

# Symbols for Electrical Construction Drawings

NEIS



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# 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

- a) All information in this publication is intended to conform to the National Electrical Code (ANSI/NFPA 70).
- b) General requirements for installing electrical products and systems are described in NECA 1, *Standard Practices for Good Workmanship in Electrical Contracting* (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

**Table 1: Symbol Groups**

<i>Group</i>	<i>Description</i>
1.0	Wiring Methods
1.1	Raceways—Indicators
1.2	Raceways—Boxes and Busways
2.0	Luminaire (Lighting Fixtures)
2.1	Luminaire Fixtures—Basic Modifiers Mounting
2.2	Luminaire Fixtures—Basic Modifiers Orientation
2.3	Luminaire Fixtures—Basic Modifiers Emergency
2.4	Luminaire Fixtures—Extended Fixtures
3.0	Outlets and Receptacles
4.0	Switches and Sensors
5.0	Motors—Controls
5.1	Motorized & HVAC Equipment
<del>6.0</del>	<del>Security</del>
7.0	Fire Alarm Communications & Panels
<del>7.1</del>	<del>Fire Alarm Indicators</del>
<del>7.2</del>	<del>Fire Alarm Sensors</del>
8.0	Distribution Equipment
<del>9.0</del>	<del>Communications—Teledata</del>
<del>9.1</del>	<del>Communications—Audio/Visual</del>
<del>9.2</del>	<del>Communications—Equipment</del>
10.0	Site Work
11.0	Schematic Fault Circuit Interrupter, Personal Protection
<del>11.1</del>	<del>One-Line Diagram Symbols— Switchboard Meters</del>
11.2	Schematic and One-Line Diagram Symbols—Switches
12.0	Miscellaneous
13.0	Abbreviations
<del>14.0</del>	<del>Nurse Call System</del>

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 this 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 groups.

## 2.2 Alternate Fire Safety Symbols

The fire protection industry has developed and published symbols, not all of which are currently in widespread use on electrical construction drawings. They 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 usually 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

- a) 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 on a symbol legend sheet.
- b) The orientation of a symbol on a drawing does not alter the meaning of the symbol.
- c) 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.
- d) Circuitry symbols may cross one another at any angle.
- e) 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.
- f) 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.
- g) 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

- a) 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.
- b) 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.
- c) 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.
- d) Electrical wiring required for other systems such as HVAC, manufacturing equipment, data processing systems, etc, 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.

- a) All CADD electrical construction drawings should be created at full scale, (1" = 1"), and should be plot-

ted 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.

b) 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.

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

d) 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.

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

f) 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 *CAD Layer Guidelines* is shown in Annex C.

### 3.4 Electrical Construction Drawing Set

A typical set of electrical construction drawings includes the following:

- a) Plan for each floor, roof, surrounding site, and other area with electrical installations.
- b) Site plan(s) showing incoming utility services and substations; exterior transformers; feeders, trunk

lines and backbone cables between buildings; and site lighting.

c) Symbol list and abbreviation list.














d) Schedule(s) of lighting fixtures, mechanical equipment connections, transformers, etc. as appropriate. Typical schedules are shown in Annex B.

e) Riser and/or one-line diagram(s) for power distribution and other systems, as appropriate. Typical risers and one-line diagrams are shown in Annex B.

# Contents for Symbol Groups




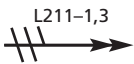



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<b>1.0 Raceways</b>
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



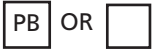


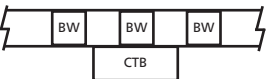
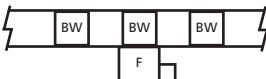




Number	Preferred Symbol	Description
1.001		Conduit concealed in finished areas, exposed in unfinished areas.
1.002		Conduit concealed in or under floor slab.
1.003		Non-rigid raceway system.
1.004		Normal/emergency circuit.
1.005		Emergency battery system wiring, minimum 10 AWG.
1.006		Heat trace.
1.007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










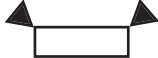

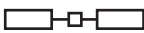


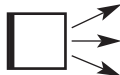
**1.1 Raceways—Indicators**

Number	Preferred Symbol	Description
1.101		Conduit stub. 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.	Indicates trade size 2" or 53 mm conduit with (4) 1 AWG and (1) 6 AWG ground.
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.
1.106		Homerun to panelboard. Number of arrows indicates number of circuits. (Example: Homerun to panel L211 CKTS. #1 and #3.)
1.107		Flexible connection to equipment.
1.108		Direct connection to equipment.
1.109		Branch circuit, full hashes indicate ungrounded-"hot" (or switch-leg) circuit conductors. Half hashes indicates grounded neutral circuit conductors. (No hashes indicates 1 hot and 1 neutral.) Dots indicate grounding conductors. Equipment bond size U.N.O. "IG" indicates an isolated grounding conductor.








## 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 indicated in the specifications and 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 required.
1.206		Cabletray size as indicated.
1.207		Cabletray size as indicated, concealed.
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.



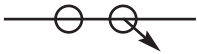
**2.0 Luminaire (Lighting Fixtures)**

Number	Preferred Symbol	Description
2.001		Luminaire: (drawn to approximate shape and to scale or large enough for clarity).
2.002		Luminaire strip type (length drawn to scale).
2.003		Fluorescent strip luminaire.
2.004		Fixture—double or single head spotlight.
2.005		Exit luminaire fixture. 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, with 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 luminaire heads.
2.009		Single luminaire pole mounted site luminaire fixture.
2.010		Twin luminaire pole mounted site luminaire fixture.
2.011		Roadway luminaire—cobra head.
2.012		Bollard type site luminaire.
2.013		Outdoor wallpack.


**2.1 Luminaire Fixtures—Basic Modifiers Mounting**

Number	Preferred Symbol	Description
2.100		Surface mounted fixture.
		Recessed fixture.
		Wall mounted fixture.
		Suspended, pendant, chain, stem or cable hung fixture.
		Pole mounted with arm.
		Pole mounted on top.
		In-ground or floor mounted. (Box around symbol.)

**2.2 Luminaire Fixtures—Basic Modifiers Orientation**

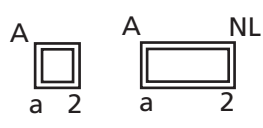
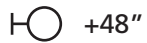


2.200		Accent/directional arrow, with or without tail. (Drawn from photometric center in direction of optics or photometric orientation.)
		Directional aiming line. (Drawn from photometric center and may be extended to actual aiming point if required.)
		Track mounted; length, luminaire types and quantities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

### 2.3 Luminaire Fixtures—Emergency









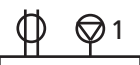
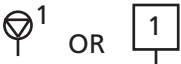



Number	Preferred Symbol	Description
2.300		Luminaire providing emergency illumination. (Filled in.)

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



### 2.4 Luminaire Fixtures—Extended Modifiers

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		Floor duplex receptacle. F=flush MTD. S=surface MTD.
3.002		Duplex convenience receptacle. 20A 125V.
3.003	EP-2 CKT.1 	Duplex convenience receptacle on emergency/standby circuit. Specify panelboard and circuit.
3.004		Single convenience receptacle.
3.005	EP-2 CKT.3 	Single convenience receptacle on emergency/standby circuit. Specify panelboard and circuit.
3.006		Double duplex convenience receptacle.
3.007	EP-2 CKT.5 	Double duplex convenience receptacle on emergency/standby circuit. Specify panelboard and circuit.
3.008		Multi-outlet assembly with outlets on centers as indicated on the drawings and in the specifications, mounted 6" above counter or at height as directed, A - indicates type.
3.009		Multioutlet assembly, devices as indicated.
3.010		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 ___-__
3.011		Clock hanger outlet recessed mounted 8'-0" AFF or 8" below ceiling as appropriate and as directed.
3.012		Flush mounted floor box, adjustable, with both power and voice/data receptacles.
3.013		Junction box. "AxBxC" indicates dimensions of junction box in either inches or centimeters.

### 3.0 Outlets and Receptacles

Number	Preferred Symbol	Description
3.014		Duplex receptacle ceiling mounted 20A 125V.
3.015		Double duplex receptacle—ceiling mounted.

#### Receptacles And Outlets

##### Typical Outlet Notations:









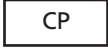

- "a" = Switched outlet, "a"—indicates switch control.
- "B" = Pedestal mounted on bench top.
- "BF" = Below floor.
- "C" = Mounted 6" above counter of 42" AFF. Coordinate exact mounting height with architectural drawings.
- "CLG" = Ceiling mounted.
- "D" = Dedicated device on individual branch circuit.
- "E" = Emergency.
- "EXIST." = Existing device/equipment.
- "F" = Flush floor box with fire/smoke rated penetration.
- "GFCI" = Ground fault circuit interupter, personal protection.
- "GFPE" = Ground fault protection of equipment.
- "H" = Horizontally mounted.
- "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 48" AFF unless otherwise indicated.
- "WP" = Weatherproof receptacle with "NRTL" listed coverplate for wet location with plug installed. MTD. 48" AFF unless otherwise indicated.
- +XX = Dimensioned height.

## 4.0 Switches and Sensors












Number	Preferred Symbol	Description
4.001	\$ or S	Single pole switch.
4.002	\$ <sub>2</sub> or S <sub>2</sub>	Double pole switch.
4.003	\$ <sub>3</sub> or S <sub>3</sub>	Three way switch.
4.004	\$ <sub>4</sub> or S <sub>4</sub>	Four way switch.
4.005	\$ <sub>a</sub> or S <sub>a</sub>	Switch control (lower case letter).
4.006	\$ <sub>CB</sub> or S <sub>CB</sub>	Circuit breaker switch.
4.007	\$ <sub>DT</sub> or S <sub>DT</sub>	Single pole/double throw switch.
4.008	\$ <sub>G</sub> or S <sub>G</sub>	Glow switch toggle, glows in off position.
4.009	\$ <sub>H</sub> or S <sub>H</sub>	Horizontally mounted—with on position to the left.
4.010	\$ <sub>K</sub> or S <sub>K</sub>	Key operated switch.
4.011	\$ <sub>KP</sub> or S <sub>KP</sub>	Key operated switch with pilot light on when switch is on.
4.012	\$ <sub>LV</sub> or S <sub>LV</sub>	Low voltage switch.
4.013	\$ <sub>LM</sub> or S <sub>LM</sub>	Low voltage master switch.
















**5.0 Motorized and HVAC Equipment—Controls**

Number	Preferred Symbol	Description
5.001	xxA 	Disconnect switch, unfused type, size as indicated on drawings. "xxA" indicates amperage.
5.002	$\frac{xxAF}{yyAT}$ 	Disconnect switch, fused type, size as indicated on drawings. "xxAF" indicates frame size. "xxAT" indicates trip size.
5.003	$\frac{xxAF}{yyAT}$ 	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	$RV$  NEMA x	Magnetic motor starter. "RV" indicates reduced voltage. Starter size as indicated.
5.008	$F$  $\frac{NEMA\ x}{xxA-xP}$	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	$\mathcal{T}$	Toggle disconnect switch.
5.013	$\mathcal{T}_P$	Thermal motor switch with handle guard and padlock capability. "P"—indicates pilot light.














## 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.




## 7.0 Fire Alarm Communications and Panels

Number	Preferred Symbol	Description
7.001		Fire alarm master box.
7.002		Fire fighter's phone.
7.003		Coded transmitter.
7.004		Drill key switch.
7.005		Key repository (knock 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.




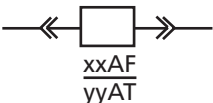


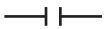


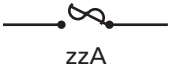



**8.0 Power Distribution Equipment**

Number	Preferred Symbol	Description
8.001		Lighting or power panel, recessed.
8.002		Lighting or power panel, surface.
8.003		Distribution panel.
8.004		Lighting or power panel on normal/generator feeder.
8.005		Distribution panel on normal/generator feeder.
8.006	<p style="text-align: center;">MCC</p> 	Motor control center.
8.007	 <p style="margin-left: 20px;">T45-1 ↙ XFMR NUMBER</p>	Dry type transformer, refer to transformer schedule, "T45"—indicates transformer type floor mounted. Unless otherwise indicated, "W"—indicates wall, "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.









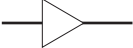



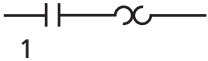
<b>10.0 Site Work</b>
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Number	Preferred Symbol	Description
10.001	-----UF-----	Underground feeder.
10.002	-----UT-----	Underground telephone.
10.003	-----UFA-----	Underground fire alarm.
10.004	-----UTV-----	Underground television (CATV).
10.005	—— E ——	Above ground pole mounted electrical.
10.006	—— T ——	Above ground pole mounted telephone.
10.007	—— F ——	Above ground pole mounted fire alarm.
10.008	—— TV ——	Above ground pole mounted television (CATV).
10.009	— <span style="border: 1px solid black; padding: 2px;">MH</span> —	Manhole.
10.010	— <span style="border: 1px solid black; padding: 2px;">HH</span> —	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 tel/data.
10.013		"J" hook.


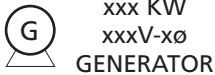
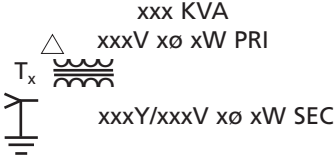
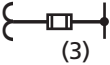
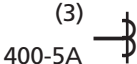




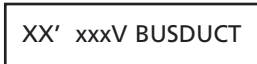
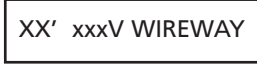
**11.0 Schematic and One-line Diagram Symbols**

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 with fuse. "zzA" indicates fused rating.
11.013		Fuse. "zzA" indicates fuse rating.

## 11.0 Schematic and One-line Diagram Symbols

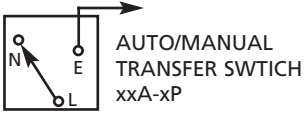



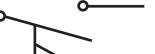




Number	Preferred Symbol	Description
11.014		Overload relay.
11.015		Grounding connection—system and or equipment.
11.016		Kirk key interlock system. "2"—indicates related kirk keys.
11.017		Lightning arrester and grounding to protect all phases.
11.018		Motor and label. "3" denotes horsepower.
11.019		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.

**11.0 Schematic and One-line Diagram Symbols**










Number	Preferred Symbol	Description
11.027		Ground fault circuit interrupter, personnel protection.
11.028		Generator.
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.



**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.

**12.0 Miscellaneous**

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

## 13.0 Abbreviations

Abbreviation	Description	Abbreviation	Description
1P	One pole	DIST	Distribution
2P	Two pole	DN	Down
3P	Three pole	DWG	Drawing
4P	Four pole	DT	Dusttight(*)
1P1W	One pole, one wire	E	Wired on emergency circuit
1P2W	One pole, two wire	EA	Each
2P2W	Two pole, two wire	EC	Electrical contractor
2P3W	Two pole, three wire	EF	Exhaust fan
3P2W	Three pole, two wire	ELEC	Electric(al)
3P3W	Three pole, three wire	EMER	Emergency
3P4W	Three pole, four wire	EMT	Electric metallic tubing
4P4W	Four pole, four wire	ENCL	Enclosure
A	Ampere	EOL	End of line
AC	Alternating current	EPO	Emergency power off
AF	AMP frame	EQUIP	Equipment
AFCI	Arc-fault circuit interrupter	EWC	Electric water cooler
AFF	Above finished floor	EWH	Electric water heater
AFG	Above finished grade	EXIST.	Existing
AHU	Air handling unit	F	Flush
AIC	Ampere interrupting capacity	FA	Fire alarm
AL	Aluminum	FBO	Furnished by others
AS	AMP switch	FC	Fire protection contractor
AT	AMP trip	FCU	Fan coil unit
ARCH	Architect	FDN	Foundation
ATS	Automatic transfer switch	FIXT	Fixture
AUD	Audiometer box connection	FLA	Full load amps
AUX	Auxiliary	FLEX	Flexible
A/V	Audio visual	FLR	Floor
AWG	American wire gauge	FMC	Flexible metallic conduit
BLDG	Building	FRE	Fiberglass reinforced epoxy conduit
C	Conduit (Generic term for raceway. Provide as specified.)	FURN	Furniture
CAM	Camera	GC	General contractor
CAT	Catalog	GEN	Generator
CATV	Cable television	GFCI	Ground fault circuit interrupter
CB	Circuit breaker	GFPE	Ground fault protection equipment
CKT	Circuit	GND	Grounded
COL	Column	GRC	Galvanized rigid conduit
C.T.	Current transformer	HGT	Height
CU	Copper	HP	Horsepower
☪	Centerline	HV	High voltage
DC	Direct Current	HVAC	Heating, ventilating and air conditioning
△	Delta	HW	Hot water
DET	Detector	Hz	Hertz (cycle) per second
DISC	Disconnect	IAM	Individual addressable module

## 13.0 Abbreviations

Abbreviation	Description	Abbreviation	Description
IC	Intercommunication	#	Number
ID	Identification	NTS	Not to scale
IG	Isolated ground	O2	Oxygen
IMC	Intermediate metal conduit	OHD	Overhead door operator
IPS	Interruptible power supply	P	Pole
IR	Passive infrared	PB	Pull box
JB	Junction box	PC	Plumbing system contractor
KCMIL	Thousand circular mils	PE	Primary service
K/O	Knock-out	PH $\emptyset$	Phase
KVA	Kilovolt ampere	PNL	Panel(board)
KVAR	Kilovolt ampere reactive	PIV	Post indicating valve
KW	Kilowatt	PP	Power panel
LFMC	Liquidtight flexible metallic conduit	PR	Pair
LFNC	Liquidtight flexible nonmetallic conduit	PRI	Primary
LP	Lighting panelboard	PT	Potential transformer
LS	Limit switch	PVC	Polyvinyl chloride conduit
LTG	Lighting	PWR	Power
LV	Low voltage	RE	Remove existing
MAINT	Maintained	REC	Recessed
MAU	Make-up air unit	RECP	Receptacle
MAX	Maximum	REF	Roof exhaust fan
MC	Metal clad cable	RL	Relocate existing
MCB	Main circuit breaker	RM	Room
MCC	Motor control center	RMC	Rigid metal conduit
MD	Motorized damper	RT	Raintight(*)
MDP	Main distribution panel	RTU	Rooftop unit
MISC	Miscellaneous	RSC	Rigid steel conduit
MFR	Manufacturer	S	Surface mounted
MLO	Main lugs only	SCH	Schedule
MOD	Motor operated disconnect switch	SD	Smoke damper
MTD	Mounted	SE	Secondary electric service
MTG	Mounting	SEC	Secondary
MTS	Manual transfer switch	SIG	Signal
N	North	SN	Solid neutral
N/A	Not applicable	SP	Spare
NC	Normally closed	SPKR	Speaker
NEC	National Electrical Code	SPL	Splice
NF	Non-fused	SS	Stainless steel
NIC	Not in contract	STP	Shielded twisted pair
NL	Night light	STL	Carbon steel
NM	Nonmetallic sheathed cable	SUSP	Suspended
NO	Normally open	SW	Switch
NRTL	Nationally recognized testing lab	SWBD	Switchboard

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

## 13.0 Abbreviations

Abbreviation	Description	Abbreviation	Description
SWGR	Switchgear	UTP	Unshielded twisted pair
TC	Telephone cabinet	V	Volt
TCI	Telecommunications cabling installer	VT	Vaportight(*)
TCP	Temperature control panel	Y	Wye
TEL/DATA	Telephone/data	W	Watt
TEL	Telephone      TEMP      Temporary	W/	With
TERM	Terminal(s)	WH	Watt-hour
TV	Television	WP	Weatherproof
TYP	Typical	WP	Weatherproof
UC	Under counter	WT	Watertight(*)
UG	Underground	XFMR	Transformer
UH	Unit heater	XP	Explosion proof(*)
U.O.I.	Unless otherwise indicated	ZAM	Zone adapter module
UPS	Uninterruptible power source	+72	Mounting units to centerline above finished floor or grade
UTIL	Utility		

# 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:

<u>Type</u>	<u>Page</u>
Panel schedule . . . . .	49
Lighting fixture schedule . . . . .	50
Transformer schedule . . . . .	51
Mechanical equipment schedule . . . . .	52
Feeder schedule . . . . .	53
Electrical one-line diagram . . . . .	54
Fire alarm riser . . . . .	55

## 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.: \_\_\_\_\_











## Electrical One-Line Diagram

