

DROP WIRE

PLACING, REPLACING, AND LOWERING

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NOTICE

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1.04 All poles must be visually examined (some require testing, see Section 620-132-010) before climbing or placing a ladder against a pole or strand, as described in Section 620-131-010. Whenever it is necessary to place an extension ladder against a suspension strand, test the strand as described in Section 460-300-110.

1.05 Drop wires shall be placed so that clearances specified in Section 462-070-015 are met.

1.06 In placing or replacing a drop wire, except when crossing over a trolley wire, the basic concept of having the individual employee control the entire work operation has proved to be the safest manner to perform this task.

1.07 On busy or high speed roadways where it is impossible to safely place a drop wire, obtain the assistance of another employee. In some cases, it may be necessary to seek the assistance of the local law enforcement agency to control the traffic.

1.08 Whenever it is necessary to alert or divert oncoming traffic, or guard any part of the work area, place appropriate warning devices as described in Section 620-135-010.

2. PRECAUTIONS

2.01 Never place a drop wire over primary power conductors.

2.02 Insulating gloves and other protective equipment shall be worn by employees when performing operations in which the handline or drop wire may come in contact with the power wires.

2.03 The handline used for raising a drop wire shall be free from metallic strands and preferably shall be dry.

2.04 When necessary to carry the handline up a pole or ladder, secure one end of the handline to the B handline carrier (Fig. 1) attached to the body belt. The steel loop of the B handline carrier is designed to release the handline if it is placed under tension, while climbing a pole or ladder. If a B handline carrier is not available, double the end of the handline back on itself and place the loop under the side or back of the body belt, so it will be readily released if placed under tension.

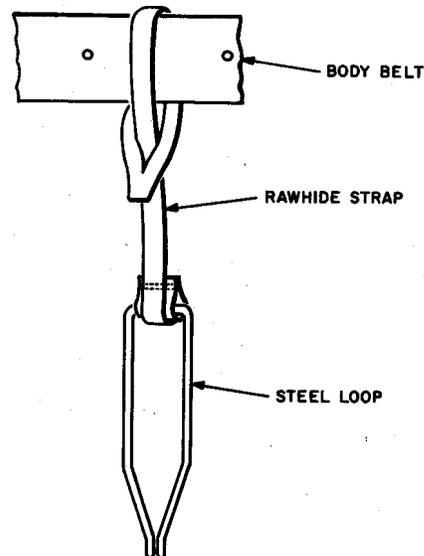


Fig. 1—B Handline Carrier

2.05 Never release the drop wire attachment from a span while working inside the angle formed by the wire.

2.06 Avoid working from a ladder placed against a building with the side rails crossing a wire run or in any other position where movement of the wire, due to loosening of the attachments, would cause an accident.

2.07 When a drop wire is to be attached to a span clamp, place the base of the extension ladder on the field side of the suspension strand, not in the roadway. If there is no street or highway adjacent to the span clamp, place the ladder against the strand, opposite from the drop wire run to the building.

2.08 In placing or replacing a drop wire, precautions must be taken to ensure that the drop wire or handline will not slide along or become disengaged from its support. Whenever there is such a possibility, place a temporary guide to enclose the drop wire by any one of the following methods:

- At strand—attach an E span clamp.
- At pole—attach a C bridal ring.

- At building attachment—use a short piece of ground wire to form a guide loop as shown in Fig. 2.

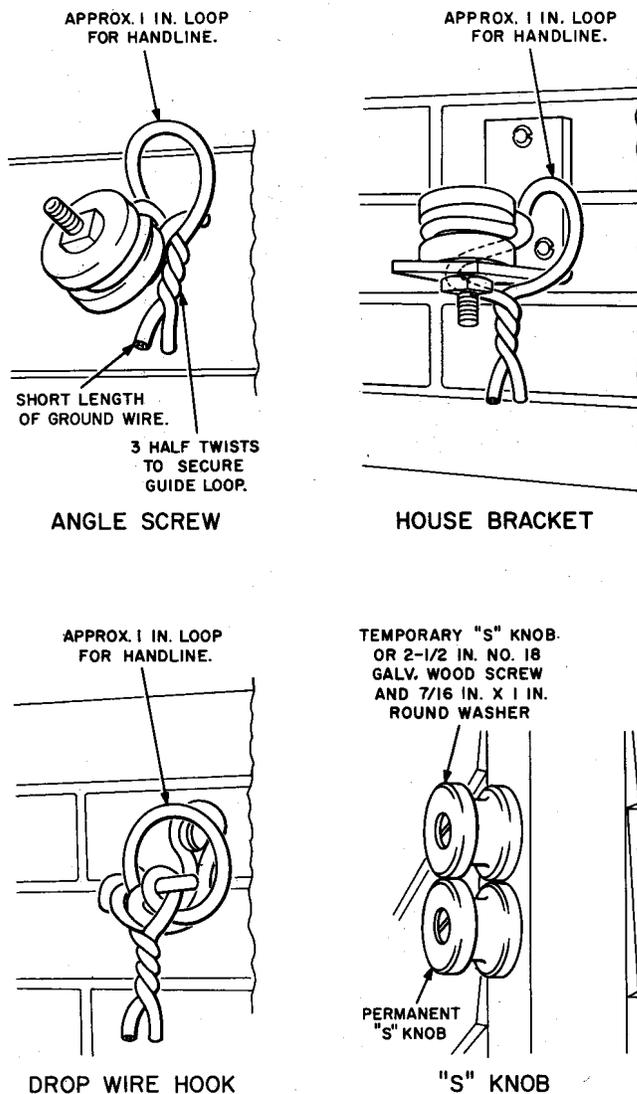


Fig. 2—Temporary Guide Loop

3. PLACING DROP WIRE OVER ROADWAY

No Interference

3.01 When a drop wire is to be placed over a roadway free of any interference, place the wire in the following manner:

Caution: Before proceeding with the following operation, fasten the inner end

of the coil of drop wire securely to one of the rigid spokes of the drop wire reel.

(a) Install the building attachment and secure the drop wire to this support. Complete building run in a standard manner. Keep drop wire reel near the building to avoid accidents or damage to wire (Fig. 3).

(b) From the ground level, throw or place a handline over the strand, guard arm, drive hook, or cross arm so that both ends reach the ground, with no excess length in the portion of the handline towards the building. After the handline is in place, tie it to the base of the pole or lower rungs of the ladder to avoid interference with pedestrians or vehicles. If it is necessary to climb the pole or ladder to place the handline, install any drop wire support needed.

(c) Roll the drop wire reel from the building to the edge of the roadway, paying out sufficient slack to ensure the wire rests flat on the ground.

(d) When no traffic is approaching, roll the drop wire reel across the roadway to the previously placed handline, paying out the wire so it rests flat on the ground.

Note: If a metal or hard rubber-tired vehicle passes over the wire, return the drop wire reel back to the building side of the roadway and pull the wire from the roadway. Inspect the wire for possible damage and replace or repair if necessary.

(e) Release the handline from the base of the pole or ladder. Tie a bowline knot at the end of the handline toward the building and around the drop wire at the reel as shown in Fig. 4. Be careful not to raise the wire on the roadway when securing the rope. Take up any excess wire on the reel.

(f) Set the brake of the drop wire reel so that when the wire is raised by the handline, there will be sufficient tension on the wire to enable it to be pulled up to the approximate required height in the span over the roadway.

(g) After checking to make sure the drop wire reel is in a stable position and its brake is properly set, grasp the free end of the handline.

When no vehicles or pedestrians are approaching, raise the drop wire as shown in Fig. 5. If it is necessary to remove excess slack from the span as the wire is being raised, pull the wire at the reel end to obtain desired slack. Wind excess length of wire on reel.

(h) After the drop wire has been raised to the approximate required height, secure the handline to the base of the pole (Fig. 6) or to the lower rungs of the ladder.

(i) Climb the pole or ladder and attach drop wire to the pole or strand in a standard manner, without removing handline from the drop wire. When attaching drop wire to a span clamp, the ladder will force the strand out of line. Make necessary adjustments to ensure proper sag and clearance after the ladder is removed.

(j) Remove handline from drop wire. Cut drop wire of sufficient length to reach terminating point. Complete connection in a standard manner.

Tree Interference

3.02 Placing drop wire through trees shall be avoided when practical. However, if trees cannot be avoided, proceed in the following manner:

Caution: Before proceeding with the following operation, fasten the inner end of the drop wire securely to a rigid spoke of the drop wire reel.

(a) When the tree is located on the same side of the roadway as the building:

(1) Place the drop wire reel on the side toward the pole line. If the tree overhangs the road, the reel shall not be placed in the road unless it is properly guarded by means of a company truck or equivalent.

(2) Place the handline in the desired location among branches of the tree. Attach the drop wire and pull into position among the branches. A wire raising tool may be used to facilitate this operation.

Warning: The handline and drop wire shall not overhang the road unless properly guarded. If practical, park the company

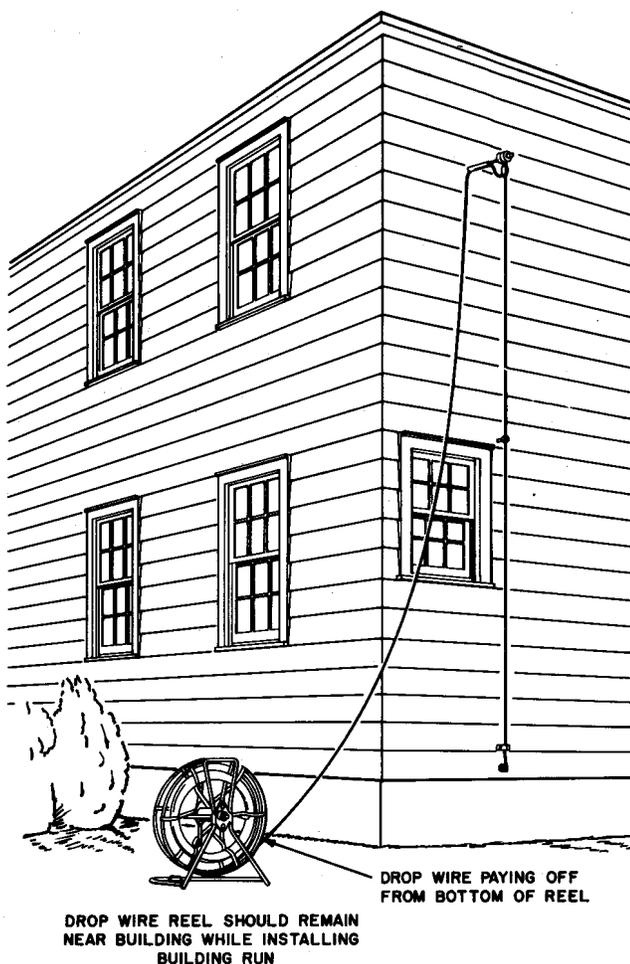


Fig. 3—Drop Wire Attached to Building

truck so it will shield the handline and drop wire.

(3) Attach drop wire to building, as covered in 3.01 (a), making sure the wire rests flat on the ground between tree and building.

(4) Complete wire run across roadway to pole or span clamp as covered in 3.01 (b) through (j).

(b) Procedure where tree is located in the immediate vicinity of pole or span clamp:

(1) Place handline over strand, guard arm, drive hook, or cross arm and among the tree branches as illustrated in Fig. 7, so that the drop wire may be raised into position. A

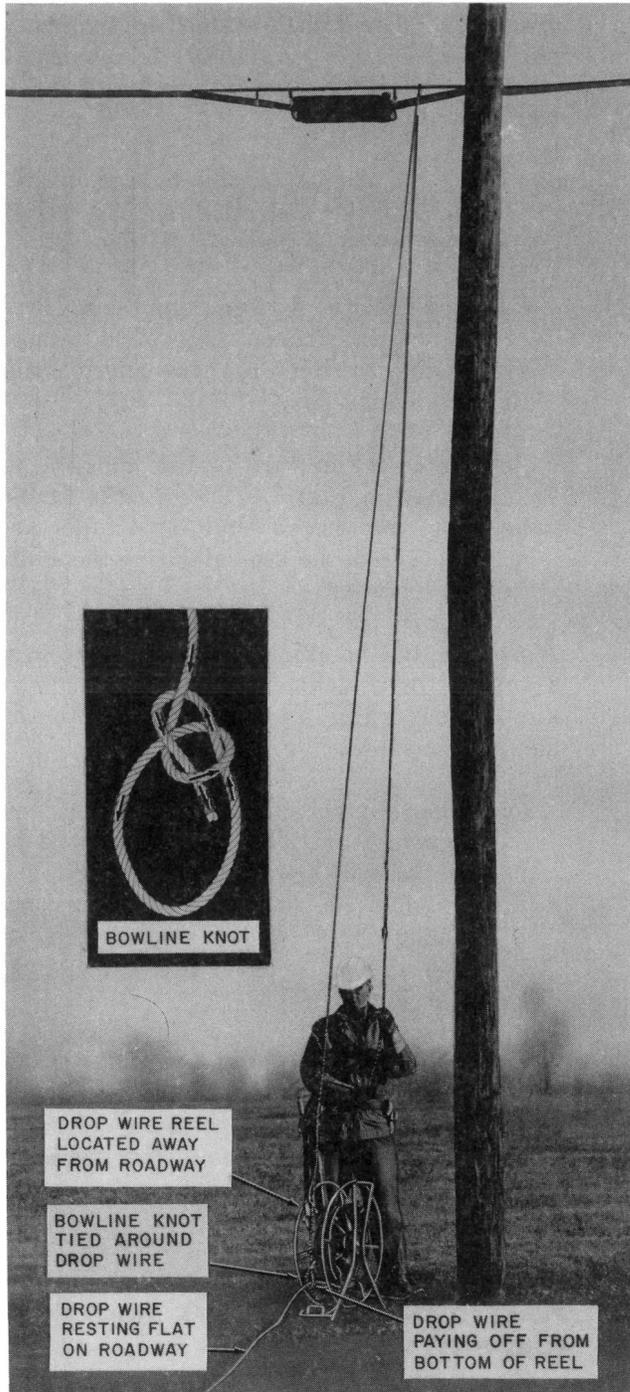


Fig. 4—Bowline Knot Placed Around Drop Wire

wire raising tool may be used to facilitate this operation. After the handline is placed, tie it off to the pole or lower rungs of the ladder to avoid interference with pedestrians or vehicles.

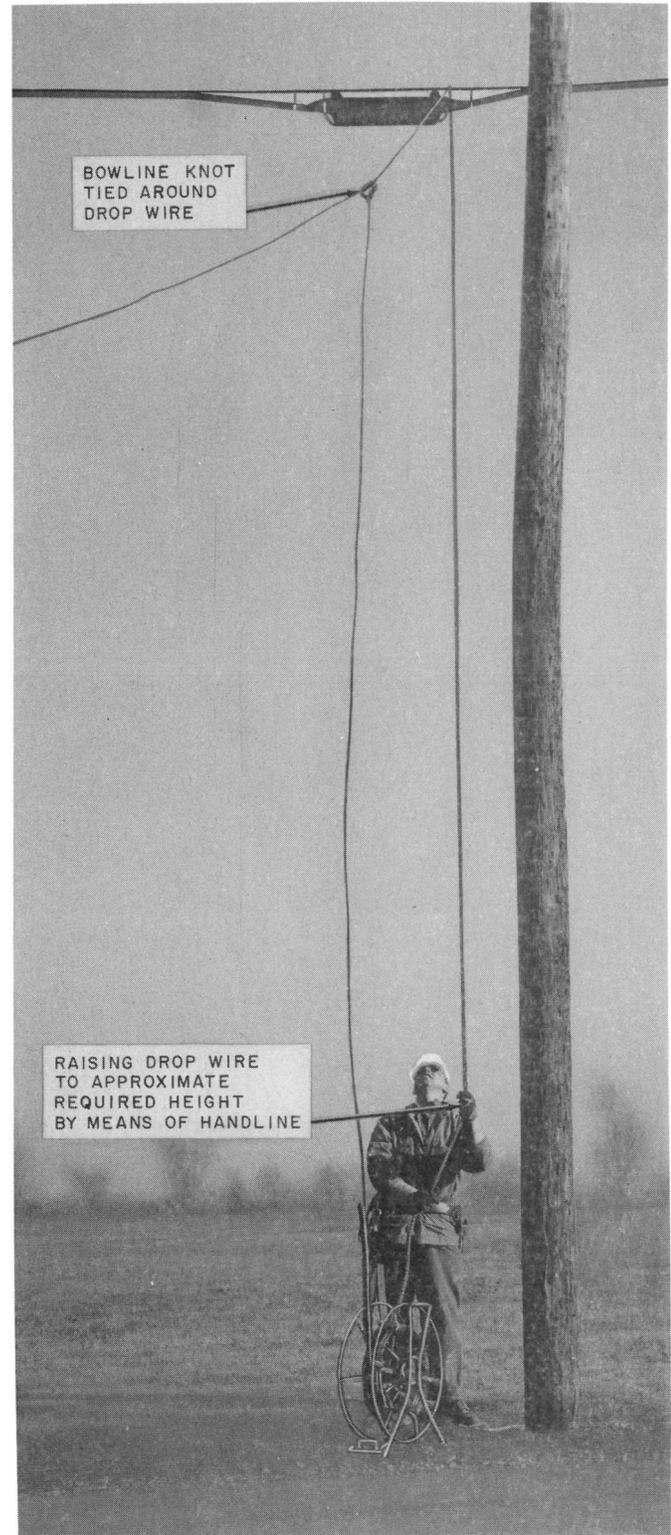


Fig. 5—Raising Drop Wire

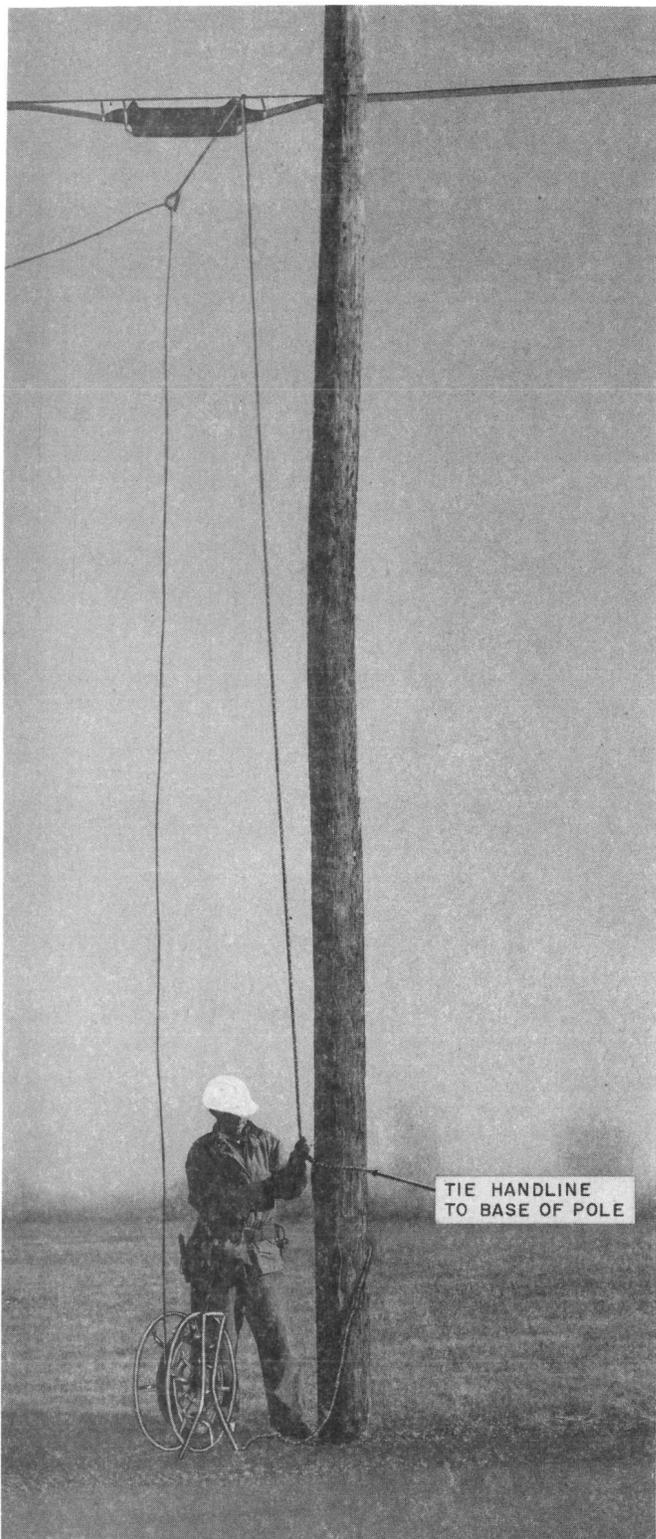


Fig. 6—Drop Wire Raised to Approximate Height

Warning: *The handline shall not overhang the street unless guarded. If practical, position the company truck so it will shield the handline.*

(2) Place the drop wire as covered in 3.01 (a), (c), and (d) and raise the wire at the pole of strand end of the span as follows:

- (a) With the drop wire crossing the roadway and resting flat on the ground, remove sufficient wire from drop wire reel to reach the terminating point.
- (b) Tie the drop wire to the handline as shown in Fig. 7. The handline must be long enough so that both ends are accessible from the ground during the entire raising operation.

Note: If the handline is to be placed over a support or attachment on which a square knot would snag, fasten the wire to the handline as shown in Fig. 8.

- (c) When no vehicles or pedestrians are approaching, raise the drop wire by pulling the end of the handline placed over the strand or pole attachment. If necessary, the handline can be pulled in either direction to work the drop wire into position as shown in Fig. 9.

- (d) After the wire has been raised to the approximate height, tie the handline to the base of the pole or to the lower rungs of the ladder and complete the operation as outlined in 3.01 (i) and (j).

4. PLACING DROP WIRE OTHER THAN OVER ROADWAY

Between Building and Pole or Strand

4.01 When placing a drop wire which does not cross a roadway, follow the methods outlined in 3.01 or 3.02 if these procedures are necessary to raise the wire safely. However, if no conflict or hazard is encountered, the procedure to raise the wire can be modified as described in 4.02.

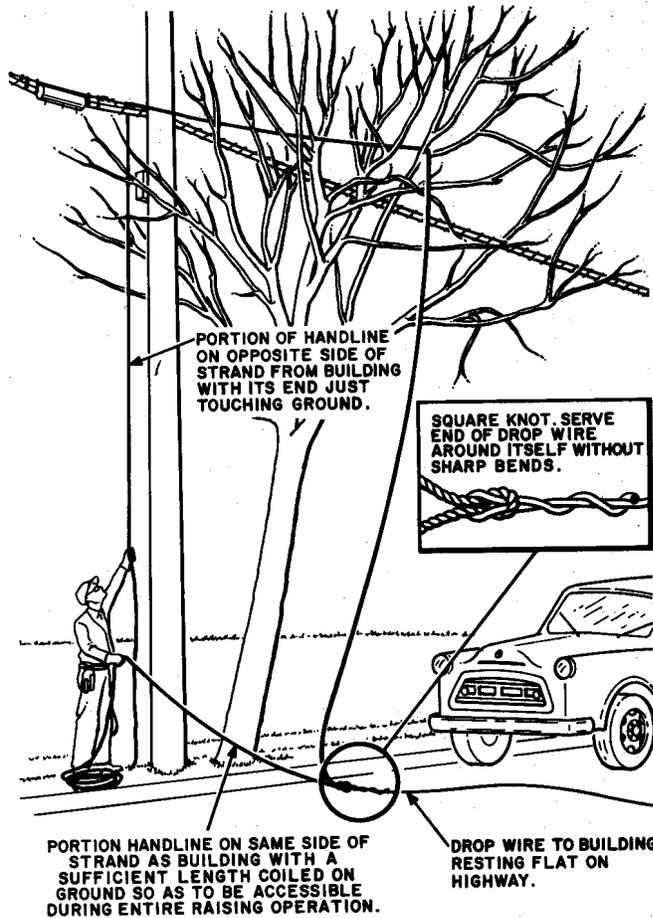


Fig. 7—Drop Wire Tied to Handline

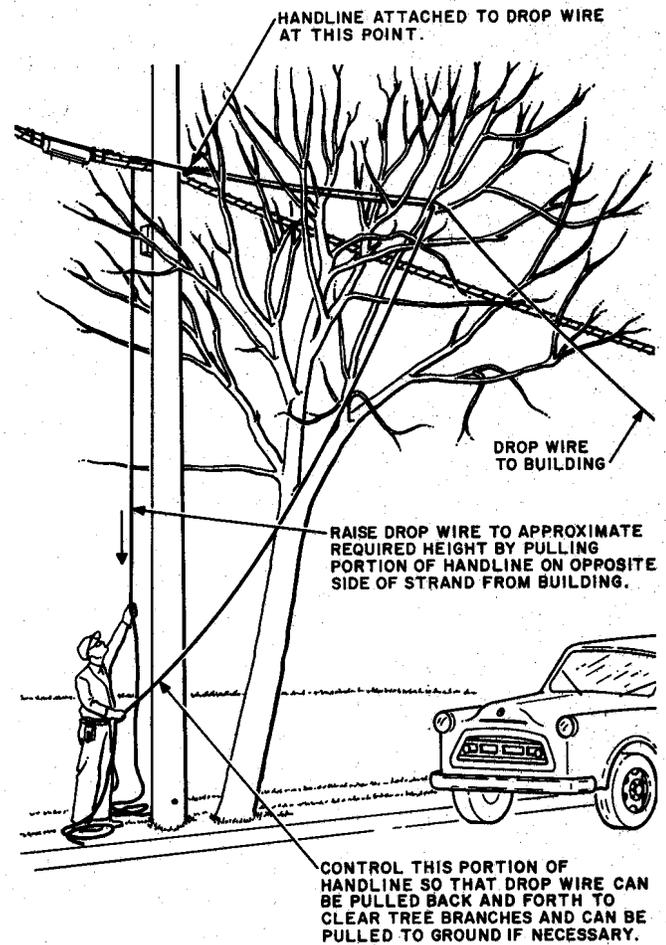


Fig. 9—Raising Drop Wire

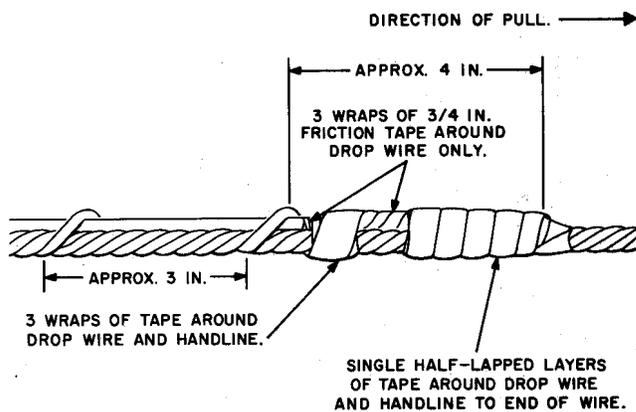


Fig. 8—Alternate Tie to Prevent Snagging

4.02 After the drop wire has been attached to the building and payed out with the drop wire reel to the pole or strand:

- (a) Tie a bowline knot around the drop wire at the reel with a handline.
- (b) Set the drop wire reel brake so there will be sufficient tension to pull the wire to the approximate required height in the span.
- (c) Loop the other end of the handline to the B handline carrier or under the body belt as described in 2.04. Climb the pole or ladder.
- (d) Place the handline over the strand, guard arm, drive hook, or cross arm and raise the drop wire to the approximate required height and secure the handline to the pole or strand.

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- (e) Attach the drop wire to the pole or strand in a standard manner, without removing the handline until the drop wire is secured.

Between Two Buildings

4.03 Place a drop wire between two buildings in the same manner as a building to pole run, providing as much sag as practical and still maintaining proper clearance. However, after attaching the drop wire to the first building:

- (a) Place a handline in the drop wire attachment at the second building.
- (b) Pay out the drop wire from the first building attachment so it rests flat on the ground.
- (c) Tie a bowline knot around the wire at the reel with a handline.
- (d) Set the drop wire reel brake.
- (e) From ground level, raise the drop to the desired height.
- (f) Tie the handline to a substantial and secure support near the base of the building.
- (g) Ascend the ladder to attach the drop wire clamp and complete the drop wire run.

5. PLACING DROP WIRE OVER SECONDARY POWER SUPPLY

5.01 When there is no alternative and a drop wire must be placed over secondary power wires, follow the same procedures outlined in other parts of this practice and:

- (a) Wear insulating gloves and other protective equipment.
- (b) Handle drop wire or handline, crossing over secondary conductors, with insulating gloves. Do not allow wire to contact other body parts.
- (c) Minimize the amount of time a drop wire or handline is exposed to a secondary power source by placing and raising the wire without delay.
- (d) Throw or place a dry handline over the secondary conductors, tie to drop wire and

raise from the ground level at pole, strand, or the second building attachment.

6. PLACING DROP WIRE OVER TROLLEY WIRES (750 VOLTS OR LESS)

6.01 When placing a drop wire over trolley wires, the following additional precautions are to be taken:

- Two employees shall be used for this operation.
- Both employees shall wear insulating gloves and other protective equipment.
- A dry handline shall be placed in the span over the trolley power supply to pull the drop wire.
- One employee shall control the reel end of the wire, while the other employee exerts a strain on the handline to pull the drop wire.
- The drop wire should not be permitted to contact a trolley wire.
- When necessary, obtain assistance of the local law enforcement agency on busy or high speed roadways.

6.02 Proceed as follows:

- (a) If the span over the trolley wire is to extend from a building to a pole, install the building attachment. In a pole to pole span, fasten the attachment at the pole.
- (b) If there is any possibility that the drop wire or handline could become disengaged during a pulling operation, place a temporary guide as described in 2.08.
- (c) Ensure that the drop wire reel is in a stable position at the initial attachment: at the building, pole, or strand.

Caution: *Fasten the inner end of the drop wire coil to a rigid spoke of the drop wire reel.*

- (d) Set the brake of the drop wire reel so that when the wire is pulled, there will be

sufficient tension to prevent it from sagging into the trolley contact.

(e) Using a dry handline of sufficient length to extend across the span and to the ground level on both sides of the roadway, secure one end of the handline to the base of the pole or ladder and pass the other end over the pole attachment or strand on the side toward the roadway.

(f) When no vehicles or pedestrians are approaching, one employee is to throw the free end of the handline over the trolley wire, while the other employee, using a warning flag, is alert for any oncoming traffic.

(g) If the drop wire is to extend to a pole or strand, throw or place the handline over the attachment and pull up the slack in the handline.

(h) If the drop wire extends to a building attachment, place the handline over the drive hook or other support and pull up the slack in the handline.

(i) With the handline in place, one employee maintains a strain on the handline while the other employee secures the drop wire to the handline as shown in Fig. 8. Any slack in the handline and drop wire is to be reeled onto a drop wire reel.

(j) The drop wire can be safely pulled over the trolley wire, with one employee controlling the action of the drop wire reel and the other employee pulling the drop wire across the span with the handline.

(k) The handline is to be lashed to the base of the pole or ladder after a sufficient length is obtained for terminating purposes.

(l) The drop wire is to be secured to its attachment at the reel end of the drop wire and then at the terminating end, always maintaining sufficient tension on the wire to keep it clear of the trolley wire.

(m) Verify that the drop wire clearance conforms to the requirements in Section 462-070-015.

(n) Place a wire guard at the point where the drop wire crosses the trolley wire.

7. REPLACING DROP WIRE

Over Roadway, Secondary Wires, or Other Hazards (Not Trolley Wires)

7.01 When it is necessary to replace a defective drop wire, the same basic principals outlined in this practice on the placing of the wire must be followed. The existing drop wire can be used as a means to pull in the new drop wire. Proceed as follows when the existing drop wire has a normal sag:

Note: See 7.02 if a taut span is encountered.

(a) Locate the drop wire reel at the building, pole, or strand.

(b) Firmly tape the new drop wire at the building attachment to the existing wire beyond the drop wire clamp.

(c) Set the drop wire brake so that there will be sufficient tension to hold the span when the old drop wire is cut.

(d) Ascend the pole or ladder and remove the old drop wire and clamp from its attachment and place the new wire in the drop wire hook or similar attachment. Verify that the brake on the drop wire reel exerts sufficient tension to prevent excess sagging. If the brake is not set properly, reattach the drop wire clamp and readjust the brake on the reel. After the drop wire reel is properly adjusted, cut the old drop wire at the point where the drop wire clamp is attached.

Warning: *Never release the drop wire attachment from a span while working inside the angle formed by the wire.*

(e) At the terminating end of the drop wire, secure a handline to the base of the pole or ladder. Ascend the pole or ladder and firmly secure the rope to the existing drop wire with tape at a point in the span beyond the drop wire clamp.

(f) Release the drop wire clamp from its attachment and remove it from the existing

drop wire. Cut the old drop wire end near the rope.

(g) Descend the pole or ladder and pull in the replacement wire from the ground level. After allowing the required amount of wire for terminating, tie off the handline at the base of the pole or ladder.

(h) Place and secure the necessary attachments at the reel end of the drop wire and then at the terminating end.

Taut Span

7.02 Special precautions shall be taken when a taut drop wire span is encountered. Employees are always expected to visually examine poles before climbing or working from a strand or pole supported equipment as covered in Section 620-131-010, but it is more important when confronted with a taut span. A damaged or defected pole may be the cause of the taut wire.

7.03. Before replacing or lowering a taut span, release the tension in the span in the following manner:

- (a) Lash a handline to the base of the pole or to the lower rungs of the extension ladder.
- (b) Disconnect the drop wire from the terminal and remove the free end from the rings on the pole.
- (c) Place a temporary drop wire clamp on the wire, about one foot out in the span. Seat the clamp firmly on the wire.
- (d) Pass a loop of the handline through the tail of the temporary drop wire clamp. Apply enough strain to relieve the tension on the original drop wire clamp and secure the handline.
- (e) Remove and relocate the original drop wire clamp to allow near normal sag on the drop wire.
- (f) Slowly release the strain on the handline and secure the drop wire clamp to its original attachment.

(g) Remove the temporary drop wire clamp and proceed to replace or remove the drop wire as covered in other parts of this practice.

Over Trolley Wires (750 Volts or Less)

7.04 When replacing a drop wire span over a trolley power supply, follow the procedures described in 7.01 and take additional precautions specified in Part 6, which includes:

- Two employees shall be used for this operation.
- Insulating gloves and protective equipment must be worn.
- One employee shall control the reel end of the span and the other employee at the pulling end.
- The drop wire is to be pulled in without contacting a trolley wire.

8. LOWERING DROP WIRE

Warning: *The lowering of a taut drop wire span requires that special precautions be taken to ensure that the wire is lowered safely. The excessive strain on a taut span must be released, as covered in 7.02, before the drop wire is lowered.*

8.01 A wire span may be dropped from a pole providing conditions are such that:

- (a) The drop wire does not cross over a roadway, a trolley wire, or a secondary power wire.
- (b) The drop wire will not interfere with pedestrians or cause property damage.
- (c) The drop wire will not be struck by passing vehicles.

If any of these conditions are present, the span shall be lowered by the handline method described in 8.02 and 8.03.

HANDLINE METHOD

Lowering Wire Span From a Pole or Strand

8.02 Lower the drop wire from its attachment on a pole or strand in the following manner:

- (a) Lash a handline securely to the base of the pole or ladder rungs, allowing a sufficient length on the ground so that both ends will be accessible from the ground level until the wire has been lowered.
- (b) Throw or place the other end of the handline over the strand, guard arm, drive hook, or cross arm so that the end reaches the ground. If the drop wire passes through a tree in the immediate vicinity, place the handline so that it follows the route of the wire through the tree. A wire raising tool may be used to facilitate this operation. After the handline has been placed, tie it to the base of the pole or ladder to avoid interference from pedestrians or vehicles.

Warning: *The handline shall not overhang the street unless it is properly guarded. If practical, park the company vehicle so it will shield the handline.*

- (c) Disconnect the drop wire from the terminal and release the free end up to the drop wire clamp.
- (d) Place a temporary drop wire clamp on the wire to be lowered, about one foot out in the span. Seat the clamp firmly on the wire.
- (e) Tie a loop of the handline to the tail of the temporary drop wire clamp so that the lashed end of the handline is sufficiently taut to remove tension from the original drop wire clamp.
- (f) Remove the original drop wire clamp from the drop wire, thus leaving the wire suspended by the temporary drop wire clamp and the lashed end line.
- (g) Return to the ground level. Untie the handline from the base of the poles or ladder rungs, and, when no vehicles or pedestrians are approaching, lower the drop wire to the ground. The employee shall have control of both ends of the handline (Fig. 10) so that a pull can be exerted in either direction to work the drop wire among tree branches or to raise the wire quickly if necessary.

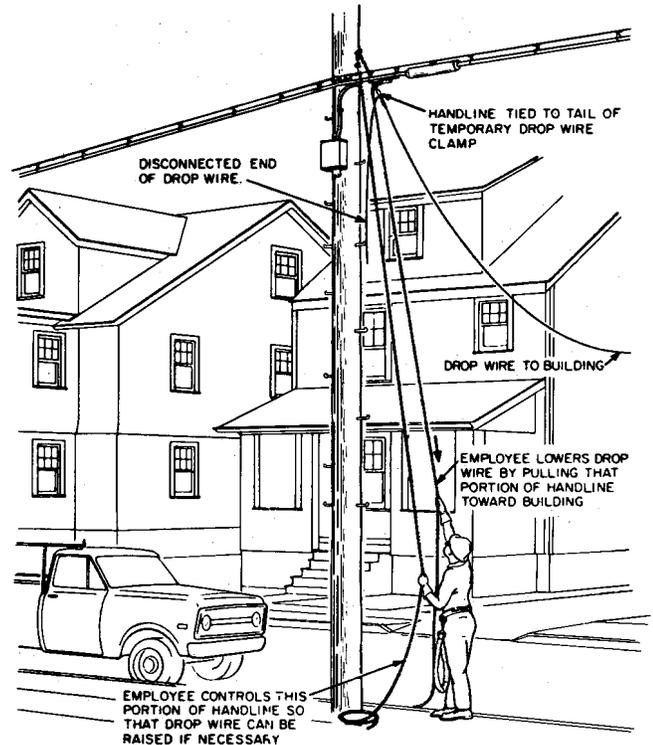


Fig. 10—Lowering Drop Wire

Lowering Wire Span Between Buildings

8.03 The following method shall be used when it is necessary to lower a drop wire between buildings with a handline:

- (a) Select the end of the drop wire span at which the operation can be best performed.
- (b) Remove the drop wire from hardware attachments on the building up to the first attachment. Do not remove the drop wire clamp which supports the wire span.
- (c) Place the handline over the drive hook or similar attachment, so the end of the handline toward the span reaches the ground level. If there is a possibility that the handline could become accidentally disengaged during the lowering process, place a temporary guide to enclose the attachment as described in 2.08.
- (d) Place a temporary drop wire clamp on the wire to be lowered, about one foot out in the span. Seat the clamp firmly on the wire.

- (e) Tie a loop to the handline securely to the tail of the temporary drop wire clamp.
- (f) Return to the ground. Pull the long end of the handline sufficiently taut to remove tension from the original drop wire clamp. Lash the handline firmly and secure support at the base of the building, thereby supporting the wire span by means of the temporary drop wire clamp and lashed handline.
- (g) Remove the original drop wire clamp from the building attachment.
- (h) Return to the ground level and lower the drop wire with the handline.

- The span over the trolley power supply must be lowered independently of any additional spans.
- Both employees shall wear insulating gloves and other protective equipment.
- A dry handline, of sufficient length to reach across the trolley span, is to be used for this operation. The end to which the long handline is attached depends upon job conditions, such as:

LOWERING DROP WIRE SPAN

Crossing Over Secondary Power Wires

8.04 Whenever it is necessary to lower a drop wire span which crosses a secondary power supply, follow the procedures outlined in 8.02 or 8.03 and:

- (a) Wear insulating gloves and other protective equipment.
- (b) If the drop wire span to be lowered includes the end which was connected to the terminal, cut off the exposed conductor ends.
- (c) After lowering the drop wire to the ground level and removing the temporary drop wire clamp, free the drop wire from the power contact without delay.
- (d) In the lowering process, the employee shall not contact the drop wire with any part of the body other than with the insulating gloves.
- (e) If there is a possibility that the drop wire or handline could become disengaged during the operation, place a temporary guide as described in 2.08.

Crossing Over Trolley Power Wires

8.05 When it is necessary to remove or lower a drop wire span crossing over a trolley wire, the following additional protection shall be taken:

- Two employees shall be used for this operation.

SPAN OVER TROLLEY	LOCATE LONG HANDLINE
Terminal Pole to Pole or Strand	Terminal End
Building to Terminal Pole	Terminal End
Building to Building	Building End

- The drop wire end to which the long handline is attached should be securely taped, instead of being secured to a temporary drop wire clamp. This will allow it to pass over or through any attachments.
- The drop wire should not be permitted to contact the trolley wire.
- Excessive strain on a taut drop wire span must first be released, as covered in 7.03, before any other operations are begun.
- If there is a possibility that the drop wire or handline could become disengaged during the operation, place a temporary guide as described in 2.08.

8.06 Proceed in the following manner to remove the drop wire from the trolley span:

- (a) Place the long handline over the strand, pole attachment, or building attachment.
- (b) Tape the free end of the handline to the drop wire at the drop wire clamp toward the span.

(c) Secure the handline by tying it to the base of the pole or lower ladder rung. (In a building-to-building span, secure the handline to a stable support at ground level.)

(d) Disconnect the drop wire from the terminal and its attachments (in a building-to-building span, cut the drop wire) and remove the drop wire clamp. The drop wire is now secured to the long handline.

(e) At the other end of the span, secure another handline to the drop wire so the pulling operation can be performed from the ground level by:

- (1) Secure the handline to the base of the pole or lower rung of the extension ladder.
- (2) Place the handline over the strand or pole attachment.

(3) Tape the handline to the drop wire at the clamp end toward the span.

(4) Remove the drop wire clamp (the entire span is now secured by both handlines).

Note: If the trolley span is attached to a building, the additional handline would not be used for the pulling operation.

(f) With both employees at the ground level, the drop wire and handline can be pulled across the span. An even steady strain should be applied to keep the drop wire free of the trolley contact.

(g) The long handline, pulled across the span, is to be secured and can be used to pull in the same or new drop wire.