

STATION PROTECTION AND GROUNDS

1. General

1.01 This addendum is reissued to add the following information:

- (a) Changes or supplements information in 460-100-400.
- (b) Add information formerly contained in BSP 460-100-100SN, 460-100-101SN, 460-100-200SN, and 460-100-201SN.
- (c) Adds information on the installation and maintenance of gas tubes.
- (d) Provides information on protection when plastic water meters are found.
- (e) Provides information on CATV bonding and grounding requirements.

Add the following to Paragraph 1.13

When a fusible link is required, it shall be placed at a pole location so that the drop wire on the station side of the link shall not be exposed to power over 300 volts either through a crossing or joint use condition. The installation of a fusible link shall be in accordance with Section 462-240-200.

2. Location of Protectors

Add the following to Paragraph 2.03:

- (a) The protector ground should be installed so as to permit visual inspection on future visits to the subscribers premises. Do not run ground wires inside partitions and other areas that are permanently enclosed.
- (b) On a revisit to a subscriber premises where the station ground wire is found concealed, examine the ground wire connections and tighten those that are loose. Test for proper grounding at the protector by using the test set connected between the ring side of the station loop and the ground lug. If the above testing procedures can not be carried out, or the ground wire test indicates a faulty ground wire, a new ground wire shall be run exposed in the best possible manner.
- (c) In all cases the station protector must be located on the building, preferably outside or immediately inside, as close to the building entrance as possible.

3. Selecting Protectors and Protector Mountings

Add the following:

Note: GAS TUBE PROTECTORS SHALL BE USED ONLY WHEN THEIR USE HAS BEEN RECOMMENDED BY THE TRANSMISSION SUPERVISOR-PROTECTION

Add the following to Paragraph 3.01:

The TII 316 gas tube (Figure 1) can be used with the 106C Protector as shown in Figure 2. The method of testing gas tubes can be found in Paragraph 3.04.

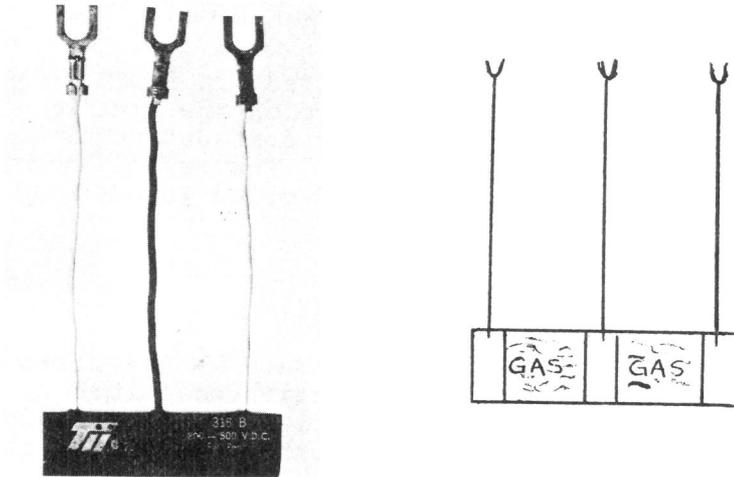


FIGURE 1
TII 316B 3 ELEMENT GAS TUBE

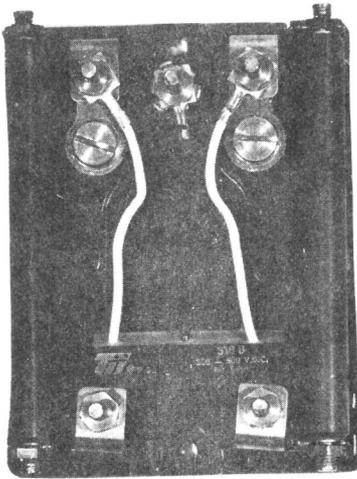


FIGURE 2
106C WITH TII 316B MOUNTED

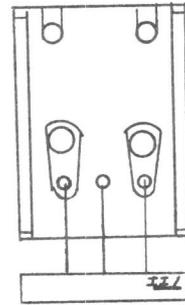


FIGURE 2

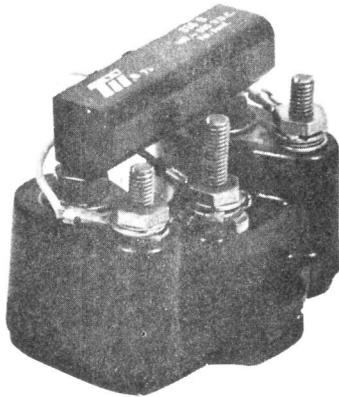


FIGURE 3
123A1A WITH TII 316B MOUNTED

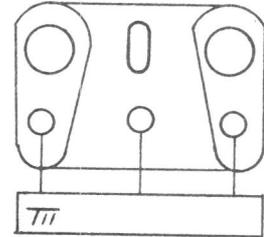


FIGURE 3

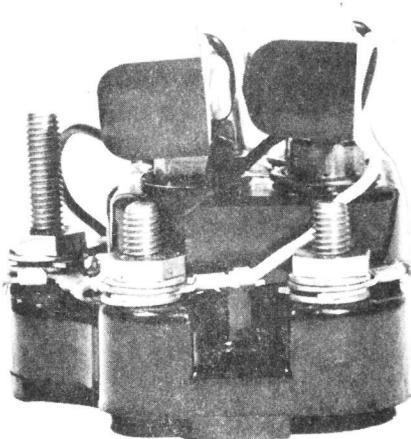


FIGURE 4
128A1B-2 WITH 2TII PROTECTOR'S MOUNTED

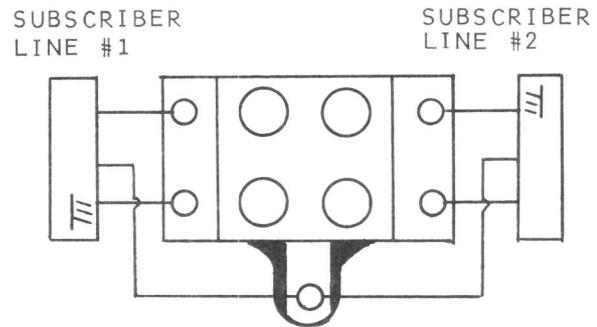


FIGURE 4

Add the following to Paragraph 3.03:

The TII 316 gas tube (Figure 1) can be used with the 123A1A Protector as shown in Figure 3. The 150B cover will fit if the gas tube is installed as shown.

Add the following to Paragraph 3.04:

- (a) The 123B1A can be used only when recommended by the Transmission Supervisor-Protection.

TESTING GAS TUBES WITH TII GAS TUBE TESTER-MODEL 100

- (b) The TII-100 Gas Tube Tester shown below is a GO/NO GO tester used to visually check all gas tube protectors to see if they (1) fire at their rated striking voltage (2) have an open circuit or (3) are shorted.



To turn tester on, depress the black rubber coated button. The neon lamp should show a steady glow (leads clipped together) or a dim flashing light (leads not connected together). If there is no indication of either condition, replace battery.

TABLE A - Gas Tube Status And Test Condition

Tube Status	Test Condition	Action
Discharge Surge	Bright flashing light (30-50 Flashes/Min)	Gas Tube OK
Open circuit or has over 700 volt discharge	Dim Flashing Light	Replace Gas Tube
Short Circuit or High Leakage Current	Steady Glow or Rapid Flashing	Replace Gas Tube
	No Light	Replace Battery in the Tube Tester
<p>The same conditions apply to carbon blocks.</p> <p><i>NOTE: When using the gas tube tester you MUST disconnect the protector ground or the lines during the test to prevent impedance loading of the tester.</i></p>		

To Test any gas tube, connect the red lead of the tube tester to the line side of the gas tube and connect the black lead to the ground side of the gas tube. Table A shown the condition of the gas tube for each test condition.

To turn the TII-100 tester off, depress the black rubber covered button on the bottom of the unit. Clip the two leads together and observe the neon lamp to verify that the switch is in the off position. (Switch OFF - no indication on the neon lamp. Switch On - Steady glow). The tester should always be stored in the off condition with the leads clipped together.

- (c) If a repair visit to a station with a gas tube is made, and the standard carbons are grounded, or the fuse operated, replace the gas tube. Forward the carbons, fuses and the gas tubes to the Transmission Supervisor-Protection with the line number and exchange from where it was removed.

Add the following to Paragraph 3.05:

The TII 316 gas tube (Figure 1) can be used with the 128A1A-2. Two gas tubes are required as shown in Figure 4. The 150B cover will fit over the protector if the gas tubes are installed in this manner.

Delete reference to Paragraphs 3.21, 3.22, 3.23.

Delete reference to the PMP (Paragraph 3.24) which is non-standard.

Delete reference to Paragraphs 3.25, 3.26, 3.27, and 3.28

4. Installing Protectors

Add Notes 1 and 2 to Paragraph 4.07:

Note 1: In all cases the station protector must be located on the building, preferably outside or immediately inside, as close to the building entrance as possible.

Note 2: In the case of 123 or 128 type protectors, this location should be preferred to mounting them directly on a cold water pipe.

Delete Paragraphs 4.09 and 4.12.

6. Grounding and Bonding

Add the following note:

Note: The minimum size ground wire used by SNET shall be No. 12 AWG. It may be used for applications shown in Table F for both No. 14 and No. 12 wire sizes.

Add the following to Paragraph 6.01:

GROUNDING - ORDER OF PREFERENCE

- (a) Power service conduit, service-equipment enclosure or grounding electrode where the grounding conductor of the power service is connected to the acceptable metallic water pipe (See Note) on the street side of the water meter (if any) or directly to the water pipe.
- (b) Service conduit, service-equipment enclosure or grounding electrode of the power service of a multigrounded neutral power system.
- (c) An effectively grounded metallic structure, pipes or conduit.
- (d) A ground rod or pipe driven into permanently damp earth (See Paragraph 9.01).

Note: Acceptable metallic water pipe is defined as a metallic water pipe with at least 10 feet buried in permanently damp soil. See Paragraph 6.04, Note 4.

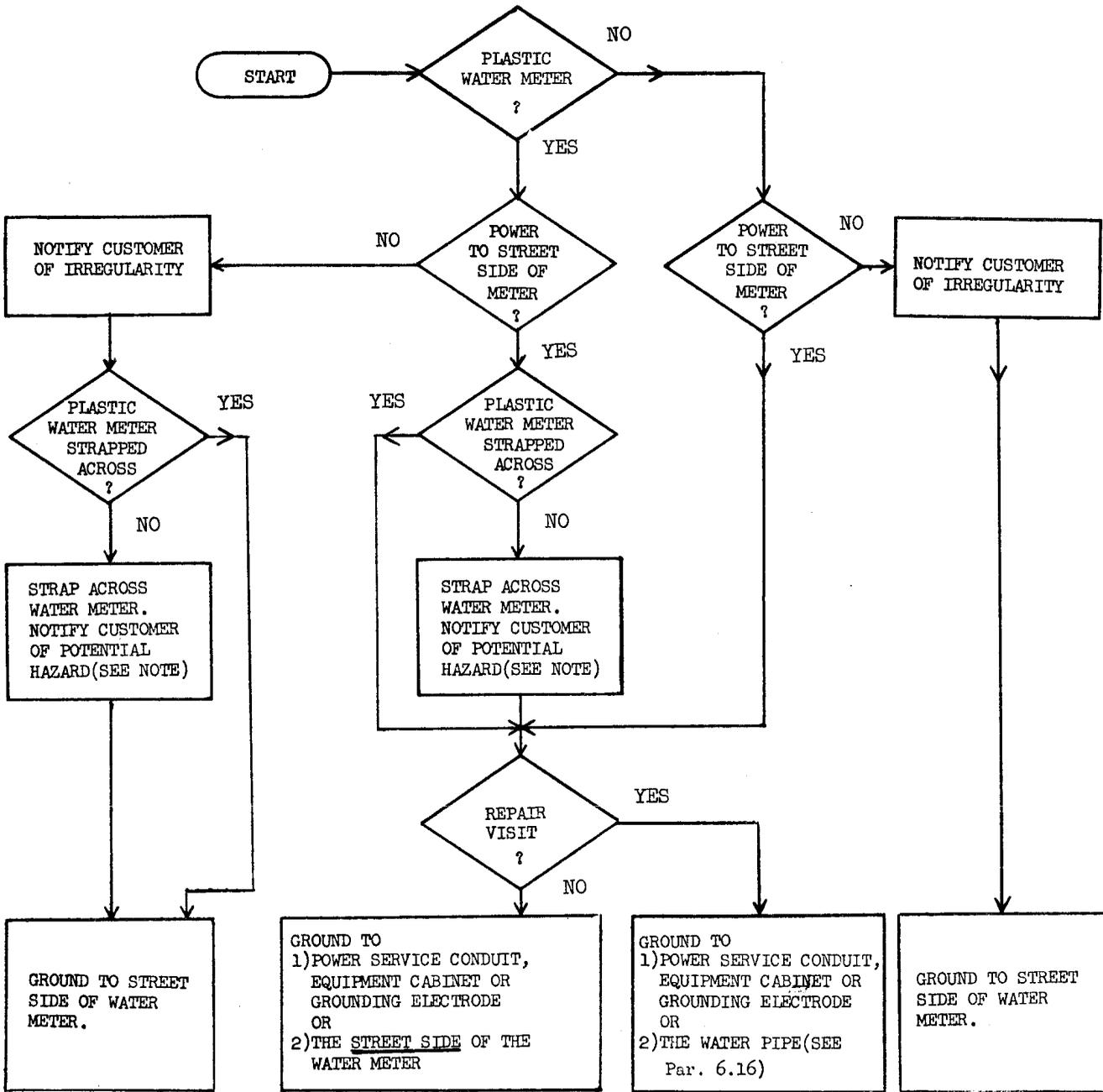
Delete Paragraph 6.03.

Add the following notes to Paragraph 6.04.

Note 1: Unless the building steel is used as the principle grounding means (See 6.01, Grounding-Order of Preference), it will be used only to avoid very long runs of the ground wire. It must be bonded to the metallic cold water pipe and the power service ground.

Note 2: The power must be to street side of the water meter. If not, notify customer of the irregularity and run to street side of meter.

Note 3: Where a plastic or metallic water meter is found, and there is an acceptable water pipe for ground, follow the flow chart below. All straps will be at least a #6 AWG wire.



Notes: The strap is for the telephone ground or bond only. It is not intended to provide the power service bond to the interior metallic cold water pipe. The power service bond may require a larger wire.

Add the following to Paragraph 6.06:

Figure 39 is for an unacceptable metallic water pipe in a non-MGN area.

Change the following Paragraph 6.07:

If a plastic water meter is found, see the note on plastic water meters on Page 7.

Change Paragraph 6.12 to read as follows:

Due to corrosive action, it is important to use the proper Fargo connector. It is listed in the catalog as Fargo GA620C.

Change Paragraph 6.16 as follows:

Strap across any insulating joints between the protector ground connection and earth with a #6 bonding wire.

Change Paragraph 6.19 to read as follows:

No splices will be made in the ground or bond wire.

Delete Paragraph 6.20

7. Signaling Ground

Add the following paragraphs:

7.08 In addition to the SIGNALING GROUND mediums given in Paragraph 7.01, the following may be used when the above are not satisfactory for signaling:

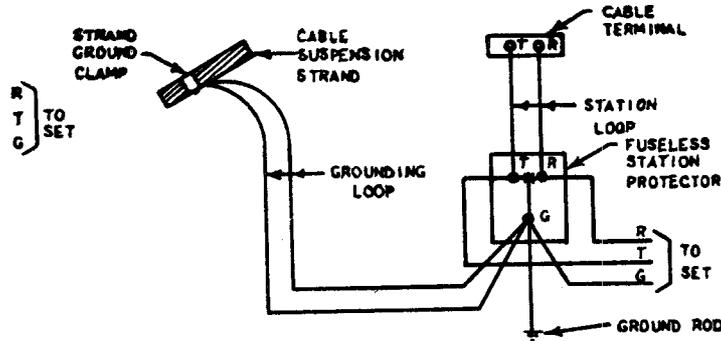
- (a) Multiple Ground Rods, when a single ground rod does not give a sufficiently low impedance ground or signaling purposes. (See Below)
- (b) Cable Suspension Strand
- (c) Public Water System in Nearest Building, an alternate when apparatus is mounted on a pole and suspension strand or ground rods are not satisfactory, (See Below)

7.09 Multiple Ground Rods: If the ground obtained from a single rod does not meet the signaling requirements, one or two additional rods may be installed as follows:

- (a) Drive the rods in soil most likely to remain moist throughout the year. Place them about 6 feet apart, avoiding locations where they may be damaged by digging or grading.
- (b) Splice the ground rod terminal wire from the second and third rods to the first ground rod, with No. 12 ground wire and E Connectors Size 1.

- (c) Make a narrow trench from the first rod to the second and third rod by cutting through the sod with a hand axe or spade. Bury the wire, then tamp the soil down firmly to hold the wire in place.
- (d) If the ground does not meet the requirements, refer the case to your supervisor.

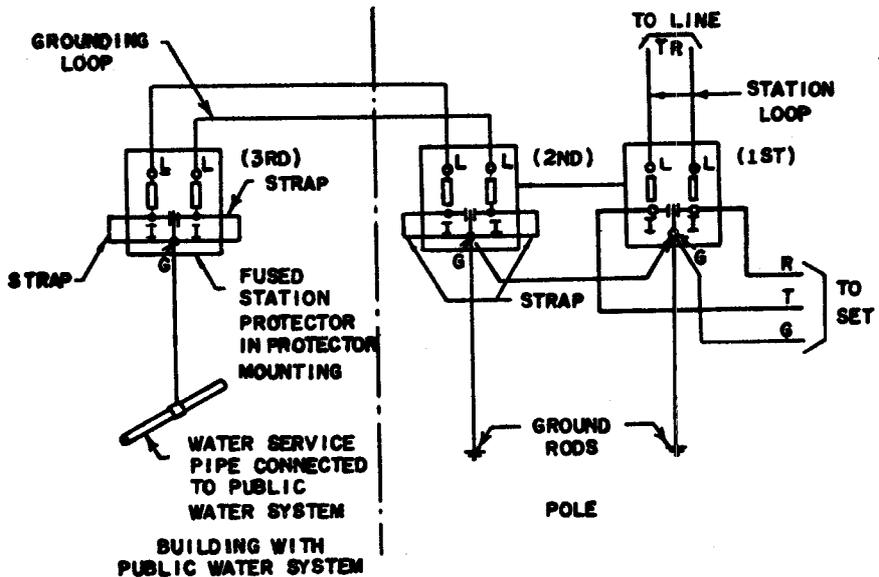
CABLE SUSPENSION STRAND GROUND



SIGNALING GROUND WHERE CABLE SUSPENSION STRAND GROUND IS USED

- (a) Install a grounding loop between the fuseless station protector and the cable suspension strand by means of a strand ground clamp.
- (b) Connect both sides of the grounding loop to the ground lug of the fuseless station protector.

PUBLIC WATER SYSTEM IN NEAREST BUILDING



SIGNALING GROUND WHERE A PUBLIC WATER SYSTEM IN THE NEAREST BUILDING IS USED

PUBLIC WATER SYSTEM (CONTINUED)

- (a) Install a second station protector and associated ground rod adjacent to the first protector and strap the ground terminals of the first and second protectors. Also strap the ground terminal of the second protector to its instrument terminals.
- (b) Install a third station protector, in a protector mounting, on the outside of the nearest building with a public water system and connect the ground terminal to a cold water pipe. Also strap the ground terminal of the third protector to its inside wire terminals.

8. Coin Station Ground

Add the following to Paragraph 8.03:

No. 12 ground wire is the smallest wire used by SNET.

9. Locating and Installing Ground Rods

Delete Paragraph 9.05.

14. Coverting Protectors

Change Paragraph 14.01 to read as follows:

Fused protectors found in locations where a fuseless protector should be, shall be replaced by a fuseless protector.

Delete Paragraphs 14.02, 14.03, and 14.04.

16. CATV-Station Protection

16.01 CATV companies are required to ground the outer conductor of their coaxial service drop wire at the subscribers location in accordance with the National Electrical Code. The preference of grounding is the same as the telephone grounding preferences listed in Section 6.01.

- (a) Where the power service conduit, service equipment enclosure or grounding electrode is grounded to an acceptable metallic water pipe and the telephone and CATV are grounded to either the power service conduit, service equipment enclosure or grounding electrode or the water pipe, they shall be considered bonded.

(b) If separate ground rods are used all grounds (power service, CATV and telephone) must be bonded together with a #6 bonding wire (See Figure 5). Where it is impractical to run a #6 bonding wire, the unacceptable metallic water pipe may be used as the bonding conductor if the power service is bonded to it and it is not likely to be disconnected or rearranged. Bond across any insulating joints between the two rods. If the power service grounding conductor is broken, corroded or missing entirely, run a #6 bonding wire from the telephone protector to the power service ground rod and to the metallic water pipe. The customer should be notified of the irregularity per local customs.

16.02 The telephone ground is always bonded to the power service ground and metallic water pipe. The CATV ground must be bonded to the power service ground. THE BOND BETWEEN THE TELEPHONE GROUND AND POWER SERVICE GROUND COMPLETES THE BOND BETWEEN CATV GROUND AND TELEPHONE GROUND.

16.03 During a station inspection, if the CATV is found not grounded or bonded properly, the subscriber shall be notified of the condition. It will be the subscrib's responsibility to contact CATV. Telephone employees shall not take it upon themselves to alter the CATV bonding or grounding, or to directly bond telephone and CATV grounds.

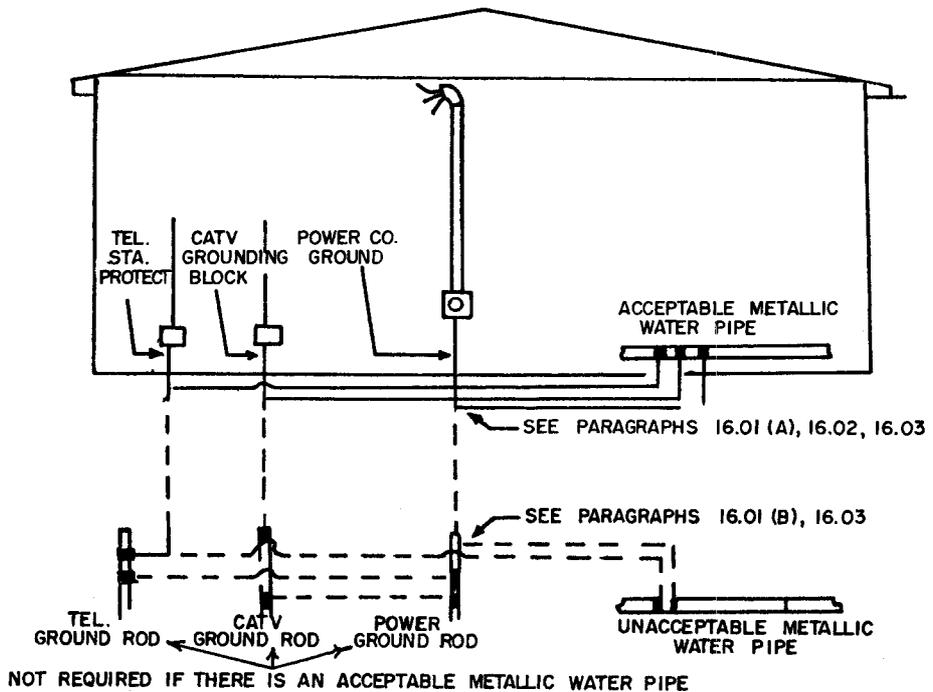


FIGURE 5