UniSource Energy Services
Kingman
Lake Havasu City

ELECTRIC SERVICE INSTALLATION REQUIREMENTS

Revised June 2010
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INTRODUCTION

Contact the business office of UniSource Energy Services, hereinafter referred to as the “Company”, for questions concerning application of these rules or for electric service requests. Questions can be answered by authorized representatives before customers and contractors purchase equipment or install wiring.

This information is not intended to take the place of the National Electric Code and its contents or to cover all local codes, but to give customers and contractors a guide to Company requirements in order to maintain safety for the workers and the public. The Company’s electric service tariffs provide that the Company may refuse to connect a service or may disconnect an existing service. This would occur when, in the Company’s judgment, the customer’s installation is not in proper operating condition or does not conform to these rules. Service may also be refused or disconnected if the customer’s equipment or use thereof impairs the Company’s equipment or service to other customers.

The characteristics of service the Company supplies in each case depend upon the size, nature and location of the load. These rules are not intended to be restrictive or burdensome, but rather that the requirements as a whole may serve to promote safety and expedite the establishment of electric service.

These rules will be revised or amended from time to time to conform to development and progress in the electrical industry. It is the customer’s and contractor’s responsibility to verify that these rules are still applicable.

Note: For further information concerning electric service requirements, contact your local UniSource electric engineering department.

Kingman: (928) 681-8969
Lake Havasu City: (928) 505-7016

For Billing questions or emergencies: (877) UES-4YOU (877) 837-4968

Santa Cruz County: (520) 761-7951

(See http://www.tep.com/business/Construction/index.asp for Santa Cruz County Electric Service Requirements.)
I. CITY/COUNTY INSPECTIONS

A. **Inside Kingman or Lake Havasu City Limits:** Certain city ordinances prohibit the Company from supplying electric service to a customer until a certificate of inspection and acceptance, or “green tag”, has been issued by the city inspector. Contact the City of Kingman Building department at (928) 753-5561 or the Lake Havasu City Community Development department at (928) 453-4149.

B. **Outside City Limits:** The Mohave County Planning and Zoning department will inspect the service entrance and issue an inspection tag or certificate of acceptance, or “green tag”. Contact the Mohave County Planning and Zoning department at (928) 757-0903.

C. **Manufactured Housing:** All types of manufactured housing inside city limits and all areas outside city limits require an inspection tag or certificate of acceptance, or “green tag”, by the State of Arizona Division of Manufactured Housing and Fire Safety. Contact the State of Arizona Division of Manufactured Housing and Fire Safety at (602) 364-1003.

D. **Inspection Tags:** All inspection tags must be completed and approved by the appropriate authorities before accepted by Company.

II. OVERHEAD SERVICES

A. The usual method of connection from the Company’s distribution system to the customer’s service entrance conductors is by an overhead service drop from the Company’s pole to the customer’s building or service support. A building or other structure shall be supplied by only one service.

B. The Company designates the point of attachment of the service drop on the customer’s building or service support at the most practical location accessible from the Company’s facilities.

C. The point of attachment to a building or service support shall be below the service head (weather head) and so located that the bottom wire of the service drop is not less than the clearances specified in paragraph D of this section, nor more than 25 feet above finish grade. In addition, the attachment shall be so located to provide clearances at the building as follows:
1. Vertical clearance over roofs of buildings, where permitted, with prior approval of the Company. 8 feet

2. Horizontal clearance to building openings such as windows, doors, porches, fire escapes or similar locations. 3 feet

3. Telephone service drop, radio or television lead-in, etc. 2 feet

4. Rainspout, gutter, vent pipe or ventilator opening. 1 foot

D. The bottom wire of a service drop, at the lowest point in the span, shall have the following minimum clearances. If clearances cannot be obtained, the customer may be billed for a mid-span pole:

1. Public roads, streets, alleys, etc. 18 feet

2. Walkway or space accessible to pedestrians only:
   a. When service is not in excess of 150 volts to ground. 12 feet
   b. When service is not in excess of 300 volts to ground. 12 feet

3. Private driveway to residence, garage, or over parking lot, excluding trucks. 12 feet

4. Drive to and over commercial parking lot or areas subject to truck traffic. 18 feet

E. **Swimming Pool Clearance Requirements:** Service drop conductors shall not be installed above a swimming pool or surrounding area extending 10 feet horizontally from the pool edge, diving structure, and observation stands, towers, or platforms. See “Clearance from Pool Structures” service specification “M”, page 26.

F. Where building construction does not lend itself to satisfactory anchorage for the service bracket, the customer shall install additional reinforcement to support the service drop attachment.
G. Service mast shall be rigid metal conduit and have a minimum diameter of 1½ inch. The mast shall not exceed 4 feet or be less than 2 feet above the roof line, except as approved or required by the Company.

III. TEMPORARY AND PERMANENT SERVICE

A. Temporary Construction Service

When a temporary meter for construction purposes is requested, the customer is required to pay the cost of installing and removing the facilities required less salvage value. In instances where the facilities will later be used to supply the permanent service and UniSource can meet the customer’s requested installation date, temporary construction power will be provided at estimated cost. Payment is non-refundable. Permanent service connections will receive priority over temporary service.

B. Service, Temporary or Permanent

The customer shall contribute the entire cost of construction, including the transformers and associated structures. Structures with multiple meters (apartments, condos, etc.) shall have each meter position permanently labeled (not painted). The customer is required to enter into a contract with the Company.

C. Application Changes

The Company reserves the right to charge customers any additional costs incurred by Company when a customer makes changes to the original electric service application without notifying the Company (UniSource Electric Engineering Department in your area) prior to construction. Charges may include costs associated with re-engineering, lost Company construction crew time, and material re-stocking expenses.

IV. UNDERGROUND SERVICE

A. Residential

1. Customer shall provide all trenching and backfilling in accordance with Section 9.D.2.a.(vi) of UNS Electric Inc.’s Tariffs for Electric Service, as filed with the Arizona Corporation Commission.
2. Customer shall provide and install underground service conduit per Company specifications (according to the following and including Specification B, page 15).

3. Conduit size requirements:

**100 AMP and 200 AMP Panels:**
Minimum* 2 ½ inch conduit

*2 ½ inch x 2 inch swedged reducer, bell to plain end, may be used at conduit connection to panel when panel does not accept 2 ½ inch conduit.

**320 AMP and 400 AMP Panels:**
Minimum* 3 inch conduit

*Contact your local UniSource Electric Engineering Department for exact conduit sizes with 320 AMP and 400 AMP applications.

4. All exposed conduit shall be IMC, RMC, or Schedule 80 PVC. IMC and/or RMC below ground level shall be wrapped with protective tape.

5. Conduit run from panel to ground shall be free of bends or sweeps, and the total of all sweeps between outlets shall not exceed 270° or the equivalent of three 90° sweeps. All sweeps shall have a minimum 24 inch radius with no sweeps installed back-to-back.

6. Customer provided conduit connection to Company facilities:

   a. Conduit shall be free of any and all debris. Pull string shall be installed in all conduit runs, and conduit shall be taped or capped.

   b. Conduit runs from Company facilities:

      (1) Customer shall direct trench and conduit to secondary side of Company transformer.

      (2) Customer shall not dig within 2 feet of Company facilities unless Company personnel are present.
(3) Customer shall provide sufficient amount of Schedule 40 conduit, including 90° sweeps with minimum 24 inch radius, to stub into the facility.

7. Trench and conduit shall be inspected by Company prior to backfilling. Customer shall notify Company when ready for inspection and allow Company 2 business days prior to backfill. Backfill material shall be available at time of inspection.

8. Service lines not installed to Company specifications may be subject to a charge for repair or replacement at actual cost incurred, in accordance with Section 9.D.2.a.(vii) of UNS Electric Inc.'s Tariffs for Electric Service, as filed with the Arizona Corporation Commission.

9. Customer shall be responsible for contacting Arizona Blue Stake, Inc. (1-800-STAKE-IT or 1-800-782-5348) and for securing all necessary permits required by local municipalities and/or governing bodies.

B. Commercial


2. Minimum depth of any service is 2 feet with rock-free soil or sand backfill, installed 6 inches above and below the service conduit.

3. All underground secondary, from the Company’s equipment to the service entrance, shall be in conduit.

4. All underground services will be maintained by customer at customer’s expense.

V. OTHER SERVICE REQUIREMENTS

A. Voltages Available

1. For single-phase service, the Company will normally supply 120/240 volts. Other voltages may be available upon request and approval by the Company.

2. The following voltages are available for three-phase service:
a. Four-wire, 120/208 volts.
b. Four-wire, 277/480 volts.
c. Three-phase primary service is available upon request and approval by the Company.
d. Customer shall contact Company prior to project design to determine service voltage availability.

B. Service Panels

All meter and main disconnect device locations require Company approval. The Company will supply the meter, and if necessary, current transformers. Customer will provide and install the meter socket, current transformer cabinet, and a main disconnect. The mounting height of the meter socket shall be between 4 feet and 6 feet. The meter and disconnect shall be located outside the building and accessible to Company personnel. Service panels must be EUSERC approved and meet Company Specifications.

1. The following are available for single-phase, three-wire service:

   a. 120/240 volts
      200 AMPS or under
      4-terminal socket
      NEMA or equivalent

   b. 120/240 volts
      320 AMPS all in one
      with manual bypass (optional)
      4-terminal socket

   c. 120/240 volts
      400 AMPS or over
      6-terminal socket
      CTs furnished by the Company

2. The following are available for three-phase, four-wire service (three-phase, three-wire will not be accepted on new service installations):

   a. 120/208 volts
      200 AMPS or under
      7-terminal socket
b. 120/208 volts over 200 AMPS
   13-terminal socket with test switch, socket and CTs furnished by the Company

c. 277/480 volts 200 AMPS or under
   7-terminal socket

d. 277/480 volts over 200 AMPS
   13-terminal socket with test switch, socket and CTs furnished by the Company

3. Meters marked as Class 400 are not approved in the Kingman or Lake Havasu City Districts of UniSource Energy Services.

4. Unmetered conductors shall not be in the same enclosures as metered conductors.

5. For more information on what service equipment is acceptable or unacceptable, please contact UniSource Energy Services.

C. Multiple Meters at One Location

1. Where the installation requires more than one meter for service to the premises, each meter panel shall be permanently marked (not painted) by the contractor or customer to properly identify the portion of the premises being served.

   The identification shall be the same as the apartment, office, etc. served by that meter socket. The identifying marking placed on each meter panel shall be impressed into or raised from a tab of aluminum, brass, or other approved non-ferrous metal with minimum ¼ inch-high letters. This tag must be riveted to the meter panel. The impression must be deep enough to prevent the identification(s) from being obscured by subsequent painting of the building and attached service equipment.

   The Company may require the assistance of the customer and/or the customer’s contractor to open the apartments at the same time the meters are set, in order to verify that each meter socket actually serves the apartment or the office indicated by the marking tag.
The above taken from the Arizona Corporation Commission’s (ACC) Decision No. 59951, Sheet 16 D.h.

D. Maximum Starting Horsepower:

The maximum starting horsepower allowed across the line is listed below:

1. Single-phase ................................ 10 HP
2. Three-phase .................................. 25 HP

VI. GROUNDING

A. Grounding, Wire and Equipment

1. The customer’s wiring and equipment shall be grounded in accordance with the latest edition of the National Electric Code and any other codes or regulations in effect in the area served.

2. Each service location shall have a ground electrode system. In Lake Havasu City, a 20-foot long section of minimum #4 bare copper imbedded in the building footings or foundation (underground) is the typical ground required by Lake Havasu City building codes.

3. In all other locations, the preferred grounding electrode shall be an 8 foot x 5/8 inches copper or copper-weld rod driven into the ground. A concrete-encased electrode (Ufer ground) is an acceptable alternative where permitted by the appropriate inspecting authority. The grounded service conductor (neutral wire) shall be grounded on the supply side of the service entrance protective equipment by means of a grounded neutral terminal bus.

4. The neutral terminal bus shall be connected to the grounding electrode system by means of a grounding electrode conductor. The grounding electrode conductor shall be sized according to NEC Section 250, but not smaller than #6 copper wire. All service entrance raceways, metal cases of all switches, circuit breakers, or load centers shall be securely bonded and connected to the common ground connection.
VII. TRENCHING REQUIREMENTS – UNISOURCE’S FACILITIES

A. Coordination

Company shall be responsible for coordinating, routing, and inspecting all trenches.

B. Blue Stake and Permits

Customer shall be responsible for contacting Blue Stake (1-800-STAKE-IT or 1-800-782-5348) and for securing all necessary permits required by local municipalities and/or governing bodies.

C. Final Grade

Customer shall establish grade and flag all property corners before Company will survey the job. In addition, easements, alleys, water retention areas, and streets must be graded within 6 inches of finished grade and grade stakes set before Company will begin construction. Customer shall reimburse Company for any costs incurred in adjusting facilities due to change in the final grade.

D. Separations from Obstructions

1. If electric service is to cross over or under an existing underground obstruction, a minimum 12-inch clear vertical separation is required.

2. If electric service is to run parallel to water, sewer, or gas lines, a minimum 60-inch horizontal separation must be maintained unless special permission is granted by Company. Only the above horizontal separation is acceptable; vertical separation is not an acceptable alternative. **Note:** Check with your local city or county codes for possible greater clearances.

E. Trench Bottoms

1. Trench bottoms must be smooth, flat, and without surface irregularities. Otherwise, a sufficient amount of bedding material shall be installed to provide the required surface. The bedding material shall not contain rocks larger than 1½ inch. The bedding material shall contain sufficient materials to fill all voids.
2. Trench bottoms shall be free and clear of debris or any decomposable (organic) material. Any change in the level of the trench bottom shall be made over sufficient distance to provide as gradual a change as possible.

3. When changing elevations with straight conduit sections, a change in elevation of the trench bottom shall not exceed 1 foot in 12 feet.

F. Shading Material

Customer shall provide 6 inches of approved shading material around all electrical conduit. Shading material shall not contain rocks larger than 3/8 inch. Material shall contain enough fines to fill all voids. The soil shall be free of decomposable material. Material shall be supplied in locations at a maximum of every 15 feet along the trench on the opposite side from spoils and no closer than 2 feet from the side of the trench. **Note:** If shading material is not contaminated by spoils, both shading material and spoils may be on the same side of the trench.

G. Backfill

1. Backfill within 6 inches above conduit shall be considered shading material and shall meet the above requirements.

2. Backfill within 6 inches above shading material shall not contain rocks larger than 3 inches in diameter. Trench run material may be used for the remainder of the backfill.

H. Unacceptable Backfill

1. Backfill containing foreign objects such as trash, cans, glass, decomposable material, or lava.

2. Backfill which contains concrete pieces larger than 3 inches in diameter or any asphalt material.

3. Any native soil that will not compact to achieve the required composition level (must have some fines).

4. Any backfill material not conforming to the requirements of the local government agency or other public regulatory agency.
I. Compaction

Backfill shall be compacted to 95% of maximum density as defined by ASTM D-6938 (formerly D-2922 and D-3017). Acceptable compaction methods are hand-tamping with pneumatic or vibrating equipment, and/or jetting or irrigation-style flooding of each backfill lift (each backfill lift not to exceed 12 inches). Vehicular-mounted tamping equipment or wheel rolling is not acceptable. Irrigation-style flooding must be so controlled that soil erosion of the shaded material does not occur in the trench. The Company reserves the right to check soil compaction through the use of a certified laboratory.

J. Inspection of Customer’s Work

Company reserves the right to inspect all and every part of the customer’s work during or after completion of installation of conduit, trenching, trench bottom, shading, backfill, or compaction. If all or any part of the work does not meet Company’s specification, the customer, at customer’s own expense, must make corrections. Company, at the customer’s request, may perform the corrective action at the customer’s expense. Neither inspection of the work by the Company nor lack of same shall relieve customer of customer’s responsibility to provide and perform the work per Company’s specifications.
VIII. **SPECIFICATIONS**

The following pages display specific details for your convenience:

A. Typical Service Trench Detail
B. Residential Underground Service
C. Commercial Underground Service
D. Underground Temporary or Manufactured Home Service Pedestal
E. Overhead Temporary or Manufactured Home Service Pole
F. Residential Overhead Service Conductor Clearances
G. Commercial Overhead Service Conductor Clearances
H. Service Panel Working Space, 600A or less
I. Electric and Gas Meter Separation
J. Distribution Primary and Secondary Trench Detail
K. Current Transformer Cabinet, 600A or less
L. 320 AMP, 120/240V, Three-Wire, Single Phase, Service Panel
M. Clearances from Pool Structures
Company Owned Transformer or Handhole

FINISHED GRADE

24" MIN.

24" MINIMUM

SELECT FILL

MATERIAL NOT TO CONTAIN ROCKS LARGER THAN 3" IN DIAMETER

RATIO OF ROCK TO SOIL NOT TO EXCEED 1:3

6" SHADE (3/8" MINUS OR PLANTING SAND)

ELECTRIC CONDUIT

6" BEDDING (IF REQUIRED, EXTENDS TRENCH DEPTH)

TELEPHONE AND CATV CONDUITS

12" SEPARATION MIN

NOTES:

1. CUSTOMER IS NOT TO DIG WITHIN 2 FEET OF COMPANY TRANSFORMER OR HANDHOLE UNLESS COMPANY PERSONNEL ARE PRESENT.

2. MINIMUM CONDUIT REQUIREMENTS:
   - 100 AMP AND 200 AMP PANELS:
     - ALL DISTANCES 2 1/2" MINIMUM* SCHEDULE 40 PVC
     - * 2 1/2" X 2" SWEDGED REDUCER, BELL TO PLAIN END, MAY BE USED AT CONDUIT CONNECTION TO PANEL WHEN PANEL DOES NOT ACCEPT 2 1/2" CONDUIT.
   - 320 AMP AND 400 AMP PANELS:
     - ALL DISTANCES 3" MINIMUM* SCHEDULE 40 PVC
     - *CONTACT YOUR LOCAL UNISOURCE ENGINEERING DEPARTMENT FOR EXACT CONDUIT REQUIREMENTS FOR 320 AND 400 AMP PANELS.

3. SHADE IS MEASURED FROM TOP OF CONDUIT.
Notes:
1. Customer shall provide and install all trenching, conduit, pull string, shading and backfill per company specifications. Underground service installation must be approved by company prior to backfill.
2. Buried conduit shall be Schedule 40 PVC. Exposed conduit shall be Schedule 80 PVC, intermediate metal conduit (IMC) or rigid metal conduit (RMC/GRC). IMC or RMC below ground level shall be wrapped with protective tape.
3. All sweeps in service run to be a 24 inch radius minimum with a maximum of 3-90° (or equivalent).
4. Water, gas and sewer shall be installed in separate trench.
5. Company will install and maintain underground service cable, provided the initial installation is per company specifications. (See page 5, section IV, A.)
6. Customer shall furnish a means for the meter to be mounted outside of the building, permitting direct access for reading and maintenance. Meter and service location must be approved by company prior to installation.
7. Ground rod not acceptable within Lake Havasu City (LHC) limits. Customer must install minimum of 20ft #4 copper, imbedded in footing (UFER) per LHC building codes.
NOTES:

1. CUSTOMER SHALL PROVIDE AND INSTALL ALL TRENCHING, CONDUIT, PULL STRING, SHADING AND BACKFILL PER COMPANY SPECIFICATIONS. UNDERGROUND SERVICE INSTALLATION MUST BE APPROVED BY COMPANY PRIOR TO BACKFILL.

2. CUSTOMER SHALL FURNISH AND INSTALL THE SERVICE CABLE AND CONDUIT. COMPANY WILL MAKE ALL TRANSFORMER CONNECTIONS. CUSTOMER SHALL RETAIN OWNERSHIP OF THE SERVICE LINE AND SHALL MAINTAIN THE LINE AT NO COST TO COMPANY.

3. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC. EXPOSED CONDUIT SHALL BE SCHEDULE 80 PVC, INTERMEDIATE METAL CONDUIT (IMC) OR RIGID METAL CONDUIT (RMC/GRC). IMC OR RMC BELOW GROUND LEVEL SHALL BE WRAPPED WITH PROTECTIVE TAPE.

4. ALL SWEEPS IN SERVICE RUN TO BE A 24 INCH RADIUS MINIMUM WITH A MAXIMUM OF 3-90° (OR EQUIVALENT).

5. WATER, GAS AND SEWER SHALL BE INSTALLED IN SEPARATE TRENCH.

6. IF NECESSARY, CUSTOMER SHALL FURNISH (IN ACCORDANCE WITH COMPANY'S SPECIFICATIONS) TRANSFORMER PAD (POURED IN PLACE) AND TRAFFIC BARRIERS TO PROTECT COMPANY FACILITIES.

7. CUSTOMER SHALL FURNISH A MEANS FOR THE METER TO BE MOUNTED OUTSIDE OF THE BUILDING, PERMITTING DIRECT ACCESS FOR READING AND MAINTENANCE. METER AND SERVICE LOCATION MUST BE APPROVED BY COMPANY PRIOR TO INSTALLATION.

8. GROUND ROD NOT ACCEPTABLE WITHIN LAKE HAVASU CITY (LHC) LIMITS. CUSTOMER MUST INSTALL MINIMUM OF 20FT #4 COPPER, IMBEDDED IN FOOTING (UFER) PER LHC BUILDING CODES.
3. Within LHC, 3/4" L.T. FLEX conduit is acceptable for temporary construction poles per LHC building codes.

NOTES:

1. Temporary pole to be set no further than 4 feet from transformer or junction box (handhole). Company to determine which transformer or handhole shall feed service pole. A sufficient coil of wire to reach the secondary terminals of the transformer must be left.

2. All wires and equipment shall be per N.E.C. and local codes.

CAUTION

Before setting pole, notify Blue Stake at 1-800-STAKE-IT.
UniSource Energy Services
ELECTRIC SERVICE INSTALLATION REQUIREMENTS

SERVICE DROP ATTACHMENT BY COMPANY

COMPANY SERVICE DROP

MINIMUM 20' CLASS 6 PRESSURE TREATED WOOD POLE

SERVICE ENTRANCE WIRING IN RIGID METAL CONDUIT

RAIN TIGHT SERVICE PANEL
APPLICABLE VOLTAGE - 120/240V, 3 WIRE SINGLE PHASE ONLY

GFCI OUTLET BOX

SCHEDULE 80 PVC, RIGID METAL CONDUIT (RMC/GRC), OR INTERMEDIATE METAL CONDUIT (IMC)

#3 (400A), #4 (200A), #6 (100A) COPPER GROUNDWIRE

N.E.C. APPROVED TYPE GROUND CLAMP AND 8' X 5/8" OR LARGER COPPER WELD GROUND ROD, DRIVEN TO A DEPTH OF 8'

NOTES:
1. OTHER STATE AND/OR LOCAL CODES MAY APPLY.
2. OVERCURRENT DEVICE (FUSE OR BREAKER) TO CONFORM TO N.E.C.

REVISIONS
REVISIONS DATE APPROVED NAME
MANUFACTURED HOME SERVICE POLE
OVERHEAD TEMPORARY OR E

10' MINIMUM
MINIMUM HEIGHT 15'

SCHEDULE 80 PVC, RIGID METAL CONDUIT (RMC/GRC), OR INTERMEDIATE METAL CONDUIT (IMC)

#3 (400A), #4 (200A), #6 (100A) COPPER GROUNDWIRE

N.E.C. APPROVED TYPE GROUND CLAMP AND 8' X 5/8" OR LARGER COPPER WELD GROUND ROD, DRIVEN TO A DEPTH OF 8'

NOTES:
1. OTHER STATE AND/OR LOCAL CODES MAY APPLY.
2. OVERCURRENT DEVICE (FUSE OR BREAKER) TO CONFORM TO N.E.C.
THESE MINIMUM CLEARANCES APPLY TO THE LOWEST POINT OF SERVICE DROP SAG.
<table>
<thead>
<tr>
<th>AREA ACCESSIBLE TO PEDESTRIANS ONLY</th>
<th>COMMERCIAL DRIVESWAYS, PARKING LOTS AND OTHER AREAS SUBJECT TO TRUCK TRAFFIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>12' MIN.</td>
<td>18' MIN.</td>
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<tr>
<td>18' MIN.</td>
<td>18' MIN.</td>
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</tbody>
</table>

**MINIMUM CLEARANCES APPLY TO THE LOWEST POINT OF SERVICE DROP SAG**

**FIGURE 1**

**FIGURE 2**

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<table>
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<tr>
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<th>DATE</th>
<th>NAME</th>
<th>APPROVED</th>
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</thead>
<tbody>
<tr>
<td>TITLE CHANGE</td>
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<td>GMK</td>
<td>RAC</td>
</tr>
</tbody>
</table>

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**COMMERCIAL SERVICE SPECIFICATIONS**

**COMMERCIAL OVERHEAD CLEARANCES**

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20
NOTES:
1. TO PERMIT ACCESS TO THE METERING INSTALLATION AND PROVIDE SAFETY FOR PERSONNEL, A LEVEL AND OBSTRUCTION FREE WORKING AND STANDING SPACE (ENTIRELY ON THE CUSTOMER'S PROPERTY) SHALL BE PROVIDED IN FRONT OF ALL METERING EQUIPMENT.
2. PANEL DOORS SHALL OPEN COMPLETELY AND WITHOUT OBSTRUCTION IN ALL RECESSED PANEL INSTALLATIONS.
ELECTRIC AND GAS PANEL

36" MIN

48" MIN

72" MAX

36" MIN

36" MIN

NOTES:
1. SIZE AND DIMENSIONS OF PANELS WILL VARY.
2. MAINTAIN 3’ CLEAR AND LEVEL WORKING SPACE IN FRONT OF ELECTRIC METERS
NOTES:
1. OSHA STANDARDS FOR TRENCHING MUST BE MET.
2. CUSTOMER IS RESPONSIBLE FOR ALL TRENCHING, SHADING, COMPACTION AND BACKFILL.
3. WATER, GAS AND SEWER LINES MUST BE IN A SEPARATE TRENCH OR MAINTAIN A MINIMUM 5 FOOT SEPARATION.
4. COMPANY SHALL INSPECT TRENCH PRIOR TO BACKFILL.
5. CUSTOMER TO ENSURE SHADING IS TO COMPANY SPECIFICATIONS AND WARNING TAPE IS INSTALLED AT PROPER DEPTH AND HAND SHADED PRIOR TO BACKFILL.
6. IF ONLY SECONDARY CABLE IS TO BE INSTALLED, TRENCH DEPTH MAY BE REDUCED TO 42".
NOTES:
1. THE TRANSFORMER CABINET SHALL BE FURNISHED AND MOUNTED BY THE CUSTOMER AND HAVE THE FOLLOWING MINIMUM DIMENSIONS:
   1.A. SINGLE PHASE, 11" X 24" X 36" AND BE EQUIVALENT TO "CIRCLE A-W" CATALOG # 243011RTCT
   1.B. THREE PHASE, 11" X 36" X 36" AND BE EQUIVALENT TO "CIRCLE A-W" CATALOG # 363611RTCT
2. THE TRANSFORMER SHALL BE GROUNDED BY THE CUSTOMER PER THE N.E.C. REQUIREMENTS.
3. THE REMOVABLE COVER PANEL SHALL BE SECURED TO THE CABINET WITH A MINIMUM OF SIX CAPTIVE SCREWS WITH TWO BOLTS AND SEALABLE WING NUTS AT THE BASE OF THE CABINET. THE COVER PANEL SHALL HAVE TWO HANDLES FOR SAFE HANDLING AND AN ATTACHED LABEL STATING "DO NOT REMOVE, NO FUSES INSIDE".
4. THE TRANSFORMER CABINET SHALL HAVE A C.T. MOUNTING BASE EQUIVALENT TO "CIRCLE A-W" CATALOG # 6019A FOR SINGLE PHASE APPLICATION AND CATALOG # 6067A FOR THREE PHASE APPLICATIONS. THE CURRENT TRANSFORMERS WILL BE FURNISHED AND MOUNTED BY COMPANY.
5. CUSTOMER CABLES ARE TO BE IDENTIFIED AS TO PHASE, WILD LEG, NEUTRAL AND GROUND.
6. CUSTOMER SHALL PROVIDE CABLE TERMINAL LUGS AND TERMINATE THE CABLES TO THE CURRENT TRANSFORMER MOUNTING BASE.
7. THE METER SOCKET WILL BE FURNISHED BY COMPANY AND MOUNTED BY CUSTOMER. THE SOCKET CAN BE MOUNTED ON EITHER THE LEFT OR RIGHT SIDE AND SHALL BE BETWEEN 5 AND 6 FEET FROM ABOVE GROUND LEVEL. THE SOCKET WILL HAVE ACCESS TO THE TRANSFORMER CABINET THROUGH A MINIMUM 1" X 3" SIZE GALVANIZED CONDUIT OR A MINIMUM 1" SIZE OFFSET NIPPLE.
8. CUSTOMER MUST HAVE UNS METERING APPROVAL PRIOR TO INSTALLATION IF CONDUIT RUN FROM CT CABINET TO METER SOCKET IS GREATER THAN 75 FEET IN LENGTH.
9. INSTALLATIONS WILL BE INSPECTED AND APPROVED BY A COMPANY REPRESENTATIVE BEFORE THE SERVICE IS CONNECTED.
NOTES:

1. THIS SERVICE EQUIPMENT SHALL MEET EUSERC APPROVAL, BE LISTED BY AN APPROVED TESTING LABORATORY, AND MARKED WITH A CONTINUOUS AMPERE RATING OF 320 AMPERES. ALTERNATIVELY, IT MAY BE MARKED "400 AMPS (320 AMPERES CONTINUOUS)."

2. BOTH RING AND RINGLESS TYPE SOCKETS ARE ACCEPTABLE. RINGLESS TYPE SOCKET COVER PANELS SHALL BE REMOVABLE, SEALABLE AND RAINPROOF.

3. THE METER SOCKET MAY BE LOCATED ABOVE, TO THE LEFT, OR TO THE RIGHT OF THE UNDERGROUND PULL SECTION.

4. MANUAL BYPASS PROVISIONS WHICH DE-ENERGIZE THE METER SOCKET ARE PREFERRED BUT NOT REQUIRED. (AUTOMATIC BYPASSES ARE UNACCEPTABLE)

5. CUSTOMER-OWNED WIRING EXTENDING FROM THE DISTRIBUTION SECTION (BRANCH CIRCUITS) SHALL NOT PASS THROUGH ANY SECTION SEALED BY UES OR SERVICE PROVIDER.

6. PULL SECTION COVER PANELS SHALL BE REMOVABLE, SEALABLE, PROVIDED WITH TWO LIFTING HANDLES, AND LIMITED TO A MAXIMUM SIZE OF 9 SQUARE FEET IN AREA. SEALING PROVISIONS SHALL CONSIST OF TWO DRILLED STUD AND WING NUT ASSEMBLIES ON OPPOSITE SIDES OF THE PANELS. ALL SECURING SCREWS SHALL BE CAPTIVE.

7. TERMINAL CONNECTORS WITH A CONNECTOR RANGE OF #1/0 AWG-350 KCML SHALL BE PROVIDED.

8. RESIDENTIAL AND COMMERCIAL SERVICES GREATER THAN 320 A WILL REQUIRE TRANSFORMER (CT) RATED SERVICE PANELS.

9. UNDERGROUND SERVICE WIRE (NORMALLY INSTALLED BY UES) SHALL BE ROUTED IN SUCH A MANNER AS NOT TO INTERFERE WITH MANUAL BYPASS FACILITIES.
### Clearance Parameters

<table>
<thead>
<tr>
<th></th>
<th>Insulated Cables, 0-750 Volts to Ground, Supported on and Cabled Together with a Solidly Grounded Bare Messenger or Solidly Grounded Neutral Conductor</th>
<th>All Other Conductors Voltage to Ground</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>ft</td>
<td>0 through 15 kV</td>
</tr>
<tr>
<td>A. Clearance in any direction to the water level, edge of water surface, base of diving platform, or permanently anchored raft</td>
<td>22.5</td>
<td>25</td>
</tr>
<tr>
<td>B. Clearance in any direction to the observation stand, tower, or diving platform</td>
<td>14.5</td>
<td>17</td>
</tr>
<tr>
<td>C. Horizontal limit of clearance measured from inside wall of the pool</td>
<td>This limit shall extend to the outer edge of structures listed in A and B of this table but not less than 10 feet.</td>
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