

BELL SYSTEM PRACTICES
Outside Plant Construction
and Maintenance

SECTION G85.800.1
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AT&TCo Standard

MANILA ROPE AND BLOCKS

ROPE—GENERAL

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1. GENERAL

1.01 This section, together with Sections G85.800.2 through G85.800.5 describes the use, care, maintenance, serving, splicing, knots and lashings pertaining to standard manila rope. The use and description of standard blocks and manila rope snatch blocks is also covered. This group of practices replaces Section G85.800 and includes:

- (a) Section G85.800.1 Rope—General
- (b) Section G85.800.2 Serving and Splicing Rope
- (c) Section G85.800.3 Knots, Bends and Hitches
- (d) Section G85.800.4 Lashings
- (e) Section G85.800.5 Blocks

2. SAFETY PRECAUTIONS

2.01 Safety to life and property requires that rope be in good condition, used properly and be well cared for. Observe the following precautions when using rope.

- (a) Inspect all rope for surface imperfections before using. Rope that is used on aerial cable platforms, as tree slings or other similar purposes shall be thoroughly inspected before using, not only for surface imperfections but also for internal conditions as outlined in Part 9. Never use rope in a doubtful condition.
- (b) Be thoroughly familiar with the proper methods of handling rope. Faulty knots or hitches in ropes under strain may cause serious accidents.
- (c) Determine the proper size of rope to handle the weight of the load. Do not overload it. (See Paragraph 4.01.)
- (d) Never use manila rope containing metal strand.
- (e) Avoid twists and kinks in rope. (Kinks greatly weaken the rope and may result in breakage under moderate tension.) Rope kinks should be turned out by hand before the rope is stressed.
- (f) When moving from one location to another do not drag rope on the ground.
- (g) Do not stand unnecessarily close to and never straddle rope under tension.
- (h) Do not stand in the inside angle or in the path of rope being paid out or under tension.
- (i) Do not spill hot solder or paraffin on ropes.
- (j) Avoid sudden jerks in raising or lowering a load.
- (k) Do not use frozen rope.
- (l) Keep ropes away from (storage batteries) acids or surfaces upon which acid may have been spilled during storage or transportation.
- (m) Select a reasonably smooth rounded surface in making rope fast.
- (n) Wet or damp rope shall not be used around high voltage wires except in an emergency and only then when the workmen are protected by rubber gloves.
- (o) Hand line shall not be attached to the belt when working aloft. Fasten it to a crossarm, cable strand, or similar structure.
- (p) Hand line or other rope secured aloft, when not in use shall be coiled or secured at a point near the ground to prevent it from being blown about.

- (q) When tying knots or hitches in rope leave enough end to ensure that it will not pull out.
- (r) Rope shall be so placed as to form no obstruction on highways or thoroughfares used by others unless unavoidable; in that event place a man to warn traffic. Temporary guys shall afford sufficient clearance for passing vehicles.
- (s) Gloves should be worn when handling new rope to avoid the possibility of injury from fibre slivers.

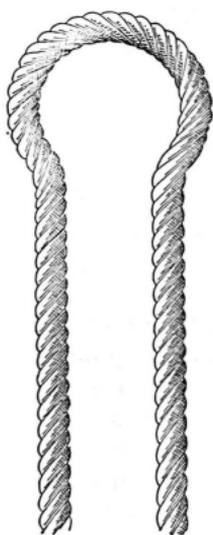
3. CORDAGE TERMS

3.01 The cordage terms as pertaining to these practices are as follows:

Bight: A section of rope turned back on itself.

Turn or Loop: A turn in a rope with ends extending in opposite directions.

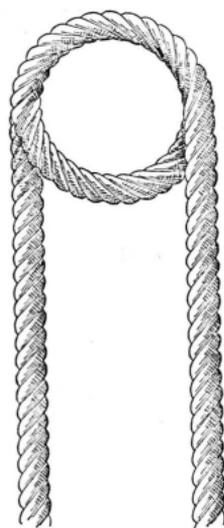
Round Turn or Bend: Any turn in a rope around itself or other object.



Bight



Turn or Loop



Round Turn
or Bend

Knot: A combination of bights and turns arranged so that the tight part of the rope will bear on the free end of the rope.

Hitch: Attaching a rope to an object so it can be readily detached.

Half Hitch: A turn in the rope arranged so that a section of the turn will bear on another section of the turn.

Haul: To pull on a rope.

Running Part or Fall Line: That part of a rope in motion or which is hauled upon; that is, the free end or part.

Standing Part: That part of a rope which is stationary or around which turns are taken in making hitches and bends; that is, the tight end or part.

Seized: Two parallel parts of rope bound together.

Serve or Whip: To wrap the ends of rope to keep the strands from separating.

Splice: Two ropes joined together by interweaving their strands.

Taut: Hauled tight or under tension.

4. STANDARD MANILA ROPE

4.01 Manila Rope is furnished in the following sizes.

Size (Nominal Diam. Inches)	Breaking Strength of New Rope (Pounds)	Safe Working Strength New Rope (Pounds)	Net Weight of Coils		Wt. of Rope (In pounds per foot)
			Pounds (Maximum) 1200-Ft.	600-Ft.	
	**	*			
1/4	600	170	24.0		.020
3/8	1350	370	49.2		.041
1/2	2650	750	90.0		.075
5/8	4400	1200	159.6		.133
3/4	5400	1500		100.0	.167
1	9000	2500		162.0	.270
1-1/4	13500	3200		250.8	.418
1-1/2	18500	5200		359.0	.600

* Half the value of the loads specified in this table shall be used if rope has been in service more than 6 months. New rope loses one-third to one-half of its strength in six months of ordinary use.

** Spliced rope has approximately 80 per cent of the strength of the rope.

5. USE OF MANILA ROPE

5.01 In telephone work either manila rope or steel rope (jacks and hoists excepted) shall be used in connection with pulling, hauling or holding the loads encountered, depending on the nature of the work and the conditions encountered. Only manila rope, preferably dry, should be used where there is a possibility of contact with wires or plant carrying electric light, power or trolley current. Instructions concerning the use of manila rope in joint use construction, power crossings, etc., will be found in the practice covering the specific work operation. If manila rope other than the standard rope is used examine it carefully so as to make sure it does not contain metallic strands. To do this untwist the strands for a few inches, then untwist the yarn.

6. SELECTING SIZE OF MANILA ROPE FOR THE WORK TO BE PERFORMED

6.01 The approximate weight of the load to be hauled, lifted or held must be known before selection of the size of rope required can be made. Knowing this and the rigging that is to be used select a size of rope, the working strength (see Part 4) of which will not be exceeded by the load to be applied. If the load is such as to require the use of blocks the simplest rigging should be selected to adequately accomplish the work with safety and without loss of time. If the rope is to be used as a lashing use the size as specified in the section "Lashings" of this group of practices. The size of rope required for use with blocks is determined by the diameter of the sheave groove. Too small a diameter sheave groove places an excessive bend in the rope causing the fibres to break. Therefore, use only the size of rope as specified for the various size blocks in the section "Blocks" of this group of practices.

6.02 In connection with telephone work the following sizes of rope have been found satisfactory for the uses specified and are the sizes in general being used by the construction forces for this type of work.

Size of Rope

Uses

1/4 inch

Intended for use as a fish line in aerial cable rings, a pulling line for the winch line when placing prelashd cable, and for operating tree pruners, wire and cable cutters and B or C clip crimpers.

- 3/8 Intended for use in operating extension ladder and tree pruners, as a handline, for making rope screens when dismantling open wire lines, in connection with 3-inch blocks and as a towing line for cable lashers.
- 1/2 Intended for use as guys for splicers' platforms, temporary supports for wires being paid out over electric light, power or trolley wires or over congested traffic, pulling small size cable, pulling several pairs of open wire, and with 4-inch blocks. Also as a handline when the 3/8-inch rope is considered too small.
- 5/8 Intended for use in connection with pulling aerial cable 400 pair 24 gauge or less, where rope is required in pulling open wires.
- 3/4 Intended for use in connection with braking pay out reels, unloading poles, guying gin pole or poles temporarily, light rope lashings and general rigging. Also as supports for splicers' platforms and with 6-inch blocks.
- 1 Intended for use in connection with general rigging, unloading poles, heavy rope lashings, pulling large size aerial cable and with 8-inch blocks.
- 1-1/4 Intended for use in connection with general rigging.
- 1-1/2 Intended for use in connection with general rigging and submarine cable work.

7. REASONS FOR INSPECTION OF MANILA ROPE

7.01 The strength of manila rope may be reduced through one or more of the following causes and damage or personal injury may occur through the parting of the rope.

(a) **Overstressing:** Rope loses its strength through the repetition of ordinary tension, overloading and sudden stresses.

(b) **Internal Friction:** Internal friction is caused chiefly through working ropes over sheaves which are too small or running rope around too small an object. This has a tendency to break up the internal fibres.

(c) **External Wear:** Dragging rope over rough or sharp surfaces or over itself wears and cuts through the external fibres.

(d) Mud, Sand and Grit: Hauling rope through mud, sand and grit will collect small particles of sharp substances which will gradually work between the fibres and grind them into a fine powder.

(e) Chemicals: The common commercial chemicals such as are used in storage batteries and uric acid exert a very injurious effect on rope fibre.

(f) Wet and Dampness: The strength of rope is not reduced by becoming wet if precautions are taken to promptly dry it. Rope, when not thoroughly dried or when stored in damp places, becomes subject to mildew and will rot rapidly.

(g) Other Causes: Misalignment of tackle or kinks in rope may cause broken or cut fibres. Kinks greatly weaken or entirely break a rope under a very moderate tension. They should be turned out by hand before the rope is stressed. Cut by tools and materials (to avoid this do not carry rope on truck floor). Run over by vehicles or heavy equipment.

8. INSPECTION ROUTINE

8.01 Each employee, on receipt of and at least once during each week of use thereafter if the rope has remained in his possession, shall make an inspection of the surface of the rope in accordance with Part 9 in order to determine whether any fault may have developed. Inspection shall be made at least once a month for the internal condition of the rope.

8.02 Each employee shall at all times assume the responsibility of determining that the rope is in good condition and that its appearance does not indicate deterioration or injury sufficient to affect its strength.

8.03 Manila rope shall be check inspected periodically (not less than 3 month periods) and the employee performing this work shall see that all instructions contained herein are complied with.

9. INSPECTION OF MANILA ROPE

9.01 In view of the numerous conditions that may affect the strength of manila rope and even though only part of the rope may be affected, examinations shall be made to determine the condition of the rope throughout its entire length as suggested below: If any of the following conditions of the rope is such that there is any doubt as to its being safe to use, it shall be exchanged at once for rope in good condition in accordance with the Company's established routine.

9.02 The important conditions to look for on the surface of the rope are:

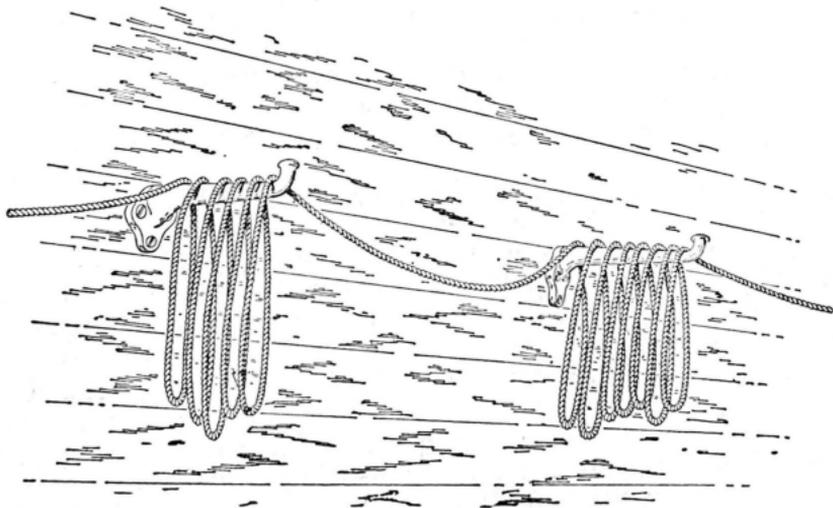
- (a) Abrasion (broken fibres).
- (b) Cuts.
- (c) Extremely soft (badly worn rope is extremely soft and has lost its stretch).
- (d) Decayed or burned by a hot substance or chemical.

9.03 The important conditions to look for internally are listed below: Separate the strands at three-foot intervals, and at any other locations that appear or feel suspicious, and observe the inner part for:

- (a) Broken fibres.
- (b) Fine powder, which determines the presence of grit.
- (c) Mildew or mould.
- (d) Change in color of fibres.

10. STORING ROPE WHEN NOT IN USE

10.01 New rope shall be left in the original coil until required for use and shall be stored in a dry place in a manner to provide a free circulation of air. Used rope not required in service shall be stored in the same manner after it has been coiled (see Part 12) or placed on reels. Do not store new or used rope unless it is completely dry. To dry rope, hang it up in loose coils on harness hooks, rounded pegs or the equivalent to permit a free circulation of air around it and through its coils.



10.02 Rope should be thoroughly dried as soon as practicable after it becomes wet. The drying should be done by placing the rope in the sunshine or in a warm room. Rope, wet or dry, should never be hung over a hot radiator or placed too near a fire.

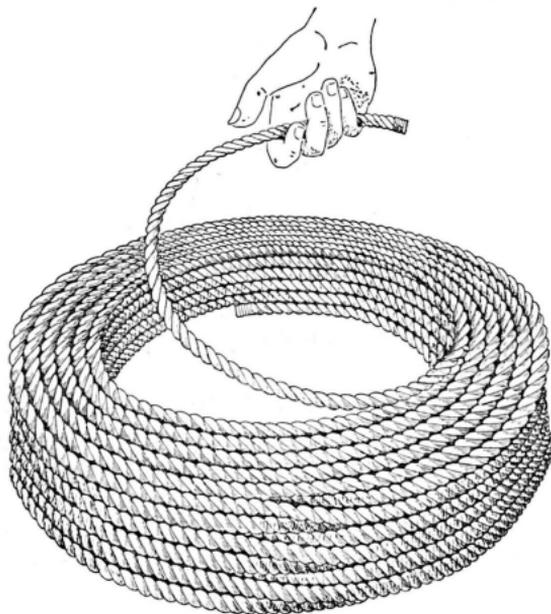
11. TRANSPORTING ROPE

11.01 Hand lines, ropes, block and tackle shall be hung on brackets provided for this purpose; the floor of the truck being kept clear to prevent tripping employees, cutting rope with edged tools and tangling of rope. Never store or transport rope near a storage battery as the acid or alkali will seriously injure the rope.

11.02 Do not carry rope in a truck compartment containing sharp edged tools.

12. COILING AND UNCOILING ROPE

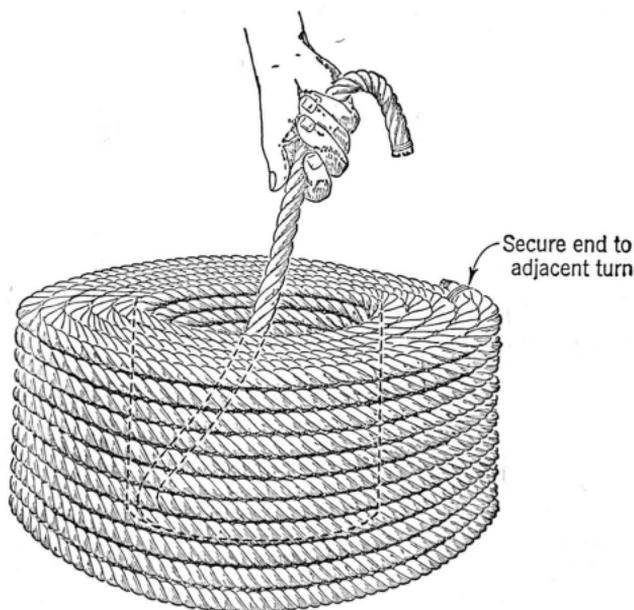
12.01 Coil used rope when not placed on reels by laying out a turn of the desired size and making the turns in a clockwise direction.



12.02 In uncoiling used rope, turn the coil over and draw the end first laid down from the inverted coil. Before uncoiling see if coil has been upset during handling and there is a possibility of selecting the wrong end.

12.03 Remove new rope from a coil, as described below; this method retains the rope in its proper form and prevents kinks.

- (a) Remove burlap wrapping and binding material, then secure outside end of rope on coil to an adjacent turn.
- (b) Lay coil on flat side with the inside end of rope nearest to floor.
- (c) Reach down through center of coil, grasp inside end of rope and withdraw from top of coil.



13. CUTTING MANILA ROPE

13.01 Before cutting, wrap several turns of friction tape around the rope on each side of point where the cut will be made, then cut with a sharp edged tool. If it is desirable to keep the ends from permanently untwisting serve them or make crown splices in the ends as covered in the section "Serving and Splicing Rope" of this group of practices.

14. CLEANING MANILA ROPE

14.01 Hauling rope through mud, sand and grit will collect small sharp particles which will gradually work between the fibres and grind them into a fine powder. For this reason rope shall, so far as practicable, be kept free from dirt. If rope is covered with mud, allow it to dry as soon as practicable. After the rope is dry, whip it up and down upon a smooth flat surface such as a paved road to remove the embedded dirt.

15. DISPOSITION OF MANILA ROPE

15.01 Rope found to be defective shall be disposed of in accordance with the Company's established routine.

15.02 Rope drawn from stock for a particular job shall, upon completion of the work and when there is no known need for it in the immediate future be returned to the storeroom tagged as "satisfactory" or "defective" as the conditions warrant, in order to keep down the load and conserve space on the truck.