# UPGRADE RESIDENTIAL AND COMMERCIAL QUICK INFORMATION REFERENCE

# PROVO CITY POWER STANDARDS

**ELECTRICAL ENGINEERING** 

UPDATED: 2015

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTIFICATION.





# ELECTRICAL SERVICE UPGRADE INFORMATION (RESIDENTIAL/COMMERCIAL)

PRE-INSPECTIONS REQUIRED ON ALL SERVICE UPGRADES.

PERMIT APPLICATION FOR ELECTRICAL SERVICE UPGRADE MUST BE COMPLETED BY OWNER/CONTRACTOR PRIOR TO PRE-INSPECTION OF ELECTRICAL SERVICE UPGRADE. ALL SERVICE UPGRADES REQUIRE A PRE-INSPECTION.

ALL ELECTRICAL SERVICE UPGRADE INSTALLATIONS SHALL MEET PROVO CITY POWER / BUILDING INSPECTION SERVICE SPECIFICATIONS, NATIONAL ELECTRICAL CODE AND NATIONAL ELECTRICAL SAFETY CODE LATEST REVISIONS.

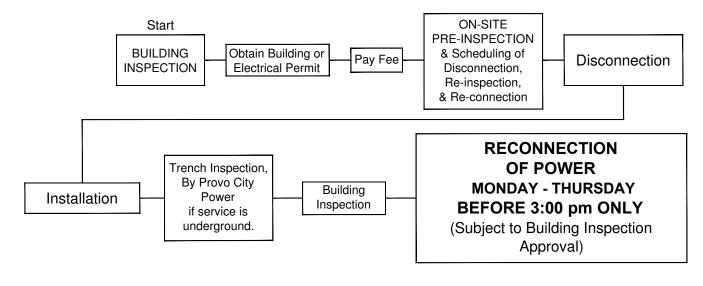
ADDRESS SHALL BE POSTED AT BUILDING SITE.

METER & SERVICE LOCATIONS ARE TO BE DETERMINED BY PROVO CITY POWER. (SEE ATTACHMENT TO JOB COPY DRAWINGS). GENERAL RULES FOR THE SERVICE LOCATION ARE AS FOLLOWS: THE METER AND MAIN DISCONNECT SHALL BE SETBACK FROM THE FRONT CORNER OF THE STRUCTURE A MAXIMUM OF 12'. THE METER & MAIN DISCONNECT SHALL BE ON THE SIDE OF THE STRUCTURE CLOSEST TO THE DISTRIBUTION POWER SOURCE INTENDED FOR THAT SITE.

ALL SERVICE UPGRADES NOT CONFORMING TO CURRENT PROVO CITY POWER / BUILDING INSPECTION STANDARDS SHALL BE DENIED. LINE SIDE JUNCTION BOXES AND ELECTRICAL GUTTERS ARE NOT ALLOWED. ALL UNUSED ELECTRICAL EQUIPMENT SHALL BE REMOVED.

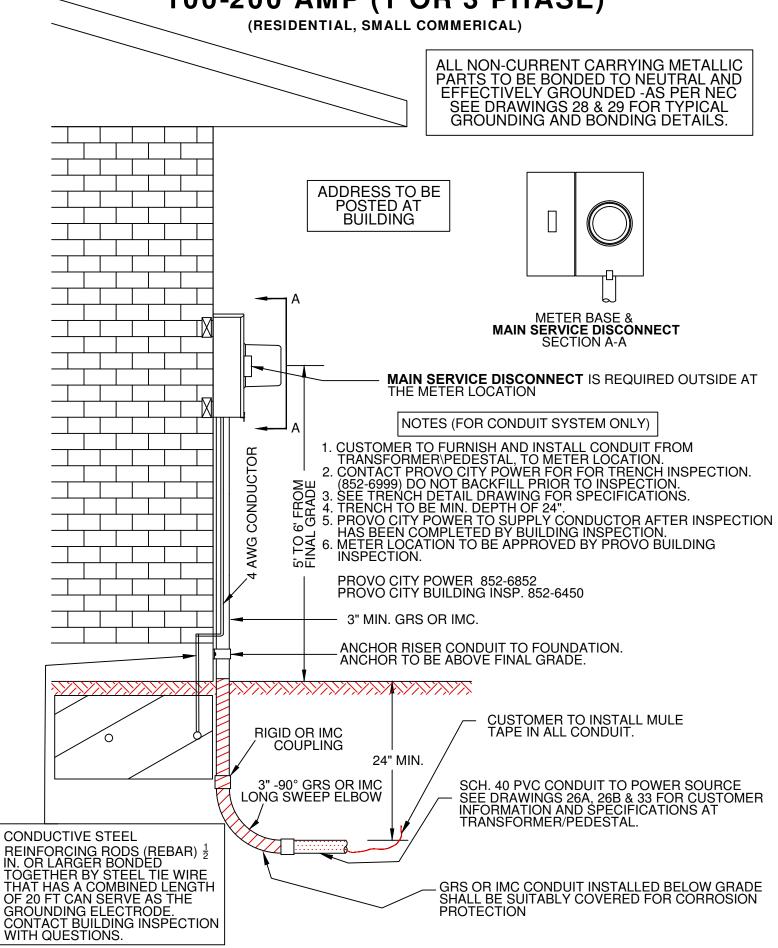
ALL UNDERGROUND TRENCHES SHALL BE INSPECTED BY PROVO CITY POWER. CALL 852-6999 FOR INSPECTIONS. PROVO BUILDING INSPECTION TO ISSUE FINAL ELECTRICAL CONNECTION APPROVAL CALL 852-6450 FOR INSPECTION.

NOTE: CHECK WITH BUILDING INSPECTION ABOUT LABELING EACH OUTSIDE METER BASE AS WELL AS EACH INSIDE BREAKER PANEL WITH A PERMANENT LABEL.





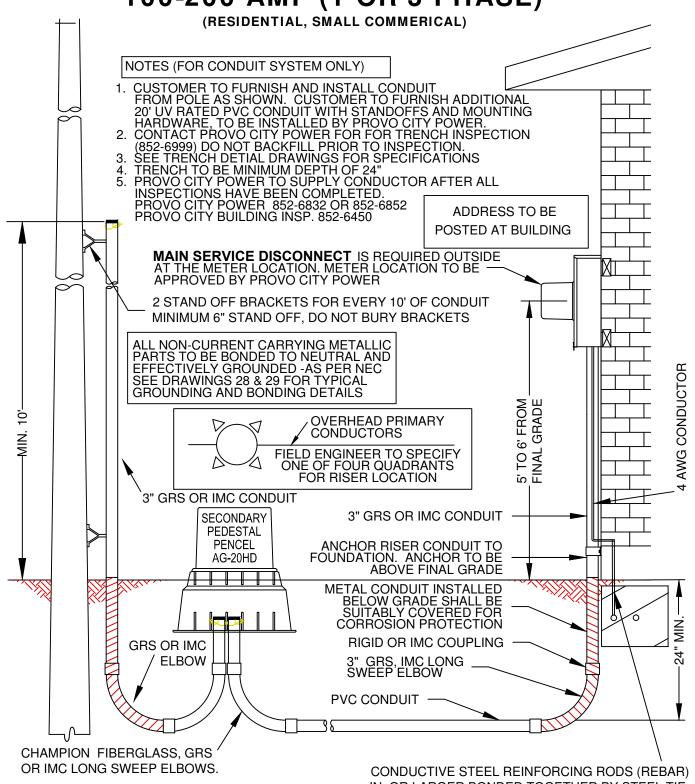
# UNDERGROUND SERVICE INSTALLATION 100-200 AMP (1 OR 3 PHASE)







# OVERHEAD TO UNDERGROUND SERVICE INSTALLATION 100-200 AMP (1 OR 3 PHASE)



CUSTOMER TO INSTALL MULE TAPE IN CONDUIT WITH 24" LEAD AT BOTH ENDS. CAP AND/OR TAPE ALL CONDUIT OPENINGS WITH MULE TAPE LEADS SHOWING.

CONDUCTIVE STEEL REINFORCING RODS (REBAR) 1/2 IN. OR LARGER BONDED TOGETHER BY STEEL TIE WIRE THAT HAS A COMBINED LENGTH OF 20 FT CAN SERVE AS THE GROUNDING ELECTRODE. CONTACT BUILDING INSPECTION WITH QUESTIONS.

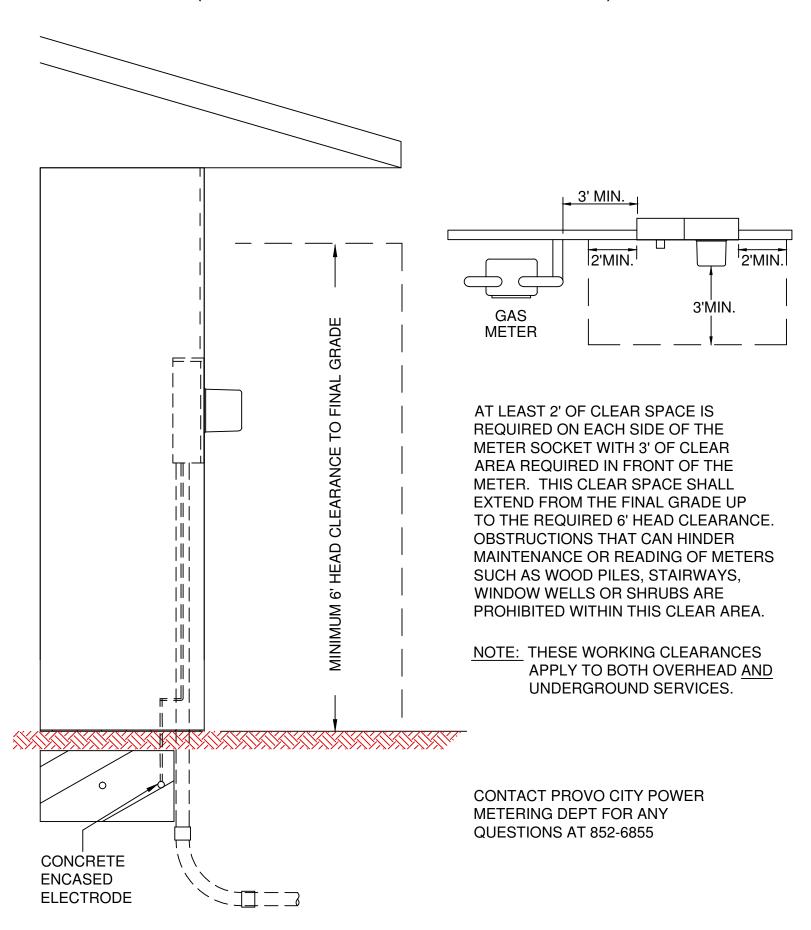


DRAWING: DWG-03B REVISED 25-ARP-2013

# **STANDARDS**

# UNDERGROUND RESIDENTIAL RECESSED METER SERVICE

(AND REQUIRED RESIDENTIAL WORKING CLEARANCES)

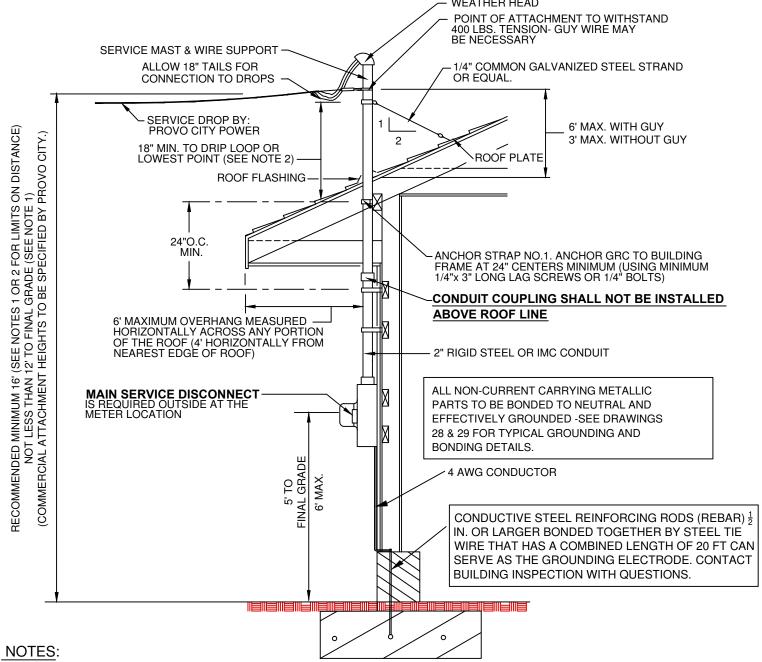






# TYPICAL RESIDENTIAL\SMALL COMMERICAL 1 PHASE OVERHEAD SERVICE

(200 AMP MAX. FOR OVERHEAD SERVICE)

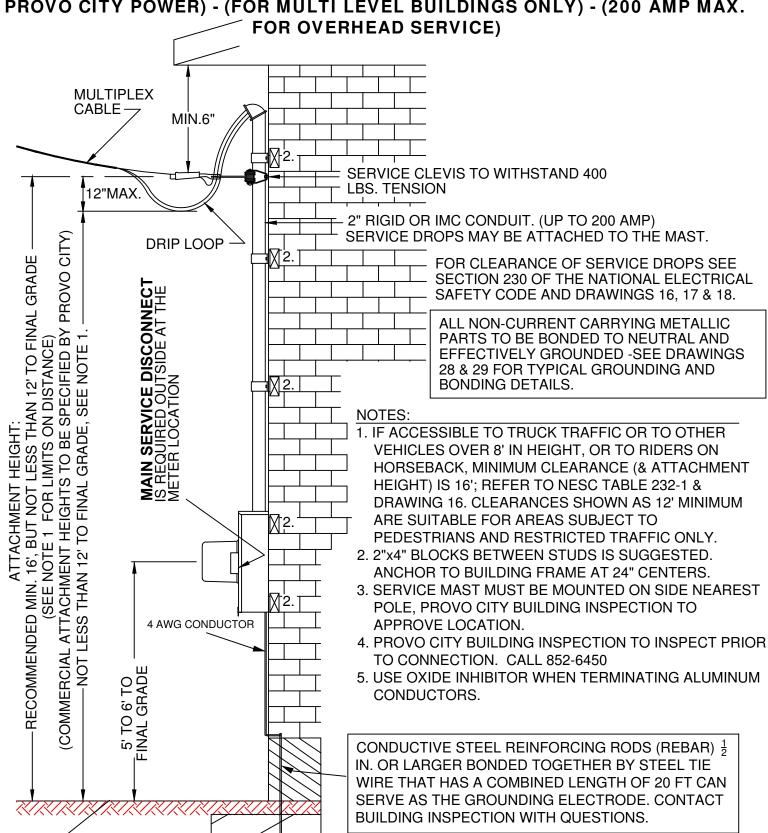


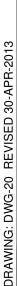
- 1. IF ACCESSIBLE TO TRUCK TRAFFIC, TO OTHER VEHICLES OVER 8' IN HEIGHT, OR TO RIDERS ON HORSEBACK, MINIMUM ATTACHMENT HEIGHT IS 16'; REFER TO NESC TABLE 232-1 & DRAWING 16.
- 2. IF THE SERVICE IS CROSSING THE ROOF FOR MORE THAN 6' HORIZONTALLY IN ANY DIRECTION, OR MORE THAN 4' HORIZONTALLY FROM THE NEAREST EDGE OF THE ROOF, REFER TO NESC 234C3 & DRAWING 17 FOR THE APPROPRIATE CLEARANCE:
- 3. FOR CLEARANCE OF SERVICE DROPS, SEE SECTION 230 OF THE NESC AND DRAWINGS 16, 17 & 18.
- 4. SERVICE MAST MUST BE MOUNTED ON SIDE NEAREST POLE, PROVO CITY BUILDING INSPECTION TO APPROVE LOCATION.
- 5. PROVO CITY BUILDING INSPECTION TO INSPECT PRIOR TO CONNECTION. CALL 852-6450
- USE OXIDE INHIBITOR WHEN TERMINATING ALUMINUM CONDUCTORS.



# TYPICAL RESIDENTIAL UNDER EAVES SERVICE INSTALLATION

(THIS IS A NON-STANDARD INSTALLATION AND REQUIRES APPROVAL BY PROVO CITY POWER) - (FOR MULTI LEVEL BUILDINGS ONLY) - (200 AMP MAX.

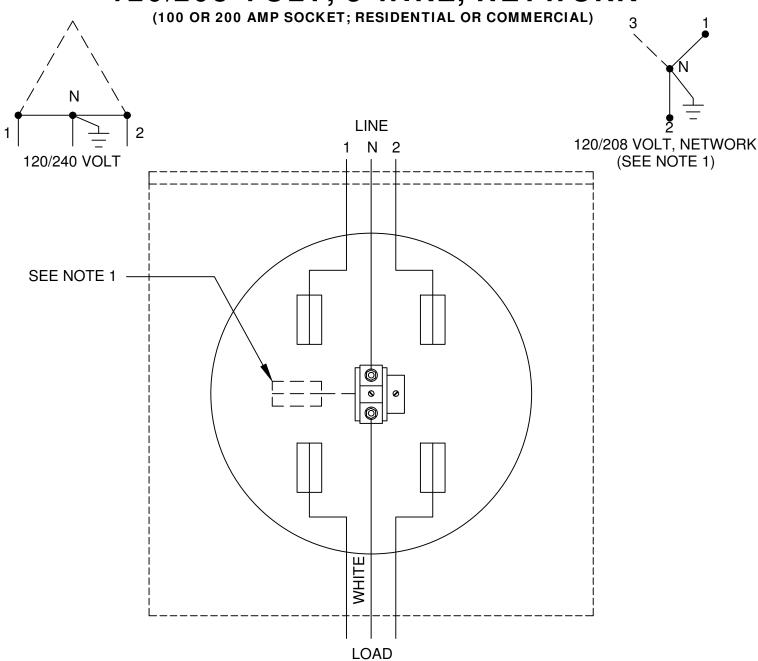






# METER SOCKET WIRING DIAGRAM SINGLE PHASE, 3 WIRE, 120/240 VOLT OR

120/208 VOLT, 3 WIRE, NETWORK



# NOTES:

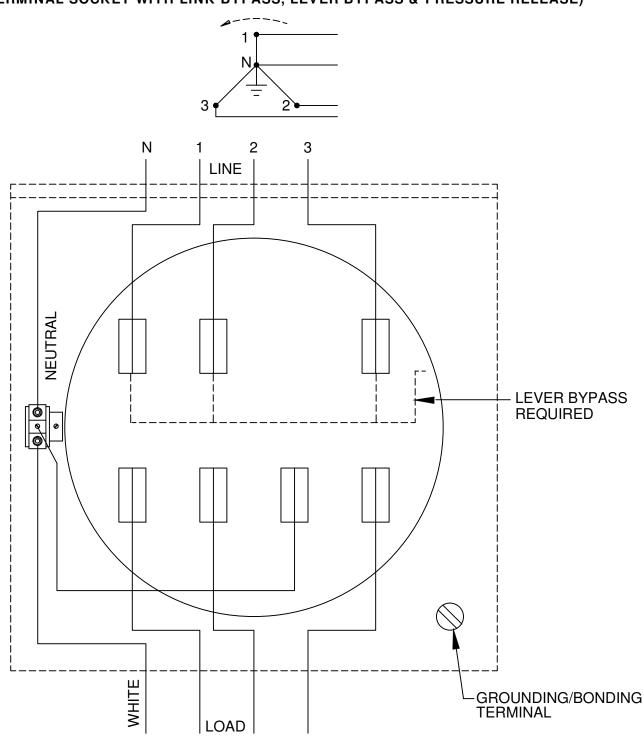
- 1. A FIFTH TERMINAL (STINGER) IS REQUIRED FOR 120/208 VOLT SERVICE.
- 2. WIRE SIZE RANGE:
  - 2.1 100 AMP SOCKET: LUGS SUITABLE FOR #6 #2/0 STRANDED CU/AL CONDUCTORS.
  - 2.2 200 AMP SOCKET: LUGS SUITABLE FOR #2 350 KCMIL CU/AL CONDUCTORS.
- 3. APPROXIMATE DIMENSIONS:
  - 3.1 100 AMP SOCKET: 3-5/16"(D) X 8"(W) X 11-1/2"(H).
  - 3.2 200 AMP SOCKET: 4-3/8"(D) X 11"(W) X 15-1/2"(H).
- 4. CONTACT PROVO CITY POWER AT 852-6952 FOR SERVICE VOLTAGE INFORMATION.





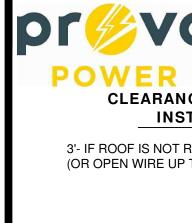
# METER SOCKET WIRING DIAGRAM THREE PHASE, 4 WIRE WYE DELTA 120/240, 120/208, 240/480, 277/480 VOLT

(200 AMP, 7 TERMINAL SOCKET WITH LINK BYPASS, LEVER BYPASS & PRESSURE RELEASE)

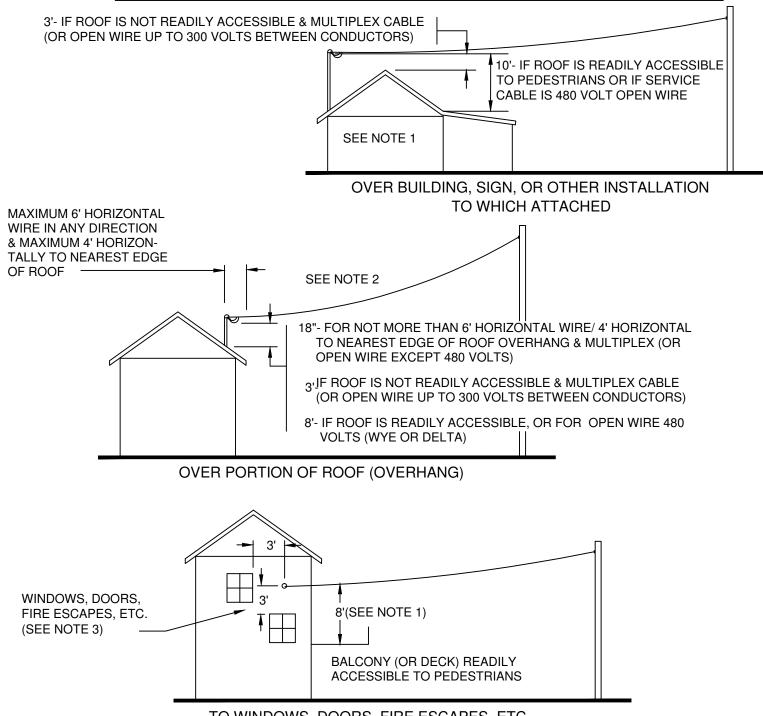


# NOTES:

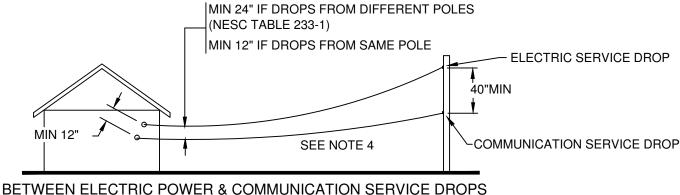
- 1. WIRE SIZE RANGE: LUGS SUITABLE FOR #2 350 kcmil Cu/Al CONDUCTORS.
- 2. APPROXIMATE DIMENSIONS: 5"(D) x 13"(W) x 19"(H).
- 3. METER SOCKET SHALL HAVE BYPASS. (LINK OR MANUAL)
- 4. KNOCKOUTS: THREE ON BOTTOM AND ONE EACH ON BOTH SIDES AND BACK; KNOCKOUTS ARE CONCENTRIC TYPE WITH A MAXIMUM DIAMETER OF 3".
- 5. FOR OVERHEAD SERVICES, METER SOCKETS ARE FURNISHED WITH A HUB SIZED AS NEEDED; AVAILABLE HUB SIZES ARE  $1-\frac{1}{4}$ ",  $1-\frac{1}{2}$ ", 2" AND  $2-\frac{1}{2}$ ".



CLEARANCES OF 600 VOLT SERVICE DROPS TO BUILDINGS, SIGNS, AND OTHER INSTALLATIONS TO WHICH ATTACHED (NESC RULE 234C3 & 235C1)



TO WINDOWS, DOORS, FIRE ESCAPES, ETC.



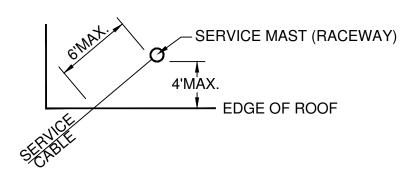


CLEARANCES OF 600 VOLT SERVICE DROPS TO BUILDINGS, SIGNS, AND OTHER INSTALLATIONS TO WHICH ATTACHED (NESC RULE 234C3 & 235C1)

SERVICE DROP CONDUCTORS SHALL NOT BE READILY ACCESSIBLE.

### NOTES:

- 1. IF A ROOF OR BALCONY IS NOT READILY ACCESSIBLE TO PEDESTRIANS AND THE SERVICE CABLE IS MULTIPLEX (UP TO 600 VOLTS) OR IS INSULATED OPEN WIRE (UP TO 300 VOLTS BETWEEN CONDUCTORS, I.E. NOT INCLUDING 480 VOLT WYE OR DELTA), THE CLEARANCE MAY BE A MINIMUM OF 3 FEET PER NESC 234C3d(1) EXCEPTION 1. (NEC 230-24 ALSO REQUIRES 3' MINIMUM FOR UP TO 300 VOLTS BETWEEN CONDUCTORS AND A ROOF SLOPE OF AT LEAST 4" IN 12" TO BE CONSIDERED NOT ACCESSIBLE TO PEDESTRIANS.) NESC DEFINES A ROOF OR BALCONY READILY ACCESSIBLE TO PEDESTRIANS IF IT CAN BE CASUALLY ACCESSED THROUGH A DOORWAY, WINDOW, RAMP, STAIRWAY, OR PERMANENT LADDER (WITH ITS BOTTOM RUNG LESS THAN 8' FROM GROUND OR FROM PERMANENT ACCESSIBLE SURFACE) BY A PERSON, ON FOOT, WHO NEITHER EXERTS EXTRAORDINARY PHYSICAL EFFORT NOR EMPLOYS SPECIAL TOOLS OR DEVICES TO GAIN ENTRY. NESC SHALL GOVERN FROM THE UTILITY'S POLE TO THE DRIP LOOP AT THE CUSTOMER'S SERVICE ENTRANCE; NEC SHALL GOVERN FROM THAT DRIP LOOP INTO THE BUILDING.
- 2. WHERE NOT MORE THAN 6 FEET (MEASURED HORIZONTALLY) OF A SERVICE DROP PASSES OVER A ROOF TO TERMINATE AT A (THROUGH-THE-ROOF) SERVICE RACEWAY OR APPROVED SUPPORT LOCATED NOT MORE THAN 4' MEASURED HORIZONTALLY FROM THE NEAREST EDGE OF ROOF AND THE CABLE IS EITHER MULTIPLEX (UP TO 600 VOLTS), OR IS INSULATED OPEN WIRE (UP TO 300 VOLTS BETWEEN CONDUCTORS, I.E. NOT INCLUDING 480 VOLT WYE OR DELTA), THE CLEARANCE ABOVE THE ROOF MAY BE A MINIMUM OF 18". SEE THE PLAN VIEW SKETCH BELOW. (NEC 230-24 ALLOWS THE SAME 18" CLEARANCE FOR SERVICES UP TO 300 VOLTS BETWEEN CONDUCTORS AND SIMILAR OVERHANG.)



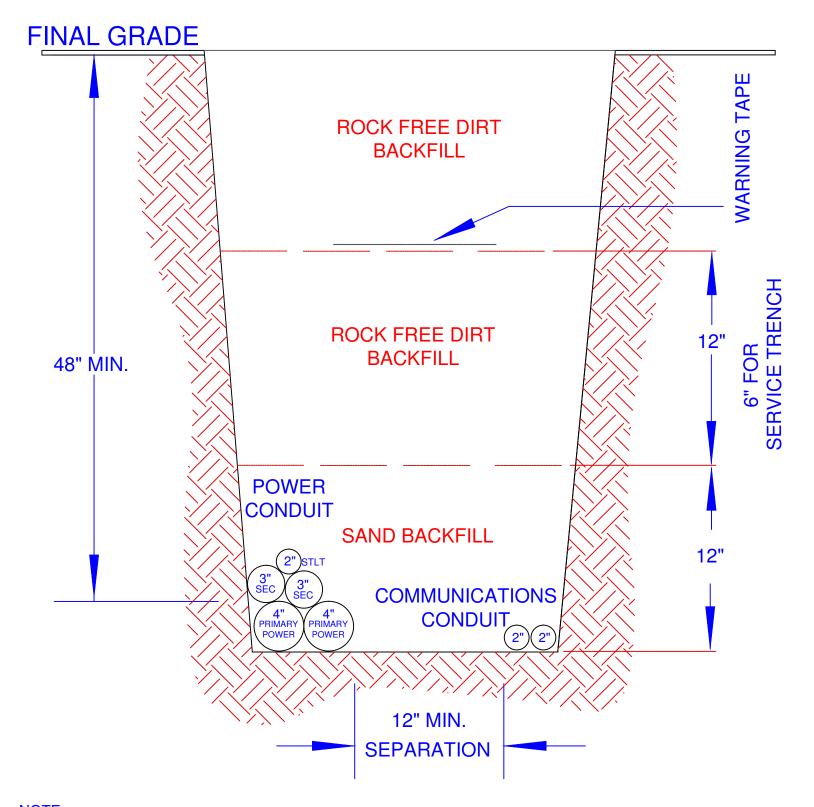
- 3. A CLEARANCE OF 3 FEET IN ANY DIRECTION FROM WINDOWS, DOORS, FIRE ESCAPES, OR SIMILAR LOCATIONS IS REQUIRED, EXCEPT IT DOES NOT APPLY TO:
  - A. MULTIPLEX CABLE ABOVE THE TOP OF A WINDOW, OR
  - B. WINDOWS THAT DO NOT OPEN.
  - (NEC 230-9 REQUIRES THE SAME 3' OF CLEARANCE EXCEPT ABOVE THE TOP LEVEL OF A WINDOW; SERVICE CONDUCTORS ARE NOT ALLOWED BELOW WINDOWS OR OPENINGS THROUGH WHICH MATERIALS MAY BE MOVED, E.G. IN FARM OR COMMERCIAL BUILDINGS.)
- 4. PER NESC RULE 235C1 (EXCEPTION 3) A SPACE OF NOT LESS THAN 12" IS REQUIRED BETWEEN ELECTRIC SERVICE DROPS OF 0-600 VOLTS RUNNING ABOVE AND PARALLEL TO COMMUNICATION SERVICE DROPS. THIS APPLIES TO ANY POINT IN THE SPAN AS WELL AS AT THE BUILDING ATTACHMENT. OTHER CLEARANCES APPLY AT THE POLE. IF THESE SERVICES ARE RUN FROM DIFFERENT SUPPORT STRUCTURES, NESC TABLE 233-1 REQUIRES 24" VERTICAL CLEARANCE BETWEEN CONDUCTORS. COMMUNICATION CABLES SHOULD BE INSTALLED BELOW POWER SUPPLY CONDUCTORS WHENEVER POSSIBLE.

### CAUTION

ALL NESC VERTICAL CLEARANCES APPLY TO THE CONDUCTORS AT MAXIMUM FINAL SAG. ALLOW FOR 1.0 FOOT OF ADDITIONAL SAG FOR INCREASE FROM INITIAL SAG TO MAXIMUM FINAL CONDITIONS.



# JOINT TRENCH TYPICAL DETAIL COMMERCIAL / RESIDENTIAL SUBDIVISION



# NOTE:

- 1. PROVO CITY POWER TO APPROVE BACKFILL MATERIAL
- 2. PROVO CITY POWER SHALL INSPECT TRENCH/CONDUIT PRIOR TO BACKFILL.
- 3. SECONDARY DEPTH 36" MINIMUM.
- 4. SERVICE DEPTH 24" MINIMUM.



# REQUIRED TRENCH AND FINAL INSPECTIONS

### **FOR PROJECTS:**

### FOR MAIN LINE TRENCH INSPECTIONS:

CALL AFTER CONDUIT HAS BEEN PLACED IN TRENCH AND 12" OF SAND HAS BEEN PLACED ON CONDUIT. TRENCH MUST BE LEFT OPEN FOR INSPECTION OR YOU WILL BE ASKED TO RE-OPEN TRENCH FOR INSPECTION AND FOR INSPECTOR TO GPS CONDUIT LOCATION.

CALL THE PROJECT ENGINEER YOU HAVE BEEN WORKING WITH. PROVO POWER ENGINEERING: 801 852-6852

### **SERVICE TRENCH INSPECTIONS:**

CALL BEFORE DOING ANY BACKFILL ON TRENCH. A 1" POLY PIPE NEEDS TO BE INSTALLED BY PROVO CITY POWER AT THE TIME OF INSPECTION.

PROVO CITY POWER DISPATCH: 801 852-6999

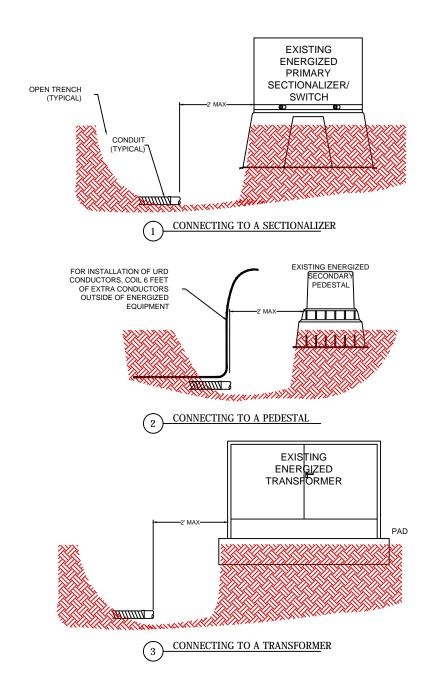
### TO HAVE CONDUIT ELBOWS PLACED INTO EXISTING POWER EQUIPMENT:

CALL AFTER TRENCH HAS BEEN OPENED TO BASE OF POWER EQUIPMENT, CONDUIT HAS BEEN INSTALLED AND LEFT 2' SHORT OF POWER EQUIPMENT AND FIBERGLASS ELBOW HAS BEEN LEFT ON SITE FOR OUR CREW TO INSTALL. **NEVER PLACE CONDUIT INTO LIVE EQUIPMENT.** PROVO CITY POWER DISPATCH: 801 852-6999

### FOR FINAL PROJECT INSPECTION:

CALL WHEN BOXES ARE INSTALLED AT PROPER HEIGHT AND ARE LEVEL, GROUND RODS HAVE BEEN INSTALLED, MULE TAPE HAS BEEN PLACED IN CONDUIT, AND CONDUIT IS AT PROPER HEIGHT. CALL THE PROJECT ENGINEER YOU HAVE BEEN WORKING WITH. PROVO POWER ENGINEERING: 801 852-6852

# U.G. POWER INSTALLATION EXISTING ENERGIZED EQUIPMENT

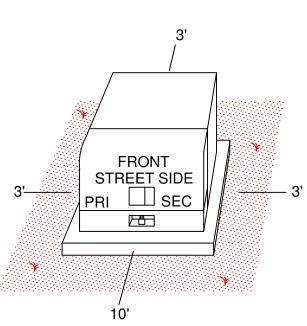


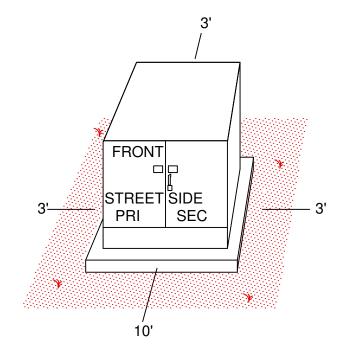
### NOTES:

- 1. FOR SAFETY REASONS DO NOT INSTALL CONDUITS/CONDUCTORS INSIDE ENERGIZED EQUIPMENT.
- 2. STOP INSTALLATION OF CONDUITS/CONDUCTORS A MAXIMUM OF 2 FEET FROM ENERGIZED EQUIPMENT.
- 3. EXTEND TRENCH TO THE EDGE OF THE EQUIPMENT.
- CONTRACTOR TO SUPPLY SWEEP & ADDITIONAL CONDUIT TO COMPLETE INSTALLATION BY PROVO POWER.
- CONTACT PROVO POWER AND NOTIFY CREWS FOR INSTALLATION OF CONDUIT/CONDUCTORS INTO ENERGIZED EQUIPMENT.



# TRANSFORMER & PADMOUNTED EQUIPMENT ACCESS-CLEARANCES





# RESIDENTIAL SINGLE-PHASE TRANSFORMER PADMOUNTED EQUIPMENT

# <u>COMMERCIAL 3-PHASE TRANSFORMER</u> <u>PADMOUNTED EQUIPMENT</u>

### NOTE:

IN THE EVENT OF AN EQUIPMENT FAILURE OR POWER OUTAGE, IT IS NECESSARY FOR UTILITY CREWS TO HAVE ADEQUATE ACCESS TO PADMOUNTED EQUIPMENT AND TRANSFORMERS. ACCESS TO THE FRONT SHALL BE TEN FEET, ACCESS TO THE REAR AND SIDES SHALL BE THREE FEET. NO TREES, SHRUBS, FENCES, LARGE LANDSCAPE ROCKS, OR OTHER OBSTRUCTIONS SHALL BE PERMITTED IN ACCESS AREA.

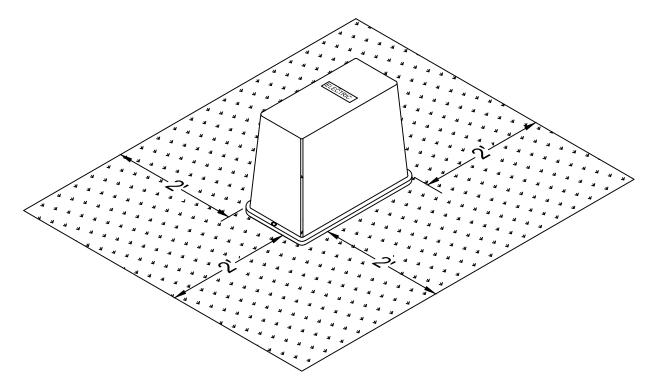
# NOTE FOR NEW SERVICES

- 1. PADMOUNTED EQUIPMENT, TRANSFORMERS AND SECONDARY PEDESTALS ARE LOCKED FOR PROTECTION AGAINST ELECTRICAL SHOCK.
- 2. WHEN INSTALLATION OF A NEW SERVICE REQUIRES ACCESS TO A TRANSFORMER OR PEDESTAL, OWNER\CONTRACTOR SHOULD CALL PROVO CITY POWER AT 852-6999.
- 3. ALL NEW CONDUIT RUNS SHALL BE INSTALLED BY CONTRACTOR INTO TRANSFORMER \PEDESTAL WITH PROVO CITY POWER SUPERVISION.
- 4. BLUE STAKE LAWS PROHIBIT ANY DIGGING WITH EQUIPMENT WITHIN THE 2' SAFETY ZONE. PLEASE HAND DIG AROUND ANY ELECTRICAL EQUIPMENT.





# STANDARDS SECONDARY PEDESTAL ACCESS-CLEARANCES



# **SECONDARY JUNCTION BOXES**

(TYP. 12" x 20" LID APPROX.)

## NOTE:

IN THE EVENT OF AN EQUIPMENT FAILURE OR POWER OUTAGE, IT IS NECESSARY FOR PROVO CITY CREWS TO HAVE ADEQUATE ACCESS TO SECONDARY PEDESTAL LIDS. ACCESS TO THE FRONT AND SIDES AND REAR SHALL BE 2 FEET. NO TREES, SHRUBS, FENCES, LARGE LANDSCAPE ROCKS, OR OTHER OBSTRUCTIONS SHALL BE PERMITTED IN ACCESS AREA.

### NOTE FOR NEW SERVICES

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- 2. WHEN INSTALLATION OF A NEW SERVICE REQUIRES ACCESS TO A TRANSFORMER OR PEDESTAL, OWNER\CONTRACTOR SHOULD CALL PROVO CITY POWER AT 852-6999.
- 3. ALL NEW CONDUIT RUNS SHALL BE INSTALLED BY CONTRACTOR INTO TRANSFORMER \PEDESTAL WITH PROVO CITY POWER SUPERVISION.
- 4. BLUE STAKE LAWS PROHIBIT ANY DIGGING WITH EQUIPMENT WITHIN THE 2' SAFETY ZONE. PLEASE HAND DIG AROUND ANY ELECTRICAL EQUIPMENT.