

SECTION CONTENTS

SECTION II

DEFINITIONS OF TERMS AS USED IN THE RULES OF THIS ORDER

RULE	PAGE
20.1 BACKBONE -----	13
20.2 BRIDGE -----	13
20.3 CABLE -----	13
20.4 CATENARY CONSTRUCTION -----	13
20.5 CIRCUIT -----	13
A. Class C Communication -----	13
(1) Major Class C -----	13
(2) Minor Class C -----	14
B. Private Communication -----	14
C. Railway Signal -----	14
D. Supply -----	14
(1) Class H -----	14
(2) Class L -----	15
E. Class T -----	15
20.6 CLIMBING SPACE -----	15
20.7 COMMON NEUTRAL SYSTEMS -----	15
20.8 CONDUCTOR -----	15
A. Lateral -----	15
B. Line -----	15
C. Open Wire -----	15
D. Unprotected -----	15
20.9 CROSSARM -----	16
A. Combination Arm -----	16
P. Related Buck Arm -----	16

SECTION CONTENTS

SECTION II

RULE	PAGE
C. Clearance Arm -----	16
D. Guard Arm -----	16
21.0 DISTRICTS -----	16
A. Urban -----	16
B. Rural -----	16
C. Loading -----	16
21.1 GROUND CONNECTION -----	16
21.2 GROUNDED -----	17
A. Effectively -----	17
B. Permanently -----	17
C. Securely -----	17
21.3 GUY -----	17
A. Overhead -----	17
B. Anchor -----	17
C. Exposed -----	17
D. Guy in Proximity -----	18
21.4 JOINT USE OF POLES OR POLES JOINTLY USED -----	18
21.5 LEAD WIRES -----	18
21.6 LIGHTNING ARRESTERS, SET OF -----	18
21.7 LINES -----	18
A. Conflicting -----	18
B. Colinear -----	18
C. Tower -----	19

SECTION CONTENTS

SECTION II

RULE	PAGE
21.8 MAINTENANCE -----	19
21.9 MESSENGER -----	19
21.10 PARTIAL UNDERGROUND DISTRIBUTION -----	19
22.0 POLE -----	19
A. Pole Top Extension -----	19
B. Spliced Pole -----	19
C. Stub Reinforced Pole -----	20
D. Non-Climbable Pole -----	20
22.1 PRACTICABLE -----	20
22.2 PROTECTIVE COVERING, SUITABLE -----	20
22.3 RAILWAYS -----	20
A. Minor -----	21
B. Major -----	21
C. Street -----	21
22.4 RECONSTRUCTION -----	21
22.5 RISERS -----	21
22.6 RUNS -----	21
22.7 SAG -----	21
A. Normal -----	21
B. Apparent -----	21
22.8 SERVICE DROPS -----	21
22.9 SPAN WIRE -----	21

SECTION CONTENTS

SECTION II

RULE	PAGE
22.10 SWIMMING POOL -----	22
23.0 TENSION -----	22
A. Maximum Allowable -----	22
B. Maximum Working -----	22
23.1 THOROUGHFARE -----	22
A. Public -----	22
B. Private -----	22
23.2 VOLTAGE (OR VOLTS) -----	22
23.3 WIRE GAGE -----	22
A. American -----	22
B. Birmingham -----	22
C. New British Standard -----	23
23.4 WORKING SPACE -----	23

SECTION II

DEFINITIONS OF TERMS AS USED IN THE RULES OF THIS ORDER

- 20.1 BACKBONE means an auxiliary span support for pull-offs and cross-spans to trolley contact conductors to which it is approximately parallel.
- 20.2 BRIDGE means a structure which is used primarily for foot, vehicular or train traffic as distinguished from those which span certain areas and support signals or wires and which are classed as supporting poles, towers or structures.
- 20.3 CABLE means a stranded conductor (single conductor cable) or a combination of conductors insulated from one another (multiple-conductor cable).
- 20.4 CATENARY CONSTRUCTION, applied to trolley systems, means construction wherein auxiliary wire or cable messengers are in alignment with and support trolley contact conductors at one or more (usually many) points throughout the spans.
- 20.5 CIRCUIT means a conductor or system of conductors located outside of buildings and through which an electric current is intended to flow.
- A. Class C Communication Circuits mean circuits which are used for public or private communication service and which operate at not exceeding 400 volts to ground nor 750 volts between any two points of the circuit and the transmitted power of which does not exceed 150 watts. When operated at less than 150 volts no limit is placed on the capacity of the system.

NOTE-Telephone, telegraph, messenger-call, clock, fire or police alarm circuits are included in this classification and other circuits used for signal purposes in which the above limitations are not exceeded may be included.

- (1) Major Class C Circuits mean communication circuits which include the following:

More than four conductors (open, paired or in cable) used chiefly for local exchange service.

Toll telephone or telegraph circuits used for transmission of messages of the general public, and not including clock, messenger-call, railway signal, police, fire alarm and other special communication circuits.

(2) Minor Class C Circuits mean communication circuits not included in the definition of Major Class C Circuits. (See Rule 20.5-A1.)

- B. Private Communication Circuits mean circuits used for private communication, signal or control service in the operation of other facilities. (See Rules 78.2 and 89.)
- C. Railway Signal Circuits mean those supply and communication circuits used primarily for supplying energy for controlling the operation of railway block signals, highway crossing signals, interlocking apparatus and their appurtenances.

Circuits which operate at less than 400 volts to ground are considered as communication (Class C) circuits and shall be so classified and treated provided that, if the voltage exceeds 150 volts between conductors the power transmitted shall not exceed 150 watts. Where all circuits of a line are owned and operated by one utility, the voltage between conductors carrying in excess of 150 watts may be increased to not more than 250 volts and the signal circuits may be considered as communication (Class C) circuits.

All railway signal circuits which do not meet the requirements above shall be treated as supply circuits of corresponding voltage.

- D. Supply Circuits mean those circuits which are used for transmitting a supply of electrical energy.

(1) Class H Circuits include the following:

Constant potential alternating current circuits of 5000 volts or more between any two conductors

Constant potential alternating current circuits of 2900 volts or more between any conductor and ground

Constant potential direct current circuits exceeding 750 volts between any conductor and ground

Constant current circuits of 7.5 amperes or less supplied from transformers or devices having a normal full-load output voltage of 5000 volts or more.

Constant current circuits of more than 7.5 amperes supplied from transformers or devices having an open-circuit voltage of 2900 volts or more.

(2) Class L Circuits include the following:

Constant potential alternating or direct current supply circuits of lower voltage than Class H

Constant current circuits of 7.5 amperes or less supplied from transformers or devices having a normal full-load output voltage less than 5000 volts

Constant current circuits of more than 7.5 amperes supplied from transformers or devices having an open-circuit output voltage less than 2900 volts.

E. Class T Circuits mean trolley contact conductors, feeder wires and other conductors metallically connected to such contact conductors, used in electric railway or trolley operation. These Class T circuits are supply circuits, further classified as Class L or Class H depending upon the voltage and nature of current used (see Rule 20.5-D).

20.6 CLIMBING SPACE means the space reserved along the surface of a climbable pole or structure to permit ready access for linemen to equipment and conductors located on the pole or structure.

20.7 COMMON NEUTRAL SYSTEMS mean those electrical supply distribution systems wherein the same specially grounded conductor is utilized as a neutral conductor of primary circuits of less than 15,000 volts and secondary circuits of 0-750 volts supplied therefrom.

20.8 CONDUCTOR means a wire, or combination of wires not insulated from one another, suitable for carrying electric current.

A. Lateral Conductor means a conductor extending in a general horizontal direction and usually at an angle of approximately 90 degrees to the direction of the line conductors.

B. Line Conductor means an overhead conductor which extends from the last point of support on one overhead line structure to the first point of support on another overhead line structure.

C. Open Wire Conductors mean communication conductors separately supported.

D. Unprotected Conductors mean supply conductors not covered by a "suitable protective covering" (see Rule 22.2), grounded metal conduit, grounded metal sheath or shield, or impregnated fiber, and not enclosed in a grounded metal pole.

- 20.9 CROSSARM or ARM means a horizontal support of wood or metal attached to poles or structures generally at right angles to the conductor supported,
- A. Combination Arm means a crossarm supporting supply conductors of 0-750 volts and supply conductors of 750-7500 volts.
 - B. Related Buck Arm means a crossarm used to change the direction of all or a part of the conductors on the line arm immediately above or below. A buck arm is generally placed at right angles to the line arm.
 - C. Clearance Arm means a crossarm supporting conductors installed on a pole of another line for the purpose of maintaining the prescribed clearances of this order which, if the other line did not exist, could be maintained without such clearance arm.
 - D. Guard Arm means a wood crossarm installed on a pole directly above and parallel to the messenger, cable or conductors being guarded. Guard arms are required in certain cases of low voltage rack construction (see Rule 54.9-E) and certain cases of cable construction (see Rules 57.7, 87.7, and 92.1). Guard arms shall not be used to support conductors or other line facilities except as specifically provided in these rules. This rule will not make the use of guard-arms mandatory provided that the electric and communication companies involved agree that the basic minimum clearances specified by this general order and its revisions, are adequate without the use of guard arms. (See Rule 84.8-B2c and 87.7-B)
- 21.0 DISTRICTS mean areas as defined in the following:
- A. Urban Districts mean thickly settled areas (whether in cities or suburbs) or where congested traffic often occurs. Highways on which traffic is often very heavy or locations such as picnic grounds, summer resorts, etc., where people congregate seasonally, are considered as urban.
 - B. Rural Districts mean all areas not urban, usually in the country but in some cases within city limits.
 - C. Loading Districts mean those areas in which the specified loadings of Rule 43 apply and are known as "Heavy" and "Light" loading districts.
- 21.1 GROUND CONNECTION means the equipment used in establishing a conducting path between an electric circuit or equipment and earth. A ground connection consists of a ground conductor, a ground electrode and the earth (soil, rock, etc.) which surrounds the electrode.

21.2 GROUNDED means connected to earth by a ground connection or by an unintentional conducting path.

- A. Effectively Grounded means grounded through a ground connection of sufficiently low impedance (inherently and/or intentionally obtained) that fault grounds which may occur cannot build up voltages dangerous to connected equipment.

If an impedance of less than 25 ohms is not obtained, the equivalent of a ground conductor not less than No. 6 AWG copper connected to two corrosion resisting rods, not less than $\frac{1}{2}$ inch in diameter and 8 feet in length and continuous throughout, driven to a minimum depth of 8 feet in the earth at not less than 6 foot centers, will be considered an effective ground for the purpose of these rules.

Three interconnected ground rods, each $\frac{1}{2}$ inch in diameter, 6 feet in length, driven in the earth with no less than 6 feet separation between any two, will also be considered an effective ground.

Where a common neutral system is installed, the grounding provisions for such systems, as covered in Rule 59.4 shall apply.

- B. Permanently Grounded refers to time, and means grounded while the equipment concerned is in place under the conditions specified in the rules.
- C. Securely Grounded means connected to earth through a metal surface in good contact with the earth (soil, rock, etc.) such as the contact of anchor rods or metal poles set directly in the ground. Metal poles set in concrete are considered as grounded but will not be considered as securely grounded.

21.3 GUY means a tension member (a solid wire or stranded wires) used to withstand an otherwise unbalanced force on a pole, crossarm or other overhead line structure (see Rule 21.9 for definition of messenger).

- A. Overhead Guy means a guy extending from a pole, crossarm or structure to a pole, crossarm, structure or tree and is sometimes called a span guy.
- B. Anchor Guy means a guy which has its lower anchorage in the earth and is sometimes called a sidewalk, truss or ground guy.
- C. Exposed Guy means a guy of which any part is less than 8 feet horizontally from the vertical plane of any supply conductor of more than 250 volts (see App. G, Fig. 44).

D. Guy In Proximity means a guy of which any part is both within a vertical distance of less than 8 feet from the level of supply conductors and a radial distance of less than 6 feet from the surface of a wood pole or structure (see App. G, Fig. 45).

21.4 JOINT USE OF POLES OR POLES JOINTLY USED means occupancy of poles or structures by circuits of different ownership or by two or more of the following classes of circuits of the same ownership:

Communication circuits for public use
Railway or trolley circuits
Supply circuits other than trolley circuits

A luminaire mounted four feet or more from the surface of the pole shall not constitute reason to deem the pole jointly used.

21.5 LEAD WIRES mean those wires which are sometimes termed "jumpers," "bridle wires" or "taps" and which are used for connecting the line conductors to equipment and apparatus.

21.6 LIGHTNING ARRESTERS, SET OF, means lightning arresters (one or more) at one location connected to the various conductors of a single circuit.

21.7 LINES mean those conductors together with their supporting poles or structures and appurtenances which are located outside of buildings.

A. Conflicting Lines (lines in conflict or conflicts) mean lines so situated with respect to each other (except at crossings) that the overturning of one line will result in contact of its poles or conductors with the poles or conductors of the second line, assuming no conductors are broken in either line; except that lines on opposite sides of a thoroughfare are not considered as conflicting if separated by a distance not less than 60 per cent of the height of the higher pole line above the ground line and in no case less than 20 feet (see App. G, Fig. 1).

B. Colinear Lines mean:

Conflicting lines so situated that one line is wholly or partly over the other line, often called "overbuild"

Conflicting lines not "overbuilds" but separated a horizontal distance of less than the required pin spacing of the highest voltage circuit involved

Conflicting lines not "overbuilds" but separated a horizontal distance of less than one foot, regardless of pin spacing. (See App. G, Figs. 2 and 3.)

NOTE-For the purpose of measurement, the horizontal distance between the conflicting lines shall be that distance measured horizontally between vertical planes passing through the adjacent extremities of the conflicting lines.

- C. Tower Lines (Class H, L and T) mean supply lines, the supporting structures of which are of steel or other metal and have a maximum outside dimension of more than 4 feet measured either along or across the line in a horizontal plane at the ground level. Metal supporting structures, "A" frames or "H" structures, having a dimension from outside of one support to outside of another support greater than 4 feet at the ground level will be classified as towers.

NOTE-Steel or metal structures having maximum outside dimensions of 4 feet or less, measured along and across the line in a horizontal plane at the ground level, will be classified as poles under supply lines.

- 21.8 MAINTENANCE means the work done on any line or any element of any line for the purpose of extending its life (excepting the replacement of the supporting poles or structures) and includes the replacement, for any reason, of crossarms, pins, insulators, wires, cables, messengers, etc., but does not contemplate the addition of elements (excepting pole stubs and guy wires) which will change the identity of the structure (see Rule 12).
- 21.9 MESSENGER means stranded wires in a group which MAY OR MAY NOT BE part of the conducting system, its primary function being to support wires or cables of the conducting system; sometimes called "suspension strand."
- 21.10 PARTIAL UNDERGROUND DISTRIBUTION means a supply system of overhead primary conductors supported in vertical or triangular configuration, without crossarms, on nonclimbable, non-joint poles, and with underground secondary distribution facilities (see App. G, Fig. 87).
- 22.0 POLE
- A. Pole Top Extension means a bracket or structure (exclusive of a pole top pin) attached to a pole and extending above its top to support conductors.
- B. Spliced Pole means a wood pole comprised of two or more sections spliced end to end by means of a lap, scarf or butt joint with suitable and adequate lashing or other fastenings, the sections of pole being usually coaxial.

C. Stub Reinforced Pole means a wood pole attached by suitable and adequate fastenings to a stub (usually a short length of wood pole or timber) set in the ground, such stub being intended to provide the support originally afforded by the pole butt.

D. Non-Climbable Pole means a non-joint use pole of smooth exterior surface (not latticed), that is not equipped with pole steps or other provisions for climbing, and upon which work is performed only from aerial lifts.

22.1 PRACTICABLE means capable of being accomplished by reasonably available and economic means.

22.2 PROTECTIVE COVERING, SUITABLE, means a covering of wood, or other material as authorized by the Public Utilities Commission, having the electrical insulating efficiency and mechanical strength of $1\frac{1}{2}$ inches of redwood. Materials meeting the requirements of this definition, when installed in a workmanlike manner include:

A. Impregnated Fibre Conduit, having a wall thickness of not less than one quarter of an inch, installed over rigid metal conduit as illustrated in Figure 82 of Appendix G.

B. Hardwood Moulding (oak or rock elm) three eighths of an inch in thickness, or having a cross-section as shown in Figure 81 of Appendix G, when used as a covering for ground wires and communication conductors.

C. The use of Douglas Fir Wood Moulding $\frac{1}{2}$ inch in thickness or rigid polyvinyl chloride plastic moulding, not less than $1/16$ " thick, having dielectric strength of not less than 1000 volts per mil will be permitted as a suitable protective covering for ground wires, bond wires and lateral wires, installed on the surface of wood poles or crossarms.

For 0-750 volt cable risers, No. 14 gauge steel U cable guard covered with an impregnated fibre conduit having a wall thickness of $\frac{1}{2}$ " shall be considered to meet the requirements of this rule.

D. Plastic Pipe made of rigid unplasticized polyvinyl chloride having the properties and dimensions specified as Type II, High Impact of not less than 0.20 inch wall thickness and having a dielectric strength of not less than 1000 volts per mil. Normal Chemical Resistance in United States Department of Commerce Commercial Standard No. CS 207-60.

22.3 RAILWAYS are classified as Minor, Major or Street, as in the following definitions:

A. Minor Railway means:

Spur tracks less than 2000 feet in length and not exceeding two tracks in the same crossing span.

Branches on which no regular service is maintained or which are not operated during part of the year.

Tracks used only temporarily for a period not exceeding one year.

Tracks not operated as a public utility, such as industrial railways used in logging, mining and like operations.

Tracks other than standard gage.

- B. Major Railway means any railway not included above, other than street railways as defined below.
 - C. Street Railway means a railway by whatsoever power operated for public use in the conveyance of passengers or freight which is mainly located upon, over, above, across, through or along public thoroughfares.
- 22.4 RECONSTRUCTION means that work which in any way changes the identity of the pole, tower or structure on which it is performed. For exceptions see Rule 12.1.
- 22.5 RISERS mean conductors which extend below the ground line and are generally installed on the surfaces of poles.
- 22.6 RUNS mean vertical or lateral conductors supported in coverings or casings on overhead line structures, or certain insulated communication conductors supported along the surfaces of poles or crossarms.
- 22.7 SAG includes either Normal or Apparent, as defined in the following:
- A. Normal Sag means the difference in elevation between the highest point of support of a span and the lowest point of the conductor in the span at 75° F. and no wind loading (see App. G, Fig. 4).
 - B. Apparent Sag means the maximum departure, measured vertically, of a wire in a given span from a straight line between the two points of support of the span at 75° F. and no wind loading. Where the two supports are at same level, this will be the normal sag. (See App. G, Fig. 5.)
- 22.8 SERVICE DROPS mean the conductors strung between a pole line and a building or structure.
- 22.9 SPAN WIRE means a wire or cable used as an auxiliary support for wires, cables, or other equipment. As applied to trolley construction it means a wire or cable used to support laterally, or which is attached to wires which support laterally, trolley contact conductors and appurtenances in electrical contact therewith,

including wires commonly referred to as cross span wires, bracket span wires, pull-offs, trolley strain guys, dead ends, etc.

A. Lift Span means a wire, cable or rod used to share the load of span wires or brackets.

22.10 SWIMMING POOL means that portion of any natural or artificially contained body of water which is 24 inches or more in depth at any point below the highest water level, which is intended for use for swimming, bathing or other similar recreational purposes, and which has a surface area exceeding 100 square feet.

23.0 TENSION means either Maximum Allowable or Working as defined in the following definitions:

A. Maximum Allowable Tension for a supply conductor means one-half the ultimate tensile strength of the conductor.

B. Maximum Working Tension is that conductor tension resulting under the construction arrangement with the maximum loading conditions specified in Rule 43.

23.1 THOROUGHFARE means any public or private highway, avenue, street, road, alley, or other place generally used for vehicular travel.

A. Public Thoroughfare means any way open or intended for general vehicular use.

B. Private Thoroughfare means any vehicular way intended primarily for the use of the owners, occupants or visitors of the particular premises with which the way is associated.

23.2 VOLTAGE (OR VOLTS) means the highest effective voltage between any two conductors of the circuit concerned except where, in certain rules, the term "voltage (or volts) to ground" is used.

When one circuit is directly connected to another circuit of higher voltage (as in the case of an auto transformer) both are considered as of the higher voltage unless the circuit of the lower voltage is effectively grounded. Direct connection implies electrical connection as distinguished from connection merely through electromagnetic or electrostatic induction.

23.3 WIRE GAGE means a standard of measurement used for convenient nomenclature of the various sizes of wire.

A. American Wire Gage (AWG) otherwise known as Brown and Sharpe (B&S) for copper, aluminum and other conductors.

B. Birmingham Wire Gage (BWG) for iron and steel conductors (used principally for telephone and telegraph conductors).

C. New British Standard (NBS), a wire gage for certain copper, bronze or copper-covered steel conductors (a modification of BWG used principally for telephone conductors).

23.4 WORKING SPACE means the space, extending laterally from the climbing space, reserved for working below, above, and between conductor levels.