clearance distances.

measuring sticks be used to verify
ator of the boom.

vicinity so as to be visible to the oper-
rial, and mounted in the buckets or its

a plate of durable nonconductive mate-

shall be printed on

excess of the manufacturer's rating.

tempting to lift or support weights in

boom shall not be overstressed by at-

et, except for appropriate length jump-

inches long shall be placed in the buck-

hibited.

buckets, booms, and the ground is pro-
bushing or insulator string.

bucket and the grounded end of the

maintained between all parts of the

ground clearances of Table V–2 must be

ator string, the minimum line-to-

maximum clearance distance may be reduced provided the dis-

ances are not made less than the shortest distance between

the energized part and a grounded surface.

(20)(i) A minimum clearance table (as shown in table V–2) shall be printed on

a plate of durable nonconductive mate-

rial, and mounted in the buckets or its vicinity so as to be visible to the oper-

ator of the boom.

(ii) It is recommended that insulated measuring sticks be used to verify clearance distances.

<table>
<thead>
<tr>
<th>Voltage range (phase-to-phase) kilovolts</th>
<th>Distance in feet and inches for maximum voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 to 15</td>
<td>20″, 20″</td>
</tr>
<tr>
<td>15.1 to 35</td>
<td>24″, 24″</td>
</tr>
<tr>
<td>35.1 to 46</td>
<td>26″, 26″</td>
</tr>
<tr>
<td>46.1 to 72.5</td>
<td>30″, 30″</td>
</tr>
<tr>
<td>72.6 to 121</td>
<td>34″, 46″</td>
</tr>
<tr>
<td>138 to 145</td>
<td>36″, 50″</td>
</tr>
<tr>
<td>161 to 169</td>
<td>38″, 56″</td>
</tr>
<tr>
<td>230 to 242</td>
<td>50″, 64″</td>
</tr>
<tr>
<td>345 to 362</td>
<td>170″, 134″</td>
</tr>
<tr>
<td>500 to 552</td>
<td>1110″, 1200″</td>
</tr>
<tr>
<td>700 to 765</td>
<td>1515″, 1310″</td>
</tr>
</tbody>
</table>

1For 345–362 kv, 500–552 kv, and 700–765 kv, the mini-
mum clearance distance may be reduced provided the dis-
tances are not made less than the shortest distance between
the energized part and a grounded surface.

(16) When approaching, leaving, or bonding to an energized circuit the
minimum distances in Table V–2 shall be maintained between all parts of the
insulated boom assembly and any grounded parts (including the lower
arm or portions of the truck).

(17) When positioning the bucket alongside an energized bushing or insu-
lator string, the minimum line-to-
ground clearances of Table V–2 must be
maintained between all parts of the
bucket and the grounded end of the
bushing or insulator string.

(18)(i) The use of handlines between
buckets, booms, and the ground is pro-
hibited.

(ii) No conductive materials over 36
inches long shall be placed in the buck-
et, except for appropriate length jump-
ers, armor rods, and tools.

(iii) Nonconductive-type handlines
may be used from line to ground when
not supported from the bucket.

(19) The bucket and upper insulated
boom shall not be overstressed by at-
tempting to lift or support weights in
excess of the manufacturer's rating.

(20)(i) A minimum clearance table (as
shown in table V–2) shall be printed on
a plate of durable nonconductive mate-
rial, and mounted in the buckets or its
vicinity so as to be visible to the oper-
ator of the boom.

(ii) It is recommended that insulated measuring sticks be used to verify clearance distances.

§ 1926.956 Underground lines.

(a) Guarding and ventilating street opening used for access to underground lines or equipment. (1) Appropriate warning signs shall be promptly placed when covers of manholes, handholes, or vaults are removed. What is an appropriate warning sign is dependent upon the nature and location of the hazards involved.

(2) Before an employee enters a street opening, such as a manhole or an unvented vault, it shall be promptly protected with a barrier, temporary cover, or other suitable protection.

(3) When work is to be performed in a manhole or unvented vault:

(i) No entry shall be permitted unless forced ventilation is provided or the atmosphere is found to be safe by testing for oxygen deficiency and the presence of explosive gases or fumes;

(ii) Where unsafe conditions are detected, by testing or other means, the work area shall be ventilated and otherwise made safe before entry;

(iii) Provisions shall be made for an adequate continuous supply of air.

(b) Work in manholes. (1) While work is being performed in manholes, an employee shall be available in the immediate vicinity to render emergency assistance as may be required. This shall not preclude the employee in the immediate vicinity from occasionally entering a manhole to provide assistance, other than emergency. This requirement does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, reading, or similar work if such work can be performed safely.

(2) When open flames must be used or smoking is permitted in manholes, extra precautions shall be taken to provide adequate ventilation.

(3) Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of the manhole or excavation shall be tested and found safe or cleared of the combustible gases or liquids.

(c) Trenching and excavating. (1) During excavation or trenching, in order to
§ 1926.957 Construction in energized substations.

(a) Work near energized equipment facilities. (1) When construction work is performed in an energized substation, authorization shall be obtained from the designated, authorized person before work is started.

(2) When work is to be done in an energized substation, the following shall be determined:
   (i) What facilities are energized, and
   (ii) What protective equipment and precautions are necessary for the safety of personnel.

(3) Extraordinary caution shall be exercised in the handling of busbars, tower steel, materials, and equipment in the vicinity of energized facilities. The requirements set forth in §1926.950(c), shall be complied with.

(b) Deenergized equipment or lines. When it is necessary to deenergize equipment or lines for protection of employees, the requirements of §1926.950(d) shall be complied with.

(c) Barricades and barriers. (1) Barricades or barriers shall be installed to prevent accidental contact with energized lines or equipment.

(2) Where appropriate, signs indicating the hazard shall be posted near the barricade or barrier. These signs shall comply with §1926.200.

(d) Control panels. (1) Work on or adjacent to energized control panels shall be performed by designated employees.

(2) Precaution shall be taken to prevent accidental operation of relays or other protective devices due to jarring, vibration, or improper wiring.

(e) Mechanized equipment. (1) Use of vehicles, gin poles, cranes, and other equipment in restricted or hazardous areas shall at all times be controlled by designated employees.

(2) All mobile cranes and derricks shall be effectively grounded when being moved or operated in close proximity to energized lines or equipment, or the equipment shall be considered energized.

(3) Fenders shall not be required for lowboys used for transporting large electrical equipment, transformers, or breakers.

(f) Storage. The storage requirements of §1926.953(c) shall be complied with.

(g) Substation fences. (1) When a substation fence must be expanded or removed for construction purposes, a temporary fence affording similar protection when the site is unattended, shall be provided. Adequate interconnection with ground shall be maintained between temporary fence and permanent fence.

(2) All gates to all unattended substations shall be locked, except when work is in progress.

(h) Footing excavation. (1) Excavation for auger, pad and piling type footings for structures and towers shall require the same precautions as for metal tower construction (see §1926.955(b)(1)).

(2) No employee shall be permitted to enter an unsupported auger-type excavation in unstable material for any purpose. Necessary clean-out in such cases shall be accomplished without entry.