INNERDUCT PLACING
UNDERGROUND

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1. GENERAL

1.01 This section covers innerduct placing methods and recommends tools and equipment for use in the placing operation.

1.02 Whenever this section is reissued, the reason for reissue will be given in this paragraph.

1.03 The B innerduct (AT-8954) is a nominal 1-inch ID polyethylene pipe that is placed in an existing duct in a conduit structure for the purpose of housing a single LGA-1-type lightguide cable. As many as four innerducts may be placed in an existing 3-1/2 inch square or 4-inch square or round duct. As many as three innerducts may be placed in an existing 3-1/2 inch round duct.

1.04 The methods used for placing innerduct are essentially the same as for placing any underground cable. Refer to Sections 628-200-208 and 628-200-209 for instructions regarding presurvey, placing pulling lines, manhole setups, and tool and equipment requirements.

2. PRECAUTIONS

2.01 Before starting innerduct placing operations, all personnel must be thoroughly familiar with the 620 Division of the Bell System Practices. The sections covering the following should be given special emphasis:

(a) Guarding and protecting work areas

(b) Testing and ventilating manholes

(c) Occupational exposure to lead dust

(d) Precautions pertaining to smoking or use of open flames around manholes

(e) Removing and replacing manhole covers

(f) Signals used in outside plant construction work.

2.02 All precautions in Section 628-200-208 shall be considered a part of this section and shall be strictly observed.

2.03 Innerduct being placed in an existing duct shall be of one continuous length, ie, shall not be two or more short lengths coupled together. The innerduct coupling described in Section 628-200-216 shall not be used to join innerduct lengths for placing. The innerduct coupling is used for joining innerduct in manholes for racking or for repairing innerduct already in place.

3. DESCRIPTION

3.01 B innerduct is a polyethylene pipe with nominal 1-inch ID and 3/16-inch wall thickness. It is available in maximum reel lengths of 1650

feet and may be ordered in specific lengths shorter than 1650 feet.

3.02 There are interval marks printed on the B innerduct every foot. These marks can be useful in determining wall-to-wall measurements for cable orders. The standard color for the markings is white. An orange color marking is available, but it must be specified when the innerduct is ordered. When multiple innerducts are placed, orange color markings on one innerduct can be helpful in innerduct identification.

3.03 The B innerduct can be handled in the same manner as plastic-sheathed cable of approximately the same OD. Innerduct can be placed at temperatures ranging from -20°F to +120°F (-29°C to 49°C). A single innerduct at room temperature begins to yield at a tensile load of about 800 pounds.

3.04 Innerduct is shipped on nonreturnable, 48-inch flange-diameter wooden reels. The reels are 31 inches wide, have a 23-inch drum diameter, and have a 2-11/16 inch arbor hole. The ends of each coil of innerduct are sealed with dust-tight plugs for shipping.

4. PLACING INNERDUCT

PREPARATION

4.01 All of the innerducts being placed in one existing duct are pulled in simultaneously. Therefore, the means for setting up as many as four reels of innerduct at the feed manhole may be required.

4.02 The various types of equipment normally used at the feed manhole for placing cable can be used for placing innerduct. When multiple innerducts are to be placed, a flatbed trailer or semitrailer with side or rear payout may be used, or a vehicle equipped with a reel lift and reel carrier capable of handling as many as four reels (Fig. 1) may be used. In any case, the equipment used must allow the innerducts to be fed freely into the manhole.

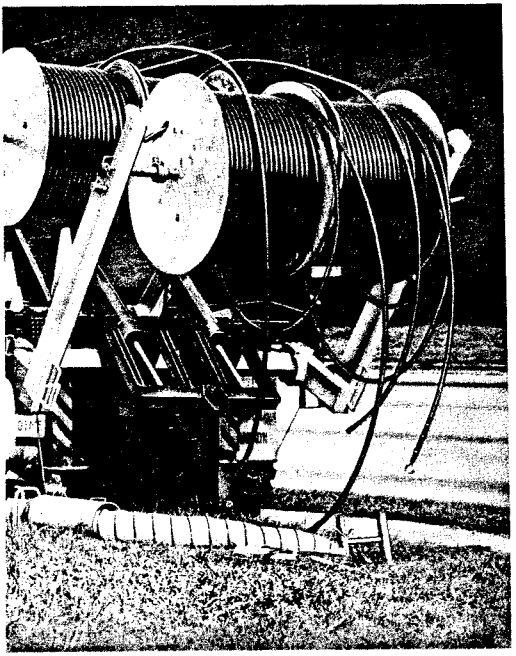

Fig. 1—Setup for Reel Handling at Feed Manhole

4.03 Before innerduct placing begins, the existing duct must be checked for obstructions. This may be done several days in advance of the innerduct placing or as a part of the innerduct placing operation. Sections 628-200-208 and 628-200-209 cover the various options available.

4.04 At the feed manhole, set up the manhole with a cable feeder, a cable feeder extension, and a cable lubricator.

4.05 One method for attaching the pulling line to the innerducts is illustrated in Fig. 2. Cut the plugs from the ends of the innerducts and insert a 1-foot length of 1-inch diameter wooden dowel into each innerduct. The dowel will keep the cable grip from compressing the innerduct and losing its purchase on the innerduct.

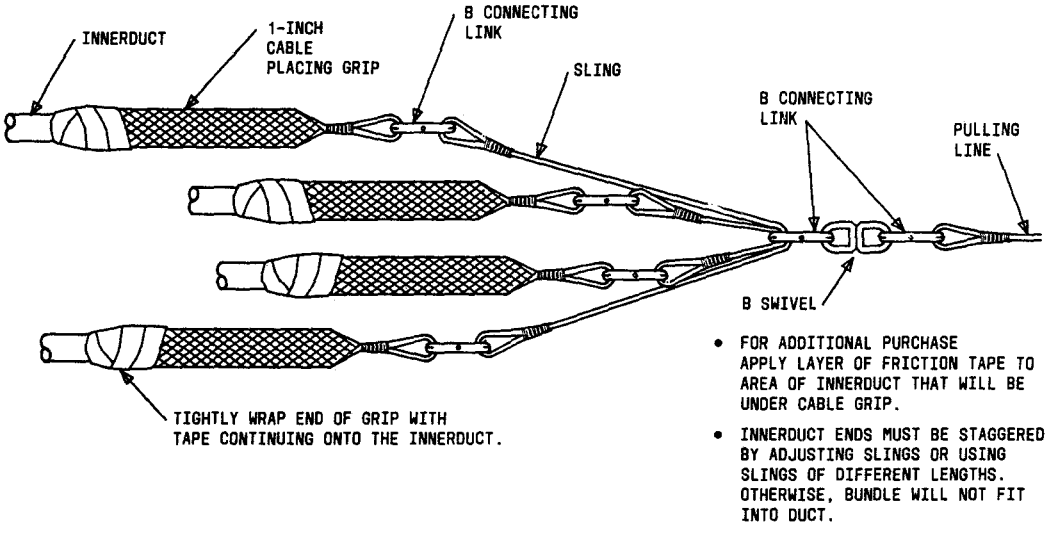

Fig. 2—Method of Attaching Pulling Line to Innerduct

FEEDING AND PULLING

4.06 Start the pull by slowly applying tension to the pulling line. After the innerduct(s) enter the existing duct, gradually increase pulling speed until the desired speed is reached. Maintain a steady pull.

4.07 Watch the innerduct(s) as they unreel (Fig. 3) to be sure payout is even and that no cracks or breaks are visible. If any problems should arise, stop the pull. Use a talk line or radio to communicate between the feed manhole and pulling truck.

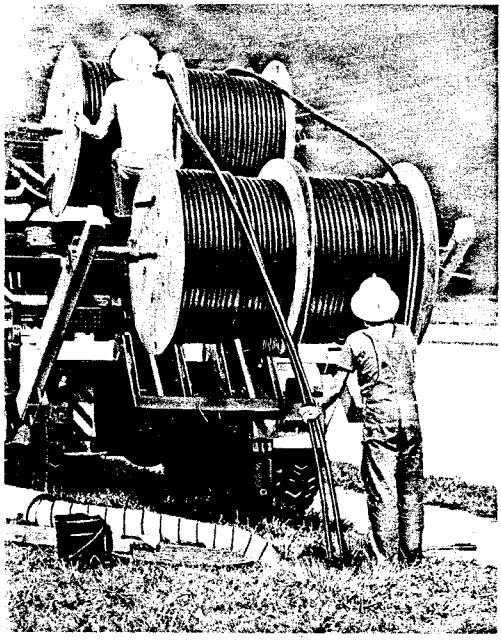

Fig. 3—Observing Innerduct as It Is Placed

4.08 Station a craft person at each pull-through manhole to guide the connecting hardware and innerduct(s) into the duct entrance. An LG-345 leadergard placed in the duct entrance will prevent damage to the innerduct(s). The person at the pull-through manhole must be in contact with the pulling truck so the pull can be stopped and restarted as necessary.

4.09 After the pull has been completed, there should be sufficient slack in the innerduct(s) so the end(s) will reach the far wall in the pull and feed manholes, and enough slack in pull-through manholes so the innerduct(s) can be positioned out of the way of any necessary work operations in the manhole that will occur prior to final racking of the innerduct(s). Final racking of the innerduct(s) will not be made until after the lightguide cable has been placed (see Section 628-200-216).

5. LUBRICATING INNERDUCT

5.01 Bell System standard cable lubricants may be used to lubricate innerduct. In general, the quantities of lubricant required for innerduct are the same as for plastic sheath cable of equivalent size as given in Section 628-200-208.

6. PLACING MEASURING TAPE AND PULLING LINE

6.01 After the innerduct has been placed, accurate measurements for cable ordering information can be made by placing measuring tape marked in 1-foot increments in an innerduct. Using a measuring tape with tensile strength greater than the anticipated pulling tension required for placing the winch line will provide the means for measuring the required cable length and then pulling in the winch line. The tape is manufactured in 3000-foot lengths and is available with tensile strengths of 475, 625, 785, and 1250 pounds. The tapes are available from Kyova Corporation, Columbus, Ohio 43285.

6.02 To place the tape, set up the Greenlee 690 vacuum/blower (Fig. 4) at one end of a length of innerduct. At the opposite end, attach a Greenlee 610 rodding missle to the measuring tape and vacuum the tape into the innerduct. The vacuum/blower can then be moved to the next manhole where the innerduct is interrupted, or the innerduct can be cut at any intermediate manhole for the purpose of placing the tape, and the tape vacuumed into that length of innerduct. With this procedure, using manual assist where necessary, one continuous length of measuring tape can be used to measure distances up to the maximum length of the tape. When recording lengths for cable ordering purposes, allowances must be made for racking and surplus requirements at splice locations.

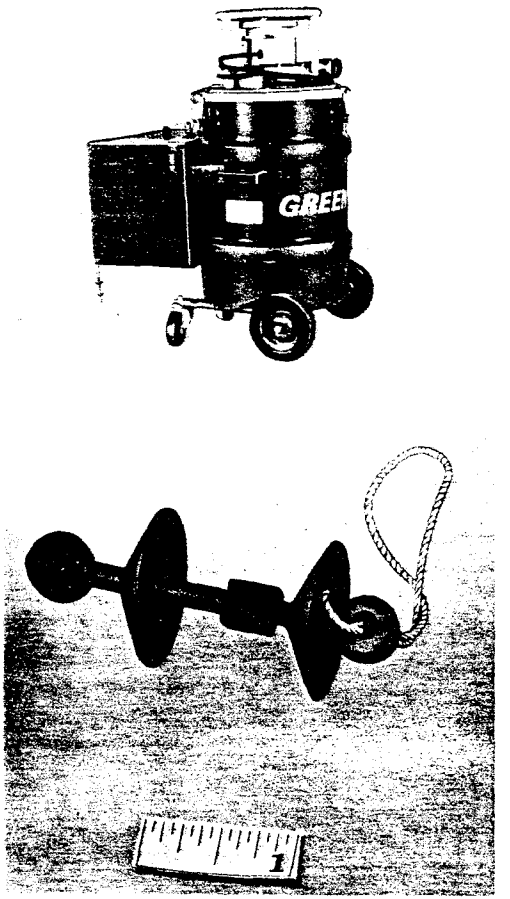

Fig. 4—Greenlee 690 Vacuum System

6.03 After recording the measurements, cut the tape at the ends of each innerduct length leaving sufficient slack for attaching the winch line or for rejoining the measuring tape. Fold the tape back on itself several times leaving a 6- to 8-inch tail free. Insert the folds of tape into the end of the innerduct while holding the tail of the tape. Lay the tail of the tape back along the outside of the innerduct and place a 1-1/2 inch size B or C cable cap on the end of the innerduct with the tail of the tape between the outside of the innerduct and the inside of the cap.

7. SEALING INNERDUCTS

7.01 Innerduct must be plugged or capped during placing. If the plugs furnished with the innerduct have been removed for any reason, ie, to place measuring tape or to cut ends at feed manhole, replace them with the standard, 1-1/2 inch size, B or C cable cap after placing is completed.

7.02 To seal the duct containing innerduct and to seal the innerduct after the cable is placed, use methods covered in Section 628-200-216.