1.06 The practice of insulating only for the single phase voltage (i.e., voltage to ground) should, in general, be limited to single phase spur lines serving a single customer on private property. Single phase lines on through roads, etc., are likely to be reinforced with the second and third phase conductors as power loads grow. In order to avoid adding or replacing insulators, these lines should be considered as being three phase lines when selecting the size of guy strain insulator.

2. SIZES AND RATINGS OF STRAIN INSULATORS

2.01 Table A lists the sizes of current standard commercial insulators and the conditions under which each may be used. These are so called "single-fin" type insulators. Their general appearance is shown in Fig. 1. Insulators are not marked to identify either their mechanical or electrical ratings. However, ratings can be readily determined by measuring the length and diameter of insulators and comparing the measurements with Table A.

<table>
<thead>
<tr>
<th>MAXIMUM SIZE OF GUY</th>
<th>MAXIMUM VOLTAGE</th>
<th>MINIMUM LENGTH (INCHES)</th>
<th>MINIMUM DIAMETER (D) (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10M and Smaller</td>
<td>13,500</td>
<td>3-1/4</td>
<td>2-3/8</td>
</tr>
<tr>
<td>16M and Smaller</td>
<td>15,000</td>
<td>4-1/8</td>
<td>2-3/4</td>
</tr>
<tr>
<td>25M and Smaller</td>
<td>18,000</td>
<td>5-1/4</td>
<td>3-1/4</td>
</tr>
</tbody>
</table>

Fig. 1—Insulator—Single Fin Type

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2.02 Insulators for 25M strand were also furnished in the so-called "multiple-fin" type and these may be reused. Their general appearance is shown in Fig. 2. Multiple fin insulators should not be used unless they measure at least 6-1/2 inches by 3-3/8 inches. Such insulators carry a rating of 23,000 volts.

2.03 "Wire" size insulators (2-1/4 inches by 1-1/2 inches) have been used in the past where no voltage rating is necessary and wire guys have been employed. These insulators have no voltage rating and should not be used in any situation where a voltage rating is required. If wire guys are placed in a situation where they must be insulated, use insulators of the size required by the voltage involved. (See Table A).

2.04 If it is necessary to insulate against voltages higher than the rating of a single insulator, use two or more insulators in series. For example, if it is necessary to insulate a 10M guy against a 25,000 volt exposure, use two 10M strain insulators. An exposure of 50,000 volts would require three 25M insulators in series.

3. LOCATING INSULATORS

3.01 Where guys are placed so one crosses or is above another guy, insulators should be located so they will not become ineffective if one guy sags down upon the other.

3.02 All guy strain insulators shall be installed at least 8 feet above the ground.

3.03 On nonjoint poles, guy strain insulators in pole-to-pole and stub guys shall be located outside of the "zone of exposure." (See Fig. 3.) The zone of exposure is defined as the space within a horizontal distance of 10 feet from a power conductor and extends both above and below the conductor. Strain insulators in anchor guys should be located outside of the zone of exposure.

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3.04 Guy strain insulators shall be located to provide the horizontal clearances from the pole as shown in Table B.

3.05 On poles carrying power conductors below telephone attachments, place two strain insulators so one will be above the power conductor and one will be below. The upper insulator should be located 6 to 12 inches above the level of the power conductor. Avoid grounding the upper part of the guy. (See Fig. 4.)

### Table B

<table>
<thead>
<tr>
<th>KIND OF GUY</th>
<th>POLE CARRIES CABLE OR MULTIPLE LINE WIRE</th>
<th>POLE CARRIES OPEN WIRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor</td>
<td>40 in. (if practical)</td>
<td>40 in. (if practical)</td>
</tr>
<tr>
<td>Pole-to-Pole or Pole-to-Stub</td>
<td>40 in. – 8 ft.</td>
<td>6 ft. – 8 ft.</td>
</tr>
</tbody>
</table>

![Fig. 4—Insulating Guys for Attachments Above Power Conductors](image-url)
3.06 The examples in Fig. 5 and 6 further illustrate the application of the requirements governing the location of guy strain insulators.

**Note:** Where there is not sufficient space to place strain insulator between guy stub and zone of exposure as shown, it shall be placed in the down guy at least 8 feet above ground.

Fig. 5—Insulating Guy on Jointly Used Pole

Fig. 6—Insulating Guys in Zone of Exposure—Voltages Less than 18,000
4. METHODS OF INSTALLING STRAIN INSULATORS

4.01 Strain insulators shall be installed as follows:

(a) **Galvanized Wire Guy:** Serve galvanized wire back on itself. (See Fig. 7)

(b) **2200 Pound Strand:** Use a one-bolt guy clamp on each side of the insulator. (See Fig. 8.)

(c) **6000, 6600, and 10,000 Pound Strand:** Use one 3-bolt guy clamp, B strand grip or strandvise on each side of the insulator. (See Fig. 9) Tightening the bolts on three-bolt guy clamps should preferably be done with the clamps held in a vise.

(d) **16,000 Pound Strand:** Use a B strand grip on each side of the insulator. Alternatives: Use two 3-bolt guy clamps or a long bail strandvise on each side of the insulator. (See Fig. 10.)

(e) **25,000 Pound Strand:** Use a B strand grip on each side of the insulator. Alternatives: Use three 3-bolt guy clamps on each side of the insulator. (See Fig. 11.)
(f) **Strain Insulators In Series:** Insulators placed in series shall be connected with loops of strand not less than the sizes shown in Table C. The use of B strand grips and the B strand connector to install strain insulators is shown in Fig. 12. Alternatives: Use 3-bolt guy clamps as shown in Fig. 13 or two long bail strandvises and a strand connector to close the loop connecting the insulators.

**TABLE C**

**MINIMUM STRAND SIZES REQUIRED FOR LOOPS**

<table>
<thead>
<tr>
<th>SIZE OF GUY STRAND</th>
<th>SIZE OF STRAND IN LOOP</th>
</tr>
</thead>
<tbody>
<tr>
<td>6M, 6.6M, 10M</td>
<td>6M</td>
</tr>
<tr>
<td>16M</td>
<td>10M</td>
</tr>
<tr>
<td>25M</td>
<td>16M</td>
</tr>
</tbody>
</table>

**Fig. 12—Installing Strain Insulators in Series Using Strand Connector**

Use one 1-bolt guy clamp for 2,200 lb. Strand.
Use one 3-bolt guy clamp for 6,000, 6,600 and 10,000 lb. Strand.
Use two 3-bolt guy clamps for 16,000 lb. Strand.

Strand: same size as used in guy. Next smaller size strand may be used if guy is 10,000, 16,000 or 25,000 lb.

**Fig. 13—Installing Strain Insulators in Series Using 3-Bolt Guy Clamps**

Use number of clamps etc. See preceding paragraphs.