

## INDEX

## Volume No. 1

References are to sections unless otherwise noted. The following abbreviations are used: Def. for definitions; Chap. for chapter.

## A

- Abandoned lines, E 121.04(2)(c)  
 Accessible (def. 1), E 101.02  
 Accessibility of  
   conductors in manholes, E 129.04(1)  
   fuses, E 117.01  
   grounding conductors, E 103.08(1)  
   lines, E 121.03  
   live parts, E 113.02(2)  
   manholes, E 129.01(3)  
   overhead lines, E 121.03  
   station equipment, E 113.02(2), E 117.01, E 118.01(3) & (4)  
   supply lines, E 121.03  
   switchboards, E 118.01, E 143.01  
   switches, E 117.01, E 121.07(1)  
   underground lines, E 129.01  
   working space, E 112.06  
 Acid, E 114.01, E 143.01(5)  
   fumes, E 111.01(2)(c), E 112.04(2), E 114.02  
   resistive coverings, E 114.06  
 Additions, application of orders to, E 20.13(2)  
 Address lists, E 141.01(3)(a), E 144.02  
 Adjustable speed motor, E 118.01(5)  
 Adjusting lightning arresters, E 119.05(2)  
 Administrative authority (def. 3), E 101.02, E 2.02  
   application and waving of rules by, E 20.13  
 Alive (def. 4), E 101.02  
   by leakage, E 140.03  
 Allowable  
   fibre stresses wood poles, E 126.02 (Table 19)  
   unit stresses, steel, E 126.02 (Table 16)  
 Alternating—Current circuits, E 103.02(2)  
   ground connections, E 103.07  
   made electrode, E 103.08(4)  
   anchors, E 103.08(4)  
   grounding, E 103.08  
   grounding conductor, E 103.06  
   size and capacity, E 103.06  
   ground resistance, E 103.09  
 Anchors and guys, E 103.08(4), E 128.03  
 Angles in line, strength, E 126.03(1)(d)  
   loading at, E 125.03(2)(d)  
   use of guys with, E 128.03(1)  
 Antislip treads, E 111.03(5)  
 Antenna, community (def. 23), E 101.02  
   conflict (def. 38), E 101.02  
 Apparatus  
   location relative to climbing space, E 128.07(4)  
 Apparent sag, of span (def. 135(b)), E 101.02  
   at any point (def. 135(a)), E 101.02  
 Appliances, electrical (def. 6), E 101.02  
   branch circuit (def. 12), E 101.02  
   fire-extinguishing, E 111.04  
 Application of loads, E 125.03(5)  
 Application of rules, E 20.13, E 103.01, E 110.01, E 120.01, E 104.01  
   communication circuits, E 143.06(1)  
   grounding, E 103.01  
   intent, E 20.13(1)  
   killing equipment and lines, E 142.04  
   meters, E 143.02  
   overhead lines, E 143.04  
   protective grounds, E 142.05  
   series street lights, E 143.05(1)  
   specialized work, Chap. 143  
   supply equipment, E 110.01  
   temporary installations, E 20.13(3)  
   testing, E 20.13(4), E 143.03(1)  
   tunnel and subway, E 143.03(1)  
   underground lines, E 143.07(1)  
   waivers, E 20.13(1)  
 Approval of lines, E 122.05  
 Approved (def. 7), E 101.02  
   materials, E 20.11(1)  
   methods of installation, E 20.11(2)  
 Arcing at insulators, E 127.03  
 Arcing parts, E 117.08, E 119.05  
   guarding, E 119.05  
   lightning arresters, E 119.05  
   precautions, E 142.01(6)  
   shielding, E 117.08  
 Arcing shields, E 113.02(4)  
 Arc lamps, E 128.07(5)(f)  
 Armored cable (def. 8), E 101.02  
   grounding, E 103.03  
 Arrangement of equipment, Chap. E 111, E 121.07  
   lines, E 141.02(4)  
   station and substations, Chap. E 111  
   switchboards, Chap. E 118  
   switches, Chap. E 117, E 121.07  
 Arresters (see lightning arresters), E 103.02(2)(f), E 103.10(1)(a), E 111.05(4), Chap. 119  
 Artificial grounds, E 103.07(3), E 103.08(4), E 103.09  
 Assumptions for stress calculation, E 126.01  
 Attachment of  
   conductor to insulator, E 126.02(5), E 126.03(8)  
   lightning rods, E 103.10(1)(d)  
   wires and grounds, E 142.03(8)  
 Attachment plugs, E 111.02(4)  
 Attendance, E 141.02  
 Authority (def. 10), E 101.02  
   in charge of operation, E 141.01(6)(a)  
   of deputy, E 141.01(6)(b)  
 Authorization  
   for work, E 142.02(4)  
 Automatic (def. 11), E 101.02  
 Automatic cutout and grounding conductor, E 103.06(1)  
 Auxiliaries, E 113.03(3)  
 Availability of water pipes, E 103.07  
 Averaging, adjacent poles, E 126.02(1)(a)  
   span length, E 125.03(4)  
 Avoiding, flames, E 143.07(5)  
   shock, E 142.03  
 Avoidance of conflict, E 122.02  
 Avoidance of current flow over grounding conductor, E 103.02(3)

## B

- Bare, conductors, E 116.03  
 Bare grounding conductors, E 103.06

- Bare parts, separation of, E 112.06, E 118.05
- Barriers for**
- conductors, E 112.05(3)
  - coupled machines, E 118.03
  - disconnectors, E 112.05(3)(f)
  - protection of traffic, E 142.02(8)(a)
  - rotating machinery, E 112.03(1), E 118.02
  - switchboard equipment, E 118.06, E 118.07(1)
  - testing, E 143.03(5)
  - use of employees, E 143.03(5)
  - working space, E 112.05, E 123.08
- Baskets, work from, E 142.08(1)
- Batteries, Chap. 114, E 143.05(1), E 145.01(9)
- emergency lighting, E 111.02
- Battery rooms, Chap. 114, E 145.01(9)
- floors, E 114.06
  - guarding live parts, E 114.08
  - illumination, E 114.09
  - smoking in, E 143.01(5), E 145.01(9)
  - supply stations, E 143.01(5)
  - supports in, E 114.05
  - ventilation, E 114.03
  - wiring in, E 114.07
  - working in, E 143.01(5), E 145.01(9)
- Belts, guarding of, E 112.03
- safety, E 141.02(7), E 142.01(10), E 144.05, E 145.01(4)(b)
- Blasting, tunnels, E 143.08(12)(c)
- Blocking switches, E 117.01(2), E 117.05(2)
- Bolts, E 123.10(6)(d), & (7)(d)
- Bonding, E 113.03, E 129.06(2)
- Braces for, crossarms, E 126.08(4)(b), E 126.04(3), E 128.01(2)(b)
- poles, E 123.03(1), E 143.04(2), E 145.02(1)
  - racks, E 126.03(5)
- Brackets and racks
- conductor separation on, E 123.06(1)(d)
  - Grades B and C, E 126.02(4)
  - Grade D, E 126.03(5)
- Branch circuits (def. 12, 13, 14, 15), E 101.02
- Branch connections for conductors, E 123.06(2)
- Bridges**
- conductor clearance, E 123.05(4)
  - conductor separation, E 123.06(3)
  - guards under, E 123.10(5)
- Bridging series lamps, E 143.05(4)
- Brushes, handling of, E 143.01(4), E 145.01(8)
- Buckarms, E 123.07(6), E 123.08(4)
- Building (def. 16), E 101.02
- as conductor supports, E 123.04(3), E 128.01(3)
  - clearance of conductors from, E 123.05(3)
  - separation of conductors attached to, E 123.06(2)
  - yards and general safety, E 111.03
- Buried grounds, E 103.07(2) & (3), E 103.09
- cable, E 129.05
- Burns, protection from, E 117.08(1)
- Bus bars, E 116.03, E 116.05(1), E 118.05(1), E 118.07(3)
- ground, E 103.02(2), E 103.06(6)
- Bushings, E 113.04(2)
- C**
- Cabinets (def. 17), E 101.02
- grounding of, E 117.09
- Cable (def. 18), E 101.02
- Cabled service drops, E 126.04(5)(d)
- Cables**
- bonding, E 129.06(2)
  - communication, E 123.10(7)(a), E 126.02(9)
  - grades B and C, E 126.02(7) & (9)
  - grade D, E 126.03
  - grade N, E 126.04
  - injury, E 143.08
  - installation, E 116.04, E 116.05(2), E 143.07, Chap. 129
  - live, in manholes, E 143.07(8)
  - location in manholes, E 129.04
  - portable, inspection, E 143.08(8)
  - protection, E 129.08
  - underground, E 129.04
  - pulling, E 143.07(6), E 145.03(5)
  - splicing of live, E 143.07(8)
  - strength, of communication, E 126.02(9)
  - supply lines, E 124.02, E 126.02(7)
    - construction, E 124.02
    - covering, E 123.10(6)(a)
    - grounding, E 103.02(2)(d) & (e)2., E 126.02(7)
    - insulation of, E 126.02(7)
    - messengers for, E 126.02(7), (9) & (10)
    - pole strength for, E 124.02(1), E 124.04
    - specially installed, E 124.02, E 126.02
    - splices, E 126.02, Chap. 129, E 143.07(8)
    - strength, E 126.02(7) & (9)
    - supports in manholes, E 129.03(7)
    - testing before working on, E 143.07(8)
    - underground, accessibility, Chap. 129
      - accessibility, E 129.04(1)
      - protection of, E 129.05
      - spacing of, E 129.03, E 129.05
      - supports, E 129.03
      - unidentified, E 143.07(7)
- Cable vault (def. 19), E 101.02
- Calculation of stresses, Chap. 125, Chap. 126
- Capacity**
- disconnectors, E 117.05
  - switches, E 117.05
- Care, exercising, E 142.01(5), E 143.08(2), E 145.02(6)
- live parts, E 142.01(5), E 143.04(6)
  - near live parts, E 142.01(5), E 143.04(6)
  - supply lines, E 145.02(6)
- Carrying tools, E 143.08(6)
- Casings, E 116.02(1)
- Catenary construction, E 123.10
- Cedar poles (see poles)
- Chestnut poles (see poles)
- Character of construction etc., E 20.10, E 20.12
- Checking conditions testing, E 143.03(3)
- Checking grounds, E 103.09
- Chief operator, E 141.01(6)(a)
- authorization from, E 142.02(4)(a)
  - communication lines, E 143.06(2)
  - deputy, E 141.01(6)(b)
  - diagrams, E 141.02(4)
  - duties, E 141.01(6), E 142.02(1)
  - official in charge, E 143.06(2)
  - reporting circuit trouble, E 143.01(8)
- Choke coils, E 119.05(3)
- Circuit-breakers (def. 21), E 101.02, E 111.05(1)
- arrangement, E 117.01(1)
  - grounding, E 112.04, E 117.09
  - guarding, E 112.05, E 117.10
  - installation, Chap. 117
  - location, Chap. 117, E 117.02
  - protection required, E 111.05(1)
  - where required, E 117.06
- Circuits (def. 20), E 101.02
- communication, E 143.06
  - constant current, E 123.01(2)
  - disconnected periodically, E 143.05(6)
  - fusing, E 117.06
  - grounding, Chap. 103, E 103.02, E 115.02, E 116.01(2) & (3), E 118.06
  - operation of, by employees, E 142.02(4)(b)
  - power, central offices, E 145.01(7)
  - protection of, E 115.01(2), E 116.01(1), E 116.02(1), E 117.06, E 119.01
  - series, handling of, E 142.03(9)
  - switches on, E 117.03
  - tagging, E 142.02(6)
- Classification of**
- circuits, E 124.03
  - supply cables, E 124.02(1)
  - voltages, E 122.01(3), E 123.09(1)
- Clearances, Chap. 123**
- basic
    - vertical, E 123.03(1)
    - wire-crossing, E 123.04(1)
  - branch connections, E 128.06(2)(b)
  - cable, E 123.01(3)
  - circuits, constant-current, E 123.01(2)

- conductors
- above rails and ground, E 123.03
  - at supports, E 123.06(1)
  - from buildings, E 123.06(3)
  - from bridges, E 123.06(4)
  - from conductors of another line, E 123.05(1)
  - from floor, E 112.05
  - from ground, E 123.03, E 123.05(11)
  - from light standards, E 123.05(6)
  - from other conductors at crossings, E 123.04
  - from poles of another line, E 123.05(2)
  - from scaffolds, E 123.05(3)(e)
  - from signs, E 123.06(5)
  - from stored material, E 123.05(8)
  - from tanks, E 123.05(9)
  - from trees, E 123.05(7)
  - from wells, E 123.05(10)
  - in ground, cables, E 129.05
  - in manholes, E 129.04
  - lateral and vertical
    - climbing space, E 123.07, E 123.10
    - communication, E 123.10(5) & (6)
    - conductors not in conduit, E 123.10(2)
    - from supports and other wires, E 123.06(1)
    - (c), E 123.10
    - mechanical protection, E 103.06(3), E 123.10(3)
    - pole steps, E 123.10(1)
    - power wires on poles, E 123.10(4), (5)
    - separation, E 123.06(1)
    - working space, E 123.10(1)
    - longitudinal runs, E 123.07(7)
    - neutral, E 123.01(4)
    - on buildings, E 123.05(2)(c)3, E 123.06(2)
    - on bridges, E 123.06(3)
    - on pole lines, Chap. 123
    - on racks, E 123.06(1)(d)
    - open not in conduit, E 123.10(2)
  - connections on poles, E 123.06(2)
  - constant current circuits, E 123.01(2), E 123.07(5)
  - ducts, from other structures, E 129.02(5)
  - employees from, arcing parts, E 142.01(6)(b)
  - high voltages, E 142.03(2) & (3)
  - guards, from live parts, E 112.05
  - hand, E 128.07(4)
  - increases for, flexible supports, E 126.02(1)(f) 2
  - high voltage, E 123.03(2), E 123.04(2)
  - large sags, E 123.03
  - long spans, E 123.03(2), E 123.04(2)F
  - suspension insulators, E 123.03(2), E 123.04(2)
  - maintenance of, E 20.12, E 123.01(5)
  - metal sheath cables, E 123.01(3)
  - minimum requirements, E 20.01, E 120.02
  - poles, from conductors on another line, E 123.05(2)
    - from curbs, E 123.02(3)
    - from hydrants, E 123.02(1)
    - from rails, E 123.02(4)
    - from street corners, E 123.02(2)
    - pole steps above ground, E 123.01(1)(e)
    - street lamps above ground, E 123.07(5)(b)
    - from buildings, E 123.07(5)(c)
    - from poles, E 123.07(5)(a)
  - supply equipment from communication equipment, E 123.09(5), E 129.08(1)
  - trolley contact conductors
    - above ground, E 123.03(1), E 123.10(1) & (2)
    - above rails, E 123.03(1)
    - from other wires at crossings, E 123.04(1)
- Climbers, E 143.04(5)
- Climbing poles, E 143.06(3)
- Climbing space (def. 22), E 101.02, E 123.07
- dimensions, E 123.07(1) & (5)
  - longitudinal conductors, E 123.07(7)
  - obstruction of, E 123.10(1), E 123.07(2)
  - past apparatus, E 123.07(4), E 123.07(2)
  - through conductors, E 123.07(5)
  - vertical conductors, E 123.07(8)
  - with buckarm construction, E 123.07(6)
  - with racks, E 123.07(7)
  - with ridge pins, E 123.07(9)
- Closing circuits, E 142.02(7)(b)
- Clothes, E 141.02(6)(a), E 142.01(8)
- Clothing, suitable, E 142.01(8)
- Communication cable strength, E 126.02(9)
- Communication circuits classed as supply circuits,
  - clearances, E 123.05
  - grade of construction, E 124.03(3)
  - guarding of, E 123.09(2)
  - used in operation of supply lines, E 124.03(3), E 123.09
- Communication conductors, E 126.02, E 126.03, E 126.04(9)
- climbing space, E 123.07
  - crossarm separation, E 123.09
  - strength, E 126.02
  - unguyed at railroad crossings, E 125.03(3)(d)
  - vertical and lateral conductors, E 123.10(5) & (6)
- Communication lines (def. 24 & 105), E 101.02
- alone, E 124.03, E 126.04(9)
  - clearance above ground and rails, E 123.03
  - clearance from other wires, E 123.04
  - climbing space, E 123.07
  - concerned only with other communication lines, E 124.03, E 126.04(9)
  - conductor sizes, E 126.03(9)
  - crossing over trolley contact conductors, E 124.03
  - crossing railways, grade of construction, E 124.03
  - inspection of, E 121.04
  - maintenance of, E 121.04
  - minimum sizes of
    - crossarms, E 126.03(4)(b)
    - pins, E 126.03(6)(c)
    - poles, E 126.03(1)(f)
    - wires, E 126.03(9)(b)
  - transverse and longitudinal strength, E 126.03(1)
  - underground, E 129.02(4), E 129.05
  - fire alarm lines, E 124.03(4), E 123.08(1)
  - grades of construction, E 124.03
  - grounding, isolation or protection of, E 123.08(1)
  - joint use of poles, E 122.03, E 126.02(7)
  - rules for employees, E 145.01
  - rules for employers, E 144.01
  - supporting structures for, E 126.03, E 126.04(1)
- Community antenna (def. 23), E 101.02
- Commutators, E 113.02(4)
- Complaints, E 2.02(5)
- Compliance with orders, E 20.13
- Compliance with building code, E 111.03
- Compression members unsupported length,
  - E 126.02(1)(c)6
- Compression ratio (steel), E 126.02(1)(c)
- Concealed (def. 25), E 101.02
- Concrete poles, E 126.02(1)(b)
- Condensers (see capacitors)
- Conductance of grounding conductor, E 103.06
- Conductors (def. 26-33), E 101.02, Chap. 116
- accessible, E 129.04
  - attached to buildings, E 123.05(3)(c)
  - attaching, E 142.03(8)
  - attachment to insulator, E 126.03(8)
  - bare, E 116.02(3), E 116.03, E 123.07(1)
  - branch connections, E 123.06(2)
  - clearance (see clearances)
  - conflict (def. 38 & 40), E 101.02, E 124.02(5)
  - connecting lightning arresters, E 119.03
  - contact, clearance above ground, E 123.03, E 123.10(1) & (2)
  - high voltage, E 123.10(2)
  - jointly used poles, E 123.09(5)(c)
  - supports for, E 123.10(1)
  - third rails, protection of, E 123.10(3)
  - cradles, E 126.02(12), E 126.04(8)
  - damage, E 116.02
  - different voltage on same crossarm, E 123.06
  - exposed to higher voltages, E 116.01(3)
  - fallen, protection from, E 142.02(8)(b)
  - fastenings, strength of, E 126.02(5)
  - fire-alarm, E 124.03(4)
  - flame proofing, E 116.02(2)
  - form of guards, E 116.04(2)
  - fuses, E 116.01(1)

- fuses in ground, E 116.01(2)
- grade of construction, E 124.03, E 126.02(6)
  - B & C, E 126.02(6), E 126.02(8)
  - D, E 126.03(9)
  - N, E 126.04
- grounded, fuses in, E 116.01(2)
- grounding, installation of, E 103.06
- grounding, Chap. 103, E 119.03, E 121.06
- guarding, E 112.05, E 116.02, E 116.04
- identification, E 116.01(3), E 128.06(1)
- in high temperature, E 116.02(5)
- insulation of, E 112.05(3)(e), E 116.02(5), E 123.10(4), E 123.10(6), E 129.08
- isolation, E 112.05(3), E 116.03
- lateral (def. 100, 101), E 101.02
- lightning protection, E 126.02(6)(c), E 126.04(6)
- loading, E 125.01
- location in manholes, E 129.04
- location of vertical and lateral, E 123.10(1)
- longitudinal runs of, protected, E 123.07(7)
- material, E 126.02(6)(a), E 126.02(9), E 126.04(4)(a)
- mechanical protection, E 123.10(3), E 129.08(2)
- metal sheaths, E 116.04(1)
- minimum sizes, E 126.02(6)(b)
- neutral, E 123.01(4)
- not in conduit, E 123.10(3)
- over buildings, E 123.05(3)(d)1
- paired communication, E 126.02(10)
- protection of, E 116.01, E 126.02(6)(a)2
  - against contact, E 116.02(3)
  - breakage, E 126.02(1)(f) & (6), E 128.02(2)
  - damp locations, E 116.05(2), E 129.06(1)
  - from falling trees, E 128.02(1)
  - hazardous locations, E 116.05
  - heat, E 116.02 & (5)
  - high voltages, E 116.01
  - magnetic force, E 116.02(3)
  - mechanical injury, E 116.02(1), E 116.04(1) E 123.10(3)
  - overload, E 116.01(1)
  - sags, E 126.02(6)(d), E 126.02(10)(a)2, E 126.03(9)(d), E 126.04(5)(c)
  - sags, at same supports, E 123.09(2)(c)
  - separation
    - from communication equipment, E 123.09(5)
    - from stored equipment, E 123.02(7)
    - from signs, E 123.05(5)
    - from tanks, E 123.02(8)
    - from trees, E 123.02(6)
    - from wells, E 123.02(9)
    - in any direction, E 123.09(5)
    - in manholes, E 129.04
    - on buildings, E 123.06(2)
    - on bridges, E 123.06(3)
    - on poles, E 123.06
    - on racks, E 123.06(1)(d)
    - when attached to bridges, E 123.06(3)
    - when attached to buildings, E 123.05(3)3, E 123.06(2)
  - service, E 126.04(5)
  - size for grounding, E 103.06
  - size, minimum, E 126.02(6)(b), E 126.03(9), E 126.04(4)(b)
  - slack, taken up, E 123.01(5)
  - span lengths, E 123.03(1), E 125.03(4)
  - splices and taps, E 126.02(6)(e), E 126.03(4)
  - storage-battery rooms, Chap. 114
  - strength, E 124.03, E 126.02, E 126.03, E 126.04 supported by suspension insulators, E 123.04(2)(c)
  - supported by trees and roofs, E 128.01(3)
  - tensions, maximum, E 126.02(6)(d)
  - terminal construction, E 129.08(4)
  - third-rail, E 123.10(3)
  - trolley contact, E 126.02(6)(f)
  - twisted pair, E 126.02(10)
  - underground, clearance, of in manholes, E 129.04(3), E 129.05
    - guarding of live parts, E 129.07
    - location of, E 129.04, E 129.05
    - mechanical protection of, E 129.06, E 129.08
    - separation of, E 129.04(3), E 129.05(1)
    - supports for, E 129.03(7)
    - unusual supports, E 128.01(3)
    - vertical (def. 169), E 101.02, E 123.09, E 123.10
    - vertical separation, E 123.09(2) & (4)
- Conduit (def. 35), E 101.02
  - for grounding conductors, E 103.06(3), E 123.10(1)
  - grounding, E 103.03, E 103.04, E 103.08(1) & (2), E 115.01(2), E 116.01(3), E 116.05, E 126.06(2)
  - grounding noncurrent-carrying parts, E 103.04
  - hazardous locations, E 116.05
  - in stations, E 116.05
  - service entrance, E 103.02(2)(b)
  - use of, E 103.06(3), E 115.01(2), E 116.01(3), E 116.05(1)
- Conflict (def. 38, 39, 40), E 101.02
  - antenna (def. 38), E 101.02
  - avoidance, E 122.02, E 122.03(3)
  - conductor (def. 39), E 101.02
  - grade of construction for, E 124.03
  - how determined, E 124.02(5)
  - structure (def. 40), E 101.02
- Connections, attaching to live parts, E 142.03(8)
- Connections to be avoided, E 103.07(4), E 103.10
- Connectors (def. 41), E 101.02
  - plug, E 111.02(3) & (4), E 118.07(2)
  - separable, E 111.02(4)
- Constant-current circuits (series), E 124.03(1)
  - clearances for, E 123.01(2)
  - grade of construction, E 124.03(1)
  - insulators for, E 127.07(1)
- Construction of
  - duct system, E 129.02
  - lines and equipment, E 20.10, E 20.12, E 121.01
  - manholes, E 129.03
  - railways, E 123.10
- Construction, grades of, E 124.03
- Contact conductors (trolley), E 124.03(2), E 125.03(2)(b), E 126.04(7), E 123.10
  - surface, E 103.08(3)
- Control apparatus
  - circuit protection for, E 113.01(6), E 113.06(1)
  - equipment, E 113.06(1), E 117.01(1)
- Control of
  - oil switches, E 117.02
  - remote, E 117.01(1), E 117.02, E 117.05(2), E 119.02(2)
  - rotating machines, E 113.01
- Controllers (def. 42), E 101.02
  - arrangement, E 117.01(1)
- Cooperation, between utilities, E 122.03(2)
  - to avoid hazard, E 122.02, E 122.03
- Cooperative study, E 122.03(2)
- Corner poles, E 123.02(2), E 126.02(2)
- Corrosion of conductors, E 114.06, E 126.02(6)(a), E 126.03(9)(a), E 126.04(4)(a)
- Corrosive vapors, Chap. 114
- Coupled machines, E 113.03(2)
- Covers for, enclosed control equipment
  - live parts, E 112.05(3)
  - manholes, E 129.03(6)
- Cradles, E 126.02(12), E 126.04(8)
- Creosoted poles (signs on), E 121.05(3)
- Crossarms
  - at ends of high grade construction, E 126.02(4)
  - at ends of transversely weak sections, E 126.04(3)
  - bracing for, E 126.02(4), E 126.03(4), E 126.04(3), E 128.01(2)(b)
  - dimensions, E 126.02(4)(d), E 126.03(4), E 126.04(3)
  - double, E 126.02(4)(e), E 126.03(4), E 126.04(3)
  - grade of, E 124.04(2)
  - grade B & C, E 126.02(4)
  - grade D, E 126.03(4)
  - grade N, E 126.04(3)
  - loading, E 125.03(1)
  - location, E 126.02(4)(f), E 128.01(2)
  - material, E 126.03(4)
  - minimum size, E 126.03(4)
  - separations, E 123.09
  - size, E 126.02(4)(d), E 126.03(4), E 126.04(3)

steel, E 126.02(4)  
 strength, E 126.02(4)(c), E 126.03(4), E 126.04(8)

Crossings  
 average pole strength, not applicable, E 126.02(1)  
 average span not applicable, E 125.08(4)  
 communication over railroad, E 126.03  
 supply conductors, E 123.04  
 trolley contact, E 126.02(10)(b)2, E 126.04(7)  
 clearances, E 123.04  
 cradles, E 126.02(12), E 126.04(8)  
 double, E 124.02(4)(c)  
 grade of construction at, E 124.02(4), E 124.03,  
 E 124.04  
 short-span construction, E 126.02(11)  
 supply lines over, communication, E 126.02  
 railways, E 126.02  
 underground, E 129.04, E 129.05(2)

Curbs, clearance from, E 123.02(8)

Current-carrying parts (def. 44), E 101.02,  
 E 121.05(1)  
 isolation, guarding & marking, E 121.05(1)

Current transformers, bridging of, E 115.01(1),  
 E 143.02(5)  
 grounding, E 103.04, E 115.02  
 secondary circuits, E 115.01

Cutout  
 box (def. 46), E 101.02

Cutting into insulation, E 142.03(1)(d)

**D**

Damp locations, conductors in, E 116.05(2)  
 grounding station, equipment in, E 112.04,  
 E 115.03

Dangerous conditions (see hazardous)

Danger signals, E 143.07(2), E 145.03(1)  
 signs, E 121.05(3), E 141.02(9)

Dead (def. 47), E 101.02

Dead ends, loading, E 125.03(3)(c)  
 strength of construction at, E 126.02(1)(d)  
 use of guys at, E 123.03(1)

Dead-front boards, E 118.07(3)

Defective equipment, E 112.02(1), E 113.01(2)

Defects, in wood poles, E 126.02(1)(d)5,  
 E 126.03(1)(e)  
 record, E 121.04  
 reporting, E 121.04(1)(d), E 143.01(9),  
 E 143.02(7), E 143.03(7), E 143.04(11),  
 E 143.05(7), E 143.06(7), E 143.07(9),  
 E 143.08(14), E 145.02(9), E 145.03(6)

Definitions, E 101.02

Deflecting supports, use of guys with, E 126.02(1)(f),  
 E 123.03

Deflection or deformation of supports, E 126.01

Demand factor (def. 48), E 101.02

Depth of setting poles, E 126.02(2)(b)2

Desirability of joint use, E 122.03(8)

Deteriorating agencies, protection against, E 112.09,  
 E 113.05, E 126.02(1)(c)8, E 126.02(13)

Device (def. 49), E 101.02

Diagrams, for chief operator, E 141.02(4)  
 organization, E 141.01(2)

Dimensions of, climbing space, E 123.07(1)  
 E 123.07(5)  
 working space, E 123.08(2)

Disconnecting means, (def. 50), E 101.02

Disconnection of fuses, E 117.07

Disconnectors (def. 51), E 101.02  
 air break, E 117.05(3)  
 alignment, E 117.05(4)  
 barriers for, E 112.05(3)(e)  
 capacity of, E 117.05(1)  
 for lightning arrester, E 119.02  
 for street lamp, E 123.07(5)(f)  
 identification, E 112.10(1)  
 locking of, E 117.05(2)  
 opening and tagging, E 142.04(3)  
 protecting workman by, E 142.02(9)  
 rating, E 117.05(1)  
 use, E 117.03, E 117.05(3)

Distribution systems, grounding of, Chap. 103,  
 E 103.02

Double crossarms, E 126.02(4)(e), E 126.03(4)(c),  
 E 126.04(3), E 123.01(2)(b)

Double crossings, E 124.02(4)(c)

Double pins, E 126.02(5)(c)

Drainage  
 for oil-filled apparatus, E 111.05, E 115.04  
 of manholes, E 129.03(3)  
 of underground systems, E 129.02(2)

Drip pans, E 113.06(2)

Driven-pipe ground (made ground), E 103.08(4)(c)

Ducts (def. 53), E 101.02  
 alignment, E 129.01(2), E 129.02  
 arrangement, E 129.02(8)  
 clearance from other structures, E 129.02(4)  
 construction, E 129.02(1)  
 dissipation of heat in, E 129.02(8)  
 for generator leads, E 116.02(4)  
 grading of, E 129.02(2)  
 location of, E 129.01(1)  
 material size and finish, E 129.02(1)  
 protection of, E 129.02(7)  
 separation between communication supply,  
 E 129.02(5)

Dust proof (def. 54), E 101.02

Dust-tight (def. 55), E 101.02

Duties of chief operator, E 142.02(1)

Duties of foreman, E 142.02(2)

Duty (defs. 56-60 incl.), E 101.02

**E**

Earth, resistance between ground part and, E 103.09

Effectively grounded (def. 61), E 101.02, E 103.02,  
 E 103.02(2)(d) & (e)

Effectiveness of ground connection, E 103.07

Electrical strength of insulators, E 127.03

Electrical supply equipment (def. 64), E 101.02

Electrical supply lines (def. 65), E 101.02, Chap. 126,  
 E 145.02(6)

Electrical supply station (def. 66), E 101.02

Electrical lines on highway, Chap. 122

Electric railway construction, E 128.10

Electric sign (def. 62), E 101.02

Electrodes, made, E 103.07(3)

Electrolysis of anchor rods, protection against,  
 E 123.03(6)  
 prevention, E 103.07(1)

Elevated parts, E 112.06(3)

Elevation, working in positions of, E 143.01(6)

Emergencies, first-aid address book, E 141.01(3)(a),  
 E 144.02(1)  
 waiver of rules in, E 20.13(5)

Emergency, E 20.13(5)  
 control, E 113.01(2)  
 equipment, E 112.02(3)  
 illumination, E 111.02  
 installations, E 20.13(5)  
 methods, E 141.01(3), E 142.01(1), E 144.02(1)(b)  
 rules, E 144.02

Employees, battery rooms, E 143.01(5)  
 communication systems, avoidance of supply  
 lines and equipment by, E 145.02(4)  
 E 145.02(5)  
 duties of, E 142.02(1), E 142.02(2), E 145.01(3)  
 fuses, about, E 143.01(4)  
 inexperienced and unfit, E 142.01(3), E 145.01(2)  
 instruction, concerning equipment, E 141.02(5)  
 for first aid, E 141.01(4), E 144.03  
 protection of, by disconnectors, E 112.04(3),  
 E 142.02(9), E 142.04  
 by grounding, E 112.04(3), E 117.04,  
 E 118.06(2), E 142.04(4), E 142.04(6),  
 E 142.05  
 qualification of, E 141.01(5), E 144.04  
 rules for, on communication systems, E 145.01  
 on supply systems, general, E 142.01  
 special, E 143.01  
 supervision of, E 142.01(4)

- two required, E 141.02(2), E 142.03(4),  
E 143.03(6)  
uninstructed, E 141.02(3)
- Employers'**  
instruction to employees, E 141.02(5)  
operating rules, Part 3  
responsibility, E 141.01(7)  
rules, communication system, Chap. 144-145
- Enclosed (def. 67), E 101.02, E 112.05, E 112.07,  
E 114.01, E 115.04, E 117.03, E 118.07
- Enforcement, E 2.02(3)
- Enforcement of rules by distribution of rules books,  
E 141.01(1)(a)
- Entering manholes, E 129.02(5)(b)
- Equipment (def. 69), E 101.02  
accessibility of connections to, E 128.06(2)  
and wire runways, grounding of, E 103.03, E 103.04  
emergency, E 112.02(3)  
for work on live parts, E 112.07  
grounding during repairs, E 112.04(3)  
grounding of, E 103.03, E 103.04, E 103.05,  
E 112.04, E 121.06, E 128.01(1)(d)  
guarding (see guarding)  
identification (see identification)  
inspection of, E 112.02  
isolation, E 111.05, E 112.05, E 114.01, E 115.04,  
E 121.05(2)  
live, handling of, E 142.03  
on poles, E 115.04, E 128.07  
permission to work on, E 142.04(5)  
request for killing of, E 142.04(2)  
switchboard, E 118.03  
tests of, E 112.02(3), E 121.04(1)(c)
- Existing installations, E 20.13  
Exists, station and substation, E 111.03(4)
- Exposed (def. 74), E 101.02  
communication lines, E 140.03  
conductors, E 116.01(3)  
to higher voltage, E 116.01(3), E 142.03(1)(c)
- Extension, application of rules to, E 20.13,  
E 122.01(2)
- Externally operable (def. 75), E 101.02
- Extinguishers, E 111.04
- F**
- Factor of safety, E 126.02
- Factory tests of insulators, E 127.06
- Falling objects, E 143.04(9)
- Feeders (def. 76), E 101.02  
electric railway, E 124.03(2)  
protection of supply, Chap. 110
- Fences, E 111.01(4), E 112.05(3)(c)
- Field rheostats, E 115.05
- Fire alarm  
conductors, E 124.03(4)
- Fire extinguishers, E 111.04, E 141.02(6), E 142.01  
(11), E 144.05
- Fire hydrants, horizontal clearance, E 123.02(1)
- Fire proof construction for supply stations,  
E 111.01(2)
- Fires, protecting of poles against, E 123.02(5),  
E 128.01(1)(a)
- First aid, instruction, E 141.01(4), E 142.01(1),  
E 144.03  
outfits, E 141.02(6)(1), E 144.05(1)(a)  
rules, E 141.01(3)(b), E 144.02
- Fittings (def. 77), E 101.02  
approval, E 20.11
- Fixtures, lighting, sockets and lampholders or plug  
receptables, E 111.02
- Flame-proofing, E 116.02(2)
- Flammable gas and flyings, E 111.01(2)(c),  
E 112.04, E 112.08(1), E 113.06(2), E 114.02,  
E 115.03, E 116.05(1)
- Flash-over voltage for insulators, E 127.04, E 127.05
- Flat surfaces, wind pressure on, E 125.03(2)(c)
- Flexible line supports, E 126.02(1)
- Flexible metallic tubing (def. 78), E 101.02
- Floor, E 111.03(5)  
surfaces (see mats), E 112.05(3)(f), E 114.06
- Floors in storage-battery rooms, E 114.06
- Flying taps, E 123.02(2)
- Foreman, duties of, E 142.02(2), E 143.03(4),  
E 145.01(5)
- Foundation for, ducts, E 129.02(3)  
poles and towers, E 126.02(2), E 126.03(2)  
rotation machinery, E 111.01(3)
- Frame switches, E 113.02(3)
- Fumes (see also deteriorating agencies) E 111.01(2),  
E 112.04(2), E 114.03
- Fuses and Circuit breakers  
arrangement, E 117.01(1), E 117.07  
disconnected by switch, E 117.07  
enclosure, E 117.08(1), E 117.10  
grounding of cases, E 103.04, E 117.09  
guarding, E 117.08(1), E 117.09, E 117.10  
handling of, E 117.07  
identification, E 117.01(1), E 118.04  
in ground conductors, E 103.06(1), E 116.01(2)  
installation of, E 117.01(1)  
on switchboard, E 118.05(2)  
where required, E 116.01(1), E 117.06  
working on, E 143.01(4)
- G**
- Galvanizing, E 103.08(4), E 126.02(1)(c)7.,  
E 126.02(13).
- Garage (def. 79), E 101.02
- Gas, flammable, E 111.01(2), E 112.04(2),  
E 112.08(1), E 113.06(2), E 114.01,  
E 115.03, E 116.05(1)  
in underground systems, E 129.03(4), E 143.07(3),  
E 145.03(2)  
piping for grounds, E 103.08(1)
- General precautions in operation of supply & com-  
munication lines, Part 3
- Supply line operation, Chap. 141, 142 & 143  
communication, Chap. 144 & 145
- General requirements, Chap. 20
- General requirements for supply stations, Part 1
- General requirement for overhead and underground  
lines, Part 2
- General use switch (def. 157), E 101.02
- Generators (see motors)  
leads, E 116.02(3) & (4)  
protection of, E 113.01, E 117.06
- Gloves, insulating, E 112.07(1), E 117.07, E 141.02,  
E 142.03, E 143.05(3)
- Goggles, E 113.02(4), E 141.02(6), E 142.03
- Good practice, conformity with, E 120.01(3)
- Grade of  
additional requirements (two or more conditions),  
E 124.02(2)  
communication conductors, E 124.02(3), E 124.03  
in operation of supply lines, E 124.03(3)  
communication lines over RR & supply lines,  
E 124.02(4)  
conductors, E 124.03  
conductor fastenings, E 124.04(3)  
constant current circuits, E 124.03(1)  
cradles, E 126.02(12)  
crossarms, E 124.03(4), E 124.04(2), E 126.02(4),  
E 126.04(3)  
fire-alarm conductors, E 124.03(4)  
foundations, E 126.02(2), E 126.03(2)  
guys, E 126.02(3), E 126.03(3), E 126.04(2)  
E 128.03  
insulators, E 124.04(3), Chap. 127  
joint poles at crossings, E 125.03(3)  
lightning protection wires, E 126.04(6)  
neutral, E 123.01(4)  
order of grades, E 124.02(3)  
pins, E 124.04(3), E 126.02(5)  
poles and towers, E 124.04(1), E 126.02(1),  
E 126.04  
railway feeders, E 124.03(2)  
supply lines, E 124.02, E 124.03, E 126.04(1)  
supply services, E 126.04(5)

- supporting structures, E 124.04
- trolley contact conductors, E 124.03(2)
- under two or more conditions, E 124.02(2)
- Grades of construction
  - B & C, E 126.02
  - D, E 126.03
  - N, E 126.04
  - neutrals, E 124.03(5)
  - relative order of, E 124.02(3)
  - required, at conflicts, E 124.02(5)
    - at crossings, E 124.02(4)
  - short span construction, E 126.02(11)
  - two or more conditions, E 124.02(2)
- Ground
  - as part of circuit, E 121.06(3)
  - busses, E 103.02(2)(b), E 103.06(6)
  - checking, E 103.09(2)
  - clamps, E 103.08(2)
  - connections
    - artificial (made electrode), E 103.02(2)(b), E 103.07(3), E 103.08(4)
    - at building service, E 103.02(2)
    - contact surfaces, E 103.08(3)
    - direct current, E 103.02(1)
    - for alternating-current systems, E 103.02(2)
    - for direct-current systems, E 103.02(1)
    - gas piping, E 103.07(1)
    - guys, E 103.08(4)(e), E 128.03
    - individual services, E 103.02(2)
    - limited piping, E 103.08(1)
    - location of (for noncurrent-carrying parts), E 103.03, E 103.04, E 103.05
    - method of making, E 103.08
    - multiple, E 103.02(2)(e), E 103.07(4)
    - number, E 103.02(2), E 103.07(3)
    - piping, E 103.07(1), E 103.08(1)
    - resistance, E 103.09
    - to building frames, E 103.07(2)
    - to piping systems, E 103.07(1)
    - to railway returns, E 103.07(4)
    - within building served, E 103.04(4), E 103.08(1)
  - detectors, grounding conductor for, E 103.06(1)
    - where required, Chap. 115, E 115.06
  - resistance, E 103.09(1)
    - checking, E 103.09(2)
    - limits of, E 103.09
    - standing on, E 143.08(5)
  - wire, E 103.06
- Grounded (def. 82), E 101.02
  - anchor rods, E 128.03
  - circuits, E 103.02
  - circuits, testing, E 142.02(7)(c)
  - conductor, continuity of, E 103.06, E 116.01(2)
    - switch in, E 117.03
  - guys, E 103.08(4)(e), E 128.03
  - system (def. 85), E 101.02
- Grounding, Chap. 103, E 112.01, E 121.01, E 142.05
  - alternate methods, E 103.07(2)
  - arresters, E 103.02(2)(f), E 103.06(1), E 103.06(2)(d), E 103.07(3)(a), E 103.10(1)(a), E 119.04, E 121.06(1)
  - auxiliaries, E 113.03(3)
  - cable sheaths, E 103.02(2)(e)2, E 121.06(2), E 126.02(7)(a)
  - capacity of, E 103.06(2)
  - circuits, Chap. 103, E 103.01, E 103.02, E 116.01(3), E 121.06(1)
  - circuits worked on, E 118.06(2), E 142.04(6), E 142.05
  - conductors (def. 80), E 101.02
    - accessible to public, E 103.06(3)
    - attachment of, E 103.07, E 142.03(8)(b)
    - capacity of, E 103.06(2)
    - continuity of, E 103.06
    - current in, E 103.02(3)
    - for conduit, cable sheaths and metal raceways, E 103.02(2)(e)2 E 103.03, E 103.04, E 103.05, E 103.06(1)
    - for ground detectors, E 103.06(1)
    - for lightning arresters, E 103.02(2)(f), E 103.06(1), E 103.06(2)(d), E 103.07(3)(a), E 103.10, E 119.04, E 121.06(1)
    - for lines, E 121.06(1) & (2)
    - for fixed equipment, E 103.04, E 103.06, E 113.03, E 121.06
    - for portable equipment, E 103.05
    - for rotating machinery, E 113.03
    - fuses in, E 103.06(1), E 116.01(2)
    - insulation, E 103.06(3)
    - joints, E 103.06(1)
    - material, E 103.06(1)
    - mechanical protection of, E 103.06(3)
    - neutrals, E 103.02(2)(e)
    - separate, E 103.10
    - size of, E 103.06(2)
    - switch in, E 103.06(1)
    - underground, E 103.06(4)
  - conduit, E 103.06(5)
  - connections, Chap. 103, E 103.07, E 103.08(2)
  - coupled machines, E 113.03(2)
  - devices, E 103.07, E 117.03, E 141.02(6), E 142.05(4)
  - distribution systems, Chap. 103
  - effective protection measure, E 103.01
  - electric systems, E 103.02
  - electrodes (made grounds), E 103.08(4)
  - enclosed switches, E 103.04(4)
  - equipment, conduit, raceway, E 103.03, E 103.04, E 103.02(2)(e)2, E 103.05
  - equipment during repairs, E 112.04(3), E 142.03(8)
  - frames of
    - lightning arresters, E 119.04
    - motors, E 103.04, E 113.06
    - switchboard, E 103.10, E 118.06
  - fuse cases, E 117.03
  - general, Chap. 103
  - ground detector, E 103.06(1)
  - guys, E 103.08(4)(e), E 128.03(8)
  - Individual systems, E 103.02(2)(c)1
  - in hazardous locations, E 113.05(2)
  - in stations, E 112.04
  - instrument cases, E 103.04(3), E 118.08
  - instrument transformer, E 115.02
  - in wet places, E 112.04(2), E 115.03
  - lightning arresters, E 103.02(2)(f), E 103.06(1), E 103.06(2)(d), E 103.07(3)(a), E 103.10(1)(a), E 119.04, E 121.06(1)
  - lightning rods, E 103.10(1)(d)
  - lines, E 103.02, E 142.04(6)
  - machine frames, E 113.03
  - metal frames, E 103.04, E 112.08(2)
  - metal poles, E 128.01(1)(d)
  - metal sheath, E 103.02(2)(e)2, E 121.06(2), E 126.02(7)(a)
  - methods, Chap. 103, E 103.08
  - motor frames, E 103.04, E 113.06
  - neutral conductors, E 103.02(2)(e)
  - non-current parts, E 103.03, E 103.04, E 103.05, E 112.08(2), E 113.05(2), E 117.03, E 118.06(1), E 119.04, E 121.06(2)
  - on farms (limited water systems) E 103.08(1) & (3)
  - permanent protective measure, E 103.01
  - portable devices, E 103.05
  - protection in subway work, E 143.08
  - riser pipes, E 129.08(3)
  - rotating machinery, E 113.03(1)
  - scope, E 103.01
  - small isolated plants, E 103.02(2)(c)
  - supply conductors, E 103.01
  - switch, E 112.04(3), E 117.04
  - switchboard frames, E 103.04, E 118.06(1)
  - temporary installation, E 20.13(3)
  - to buried metal structures, E 103.07(2), E 103.08(1) & (3)
  - to limited metallic bodies, E 103.08(1) & (3)
  - transformer cases and circuits (interconnection), E 103.02(2)(d), E 103.04(4), E 115.01(2), E 115.02, E 115.03
  - water pipe connections, E 103.06(2), E 103.08(1) & (3)
  - wires, E 123.10(6)
- Grounds
  - abandoned, E 103.02(3)
  - arrangement, E 103.02(3), E 103.08, E 103.09

- artificial (see made grounds)  
 attaching and removing temporary, E 142.04(4),  
 E 142.04(6), E 142.05  
 completing, E 142.05(4)  
 lightning rods, E 142.05(4)  
 made electrodes, E 103.07(3)  
 multiple, E 103.02(2), E 103.07(4)  
 relocated, E 103.02(3)  
 resistance of, E 103.09  
 separate, E 103.10  
 tests for, E 103.09(2), E 142.02(7)(c)
- Guarded (def. 87), E 101.02
- Guarding, E 103.06(3), E 112.05  
 against deteriorating agencies, E 112.09, E 113.05  
 (1)  
 apparatus in manholes, E 129.07(2)  
 arcing and sparking parts, E 112.08(1), E 117.08(1)  
 circuit breakers, E 112.05, E 117.10  
 conductor joints in manholes, E 129.07(1)  
 conductors, E 116.02(1), E 116.04, E 116.05  
 current-carrying parts, E 112.05, E 121.05(1)  
 equipment, E 113.05(1), E 121.05(2), E 128.07(3)  
 grounding conductors, E 103.06(3)  
 in hazardous locations, E 116.05  
 lightning arresters, E 119.04  
 live equipment on poles, E 128.07(3)  
 live parts, in manholes, E 129.07  
 in storage battery rooms, E 114.08  
 of line equipment, E 121.05(1)  
 of rotating machinery, E 113.02  
 of supply equipment, E 112.05  
 of switchboards, E 118.07  
 of switches, fuses and circuit-breakers, E 117.10  
 underground, E 129.07(2)  
 manholes, E 143.07(2), E 143.07(4), E 145.03(1)  
 metal sheath, E 116.05(1)  
 methods of, E 112.05, E 113.02  
 moving parts, E 112.03, E 117.08(2)  
 noncurrent-carrying parts, E 112.04(2),  
 E 121.05(2)  
 poles, E 128.07(3)  
 against climbing, E 121.05(3), E 128.01(1)(b)2  
 against mechanical injury, E 121.05, E 128.01  
 (b)1  
 warning signs, E 121.05(3), E 128.01(1)(c)  
 shaft ends, pulleys, belts, E 112.03  
 street openings, E 143.07(2), E 145.03(1)  
 suddenly moving parts, E 112.03  
 switchboards, E 118.07  
 third rails, E 128.10(3)  
 transformers, E 115.03  
 trolley contact conductors, E 123.05(4)(b),  
 E 128.10(1)
- Guard zone (def. 88), E 101.02, E 112.05
- Guards  
 climbing, E 128.01(1)(b)2  
 conductor, E 116.04  
 for floor openings, E 111.03(2)  
 for grounding conductors, E 103.06(3)  
 for guy wires, E 123.03(5)  
 for ladders, heads of, E 111.03(10)  
 for live parts, E 113.02  
 for manholes, E 129.03  
 for poles and towers, E 128.01(1)  
 for protection of traffic, E 142.02(8)(a)  
 for stairs, E 111.03  
 for trolleys, at railroad crossings, E 128.10(4)  
 under bridges, E 123.10(5)  
 for vertical conductors, E 123.10(3)  
 guy, E 123.03(5)  
 location, E 112.05  
 on buildings, E 123.05(3)(c)  
 on grounding conductor, E 103.06(3)  
 portable, E 143.03(5)  
 railway, E 123.10(5)  
 rotating equipment, E 113.02(1)  
 strength, E 112.05  
 types, E 112.05(3)  
 under bridges, E 123.10(5)
- Guides, E 142.02(3)
- Guying at a distance, E 126.02(1)(e), E 126.03(1)(c)  
 for communication lines at railroad crossing  
 longitudinal, E 126.03(3)(d)  
 transverse, E 126.03(3)(d)
- Guys  
 anchor rods, E 123.03(7)  
 attachment, E 123.03(3)  
 clearances from other wires, E 123.04  
 from rails or ground, E 123.03  
 fastenings for, E 123.03(4)  
 for flexible supports, E 126.02(1)(e)  
 for lines in exposed locations, E 126.02(3)(b)  
 for steel structure, E 126.02(3)(c)  
 general requirements, E 123.03  
 grades B and C, E 126.02(3)  
 D, E 126.03(3)  
 N, E 126.04(2)  
 grounding, E 123.03(8)  
 guards for mechanical, E 123.03(5)  
 head, for communication lines crossing railways,  
 E 126.03(3)(d)  
 insulation of, E 123.03(6)  
 insulators for, E 123.04  
 location, E 123.03(3)  
 strength of, E 126.02(3)(e), E 126.03(3)(d)  
 take total load, E 126.02(3)(d), E 126.03(3)(c),  
 E 123.03(2)  
 used with steel supports, E 126.02(3)(c)  
 wood and concrete, E 126.02(3)(d)
- H**
- Hand clearance, E 128.07(4)
- Handholes (def. 89), E 101.02
- Hand line, specifications for, E 143.04(6)(e)
- Handling connecting lines, E 142.03(8)(a)
- Handling live equipment, E 142.03
- Handling series circuits, E 142.03(9)
- Hazard, conditions of, E 124.01
- Hazardous locations (def. 90), E 102.01, E 111.01(2),  
 E 112.04(2), E 112.03(1), E 113.06(2),  
 E 114.02, E 115.03, E 116.05(1)
- Hazardous locations, conductors in, E 116.05(1)  
 storage battery rooms, E 114.02
- Head guys (See guys, guying)
- Headroom of passageway and working spaces,  
 E 111.03(6), E 112.05(1)
- Heat, dissipation of, in ducts, E 129.02(8)
- Heavy loading, E 125.02, E 125.03
- Height of pins, E 126.02(5)(a)1
- High voltage contact conductors, E 128.10(1)
- High voltages, clearance of employees from  
 E 142.03(3)(a)
- Highways
- clearance of wires over, E 123.03  
 clearance of wires along, E 123.03  
 obstruction by poles, E 123.02
- Holstway (def. 91), E 101.02
- Horizontal separation between line conductors,  
 E 123.06
- Hydrants, clearance of poles and towers from,  
 E 123.02(1)
- I**
- Ice on conductors (See loading), E 125.02
- Identification, E 118.04
- circuits, E 113.03(3), E 116.01(3)  
 conductors, E 123.06(1)  
 equipment, E 112.10(1)  
 generators, E 112.10(2)  
 lines and equipment, E 128.07(1), E 141.02(4)  
 motors, E 112.10(2)  
 poles, E 123.01(1)(f)  
 station equipment, E 112.10  
 switchboard equipment, E 113.04
- Illumination, E 111.02  
 of storage battery rooms, E 114.09



of supply station, E 111.02, E 116.07  
of switchboards, E 118.02(2)

Increase in vertical clearance, E 123.03(2)

Indicating position of switches, E 121.07(2)

Induction regulators, Chap. 115

Inspection and repairs, E 20.12, E 121.04

Inspection of, E 20.12

ground connections, E 103.09(2)

lines, E 121.04

portable cables, E 143.08(8)

protective devices, E 141.02(7), E 144.05

station equipment, E 112.02

supply lines and equipment, E 121.04

structures and equipment, E 121.04(1)(b)

Installation, emergency, E 20.13(5)

Instructing employees, E 141.02(4), E 144.03

Instructions to employees, E 141.02(5)

Instruments, grounding of, E 103.04(3), E 118.08  
switchboard, E 118.06

Instrument transformers, E 115.01, E 115.02,  
E 118.08

grounding, E 103.04(3)

Insulated (def. 93), E 101.02

supports, E 142.03(1)

Insulating (def. 94), E 101.02

conductor supports, E 116.05(2)

conduit or molding, E 123.10(3) & (4) & (6)

gloves, E 112.07(1), E 117.07, E 142.03(1)(d),  
E 142.03(2), E 143.05(3)

guards, E 112.05, E 118.05(1)

guys from poles, E 128.03(6)

live parts of switchboards, E 118.05(1)

supports, E 116.05(2)

wearing apparel, E 141.02(6)(a), E 144.05(1)

Insulation and guarding, E 103.06(3)

Insulation, cutting into, E 142.03(1)(d)

dependence on, E 112.05(3)(e), E 142.03(1)(b),  
E 143.04(6)(d)

Insulation for

conductors in battery rooms, E 114.07

grounding conductor, E 103.06(3)

lightning protection equipment, E 119.05(3)

protection of, E 116.02(1)

services, E 126.04(5)(a)

supply cables, E 126.02(7)(a)

terminal bases, E 113.04(1)

vertical and lateral conductors, E 123.10(3) &  
(4) & (5)

Insulators, arcing at, E 127.08

arc lamp disconnectors, E 128.07(5)(f)

at crossings, E 126.03(7)

factory test, E 127.06

flash-over voltages, E 127.04, E 127.05

for communication lines at crossings, E 126.03(7)

for conductors entering stations, E 116.02(4)

for conductors in damp places, E 116.05(2)

for constant current circuits, E 127.07(1)

for guys, E 123.04

for nominal line voltage, E 127.07(3)

for span wires, E 123.05

for suspension, E 128.07(5)(e)

grade of, E 124.04(3)

grade B, E 127.02, E 127.03, E 127.04, E 127.05,  
E 127.06

grade D, E 126.03(7)

in strain position, E 127.03, E 123.04

material and working, E 127.02

selection of, E 127.07

strain, E 127.03

strength, electrical, E 127.03

suspension, increased clearance for, E 123.03(2),  
E 123.04(2)

test voltage, E 127.05

wet process, E 127.02

Intensity of illumination, E 111.02

Intent of rules, realization of, E 20.13(2)

Inter-connection of transformer, E 103.02(2)(b)

Interpretation of rules by employer or authorized  
agent, E 141.01(1)(b)

Interior conduit grounding, E 103.03, E 103.04

Interior wiring system, or grounding of, E 103.03,  
E 103.04

Introduction, E 2.01, E 103.10

Isolated (def. 95), E 101.02

switch in grounding conductor, E 103.06(1)

Isolated plants (def. 96), E 101.02, E 103.02(2)(c)1

Isolating live parts by elevation, E 112.05

switchboard equipment, E 118.07(3)

Isolating switch (def. 97), E 101.02

Isolation by elevation (def. 98), E 101.02

Isolation of, batteries, E 114.02

conductors, E 116.03

circuits, E 116.01(3)

lightning arresters, E 119.02(1)

live parts by elevation

communication lines, E 128.08(1)

conductors, E 116.03

fuses and switches, E 117.10

lightning arresters, E 119.04, E 119.05(1)

motors, E 113.06

noncurrent-carrying parts, E 121.05(2)

oil switches, E 117.02

overhead lines and equipment, E 121.05

station equipment, E 112.03(1)

suddenly moving parts, E 117.08(2)

transformers, E 115.03, E 115.04

## J

Jointly used poles, at crossings, E 125.03(3)(b)

extensions on, E 122.01(2)(b)

steps on, E 128.01(1)(e)

Joint poles

conductors on, E 123.10(4)

grades of construction at crossings, E 125.03(3)(b)

Joints, in conductors, E 116.06, E 126.02(6)(e),  
E 126.02(7)(a)3

in grounding conductors, E 103.06(1)

Joint use (def. 99), E 101.02

poles, E 122.03

Jurisdiction of municipal code, E 2.04(4)(b)

## K

Killing circuits, E 142.02(4)(c), E 142.03(5), E 142.04

equipment or lines, E 142.04

lines, E 142.04

parts, E 142.03(6)

## L

Ladder space on building, E 123.05(3)(b)

Ladders

guards for, E 111.03(10)

metal reinforced, E 142.03(1)(f)

portable, E 142.01(9)

Lamps

clearance of, on jointly used poles, E 123.09(5)(c)

disconnectors for, E 128.07(5)(f)

handling of, E 128.07(5)(f)

in battery rooms, E 114.09

location of, E 128.07(5)

suspension for, E 128.07(5)(d)

Lanterns, E 111.02(2)

Lateral conductors (def. 100), E 101.02, E 123.03(3),  
E 123.10

Lateral and vertical conductors, E 123.10(4)

Lateral working space (def. 101), E 101.02, E 123.03,  
E 123.10(1)

Laterals, E 129.02(7)

Latticed structures, E 125.03(2)(c)

Legal authority and requirements, Chap. 2

Laws (quoted or referred to), Chap. 123, E 2.02(3)  
(a), E 2.02(4)(b)

Leakage from live parts, E 117.09

- Levels, arrangement of relative levels, E 122.01  
 Levers, protection from suddenly moving,  
 E 112.03(2), E 117.08(2)  
 Lighting, E 111.02  
 branch circuits (def. 12), E 101.02  
 emergency, E 111.02(2)  
 fixture—  
 in stations, E 111.02, E 116.07  
 outlet (def. 120), E 101.02  
 Lightning arrester (def. 103), E 101.02, Chap. 119  
 charging of, E 119.05(2)  
 disconnecting, E 119.02  
 ground conductors, E 103.06(1)  
 grounding, E 103.02(2)(d), E 103.06(2), E 103.07  
 (3), E 103.10, E 119.04, E 121.06(1)  
 guarding, E 119.05(1)  
 installation of, E 111.05(4), E 119.01  
 location, E 119.01  
 on poles, E 128.07(2)  
 requirement for in stations, E 119.01  
 where required, E 119.01(1)  
 Lightning protection wires, E 126.02(6)(c),  
 E 126.04(6)  
 clearance of, E 123.03  
 Limited metallic structures, grounding of,  
 E 103.08(1)  
 Line conductors (def. 104), E 101.02  
 clearance on poles, E 123.06  
 Line insulators, Chap. 127  
 Lines, accessibility, E 121.03  
 communication (def. 24 and 105), E 101.02  
 construction of, general, E 120.01(3), E 121.01,  
 E 121.02, E 143.04(10)  
 design of, E 121.01  
 electrical supply (def. 65 and 106), E 101.02  
 grounding of, E 142.04(6)  
 guarding of, E 121.05  
 handling of, E 142.03  
 inspection, E 20.12, E 121.04  
 in trees, E 123.02(6)  
 isolation, E 121.05  
 killing of, E 142.02(4)(c), E 142.03(5), E 142.04  
 near stored material, E 123.02(7)  
 near wells, E 123.02(9)  
 out of service, E 121.04  
 over tanks, E 123.02(8)  
 relation of, Chap. 122  
 relative levels, E 122.01  
 standardization of levels, E 122.01(1)  
 stringing of, E 143.04(10)  
 tests of, E 121.04(1)(c)  
 Live (def. 4), E 101.02  
 Live electrical, parts, E 143.08(3)  
 equipment, E 142.03  
 lines, handling, E 142.03  
 not worked on, climbing space of, E 123.07(5),  
 E 123.07(6), E 123.07(7)  
 permission to work on, E 142.04(5), E 142.04(7),  
 E 142.04(8)  
 request for killing of, E 142.04(2)  
 series circuits considered as, E 143.05(4)  
 Live or moving parts, care about, E 143.01(3)  
 Live parts, E 112.07, E 142.01(6)  
 care about, E 143.01(3), E 143.04(6), E 145.01(6)  
 care when exposed to, E 142.01(5), E 142.03(2),  
 E 142.03(3), E 143.01(3), E 143.04(6)  
 guarding or isolated, E 112.05, E 113.02, E 114.04,  
 E 121.05(1)  
 handling in subway operations, E 143.08(3) &  
 (7)(a)  
 handling of, E 142.08(1), E 142.08(10), E 145.01(6)  
 isolation by elevation, E 112.06(3)  
 repairing in subway operations, E 143.08(7)(a)  
 touching of, E 142.03(1), E 143.04(7)  
 treat everything as alive, E 142.01(6)(a)  
 underground guarding of, E 129.07  
 handling of, E 143.08(3), E 143.08(7)  
 repairing, E 143.08(7)  
 when to kill, E 142.02(4)(c), E 142.03(5), E 142.04  
 working space about, E 112.06  
 Loading, Chap. 125  
 dead ends, E 125.03(3)(c)  
 districts, E 125.01  
 flat surfaces, E 125.03(2)(c)  
 for conductors, E 125.02  
 latticed structures, E 125.03(2)(c)  
 supports, longitudinal, E 125.03(3)  
 transverse, E 125.03(2)  
 vertical, E 125.03(1)  
 trolley contact conductors, E 125.03(2)(b)  
 Loads upon  
 line supports, E 125.03  
 Local electrical regulations, E 2.02(4)  
 Location of (def. 107, 108, 109), E 102.01  
 buckarms relative to working space, E 123.08(4)  
 climbing space, E 123.07(1)  
 conductors relative to working space, E 123.08  
 conductors vertical and lateral, E 123.10(1)  
 diagrams, E 141.02(4)  
 equipment in climbing space, E 123.07(4)  
 guards, E 112.05(3)  
 lightning arresters, E 111.05(4)  
 oil switch and circuit breakers, E 111.05(1)  
 regulators, E 111.05(2)  
 transformers, E 111.05(2), E 115.04, E 123.07  
 vertical and lateral conductors, E 123.10(1)  
 working space, E 123.08  
 Locking switches, E 117.05(2)  
 Longitudinal, conductors or runs  
 loading, E 125.03(3)  
 runs, climbing space, E 123.07  
 strength requirements, grades B & C  
 concrete poles, E 126.02(1)(b)  
 conductors, E 126.02(6)  
 crossarms, E 126.02(4)(c)  
 guys, E 126.02(3)(e)  
 messengers, E 126.02(7)(a)1  
 method of providing, E 126.02(1)(e)  
 steel poles, E 126.02(1)(c)2  
 wood poles, E 126.02(1)(d)2  
 strength requirements, grade D  
 conductors, E 126.03(9)  
 crossarms, E 126.03(4)  
 guys, E 126.03(3)(d)  
 insulators, E 126.03(7)  
 messengers, E 126.03(10)  
 pins, E 126.03(6)b  
 poles, E 126.03(1)  
 strength requirements, grade N, E 126.04  
 Loss of contact at railroad crossings, E 123.10(4)  
 Low-voltage, protection (def. 111), E 101.02,  
 E 113.01(4)  
 release (def. 112), E 101.02, E 113.01(5)  
 L/R for compression members, E 126.02(1)(c)

## M

- Machinery, foundations, E 111.01(3)  
 Machines  
 care about, E 143.01(2)  
 coupled, E 113.03(2)  
 protection from accidental starting, E 113.01,  
 E 143.01(2)  
 Made electrodes, E 103.07(3), E 103.08(4)  
 contact surface, E 103.08(3) & (4)  
 installation of, E 103.08(4)  
 guy as ground, E 103.08(4)(e)  
 limited water systems, E 103.08(1)  
 number of, E 103.09  
 on water systems, E 103.08(1)  
 resistance, E 103.09  
 wood pole grounds, E 103.08(4)(d)  
 extra for buried structures, E 103.08(4)(f)  
 Magnetic forces on conductor, E 116.02(3)  
 Maintaining service, E 142.02(7)  
 Maintenance of  
 clearance, E 123.01(5)  
 lines and equipment, E 20.12, E 121.02  
 overhead and underground lines, E 20.12  
 stations, E 112.02(1)  
 steel poles and towers, E 126.02(13)  
 wood poles, E 126.02(1)(d)

- Making protective grounds, E 142.05
- Manholes (def. 118), E 101.02, E 129.03  
 avoid smoking in, E 143.07(5), E 145.03(4)  
 avoid use of flames in, E 143.07(5), E 145.03(4)  
 conductor location in, E 129.04, E 129.06, E 129.07  
 construction of, E 129.03  
 covers, E 129.03(6)  
 dimensions, E 129.03(2)  
 ducts, entrance into, E 129.02(6)  
 entrance to, E 129.03  
 guarding live parts in, E 129.07  
 guards and guarding of, E 129.06, E 143.07(2),  
 E 143.06(4), E 145.03(1), E 145.03(3)  
 jointly used, E 129.02(6)  
 location of, E 129.01(3), E 129.03  
 minimum strength, E 129.03(1)  
 openings, E 129.03(5)  
 precautions with fire, E 143.07(5), E 145.03(4)  
 strength, E 129.03(1)  
 supporting cables, E 129.03(7)  
 supports, E 129.03(7)  
 ventilation, E 129.03(4)  
 watchmen for, E 143.07(2), E 145.03(1)  
 working space, E 129.03(2)(b)
- Manual (def. 114), E 101.02  
 operation, E 117.03
- Manufacturing processes in stations, E 111.01(2)(b)
- Marking of  
 insulators, E 127.02  
 poles, E 121.05(3)
- Master service (def. 142), E 101.02
- Materials for  
 ground conductors, E 103.06(1)  
 switchboards, E 118.02
- Mats, E 112.05(3)(f)
- Mats, floors and platforms, insulating, as  
 guards for live parts of  
 machines, E 112.05  
 station equipment, E 112.05(3)(f), E 112.07(1),  
 E 117.07, E 142.03  
 switchboards, E 118.07(1)  
 switches, E 117.10
- Mechanical protection of conductors, E 103.06(3),  
 E 113.01(6), E 116.02(11), E 123.10(3)
- Messengers, repeating of, E 142.01(12)
- Messengers, E 126.03(10)  
 communication cable, E 126.02(9)(b),  
 E 126.03(10)(a)  
 communication conductors paired, E 126.02(10)  
 (a), E 126.03(10)  
 grounded effectively, E 103.02 (2)(d) & (e)  
 sag, E 126.02(10)(a)2  
 size, E 126.03(10)(a)  
 specially installed cable, E 126.02(7)(a)1  
 strength, E 126.02(9)(b)  
 supply cable, E 126.02(7)
- Metal  
 cabinets grounding, E 117.09  
 poles, E 126.02(1)  
 grounding of, E 128.01(1)(d)  
 guarding of, E 128.01(1)(d)  
 use of guys with, E 126.02(3), E 128.03(6)  
 raceways, grounding of, E 103.03  
 protection of conductors, E 123.10(3),  
 E 123.10(4)(b), E 123.10(6)(a)  
 protection of control circuit, E 113.01(6)  
 sheathed cable, E 116.04(1), E 123.01(3),  
 E 124.03, E 126.02(7)(a), E 126.02(9)(a),  
 E 128.03(2)  
 clearances, E 123.01(3)
- Meters, care about live parts, E 143.02  
 current-transformer secondary, E 103.06(2)(c),  
 E 143.02(5)  
 open circuits at connections, E 143.02(4)  
 reporting defects, E 143.02(7)  
 special tools, E 143.02(6)  
 taped joints, E 143.02(2)  
 water, ground connections near, E 103.07(1) &  
 (2), E 103.08  
 shunting of, E 103.08(1)
- Methods of protective grounding, Chap. 103,  
 E 103.01
- Methods, of connection to ground, E 103.06,  
 E 103.07  
 of construction, E 20.11(2)  
 of first-aid instruction, E 141.01(4)  
 of providing longitudinal strength, E 126.02(1)(f)
- Minimum  
 clearance for live parts, E 112.05  
 pole sizes, E 126.02(1)(d)6, E 126.03(1)(f)  
 sizes of conductors, E 126.02(6)(b), E 126.03(9),  
 E 126.04(4)(b)  
 sizes of crossarms, E 126.03(4)(b)
- Miscellaneous requirements for overhead lines,  
 Chap. 128
- Modification  
 of rules, E 20.13(1)
- Moisture and weather, E 111.01(2)(e), E 112.09
- Molding, wood, E 123.10
- Motor circuit switch (def. 115), E 101.02
- Motor generators, control of, E 113.01(3)(c)
- Motors and generators, E 113.01, E 113.06  
 control devices for, E 113.01, E 113.06(1)  
 enclosed type, E 113.06(2)  
 guards for live parts of, E 113.02, E 113.05(1)  
 identification of, E 112.10  
 in hazardous locations, E 113.06(2)  
 leads of, E 113.04(2), E 113.05(1)  
 location, E 113.06(2)  
 speed limits for, E 113.01(3)  
 starters for, E 113.06(1)  
 terminal bases, E 113.04(1)
- Moving parts, care about, E 143.01(3)  
 guarding of, E 112.03, E 143.01(3)  
 protection against, E 117.08(2)
- Multiple made grounds, E 103.02(2)(e), E 103.07(3),  
 E 103.10  
 crossings, E 124.02(4)(c)  
 grounds, E 103.02(2), E 103.02(3), E 103.07(3),  
 E 103.10
- Municipal codes, jurisdiction, E 2.02(4)(b)
- ## N
- Name plates, E 112.10
- Nature of ground connections, Chap. 103
- Neutral conductors, grounding of, E 103.02,  
 E 103.02(2)(e), E 123.01(4)  
 clearance, E 123.01(4)  
 use of circuit breakers on, E 116.01(2)
- New construction (def. 117), E 101.02
- N-grade construction, E 126.04
- Noncombustible construction, E 111.01(2)
- Noncurrent-carrying parts  
 grounding, E 103.03, E 103.04, E 103.05, E 112.04  
 frames of generators, cases of transformers,  
 E 112.04(2), E 113.05(2), E 118.06(1),  
 E 119.04  
 metal conduit, cable sheath etc., E 121.06(2)  
 where leakage is liable to occur, E 117.09  
 isolation guarding and marking, E 121.05(2)
- Notification  
 aeronautics commission, E 122.06  
 other utilities, E 122.02(2)
- Number of made grounds, E 103.02(2)(e),  
 E 103.07(3)
- ## O
- Obstruction of highway, E 123.02
- Obstruction on poles, E 128.01(1)(g)
- Oil filled apparatus, E 111.05  
 lightning arresters, E 119.01  
 requirements for general, E 111.05  
 switches, E 117.02  
 transformers, E 115.04
- Oil switches, E 111.05(1), E 117.02

- Omission of guys, communication line crossing, E 126.03(3)(b)
  - Open communication conductors, E 126.02(8)
  - Open circuits, E 143.02(4)
  - Open wire communication lines, E 128.08(1)
  - Open wires (def. 119), E 101.02
  - Operating
    - lines and equipment, E 20.10
    - routine, E 142.02
    - rules, E 140.01 to E 145.03
    - application, E 140.02
    - scope, E 140.01
  - Operation, at stations, E 142.02(4)(b)
    - of electrical equipment and lines, E 140.01
  - Order, of grades of construction, E 124.02(3)
  - Organization diagram, E 141.01(2)
  - Outlet (def. 120), E 101.02
  - Outline lighting (def. 121), E 101.02
  - Overhead and underground lines, Part 2
    - accessibility, E 121.03
    - design and construction, E 121.01
    - installation and maintenance, E 121.02
  - Overhead lines, operation, E 143.04
    - grounding when worked on, E 142.04(6)
    - miscellaneous requirements, Chap. 128
    - precautions in climbing structures, E 145.02(1)
- P**
- Painting steel poles, E 126.02(1)(c)8
  - Paired conductors, E 123.06(1)(a), E 126.02(10), E 126.03(9)(c)
  - Panelboard (def. 123), E 101.02
  - Parts to be grounded, E 121.06(2)
  - Passageways, E 111.03(6)
    - guarding equipment near, E 112.05(1)(b), E 118.07(1), E 119.01(2)
  - Penalties, E 2.02(3)
  - Pendants (see also portables), E 111.02(3)
  - Permanent supporting surface for workman, E 112.05(1)
  - Permanently grounded (def. 124), E 101.02
  - Permission
    - to work, E 142.04(5)
  - Phase, failure, E 113.01
  - Physicians, addresses, E 141.01(3), E 144.02(1)(a)
  - Pine poles (see poles)
  - Pins, grade of, E 124.04(3)
    - grades B, C, E 126.02(5)
    - grade D, E 126.03(6)
    - material, E 126.02(5), E 126.03(6)(a)
    - size, E 126.02(5), E 126.03(6)(c)
    - strength, E 126.02, E 126.03(6)(b)
  - Pins and conductor fastenings, E 126.02(5)
  - Pin spacing, E 123.06
  - Pin type insulators, E 126.03(7)
  - Pipe connections for grounding, E 103.07(1), E 103.08
    - size for made electrodes, E 103.07(3), E 103.08(4), E 103.06(3)
    - system grounds, E 103.02(2)(e), E 103.07(2)
  - Platforms, insulating (see mats)
    - protection of, E 111.03
  - Plug connectors, E 111.02(3), E 118.07(2)
  - Plugs, attachment, E 111.02(4)
  - Plug type switchboard, E 118.07(2)
  - Points
    - of attachment of grounding conductors, E 103.02, E 103.08
    - A.C. systems, E 103.02(2)
    - D.C. systems, E 103.02(1)
  - Pole face (def. 125), E 101.02
  - Poles
    - attachment of guys to, E 128.03(3)
    - clearances from, conductors, E 123.05, E 123.06, E 123.10
    - from hydrants, E 123.02(1)
    - from rails, E 123.02(4)
    - from street corners and curbs, E 123.02(2), E 123.02(3)
    - rubbish, E 123.02(5), E 128.01(1)(a)
    - climbing of, E 123.01(1)(b)2
    - communication, E 126.02(1), E 126.03(1), E 126.04(1)
    - concrete, E 126.02(1)(b)
    - deflection and deformation of, E 126.01, E 126.02(1)(f)2
    - depth of setting, E 126.02(2)(b)2, E 126.03(2)
    - equipment on, E 123.07
    - exposure to fires, E 123.02(5), E 128.01(1)(a)
    - flexible supports, E 126.02(1)(f)2
    - foundations, E 126.02(2), E 126.02(2)(b)
    - grade of, E 124.04(1), E 126.02(1)
    - grounding, E 128.01(1)(d)
    - guards for, E 128.01(1)(b)1
    - guys, E 126.02(3), E 126.03(3), E 128.03
    - hand clearance, E 128.07(4)
    - identification of, E 128.01(1)(f), E 128.07(1)
    - jointly used, grades of, E 124.04(1)
    - relative conductor levels, E 122.01
    - supply communication circuits, E 122.03
    - loading, E 125.03
    - location of, E 123.02, E 126.03(1)(d), E 128.07(2)
    - longitudinal strength of, special cases, E 126.02(1)
    - maintenance, E 20.10, E 126.02(1)(d)
    - minimum sizes, E 126.02(1)(d)7, E 126.03(1)(f), E 126.03(1)(h), E 126.04(1)
    - obstructing traffic, E 123.02
    - obstructions, E 123.01(1)(g)
    - precautions when climbing, E 143.04(2), E 145.02(2)
    - protection against climbing, E 123.01(1)(b)2, E 143.04(2), E 145.02(2)
    - against fire, E 123.01(1)
    - against mechanical injury, E 123.01(1)(b)1
    - protective coatings, E 126.02(13)
    - selected, E 126.02(1)(d)5, E 126.03(1)(e)
    - settings, E 126.02, E 126.03(2)
    - spliced, E 126.02(1)(d)7, E 126.03(1)(g)
    - steel, E 126.02(1)(c)
      - flexible, E 126.02(1)(f)2
      - foundations, E 126.02(2), E 126.03(2)
    - strength of, E 126.02, E 126.03, E 126.04(1)
    - at angles and dead ends, E 126.02(1)(g)
    - for grades B and C, E 126.02(1)
    - for grade D, E 126.03
    - for grade N, E 126.04(1)
    - when used jointly, E 124.04(1), E 126.02(7)(a)
    - stresses in maximum, E 126.02(1)(c)4, E 126.02(1)(d)4, E 126.02(2)(b)1
    - testing of, before climbing, E 143.04(2), E 145.02(1)
    - top diameter, E 126.02(1)(d)6, E 126.03(1)(f)
    - warning signs, E 121.05(3), E 123.01(1)(c)
    - wood, E 126.02(1)(d), E 126.03(1), E 126.04(1)
  - Pole steps, E 123.10(1), E 123.01(1)(e), E 143.04(3), E 145.02(2)
  - Porcelain, bushings, E 113.04(2)
    - insulators, Chap. 127, E 123.04
    - sockets, E 114.09
    - terminal bases, E 113.04(1) & (2)
  - Portable appliance (def. 126), E 101.02
    - cables, inspection of, E 143.08(3)
    - devices, grounding of, E 103.05
    - handling, E 143.08(9)
    - equipment, grounding of, E 103.05, E 103.06
  - Portable, cable connection for, E 111.02(4)
    - grounding, E 103.05
    - installation of, E 111.02(4)
    - in subway operation, E 143.03(9)
  - Position and connection
    - of switches, E 121.07(2) & (3)
  - Pothead, use of, E 116.04(1), E 129.08(4)(b)
  - Power circuits in central office, E 145.01(7)
  - Prime movers, speed limit for, E 113.01(7)
  - Private plant grounding, E 103.02(2)(c)1
  - Proceeding with work, E 142.04(7) & (8)
  - Protecting, arcing parts, (see guarding), E 112.05
  - circuits, E 116.01(1), E 116.02, E 117.06

conductors, longitudinal runs, E 123.07(7)  
 vertical runs, E 123.07(8), E 123.10(3)  
 control circuits, E 113.01(3)  
 ends and joints, E 116.06  
 moving parts, E 112.03, E 117.08(2)  
 station equipment, Chap. 113, E 117.06  
 traffic, E 142.02(8), E 143.04(3), E 145.02(8)  
 working by grounding, E 112.04(3), E 117.04,  
 E 118.06(2), E 142.04(4), E 142.05  
 by switches and disconnectors, E 142.02(9)  
 Protection against arcing insulator, E 127.08  
 arcing of underground cable, E 123.06(1)  
 deteriorating agencies, E 113.05(1)  
 rain and falling objects, E 111.03(3)  
 Protection  
 low and under voltage, E 113.01(4)  
 of conductors, E 103.06(3), E 116.01, E 116.02(1),  
 E 129.08(2)  
 of control circuits, E 113.06(1)  
 near ground, E 123.10(3)  
 of exposed communication lines, E 123.08  
 of longitudinal lines, E 123.07(7)  
 Protective arrangements of equipment, Chap. 112  
 clothing, E 142.01(8)  
 covering  
 for metal parts, E 126.02(13)  
 for steel supporting structures, E 126.02(1)(c)7  
 devices, E 141.02(6) & (7), E 144.05  
 grounding, Chap. 103  
 methods, making, E 142.05  
 methods, E 141.02  
 Pulling cables, E 143.07(6), E 145.03(5)  
 Puncture voltage for insulators, E 127.04, E 127.05

## Q

Qualifications of employees, E 141.01(5), E 144.04  
 Qualified (def. 127), E 101.02  
 Qualified guides, E 142.02(3)

## R

Raceways (def. 128), E 101.02  
 Racks  
 on communication at crossings, E 126.03(5)  
 on supply lines, vertical, E 123.06(1)(d)  
 climbing space for, E 123.07(7)  
 Railings, E 111.08(7), E 112.05(3)(c)  
 grounding, E 112.04(2)  
 guards for switchboards, E 118.07(1)  
 on machines, E 113.02(2)  
 Railroads  
 clearance of wires over, E 123.03  
 increased vertical clearance of lines over, E 123.03  
 (2) & (3)  
 tracks, horizontal clearance to poles, E 123.02(4)  
 Rails, clearance of poles from, E 123.02(4)  
 Railway construction, E 123.10  
 assurance against loss of power, E 123.10(4)  
 at railroad crossings, E 124.03(2), E 123.10(4)  
 guards under bridges, E 123.10(5)  
 high voltage contact conductors, E 123.10(2)  
 supports for contact conductors, E 123.10(1)  
 third rails, E 123.10(3)  
 Railway crossings by electric railways, E 123.10(1)  
 clearance of conductors above rails, E 123.03  
 of trolleys above rails, E 123.03(1)  
 grade of construction at, E 124.03, E 124.04  
 Railway feeders, grades of construction, E 124.03(2)  
 Rain-tight (def. 129), E 101.02  
 Ratio of flashover to puncture voltage, E 127.04  
 Readily accessible (def. 130), E 101.02  
 Readjustment of sags, E 123.09(2)  
 Realization of intent of rules, E 20.13(2)  
 Receptacle outlet (def. 131), E 101.02  
 Reconstruction (def. 132), E 101.02  
 Record of defects, E 121.04(1)(d)  
 Reduced clearance of neutral, E 123.01(4)  
 Reduction in number of wires, permissible,  
 E 125.03(3)

Redwood poles (see poles)  
 Regulators induction, E 111.05(2), E 115.03,  
 E 123.07(8)  
 Reinforced concrete poles, E 126.02(1)(b)  
 Relation between various classes of lines, Chap. 122  
 Relative levels of wires, E 122.01, E 123.09(1)(a)  
 at crossings, E 122.01(3)(a)  
 minor extensions, E 122.01(2)(b)  
 preferred levels, E 122.01(2)(a)  
 supply and communication lines, E 122.01(2)  
 supply lines of different voltage, E 122.01(3)  
 Remote control, E 117.01(1), E 117.02, E 117.05(2),  
 E 119.02(2)  
 Removing ground, E 142.05(5)  
 Repairing and inspecting, E 20.12  
 Repairing, lines, E 121.04(1)(c), E 123.03(11)  
 station equipment, E 112.04(3)  
 subway equipment, E 143.03(7)  
 Repeating messengers, E 142.01(12)  
 Replacing equipment, E 121.04(1)  
 Reporting dangerous conditions, E 143.06(7),  
 E 145.03(6)  
 Reporting defects, E 143.02(7), E 143.03(7),  
 E 143.04(11), E 143.05(7), E 143.06(7),  
 E 143.07(9), E 143.08(14), E 145.02(9),  
 E 145.03(6)  
 trouble or circuits, E 143.01(8)  
 when lines are clear, E 142.04(9)  
 Requirements for  
 in stations, E 110.01  
 overhead and underground lines, Part 2  
 rooms and spaces, E 111.01  
 stations and substations, Part 1  
 two workmen, E 141.02(2)  
 Resistance devices, E 115.05  
 location, E 115.05  
 Resistance of ground connections, E 103.09  
 Responsibility between officials and employees,  
 E 141.01(2)  
 designation of, E 141.01(7)  
 transferring of, E 142.04(9)  
 Restoring service, E 142.02(5)  
 Resuscitation from shock, E 141.01(4), E 142.01(1),  
 E 144.03  
 Rheostats, Chap. 115, E 115.05, E 117.01(1)  
 location, E 115.05  
 Rights-of-way, construction on fenced, E 124.03  
 Rigid conduit (def. 36), E 101.02  
 Risers, E 123.03(3), E 129.03  
 clearance above ground, E 123.03(3), E 129.03  
 grounding, E 121.06(2)  
 Rivets, E 126.02(1)(c)  
 Roads, clearance of wires along and over, E 123.03  
 Roadway, clearance of wires and conductors above,  
 E 123.03  
 for electric railway, E 123.10(1), E 123.10(2)  
 Rods, anchor, E 123.03(7)  
 Rod size for made grounds, E 103.03(4)  
 Roofs, attaching conductors to, E 123.01(3)  
 conductors crossings, E 123.05(3)  
 Rooms and spaces, E 111.01  
 Rotating equipment, Chap. 113  
 Rotating, machinery, Chap. 113, E 111.01(3)  
 attendance of, E 141.02(1)  
 grounding of, E 103.03, E 103.04, E 103.05,  
 E 113.03(1)  
 grounding live parts of, E 113.02(2)  
 guarding moving parts, E 112.03  
 Rubber  
 gloves, E 112.07(1), E 117.07, E 142.03(2),  
 E 143.05(3)  
 mats, E 112.05(3)(f)  
 Rubbish near poles, E 123.01(a)  
 Rules, book of, E 141.01(1), E 141.01(3), E 144.01,  
 E 144.02(2)  
 enforcement of, E 141.01(1)(a), E 144.01  
 for employees, communication systems, Chap.  
 144, Chap. 145  
 supply systems, Chap. 142, Chap. 143  
 interpretation of, E 141.01(1)(b), E 144.01(3)  
 Rural districts (def. 134), E 101.02  
 supply lines in, E 124.03

## S

- Safe supports for workman, E 143.04(2), E 143.04(4), E 145.01(4), E 145.02(1)
- Safety appliances, furnishing, E 112.07, E 141.02(6), E 144.05  
use of, E 142.01(7)
- Safety belts, inspection of, E 141.02(7), E 142.01(10)  
provision of, E 142.01(10), E 144.05(1)(c)  
use of, E 142.01(10), E 145.01(4)
- Safety loops on ladders, E 111.03
- Sags (def. 135), E 101.02  
basis of computation, E 126.02(6)(d)  
communication lines crossing contact conductors, E 126.02(10)(b)2  
conductors on same support, E 123.09(2)(b)  
different, on same supports, E 123.09(2)(c)  
grades B and C, E 126.02(6)(d), E 126.02(10)(a), E 126.02(10)(b)  
D, E 126.03(9)(d), E 126.03(10)(b)  
N, E 126.04(5)(c)  
increased clearance for, E 123.06(1)(b)1.b.  
messenger, E 126.02(10)(a)2, E 126.03(10)(b)  
readjustment of, E 123.01(5), E 123.09(2)(c)2  
service leads, E 126.04(5)(c)
- Scope of code, E 2.01  
grounding, E 103.01  
on lines, E 120.01  
operating rules, E 140.01  
stations, E 110.01
- Sealable equipment (def. 136), E 101.02
- Sealing conduit, hazardous locations, E 116.05(1)
- Sealing laterals, E 129.02(7)
- Secondaries  
grounding of, E 103.02  
instruments transformers, E 103.04(3), E 115.02
- Selection of insulators, E 127.07
- Separate, pole lines, E 122.04  
grounds and ground conductors, E 103.07, E 103.10
- Separation in any direction, E 123.09(3)
- Separation of, bare parts, E 112.05, E 118.05(1)  
cables underground, E 129.02(4), E 129.05  
circuits and equipment on joint poles, E 123.09  
communication and supply lines, E 122.04  
communication equipment and supply lines, E 123.09(5)  
communication lines and supply equipment, E 123.09(5)  
conductors, and noncurrent-carrying parts, E 123.09(5)  
at supports, E 123.06(1)  
attached at bridges, E 123.06(3)  
attached to buildings, E 123.05(3)(c), E 123.06(2)  
in manholes, E 129.04(3)(c)2  
not carried on crossarms, E 123.09(4)  
of different voltages on same crossarm, E 123.06(1)(e)  
of same voltage classification, E 123.09(2)  
on horizontal crossarms, E 123.09(2)  
on poles, E 123.06(1)  
on poles according to sags, E 123.06(1)  
on racks, E 123.06(1)(d)  
underground, E 129.04(3)  
vertical, E 123.06(1), E 123.09  
crossarms, E 123.09  
duct systems, supply and communication, E 129.02(5)  
pole lines, E 122.04  
risers, communication and supply, E 129.08(1)  
vertical, E 123.09
- Series circuits, clearance for, E 123.01(2)  
grade of, E 124.03(1)  
handling of, E 142.03(9)  
position of, E 123.06(1)(e)  
precaution when worked on, E 143.05(2), E 143.05(6)  
reporting defects, E 143.05(7)  
testing of, E 143.05(5)
- Series generators, E 113.03(2)
- Series lamps  
bridging of, E 143.05(4)  
disconnection, E 123.07(5)(f), E 143.05(6)  
handling of, E 143.05(3)  
installation of, E 123.07(5)  
on poles, E 123.07(5)  
suspension of, E 123.07(5)  
work on, E 143.05
- Service (def. 138-146), E 101.02  
cable (def. 139), E 101.02, E 126.04(5)(d)  
conductor (def. 140), E 101.02  
conduit, grounding, E 103.03  
crossings, grade of construction, E 124.03  
drops, cabled (def. 141), E 101.02, E 126.04(5)(d)  
connections of, E 123.06(2)  
supply, E 126.04(5)  
entrance (def. 142 and 143), E 101.02  
equipment (def. 144), E 101.02  
hazard by interruption of, E 117.06  
insulation, E 126.04(5)(a)  
leads, crossarms, E 124.04(2)  
poles, E 124.04(1)  
maintaining of circuits, E 142.02(7)  
materials, E 126.04(5)(a)  
pipe, E 126.04(5)(a)  
raceway (def. 146), E 101.02  
restoring, E 142.02(5), E 142.04(11)  
sag, E 126.04(5)(c)  
size, E 126.04(5)(b)
- Setting poles, E 126.02(2), E 126.03(2)
- Shading lamps, E 111.02(3)
- Shafting, guarding of, E 112.03
- Shall (def. 148), E 101.02
- Shielding equipment from deteriorating agencies, E 112.03
- Shields, E 112.05(3)
- Shock, avoiding, E 142.03(2) & (3)
- Short-span construction, E 126.02(11)
- Should (def. 149), E 101.02
- Shunting water meters, E 103.08(1)
- Side guying, E 126.02(1)(e)
- Signal (see communication)
- Signaling apparatus, fire and police special supply circuits for, E 122.01(2)(c)
- Signs, clearance from lines, E 123.05(5)
- Signs, danger, E 121.05(3), E 141.02(9)
- Signs on poles, E 121.05(3)
- Signs, warning  
as protective device, E 141.02(8) & (9)  
for bridges, E 123.01(1)(c)  
for disconnectors and switches, E 117.05(1), E 117.05(2)  
for equipment under test, E 143.03(5)  
for exposed live parts, E 141.02(9)  
for fire extinguishers, E 111.04  
for poles, E 121.05(3), E 123.01(1)(c), E 123.01(1)(c)  
for starting devices, E 143.01(2)  
for station entrances, E 111.01(1), E 141.02(8)  
for traffic protection, E 143.04(8), E 143.07(2), E 145.02(8), E 145.03(1)
- Simultaneous application of loads, E 125.03(5)
- Size of  
ground conductor, E 103.06  
lightning arrester ground connection, E 103.10  
made electrodes, E 103.08(4)  
pins, E 126.02(5), E 126.03(6)  
services, E 126.04(5)
- Slack in overhead conductors, E 123.01(5)
- Slippery floors, E 111.03(2), E 112.06(1)
- Sockets  
insulating, E 114.04
- Solid enclosure in hazardous locations, E 112.08(1)
- Spacing blocks for crossarms, E 126.03(4)(c)
- Span lengths (def. 153), E 101.02, E 126.03(9)
- Spans, averaged, E 125.03(4)  
increased clearance for long, E 123.03(2), E 123.04(2)  
length of, communication line at railway crossing, E 126.03(1)(d)2

- paired conductors, E 126.03(9)
- supply line, E 126.02(6)(b), E 126.04(4)(b)
- Span wires, clearances, above rails or ground, E 123.03
  - insulators for, E 123.05(1) & (2)
  - jointly used poles, E 123.09(5)(c)
  - on joint poles, E 123.09(1)(a)
- Sparking, distance, E 119.02(1)
- parts (see arcing parts)
- Special, authorization for station operation, E 142.02(4)
  - permission (def. 154), E 101.02
  - precautions, supply lines on unusual supports, E 123.01(3)
  - supply circuits for operating signal equipment, E 122.01(2)(c)
  - tools, E 143.02(6)
- Specially installed cables, E 124.02(1)(a), E 126.02(7)
- Speed control, E 113.01
- Speed limit, motors, E 113.01(3)
- prime movers, E 113.01(1)
- Spliced poles, E 126.02(1)(d)7, E 126.03(1)(g)
- Splices
  - and taps, E 126.02(6)(e), E 126.03(9)(e)
  - at crossings, E 126.02(6)(e), E 126.03(9)(e)
  - in supply cables, E 126.02(7)(a)3, E 129.07(1)
- Spurs or climbers, care and use of, E 143.04(5), E 145.02(3)
- Stairs, antislip treads for, E 111.03(2)
- as supporting surface for workman, E 112.05(1)
- guards for, E 111.03
- landings for, E 111.03
- Starters (see also controllers)
  - motor control, E 113.01(4)
- Starting rheostats, E 112.08(1), E 113.06(2), E 115.05, E 117.01(1)
- Station, arrangement, Chap. 111
  - equipment, authorization to work on, E 142.02(4)(a)
  - guarding live parts, E 112.05
  - guarding moving parts, E 112.03
  - identification of, E 112.10
  - in hazardous locations, E 112.08
  - inspection of, E 112.02
  - lighting, E 111.02
  - protective grounding, E 112.04, E 113.03, E 117.09, E 118.06(2), E 119.04, E 142.04(4)
  - wiring for illumination, E 116.07
  - working space about, E 112.06
- Stations (def. 66), authorization for operation of, E 101.02, E 142.02(4)(b)
  - construction of, exists, E 111.03
  - floors, E 111.03
  - rooms, E 111.03
  - stairs, and ladders, E 111.03
  - construction precautions, E 112.05(1)
  - fire protection of, E 111.04
  - hazardous conditions in, E 111.01(2), E 112.04(2)
  - identification of equipment, E 112.10
  - illumination of, E 111.02, E 114.09, E 116.07
  - requirements in, E 110.01
  - temporary wiring, E 20.13(3)
  - ventilation of, E 111.01(2)(d)
- Statutes affecting electrical construction, E 2.02(1), E 2.02(3) & (4), E 121.05(3), E 122.05, Chap. 123
- Statutory authority, E 2.02(1)
- Steel supporting structures, E 126.02(1)(c)
- Steps
  - pole, clearance above ground, E 123.01(1)(e), E 145.02(2)
  - of conductors from, E 123.10(1)
  - metal and wood, E 123.01(1)(e)
  - use of, E 143.04(3), E 145.02(2)
- Stopping devices, E 113.01
- Storage about switchboards, E 118.01(2)
- in supply stations, E 111.01(2)
- Storage batteries, Chap. 114
- Strain insulators, E 127.03
- Street lighting, E 128.07(5)
  - drip loop clearance, E 123.09(5)(d)
- Street openings, guarding of, E 143.07(2), E 145.03(3)
- Street railways construction, E 123.10
  - grade of conductors, E 124.03(2)
  - span-wire insulators, E 123.05
  - third rails, E 123.10(3)
  - tracks, separation from ducts and manholes, E 129.01(1), E 129.01(3), E 129.04, E 129.05
  - trolleys, guarding under bridges, E 123.05(4)(b), E 123.10(5)
  - included in transverse load, E 125.03(2)(b)
  - minimum size, E 126.04(7)
  - supports, E 125.03(2)(b), E 123.10(1)
  - suspension of high voltage, E 123.10(5)
- Strength of
  - communication cables, E 126.02(9)
  - conductor fastening, E 126.02(5)
  - conductors, E 126.02(6), E 126.03(9), E 126.04(4), E 126.04(5)
  - construction, minimum requirements, E 2.01
  - foundations, E 126.02(2), E 126.03(2)
  - guards, E 112.05(2)
  - guys, E 126.02(3), E 126.03, E 123.03(2)
  - messengers, E 126.02(9)(b)
  - paired communication conductors, E 126.02(10)
  - paired conductors over supply lines, E 126.02(10)(b)1
  - paired conductors over trolley conductors, E 126.02(10)(b)2
  - pins, E 126.02(5)(b), E 126.03(6)(b)
  - poles, E 126.02(1), E 126.03(1), E 126.04(1)
  - splices and taps, E 126.02(6)(e)
  - steel supporting structure, E 126.02(1)(c)
  - supply cables, E 126.02(7)
  - supports at angles, E 126.02(1)(e)2
  - trolley contact conductors, E 126.02(6)(f)
  - wood poles, E 126.02(1)(d)
  - strength requirements, Chap. 126
- Stresses in conductors, E 126.02(6)(d)
  - magnetic, E 116.02(3)
- Stringing wires, E 142.03(10), E 143.04(10), E 143.06(6), E 145.02(7)
- Structural steel, E 126.02(1)(c)
- Structure conflict (def. 155), E 101.02, E 124.02(5)
- Structures, supporting, E 124.04
- Substantial (def. 156), E 101.02
- Substations (see stations)
  - fences, E 111.01(4)
- Subway and tunnel operation, E 143.08
- Suddenly moving parts, protection, E 112.03(2), E 117.08(2)
- Supervision of employees, E 142.01(4)
- Supply cable, classification for grades, E 124.02(1)
  - strength, E 126.02(7)
- Supply equipment (def. 69), E 101.02
  - separation from communication conductors, E 123.09(5)
- Supply lines (def. 106), E 101.02
  - approaching, E 143.06(4), E 145.02(4)
  - branch connections of, E 123.06(2)
  - clearance above ground and rails, E 123.03
  - climbing space for, E 123.07
  - communication lines used in operation of supply lines, E 123.09
  - construction and maintenance general, E 121.01, E 121.02
  - construction under railways, E 129.02(4), E 129.05
  - crossarms, E 123.09
  - grades of, E 124.03, E 124.04
  - guarding or isolation, E 121.05, E 129.07
  - identification of conductors and equipment, E 123.06(1), E 123.07(1)
  - inspection and tests, E 121.04
  - insulators, E 127.07(2)
  - joint use, E 122.03
  - precautions while working on, E 142.02(4), E 142.03, E 142.04, E 143.04, E 145.02(6)
  - relative levels, E 122.01(1)
  - short-span construction, E 126.02(11)

Supply systems  
operating rules for, Chaps. 141 and 142

Supporting conductors on trees, E 128.01(3)  
structures, grade of, E 124.04

Supports (also see foundations)  
battery rooms, E 114.05  
flexible, E 126.02(1)(f)2  
for cable, E 129.03(7)  
for contact conductor, E 125.03(2), E 128.05,  
E 128.10(1)  
for large conductors and generator leads, E 116.02  
(3) & (4)  
for rheostats and resistance devices, E 115.05  
insulating conductors, E 116.05(2)  
loads on, E 125.03  
safe for workman, E 142.01(9), E 143.04(2),  
E 145.01(4), E 145.02(1)  
unsafe, E 143.04(4)

Suspension for street lights, E 123.07(5)(d)

Suspension insulators  
increased clearances for E 123.03(2), E 123.04(2)  
material for street lamps, E 123.07(5)(d)

Switch (def. 157), E 101.02

Switchboards and panelboards (def. 158), E 101.02,  
Chap. 118  
accessibility of, E 118.01(3) & (4)  
arrangement of, E 118.01(4), E 118.04, E 118.07(2)  
bare parts, E 118.06(1)  
care about, employees, E 143.01(2)  
dead-front, E 118.07(2)  
equipment, E 118.03  
frames, E 118.06  
fuses, E 118.05(2)  
grounding, E 118.06  
guarding live parts, E 118.07  
handling of, E 143.01(7)  
identification of equipment, E 118.04  
illumination, E 118.02(2)  
instruments, E 118.05, E 118.08  
location, E 118.01(1)  
material, E 118.02  
plug-type, E 118.07(2)  
separation of bare parts on, E 118.05(1)  
spaces around, E 118.01(2)  
spacings, E 118.05  
wiring on, E 118.04

Switch cells, illumination of, E 111.02  
in supply stations, E 111.02, E 117.02

Switches (def. 157) and circuit breakers, E 102.01,  
Chap. 117  
accessibility and arrangement, E 121.07(1)  
accidental operation, E 117.01(2), E 117.05(2)  
ahead of fuses, E 117.07  
air break, E 117.05(3)  
alignment, E 117.05(4)  
arrangement of, E 117.01(1), E 121.07  
blades dead, E 117.01(2)  
capacity of, E 117.05  
closing, E 117.01(2)  
construction of, for good contacts, E 117.05(4)  
frame on rotating equipment, E 113.02(3)  
grounding, E 117.04, E 117.09  
guarding, E 117.10  
in battery rooms, E 114.05  
identification, E 117.01(1), E 118.04  
indicating, E 117.01(1), E 121.07(2)  
in grounding conductors, E 103.06(1)  
in manholes, E 129.07(2)  
isolation, E 117.02  
knife, E 117.01(2)  
location, E 117.01(1), E 117.02, E 117.03  
locking or blocking of, E 117.05(2)  
oil, E 111.05, E 117.02, E 117.05(3)  
on poles, E 123.07(2)  
on switchboards, E 118.01(4)  
opening and closing, E 142.03(6)  
operation by employees, E 142.03, E 143.01(7),  
E 143.02(4), E 143.08(10)  
position, E 121.07(3)  
remote control, E 117.02  
suitability, E 117.05(1)

used as grounding devices, E 117.04  
where required, E 117.03

System ground wire, E 103.02(2)(b) and (2)(c)3

## T

Tables

clearance  
from live parts, E 112.05(1), E 142.03(3)  
underground risers, E 123.03(3)  
vertical and lateral conductors, E 123.10(4)  
wires crossing wires, E 123.04(1)  
wires from, bridges, E 123.05(4)(a)  
buildings, E 123.05(3)(d)  
ground or rails, E 123.03  
supports, E 123.06(1)(c)  
climbing space, E 123.07(5)(c)  
crossarms separation, E 123.09(1)(a)  
size, E 126.02(4)(d)  
depth of setting poles, E 126.02(2)(b)2  
foundation for poles, strength, E 126.02(2)(b)2  
grades of construction, communication conduc-  
tors, E 124.03  
at multiple crossings, E 124.02(4)  
supply conductors, E 124.03  
guys, strength for grades B and C, E 126.02(3)(e)  
for grade D, E 126.03(3)  
horizontal clearances and separations, E 123.06(1)  
illumination intensities in stations, E 111.02  
insulator test voltage, E 127.05  
isolation by elevation, E 112.05(1)  
loading specifications, E 125.02  
messenger communication cables, size,  
E 126.03(10)(a)  
pole setting depths, E 126.02(2)(b)2  
sags of communication conductors, copper and  
steel, E 126.03(9)(d)  
service leads, sags, E 126.04(5)(c)  
sizes, E 126.04(5)(b)  
steel poles, L/R ratio, E 126.02(1)(c)6  
thickness of metal, E 126.02(1)(c)5  
unit stresses, E 126.02(1)(c)4  
vertical clearances and separations, E 123.09(1)  
wood poles, allowable stresses, E 126.02(1)(d)4  
depth of setting, E 126.02(2)(b)2  
strength of grade D, E 126.03(1)(a)  
ultimate stresses, E 126.02(1)(d)3  
working space about live parts, E 112.05(1)

Tag (def. 159), E 101.02, E 141.02(6)(a)5,  
E 141.02(10)  
distinctive character, E 142.04(3)  
removal of, E 142.04(10)  
use of, E 117.05(2), E 141.02(6)(a)5, E 141.02(10),  
E 142.02(6), E 143.01(2)

Tagging, circuits, E 142.02(6)  
open disconnects, E 142.04(3)

Tapes or ropes, E 142.03(1)(e)

Taping ends and joints, E 116.06, E 143.02(2)

Taps, flying, E 123.02(2)  
in crossing spans, E 126.02(6)(e), E 126.03(9)(e)

Temperature  
of rheostats and resistance devices, E 115.05  
protection against excessive, E 116.02(5)  
Temporary decorative lighting, E 121.04(3)  
Temporary installations, E 20.13(3)  
modification of rules, E 20.13(3), E 141.01(1)(c)  
waiver for, E 20.13(3)  
wiring, disconnection of, E 143.08(12)  
for subway construction, E 143.08(12)

Tensions in, cable messengers, E 125.03(10)(b)  
conductors (def. 160), E 101.02, E 126.02(6)(d)

Terminals bases, E 113.04(1)  
construction, E 129.03(4)  
Testing, E 143.03  
and splicing live cables, E 143.07(8)  
for gas, E 143.07(3), E 145.03(2)  
for grounds, E 103.09, E 142.05(3)  
of cables to determine if alive, E 143.07(8)  
of equipment, E 122.02(2)  
of lines and equipment, E 121.04(1)(c)  
of series lamp circuits, E 143.05(5)



of structures before climbing, E 143.04(2)  
 operations, E 143.03  
 rooms, E 20.13(4)  
 Tests for insulators, E 127.05, E 127.06  
 steel towers, E 126.02(1)(c)7  
 Thermal protection of conductors, E 116.02  
 Thickness of steel, E 126.02(1)(c)5  
 Third-rail collector  
 guarding or isolating, E 128.10(3)  
 Through bolts, E 123.10(6)(d), E 123.10(7)(d)  
 Tie wires and fastenings for communication  
 lines, E 126.03(8)  
 supply lines, E 124.04(3), E 126.02(5)(a)1  
 special cases, E 126.02(5)(a)  
 Toe boards for floors, 111.03  
 platforms, E 111.03  
 stairs, E 111.03  
 surfaces above live parts, E 112.05(3)(g)  
 Tools, E 143.02(6)  
 Top diameter  
 communication poles, E 126.03(1)(f)  
 supply poles, E 126.02(1)(d)1.  
 Totally enclosed motor (def. 67), E 101.02  
 Touching equipment, E 143.06(5), E 145.02(5)  
 Touching live parts, E 142.03(1)(a)  
 Towers (see poles)  
 Traffic, protection of, E 142.02(8), E 143.04(8),  
 E 145.02(8)  
 Transformers, Chap. 115  
 general, Chap. 115  
 grounding, E 103.04(2), E 115.02, E 115.03,  
 E 121.05, E 121.06  
 guarding, E 112.05, E 121.05, E 121.06,  
 E 128.07(2), E 128.07(6)  
 installation of, E 111.05, E 115.02, E 115.04,  
 E 123.09, E 128.07  
 interconnection, E 103.02  
 location, E 111.05(2), E 115.04  
 on poles, E 128.07(2)  
 vault (def. 164), E 102.01, E 115.04, E 116.03  
 Transmission lines (see supply lines), Part 2  
 Transverse loading (see loading), E 125.03(2)  
 averaging span lengths, E 125.03(4)  
 special requirements, E 126.02(1)(e)  
 strength (line supports), E 126.02(1)(c)1,  
 E 126.02(1)(d)1, E 126.03(1)  
 three poles, E 126.02(1)(a)  
 Traps for drainage pipes in manholes, E 129.03(3)  
 Trees  
 attaching conductors to, E 128.01(3)  
 falling, E 128.02  
 lines in, E 123.02(6)  
 protection from, E 128.02  
 trimming, E 128.02  
 Trolley contact conductors (see conductors)  
 attached to bridges, E 123.05(4)  
 clearance above rails and aground, E 123.03  
 grade of, E 124.03(2)  
 guarding, E 123.05(4)(b)  
 at railway crossings, E 123.10(4)  
 under bridges, E 123.10(5)  
 high voltage, E 123.10(2)  
 insulation for, E 128.05(2)  
 minimum size, E 126.02(6)(f)  
 on jointly used poles, E 125.03(2)(b)  
 supports, E 123.10(1)  
 third rails, protection of, E 128.10(3)  
 Trolley feeders, E 122.01(2)(a), E 123.04(1)  
 E 124.03(2)  
 Trouble, reporting to chief operators, E 143.01(8)  
 Tunnel working on, E 143.08  
 Twisted pair (see paired conductors)  
 Two workmen required, E 141.02(2), E 142.03(4),  
 E 143.03(6)  
 Type of guards, E 112.05(3)

## U

Ultimate fiber stresses, wood poles, E 126.02(1)(d)3  
 Ultimate strength of  
 steel, E 126.02(1)(c)4  
 wood poles, E 126.02(1)(d)3

Underground  
 cables and lines, Chap. 129  
 conduit and ducts, Chap. 129  
 lines, communication operating rules, Chap. 145  
 crossings under railway, E 129.02(4)(b)  
 operation, E 143.07  
 risers, E 123.03(3), E 129.08(3)  
 systems, communication, operation of, Chap. 145  
 location of, E 129.01(1)  
 supply operation of, E 143.07, E 143.08  
 Under voltage protection, E 113.01(4)  
 Unguyed supports at railroad crossings, E 125.03(3)  
 Uniformity with existing construction, E 20.13(2)  
 Unqualified workman, E 141.02(3)  
 Unsafe supports, E 143.04(4)  
 Urban districts (def. 165), E 101.02  
 grade of conductors, E 124.03  
 Use of  
 approved material and construction methods,  
 E 20.11  
 ground as part of circuit, E 121.06(3)  
 of guy insulators, E 128.04(2)  
 Utilization equipment (def. 166), E 101.02

## V

Vapor-tight (def. 167), E 101.02  
 Vault, transformer (def. 164), E 101.02, E 111.03(13),  
 E 115.04, E 117.03  
 Ventilated (def. 168), E 101.02  
 Ventilation of battery rooms, E 114.03  
 manholes, E 129.03(4)  
 motor compartment, E 113.06(2)  
 station, E 111.01(2), E 111.05(2), E 115.04  
 Vertical clearance of wires, above ground and rails,  
 E 123.03  
 increase, E 123.03(2)  
 increase for suspension insulators, E 123.03(2)  
 increase for voltage, E 123.03(2)  
 Vertical conductor (def. 169) (see conductors),  
 E 101.02, E 123.10(4)  
 arrangement of, E 123.09(2)(b)  
 climbing space, E 123.07(8)  
 separations for, E 123.09  
 Vertical loading, E 125.03(1), E 125.03(5)  
 Vertical separations of  
 conductors and noncurrent-carrying parts,  
 E 123.09(5)  
 conductors on, same pole, E 123.09(2)  
 racks, E 123.06(1)(d)  
 line conductors on horizontal crossarms,  
 E 123.09(2)  
 Visitors, E 141.02(3)  
 Voltage (def. 170), E 101.02  
 increased clearance for, E 123.03(2)(b),  
 E 123.04(2)(b), E 123.06(1)(b)

## W

Waiving rules, E 20.13  
 Warning employees, E 142.01(2)  
 Warning signs (see signs), E 121.05(3),  
 E 128.01(1)(c), E 141.02(8)  
 warnings and barriers, E 143.03(5)  
 Watchman at manholes, E 143.07(4), E 145.03(3)  
 Water pipe connections, E 103.07(1), E 103.08  
 Water pipe grounds, E 103.07(1)  
 Water systems grounding, E 103.07(1), E 103.08  
 limited, E 103.08(1)  
 Water tight (def. 171), E 101.02  
 Weather conditions, E 111.01(2), E 125.01, E 125.02  
 Weatherproof (def. 172), E 101.02  
 cases, E 111.01(2)  
 Well casing grounds on, E 103.08(1)  
 Width of working space, E 112.06(2)  
 Wind pressure, E 125.02  
 Wires  
 connecting lightning arresters, E 119.03  
 handling, E 142.03(8),(9) & (10)  
 protection from falling, E 142.02(8)(b)

- stringing of, E 142.08(10), E 143.06(6),  
E 145.02(7)
- vertical clearance, above ground and rails,  
E 123.03
- Wiring
  - diagram for, equipment and lines, E 141.02(4)
  - for illumination, E 116.07
  - lightning arrester grounds, E 119.03
  - on switchboards, arrangement, E 118.01(3) &  
(4), E 118.05(1)
- Wood, molding, use of, E 103.06(3), E 123.10(3),  
E 123.10(4)(b), E 123.10(6)
- poles, E 126.02(1)(d), E 126.03(1), E 126.04(1)
- allowable fiber, stresses, E 126.02(1)(d)3
- guys, E 126.02(3)
- longitudinal strength, E 126.02(1)(d)2
- minimum sizes, E 126.02(1)(d)6
- spliced, E 126.02(1)(d)7
- top diameters, E 126.02(1)(d)6
- ultimate fiber stresses, E 126.02(1)(d)3
- Working space, E 123.03
  - about equipment, E 111.01, E 112.05(1),  
E 112.06(1) & (2), E 113.02(4), E 115.05
  - about lightning arresters, E 119.01(2), E 119.02(2)
  - about switchboards, E 118.01(2) & (4), E 118.07(3)
  - dimensions, E 123.08(2)
  - elevated parts, E 112.06(3)
  - exits from, E 111.03(4)
  - headroom for, E 111.03(6)
  - height, E 123.08(4)(a)
  - in manholes, E 123.03(2)(b)
  - in stations, E 112.06
  - lateral (def. 100 & 101), E 101.02, E 123.03
  - lightning arresters, E 119.01(2), E 119.02(2)
  - location, E 123.08(1)
  - obstruction of, by conductors, E 123.08(3),  
E 123.10(1)
  - on poles, E 123.08(2) & (4), E 123.10(1),  
E 123.07(1) & (4)
  - where required, E 112.06(1)
  - width, E 112.06(2)
- Workman's request, E 142.04(2)
- Workmen, position, E 142.03(7)
  - protection of, by disconnectors, E 142.02(9)
  - requirements for two, E 141.02(2), E 142.03(4),  
E 143.03(6)
  - unqualified, E 141.02(3)
- Work on circuits, E 118.06(2)
  - on live lines, E 141.02(2)