

PLACING POLE BRACES AND H FIXTURES

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TABLE A

TYPE OF CROSSARM	LEAD HEIGHT
A	1/2 or 1
B	2/5 or 5/6 (approx.)
8 pin S or W	2/3
10 pin CS or CW	1

1. GENERAL

1.01 This section describes the installation of Pole Braces and H Fixtures as substitutes for side or head guys when safety, economy, and structural advantages favor their use. Right-of-way difficulties, long highway crossings, or inadequate clearances sometimes make pole braces more desirable than anchor guys.

1.02 This section is reissued to include Section 621-203-213, which is cancelled, and to update the information from both sections. The arrows normally used to indicate changes have been omitted.

1.03 Careful planning of pole braces is required to avoid interference with open wires and to hold pin shifting to a minimum. Braces placed with LEAD/HEIGHT ratios as shown in Table A will best meet these objectives.

1.04 The length of brace for a line pole is determined as shown in Fig. 1.

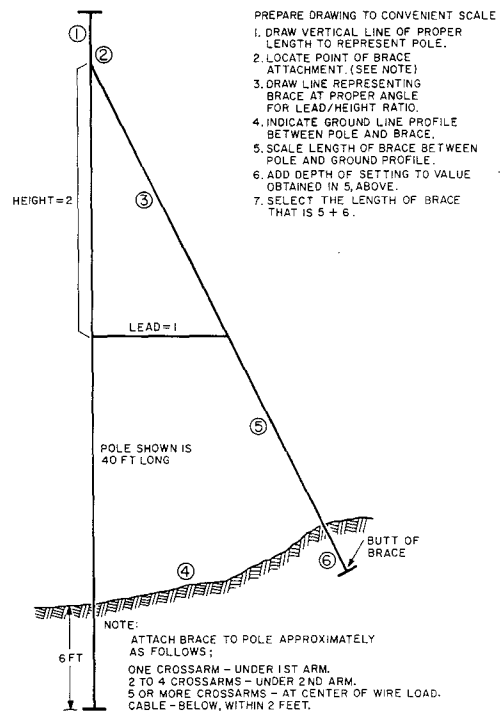


Fig. 1—Length of Pole Brace

2. POLE BRACES

2.01 A push brace, as shown in Fig. 2, can be used in place of a side guy in one direction or a head guy at a dead-end pole.

PUSH BRACE

2.02 If a push brace is placed with a LEAD/HEIGHT ratio of less than 1/2 it may be desirable to anchor the pole as shown in Fig. 3, to prevent it from lifting out. Such anchoring should be specified on the detail plans or have the concurrence of the Plant Engineer before work is done.

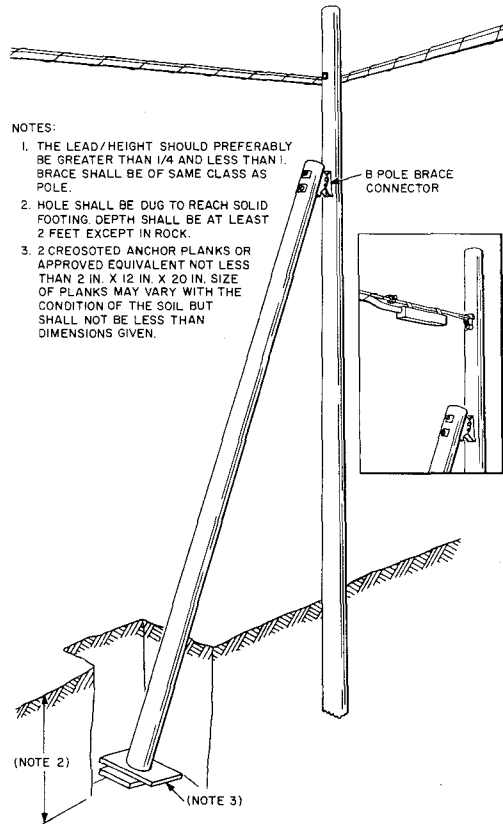
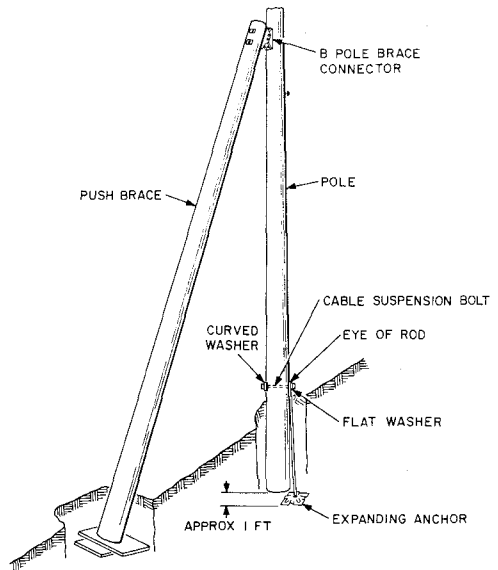


Fig. 2—Push Brace



ANCHOR		
DEPTH OF SET	ANCHOR SIZE	ROD
LESS THAN 6 FT	6 IN.	1/2 X 7
6 FT TO 7 FT	8 IN.	5/8 X 8
7.5 FT TO 8 FT	10 IN.	3/4 X 9
OVER 8 FT	12 IN.	1 X 10

Fig. 3—Push Brace and Line Pole Anchor

PUSH AND PULL BRACE

2.03 A push and pull brace, (Fig. 4), is used as a substitute for side guys in both directions in marshy ground when right-of-way cannot be secured and it is impractical to place an H Fixture.

DOUBLE POLE BRACE

2.04 A double pole brace can be used to reinforce an existing pole line in marshy ground but only if alternate construction cannot be installed. Swamp or other anchors, H Fixture, or push and pull brace construction would be more desirable. See Fig. 5.

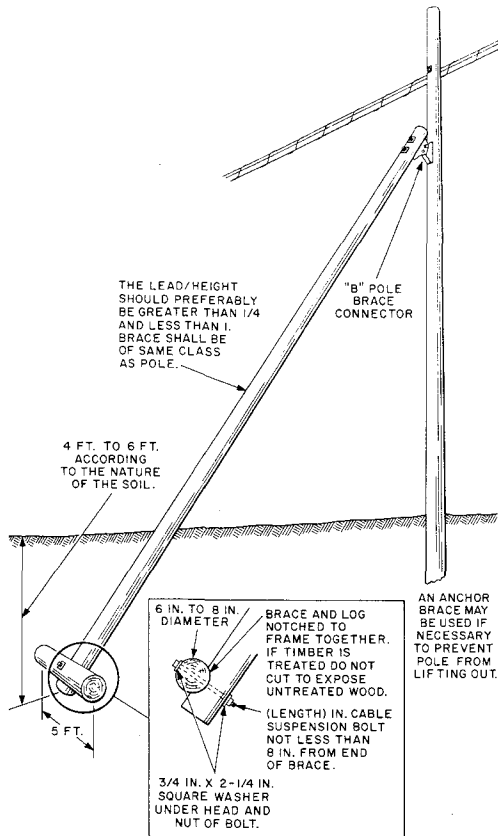


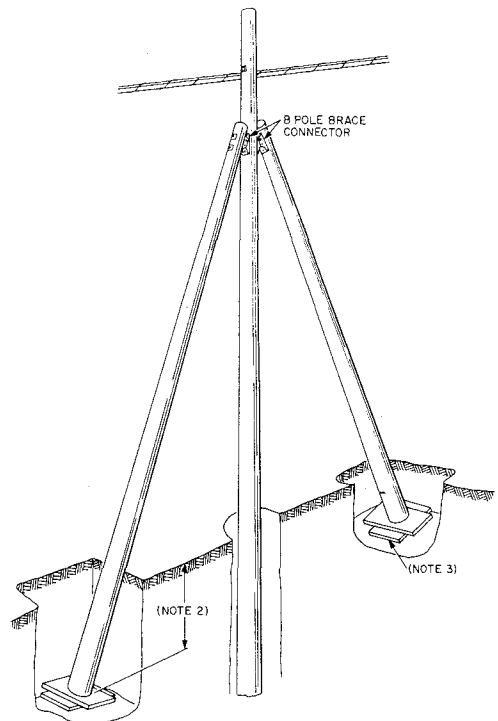
Fig. 4—Push and Pull Brace

INSTALLATION OF POLE BRACES

2.05 Pole braces are attached to poles by means of the B Pole Brace Connector which consists of two identical galvanized malleable iron castings connected by a 3/4-inch machine bolt, acting as a hinge pin. It may be used on any class pole. Difficulty may be encountered with installation on small diameter poles such as Class 9 or 10.

2.06 The installation of pole braces is as follows:

- (a) With the brace lying on the ground one of the two parts of the hinged pole connector is fastened to the brace with a 5/8-inch bolt and a B Curved Washer through the bottom



NOTES:

1. THE LEAD/HEIGHT SHOULD PREFERABLY BE GREATER THAN 1/4 AND LESS THAN 1. BRACES SHALL BE ONE CLASS SMALLER THAN POLE.
2. HOLE SHALL BE DUG TO REACH SOLID FOOTING. DEPTH SHALL BE AT LEAST 2 FEET EXCEPT IN ROCK.
3. 2 CREOSOTED ANCHOR PLANKS OR APPROVED EQUIVALENT NOT LESS THAN 2 IN. X 12 IN. X 20 IN. SIZE OF PLANKS MAY VARY WITH THE CONDITION OF THE SOIL BUT SHALL NOT BE LESS THAN DIMENSIONS GIVEN.

Fig. 5—Double Pole Brace

hole on the hinged pole connector and the top gain hole on the brace.

(b) The second hole is then drilled in the brace to line up with the top hole in the connector, and the second 5/8-inch bolt and B Curved Washer installed, as shown in Fig. 6.

(c) With the completely assembled hinged pole connector in place, and the butt of the brace in the hole, the brace is held in final position against the pole and the pole marked for drilling.

(d) The top of the brace is moved aside (but still held aloft by the derrick) and the holes drilled in the pole.

(e) The 3/4-inch machine bolt is then removed from the hinged pole connector and the second half fastened to the pole with two 5/8-inch bolts and B Curved Washers, as shown in Fig. 7.

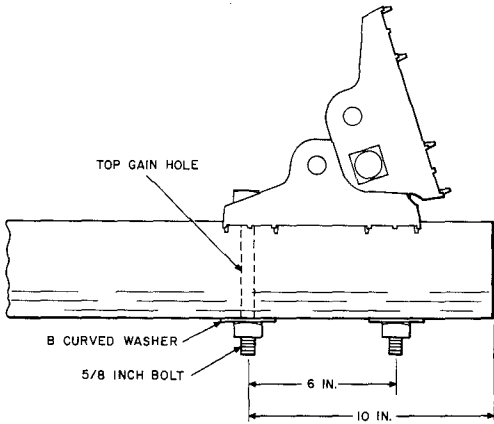


Fig. 6—B Pole Brace Connector Attached to Brace

(f) The top of the brace is then swung back to the pole and the 3/4-inch machine bolt inserted and secured, as shown in Fig. 8.

(g) With brace secured to the line pole, firmly seat the butt of the brace with its anchor planks or log. Sandy soil, gravel, or small rock well tamped under and around the footings, followed by well tamped restoration of the excavation soil, will prevent settling of fill into voids and movement of the brace.

2.07 When a double pole brace is used, the second brace is installed as follows:

(a) The 3/4-inch machine bolt is removed from the second connector and one half of the

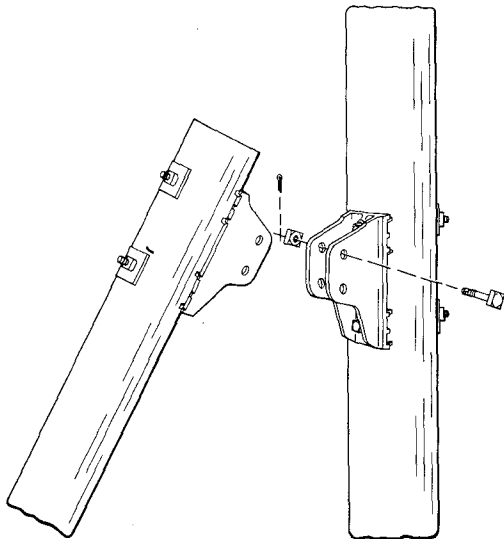


Fig. 7—B Pole Brace Connector Attached to Pole

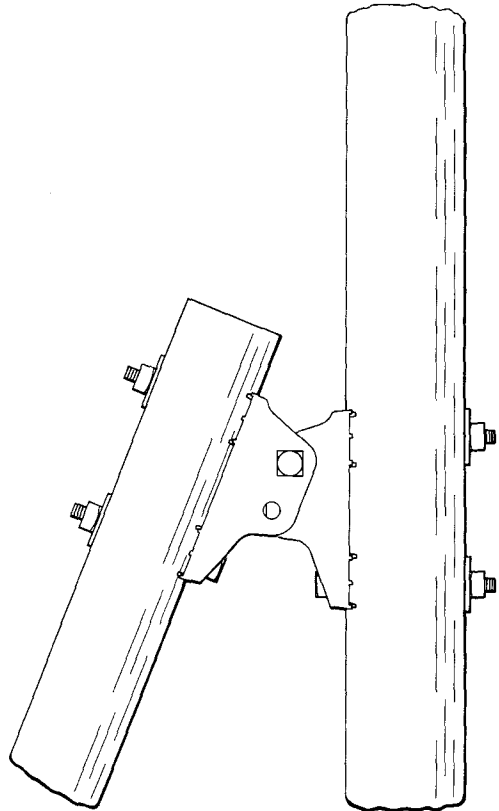


Fig. 8—Pole Brace Attached to Pole

connector is attached to the pole with the same bolts used to fasten the opposite connector. Do not use the B Curved Washers.

- (b) The other half of the connector is placed on the second brace. (See 2.06.)
- (c) The brace is then raised to position and the connector reassembled with the 3/4-inch machine bolt.

3. H FIXTURES

SUBSTITUTE FOR STORM GUYING

3.01 H Fixtures may be used at locations specified on the detail plans as a substitute for storm guyed single poles and, under certain conditions, at corners as a substitute for guyed single poles.

3.02 H Fixtures, when used as a substitute for storm side guyed single poles, provide a more substantial structure in the direction of the line and in some cases are more economical. The use of double crossarms at these H Fixtures is not necessary unless required because of excessive span lengths, railroad crossings, or sharp corners. The locations and the conditions under which H Fixtures may be used will be determined by the Plant Engineer.

3.03 Head-guyed H Fixtures may be used as a substitute for four-way storm guyed single poles. The use of double crossarms is recommended at these points in the heavy and medium loading districts, in order to provide additional structural strength.

3.04 A separation of 6 feet, 8 inches, measured center to center, between the two poles of an H Fixture is recommended. Both poles should be set vertically. With this separation it will not be necessary to shift pins on carrier crossarms. Where 10-pin A crossarms are supported, pins 2 and 9 may be shifted toward the ends of the arm where necessary to provide climbing space.

3.05 A typical installation of a head-guyed H Fixture is shown in Fig. 9. The details of placing the crossarms and the details of the guying are covered in Section 621-315-204 and the 621-400 Subdivision.

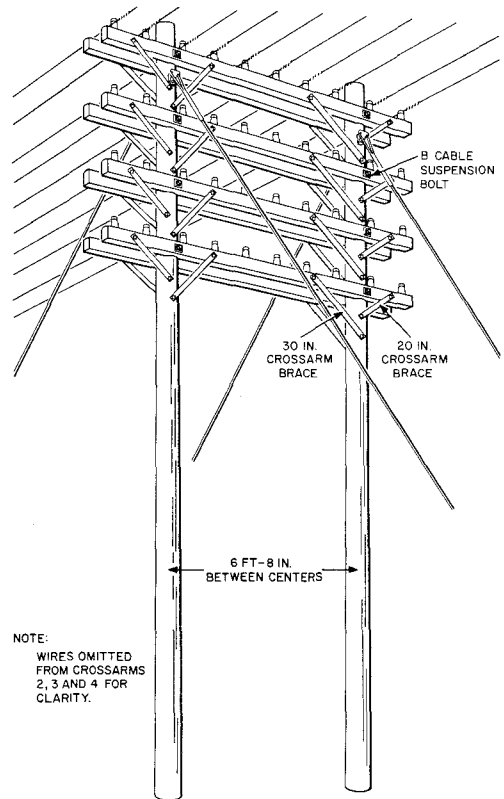


Fig. 9—H Fixture Head Guyed

AT CORNERS

3.06 The use of H Fixtures at corners may be desirable in certain cases. In general, however, and particularly on important toll leads, the use of anchor guyed single poles is preferred. H fixtures should be employed only where their use is authorized by the Plant Engineer. H Fixtures, without supplementary side guying, may be used at corners having the amount of pull shown in Table B. If poles longer than 35 feet are required, the limit of corner pull should be reduced in proportion to the additional length of pole, as indicated in Table B.

3.07 H Fixtures may be used at corners where the pull is in excess of the limits in Table

TABLE B

Length of Pole	Number of Wires	Maximum Allowable Pull on H Fixture at Corner Where Side Guying May Be Omitted
25 feet or less	60	4 feet
" " " "	40	6 "
" " " "	20	12 "
" " " "	10	24 "
30 feet	60	3 feet
" " "	40	5 "
" " "	20	10 "
" " "	10	20 "
35 feet	60	2 feet
" " "	40	4 "
" " "	20	8 "
" " "	10	16 "

B provided that the fixture is guyed and the use of the fixture is specifically authorized by the Plant Engineer. Ordinarily, the locations at which these fixtures are used do not permit the installation of a side guy other than a short lead guy extending from the pole on the inside of the corner to an anchor placed near the butt of the other pole, as shown in Fig. 10. In determining the size of guy required, reduce the actual corner pull on the fixture by the amount shown in the last column of Table B for the length of pole in question and number of wires involved. Use the reduced value

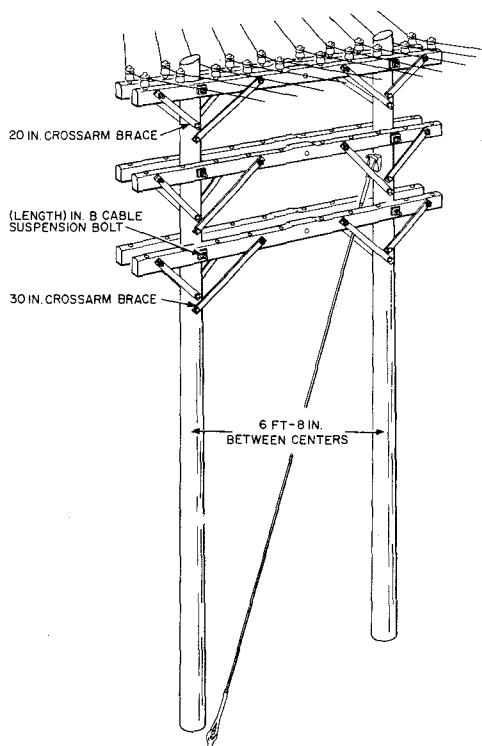


Fig. 10—H Fixture At Corner With Sideguy

of the corner pull in setting the guy rule. For example, if it is desired to determine the size of guy required on a 30-foot pole having a pull of 20 feet and supporting 20 wires, it will be found from the table that an H Fixture without guying may be used where the pull at the corner does not exceed 10 feet. Inasmuch as the amount of corner on the pole exceeds 10 feet, guying is required on the amount of corner exceeding 10 feet, ie, the additional guying required is that required for a 10-foot corner. Attach the guy to the pole at the point where a side guy would normally be attached. A typical installation is shown in Fig. 10.

IN UNSTABLE GROUND

3.08 H Fixtures set in unstable ground may require ground bracing to prevent the fixture from sinking in the ground. The type of support to be provided will usually be of the platform type described in Section 621-200-011.

3.09 A push braced H Fixture may be used where it is impracticable to place head guys, as at submarine cable crossings shown in Fig. 11.

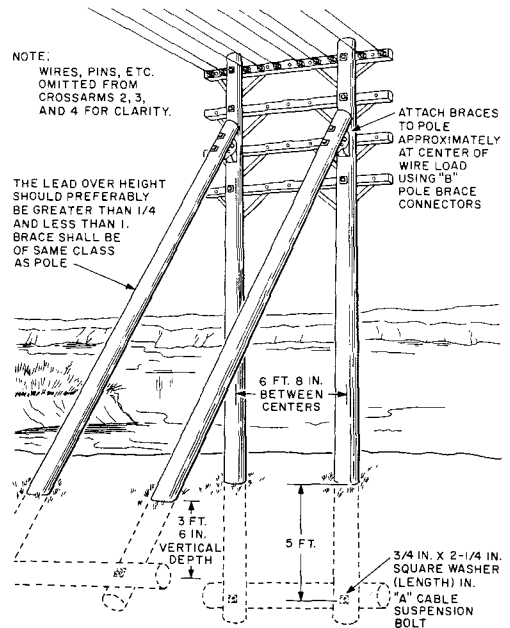


Fig. 11—H Fixture-Push Braced