



PERMANENT RESIDENTIAL UNDERGROUND SERVICE

A. INTRODUCTION

This guide's purpose is to assist customers in acquiring permanent underground residential electrical services quickly, conveniently and as economically as possible. Energy Services will provide underground service conductor, meter, and current transformers. Customer shall provide service conduit intermediate junction boxes, trenching, and backfill from building service entrance (usually a meter) to the source of power (either a pullbox, service pedestal, transformer vault or power pole).

Customer's responsibilities for permanent residential electrical services are summarized below:

1. Apply for building permit at the Richland Development Center located at 840 Northgate Drive. The building permit application must include electrical service requirements, or the proposed energy needs, so the City can determine the availability, location, and conditions for service. A representative from Electrical Engineering will review the location of service, route, and other associated information at the time of application for service. In addition to a building permit, apply for an electrical permit at the Washington State Department of Labor and Industries – Electrical Inspection (L&I) located in Kennewick, WA
2. Richland Development Services will specify what permits are necessary from city, county and state agencies before commencing excavation on any public lands or right of way. Trenching in utility easements outside customer property will require an encroachment permit from the Public Works Department of Richland.
3. Provide all trenching, conduit, and backfilling, in accordance with Section "C" below. The customer will also provide the service entrance conductor and service equipment. If the customer's service requirements are nonstandard, have unusual routing, or length of run exceeds 200 feet, they may need to provide service vaults, oversized conduit, and reimbursement for additional cost. All work and materials must be in accordance with the Utility's standards. Energy Services' crew will locate end of service stub at customer's request. Energy Services may charge customer to locate service stub.

4. Call the L&I Electrical Inspector for inspection and approval of the new electrical equipment and conductors.
5. Call the L&I Electrical Inspector for inspection and approval of the new electrical equipment and conductors.
6. Call Power Operations Division to schedule services hook-up.

B. BUSINESS OFFICES AND CONTACT INFORMATION

Office	Location	Phone
Electrical Engineering	625 Swift Blvd., Richland	942-7412
Work Scheduling Power Operations Division	2700 Duportail Street, Richland	942-7421 or 942-7423
Electrical Inspections, Wash State Dept. of Labor - Industries	4310 W. 24 th Ave., Kennewick	735-0138
Underground Utilities Locating Requests (Call Before You Dig)		811

C. INSTALLATION AND MATERIAL SPECIFICATIONS

1. **GENERAL:** The customer shall install a continuous run of service conduit from the building service entrance to the source of power. The source of power may be a padmount transformer, utility power pole, secondary junction box, or secondary pedestal. In many locations there are service conduit stubs located on the property that provides a continuous conduit system back to a power source located on adjacent property. The customer will connect the new service conduit stub to that conduit stub as directed by Energy Services.

Energy Services will provide the underground service conductor from the power source to the metering point. The metering point must conform to the SERVICE ENTRANCE drawings and must be located in an area that does not require special access. For residential homes the meter will be located on the front or side of the structure and in front of any fence or retaining wall, so as to not obstruct access.

If a temporary service is required for the lot and it is not next to a transformer or secondary pedestal, the service conduit stub may be used if a secondary junction box is installed at the lot corner. Energy Services will install the permanent service conductors to the secondary junction box and then connect the temporary service at this location.

2. **GRADING:** Final grade should be established before trenching and installing duct or vaults. Any changes in the grade that would put the conduits, vaults, or pull boxes to a depth less than required, or leave any installation in an undesirable condition, would require the customer to correct it at their own expense.

3. EXCAVATION: Customers are required to trench from the building's service entrance equipment to the power source, i.e. secondary pull box, secondary pedestal, transformer vault or utility power pole as specified by the Energy Services representative.
 - a. Call 811 for utility locates two full working days before any excavation. Any excavation within 24 inches of existing underground facilities must be done by hand. Do not excavate until all locates have been completed.
 - b. Excavation within road right-of-ways or public utility easement requires a "Use Permit" issued by the City's Public Works Department.
 - c. The trench depth must allow a minimum of 36 inches of cover from finished grade to top of the service conduit.
 - d. Customer shall excavate a trench up to the power source. The utility personnel will not hand dig or otherwise finish trenches. Failure of the customer to complete trench will cause a delay in receiving service.
 - e. To allow utility personnel enough working space to install the final conduit into a padmount transformer vault or at a utility pole, a hole 36 inches deep, 36 inches wide and 36 inches long is required at the power source.
4. CONDUIT: The required service conduit size is 3" unless the Engineering Division specifies an alternative size. The service conduit must be gray electrical Polyvinyl Chloride (PVC), schedule 40 or schedule 80 (when required by the National Electric Code), and conform to NEMA TC-2 specifications. The conduit shall have either long bell ends or long couplers at joints. Long couplers generally have insertion depths equal to or greater than the conduit diameter. A 3" X 2-1/2" reducer is allowed in the service conduit run only when the meterbase cannot accept 3" conduit. The reducer is to be installed at the meterbase. All service conduits will be required to have an expandable joint in the riser to the meterbase in order to prevent the meter base from pulling away from the structure as the ground settles.
5. COUPLINGS AND FITTINGS: Must be PVC Schedule 40, factory made, and conform to NEMA TC-3 specifications. Sweeps must be Schedule 40 or 80 or rigid steel. Sweeps must have a minimum 36" radius. Alternate 24" radius can be used with prior approval from Engineering.

6. PULL BOXES OR HANDHOLE: Only approved pull boxes shall be used as required per Section 8. Quazite pull boxes are required when installed in sidewalks or other high pedestrian traffic areas. Approved pull boxes are:
 - a. Quazite: Box Cat # PG-1730 BA18 Lid Cat # PG-1730 CA00
 - b. Pencil No PE-30-HDX
 - c. Associated Plastics No. 1730/15-1
7. PULL STRING: Pull string in conduit is not required. The conduit does need to be free from debris.
8. INSTALLATION OF THE SERVICE CONDUIT SYSTEM: Conduit runs shall provide a firm mechanical assembly using standard couplings, elbows, sweeps or offsets, as specified above. Cement conduit joints as recommended by the manufacturer. The minimum depth from finished grade to top of the conduit is thirty-six (36") inches. (See attached construction standards.)
 - a. The customer is required to provide and install conduit from the building service entrance equipment to the power source; i.e. secondary pull box, secondary pedestal, transformer vault or utility power pole. Customer shall install service conduit into service junction boxes and service pedestal using standard radius 45° conduit elbows. However, customers shall never penetrate the Utility transformer vault. Energy Services crews will install all the conduits into transformer vaults. The Energy Services crews will also install the final sweep when service is provided from a utility power pole.
 - b. No more than 270° of turns or sweeps are allowed in a conduit run. Otherwise, a pull box is required. For example, between the Utility power source and the customer meter base, not more than three 90° sweeps or six 45° sweeps, or any combination thereof, are allowed. If the number of sweeps exceeds 270°, then the customer is required to furnish and install a Utility approved pull box.
 - c. The customer shall not bend conduits using heating techniques, field bending of the conduit is not allowed, if the deflection required is greater than what is allowed by the manufacturer a standard sweep shall be used.
 - d. At locations where Utility service stubs are provided, the customer is responsible to connect the customer installed service conduit to the Utility service stub conduit. The direction of the customer service conduit must match the Utility stub or mate with the Utility stub using standard sweeps.
 - e. At locations where service stubs are provided, the customer is responsible to excavate and locate the end of the service stub. A representative from the Electrical Engineering Division will provide a general location to the Utility service conduit stub installed on the lot. If the customer cannot find the Utility service conduit stub, call the Power Operations Division for

assistance. The Power Operations personnel will assist locating the end of the stub at a cost of not less than \$50.00. Payment for the cost to locate stubs shall be made prior to connection of the permanent service.

- f. At locations where the customer's meter is at an elevation lower than the City's power source equipment, the customer is required to install a service pull box. This requirement will prevent water from entering utility vaults or pull boxes and then running into customer service entrance equipment. An acceptable air gap is provided when a service pull box is installed in the conduit run such that the top of the pull box is at least three feet below the conduit entering the final point of service at the building service entrance.
9. **DUCT BEDDING and ENCASEMENT:** If required by Electrical Engineering, a minimum of four (4) inches of bedding and four (4") inches of cover is used to encase the ducts. Bedding is used beneath the conduit and cover is over the conduit. Sand or clean soil should be used for the encasement of the duct. Rocks larger than 3" diameter or other similar stones with sharp points are NOT acceptable for encasement.
10. **CONDUIT SYSTEM INSPECTIONS:** Prior to backfilling trench, the conduit system must be inspected and approved for completeness. Failure to obtain approval before backfilling will require all or part of the conduit system to be exposed for inspection and acceptance before the installation of the service conductor. Schedule trench inspection by calling the Power Operations Division. Conduit system approval or correction instructions are noted on the inspection notice and are attached at the metering equipment conduit riser. See attached drawing identifying inspection notice, "Trench Inspection Notice" Attachment 4.
11. **BACKFILLING:** Native material may be used for backfill, provided it is free from large rock, vegetation, trash or frozen materials.

To allow utility personnel enough working space to install the final conduit into a padmount transformer vault or at a utility pole, a hole 36 inches deep, 36 inches wide and 36 inches long is required at the power source. This working space must be left open and can be backfilled only after the utility crew completes the final conduit connection at the power source.

12. **PERMANENT SERVICE CONNECTION:** Permanent service connection will be scheduled only after the following has been completed.
 - a. Conduit system approved and open trenches backfilled per Item #10 and #11.
 - b. Service entrance equipment approved by Washington State Department of Labor & Industries Electric Inspector, and evidenced by an approval sticker attached to service entrance metering equipment.

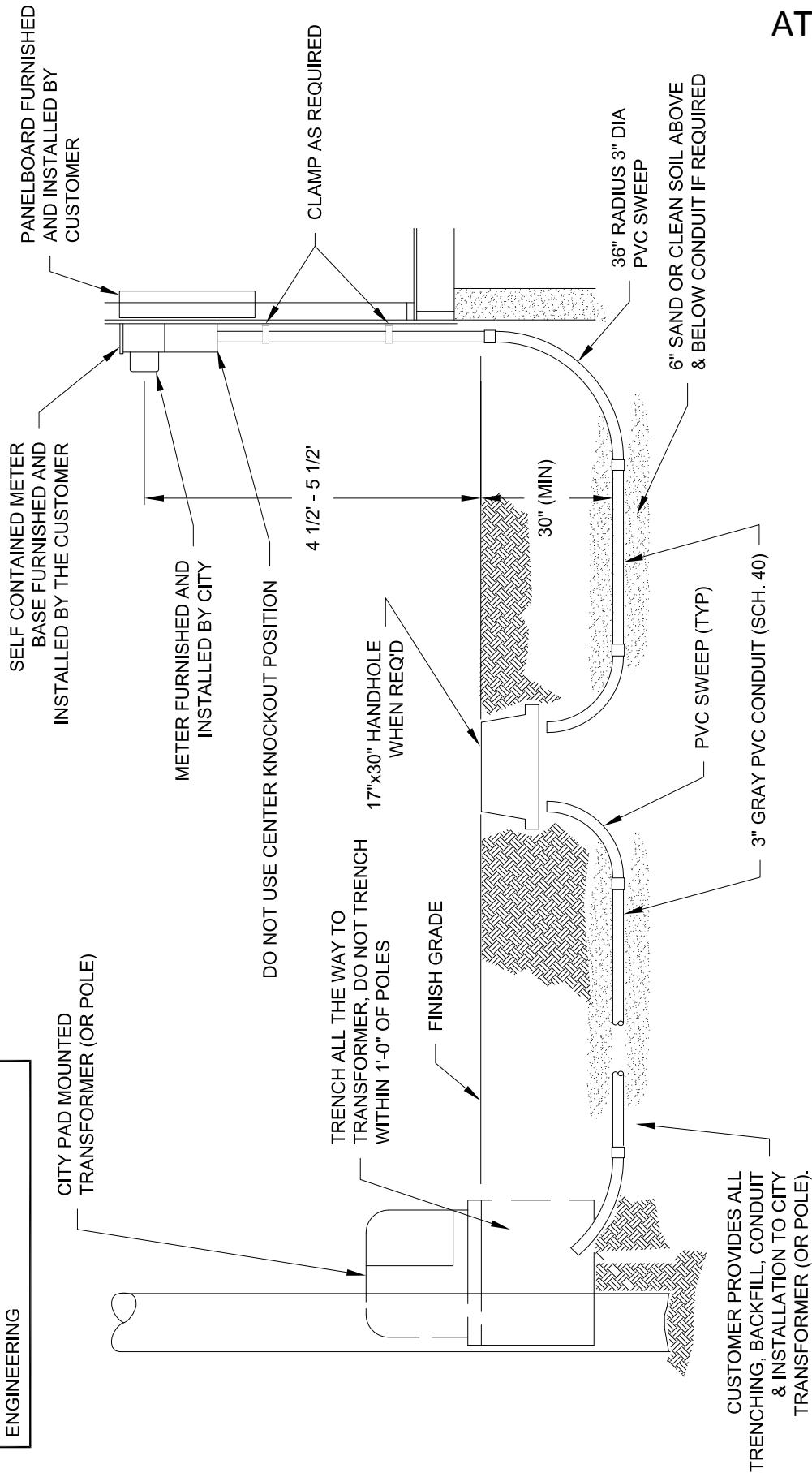
- c. Customer requests to have service connected by calling the Power Operations Division.
- d. For safety reasons, the City will energize the permanent service only after they have confirmed that the service equipment is clear of potential hazards. Therefore, the City crew must have access to the service equipment at the time of permanent service connection.

D. SERVICE ENTRANCE ATTACHMENTS AND DRAWINGS

- Attachment #1 & #2: Underground Residential Services: Typical Layout; 200A-320A, Self-Contained Surface or Flush Mounted
- Attachment #3: Residential Underground Service, 400A and Above, CT Metered
- Attachment #4 & #5: Underground Mobile Home Services; Typical Layout; and Meter Pedestal
- Attachment #6: Trench Inspection Notice - “City of Richland”

Revision Description				
Rev.	Reason for Revision	Change Description	Affected Pages (Page/Sec./Para.)	Date
0	Initial Issue		All pages.	12/14/10
1	Updates and Clarification	Identified meter location; changed: service length, conduit characteristics, locate call no., and misc. drawing corrections.	All pages.	3/20/17
2	Format change	Relocated revision section to last page	Pages 1 & 6	4/3/2018
3	Update Addresses	Address change for Electrical Engineering and City Hall	Pages 1 & 2	8/5/19
4	Update	New Section C.8c was added	Page 4	8/29/19
5	Update	Updated temporary service requirement “T Fitting” removed	Page 2 & 5	12/18/19
6	Addition	Additional information added to C.1 and C.11	Page 2 & 5	12/23/19

NOTE:
CONDUIT SIZES SHOWN ARE TYPICAL.
DIFFERENT SIZE CONDUITS MAY BE
REQUIRED. CONSULT ELECTRICAL
ENGINEERING



CALL FOR LOCATES
BEFORE YOU DIG
1-800-424-5555

CITY INSPECTION OF CONDUIT INSTALLED
IN TRENCH IS REQUIRED PRIOR TO
BACKFILLING CALL 943-7422

DRAWN BY: WR

APPRD. BY: BT

REV #: -

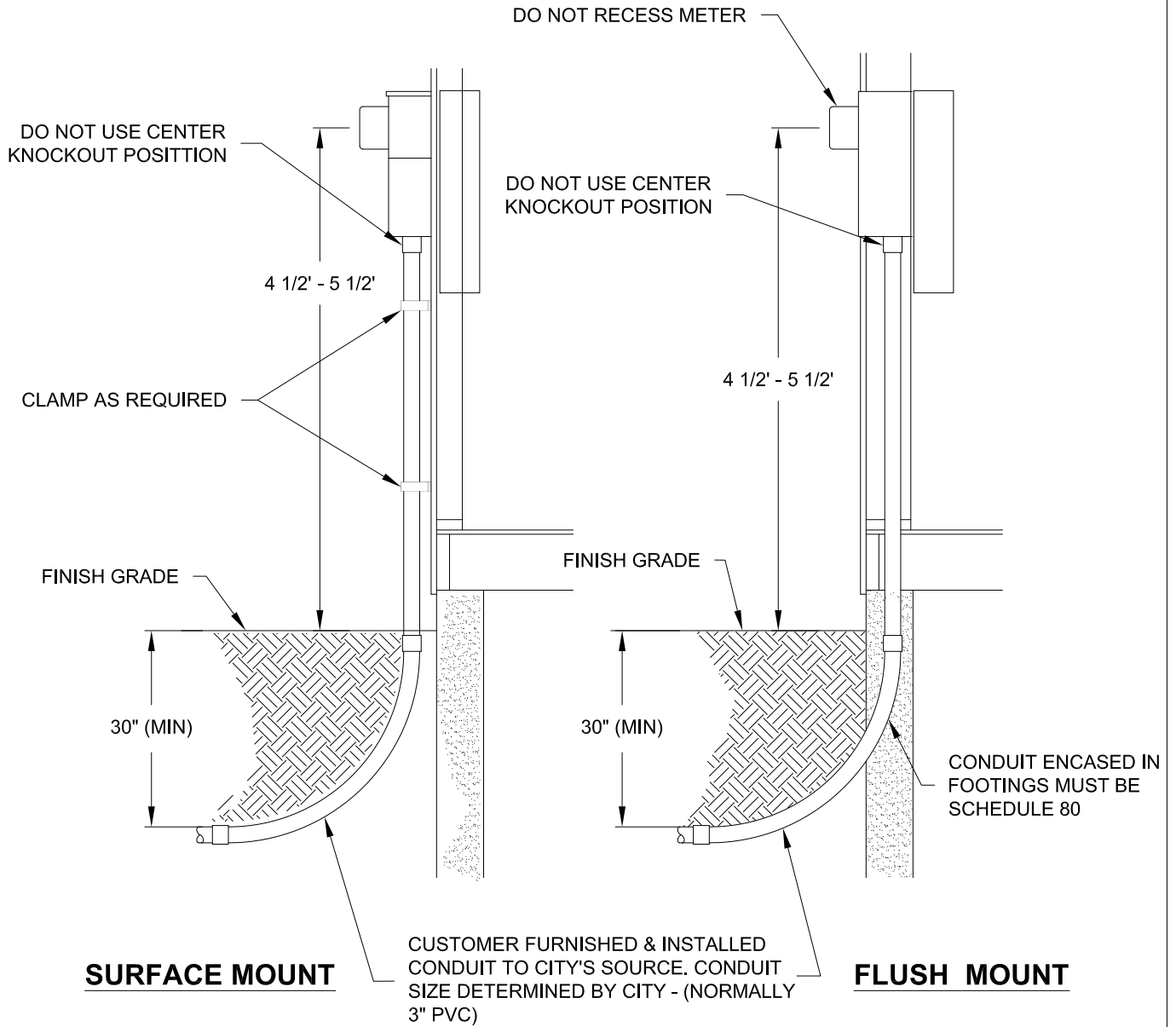
TYPICAL UNDERGROUND
RESIDENTIAL SERVICE



12/10/10

SVUGRES

SHT: 1 OF 1




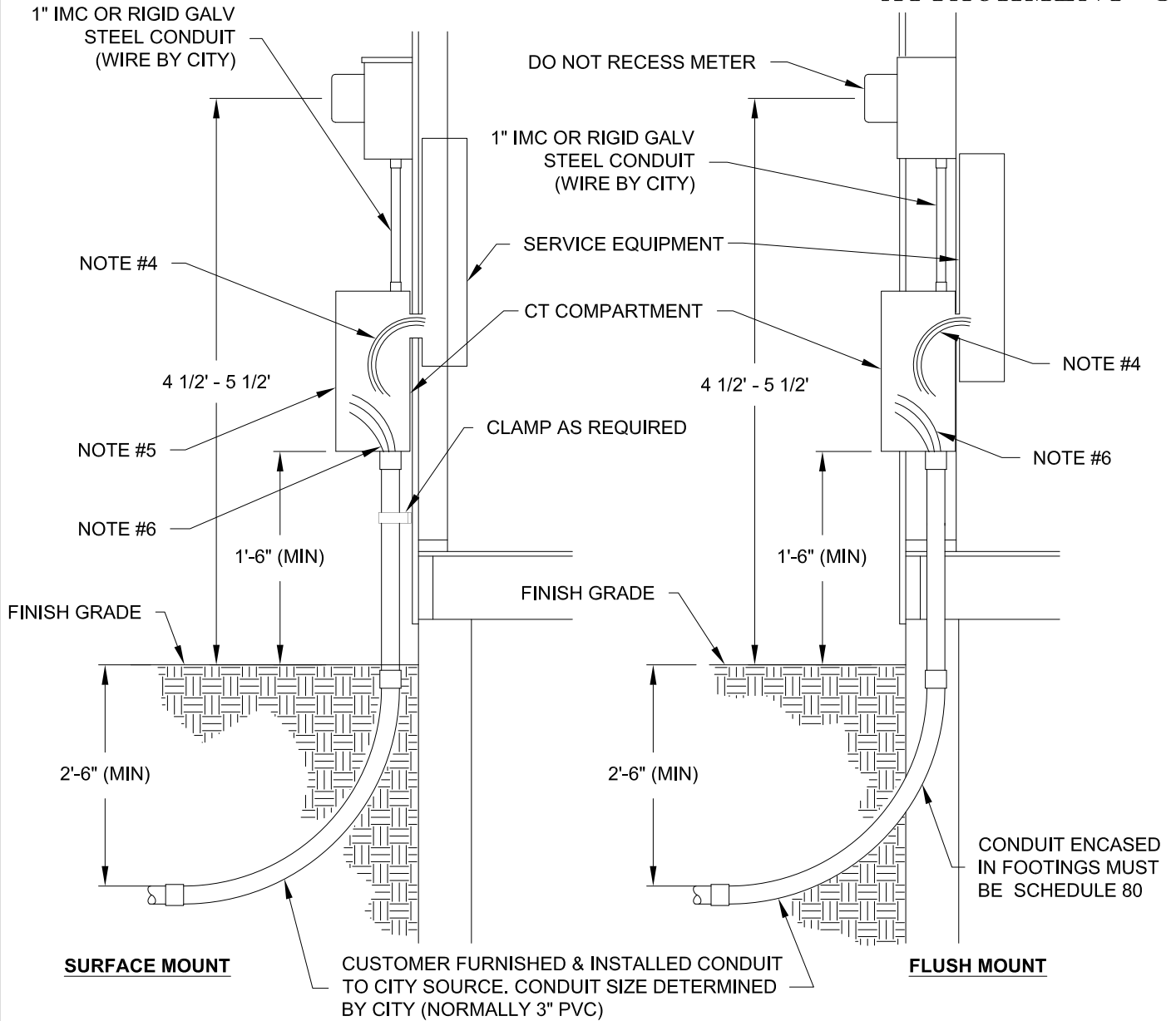
NOTES:

1. CUSTOMER TO FURNISH ALL EXCAVATION, BACKFILL MATERIAL AND CONDUIT. CITY TO PROVIDE METER AND SERVICE CONDUCTORS.
2. CUSTOMERS SERVICE EQUIPMENT NEEDS TO BE INSPECTED AND APPROVED FOR SERVICE BY THE STATE ELECTRICAL INSPECTOR PRIOR TO CONNECTION BY THE CITY.
3. REFER TO "PERMANENT UNDERGROUND SERVICE SPECIFICATIONS" FOR TRENCHING AND CONDUIT INSTALLATION DETAILS.
4. CITY'S SERVICE CONDUCTORS TERMINATE AT THE "LINE SIDE" METER TERMINAL LUGS.
5. LOCATE METERBASE ON FRONT OF HOUSE OR ON SIDE OF HOUSE WITHIN 4 FT OF FRONT.

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**UNDERGROUND RESIDENTIAL
SERVICE ENTRANCE
320 AMP OR SMALLER**

	ENERGY SERVICES
	12/10/10 SVUG200 SHT: 1 OF 1

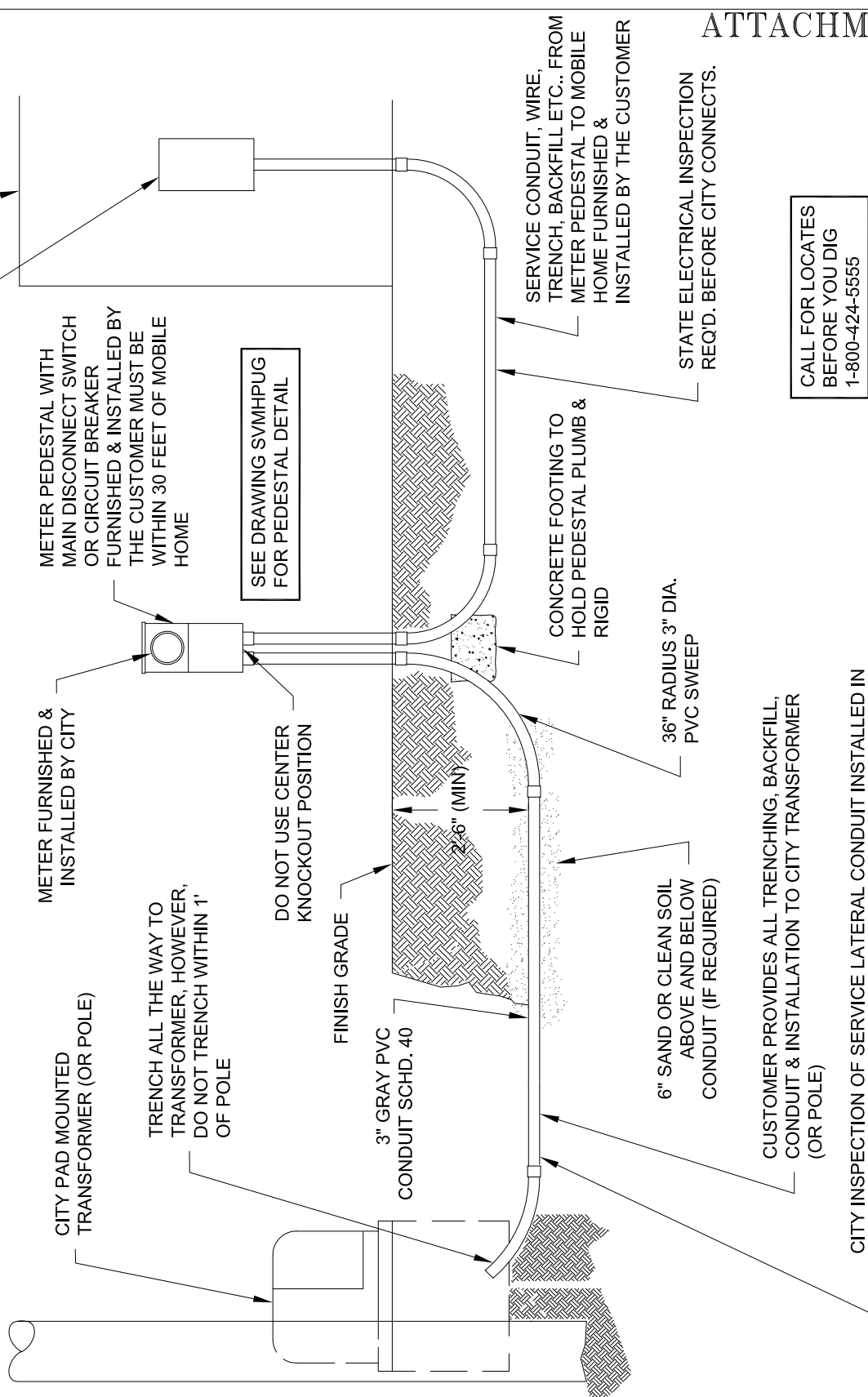


NOTES:

1. CUSTOMER TO FURNISH ALL EXCAVATION, BACKFILL AND MATERIALS AND CONDUIT. CITY TO PROVIDE METER, SERVICE CONDUCTOR, CURRENT TRANSFORMERS (C.T.s.) AND WIRE CONNECTORS IN "CT CAN".
2. CUSTOMERS SERVICE EQUIPMENT TO BE INSPECTED AND "APPROVED FOR SERVICE" BY STATE ELECTRICAL INSPECTOR PRIOR TO CONNECTION BY THE CITY.
3. REFER TO "PERMANENT UNDERGROUND SERVICE SPECIFICATIONS" FOR TRENCHING AND CONDUIT DETAILS.
4. CUSTOMER SERVICE ENTRANCE CONDUCTORS IN C.T. COMPARTMENT NEED TO HAVE A MINIMUM OF 2' OF TAIL FOR CONNECTION BY CITY.
5. THE C.T. COMPARTMENT IS TO BE WEATHER TIGHT (NEMA 3R) WITH METER SEAL CLOSURES. MINIMUM SIZE IS 24"x36"x11". DO NOT USE THE CENTER KNOCKOUT POSITION FOR CONDUIT ATTACHMENT.
6. THE CITY WILL TERMINATE SERVICE CONDUCTORS IN THE CURRENT TRANSFORMER COMPARTMENT.
7. LOCATE METERBASE ON FRONT OF HOUSE OR ON SIDE OF HOUSE WITHIN 4 FT OF FRONT.

DRAWN BY: WR	<p>UNDERGROUND RESIDENTIAL SERVICE ENTRANCE 400 AMP AND ABOVE CT METERED</p>	 <p>ENERGY SERVICES</p>	
APPRD. BY: BT			<p>12/10/10</p>
REV #: -			<p>SVUG4CT SHT: 1 OF 1</p>

NOTE:
CONDUIT SIZES SHOWN ARE TYPICAL. A DIFFERENT SIZE CONDUIT MAY BE REQUIRED BY ELECTRICAL ENGINEERING



MOBILE HOME
ELECTRIC PANEL INSIDE MOBILE HOME

METER PEDESTAL WITH MAIN DISCONNECT SWITCH OR CIRCUIT BREAKER FURNISHED & INSTALLED BY THE CUSTOMER MUST BE WITHIN 30 FEET OF MOBILE HOME

SEE DRAWING SVMHPUG FOR PEDESTAL DETAIL

METER FURNISHED & INSTALLED BY CITY

TRENCH ALL THE WAY TO TRANSFORMER, HOWEVER, DO NOT TRENCH WITHIN 1' OF POLE

DO NOT USE CENTER KNOCKOUT POSITION

FINISH GRADE

3" GRAY PVC CONDUIT SCHD. 40

2'-6" (MIN)

SERVICE CONDUIT, WIRE, TRENCH, BACKFILL ETC.. FROM METER PEDESTAL TO MOBILE HOME FURNISHED & INSTALLED BY THE CUSTOMER

STATE ELECTRICAL INSPECTION REQ'D. BEFORE CITY CONNECTS.

CONCRETE FOOTING TO HOLD PEDESTAL PLUMB & RIGID

36" RADIUS 3" DIA. PVC SWEEP

6" SAND OR CLEAN SOIL ABOVE AND BELOW CONDUIT (IF REQUIRED)

CUSTOMER PROVIDES ALL TRENCHING, BACKFILL, CONDUIT & INSTALLATION TO CITY TRANSFORMER (OR POLE)

CITY INSPECTION OF SERVICE LATERAL CONDUIT INSTALLED IN TRENCH IS REQUIRED PRIOR TO BACKFILLING. CALL 942-7421 OR 942-7423

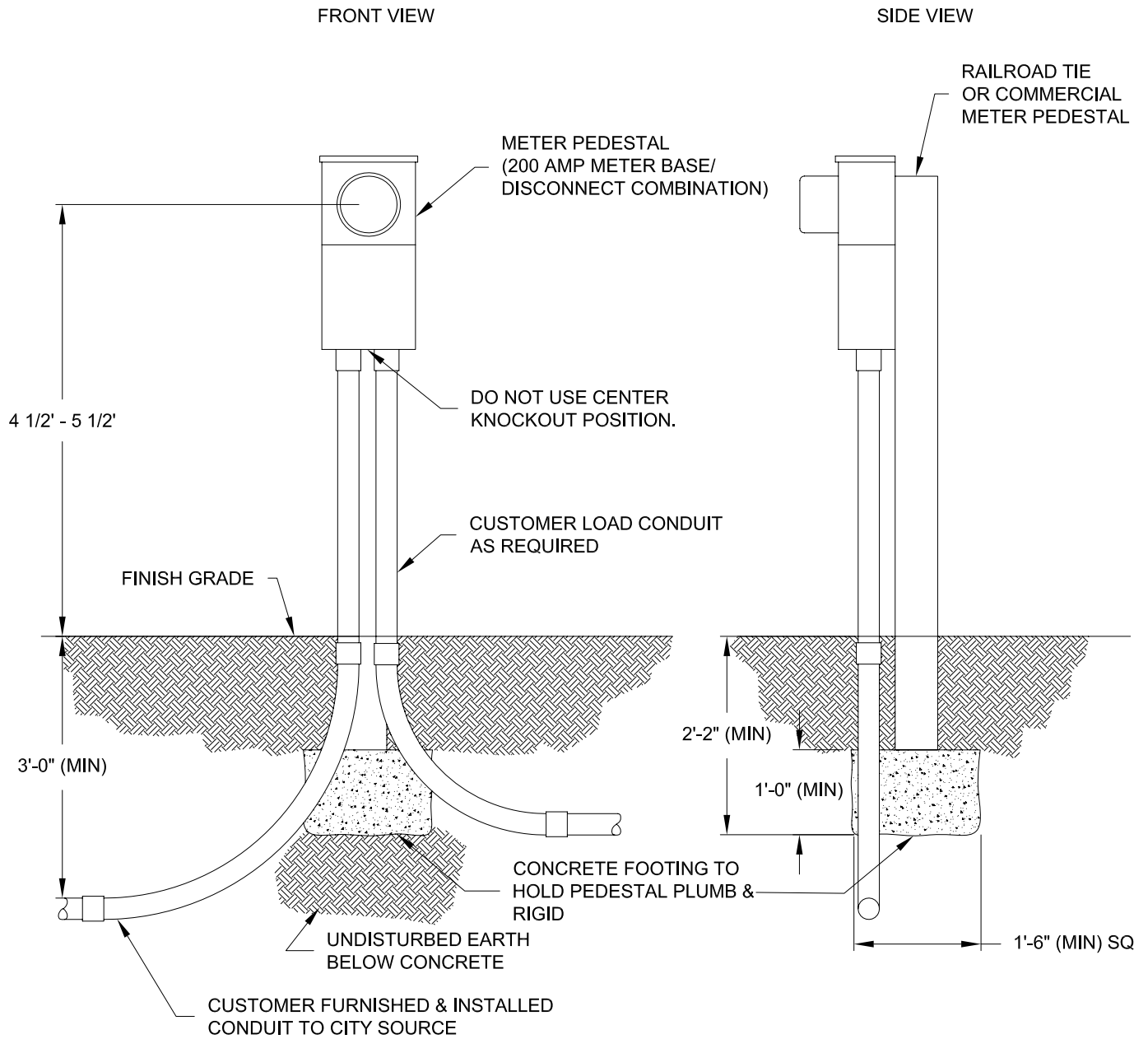
CALL FOR LOCATES BEFORE YOU DIG
1-800-424-5555

DRAWN BY: WR
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UNDERGROUND SERVICE MOBILE HOME




12/10/10
SVMHSEC
SHT: 1 OF 1



1. CUSTOMERS TO PROVIDE EXCAVATION, CONCRETE, CONDUIT AND METER PEDESTAL.
2. CUSTOMER SERVICE EQUIPMENT TO BE INSPECTED AND "APPROVED FOR SERVICE" BY STATE ELECTRICAL INSPECTOR PRIOR TO CONNECTION BY CITY.
3. REFER TO "PLAT & LAND DEVELOPMENT GUIDE" FOR TRENCHING AND CONDUIT DETAILS.
4. CITY'S SERVICE CONDUCTORS TERMINATE AT "LINE SIDE" OF METER TERMINAL LUGS.

DRAWN BY: WR	<p>UNDERGROUND SERVICE MOBILE HOME PEDESTAL</p>	 <p>ENERGY SERVICES</p>
APPRD. BY: BT		
REV #: -		-

0020



Correction

OK'd	required	
<input type="checkbox"/>	<input type="checkbox"/>	_____ Trench and Conduit
<input type="checkbox"/>	<input type="checkbox"/>	_____ Connect Conduit to Stub-out
<input type="checkbox"/>	<input type="checkbox"/>	_____ Leave "Tee" Exposed
<input type="checkbox"/>	<input type="checkbox"/>	_____ Excess 90s. Requires junction box

Comments _____

Inspection Date: _____ By: _____

THE TRENCH INSPECTION NOTICE WILL BE ATTACHED AND INITIALED AS OK OR CHECKED FOR ADDITIONAL PROCEDURES REQUIRED BEFORE HOOK UP IS MADE.