FROM AUDITORIUM OR PUBLIC BUILDING. ANY PROPOSED INSTALLATION WHICH THE O&R**
    **ENGINEERING DEPARTMENT DEEMS CONTROVERSIAL SHALL BE REFERRED TO THE PROPER**
    **FIRE INSPECTION AGENCY FOR APPROVAL BEFORE CONSTRUCTION. SEE THE FOLLOWING**
    **SKETCHES.**

C. **TRANSFORMER INSTALLATION IS NOT TO BE LOCATED: IN FRONT OF BUILDING DOORS,**
    **VENTILATION DUCTS OR ACCESS OPENINGS OR BENEATH BUILDING OVERHANG OR OVERHEAD**
    **WALKWAY.**

---

**SKETCH A**

**SKETCH B**
LEGEND:

1. WINDOW
2. DOOR
3. VENTILATING INTAKE OR EXHAUST DUCT
4. GAS METERS AND/OR REGULATORS
5. EQUIPMENT
6. LOADING RAMPS
7. TRANSFORMER PAD
8. TRANSFORMER
9. FIRE ESCAPE
10. VEHICULAR BUMPER GUARDS (BOLLARDS)
NOTES:
1. SEE FIG. 3 FOR ADDITIONAL REQUIREMENTS, SPECS. AND CLEARANCE REQUIREMENTS.
2. OPENING TO BE D X E DIMENSIONS (AFTER FORM IS REMOVED).
3. CRUSHED STONE ±3'-0" BENEATH PAD.
4. 6" X 6" X 6/6 WIRE MESH.
5. NUMBER OF SECONDARY CONDUITS TO CUSTOMERS EQUIPMENT TO SUIT LOAD AND SITE CONDITIONS.
6. CONDUITS NOT TO EXTEND ABOVE PAD.
7. PAD SHALL BE LEVEL AND ALL EDGES CHAMFERED.
8. WHEN REQUIRED, TWO (2) PRIMARY CONDUITS IN THIS AREA.
9. SECONDARY CONDUITS NOT TO EXCEED "I" DIMENSION.
10. PRIMARY CONDUITS SHALL BE WITHIN DIMENSION H.
11. ALL PAD DIMENSIONS ARE THE FINISHED PRODUCT, AFTER ALL FORMS ARE REMOVED.
12. WARNING: DO NOT PULL IN ANY PRIMARY OR SECONDARY WIRES, YOU MUST WAIT FOR THE TRANSFORMER TO BE DELIVERED.

PAD DIMENSIONS

<table>
<thead>
<tr>
<th>TRANSFORMER SIZE-KVA</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>
</tr>
</thead>
<tbody>
<tr>
<td>75-500</td>
<td>8'-6&quot;</td>
<td>7'-3&quot;</td>
<td>12&quot;</td>
<td>13&quot;</td>
<td>16&quot;</td>
<td>42&quot;</td>
<td>24&quot;</td>
<td>12&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>750-1000</td>
<td>9'-0&quot;</td>
<td>7'-8&quot;</td>
<td>12&quot;</td>
<td>18&quot;</td>
<td>10&quot;</td>
<td>42&quot;</td>
<td>30&quot;</td>
<td>12&quot;</td>
<td>24&quot;</td>
</tr>
<tr>
<td>1500-2500</td>
<td>11'-0&quot;</td>
<td>9'-2&quot;</td>
<td>18&quot;</td>
<td>18&quot;</td>
<td>10&quot;</td>
<td>42&quot;</td>
<td>42&quot;</td>
<td>12&quot;</td>
<td>24&quot;</td>
</tr>
</tbody>
</table>

SEE NOTES 1,5,6,8&9

SEE NOTES 1,6,8&10

SEE NOTES 1,6,8&10

SEE NOTE 6

SEE NOTE 6

SEE NOTE 1

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2

SEE NOTE 2
NOTES:
1. SEE FIG. 3 AND SEC. VIII, PAGE 8 OF TEXT FOR ADDITIONAL REQUIREMENTS AND SPECIFICATIONS.
2. TO TRANSFORMER OR EQUIPMENT GROUND PADS.
3. COPPERCLAD GROUND ROD - 5/8" NOMINAL DIAMETER X 8' LONG.
4. WHEN TWO OR MORE PIECES OF EQUIPMENT ARE INSTALLED WITHIN 10 FT. OF EACH OTHER, ALL GROUND GRIDS MUST BE BONDED TOGETHER WITH COMPANY AND N.E.C. APPROVED CONNECTORS.

GROUND CABLE TAILS (6 FT. MIN. ABOVE PAD)
NOTES:
1. SEE FIGS. 3 AND 11 FOR ADDITIONAL REQUIREMENTS AND SPECIFICATIONS.
2. FOLLOW MANUFACTURER'S TERMINATOR INSTRUCTIONS, EXCEPT FOR GROUNDING, INSTALL AS SHOWN.
3. CABLE TO HAVE SUFFICIENT SLACK SUCH THAT THE CABLE TERMINATOR MAY BE INSTALLED ON A STANDOFF BUSHING PLACED IN THE APPROPRIATE PARKING STAND.
4. INSTALL THE TOP ELBOW TIE WRAP PRIOR TO TWISTING CONCENTRIC NEUTRAL, TIGHTEN THE TIE WRAPS WITH ONLY SUFFICIENT TENSION ON THE TIE WRAP TO HOLD THE WIRES IN PLACE. DO NOT OVER-TIGHTEN SUCH AS TO CAUSE DAMAGE TO THE CABLE BY EMBEDDING THE CONCENTRIC WIRES INTO THE SEMI-CONDUCTING JACKET.
5. PRIMARY NEUTRAL, GROUND GRID, HO-XO BUSHING, METAL CONDUIT GROUNDS AND XFMR TANK GROUNDS MUST BE INTERCONNECTED PRIOR TO FINAL INSPECTION.
6. IN ADDITION TO BEING SECURED WITH A PENTA HEAD BOLT, THE SECONDARY COMPARTMENT DOOR IS TO BE LOCKED WITH A SHACKLE LENGTH OF 1 5/8" OR LESS.
7. SECONDARY CONDUIT(S) SIZED TO ACCOMMODATE CUSTOMER REQUIREMENTS.
8. GROUNDING CONDUCTOR REQUIRED FROM EACH GALVANIZED STEEL CONDUIT, IF INSTALLED.
9. INSTALL GRID COORDINATE AND PHASE I.D. TAGS AS PER INSTRUCTION FROM THE COMPANY REPRESENTATIVE.
10. THE RADIUS OF THE BEND IN THE CABLE SHALL NOT BE LESS THAN 12 TIMES THE OVERALL DIAMETER OF THE CABLE.

--- Diagram ---

- High Voltage Urd. Connectors: See Note 2
- Plastic Tie Wrap (Typ.):
- Primary Conductor: See Note 10
- Sch. 40 PVC Conduit: 4" for 15 KV, 6" for 35 KV
- One Strand of the Concentric Neutral
- Cable Sealing Kit
- 1"
- Plastic Tie Wrap: See Note 4
- Wrap This Single Wire Strand 3 Times Around the Braid
- See Note 9
- See Note 3
- See Note 5
- See Note 7
- See Note 6
- Xfmr. Mfr. Instl. Ground Strap (Do Not Remove)
- 2/0 Cu. 1-Hole Comp. Connector: See Note 5
- 2/0 Avg. Cu.
- Servit Post Connector
- #2 Avg. Cu. Min.: See Notes 5 & 8
- To Ground Grid: 2/0 Avg. Cu. Bare - See Fig 5

--- End Diagram ---
NOTES:

1. ON ALL CUSTOMER INSTALLED UNDERGROUND SERVICES (0-34,500 Volts), THE CUSTOMER WILL BE RESPONSIBLE TO TRENCH UP TO THE COMPANY'S DESIGNATED CONNECTION POINT. THE CUSTOMER OR HIS CONTRACTOR WILL MACHINE DIG THE TRENCH TO WITHIN THREE FEET (3') OF THE COMPANIES SERVICE CONNECTION POINT, I.E.: PRIMARY SWITCH, UTILITY TRANSFORMER OR GRADE LEVEL JUNCTION BOX, AND "HAND DIG" THE LAST THREE FEET (3'), EXPOSING THE COMPANY'S SERVICE CONNECTION POINT FOUNDATION. WHEN THE CUSTOMER/CONTRACTOR Installs THE SERVICE IN CONDUIT, THE CONDUIT SHALL BE TERMINATED THREE FEET (3') FROM THE BOTTOM FLANGE OF THE COMPANY'S BOX PAD. ALL CUSTOMERS/CONTRACTORS SHALL HAVE THE EXISTING BELOW GRADE UTILITIES LOCATED AND MARKED BEFORE EXCAVATING: CALL THE APPROPRIATE "CALL BEFORE YOU DIG" NUMBER -FOUND ON PAGE 1.

2. THE CUSTOMER WILL FURNISH (UNLESS OTHERWISE SPECIFIED) AND INSTALL:
   A. THE PRIMARY SERVICE CABLE(S) (LEAVE A 15' COIL, OF EACH CONDUCTOR, AT END OF CUSTOMER RESPONSIBILITY). THE CABLE(S) SHALL BE COILED NEATLY AND LEFT ON TOP OF GROUND FOR THE COMPANY TO COMPLETE THE INSTALLATION. PRIMARY CABLE(S) ARE TO BE AS SPECIFIED IN SECTION IX OF THE TEXT. ALL CABLE ENDS ARE TO HAVE HEAT SHRINK END CAPS INSTALLED.
GENERAL NOTES:
• THE FIBERGLASS TRANSFORMER PAD, SUPPLIED & INSTALLED BY THE CUSTOMER, MUST BE LOCATED BETWEEN 4'-0" & 10'-0" OF THE ACTUAL DRIVEWAY LEADING TO THE HOUSE AND/OR BARN. IT SHALL ALSO BE A MINIMUM DISTANCE OF 10'-0" FROM THE HOUSE AND/OR BARN.
• SEE SECTION V, PAGE 5 OF THE TEXT FOR MORE SPECIFIC RESTRICTIONS ON THE TRANSFORMER LOCATION.
• FOR SERVICES 200 AMP. & SMALLER, THE TRANSFORMER LOCATION MUST NOT BE GREATER THAN 250 FT. FROM THE METER AND PREFERABLY THE MAIN BREAKER.
• FOR SERVICES GREATER THAN 200 AMP., THE TRANSFORMER LOCATION MUST NOT BE GREATER THAN 150 FT. FROM THE METER AND PREFERABLY THE MAIN BREAKER.

SPECIFIED NOTES:
1. LEAVE 15 FT. OF SLACK OF PRIMARY & SECONDARY WIRES TO ENSURE EASE IN DISCONNECTING CABLES. SEAL ALL CABLE ENDS TO PREVENT MOISTURE AND DIRT CONTAMINATION.
2. SECONDARY WIRES MAY ALSO EXIT PAD AT THIS LOCATION.
3. BOX PAD TO BE PLACED ON 6' THICK BED OF SAND. SAND TO EXTEND 4' BEYOND PERIMETER OF BOX PAD.
4. GROUNDING BOND WIRE BETWEEN O&R AND TELEPHONE COMPANY, GROUNDING WIRE IS SUPPLIED BY TELEPHONE COMPANY AND O&RU, INC. MAKES THE CONNECTION.
5. GROUNDING WIRE BETWEEN O&R AND CATV COMPANY, GROUNDING WIRE IS SUPPLIED BY CATV COMPANY AND O&RU, INC. MAKES THE CONNECTION.
6. PRIMARY CABLE SPECIFICATIONS CAN BE FOUND IN SECTION IX OF THE TEXT.
   SPECIFICATIONS FOR CONNECTORS FOR THE PRIMARY WIRE CAN FOUND IN SECTION X OF THE TEXT. ALL CONNECTORS ARE SUPPLIED BY THE CUSTOMER & INSTALLED BY O&R.
7. IF THE AMP WRENCH-LOCK CONNECTION IS TO BE INSTALLED, DO NOT BREAK OFF BOLT HEAD OF CONNECTOR. IF APPLIED CORRECTLY, THE O&R REPRESENTATIVE WILL COMPLETE THE APPLICATION. LEAVE ENTIRE GROUNDING SYSTEM OPEN & EXPOSED FOR O&RU, INC. INSPECTION.
SPCIFICATIONS FOR ELECTRIC INSTALLATIONS

FIBERGLASS TRANSFORMER PAD & GROUND WIRE DETAIL - 15KV & 35KV CLASS

GROUNDING DETAIL

AMP WRENCH-LOC OR CAD WELD CONNECTION 18" BELOW FINAL GRADE (TYP.)

FACE THE SHORT SIDE OF THE BOX TOWARDS THE DRIVEWAY

5/8" X 8'-0" COPPERWELD GROUND ROD (TYP.)

PVC SLEEVE/45° SWEEP

AMP WRENCH-LOC GROUND CONNECTION
SEE NOTE 7

CAD WELD GROUND CONNECTION

FINAL GRADE

WIRING DETAIL

SEE NOTES 1-5

SEE ABOVE GROUNDING DETAIL

SEE NOTE 4

SEE NOTE 5

SEE NOTE 3

PRIMARY WIRE

SECONDARY WIRE

PVC SLEEVE/45° SWEEP
GENERAL NOTES:

- SEE SECTION V, PAGE 5 OF THE TEXT FOR MORE SPECIFIC RESTRICTIONS ON THE
  TRANSFORMER LOCATION.

- FOR SERVICES 200 AMP. & SMALLER, THE TRANSFORMER LOCATION MUST NOT BE
  GREATER THAN 250 FT. FROM THE METER AND PREFERABLY THE MAIN BREAKER.

- FOR SERVICES GREATER THAN 200 AMP., THE TRANSFORMER LOCATION MUST NOT
  BE GREATER THAN 150 FT. FROM THE METER AND PREFERABLY THE MAIN BREAKER.

SPECIFIED NOTES:

1. SEE FIGURES 4 AND 12 FOR ADDITIONAL REQUIREMENTS AND SPECIFICATIONS.

2. LEAVE 10 FT. (AFTER TERMINATING ALL WIRES) OF SLACK TO ENSURE EASE IN DISCONNECTING CABLES.

3. SECONDARY WIRES MAY ALSO EXIT PAD AT THIS LOCATION.

4. BOX PAD TO BE PLACED ON 6" THICK BED OF SAND. SAND TO EXTEND 4" BEYOND PERIMETER OF
   BOX PAD.

5. GROUNDING BOND WIRE BETWEEN D&R AND TELEPHONE COMPANY, GROUNDING WIRE IS SUPPLIED
   BY TELEPHONE COMPANY AND THE CUSTOMER MAKES THE CONNECTION.

6. GROUNDING BOND WIRE BETWEEN D&R AND CATV COMPANY, GROUNDING WIRE IS SUPPLIED BY CATV
   COMPANY AND THE CUSTOMER MAKES THE CONNECTION.

7. PRIMARY NEUTRAL, GROUNDING GRID, X2 BUSHING, TRANSFORMER TANK GROUNDS, TELEPHONE
   COMPANY GROUND (IF PRESENT), AND CATV COMPANY GROUND (IF PRESENT) MUST BE
   INTERCONNECTED PRIOR TO ENERGIZATION.

8. INSTALL PLASTIC TIE WRAP PRIOR TO TWISTING CONCENTRIC NEUTRAL. TIGHTEN
   THE TIE WRAPS WITH ONLY SUFFICIENT TENSION TO HOLD WIRES IN PLACE. DO NOT OVER
   TIGHTEN SUCH AS TO CAUSE DAMAGE TO THE CABLE BY EMBEDDING THE CONCENTRIC WIRES INTO
   THE SEMI-CONDUCTING JACKET.

9. INSTALL GRID COORDINATE TAG AS DIRECTED BY D&R.

10. PRIMARY WIRE SPECIFICATIONS CAN BE FOUND IN SECTION IX, PAGE 9 OF THE TEXT. SPECIFICATIONS
    FOR CONNECTORS FOR THE PRIMARY WIRE CAN BE FOUND IN SECTION X, PAGE 11 OF THE TEXT.
    ALL CONNECTORS ARE SUPPLIED & INSTALLED BY THE CUSTOMER.
NOTES:
1. WIRE BRUSH CONNECTOR ONLY IF:
   a. CONNECTOR IS NOT PLATED.
   b. IN DOUBT AS TO PLATING EXISTANCE.
2. ONE BOLT, ASSOCIATED WASHERS AND NUT ARE REQUIRED FOR EACH HOLE OF A CABLE COMPRESSION CONNECTOR FASTENED TO A FLAT "BUS BAR" (NOTE: ADDITIONAL SET IS REQUIRED FOR CONNECTION SHOWN).

ASSEMBLY SEQUENCE:
A. MATING SURFACES SHOULD BE FLAT, SMOOTH SURFACES FREE OF DIRT AND CONTAMINATION FOR MAXIMUM CURRENT TRANSFER. WIRE BRUSH "BUS" BEFORE ASSEMBLY. (SEE NOTE 1)
B. LUBRICATE MATING SURFACES WITH A THIN COATING OF AN OXIDE INHIBITOR.
C. ASSEMBLE AND TORQUE TO 45 FT. POUNDS.
D. WIPE OFF EXCESS INHIBITOR.
SPECIFICATIONS FOR ELECTRIC INSTALLATIONS

PRIMARY METER BOX INSTALLATION—CUSTOMER INSTALLED

GENERAL NOTES:
- All necessary material shall be supplied & installed by the customer unless otherwise noted.
- All customer installed equipment shall comply with the N.E.C. as well as D&R specifications and requirements.

SPECIFIED NOTES:
1. The meter box (meter devices, cat. no. 507U4163, or approved equivalent), metal conduits and all internal devices with metal cases shall be grounded with #2 AWG stranded copper (tinmed if direct buried) and interconnected to the customer installed 5/8" x 8'-0" copperweld ground rod and D&R's installed ground rod at the base of the pole.
2. Conduit (3/4" & 1 1/2" galv. steel) to extend up pole 10 feet above grade and to be bonded to the D&R ground rod with N.E.C. approved connectors.
3. When applicable, 750kV or greater of diversified load, a telephone co. box and associated equipment must be installed as directed by D&R.
NOTES:

1. INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST COMPANY SPECIFICATIONS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, NFPA 70. THE INSTALLATION SHALL ALSO BE INSPECTED BY THE AUTHORITY HAVING JURISDICTION.

2. IF NOT ALREADY INSTALLED BY THE MANUFACTURER, THE QUALIFIED ELECTRICIAN SHALL INSTALL A #10-24 UNC BOLT TO THE NEUTRAL BLOCK, FOR COMPANY USE.

2A. THE CONDUIT BETWEEN THE C.T. CABINET AND METER SOCKET/TEST SWITCH SHALL BE 11/2" RG5(RIGID GALVANIZED STEEL) CONDUIT, IMC (INTERMEDIATE METAL CONDUIT) OR EMT(ELECTRIC METALLIC TUBING) AND SHALL NOT EXCEED 50 FT. IN LENGTH. PVC OR FLEXIBLE CONDUITS, L.B.'S OR CONDULETS ARE NOT PERMITTED.

3. C.T. METERING CABINET SHALL NOT BE SMALLER THAN 28"H X 30"W X 10"D. C.T.'S ARE SUPPLIED BY D&RU, INC.

4. THE QUALIFIED ELECTRICIAN SHALL SUPPLY & INSTALL ALL COMPANY APPROVED METERING CABINETRY, INCLUDING THE COMBINATION METER SOCKET AND TEST SWITCH. THE CENTER OF THE KWH METER PAN SHALL BE BETWEEN 4-1/2' TO 5-1/2' ABOVE FINAL GRADE. REFER TO "D&RU.COM" WEBSITE FOR THE LATEST LIST OF APPROVED METERING EQUIPMENT. THE KWH METER WILL BE SUPPLIED AND INSTALLED BY THE COMPANY.

5. WIRING FROM THE SECONDARY SIDE OF THE C.T.'S TO THE TEST SWITCH SHALL BE INSTALLED BY THE COMPANY WITH THE SERVICE DE-ENERGIZED.

6. ALL METERING EQUIPMENT TO BE OUTDOORS. CUSTOMER TO SUPPLY AND INSTALL WHERE NECESSARY, PROPER WATER PROOFING ON OR IN THEIR EQUIPMENT.

7. SERVICE CONDUITS MAY ENTER AND EXIT AT THE BOTTOM OF THE C.T. CABINET.
NOTES:

1. INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST COMPANY SPECIFICATIONS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, NFPA 70. THE INSTALLATION SHALL ALSO BE INSPECTED BY THE AUTHORITY HAVING JURISDICTION.

2. IF NOT ALREADY INSTALLED BY THE MANUFACTURER, THE QUALIFIED ELECTRICIAN SHALL INSTALL A #10-24 UNC BOLT TO THE NEUTRAL BUS OR NEUTRAL BLOCK, FOR COMPANY USE.

2A. THE CONDUIT BETWEEN THE C.T. CABINET AND METER SOCKET/TEST SWITCH SHALL BE 1 1/2" RG/SG (RIGID GALVANIZED STEEL) CONDUIT, IMC (INTERMEDIATE METAL CONDUIT) OR EMT (ELECTRIC METALLIC TUBING) AND SHALL NOT EXCEED 50 FT. IN LENGTH. PVC OR FLEXIBLE CONDUITS, L.B.'S OR CONDULETS ARE NOT PERMITTED.

3. THE QUALIFIED ELECTRICIAN SHALL SUPPLY & INSTALL ALL COMPANY APPROVED METERING CABINETRY, INCLUDING THE COMBINATION METER SOCKET AND TEST SWITCH. REFER TO "DRO.COM" WEBSITE FOR THE LATEST LIST OF APPROVED METERING EQUIPMENT. THE KWH METER WILL BE SUPPLIED AND INSTALLED BY THE COMPANY. PRIOR TO ORDERING YOUR METERING CABINET OR SWITCHGEAR WITH A METERING CUBICLE, THE MANUFACTURER SPECIFICATIONS MUST BE APPROVED BY THE COMPANY.

4. WIRING FROM THE SECONDARY SIDE OF THE C.T.'S TO THE TEST SWITCH SHALL BE INSTALLED BY THE COMPANY WITH THE SERVICE DE-ENERGIZED.

5. SERVICE CONDUITS MAY ENTER AND EXIT AT THE BOTTOM OF THE C.T. CABINET.

6. ALL METERING EQUIPMENT TO BE INSTALLED IN ONE LOCATION.

7. DRILL AND TAP 1/4 - 20 N.C. ON THE LINE SIDE OF EACH BUS BAR FOR POTENTIAL TAPS.
SPECIFICATIONS FOR ELECTRIC INSTALLATIONS

METER INSTALLATION FOR 3Ø, 4W SERVICE 120/208 VOLT, SERVICE 1200A AND ABOVE

SEE NOTE 3

KWH METER PANT

SEE NOTE 2A

4'-0"

SEE NOTE 2

TO SOURCE

SEE NOTE 7

SERVICE SWITCH

WHITE DOT (TYP.)

NEUTRAL

Φ1

Φ2

Φ3

208V

208V

120V

120V

120V

120V
NOTES:

1. INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST COMPANY
   SPECIFICATIONS AND THE LATEST EDITION OF THE NATIONAL
   ELECTRICAL CODE, NFPA 70. THE INSTALLATION SHALL ALSO BE
   INSPECTED BY THE AUTHORITY HAVING JURISDICTION.

2. IF NOT ALREADY INSTALLED BY THE MANUFACTURER, THE QUALIFIED
   ELECTRICIAN SHALL INSTALL A #10-24 UNC BOLT TO THE NEUTRAL
   BLOCK, FOR COMPANY USE.

2A. THE CONDUIT BETWEEN THE C.T./V.T. CABINETS AND METER
   SOCKET/TEST SWITCH SHALL BE 11/2" RGS(RIGID GALVANIZED
   STEEL) CONDUIT, IMC (INTERMEDIATE METAL CONDUIT) OR
   EMT(ELECTRIC METALLIC TUBING) AND SHALL NOT EXCEED 50 FT. IN
   LENGTH. PVC OR FLEXIBLE CONDUITS, L.B.'S OR CONDULETS ARE NOT
   PERMITTED.

3. C.T. METERING CABINET SHALL NOT BE SMALLER THAN 28"H X 30"W
   X 10"D. C.T.'S ARE SUPPLIED BY O&RU, INC.

4. V.T. / P.T. METERING CABINET SHALL NOT BE SMALLER
   X 12-1/2"H X 10"D WITH AN INTERNAL 3/4" PLYWOOD BACKING.
   V.T.'S/P.T.'S ARE SUPPLIED BY O&RU, INC.

5. THE QUALIFIED ELECTRICIAN SHALL SUPPLY & INSTALL ALL COMPANY
   APPROVED METERING CABINETRY, INCLUDING THE COMBINATION METER
   SOCKET AND TEST SWITCH. THE CENTER OF THE KWH METER PAN SHALL
   BE BETWEEN 4-1/2' TO 5-1/2' ABOVE FINAL GRADE. REFER TO
   "ORU.COM" WEBSITE FOR THE LATEST LIST OF APPROVED METERING
   EQUIPMENT. THE KWH METER WILL BE SUPPLIED AND INSTALLED BY
   THE COMPANY.

6. WIRING FROM THE SECONDARY SIDE OF THE C.T.'S & V.T./P.T.'S TO
   THE TEST SWITCH SHALL BE INSTALLED BY THE COMPANY WITH THE
   SERVICE DE-ENERGIZED.

7. ALL METERING EQUIPMENT TO BE OUTDOORS.
   WHERE NECESSARY, PROPER WATER PROOFING ON OR IN THEIR
   EQUIPMENT.

   CUSTOMER TO SUPPLY AND INSTALL

8. SERVICE CONDUITS MAY ENTER AND EXIT AT THE BOTTOM OF THE
   C.T. CABINET.
NOTES

1. INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST COMPANY SPECIFICATIONS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, NFPA 70. THE INSTALLATION SHALL ALSO BE INSPECTED BY THE AUTHORITY HAVING JURISDICTION.

2. IF NOT ALREADY INSTALLED BY THE MANUFACTURER, THE QUALIFIED ELECTRICIAN SHALL INSTALL A #10-24 UNC BOLT TO THE NEUTRAL BUS OR NEUTRAL BLOCK, FOR COMPANY USE.

2A. THE CONDUIT BETWEEN THE C.T. CABINET AND METER SOCKET/TEST SWITCH SHALL BE 1 1/2" RGS (RIGID GALVANIZED STEEL) CONDUIT, IMC (INTERMEDIATE METAL CONDUIT) OR EMT (ELECTRIC METALLIC TUBING) AND SHALL NOT EXCEED 50 FT. IN LENGTH. PVC OR FLEXIBLE CONDUITS, L.B.'S OR CONDULETS ARE NOT PERMITTED.

3. THE QUALIFIED ELECTRICIAN SHALL SUPPLY & INSTALL ALL COMPANY APPROVED METERING CABINETRY, INCLUDING THE COMBINATION METER SOCKET AND TEST SWITCH. REFER TO “DRU.COM” WEBSITE FOR THE LATEST LIST OF APPROVED METERING EQUIPMENT. THE KWH METER WILL BE SUPPLIED AND INSTALLED BY THE COMPANY. PRIOR TO ORDERING YOUR METERING CABINET OR SWITCHGEAR WITH A METERING CUBICLE, THE MANUFACTURER SPECIFICATIONS MUST BE APPROVED BY THE COMPANY.

4. DRILL AND TAP 1/4-20NC ON THE LINE SIDE OF EACH BUS BAR FOR THE V.T./P.T. TAPS.


6. SERVICE CONDUIT MAY ENTER AND EXIT AT THE BOTTOM OF THE C.T. CABINET.

7. ALL METERING EQUIPMENT TO BE INSTALLED IN ONE LOCATION.
NOTES:

1. INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST COMPANY SPECIFICATIONS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, NFPA 70. THE INSTALLATION SHALL ALSO BE INSPECTED BY THE AUTHORITY HAVING JURISDICTION.

2. IF NOT ALREADY INSTALLED BY THE MANUFACTURER, THE QUALIFIED ELECTRICIAN SHALL INSTALL A #10-24 UNC BOLT TO THE NEUTRAL BLOCK, FOR COMPANY USE.

2A. THE CONDUIT BETWEEN THE C.T. CABINET AND METER SOCKET/TEST SWITCH SHALL BE 11/2" RG5(RIGID GALVANIZED STEEL) CONDUIT, IMC (INTERMEDIATE METAL CONDUIT) OR EMT(ELECTRIC METALLIC TUBING) AND SHALL NOT EXCEED 50 FT. IN LENGTH. PVC OR FLEXIBLE CONDUITS, L.B.'S OR CONDULETS ARE NOT PERMITTED.

3. C.T. METERING CABINET SHALL NOT BE SMALLER THAN 28"H X 30"W X 10"D. C.T.'S ARE SUPPLIED BY D&RU, INC.

4. THE QUALIFIED ELECTRICIAN SHALL SUPPLY AND INSTALL ALL COMPANY APPROVED METERING CABINETRY, INCLUDING THE COMBINATION METER SOCKET AND TEST SWITCH. THE CENTER OF THE KWH METER PAN SHALL BE BETWEEN 4-1/2' TO 5-1/2' ABOVE FINAL GRADE. REFER TO "D&RU.COM" WEBSITE FOR THE LATEST LIST OF APPROVED METERING EQUIPMENT. THE KWH METER WILL BE SUPPLIED AND INSTALLED BY THE COMPANY.

5. WIRING FROM THE SECONDARY SIDE OF THE C.T.'S TO THE TEST SWITCH SHALL BE INSTALLED BY THE COMPANY WITH THE SERVICE DE-ENERGIZED.

6. ALL METERING EQUIPMENT TO BE OUTDOORS. CUSTOMER TO SUPPLY AND INSTALL WHERE NECESSARY, PROPER WATERPROOFING ON OR IN THEIR EQUIPMENT.

7. SERVICE CONDUIT MAY ENTER AND EXIT AT THE BOTTOM OF THE C.T. CABINET.
DIMENSION FOR GROUPED METERING EQUIPMENT

A. MINIMUM HORIZONTAL AND VERTICAL SPACE BETWEEN METER CENTERS 9'.
B. MINIMUM DISTANCE LOWEST METER CENTER FROM FLOOR OR GRADE LEVEL 30' (OUTDOOR).
C. MAXIMUM DISTANCE HIGHEST METER CENTER FROM FLOOR 72' (INDOOR) AND GRADE LEVEL 72' (OUTDOOR).

NOTES:
1. INSTALLATION TO BE IN ACCORDANCE WITH THE LATEST COMPANY SPECIFICATIONS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, NFPA 70. THE INSTALLATION SHALL ALSO BE INSPECTED BY THE AUTHORITY HAVING JURISDICTION.
2. ALL METER SOCKET ENCLOSURES MUST BE D&RU, INC. APPROVED PRIOR TO PURCHASE. REFER TO 'DRU.COM' WEBSITE FOR THE LATEST LIST OF APPROVED METERING EQUIPMENT.
3. INDIVIDUAL COVERS AND LOCKING PROVISIONS FOR EACH METER SOCKET ARE REQUIRED.
4. A MAIN DISCONNECT SWITCH AND CABLE PULLING SECTION, COMPLETE WITH D&RU, INC. SEAL / LOCKING PROVISIONS, ARE REQUIRED FOR INSTALLATIONS WITH SEVEN (7) OR MORE METER ENCLOSURES.
5. FOR DISCONNECT METHODS FOR UP TO SIX (6) METER SOCKET ENCLOSURES SEE ART. 230-71 OF THE N.E.C.
6. CUSTOMER TO SUPPLY ALL EQUIPMENT. METERS SUPPLIED & INSTALLED BY D&RU, INC.
7. NOT TO BE USED FOR 277/480 VOLT SERVICES UNLESS SPECIFIC APPROVAL IS OBTAINED FROM THE COMPANY.
8. EACH METER MUST BE PERMANENTLY MARKED AS TO THE SPECIFIC PREMISE BEING SERVED.
NOTES:
1. INSTALLATION SHALL BE IN ACCORDANCE WITH THE LATEST COMPANY SPECIFICATIONS AND THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, NFPA 70. THE INSTALLATION SHALL ALSO BE INSPECTED BY THE AUTHORITY HAVING JURISDICTION.
2. ALL METER SOCKET ENCLOSURES TO BE SET LEVEL.
3. THE LINE SIDE CONDUCTORS SHALL BE LOOPED & CONNECTED TO THE TOP TERMINALS OF THE METER SOCKET TO MINIMIZE DAMAGE TO THE CABLE AND STRESS ON THE CONNECTORS.
4. ALL WIRES TO BE IDENTIFIED AT THE CONNECTION POINT AND IN THE METER ENCLOSURE.
5. FOR 277/480 VOLT SERVICES, A NON-FUSIBLE MAIN DISCONNECT MUST BE CONNECTED TO THE ENTRANCE CABLE (LINE SIDE OF METER SOCKET).
6. CUSTOMER TO SUPPLY ALL EQUIPMENT. METER SUPPLIED AND INSTALLED BY D&RU, INC.
7. THE METER SOCKET ENCLOSURE SHALL BE UL LISTED AND APPROVED BY D&RU, INC. REFER TO "DRU.COM" WEBSITE FOR THE LATEST LIST OF APPROVED METERING EQUIPMENT.
8. THE METER SOCKET ENCLOSURE SHALL BE COMPLETE WITH LOCKING JAWS AND A FULL RATED MANUAL BY-PASS SWITCH.
9. THE METER SHALL BE INSTALLED OUTDOORS.