BURIED PLANT

MAINTENANCE TO EXISTING SYSTEMS

PROCEDURES

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1. GENERAL

1.01 This section outlines the general procedures to be followed while working on the following types of buried plant:

(a) Joint-use common trench—random separation

(b) Joint-use common trench—12 inches separation of earth maintained between telephone and power conductors

(c) Telephone and power conductors in separate trenches within the same easement if 3 feet or less apart.

1.02 This section is being revised to:

- Add reference to the 188A test set
- Add table covering employee activity in joint buried trenches
- Add Bell System Practices references in paragraph 1.03
- Include additional safety procedures.

Revision arrows are used to emphasize these changes.

1.03 Prior to working on joint buried plant, review the following Bell System Practices:

SECTION	TITLE
▶081-705-101◀	B Voltage Tester—Use on Joint Use Poles and Other Equipment
081-705-102	188A Test Set (STOP-LITE) Description and Use◀
620-060-530	Locating Buried Cable
620-102-010	Outside Plant Precautions Underground and Buried Work
630-135-010	Guarding Work Areas
622-020-020	Conduit and Manhole Construction General (Shoring)
629-020-100	Buried Plant—Installation Telephone and Power in Same Trench and in Separate Trenches in Same Easement
629-100-010	Buried Plant—Precautions
629-200-205	Buried Plant—Trenching and Backfilling
▶629-295-300	Repairing Buried Cable—Pulp and Paper Insulation◀
632-020-240	Cable Removal—Cutting Splice Closures from Plant

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SECTION	TITLE
634-220-500	Locating Underground Pipes and Cables—Low Frequency Method
634-220-501	Locating Underground Pipes and Cables—High Frequency Method ▶(Metrotech Model 480)◀
▶634-315-501	173A Test Set Sheath Fault Locator◀
644-200-031	Repairing Buried PIC Cable

1.04 ▶The B voltage tester (rated Mfr Disc.) can be used until replaced by the 188A test set.◀

1.05 To work safely on joint buried plant, the following safety steps must be observed:

(a) ***Accurately locate buried cable***

(b) ***Cautiously expose the cable***

(c) ***Use positive identification methods***

(d) ***Apply proper mechanical protection***

(e) ▶***Use effective bonds.***◀

1.06 When dispatched on trouble a complete survey of the job will frequently reveal a damaged closure, a digging operation, or some other physical damage to buried plant. If power trouble is suspected, alert the employee when dispatched. ▶Table A covers situations involving digging and handling of the work operation.◀

▶TABLE A◀

TELEPHONE CRAFT ACTIVITY IN JOINT TRENCHES

WORK OPERATION	CRAFT MAY DIG WITHOUT POWER COMPANY PERSONNEL ON SITE		CRAFT PERMITTED TO HANDLE POWER CABLES	
	0-300 VOLTS TO GROUND	OVER 300 VOLTS TO GROUND	0-300 VOLTS TO GROUND*	OVER 300 VOLTS TO GROUND
1. Trouble In:				
Power company plant	No	No	No	No
Telco plant	Yes	Yes	Yes	No
Both	No	No	No	No
2. Rearrangement In:				
Telco plant	Yes	Yes	Yes	No
3. Construction In:				
Telco plant	Yes	Yes	Yes	No

*Applicable only when located in service trench.

Note: Above voltages assume MGN Systems. For Delta Systems, use phase-to-phase voltages.

2. PRECAUTIONS

2.01 Before excavating near buried plant, both the path and depth of the telephone cables must be located as outlined in Section 634-220-500 or 634-220-501. Locate path of power cable by power company staking or assuming random lay.

Test sets indicate only an approximate depth of the cable, so exercise caution when digging.

2.02 For maintenance, extensions, and new service, the existing cables should be uncovered by hand digging ***using only tools with wood handles or similar insulating material. Do not use digging bars or tools with metal handles.*** Power digging equipment may be used thereafter for extension in the direction ***away*** from the existing cable.

2.03 Under normal conditions with stable soil, shoring is not required unless excavations are 5 feet or more in depth and employees have occasion to enter them. This 5-foot guide should be modified to shorter depths if unstable soil conditions or rainy weather exists or if heavy equipment or traffic is in proximity to the excavation as outlined in Section 622-020-020.

2.04 ***Before handling, opening, or cutting cables, positive electrical identification shall be made.*** Certain electrical supply cables have characteristics that are identical to telephone cables which makes visual identification impossible. (See paragraph 4.04.)

2.05 Telephone employees may not move or handle any power cable ***in the main trench*** (primary, secondary, or service leads) or primary cables anywhere at any time. Power employees shall be requested to move primary, secondary, and service leads in main trenches.

2.06 When damage is suspected or visual observation indicates damage, before any bodily contact is made, test with a 188A test set or B voltage tester.

If the test indicates the presence of power, immediately remove test set from contact with closure. Take necessary precautions to protect the public and notify your supervisor or control center.

2.07 Electrical continuity of all bonds, including cable sheath bonds in closures or at splice locations, must be maintained during the repair process.

2.08 Telephone company employees shall not connect bonds to power cable neutral. This connection shall be made by the power company.

3. MAINTENANCE OF EXISTING BURIED PLANT CABLE CLOSURES

3.01 ***Voltage Test—Damaged Cable Closure Used in Joint-Buried Plant:*** When a telephone or power pedestal closure (this applies to all closures used in joint-buried plant whether standing alone or mounted back to back with power) has been damaged or disturbed, eg, knocked over or driven into the earth by a motor vehicle or a trouble condition involving power is suspected. Any power work shall be performed first, then proceed as follows:

(1) Test; if energized, see paragraph 2.06.

(2) If clear, straighten closure while wearing insulating gloves. Avoid bodily contact.

(3) Retest; if energized, see paragraph 2.06.

3.02 Telephone employees shall not work on the telephone plant until the power company has completed repairs. After the power company has completed its work, the pedestal shall be tested with the 188A test set before any bodily contact is made.

3.03 If the tester indicates a safe condition, remove the cover from the closure and visually inspect the cable bonding and grounding connections. If they are not intact or loose, test the connections with the test set before performing maintenance work.

3.04 If for any reason it becomes necessary to open the bond between telephone facilities and power, or across cable sheath openings, a temporary bond strap must be placed ***before*** the bond is opened. If for any reason the temporary bond cannot be placed, consult your supervisor. It may be necessary for the power company to deenergize the power briefly during repair operations to the bonds. If bonds must be removed in order to locate faults, ***wear insulating gloves and eye protection,*** then test the opened cable shield on both sides of the bond for power. Replace bond after fault has been located.

Electrical continuity of all bonds, including cable sheath bonds in closures or at splice locations must be preserved during the repair process. Until the permanent bond is installed, maintain continuity using a temporary bond strap ▶(Section 644-200-031).◀

3.05 After the work operation has been completed and the closure cover replaced, place an H identification decal on the front of the closure directly below the F warning decal. The decal is gray-green with the words JOINT BURIED printed in white lettering.

4. MAINTENANCE OF EXISTING JOINT BURIED SYSTEMS—COMMON TRENCH—VERTICAL, HORIZONTAL, AND RANDOM SEPARATION

4.01 Locate the path and depth of the cable to be exposed as outlined in Section 634-220-500, 634-220-501, ▶or 634-315-501◀ before starting excavation.

Caution: In regard to depth determination, none of the test sets can be relied on to give more than an approximate indication of the depth of cables in joint systems.

4.02 Determine the path and depth of the power conductor or cables either by power company staking or assuming random lay.

4.03 Excavation of joint buried plant may be performed when in accordance with Table A and provided that the following conditions and procedures are followed:

(a) ▶Power company is notified.

(b) Location and depth of power is known.

- Verify with power company records
- Power company staking
- Personal knowledge of route
- Locate yourself by test set

(c) Safety headgear and eye protection are worn.

(d) Insulating gloves are worn.◀

PROCEDURES

(a) Use of ***wooden handle*** shovel or similar tool having ***equivalent insulating value.***

Danger: Do not use digging bars or tools with metal handles in the vicinity of joint buried cables.

(b) Start digging at a point 6 to 12 inches to one side of the established path.

(c) When at the depth of the cable, dig toward the cables to expose them.

(d) If digging conditions are encountered which require tools other than a shovel, use a wooden handle pick or similar tool having equivalent insulating value.

(e) ▶Separate telephone and power cables.◀

Power company employees shall be requested to separate or move primary and secondary cables, service leads in main trenches, and secondary leads exceeding 300 volts to ground in service trenches.

- ▶Less than 300 volts to ground, telephone company may separate
- Wooden boards may be placed between telephone and power, but in every case use insulating blankets to cover power.◀

4.04 Electrically identify and mark the exposed telephone cables as follows before opening, or cutting.

Danger: Except in the case of a cut cable as described in (d), visual identification shall never be attempted. Never assume that a particular cable is a telephone cable because other cables in the trench have been identified by the power representative. Cable must be electrically identified and marked even though it has been identified in an adjacent pit, for the cable may be transposed in the connecting trench.

(a) Using a 76C, 138A, 146A, or KS-14103 type test set, place a tone at a terminal or central office between one conductor of a pair in one group and a conductor of a pair in a second or different group.

(b) Short these conductors at the distant end; then, using 101B or 105D test set (exploring coil) in conjunction with 147-type amplifier, identify the telephone cable. ***Do not use a ground return with the tone because the telephone cable sheath ground and the power neutral are interconnected and the tone will be picked up on power cable.***

(c) After ***positive*** electrical identification has been made, mark the cable with paper tape or muslin, etc, before any further work commences.

(d) Where telephone cables have been cut and ***positive*** identification can be made because the conductors are clearly visible, electrical identification is not required.

4.05 Repair the buried cable as outlined in Section 644-200-031.

Danger: Certain electrical supply cables have characteristics that are identical to telephone cables which make visual identification impossible; therefore, in all cases employees shall make positive electrical identification as outlined in paragraph 4.04 before working on cable.

4.06 If the maintenance work involves only the telephone cables in main trenches, it is the responsibility of the power company personnel to physically separate and mechanically protect its facilities from damage during the telephone work operations. In the case of vertical separation, power cables may not need additional protection if it can be established that there is sufficient soil cover over the power cables to protect them adequately. ▶If sufficient soil cover cannot be established, place insulating blanket under work area.◀

4.07 In the case of power cable maintenance only, measures should be taken to protect the telephone cable by covering it with boards and/or insulating blankets. While this work is in progress, it is the responsibility of the power company to separate and adequately insulate and protect its cables.

4.08 If the maintenance work involves both power and telephone facilities, the power personnel will repair their facilities first. ***Insure that telephone plant is protected. Telephone testing and maintenance shall start only after power personnel have separated and adequately protected their cables.***

4.09 Repair the cable as outlined in Section 644-200-031.

4.10 After all maintenance work has been completed and all cables and wires are in the trench, backfill and restore the surface as near to its prior condition as practical.

5. MAINTENANCE OF EXISTING SYSTEMS—SEPARATE TRENCH

5.01 Locate cable path and expose cables as described in paragraphs 4.01 through 4.03.

5.02 ***Electrically*** identify exposed cables as indicated in paragraph 4.04.

5.03 If power company cables are found in the exposed cable run, ***stop work immediately and notify your supervisor.***

5.04 Repair the cable as outlined in Section 644-200-031.

5.05 After all work has been completed and all cables and wires are in the trench, backfill and restore the surface as near to its prior condition as practical.