BELL SYSTEM PRACTICES
Outside Plant Construction and Maintenance

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SEALING DUCTS
CONDITIONS REQUIRING SEALS

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1. GENERAL

1.01 The instructions in this series cover approved methods and materials for sealing the ends of ducts to prevent the entrance of foreign materials and as protection against gas and water entering buildings, manholes or other structures through the conduit system.

1.02 This section lists the principal locations at which seals are to be applied and indicates the appropriate type of seal. Along with the related sections, it constitutes a revision of G55.150.

1.03 Seals which are required to remain tight against considerable water pressure should be made with either Rubber Conduit Plugs or Waterplug, depending on conditions. Rubber plugs are available for all sealing conditions except round bore ducts occupied by the larger sizes of cables. For the latter cases and in situations where rubber plugs can not be used, Waterplug can be employed. When requirements are less exacting, Plastic Duct Seal or wooden Conduit Plugs can be used.

1.04 Plastic Duct Seal should not be used to seal ducts containing **alpeth** cable or any cable having polyethylene as the outer covering. In such cases substitute Waterplug or

Rubber Conduit Plugs in situations where the instructions specify Plastic Duct Seal.

1.05 Existing seals made with materials other than those included in these instructions need not be replaced if they are performing satisfactorily. When it becomes necessary, however, to remove such seals in the course of other work, a replacing seal of approved type should be used.

1.06 Before replacing old seals or applying seals at new cable installations, remove all old material such as oakum, muslin, cotton waste, paper, etc., that may be in the duct.

1.07 All ducts entering central offices or other buildings should be kept sealed at all times except when it is necessary to have them open for construction or maintenance work. If the work extends over several days, all seals should be replaced temporarily at night. As soon as the work requiring their removal is completed, the seals should be replaced permanently and inspected carefully to see that they are tight.

1.08 On completion of other work on cables in manholes, cable vaults or buildings, examine for leakage and restore or replace any seals that may have been weakened as the result of cable movement during the course of the work.

1.09 Do not attempt to use for seals in buildings Rubber Conduit Plugs the rubber of which has hardened to a degree which prevents it from expanding readily. Replacement rubber parts should be obtained for such plugs which are otherwise in good condition. This will apply mainly to plugs which have been in service previously in dry locations or which have been in storage for long periods.

1.10 In using Rubber Conduit Plugs for sealing cables having protective coverings over the sheath it is not necessary to remove the protection in order to obtain a tight seal. In selecting the size of plug, obtain the cable diameter over the protection and use this figure as the "Cable Diameter" in the tables of plug sizes appearing in the section relating to split rubber plugs.

1.11 Dowel pin holes, cracked conduit walls or porous areas in the masonry adjacent to conduit entrances afford a means for gas or water to enter and should be filled if it is desired to seal the structure permanently. Waterplug can be used for this purpose, following the instructions for using this material to seal ducts. As an alternative method of plugging dowel pin holes which are dry or can be made dry at the time of sealing, a satisfactory seal can be made by forcing lead wool

or other available backing material into the hole, leaving about one inch space between the backing and the opening of the hole to be filled with Plastic Duct Seal.

2. DUCTS BETWEEN CONDUIT SYSTEM AND SIGNAL BOXES

2.01 Conduit between telephone manholes and traffic control, fire alarm or police call boxes or control boxes operated by other Companies should be sealed at both ends to minimize the hazard of gas explosions due to arcing at switches within the boxes. The ends of the conduit should be sealed with Plastic Duct Seal or with Waterplug, as described in another section of this series.

2.02 Where the alarm or control box end of the duct is not under the administration of the Telephone Company, the matter of sealing the ducts in the boxes should be referred to the city authorities or to the controlling Company through telephone organization channels to ensure that the ducts will be sealed.

2.03 The manhole ends of ducts leading to alarm or control boxes should be inspected before leaving manholes as a means of ensuring that such ducts are sealed. Ducts found open should be sealed as outlined above.

3. DUCTS BETWEEN CONDUIT SYSTEM AND BUILDINGS

3.01 Conduit connecting directly between manholes and buildings should always be sealed at the building end with Rubber Conduit Plugs or Waterplug. In localities where the hazard from gas or water in the conduit system is considerable, it may be advisable as an added precaution to seal also the manhole ends of such ducts.

3.02 Sealing ducts in manholes may interfere with drainage from the duct line. Where the duct is constructed of iron or steel pipe, therefore, consideration should be given to the possibility of damage to the cable through freezing before sealing such ducts at the manhole.

4. DUCTS FROM CONDUIT SYSTEM TERMINATING ON POLES OR OUTSIDE BUILDING WALLS

4.01 Occupied ducts extending from manholes and terminating at the ground line in cast iron bends on poles or outside building walls should be sealed at the end of the bend with Plastic Duct Seal as described in the instructions for this material. Occupied ducts terminating in steel pipe guards

on walls or poles should also be sealed at the top with Plastic Duct Seal or by wiping a lead pipe cap to the cable sheath. The cap should be large enough to cover the end of the pipe.

4.02 Unoccupied ducts extending from manholes and terminating at the ground line in cast iron bends on poles or outside building walls should be plugged with wooden Conduit Plugs. If steel pipe cable guards are used, the plug should be placed in the end of the guard.

5. DUCTS WITHIN THE CONDUIT SYSTEM

5.01 Sections of the conduit system such as steel pipe dips under other structures, submarine pipe crossings and similar types of construction should be sealed at both ends of the section with Rubber Conduit Plugs or Waterplug.

5.02 The use of Rubber Conduit Plugs or Waterplug may be indicated for temporary or permanent installation in manholes to exclude water or gas or to avoid excessive pumping during splicing or other work in the manhole.

6. DUCTS NOT CONNECTED TO CONDUIT SYSTEM

6.01 Occupied ducts extending between poles, between poles and buildings or between buildings should be sealed at each end with Plastic Duct Seal.

6.02 Unoccupied ducts extending between poles and also the outside terminations of ducts extending between poles and buildings or between buildings should be plugged with wooden Conduit Plugs. Terminations which extend through a building wall should be sealed with Plastic Duct Seal at the building entrance.

6.03 Entrances for buried cables into repeater stations or other buildings either through conduit extending from manholes or through pipe bends should be sealed at the building, using Plastic Duct Seal. Remove the protective covering from the cable sheath for a distance of about three inches into the opening so that a close bond will be obtained when the sealing material is applied.