UNDERGROUND CABLE PLACING

RODDING AND CLEANING DUCTS

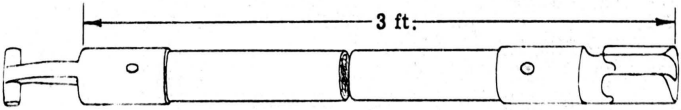
Contents

1. GENERAL

1.01 This section combines rodding and cleaning information in one practice and replaces Part 5 of G55.105 and Part 5 of G55.110.

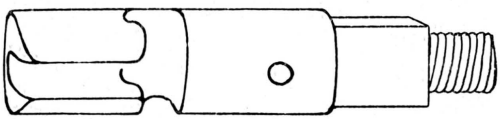
2. QUICK COUPLING DUCT RODS

2.01 Quick coupling duct rods should be used for rodding main conduit sections known to be in good condition. They can be used in conduit partially filled with silt or other material that will not block the passage of the duct rods.

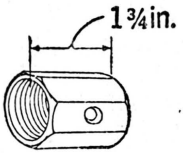


Quick Coupling Duct Rod

2.02 The Duct Rod Adapter as illustrated is used to connect the Quick Coupling Duct Rods to the rodding and cleaning tools.



The following Duct Rod Connector makes it possible to connect tools with male threaded attachments to the adapter.



3. FISH WIRE

3.01 Subsidiary conduit with one or more bends and short sections of main conduit can be rodded with a 5/8-inch steel Fish Wire.

4. RODDING DUCTS

4.01 Make certain that the ducts rodded are the ones selected. If the conduit run is on a grade the work will be easier if rodding is done down-hill. Where the run contains bends, less effort will be required if the straight portion of the duct can be rodded first. Quick coupling duct rods can be passed through medium and large radius bends by turning the rods so that the couplings pivot as they move through the bend.

4.02 Use an arrow-head or the loop section of a duct grapple as a leader on the first rod and push the rod into the duct. Then attach additional rods to the last one in the duct and push them into the duct. Repeat this operation until the leader appears in the next manhole.

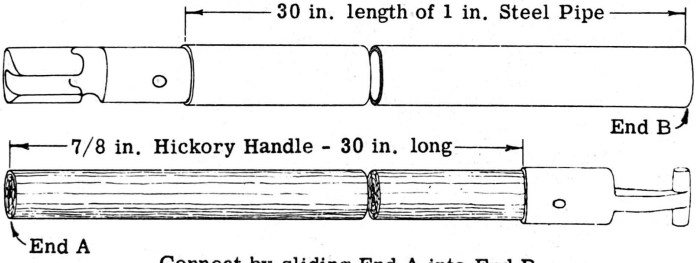
4.03 The standard Duct Rod Puller can be used to facilitate pushing or pulling duct rods or 5/8-inch fish wire (steel rodding tape) particularly when the rods and wire become wet and slippery. The puller may be attached for grasping the rodding devices for

either pushing or pulling, and the opposite movement opens a cam and permits sliding the puller along the rods and over their couplings to obtain a new grasp.

4.04 When possible, push the rods from one section to another without disconnecting them. In the case of a long duct section, rods may be pushed into the duct from each end. The first rod entering the duct from one manhole should be equipped with the loop part of the duct grapple and the first rod entering from the other manhole should be equipped with the hook part of the grapple. When the hooks meet and engage the loops, all the rods can be pulled through the duct.

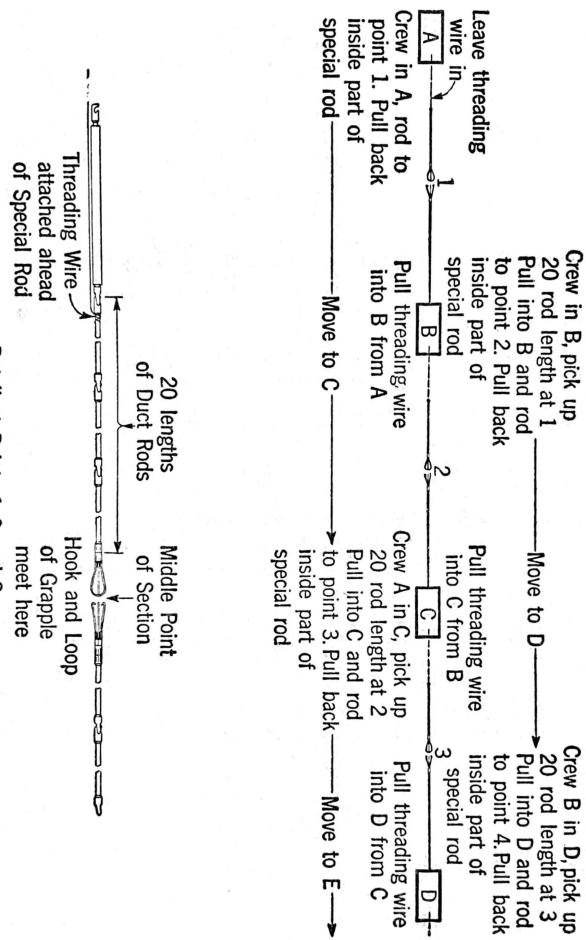
4.05 Where it is necessary to rod a number of sections from both directions the work can be aided by use of the following method:

(a) Make up a special duct rod by fitting a duct rod coupling to one end of a 30-inch length of 1-inch pipe. Cut off a coupling from one end of a duct rod and slide this end into the 1-inch pipe as illustrated.



Connect by sliding End A into End B

(b) Each rodding crew requires two of these special pipe rods. The method of operation is as illustrated.



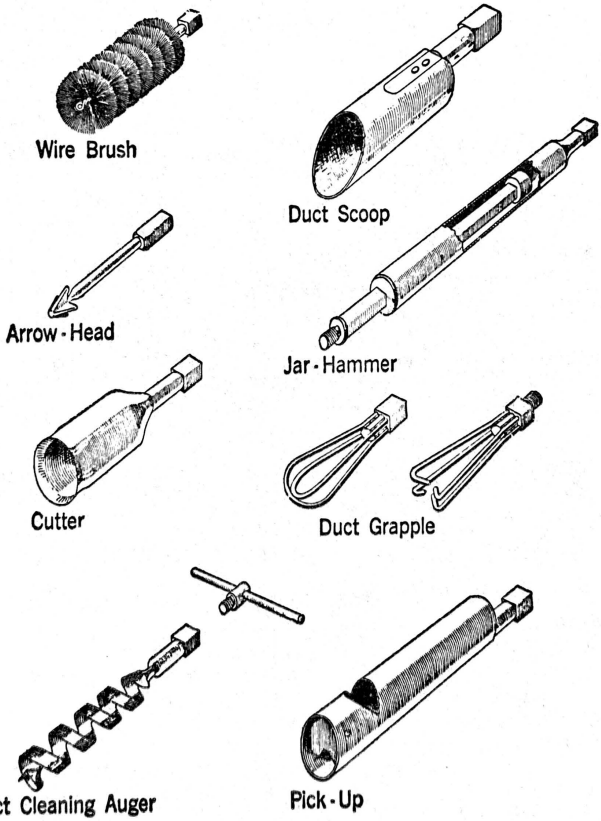
5. CLEANING DUCTS

5.01 If the duct is obstructed with sand or dirt so that it is impossible to push the rods through, withdraw the rods and remove the sand with a duct scoop or pick-up, using a jar-hammer

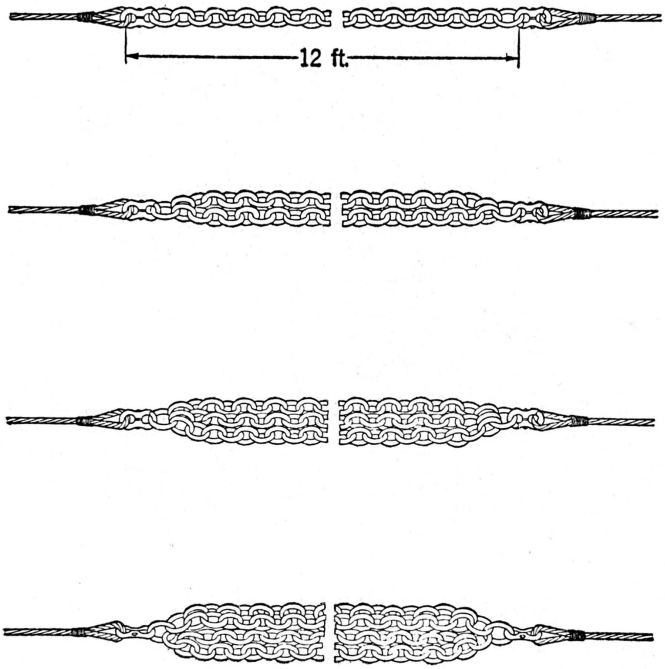
to loosen the foreign material if necessary. Broken rods stuck in the duct can usually be removed with a pick-up. Obstructions such as wire, rope swabs, etc., may be removed with the hook section of the duct grapple. If obstructions are found that can not be removed, make a report to the supervisor, giving the location of the section and the nature of the obstruction.

5.02 A number of tools which have been devised for rodding and for removing foreign material from ducts are shown below.

RODDING TOOLS

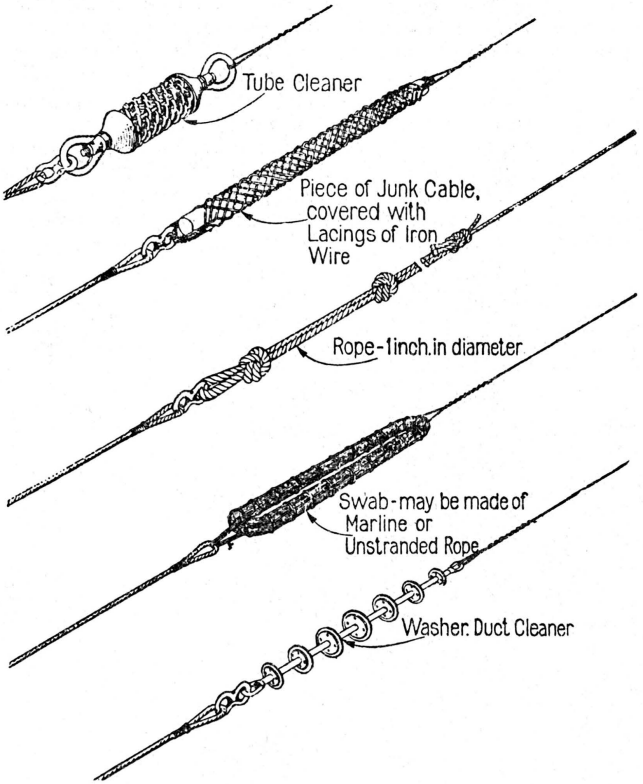


5.03 If the duct is partially obstructed with sand or dirt, but it is possible to push the rods through, pull a length of winch rope into the duct. If two winch equipped trucks are available, station one at each end of the section and use their winches to pull twelve-foot lengths of 1/2-inch chain back and forth through the duct. Commencing with a single chain, increase to double, triple and quadruple lengths as required to clear the duct of the obstruction. If only one winch is available, lengths of winch rope must be left at each manhole to be drawn into the duct as the winch pulls first from one end and then the other end.



This method will remove any material that will adhere to the chain links. Care should be taken not to force the chains through the duct. This would risk jamming the material into the duct walls and breaking the duct.

5.04 A number of other tools which have been proved satisfactory for cleaning ducts are illustrated below:

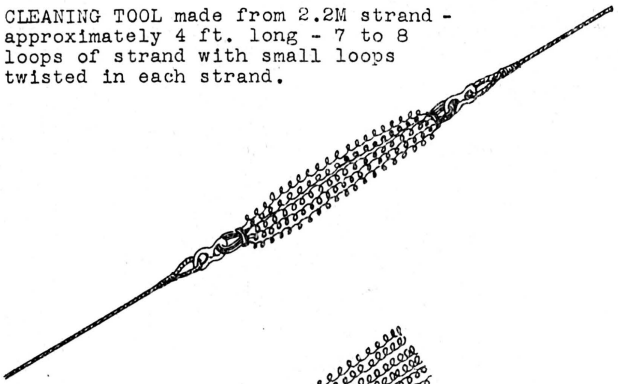


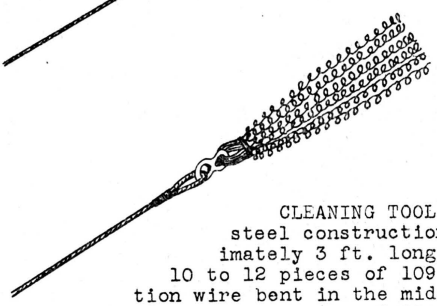
The cleaner should be pulled through the duct with the pulling rope. A cleaner should never be pulled through a duct by means of a threading wire as the wire is liable to break if obstructions are encountered.

If the cleaner is stopped by an obstruction, slack off the tension in the pulling rope before examining the duct from either end, or attempting to clear the obstruction by hand.

The two duct cleaning tools illustrated below may be made up locally.

CLEANING TOOL made from 2.2M strand - approximately 4 ft. long - 7 to 8 loops of strand with small loops twisted in each strand.



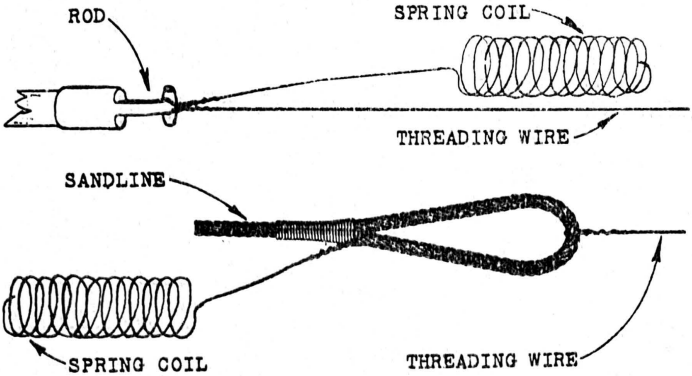


CLEANING TOOL made from 109 steel construction wire, approximately 3 ft. long. Consists of 10 to 12 pieces of 109 steel construction wire bent in the middle to form a pulling loop. Each end is wrapped around a piece of 1 in. pipe to form a spring type tail. This cleaning tool may be pulled through the duct in only one direction.

5.05 In cleaning wood ducts, do not use a tool which is liable to splinter or otherwise injure the surface of the duct, unless it is absolutely necessary. If such a tool is used, advise the supervisor as to the direction in which the tool was pushed through the duct so that the cable may be pulled in the opposite direction. This is necessary in order to prevent the cable sheath from becoming punctured or jammed due to splinters or rough spots in the duct.

5.06 After rodding a duct a Spring Coil Test shall be made to determine the condition of the duct. The wire coil should be formed as outlined in Paragraph 5.07 and attached to the rods or threading wire as illustrated below. After drawing the coil through the duct, the shape of the coil will indicate the condition

of the duct. The duct should never be considered clean until the spring coil has been passed through the duct and withdrawn in its original shape.



5.07 The wire spring for the Spring Coil Test shall be formed by wrapping 109 Steel Construction Wire around a pipe 2 inches in diameter with wraps not more than 1/8 inch apart, forming a coil approximately 2-1/2 inches in diameter and 6-1/2 inches in length. At least 18 inches of tail shall be left at one end of the coil for the purpose of securing it to the rod or threading wire. The other end of the wire shall be bent inside the coil to prevent its catching on the tile.

5.08 As an alternative to the Spring Coil Test, a test mandrel of suitable diameter, or an 8-foot length of cable equal to or slightly larger in diameter than the cable scheduled for the duct, may be drawn through the duct to prove that it is ready for placing cable. It should pass through the duct without difficulty and with no evidence of scoring of the test piece, otherwise further cleaning is required.

6. WIRING DUCTS

6.01 After each conduit section has been rodded, attach to the rods a threading wire of sufficient strength to pull the winch rope through the duct, and pull the wire into the duct as the rods are pulled out.

6.02 If cleaning operations have been necessary and a test mandrel or cable length is used to check the duct, the threading wire should be attached behind the mandrel or cable length.

6.03 Fasten the ends of the threading wire securely in the manhole to the cable rack supports, if present, otherwise to the pulling in irons.

7. RODDING AND CLEANING WITH POWER EQUIPMENT

7.01 Where power operated equipment is available for rodding and cleaning ducts, the method of operation recommended by the manufacturer should be followed.