NECA 100

Symbols for Electrical Construction Drawings

ANSI Recirculation~~Canvass~~ Draft
December 2023~~November 2019~~

Table of Contents

(This foreword is not a part of the standard)

Foreword

National Electrical Installation Standards™ (*NEIS*™) are designed to improve communication among specifiers, purchasers, and suppliers of electrical construction services. They define a minimum baseline of quality and workmanship for installing electrical products and systems. *NEIS*™ are intended to be referenced in contract documents for electrical construction projects.

Use of *NEIS* is voluntary, and the National Electrical Contractors Association (NECA) assumes no obligation or liability to users of this publication. Existence of a standard shall not preclude any member or non-member of NECA from specifying or using alternate construction methods permitted by applicable regulations.

This publication is intended to comply with the National Electrical Code (NEC). Because they are quality Standards, NEIS may in some instances go beyond the minimum safety requirements of the NEC. It is the responsibility of users of this publication to comply with State and local electrical Codes and Federal and State OSHA safety regulations as well as follow manufacturer installation instructions when installing electrical products and systems.

Suggestions for revisions and improvements to this standard are welcome. They should be addressed to:

NECA Standards & Safety
3 Bethesda Metro Center, Suite 1100
Bethesda, MD 20814
(301) 215-4546
(301) 215-4500 Fax
www.neca-neis.org
neis@necanet.org

To purchase *National Electrical Installation Standards*, contact the NECA Order Desk at (301) 215-4504 tel, (301) 215-4500 fax, or orderdesk@necanet.org. *NEIS* can also be purchased in .pdf download format at www.neca-neis.org/standards.

1. Scope

This publication describes graphic symbols used to represent electrical wiring and equipment on construction drawings. In this publication, the term "electrical" is used to include electrical, electronic, and communications systems covered by the National Electrical Code (NFPA 70). This publication also summarizes recommended drawing practices for electrical construction drawings.

1.1 Symbols Included

This standard is limited to North American symbols for electrical wiring and equipment.

1.2 Symbols Not Included

Symbols from publications of the International Electrotechnical Commission (IEC) are not included in this standard.

Symbols for equipment and systems not covered by the NEC are not included in this standard.

1.3 Regulatory and Other Requirements

All information in this publication is intended to conform to the National Electrical Code (ANSI/ NFPA 70).

General requirements for installing electrical products and systems are described in NECA 1, *Standard for Good Workmanship in Electrical Construction* (ANSI). Other *National Electrical Installation Standards* provide additional guidance for installing particular types of electrical products and systems. A complete list of *NEIS* is provided in Annex C.

2. Purpose of Symbols

Symbols are a shorthand way of showing the locations, types, and sizes or ratings of electrical wiring and equipment, and the interrelationships between these items. It should be emphasized that drawings need to be supplemented with specifications in order to establish the details of the electrical systems.

2.1 Organization of the Standard

This standard contains symbols commonly and primarily used on electrical construction drawings. Related symbols are organized into different groups, and each symbol within a group has its own unique identifying number. The group and symbol numbers are not significant except as a convenient way to identify individual symbols. See Table 1 for symbol groups.

Table 1: Symbol Groups

Group	Description
1.0	Raceways
1.1	Raceways – Indicators
1.2	Raceways – Boxes and Busway
2.0	Luminaires (Lighting Fixtures)
2.1	Luminaires – Mounting
2.2	Luminaires – Orientation
2.3	Luminaires – Emergency
2.4	Luminaires – Extended Modifiers
3.0	Outlets and Receptacles
4.0	Switches and Sensors
5.0	Motors and Controls
5.1	Motorized and HVAC Equipment
6.0	Security
7.0	Fire Alarm Communications & Panels
7.1	Fire Alarm Indicators
7.2	Fire Alarm Sensors
8.0	Power Distribution Equipment
9.0	Communications – Tele/Data
9.1	Communications –Audio/Visual
9.2	Communications –Equipment
10.0	Site Work
11.0	Schematic and One-Line Diagram Symbols
11.1	One-Line Diagram Symbols – Switchboard Meters
11.2	Schematic and One-Line Diagram Symbols – Switches
12.0	Miscellaneous
13.0	Abbreviations
14.0	Nurse Call System

2.2 Alternate Safety Symbols

The fire protection industry has developed and published symbols, not all of which are currently in widespread use on electrical construction drawings. These symbols are shown for reference in Annex A.

2.3 References

This publication does not include every known North American symbol for electrical equipment shown on construction drawings. Some older symbols are either becoming obsolete over time or have been superseded by newer symbols (which are shown in this publication). Some electrical symbols are not widely used on construction drawings, but are found on wiring schematics and other types of more specialized drawings. Other drawing symbol standards and publications are listed for reference in Annex C.

3. Drafting Practices for Electrical Construction Drawings

3.1 Symbol Design and Presentation

The symbols in this standard are widely understood by those in the electrical design and construction field. Other symbols may also be used, provided that a suitable explanation of their meaning is included on the drawing where that symbol is used, or in a symbol legend.

The orientation of a symbol on a drawing does not alter the meaning of the symbol.

Every symbol making up part of an electrical circuit must begin with and end with another symbol. When a circuit continues on a different drawing, the end of the circuitry symbol must be appropriately noted on both drawings. This circuitry continued notice is necessary for both vertical and horizontal circuits.

Circuitry symbols may cross one another at any angle.

The angle at which a circuitry symbol meets another symbol has no particular significance unless otherwise noted. Circuits normally meet one another at a junction box, pull box, or piece of electrical utilization or communications equipment.

Future circuits and future equipment should be indicated by dashed lines and clearly marked as future circuits or future equipment on every drawing where applicable.

Luminaire symbols should be drawn whenever possible in their appropriate proportions, orientation, and shape. Where a luminaire symbol drawn to scale is too small to reproduce clearly, the symbol may be enlarged to an appropriate size while maintaining proportion and orientation.

3.2 General Drafting Practices

Electrical systems should be shown on plans separate from the architectural, structural, mechanical, and other systems. For clarity, it is recommended that the electrical symbols be drawn darker than the background drawing showing the building structure and/or other systems.

Different electrical systems such as power distribution, luminaire, voice/data, fire alarm, and security/ access control should be shown on separate plans if combining them on the same drawings would reduce clarity.

Electrical plans are generally drawn to scale. However, graphic symbols indicate only the approximate locations of electrical equipment. Provide dimensions, details, elevations, and sections where accurate locations of outlets, lighting fixtures, and other equipment are required.

Electrical wiring required for other systems such as HVAC, manufacturing equipment, and data processing systems should be shown on the electrical drawings where practical, if the installation is included in the electrical contract.

3.3 CADD Practices

The following drafting practices are recommended when using computer-aided design and drafting (CADD) systems to prepare electrical construction drawings.

All CADD electrical construction drawings should be created at full scale, (25mm = 25mm [1" = 1"]), and should be plotted at an appropriate scale on uniform sheets of sufficient size and separate from architectural, structural, mechanical or other drawings. Within a single drawing set, the drawing scale should be the same on as many drawings as possible.

All electronic files should include no more than one floor level of a building per electronic file. In no case should two different floors of any building be included in one electronic file.

Architectural, structural or mechanical items on the electrical construction drawings should be plotted with lighter weight lines than the electrical items.

Electronic files should use blocks (or cells) for all symbology. Blocks (or cells) should use a uniform scale. Non-uniformly scaled blocks and nested blocks should not be used. Instead of exploding blocks to achieve a desired graphic effect, create different variations of an existing block to accomplish the graphic symbol appearance needed.

No entities should reside on layer 0. This layer is used for referencing of blocks and blocks only.

All entities should be placed on layers related to their disciplines as defined by the *CAD Layer Guidelines* published by the American Institute of Architects. These include Electrical, Plumbing, HVAC, Architectural, Structural, Civil/Site, Mechanical, Process Piping, and Telecommunications/Data. The purpose of using different layers is to rationally develop designs using shared drawings. Therefore, it is suggested that the AIA layer naming convention be followed. Ordering information for the AIA *CAD Layer Guidelines* is shown in Annex C.

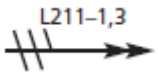
3.4 Electrical Construction Drawing Set

A typical set of electrical construction drawings includes the following:

- Plan for each floor, roof, surrounding site, and other area with electrical installations.
- Site plan(s) showing incoming utility services and substations; exterior transformers; feeders, trunk lines and backbone cables between buildings; and site lighting.
- Symbol list and abbreviation list.
- Schedule(s) of lighting fixtures, mechanical equipment connections, transformers, and other significant equipment as appropriate. Typical schedules are shown in Annex B.
- Riser and/or one-line diagram(s) for power distribution and other systems, as appropriate. Typical riser and one-line diagrams are shown in Annex B.

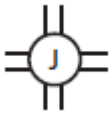
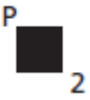
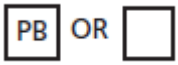
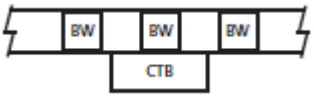
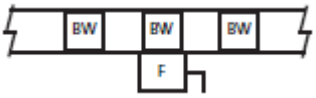
4. Contents for Symbol Groups

1.0 Raceways		
Number	**Preferred Symbol**	**Description**
1.001		Conduit concealed in finished areas, exposed in unfinished areas.
1.002		Conduit concealed in or under floor slab.
1.003		Non-rigid raceway system.
1.004	NE	Normal/emergency circuit.
1.005	EB	Emergency battery system wiring, minimum 10 AWG.
1.006	HT	Heat trace.
1.007	P	Underfloor power raceway.
1.008	T	Underfloor telecommunications raceway.
1.009	PT	Underfloor raceway for power and telecommunications.
1.010	S	Underfloor signal raceway.
1.011	PTD	Underfloor raceway for power, telephone, and data.
1.012	UCP	Undercarpet flat conductor cable (FCC) wiring system, power.
1.013	UCT	Undercarpet flat conductor cable (FCC) wiring system, telephone.
1.014	UCD	Undercarpet flat conductor cable (FCC) wiring system, data.

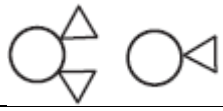
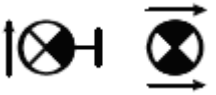
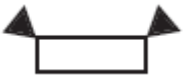
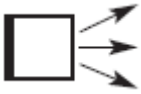
1.1 Raceways - Indicators		
Number	**Preferred Symbol**	**Description**
1.101		Conduit stub. Provide pull string. Terminate with bushing or cap if underground.
1.102		Conduit turning up.
1.103		Conduit turning down.
1.104	SZ 2C,4#1&1#6GND. OR SZ 53cm,4#1&1#6GND. N001, (2) 2 ½" GRC w/ 4-#4/0 AWG Cu, & 1-#4 AWG Cu GND / 1-#4 AWG Cu IEGC each, 150-feet"	Feeder Identifier or TAG (N-Normal Power, EM-Emergency Power. For Health Care Facilities, LS-Life Safety Branch, CR-Critical Branch, EQ-Equipment Branch). Where a Feeder Schedule is not provided: (Number of Conductor Sets or Raceways), Size (SZ), Raceway Type, Number of conductors in each set, Conductor size in AWG or KCMIL, conductor material, EGC/IEGC size and conductor material, and approximate circuit length. Example: Normal Power, Circuit Number 001, (2) sets of 2-1/2 inch Galvanized Rigid Conduit,~~Indicates trade size 2- or 53-mm conduit~~ with (4) #4/0~~1~~ AWG Copper conductors and (1) #4~~6~~ AWG Copper Isolated Equipment G~~g~~rounding Conductor in each raceway, approximately 150 feet in length.
~~1.105~~	(2)SZ 2C,4#1&1#6GND. OR (2)SZ 53cm,4#1&1#6GND.	~~Indicates (2) trade size 2- or 53-mm conduits with (4) 1 AWG and (1) 6 AWG ground conductors in each conduit.~~
1.10~~5~~6		Homerun to panelboard. Tick marks indicates the total number of conductors. The length of tick marks may vary. Number of arrows indicates number of circuits. ~~(~~Example: Two-circuit multi-wire branch circuit (two phase conductors denoted by long tick marks, one shared neutral conductor denoted by short tick mark) homerun to panelboard L211 CKTS #1 and #3.) Identification between conductor color coding, insulation types, and conductor material shall be noted either in the Feeder Schedule, if provided, on

		a symbols legend if differentiation of lines is used, or in specifications.
1.1067		Flexible connection betweento equipment locations.
1.1078		Direct connection to equipment.
1.1089		Branch circuit between equipment locations.~~,~~ Tick marks and dots indicate the total number of conductors required for the circuit (phase, neutral, EGC, IGC, and/or switch-leg conductors). Tick marks may be the same length, and tick marks may be included in lieu of dots, unless otherwise noted in the symbols legend. Identification between conductor color coding, insulation types, and conductor material shall be noted either in the Feeder Schedule, if provided, or on a symbols legend if differentiation of lines is used. Example: F~~f~~ull ~~hashes~~ tick marks indicate~~d~~ ungrounded "hot" (or switch-leg) circuit conductors. Half-~~-~~length tick mark~~hashes~~ indicates grounded (neutral) circuit conductors. (No tick marks~~hashes~~ indicate 1 hot and 1 neutral.) Dots indicate grounding conductors. Equipment bond size UNO. "IG indicates and isolated equipment grounding conductor.

268
269

1.2 Raceways – Boxes and Busways		
Number	**Preferred Symbol**	**Description**
1.201		Underfloor raceway system junction box, flush floor mounted.
1.202		Power pole with devices indicated in the specifications and on the drawing. "P" indicates type, "2" indicates circuit.
1.203		Telecom pole with devices with devices indicated in the specifications on the drawings, "T" indicates type.
1.204		Telecom/power pole with devices indicated in the specifications and on the drawings, "TP" indicates type, "2" indicates power circuit.
1.205		Pull box, size as indicated or as required.
1.206		Cabletray, size as indicated.
1.207		Cabletray, concealed, size as indicated.
1.208		Busway with cable tap box, rating and type as indicated on drawings.
1.209		Busway with plug-in device as indicated, shown with fused disconnect.
1.210		Busway feeding up.
1.211		Busway feeding down.
1.212		Busway expansion joint.
1.213		Wireway, size as indicated or required.

270
271
272

2.0 Luminaires (Lighting Fixtures)		
Number	**Preferred Symbol**	**Description**
2.001		Luminaire: (drawn to approximate shape and to the scale or large enough for clarity).
2.002		Luminaire strip type (length drawn to scale).
2.003		Multi-tube~~Fluorescent~~ strip luminaire (length drawn to scale).
2.004		Fixture – double or single head spotlight.
2.005		Exit sign/luminaire. Arrows and exit face as indicated on drawings (mounting heights to be determined by job specifications).
2.006		Light track. Length as indicated on the drawings, number of fixtures as indicated on drawings, and as indicated in the fixture schedule.
2.007		Emergency battery remote luminaire heads.
2.008		Emergency battery unit with integral luminaire heads.
2.009		Single pole-mounted luminaire.
2.010		Two pole mounted luminaires.
2.011		Roadway luminaire, cobra head type.
2.012		Bollard mounted site luminaire.
2.013		Outdoor wallpack.

2.1 Luminaires—Mounting		
Number	**Preferred Symbol**	**Description**
2.100		Surface mounted luminaire.
		Recessed luminaire.
		Wall mounted luminaire.
		Suspended, pendant, chain, stem or cable hung luminaire.
		Pole mounted luminaire with arm.
		Top pole-mounted luminaire.
		Luminaire mounted in-ground or floor-mounted. (Box around symbol.)

276
277

2.2 Luminaires—Orientation

Number	Preferred Symbol	Description
2.200		Accent/directional arrow, with or without tail. (Drawn from photometric center in direction of optics or photometric orientation.)
		Directional aiming line. (Drawn from photometric center and may be extended to actual aiming point if required.)
		Track mounted; length, luminaire types and quantities as shown. (Track length drawn to scale.)

278
279

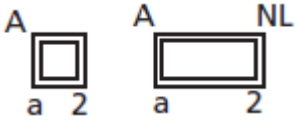
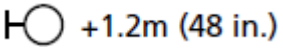
2.3 Luminaires—Emergency

Number	Preferred Symbol	Description
2.300		Luminaire providing emergency illumination. (Filled in.)

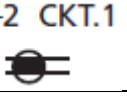
280
281

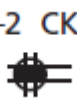
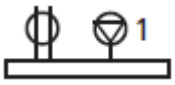
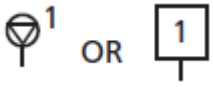
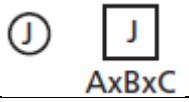
NOTE: Modifiers are shown with specific base symbols for clarity. Each modifier can be used with any of the base symbols.

2.4 Luminaires—Extended Modifiers

Number	Preferred Symbol	Description
2.401		Standard designations for all luminaire fixtures. "A" = Fixture type, refer to fixture schedule "NL" = Unswitched night light "2" = Circuit number "a" = Switch control
2.402		Mounting height.
2.403		Louvers.
2.404		Recessed, emergency fixture.

3.0 Outlets and Receptacles

Number	Preferred Symbol	Description
3.001		Duplex receptacle, floor-mounted F=flush mounted S=surface mounted
3.002		Duplex convenience receptacle. NEMA 5-15R (15A, 125V) or 5-20R (20A 125V).
3.003		Split receptacle where one outlet of the duplex receptacle (typically the top outlet) is controlled by either an automatic control device or a switch. Example, split receptacle with one outlet controlled by switch "a."
3.0043		Duplex convenience receptacle on emergency/standby circuit. Specify panelboard and circuit number.
3.0054		Single convenience receptacle.

3.0065		Single convenience receptacle on emergency/standby circuit. Specify panelboard and circuit number.
3.0076		Four-plex convenience receptacle.
3.0087		Four-plex convenience receptacle on emergency/standby circuit. Specify panelboard and circuit number.
3.0098		Multi-outlet assembly with outlets on centers as indicated on the drawings and in the specifications, mounted 150 mm (6 in.) above counter or at height as directed, A –– indicates type.
3.0109		Multioutlet assembly, devices as indicated.
3.0110		Special receptacle –– typical notation: 1 indicates example "1" = __A, ___/___V, _ Pole, _ Wire, _ NEMA __-__ "2" = __A, ___/___V, _ Pole, _ Wire, _ NEMA __-__ "3" = __A, ___/___V, _ Pole, _ Wire, _ NEMA __-__
3.0121		Clock hanger outlet recessed mounted 2.5m (8 ft) AFF or 200 mm (8 in) below ceiling as appropriate and as directed.
3.0132		Flush mounted floor box, adjustable, with both power and voice/data receptacles.
3.0143		Junction box. "AxBxC" indicates dimensions of junction box in either centimeters or inches.
3.0154		Duplex receptacle ceiling mounted.
3.0165		Four-plex receptacle—ceiling mounted

Receptacle and Outlets Typical Notations:

"a" = Switched outlet, "a"—indicates switch control.
"AFCI" = Arc fault circuit interrupter.
"B" = Pedestal mounted on bench top.
"BF" = Below floor.

“C”	=	Mounted 150mm (6 in.) to bottom of the device above counter of 1.0 m (42 in.) AFF. Coordinate exact mounting height with architectural drawings.
“CLG”	=	Ceiling mounted.
“D”	=	Dedicated device on individual branch circuit.
“E”	=	Emergency.
“EXIST.”	=	Existing device/equipment.
“F”	=	Flush floor box with fire/smoke rated penetration.
“GFCI”	=	Ground fault circuit interrupter, personal protection.
“GFPE”	=	Ground fault protection of equipment.
“H”	=	Horizontally mounted.
“HOSP”	=	Hospital grade device.
“IG”	=	Isolated ground receptacle with separate green ground conductor to isolated ground bus in panel.
“M”	=	Modular furniture service—provide flexible connection, coordinate exact location with furniture plans.
“PED”	=	Pedestal mounted with two-hour fire/smoke rated penetration.
“PT”	=	Poke thru with two-hour fire/smoke rated penetration.
“S”	=	Surface mounted floor box.
“SP”	=	Surge protection receptacle.
“T”	=	Tamper resistant safety receptacle.
“TL”	=	Twist-lock.
“W”	=	Wall mounted device at 1.2m (48 in.) AFF unless otherwise indicated.
“WP”	=	Weatherproof receptacle with “NRTL” listed coverplate for wet location with plug installed 1.2m (48 in.) AFF unless otherwise indicated.
+XX	=	Dimensioned height AFF to the centerline of the device unless otherwise indicated.

4.0 Switches and Sensors

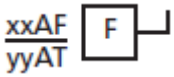
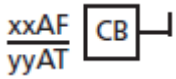
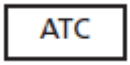
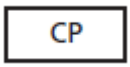
Number	Preferred Symbol	Description
4.001	$ or S	Single pole switch.
4.002	$_2$ or S$_2$	Double pole switch.
4.003	$_3$ or S$_3$	Three-way switch.
4.004	$_4$ or S$_4$	Four-way switch.
4.005	$_a$ or S$_a$	Control switch control (lower case letter indicates devices/circuit being controlled).
4.006	$_{CB}$ or S$_{CB}$	Circuit breaker switch.

4.007	$\$_{DT}$ or S_{DT}	Single pole/double throw switch.
4.008	$\$_{G}$ or S_{G}	Pilot (glow) switch toggle, glows in off position.
4.009	$\$_{H}$ or S_{H}	Horizontally mounted switch, with the “on” position to the left.
4.010	$\$_{K}$ or S_{K}	Key operated switch.
4.011	$\$_{KP}$ or S_{KP}	Key operated switch with pilot light “on” when switch is “on.”
4.012	$\$_{LV}$ or S_{LV}	Low voltage switch.
4.013	$\$_{LM}$ or S_{LM}	Low voltage master switch.
4.014	$\$_{MC}$ or S_{MC}	Momentary contact switch.
4.015	$\$_{P}$ or S_{P}	Switch with pilot light “on” when switch is “on.”
4.016	$\$_{T}$ or S_{T}	Timer switch.
4.017	$\$_{WP}$ or S_{WP}	Weatherproof, single-pole switch.
4.018		Dimmer switch, rated 1000W, unless otherwise indicated. “LV” = low voltage. “FL” = fluorescent. “0-10V” indicates low voltage dimmers that provide a 0-10 V signal to the ballasts or drivers. “FPh” indicates ballasts or LED driver dimmers that use a firing angle control that omits the beginning part of the AC alternation to provide the dimming signal control to the lighting source driver or ballast. “RPh” indicates ballasts or LED driver dimmers that use a firing angle control that omits the ending part of the AC alternation to provide the dimming signal control to the lighting source driver or ballast.
4.019		Occupancy sensor, wall mounted with off—auto override switch.

4.020		Occupancy sensor—ceiling mounted. "P"—indicates multiple switches wired in parallel.
4.021	$\$_{PROJ}$ or S_{PROJ}	Motorized projection screen raise/lower switch.

321
322

5.0 Motors and Controls

Number	Preferred Symbol	Description
5.001		Disconnect switch, unfused type, size as indicated on drawings. "xxA" indicates amperage.
5.002		Disconnect switch, fused type, size as indicated on drawings. "xxAF" indicates frame size. "xxAT" indicates trip size.
5.003		Enclosed circuit breaker, size as indicated. "xxAF" indicates frame size. "xxAT" indicates trip size.
5.004		Magnetic contactor, size as indicated on drawings.
5.005		Adjustable speed drive.
5.006	$\$_{M}$	Motor starter switch.
5.007		Magnetic motor starter. "RV" indicates reduced voltage. Starter size as indicated.
5.008		Combination magnetic starter and disconnect switch. Starter size and fuse rating as indicated.
5.009		Automatic temperature control panel.
5.010		Equipment control panel.
5.011		Relay.
5.012		Toggle disconnect switch.

5.013		Thermal motor switch with handle guard and pad-lock capability. “P”—indicates pilot light.
5.014		Emergency power shunt trip.
5.015		Pushbutton.
5.016		On/off pushbutton station.
5.017		Three function pushbutton switch (up/down/stop).
5.018		Aquastat.
5.019		Firestat.
5.020		Humidistat.
5.021		Line voltage thermostat.
5.022		Low voltage thermostat.
5.023		Thermostat.
5.024		Solenoid valve.
5.025		Time switch.
5.026		Air flow switch.
5.027		Electric/pneumatic switch.
5.028		Hand/off/automatic selector switch.
5.029		Flow switch.

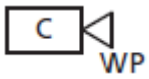
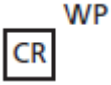
5.030		Irrigation control.
5.031		Limit switch.
5.032		Pneumatic/electric switch.
5.033		Photo cell or photo control.
5.034		Pressure switch.

323
324

5.1 Motorized and HVAC Equipment		
Number	**Preferred Symbol**	**Description**
5.101		Capacitor.
5.102		Motor. “3”—indicates horsepower.
5.103		Motorized damper.
5.104		Baseboard heater.
5.105		Baseboard heater with box.
5.106		Resistance heater.
5.107		Unit type heater.
5.108		Ceiling fan.
5.109		Paddle fan.
5.110		Wall fan.

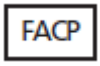
5.111		Water heater.

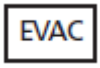
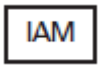
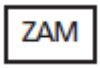
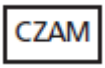
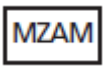
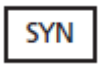
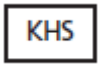
325
326

6.0 Security		
Number	**Preferred Symbol**	**Description**
6.001		CCVT camera. “WP” indicates weather-proof exterior camera.
6.002		CCTV Coaxial cable outlet and power outlet.
6.003		CCTV monitor outlet.
6.004		Doorbell.
6.005		Door buzzer.
6.006		Door chime.
6.007		Electric door opener.
6.008		Electric door strike.
6.009		Intercom unit—flush mounted.
6.010		Master intercom and directory unit.
6.011		Motion detector.
6.012		Security door alarm magnetic lock.
6.013		Security card reader. “WP” indicates weather-proof.
6.014		Security control panel.

6.015		Security door contacts.
6.016		Security exit push button.
6.017		Security keypad.
6.018		Infra-red detector.
6.019		Ultrasonic detector.
6.020		Door alarm.
6.021		Panic bar.

327
328

7.0 Fire Alarm Communications and Panels		
Number	**Preferred Symbol**	**Description**
7.001		Fire alarm master box.
7.002		Firefighter's phone.
7.003		Coded transmitter.
7.004		Drill key switch.
7.005		Key repository (Knox box).
7.006		Annunciator panel.
7.007		Fire alarm control panel.

7.008		Voice evacuation panel.
7.009		Fire alarm terminal cabinet.
7.010		Battery pack and charger.
7.011		Air sampling control/detector panel with associated air sampling piping network.
7.012		Transponder.
7.013		Individual addressable module.
7.014		Zone adapter module.
7.015		Control zone adapter module.
7.016		Monitor zone adapter module.
7.017		Synchronized module.
7.018		Kitchen hood system.

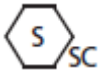
329
330

7.1 Fire Alarm Indicators		
Number	**Preferred Symbol**	**Description**
7.101		Control relay.
7.102		Door holder.
7.103		Horn and strobe.
7.104		Mini horn and strobe.

7.105		Horn unit only.
7.106		Strobe unit only.
7.107		Bell and strobe.
7.108		Buzzer and strobe.
7.109		Chime and strobe.
7.110		Speaker and strobe.
7.111		LED pilot light.
7.112		Indicating beacon. “WP” indicates weather-proof.
7.113		Speaker—ceiling mounted.

331
332

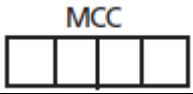
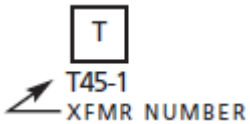
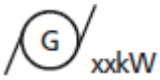
7.2 Fire Alarm Sensors		
Number	**Preferred Symbol**	**Description**
7.201		Manual pull station.
7.202		Smoke detector.
7.203		Duct smoke detector with two auxiliary contacts.
7.204		Remote station for duct mounted smoke detectors.
7.205		Area type smoke detector used at duct work opening.
7.206		Elevator recall with auxiliary contacts.

7.207		Self-contained smoke detector—single station type.
7.208		Smoke detector—visual and audible signal.
7.209		Beam smoke detector. "S"—indicates sending unit. "R"—indicates receiver.
7.210		Carbon monoxide detector. Line voltage with battery backup.
7.211		Flame detector.
7.212		Automatic heat detector (135°F rate of rise).
7.213		Automatic heat detector. "F"—indicates fixed temperature 190°F.
7.214		Hydrogen detector.
7.215		Motor operated fire/smoke duct damper.
7.216		Water flow switch.
7.217		Low pressure switch.
7.218		Tamper switch.
7.219		Post indicator valve.
7.220		End-of-line resistor.

333
334

8.0 Power Distribution Equipment

Number	Preferred Symbol	Description
8.001		Lighting or power panel, recessed.

8.002		Lighting or power panel, surface mounted.
8.003		Distribution panel
8.004		Lighting or power panel on normal/generator feeder.
8.005		Distribution panel on normal/generator feeder.
8.006		Motor control center.
8.007		Dry type transformer, refer to transformer schedule. "T45"—indicates transformer type, floor mounted unless otherwise indicated. "W"—indicates wall mounted, and "S"—indicates suspended. "R"—indicates K rating.
8.008		Transformer—pad mount.
8.009		Current transformer cabinet.
8.010		Generator. Size as noted.
8.011		Meter—single.
8.012		Meter and socket.
8.013		Transfer switch. "TS"=manual transfer switch. "ATS"=automatic transfer switch.

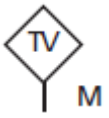
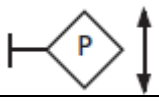
335
336

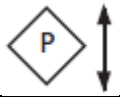
9.0 Communications—Tele/Data

Number	Preferred Symbol	Description
9.001		Data outlet.
9.002		Data outlet floor type. "F" indicates flush mounted. "S" indicates surface mounted.

9.003		Telephone/data outlet.
9.004		Telephone/data outlet floor type. “F” indicates flush mounted. “S” indicates surface mounted.
9.005		Telephone outlet.
9.006		Telephone outlet—wall mounted.
9.007		Telephone outlet floor type. “F” indicates flush mounted. “S” indicates surface mounted.

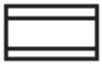
337
338

9.1 Communications—Audio/Visual		
Number	**Preferred Symbol**	**Description**
9.101		Call in switch.
9.102		Cable antenna system outlet. (CATV).
9.103		Master antenna system outlet. (MATV).
9.104		Microphone outlet—floor mounted.
9.105		Microphone outlet—wall mounted.
9.106		Speaker—ceiling mounted.
9.107		Speaker—wall mounted.
9.108		Speaker horn.
9.109		Speaker bi-directional paging—wall mounted.

9.110		Speaker bi-directional paging—ceiling mounted.
9.111		Intercom unit—flush mounted.
9.112		Master intercom and directory unit.
9.113		Volume control.

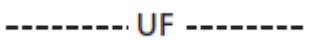
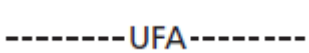
339
340

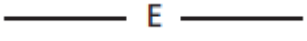
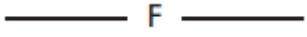
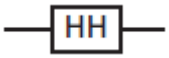
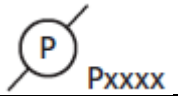
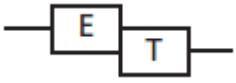
9.2 Communications—Equipment

Number	Preferred Symbol	Description
9.201		Equipment cabinet.
9.202		Equipment rack—wall mounted.
9.203		Equipment rack—free standing.
9.204		Terminal cabinet with 19mm (3/4 in.) plywood back.
9.205		Plywood backboard.

341
342

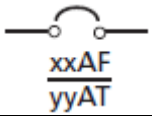
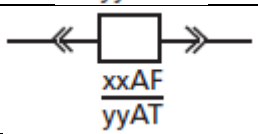
10.0 Site Work

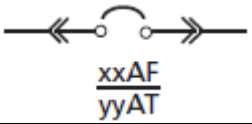
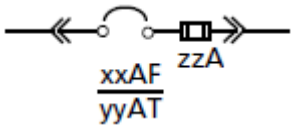
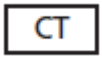
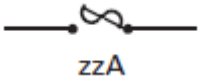
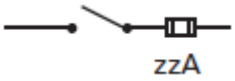
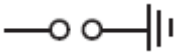
Number	Preferred Symbol	Description
10.001		Underground feeder.
10.002		Underground telephone.
10.003		Underground fire alarm.

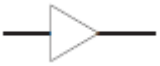
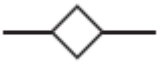
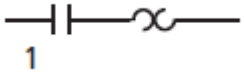
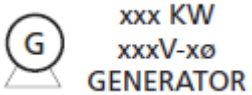
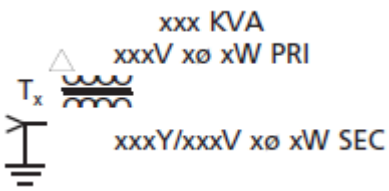
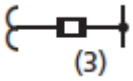
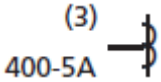
10.004		Underground television (CATV).
10.005		Above ground pole mounted electrical.
10.006		Above ground pole mounted telephone.
10.007		Above ground pole mounted fire alarm.
10.008		Above ground pole mounted television (CATV).
10.009		Manhole.
10.010		Handhole.
10.011		Utility pole. “Pxxxx” indicates pole number.
10.012		Combination pre-fabricated manholes for power and tel/data systems. “E” = denotes power. “T” = denotes tele/data.
10.013		“J” hook.

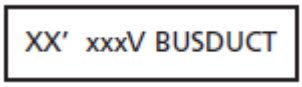
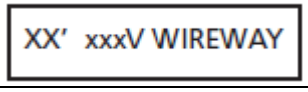
343
344

11.0 Schematic and One-line Diagram Symbols

Number	Preferred Symbol	Description
11.001		Capacitor.
11.002		Circuit breaker (open). “xxAF” indicates frame size. “yyAT” indicates trip size.
11.003		Circuit breaker (enclosed). “xxAF indicates frame size. “yyAT” indicates trip size.
11.004		Primary draw-out type circuit breaker. “xxAF” indicates frame size. “yyAT” indicates trip size.

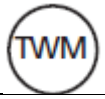
11.005		Low voltage draw-out type circuit breaker. “xxAF” indicates frame size. “yyAT” indicates trip size.
11.006		Low voltage draw-out type circuit breaker with current limiting fuses. “xxAF” indicates frame size. “yyAT” indicates trip size. “zzA” indicates fuse rating.
11.007		Contact, normally open (NO). (“TC”—with timed closing).
11.008		Contact, normally closed (NC). (“TO”—with timed opening).
11.009		Current transformer cabinet.
11.010		Fused cutout. “zzA” indicates fuse rating.
11.011		Disconnect switch unfused.
11.012		Disconnect switch, air-break type with fuse. “zzA” indicates fused rating.
11.013		Fuse. “zzA” indicates fuse rating.
11.014		Overload relay.
11.015		Grounding connection—system and or equipment.
11.016		Kirk key interlock system. “2”—indicates related Kirk keys.
11.017		Lightning arrester and grounding to protect all phases.
11.018		Motor and label. “3” denotes horsepower.
11.019		Motor operator for circuit breakers or switches.
11.020		Network protector.

11.021		Panelboard.
11.022		Pothead.
11.023		Stress cone.
11.024		Resistor.
11.025		Shunt trip.
11.026		Magnetic starter with NEMA size indicated.
11.027		Ground fault circuit interrupter, personnel protection.
11.028		Generator, ratings as noted.
11.029		Transformer, dry type. Unless otherwise indicated.
11.030		Potential transformer. “3”—indicates quantity.
11.031		Current transformer. “3”—indicates quantity, “400- 5A” indicates ratio.
11.032		3- phase, 3-wire delta connection.
11.033		Corner grounded delta.
11.034		3- phase, 4-wire wye connection (grounded neutral).
11.035		Adjustable frequency drive. “3” references detail number.

11.036		Busduct or busway.
11.037		Wireway.

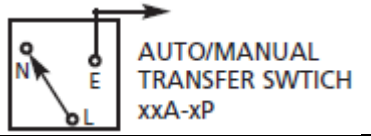
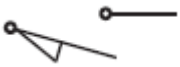
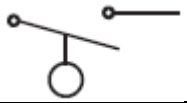
345
346

11.1 One-line Diagram Symbols—Switchboard Meters

Number	Preferred Symbol	Description
11.101		Customer meter.
11.102		Totalizing watt hour meter.
11.103		Varmeter.
11.104		Ammeter.
11.105		Ammeter phase switch.
11.106		Demand meter.
11.107		Ground detector.
11.108		Synchroscope.
11.109		Power factor meter.
11.110		Frequency meter.
11.111		Voltmeter.
11.112		Volt-ammeter.
11.113		Voltmeter phase switch.

11.114		Wattmeter.
11.115		Watthour meter.

11.2 Schematic and One-line Diagram Symbols—Switches

Number	Preferred Symbol	Description
11.201		Transfer switch.
11.202		Push button (start).
11.203		Push button (stop).
11.204		Limit switch.
11.205		Flow switch.
11.206		Pressure switch.
11.207		Float switch.
11.208		Pilot light. Letter indicates color. Example: R=red.
11.209		Solenoid.
11.210		Proximity Switch

12.0 Miscellaneous

Number	Preferred Symbol	Description
12.001	— G —	Ground bar. Length as noted.
12.002	AC / 2	Mechanical equipment tag number, refer to mechanical equipment schedule.
12.003	K2	Equipment tag number, refer to equipment schedule, "K"—indicates kitchen, "C"—indicates computer.
12.004	B	Note symbol, refer to note as indicated.
12.005	1	Feeder number, refer to "feeder schedule."
12.006	A	Typical/similar room or area layout symbol. "A"—indicates layout type.
12.007	A / E–2 CKT/ P21–5,7	Typical layout symbol—refer to layout type. "A" on drawing E-2, circuits to be used are as indicated.
12.008	2 / E–4 DESCRIPTION SCALE: N.T.S.	Detail header, indicating detail No. 2 on drawing E-4.
12.009	B / E–2	Section identifier, indicating section "B" on drawing E-2. Left or right arrow.
12.010	2 / E–4	Detail identifier, indicating detail No. 2 on drawing E-4.

351
352

13.0 Abbreviations

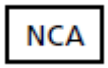
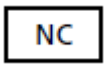
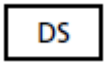
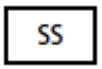
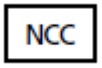
Abbreviation	Description	Abbreviation	Description
+72	Mounting units to centerline above finished floor (AFF) or grade (AFG)	LP	Lighting panelboard
1P	One Pole	LFNC	Liquidtight flexible nonmetallic conduit
1P1W	One pole, one wire	LS	Limit switch
1P2W	One pole, two wire	LTG	Lighting

2P	Two pole	LV	Low voltage
2P2W	Two pole, two wire	MAINT	Maintained
2P3W	Two pole, three wire	MAU	Make-up air unit
3P	Three pole	MAX	Maximum
3P2W	Three pole, two wire	MC	Metal clad cable
3P3W	Three pole, three wire	MCB	Main circuit breaker
3P4W	Three pole, four wire	MCC	Motor control center
4P	Four pole	MD	Motorized damper
4P4W	Four pole, four wire	MDP	Main distribution panel
A	Ampere	MFR	Manufacturer
AC	Alternating current	MISC	Miscellaneous
AF	Ampere frame	MLO	Main lugs only
AFCI	Arc-fault circuit interrupter	MOD	Motor operated disconnect switch
AFF	Above finished floor	MTD	Mounted
AFG	Above finished grade	MTG	Mounting
AHU	Air handling unit	MTS	Manual transfer switch
AIC	Ampere interrupting capacity	N	North
AL	Aluminum	N/A	Not applicable
ARCH	Architect/Architectural	NC	Normally closed
AS	Ampere switch	NEC	National Electrical Code
AT	Ampere trip	NF	Non-fused
ATS	Automatic transfer switch	NIC	Not in contract
AUD	Audiometer box connection	NL	Night light
AUX	Auxiliary	NM	Nonmetallic sheathed cable
A/V	Audio visual	NO	Normally open
AWG	American wire gauge	NRTL	Nationally Recognized Resting Lab
BLDG	Building	NTS	Not to scale
C	Conduit (Generic term for raceway. Provide as specified.)	#	Number
CAM	Camera	O_2	Oxygen
CAT	Catalog/Category	OHD	Overhead door operator
CATV	Cable television	P	Pole
CB	Circuit breaker	PB	Pull box
CKT	Circuit	PC	Plumbing system contractor
℄	Centerline	PE	Primary electric service
COL	Column	PH or Ø	Phase
CT	Current transformer	PIR	Passive Infrared
CU	Copper	PIV	Post indicating valve
DC	Direct Current	PNL	Panel or panelboard
△	Delta	PP	Power panel
DET	Detector	PR	Pair
DISC	Disconnect	PRI	Primary
DN	Down	PT	Potential transformer
DST	Distribution	PVC	Polyvinyl chloride conduit
DWG	Drawing	PWR	Power
DT	Dust-tight(*)	RE	Remove existing

E	Wired on emergency circuit	REC	Recessed
EA	Each	RECP	Receptacle
EC	Electrical contractor	REF	Roof exhaust fan
EF	Exhaust fan	RL	Relocate existing
ELEC	Electric(al)	RM	Room
EMER	Emergency	RMC	Rigid metal conduit
EMT	Electric metallic tubing	RSC	Rigid steel conduit
ENCL	Enclosure	RT	Rain-tight(*)
EOL	End of line	RTU	Rooftop unit
EPO	Emergency power off	S	Surface mounted
EQUIP	Equipment	SCH	Schedule
EWC	Electric water cooler	SD	Smoke damper
EWH	Electric water heater	SE	Secondary electric service
EXIST	Existing	SEC	Secondary
F	Flush	SIG	Signal
FA	Fire alarm	SN	Solid neutral
FBO	Furnished by others	SP	Spare
FC	Fire protection contractor	SPKR	Speaker
FCU	Fan coil unit	SPL	Splice
FDN	Foundation	SS	Stainless steel
FIXT	Fixture	STP	Shielded twisted pair
FLA	Full load amps	STL	Carbon steel
FLEX	Flexible	SUSP	Suspended
FLR	Floor	SW	Switch
FMC	Flexible metallic conduit	SWBD	Switchboard
FRE	Fiberglass reinforced epoxy conduit	SWGR	Switchgear
FURN	Furniture	TC	Telephone cabinet
GC	General contractor	TCI	Telecommunications cabling installer
GEN	Generator	TCP	Temperature control pane
GFCI	Ground fault circuit interrupter	TEL/DATA	Telephone/data
GFPE	Ground fault protection equipment	TEL	Telephone
GND	Grounded	TEMP	Temporary
GRC	Galvanized rigid conduit	TERM	Terminal(s)
HGT	Height	TV	Television
HP	Horsepower	TYP	Typical
HV	High voltage	UC	Under counter
HVAC	Heating, Ventilating and Air Conditioning	UG	Underground
HW	Hot water	UH	Unit heater
Hz	Hertz (cycle per second)	UOI or UON	Unless Otherwise Indicated/Unless Otherwise Noted
IAM	Individual addressable module	UPS	Uninterruptible power source
IC	Intercommunication	UTIL	Utility

ID	Identification	UTP	Unshielded twisted pair
IG	Isolated ground	V	Volt
IMC	Intermediate metal conduit	VT	Vapor-tight(*)
IPS	Interruptible power supply	W	Watt
IR	Infrared	W/	With
JB	Junction box	WH	Watthour
KCMIL	Thousand circular mils	WP	Weatherproof
K/O	Knock-out	WT	Water-tight(*)
KVA	KiloVolt Ampere	XFMR	Transformer
KVAR	KiloVolt Ampere Reactive	XP	Explosion-proof(*)
KW	Kilowatt	Y	Wye
LFMC	Liquidtight flexible metallic conduit	ZAM	Zone adapter module

(*) It is recommended that the appropriate NEMA designation be used in place of this abbreviation.

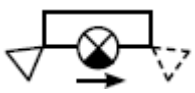
14.0 Nurse Call System		
Number	**Preferred Symbol**	**Description**
14.001		Nurse call annunciator.
14.002		Emergency pull cord station.
14.003		Dome light with tone.
14.004		Nurse call—patient station. “A” = denotes connection to remote annunciator in emergency room. “PC” = denotes patient pull station. “SA” = denotes staff assist station.
14.005		Duty station.
14.006		Staff station.
14.007		Nurse call system central cabinet.

(This Annex is not part of the Standard)

Annex A: Alternate Fire Safety Symbols

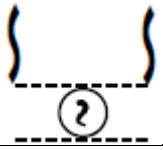
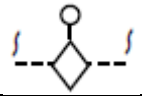
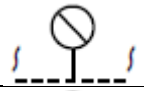
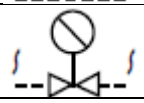
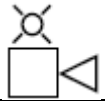
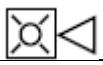
Not all of the following fire safety symbols are in common use on electrical construction drawings at this time. They are reprinted here for reference with permission from NFPA 170, *Fire Safety Symbols* (ANSI). This excerpt does not represent the official position of the National Fire Protection Association, which is represented only by the standard in its entirety. The following symbols are copyright ©2017, National Fire Protection Association, Quincy, MA.

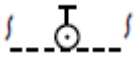
5-5 Symbols for Control Panels		
505.1		Control Panel, Basic Shape
(a)		Fire Alarm Control Panel
(b)		Fire System Annunciator
(c)		Fire Alarm Transponder or Transmitter
(d)		Elevator Status/Recall
(e)		Fire Alarm Communicator
(f)		Halon Control Panel
(g)		Control panel for heating, ventilation, air conditioning, exhaust stairwell pressurization or similar equipment.

5-5 Symbols Related to Means of Egress		
5-6.1		Emergency Light, Battery Powered. Indicate the number of lamps on the unit. Indicate if light head(s) or lamp(s) are remote from the battery.
5-6.2		Illuminated Exit Sign, Single Face. Indicate the direction of traffic flow for the face.
5-6.3		Illuminated Exit Sign, Double Face. Indicate the direction of traffic flow for each face.
5-6.4		Combined Battery-Powered Emergency Light and Illuminated Exit Sign. Number of lamps on unit to be indicated. Indicate if light head(s) or lamp(s) are remote from the battery. Indicate the direction of traffic flow for the face.

373
374

5-7 Symbols for Fire Alarm, Detection, and Related Equipment		
5-7.1 Signal Initiating Devices and Switches		
5-7.1.1		Manual Station, Basic Shape
(a)		Halon
(b)		Carbon Dioxide
(c)		Dry Chemical
(d)		Foam
(e)		Wet Chemical
(f)		Pull Station
5-7.1.1.1		Fire Service or Emergency Telephone Station, Basic Shape
(a)		Accessible
(b)		Jack
(c)		Hand-set
5-7-1.1.2		Abort Switch
5-7.1.2		Automatic Detection and Supervisory Devices, Basic Shape
5-7.1.1.1*		Heat Detector (Thermal Detector), Basic Shape
(a)		Combination Rate of Rise and Fixed Temperature
(b)		Rate Compensation
(c)		Fixed Temperature
(d)		Rate of Rise Only

5-7.1.2.2*		Smoke Detector, Basic Shape
(a)		Photoelectric Products of Combustion Detector
(b)		Ionization Products of Combustion Detector
(c)		Beam Transmitter
(d)		Beam Receiver
5-7.1.2.3		Smoke Detector in Duct
5-7.1.2.4		Gas Detector
5.7.1.2.5*		Flame Detector (Flicker Detector). Indicate ultraviolet, infrared, or visible radiation-type detector.
5-7.1.2.6		Flow Detector/Switch
5-7.1.2.7*		Pressure Detector/Switch. Specify type (water, low air, high air, etc.).
5-7.1.2.8*		Level Detector/Switch
5-7.1.2.9		Tamper Detector (Tamper Switch)
5-7.1.2.10		Valve with Tamper Detector/Switch
5-7.2 Indicating Appliances		
5-7.2.1		Speaker/Horn
(a)		Mini-Horn
5-7.2.2		Bell (Gong)
5-7.2.3		Water Motor Alarm (Water Motor Gong). Shield optional.
5-7.2.4		Horn with Light
(a)		Horn with light as separate assembly
(b)		Horn with light as one assembly
5-7.2.5*		Light (Lamp, Signal Light, Indicator Lamp, Strobe)

5-7.3 Related Equipment		
5-7.3.1		Door Holder

* Symbol orientation not to be changed

(This Annex is not part of the Standard)

Annex B: Typical Risers, One-line Diagrams, and Schedules

This Annex provides examples of typical schedules, riser diagrams, and one-line diagrams that are included in electrical construction drawings. A given set of drawings will not necessarily include every typical example included here. This Annex includes the following:

- Panel schedule
- Lighting fixture schedule
- Transformer schedule
- Mechanical equipment schedule
- Feeder schedule
- Electrical one-line diagram
- Fire alarm riser

Panel Schedule

Panel: _____ Voltage: _____ Phase: _____ Wires: _____ Mains: _____

Mount: _____ Enclosure: _____ Location: _____

Load Name	Load (VA)	Bkr. Frame	Trip	Ckt. No.	A	B	C	Ckt. No.	Trip	Bkr. Frame	Load (VA)	Load Name
				1				2				
				3				4				
				5				6				
				7				8				
				9				10				
				11				12				
				13				14				
				15				16				
				17				18				
				19				20				
				21				22				
				23				24				
				25				26				
				27				28				
				29				30				
				31				32				
				33				34				
				35				36				
				37				38				
				39				40				
				41				42				

Phase A:_____ Phase B:_____ Phase C: _____ Total VA: _____

Mfg./Type: _____ Modifications: _____ Amps RMS. Sym.: _____

Lighting Fixture Schedule

Type	Manufacturer	Catalog No.	Description	Mounting	Lamps

Transformer Schedule

Designation	Manufacturer	Catalog Number	KVA	Phases	Primary		Secondary		Grounding Conductor Size/Number	Impedance	Mounting
					Voltage	Conductor Size/Number	Voltage	Conductor Size/Number			

Transformer Schedule

Designation	Manufacturer	Catalog Number	KVA	ø	PRI. Volts	PRI. Conductor Size/No.	Sec. Volts	Sec. Conductor Size/No.	Ground Conductor Size/No.	Mounting

Mechanical Equipment Schedule

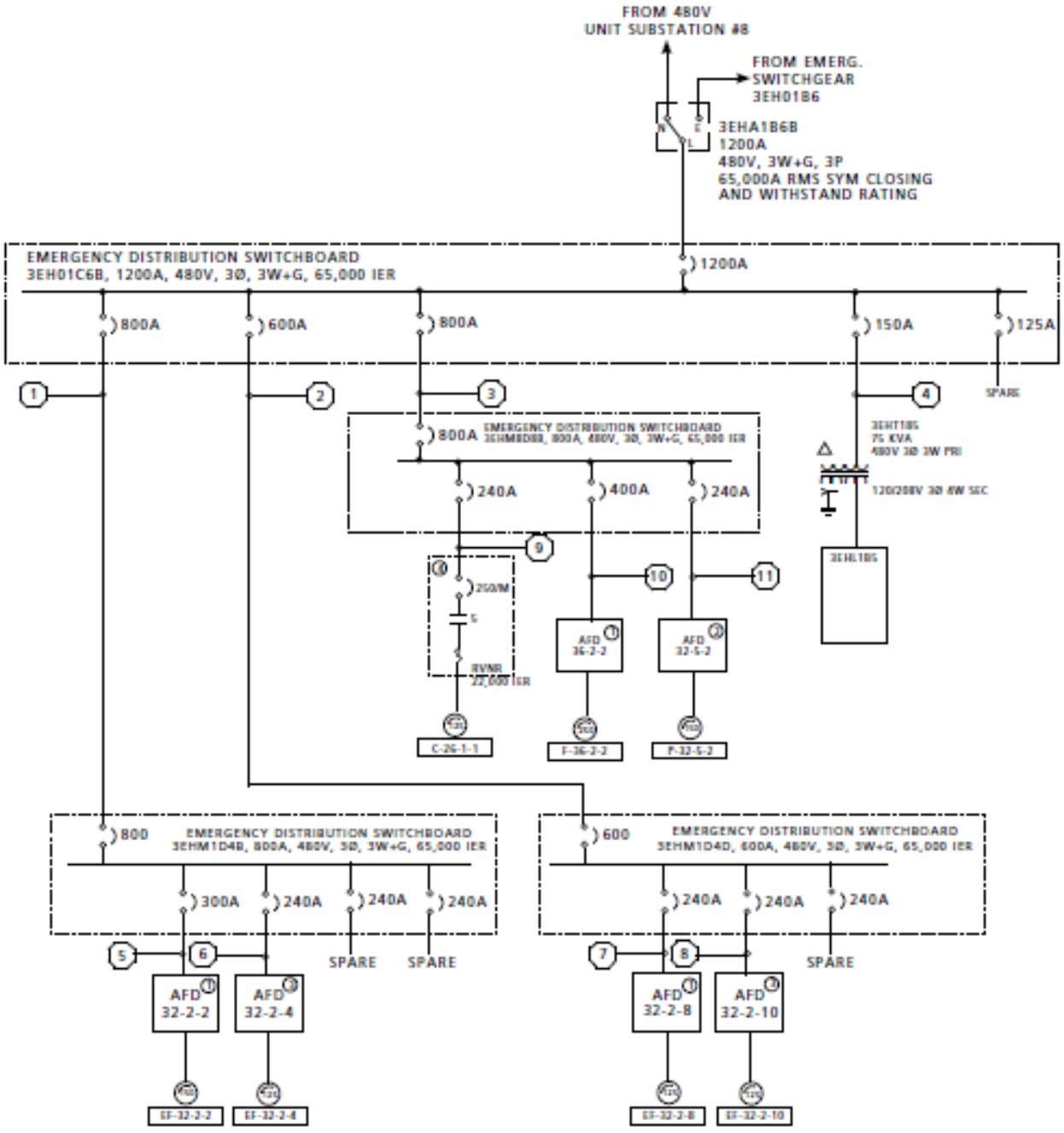
Designation	Description	Quantity	Volt	ø	FLA	HP	KVA	Min. Wire Size/Type	Max. Fuse Size	Min. CCT Amps	Remarks/ Disconnect Type

Feeder Schedule

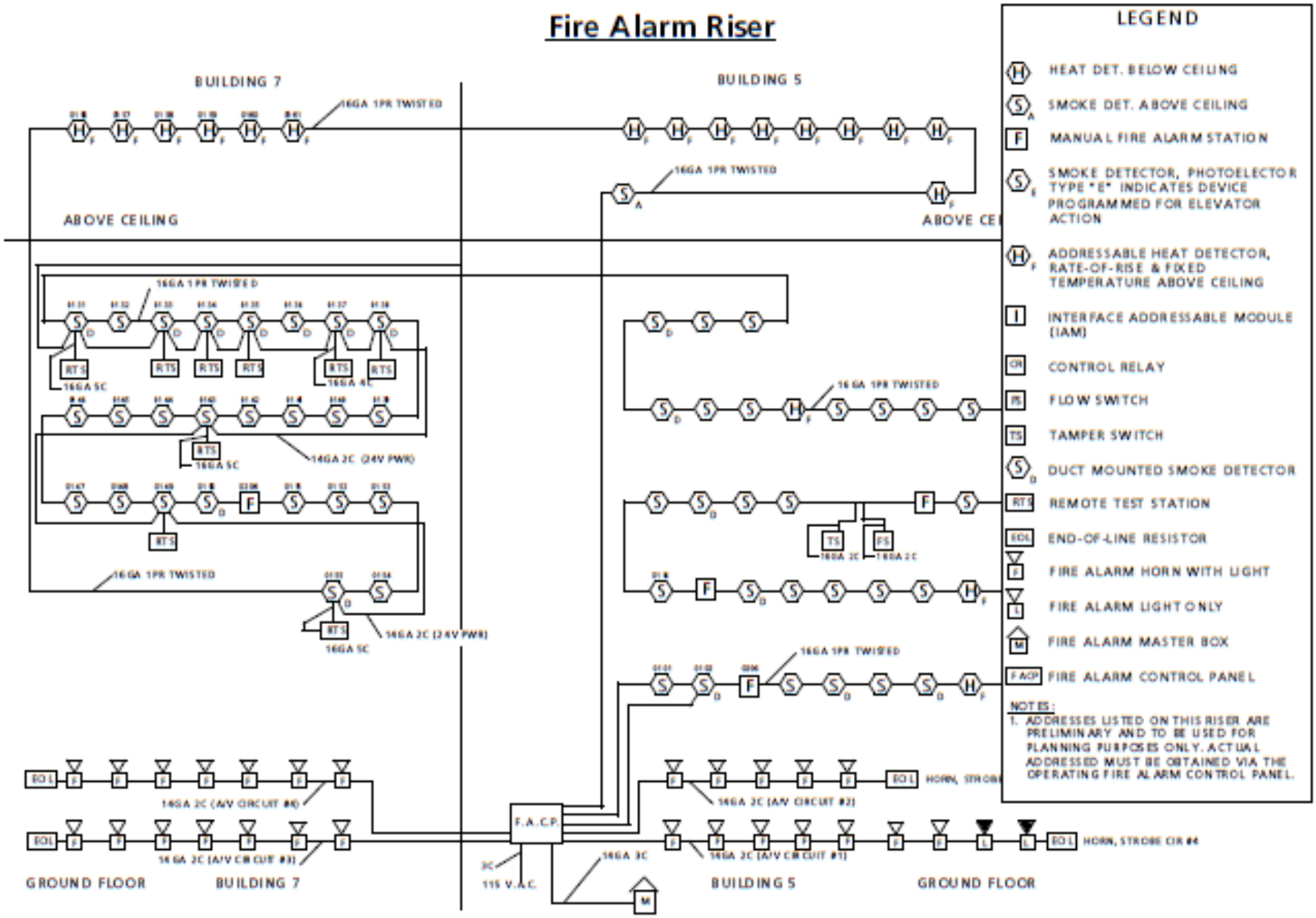
#

No.	No. Runs	No. Wires/Size	Insul.	CU/AL	Conduit	Origin	Termination

Electrical One-Line Diagram



Fire Alarm Riser



LEGEND

- H — HEAT DET. BELOW CEILING
- S_A — SMOKE DET. ABOVE CEILING
- F — MANUAL FIRE ALARM STATION
- S_E — SMOKE DETECTOR, PHOTOELECTOR TYPE "E" INDICATES DEVICE PROGRAMMED FOR ELEVATOR ACTION
- H_F — ADDRESSABLE HEAT DETECTOR, RATE-OF-RISE & FIXED TEMPERATURE ABOVE CEILING
- I — INTERFACE ADDRESSABLE MODULE (IAM)
- CR — CONTROL RELAY
- PS — FLOW SWITCH
- TS — TAMPER SWITCH
- S_D — DUCT MOUNTED SMOKE DETECTOR
- RTS — REMOTE TEST STATION
- EOL — END-OF-LINE RESISTOR
- F — FIRE ALARM HORN WITH LIGHT
- L — FIRE ALARM LIGHT ONLY
- M — FIRE ALARM MASTER BOX
- FACP — FIRE ALARM CONTROL PANEL

NOTES:

1. ADDRESSES LISTED ON THIS RISER ARE PRELIMINARY AND TO BE USED FOR PLANNING PURPOSES ONLY. ACTUAL ADDRESSED MUST BE OBTAINED VIA THE OPERATING FIRE ALARM CONTROL PANEL.

(This Annex is not part of the Standard)

Annex C: Reference Standards

This Annex includes Standards referenced by this publication, as well as other electrical symbol references that are not specifically referred to in NECA 100.

American Institute of Architects (AIA) 1735 New York Avenue, NW Washington, DC 20006
(202) 626-7300
(202) 626-7587 fax
www.aiaonline.com

CAD Layer Guidelines

American Society for Testing and Materials (ASTM) 100 Barr Harbor Drive
West Conshohocken, PA 19428-2959 (610) 832-9500
(610) 832-9555 fax
www.astm.org

ASTM F967-2018, Standard Practice for Security Engineer Symbols

Institute of Electrical and Electronics Engineers (IEEE) 445 Hoes Lane
PO Box 1331
Piscataway, NJ 08855-1331
(800) 678-4333
(732) 981-9667 fax
www.ieee.org

ANSI/IEEE 91-1991, *Standard Graphic Symbols for Logic Functions*

ANSI/IEEE 280-1985, *Letter Symbols for Quantities Used in Electrical Science and Electrical Engineering*

ANSI/IEEE 315-1975 (R1994), *Standard Graphic Symbols for Electrical and Electronics Diagrams*

ANSI/IEEE 991-1986 (R1994), *Standard for Logic Circuit Diagrams*

Illuminating Engineering Society of North America (IESNA)
120 Wall Street, Floor 17 New York, NY 10005-4001 (212) 248-5000
(212) 248-5017 fax
www.iesna.org

ANSI/IESNA DG-3-2000, Application of Luminaire Symbols on Lighting Design Drawings

National Fire Protection Association (NFPA)
P.O. Box 9101
One Batterymarch Park Quincy, MA 02269-9101
(617) 770-3000
(617) 770-3500 fax
www.nfpa.org

NFPA 70-2020, *National Electrical Code* (ANSI)

NFPA 170-2018, *Fire Safety Symbols* (ANSI)

Security Industry Association (SIA) 635 Slaters Lane, Suite 110
Alexandria, VA 22314
(703) 683-2075
(703) 683-2469 fax
www.siaonline.org

Architectural Graphics Standard—CAP Security Symbols Release 2.0

Current *NEIS* Published by NECA:

National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100
Bethesda, MD 20814
(301) 657-3110 tel
(301) 215-4500 fax
www.neca-neis.org