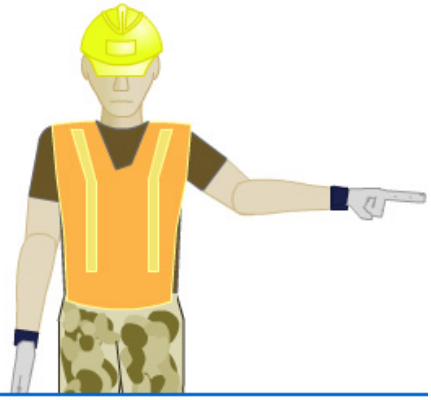
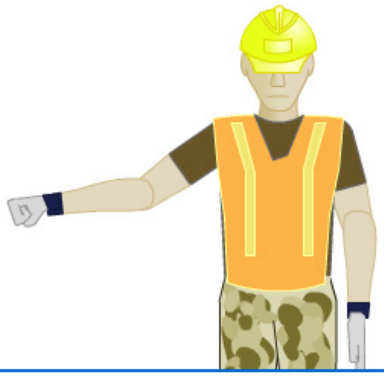
Raise Boom Slowly

Lower Boom and Raise Load

Raise Boom and Lower Load

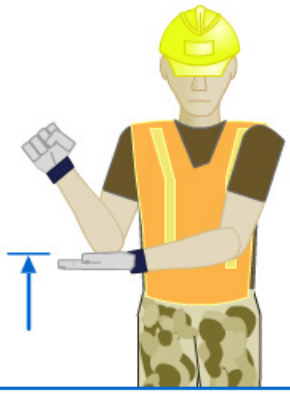


Swing In Direction Finger Points



Close Bucket

Open Bucket



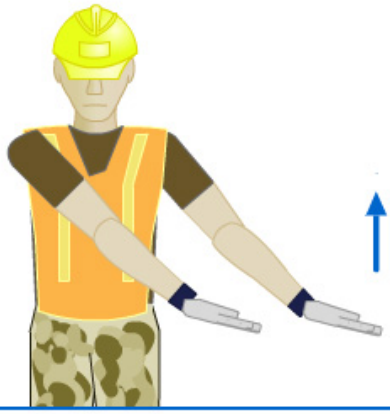
Use Whip Line For Preceding Signals
(Auxilliary Hoist)
Tap elbow then use regular signals

Make Left Turn

Make Right Turn

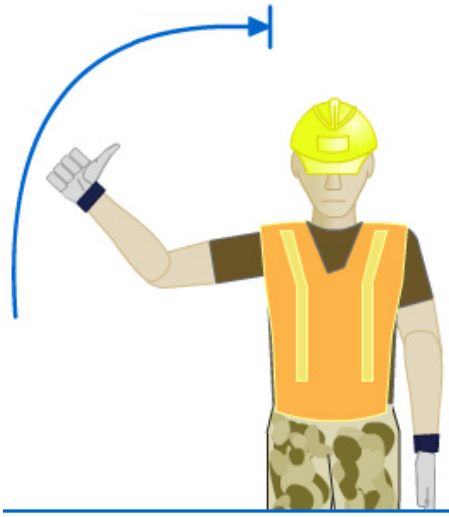
Travel Both Tracks

Cut, Fill, or Drag Road
Point to road to be dragged or bladed, then rub palms together.
Applies to scrapers, motor graders, and bulldozers.



Raise a Little

Lower a Little



Dump Load Now
Start dumping and spreading load to proper depth if given.

Rehaul or Retract

Crowd or Extend

Turn Right (Operator's Right)

Turn Left (Operator's Left)

APPENDIX III

COMMON CONSTRUCTION SYMBOLOGY

Lighting Outlets

Ceiling Wall

Surface or Pendant Incandescent, Mercury Vapor, or Similar Lamp Fixture

Surface or Pendant Individual Fluorescent Fixture

Surface or Pendant Continuous-Flow Individual Fluorescent Fixture

Bare Lamp Fluorescent Strip

Surface or Pendant Exit Light

Junction Box

Receptacle Outlets

Grounded Ungrounded

Single Receptacle Outlet

Duplex Receptacle Outlet

Duplex Receptacle Outlet - Split Wired

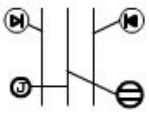
Single Special Purpose Receptacle Outlet

Range Outlet (typical)

Floor Duplex Receptacle Outlet

Floor Telephone Outlet

Application: example of the use of various symbols to identify location of different types of outlets or connections for underfloor duct or cellular floor systems



Switch Outlets

Single-Pole Switch

S

Double-Pole Switch

S_2

Three-Way Switch

S_3

Four-Way Switch

S_4

Key-Operated Switch

S_K

Switch and Pilot Lamp

S_P

Switch for Low-Voltage Switching System

S_L

Switch and Single Receptacle

Switch and Double Receptacle

Door Switch

S_D

Time Switch

S_T

Residential Occupancies

Signaling system symbols for use in identifying standardized residential type signal system items on residential drawings where a descriptive symbol list is not included in the drawing

Push Button

Buzzer

Bell

Annunciator

Interconnection Box

Bell-Ringing Tranformer

Interconnecting Telephone

Radio Outlet

Television Outlet

Panelboards, Switchboards, and Related Equipment

Flush-Mounted Panelboard and Cabinet
NOTE: Identify by notation or schedule

Surface-Mounted Panelboard and Cabinet

Switchboard, Power Control Center, Unit Substations (should be drawn to scale)

Flush-Mounted Terminal Cabinet
NOTE: In small-scale drawings the TC may be indicated alongside the symbol

Surface-Mounted Terminal Cabinet

Motor or Other Power Controller

Externally Operated Disconnection Switch

Combination Controller and Disconnection Means

Remote Control Stations for Motors or Other Equipment

Push-button Stations in General

Float Switch - Mechanical

Limit Switch - Mechanical

Pneumatic Switch - Mechanical

Electric Eye - Beam Source

Electric Eye - Relay

Thermostat

Circuiting

Wiring method identification by notation on drawing or in specifications.

Wiring Concealed in Ceiling or Wall

Note: Use heavy weight line to identify service and feed runs

Wiring Concealed in Floor

Wiring Exposed

Branch Circuit Home Run to Panelboard

Number of arrows indicates number of circuits. (A numeral at each arrow may be used to identify circuit number.)

NOTE: Any circuit without further identification indicates a 2-wire circuit. For a greater number of wires, indicate with cross lines.

Application:

Unless indicated otherwise, the wire size of the circuit is the minimum size required by the specification.
Indicate size in inches and identify different functions of wiring system, such as signaling, by notation or other means.

Wiring Turned Up

Wiring Turned Down

Manhole

Handhole

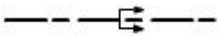
Transformer Pad

Underground Direct Burial Cable

Indicate type, size, and number of conductors by notation or schedule.

Underground Duct Line

Indicate type, size, and number of ducts by cross section identification of each run by notation or schedule. Indicate type, size, and number of conductors by notation or schedule.



Streetlight Standard Fed from Underground Circuit

Electrical Distribution or Lighting Systems, Aerial

Pole

Pole, with Streetlight

Pole, with Down Guy and Anchor

Transformer

Transformer, Constant-Current

Switch, Manual

Circuit Recloser, Automatic

Circuit, Primary

Circuit, Secondary

Circuit, Series Street Lighting

Down Guy

Head Guy

Sidewalk Guy

Service Weather Head

Qualifying Symbols

Connection Symbol

For use adjacent to other symbols

3-phase, 3-wire, delta

3-phase, 3-wire, delta, grounded

3-phase, 4-wire, delta, grounded

3-phase, open delta

3-phase, wye or star, ungrounded

3-phase, wye, grounded neutral

Graphic Symbols for Fundamental Items

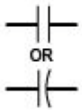
Resistor

General

Application: adjustable or continuously adjustable (variable) resistor rheostat

NOTE: Always add identification within , or adjacent to, the rectangle.

Capacitor



Antenna

General
Types or functions may be indicated by words or abbreviations adjacent to the symbol.

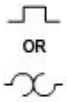
Battery

The long line is always positive, but polarity may be indicated in addition.
Example:

Multicell

Thermal Element

Actuating device, self-heating or with external heater. (Not operated primarily by ambient temperature.)



Graphic Symbols for Transmission Path

Transmission Path
Conductor
Cable
Wiring

Guided path, general

A single line represents the entire group of conditions or the transmission path needed to guide the power or signal.

When required, details of structure, type, impedance, ratings, etc., may be added adjacent to or within any symbol or in a note.

Busbar (with connections shown)
Use only if essential to distinguish bus from other circuit paths.

Conductive path or conductor; wire

Two conductors or conductive paths

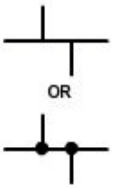
Crossing of paths or conductors not connected

The crossing is not necessarily at a 90° angle.

Junction of paths or conductors
Junction (if desired)

Junction of paths, conductors, or cable.
If desired, indicate path type, or size.

Junction of paths, conductors, or wires



2-conductor cable

Cable underground; underground line

These are long dashes

Overhead line

Circuit Return

Ground general symbol

NOTE: Supplementary information may be added to define the status or purpose of the earth if this is not readily apparent.

(1) A direct conducting connection to the earth or body of water that is a part therof.

(2) A conducting connect to a structure that serves a function similar to that of an earth ground (that is, a structure such as a frame of an air, space, or land vehicle that is not conductively connected to earth).

Chassis or frame connection, equivalent chassis connection (of printed-wiring boards)

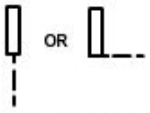
A conducting connection to a chassis of frame (or equivalent chassis connection of a printed-wiring board) may be at substantial potential with respect to the earth or structure in which this chassis or frame (or printed-wiring board) is mounted.

Graphic Symbols for Contacts, Switches, Contacts, and Relays

Electrical Contact

Fixed contact for jack, key, relay, switch, etc.

‡ Sleeve



‡ The broken line - - - indicates where line connection to a symbol is made and is not part of the symbol.

Moving Contact

Adjustable or sliding contact for resistor, inductor, etc.

Locking

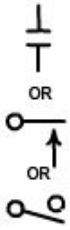
Nonlocking

Basic Contact Assemblies

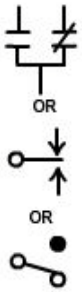
The standard method of showing a contact is by a symbol indicating the circuit condition it produces when the actuating device is in the de-energized or nonoperated position. The actuating device may be of a mechanical, electrical, or other nature, and a clarifying note may be necessary with the symbol to explain the proper point at which the contact functions; for example, the point where a contact closes or opens as a function of changing pressure, level, flow, voltage, current, etc. In cases where it is desirable to show contacts in the energized or operated condition and where confusion may result, a clarifying note shall be added to the drawing.

Closed contact (break)

Open contact (make)

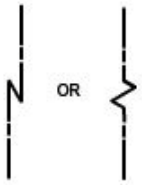


Transfer



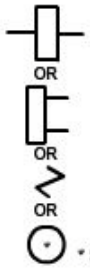
Make-before-break

Magnetic Blowout Coil



Operating Coil

Relay Coil



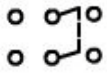
Switch

Fundamental symbols for contacts, mechanical connections, etc, may be used for switch symbols.

Single-throw, general

Double-throw, general

2-pole double-throw switch with terminals shown



NOTE: The asterisk is not part of the symbol. Always replace the asterisk by a device designation.

Push button, Momentary or Spring-Return

Circuit closing (make)

Circuit opening (break)

Two-circuit

Selector or Multiposition Switch

The position in which the switch is shown may be indicated by a note or designation of switch position.

General (for power and control diagrams)

Any number of transmission paths may be shown.

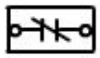
OR

Limit Switch
Sensitive Switch

NOTE: Identity by LS or other suitable note.

Track-type, circuit-closing contact

Track-type, circuit-opening contact



Flow-Actuated Switch

Closes on increase in flow

Opens on increase in flow

Liquid-Level-Actuated Switch

Closes on rising level

Opens on rising level

Pressure-or Vacuum-Actuated Switch

Closes on rising pressure

Opens on rising pressure

Temperature-Actuated Switch

Closes on rising temperature

Opens on rising temperature

Thermostat

Closes on rising temperature

* See Note

Contactor

See also CIRCUIT BREAKER

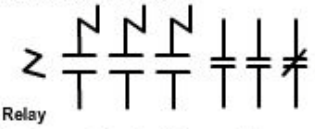
Fundamental symbols for contacts, coils, mechanical connections, etc, are the basis of contactor symbols and should be used to represent contactors on complete diagrams. Complete diagrams of contactors consist of combinations of fundamental symbols for control coils, mechanical connections, etc, in such configurations as to represent the actual device. Mechanical interlocking should be indicated by notes.

Manually operated 3-pole contactor

NOTE: The t° symbol shall be shown or be replaced by data giving the nominal or specific operating temperature of the device.

Electrically operated 1-pole contactor with series blowout coil

Electrically operated 3-pole contactor with series blowout coils; 2 open and 1 closed auxiliary contacts (shown smaller than the main contacts)



Relay

Fundamental symbols for contacts, mechanical connections, coils, etc, are the basis of relays on complete diagrams.

The following letter combinations or symbol elements may be used with relay symbols. The requisite number of these letters or symbol elements may be used to show what special features a relay possesses.

- AC Alternating-current or ringing relay
- D Differential
- DB Double-biased (biased in both directions)
- DP Dashpot
- EP Electrically polarized
- FO Fast-operate
- FR Fast-release
- L Latching
- MG Marginal
- ML Magnetic-latching (re-manent)
- NB No bias
- NR Nonreactive

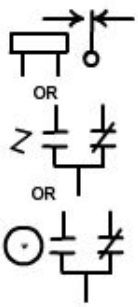
- P Magnetically polarized using biasing spring, or having magnet bias
- SA Slow-operate and slow-release

- SO Slow-operate
- SR Slow-release
- SW Sandwich-wound to improve balance to longitudinal currents

The proper poling for a polarized relay shall be shown by the use of + and - designations applied to the winding leads. The interpretation of this shall be that a voltage applied with the polarity as indicated shall cause the armature to move toward the contact shown nearer the coil on the diagram. If the relay is equipped with numbered terminals, the proper terminal numbers shall alson be shown.

Basic

Relay with transfer contacts



Graphic Symbols for
Terminals and Connectors

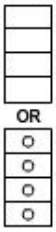
Terminals

Circuit terminal

Terminal board or terminal strip, with 4 terminals shown; group of 4 terminals

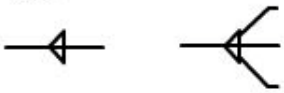
Number and arrangement as convenient.

NOTE: Internal lines and terminals may be omitted if terminal identifications are shown within the symbol.



Cable Termination

Line shown on left of symbol indicates cable.



Connector
Disconnecting Device
Jack
Plug

The contact symbol is not an arrowhead. It is larger and the lines are drawn at a 90-degree angle.

Female contact 

Male contact 

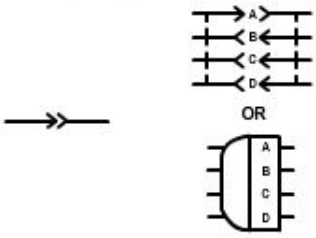
Receptacle or jack (usually stationary)

NOTE: The asterick is not part of the symbol. If desired, indicate the type of contacts: male (⟶) or female (⟵).

Plug (usually movable)

Separable connectors (engaged)

Engaged 4-conductor connectors; the plug has 1 male and 3 female contacts with individual contact designations shown in the complete-symbol column



Communication switchboard-type connector

2-conductor (jack) 

2-conductor (plug) 

Graphic Symbols for
Transformers, Inductors,
and Windings

Core

General or air core

If it is necessary to identify an air core, a note should appear adjacent to the symbol of the inductor or transformer

NO SYMBOL

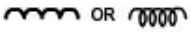
Magnetic core of inductor or transformer

Not to be used unless it is necessary to identify a magnetic core.

Inductor
Winding (machine or transformer)
Reactor
Radio-Frequency Coil
Telephone Retardation Coil

See also OPERATING COIL

General



Magnetic-core inductor
Telephone loading coil

If necessary to show a magnetic core.

Tapped 

Adjustable inductor

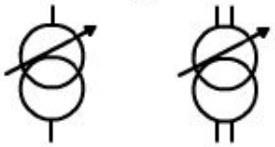
Transformer

General

Shielded transformer with magnetic core shown

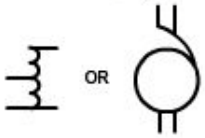
One winding with adjustable inductance

OR

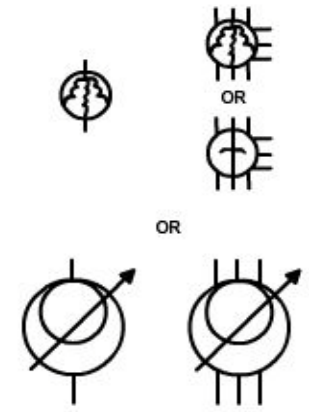


Adjustable mutual inductor; constant-current transformer

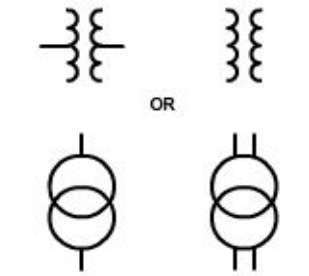
Autotransformer, 1-phase



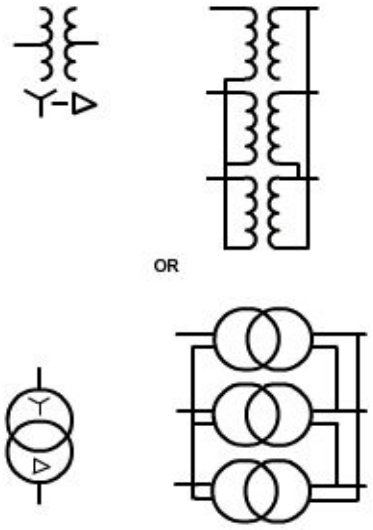
3-phase induction voltage regulator



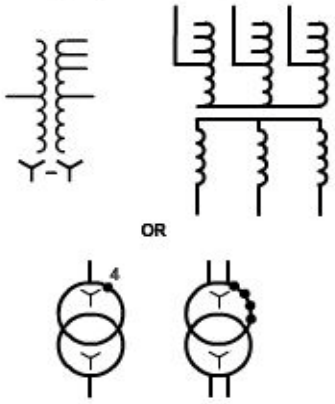
1-phase, 2-winding transformer



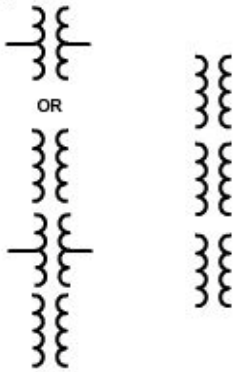
3-phase bank of 1-phase, 2-winding transformers with wye-delta connections



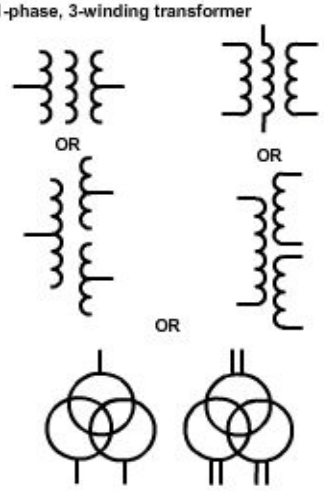
These phases transformer with 4 taps with wye-wye connections



Polyphase transformer

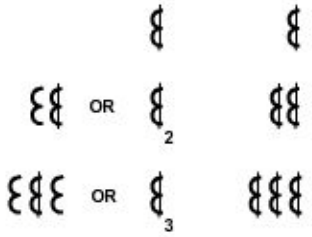


1-phase, 3-winding transformer

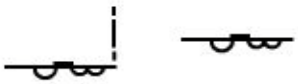


Current transformer(s)

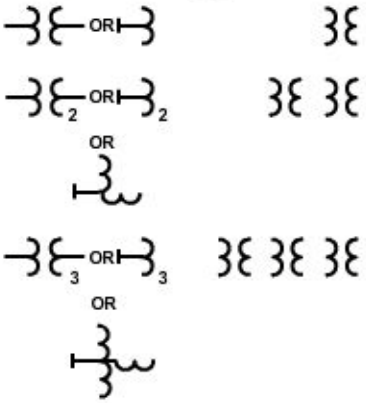
Avoid conflict with symbol for loaded line if used on the same diagram.



Bushing-type current transformer



Potential transformer(s)



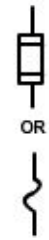
Outdoor metering device

SHOW ACTUAL CONNECTION INSIDE BORDER

Graphic Symbols for Circuit Protectors

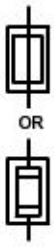
Fuse (one-time thermal current-over-load device)

General



Isolating fuse-switch: high-voltage primary fuse cutout, dry

High-voltage primary fuse cutout, oil



Current Limiter (for power cable)

The arrowheads in this case are filled.

Lightning Arrester
Arrester (electric surge, etc)
Gap

General

Carbon block; telephone protector block

Horn gap

Circuit Breaker

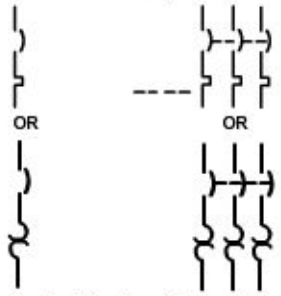
Air circuit breaker, if distinction is needed; for alternating-current circuit breakers rated at 1,500 bolts or less and for all direct-current circuit breakers

Network protector

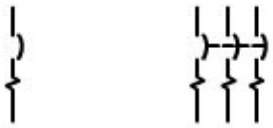
Circuit breaker, other than covered by the above symbol

The symbol in the right column is for a 3-pole breaker.

3-pole circuit breaker with thermal-overload device in all 3 poles



3-pole circuit breaker with magnetic-overload device in all 3 poles



3-pole circuit breaker, drawout type

Protective Relay

Fundamental symbols for contacts, coils, mechanical connections, etc, are the basis or relay symbols and should be used to represent relays on complete diagrams.

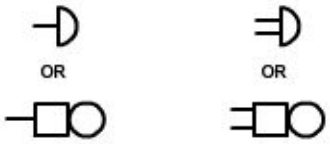
See RELAY COIL; OPERATING COIL and RELAY

Graphic Symbols for Acoustic Devices

Audible-Signaling Device

Bell, electrical; telephone ringer

NOTE: If specific identification is required, the abbreviation AC or DC may be added within or adjacent to the symbol.



Single-stroke

Buzzer

Loudspeaker
Horn, Electrical
Sirem

General

Microphone
Telephone Transmitter

General

Handset
Operator's Set

General

Telephone Receiver
Earphone

General

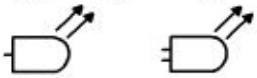
Headset, double

Headset, single

Graphic Symbols for Lamps and Visual-Signaling Devices

Lamp

Lamp, general; light source, general



NOTE: This symbol may be used to represent one or more lamps with or without operating auxiliaries.

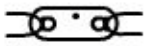
NOTE: If it is essential to indicate the following characteristics, the specified letter or letters may be inserted within or placed adjacent to the symbol.

A	Amber
B	Blue
C	Clear
G	Green
O	Orange
OP	Opelescent
P	Purple
R	Red
W	White
Y	Yellow
ARC	Arc
EL	Electroluminescent
FL	Fluorescent
HG	Mercury vapor
IN	Incandescent
IR	Infrared
NA	Sodium vapor
NE	Neon
UV	Ultraviolet
XE	Xenon
LED	Light-emitting diode

Fluorescent lamp

2-terminal

4-terminal



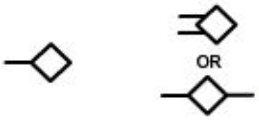
Incandescent lamp (incandescent-filament illuminating lamp

Ballest lamp; ballast tube

The primary characteristic of the element within the circle is designed to vary non-linearity with the temperature of the element.

Visual-Signaling Device

Annunciator (general)



Annunciator drop or signal, shutter or grid type

Annunciator drop or signal, ball type

Manually restored drop

Electrically restored drop

Communication switchgoard-type lamp; indicating lamp

Indicating, pilot, signaling, or switch-board light; indicator light signal light

If confusion with other circular symbols may occur, the D-shape symbol should be used.

OR

OR

Jeweled signal light

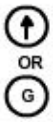
Graphic Symbols for Readout Devices

Meter Instrument

NOTE: The asterisk is not part of the symbol. Always replace the asterisk by one of the following letter combinations, depending on the function of the meter or instrument, unless some other identification is provided in the circle and explained on the diagram.

A	Ammeter
AH	Ampere-hour meter
C	Coulombmeter
CMA	Contact-making (or breaking) ammeter
CMC	Contact-making (orbreaking) clock
CMV	Contact-making (or breaking) voltmeter
CRO	Oscilloscope Cathode-ray oscillograph
DB	DB (decibel) meter Audio level/meter
DBM	DBM (decibels referred to 1 milliwatt) meter
DM	Demand meter
DTR	Demand-totalizing relay
F	Frequency meter
GD	Ground detector
I	Indicating meter
μ A or UA	Microammeter
MA	Milliammeter
NM	Noise Meter
OHM	Ohmmeter
OP	Oil pressure meter
OSCG	Oscillograph
PF	Power factor meter
PH	Phasemeter
PI	Position indicator
RD	Recording demand meter
REC	Recording meter
RF	Reactive factor meter
SY	Synchroscope
t°	Temperature meter
THC	Thermal converter
TLM	Telemeter
TT	Total time meter Elapsed time meter
V	Voltmeter
VA	Volt-ammeter
VAR	Varmeter
VARH	Varhour meter
VI	Volume indicator Audio-level meter
VU	Standard volume indicator Audio-level meter
W	Wattmeter
WH	Watthour meterv

Galvanometer



Graphic Symbols for
Rotating Machinery

Rotating Machine

Basic

Generator (general)

Avoid conflict with symbols for galvano-
meter if used on the same diagram.

OR

Generator, direct-current

Generator, alternating-current

Motor (general)

Motor, direct-current

Motor, alternating-current

Winding Connection Symbols

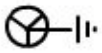
Motor and generator winding connection
symbols may be shown in the basic circle
using the following representations.

1-phase

2-phase

3-phase wye (ungrounded)

3-phase wye (grounded)

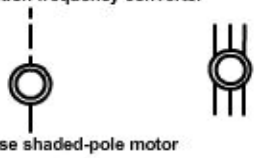


3-phase delta

Alternating-Current Machines

Squirrel-cage induction motor or
generator, split-phase induction motor or
generator, rotary phase converter, or
repulsion motor

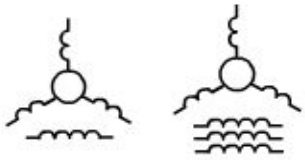
Wound-rotor induction motor, synchronous
induction motor, induction generator, or
induction frequency converter



1-phase shaded-pole motor

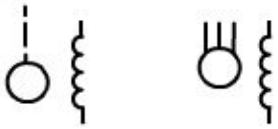
1-phase repulsion-start induction motor

3-phase regulating machine



Alternating-Current Machines with
Direct-Current Field Excitation

Synchronous motor, generator, or
condenserv



Graphic Symbols for
Mechanical Functions

Mechanical Connection
Mechanical Interlock

Mechanical connection

The top symbol consists of shor dashees.

NOTE: The short parallel lines should be
used only where there is insufficient space
for the short dashes in series

OR

Mechanical Motion

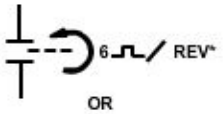
Translation, one direction

Translation, both directions

Rotation, one direction

Application: angular motion, applied
to open contact (make), symbol

NOTE: The asterisk is not part of the symbol.
Explanatory information (similar to type
shown) may be added if neccessary to
explain circuit operation.



OR

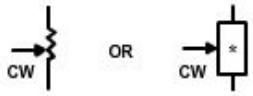
Rotation, both directions

Alternating or reciprocating

Rotation designation (applied to a resistor)

CW indicates position of adjustable contact
at the limit of clockwise travel viewed from
knob or actuator end unless otherwise
indicated.

NOTE: The asterisk is not part of the symbol. Always add identification within or adjacent to the rectangle.



Manual Control

General

Operated by pushing

Operated by pushing and pulling (pudh-pull)

Graphic Symbols for Composite Assemblies

Circuit Assembly
Circuit Subassembly
Circuit Element

NOTE: The asterisk is not part of the symbol. Always indicate the type of apparatus by appropriate words or letters.

NOTE: The use of a general circuit-element symbol is restricted to the following:

a. Diagrams drawn in block form.
b. A substitute for complex circuit elements when the internal operation of the circuit element is not important of the purpose of the diagram.

General

Accepted abbreviations from ANSI Z32.13-1950 may be used in the rectangle.

The following letter combinations may be used in the rectangle:

CLK	Clock
EQ	Equalizer
FAX	Facsimile set
FL	Filter
IND	Indicator
PS	Power supply
RG	Recording unit
RU	Reproducing unit
DIAL	Telephone dial
TEL	Telephone station
TPR	Teleprinter
TTY	Teletypewriter

Amplifier

General

The triangle is pointed in the direction of transmission.

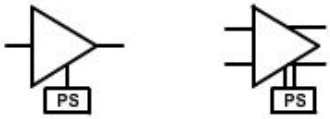
The symbol represents any method of amplification (electron tube, solid-state device, magnetic device, etc).

NOTE: If identification, electrical values, location data, and similar information must be noted within symbol, the size or aspect ratio of the original symbol may be altered providing its distinctive shape is retained.

Amplifier use may be indicated in the triangle by words, standard abbreviations, or a letter combination from the following list:

BOG	Bridging
BST	Booster
CMP	Compression
EXP	Direct-current
LIM	Limiting
MON	Monitoring
PGM	Program
PRE	Preliminary
PWR	Power
TRQ	Torque

Application: amplifier with associated power supply



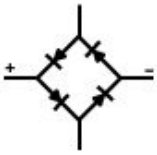
General

NOTE: Triangle points in direction of forward (easy) current as indicated by a direct-current ammeter, unless otherwise noted adjacent to the symbol. Electron flow is in the opposite direction.

NOTE: This symbol represents any method of rectification (electron tube, solid-state device, electrochemical device, etc).

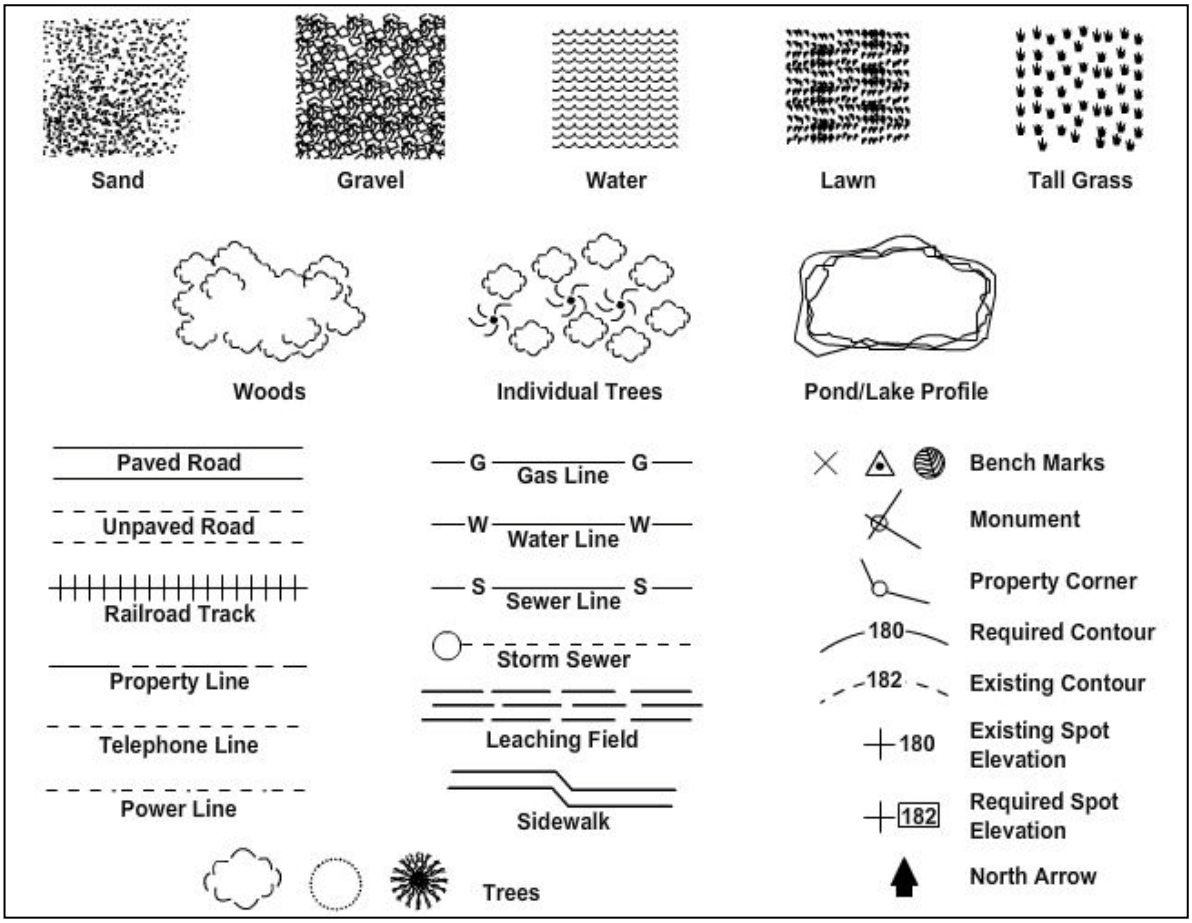
Controlled

Bridge-type rectifier



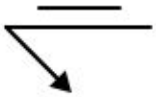
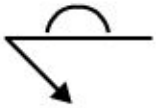
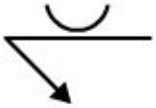
On connection or wiring diagrams, rectifier may be shown with terminals and plarity marking. Heavy line may be used to indicate nameplate or positive-polarity end.

For connection or wiring diagram

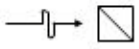


Description	Example	Symbol	Illustrated Use
W- Shape (Wide Flange)		W	W24 x 78
Bearing Pile		BP	BP14 x 73
S-Shape (American STD I-Beam)		S	S15 x 42.9
C-Shape (American STD Channel)		C	C9 x 13.4
M-Shape (Misc Shapes Other Than W, BP, S, & C)		M	M5 x 34.3 M5 x 17 M7 x 5.5
MC-Shape (Channels Other Than American STD)		MC	MC12 x 45 MC 12 x 12.8
Angles: Equal Leg Un-equal Leg		L L	3x 3x L 3x 3x 1/4 L 7x 4x 1/2
Tees, Structural: Cut From W-Shape Cut From S-Shape Cut From M-Shape		WT ST MT	WT 12x38 ST 12x38 MT 12x38
Plate		PL	PL 1/2x18"x30"
Flat Bar		BAR	BAR 2 1/2 x 1/4
Pipe, Structural			Pipe 4 STD Pipe 4x-STRG Pipe XX-STRG

BASIC WELD SYMBOLS									
BEAD	FILLET	PLUG OR SLOT	GROOVE OR BUTT						
			SQUARE	V	BEVEL	U	J	FLARE V	FLARE BEVEL
									

CONTOUR			WELD-ALL-AROUND	FIELD WELD
FLUSH	CONVEX	CONCAVE		
				


Ceiling Diffuser (Arrows Indicate Direction of Air Flow)


Return Air Grille


Supply Duct Up

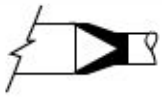

Supply Duct Down

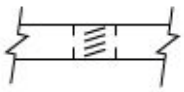

Return Duct Up

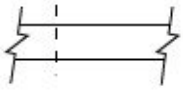

Return Duct Down

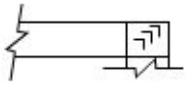
6"ϕ CD
200 ¢
Neck Size/ Air Device CFM

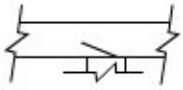

Thermostat


Square to Round Transition


Parallel Blade Damper


Fire Damper (Wall) (Floor)


Airfoil Blade Turning Vanes


Air Extractor

∅ Diameter

∅ CFM (Cubic Feet Per Minute)

RA Return Air

OSA Outside Air

CD Condensate Drain

General Outlets

Junction Box, Ceiling
Fan, Ceiling
Recessed Incandescent, Wall
Surface Incandescent, Ceiling
Surface or Pendant Single
Fluorescent Fixture

Switch Outlets

Single-Pole Switch	S
Double-Pole Switch	S_2
Three-Way Switch	S_3
Four-Way Switch	S_4
Key-Operated Switch	S_K
Switch w/ Pilot	S_P
Low-Voltage Switch	S_L
Door Switch	S_D
Momentary Contact Switch	S_{MC}
Weatherproof Switch	S_{WP}
Fused Switch	S_F
Circuit Breaker Switch	S_{CB}

Receptacle Outlets

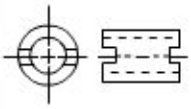
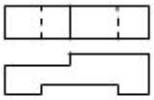
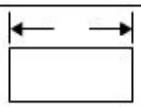
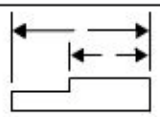
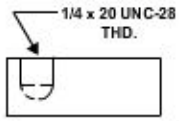
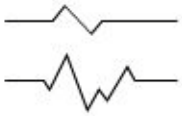
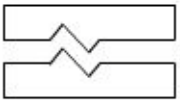
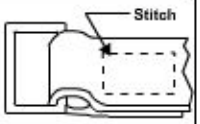
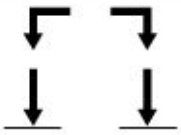
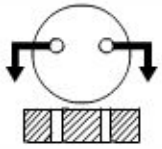
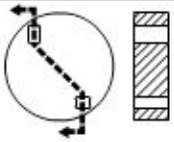
Single Receptacle
Duplex Receptacle
Triplex Receptacle
Split-Wired Duplex Recep.
Single Special Purpose Recep.
Duplex Special Purpose Recep.
Range Receptacle R
Switch & Single Receptacle S
Grounded Duplex Receptacle G
Duplex Weatherproof Receptacle WP
GFCI GFCI

Auxiliary Systems

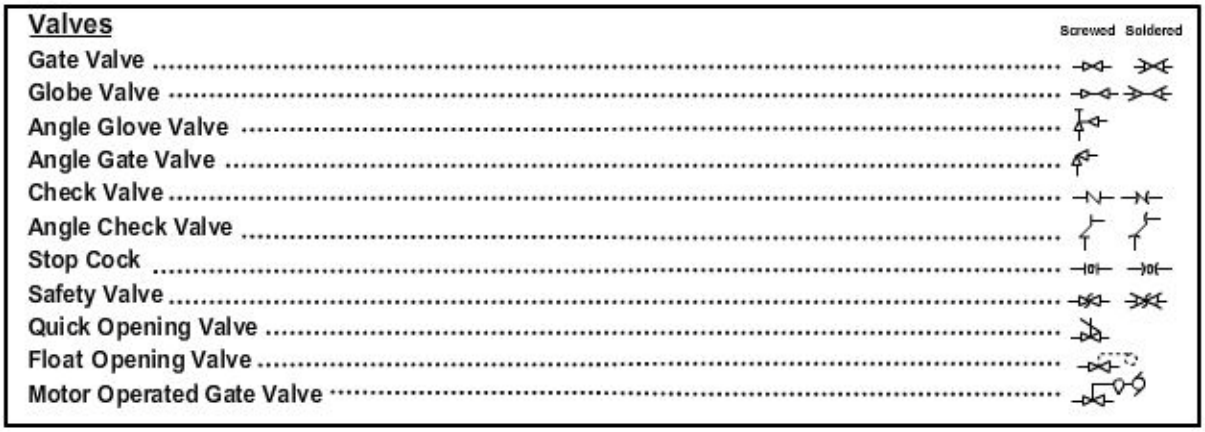
Telephone Jack
Meter
Vacuum Outlet
Electric Door Opener
Chime
Pushbutton (Doorbell)
Bell and Buzzer Combination
Kitchen Ventilating Fan
Lighting Panel
Power Panel
Television Outlet

Plumbing

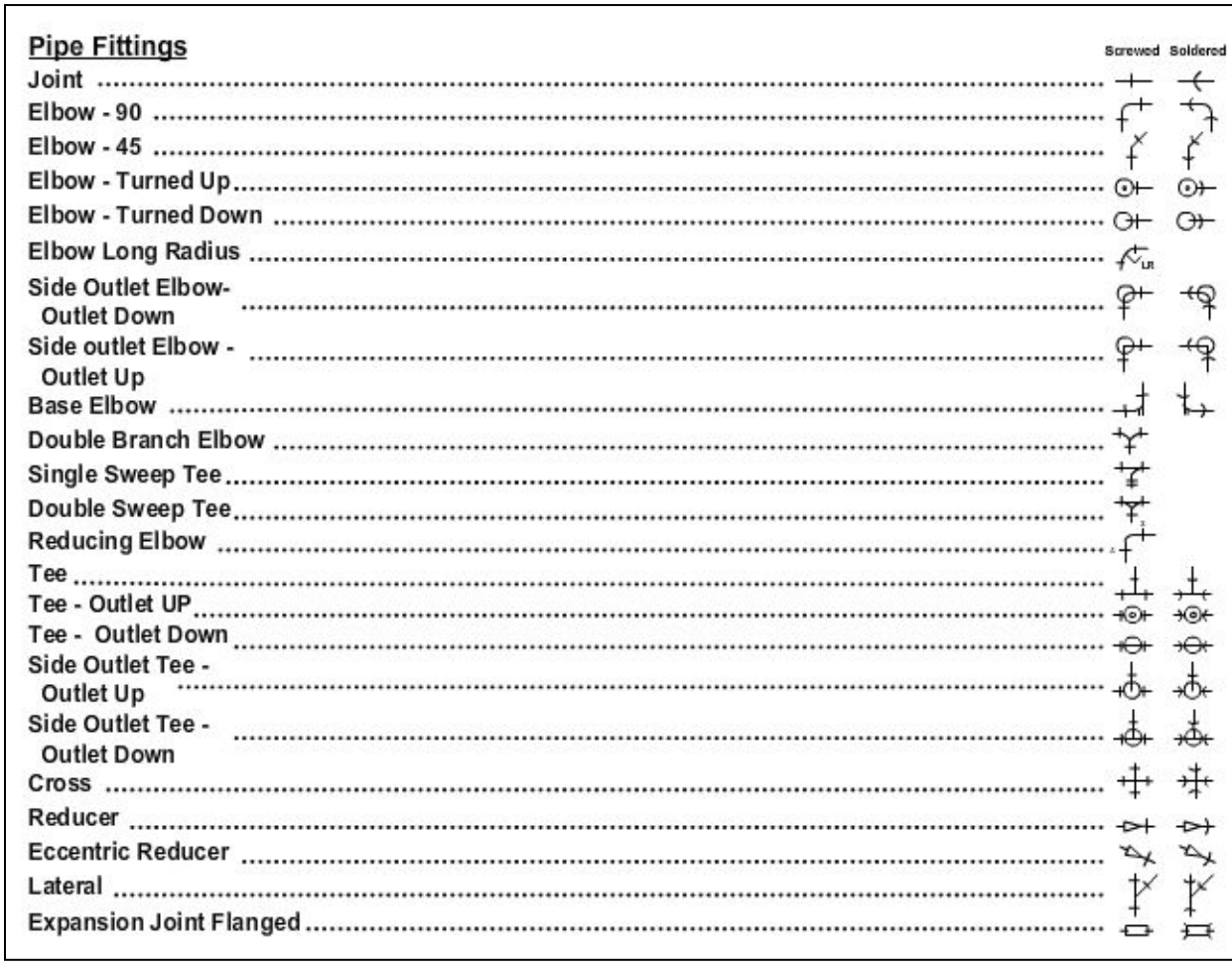
Corner Bath
Recessed Bath
Roll Rim Bath
Sitz Bath
Floor Bath
Bidet
Shower Stall
Shower Head
Overhead Gang Shower
Pedestal Lavatory
Wall Lavatory
Corner Lavatory
Manicure Lavatory
Medical Lavatory
Dental Lavatory
Plain Kitchen Sink
Kitchen Sink, R & L Drain Board
Kitchen Sink, L H Drain Board
Combination Sink and Dishwasher
Combination Sink & Laundry Tray
Service Sink
Wash Sink (Wall Type)
Wash Sink
Laundry Tray
Water Closet (Low Tank)
Water Closet (No Tank)
Urinal (Pedestal Type)
Urinal (Wall Type)
Urinal (Corner Type)
Urinal (Stall Type)
Urinal (Trough Type)
Drinking Fountain (Pedestal Type)
Drinking Fountain (Wall Type)
Drinking Fountain (Trough Type)
Hot Water Tank
Water Heater
Meter
Hose Rack
Hose Bibb
Gas Outlet
Vacuum Outlet
Drain
Grease Separator
Oil Separator
Cleanout
Garage Drain
Floor Drain With Backwater Valve
Roof Sump

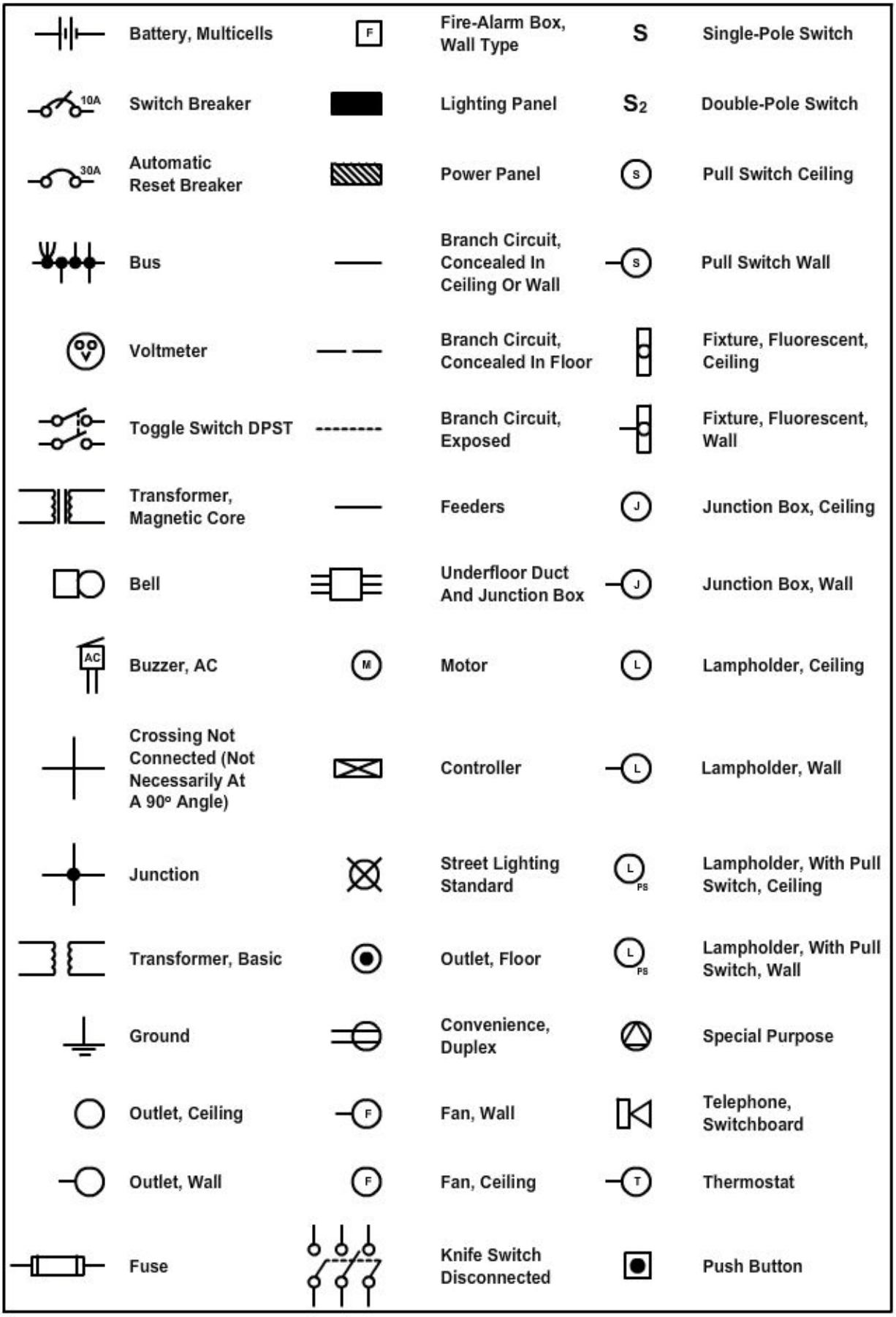
LINE STANDARDS			
Name	**Convention**	**Description and Application**	**Example**
Center Lines		Thin lines made up of long and short dashes alternately spaced and consistent in length. Used to indicate symmetry about an axis and location of centers.	
Visible Lines		Heavy unbroken lines Used to indicate visible edges of an object	
Hidden Lines		Medium lines with short evenly spaced dashes Used to indicate concealed edges	
Extension Lines		Thin unbroken lines Used to indicate extent of dimensions	
Dimension Lines		Thin lines terminated with arrow heads at each end Used to indicate distance measured	
Leader		Thin line terminated with arrowhead or dot at one end Used to indicate a part, dimension or other reference	
Break (Long)		Thin, solid ruled lines with freehand zigzags Used to reduce size of drawing required to delineate object and reduce detail	
Break (Short)		Thick, solid free hand lines Used to indicate a short break	
Phantom or Datum Line		Medium series of one long dash and two short dases evenly spaced ending with long dash Used to indicate alternate position of parts, repeated detail or to indicate a datum plane	
Stitch Line		Medium line of short dases evenly spaced and labeled Used to indicate stitching or sewing	
Cutting or Viewing Plane Viewing Plane Optional		Thick solid lines with arrowhead to indicate direction in which section or plane is viewed or taken	
Cutting Plane for Complex or Offset Views		Thick short dashes Used to show offset with arrowheads to show direction viewed	

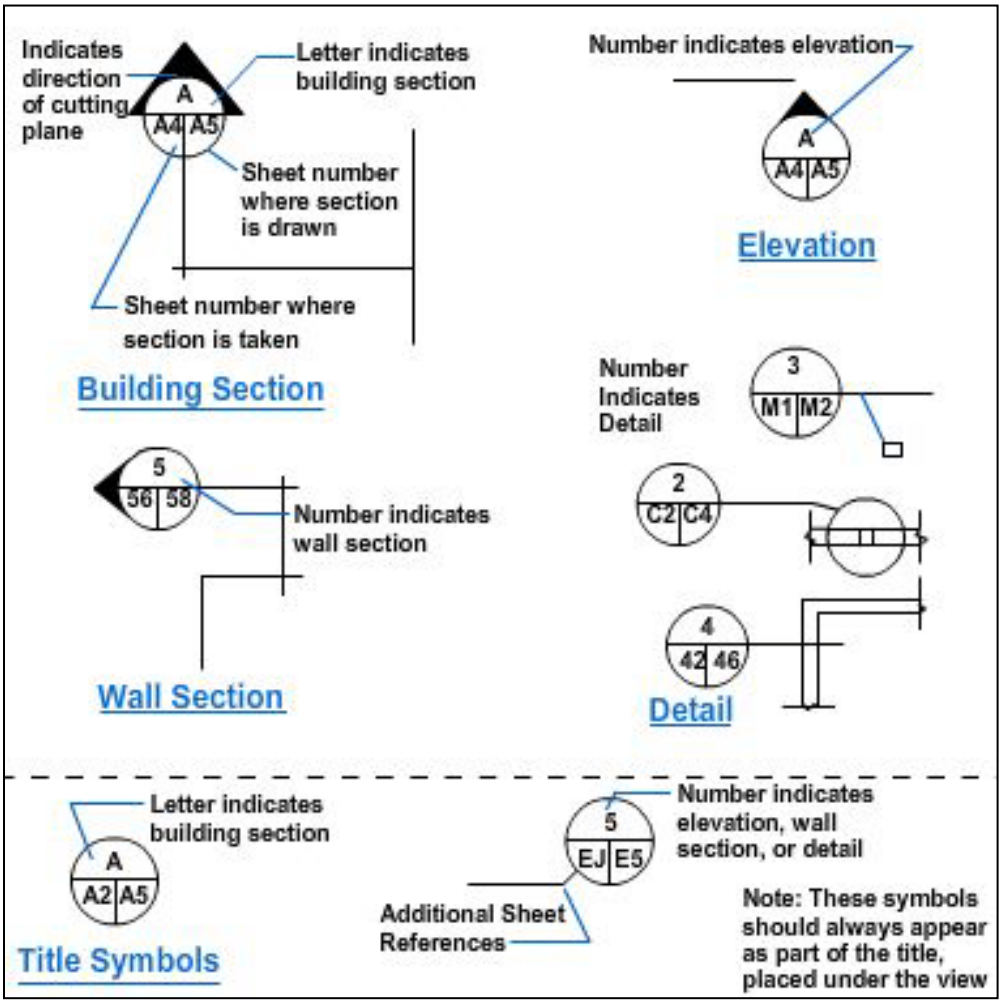
Valves

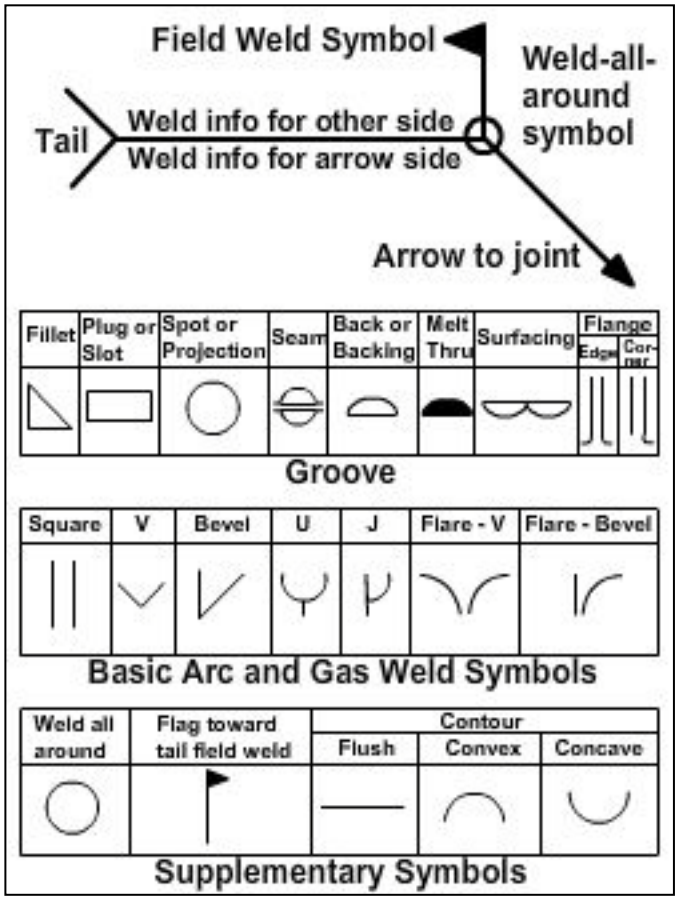


Pipe Fittings




Battery, Multicells
Switch Breaker
10A
Automatic Reset Breaker
30A
Bus
Voltmeter
V
Toggle Switch DPST
Transformer, Magnetic Core
Bell
Buzzer, AC
AC
Crossing Not Connected (Not Necessarily At A 90° Angle)
Junction
Transformer, Basic
Ground
Outlet, Ceiling
Outlet, Wall
Fuse
F
Fire-Alarm Box, Wall Type
Lighting Panel
Power Panel
Branch Circuit, Concealed In Ceiling Or Wall
Branch Circuit, Concealed In Floor
Branch Circuit, Exposed
Feeders
Underfloor Duct And Junction Box
M
Motor
Controller
Street Lighting Standard
Outlet, Floor
Convenience, Duplex
F
Fan, Wall
F
Fan, Ceiling
Knife Switch Disconnected
S
Single-Pole Switch
S2
Double-Pole Switch
S
Pull Switch Ceiling
S
Pull Switch Wall
Fixture, Fluorescent, Ceiling
Fixture, Fluorescent, Wall
J
Junction Box, Ceiling
J
Junction Box, Wall
L
Lampholder, Ceiling
L
Lampholder, Wall
L PS
Lampholder, With Pull Switch, Ceiling
L PS
Lampholder, With Pull Switch, Wall
Special Purpose
Telephone, Switchboard
T
Thermostat
Push Button


Indicates direction of cutting plane
A
A4 A5
Letter indicates building section
Sheet number where section is drawn
Sheet number where section is taken
Building Section
Number indicates elevation
A
A4 A5
Elevation
Number Indicates Detail
3
M1 M2
2
C2 C4
4
42 46
Detail
5
56 58
Number indicates wall section
Wall Section
Letter indicates building section
A
A2 A5
Title Symbols
5
EJ E5
Number indicates elevation, wall section, or detail
Additional Sheet References
Note: These symbols should always appear as part of the title, placed under the view


Field Weld Symbol
Weld-all-around symbol
Tail
Weld info for other side
Weld info for arrow side
Arrow to joint
Fillet
Plug or Slot
Spot or Projection
Seam
Back or Backing
Melt Thru
Surfacing
Flange
Edge
Corner
Groove
Square
V
Bevel
U
J
Flare - V
Flare - Bevel
Basic Arc and Gas Weld Symbols
Weld all around
Flag toward tail field weld
Contour
Flush
Convex
Concave
Supplementary Symbols

Location Significance	Fillet	Plug or Slot	Spot or Projection	Stud	Seem	Back or Backing	Surfacing	Flange Corner	Flange Edge
Arrow Side						Groove Weld Symbol			
Other Side				Not Used		Groove Weld Symbol	Not Used		
Both Sides		Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
No arrow side or other side significance	Not Used	Not Used		Not Used		Not Used	Not Used	Not Used	Not Used

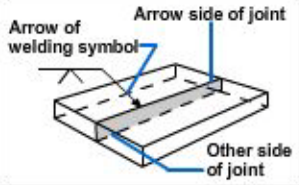
Location Significance	Groove							Scarf for Brazed Joint
	Square	V	Bevel	U	J	Flare - V	Flare - Bevel	
Arrow Side								
Other Side								
Both Sides								
No arrow side or other side significance		Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used

Supplementary Symbols

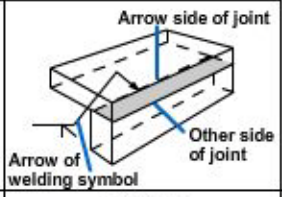
Weld all around	Field Weld	Melt Thru	Consumable Insert	Backing Spacer	Contour		
					Flush	Convex	Concave

Basic Joints
Identification of Arrow Side and Other Side Joint

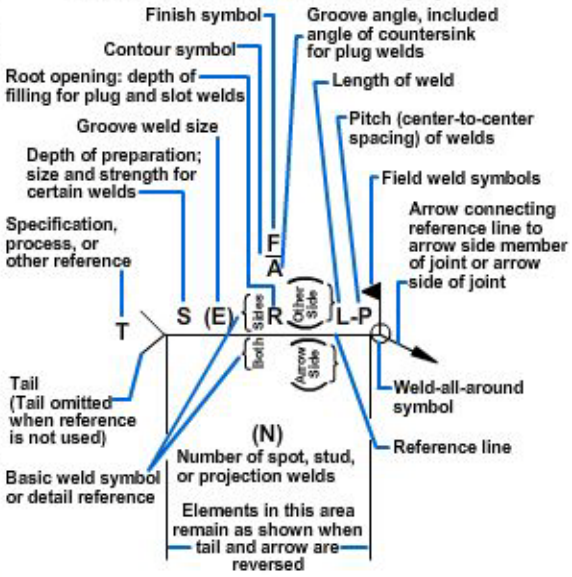
Butt Joint



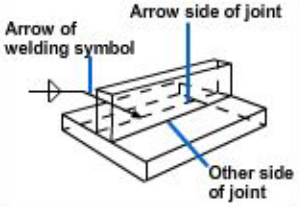
Corner Joint



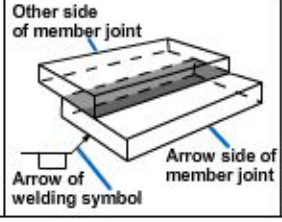
Location of Elements of a Welding Symbol



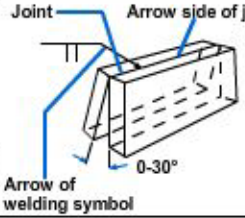
T - Joint



Lap Joint



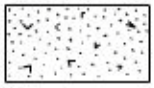
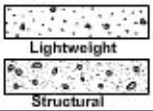
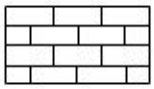
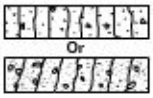
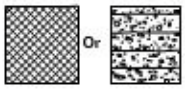
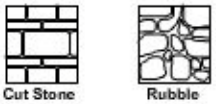
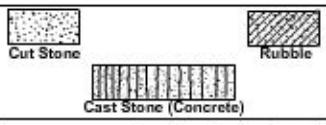
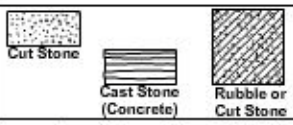
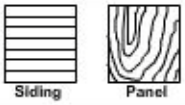
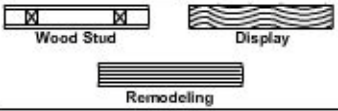
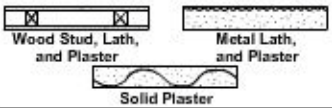
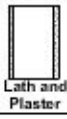
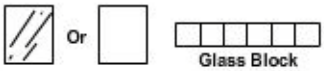
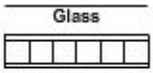
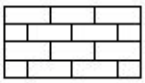
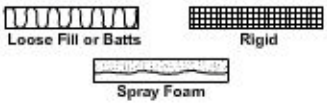
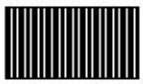
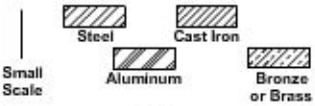
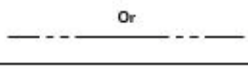
Edge Joint

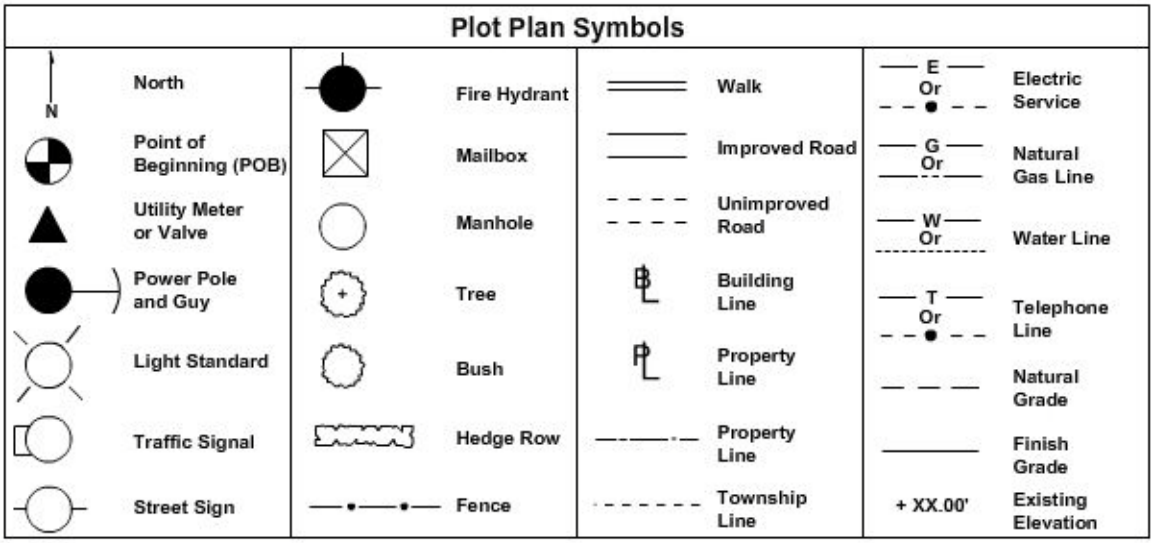


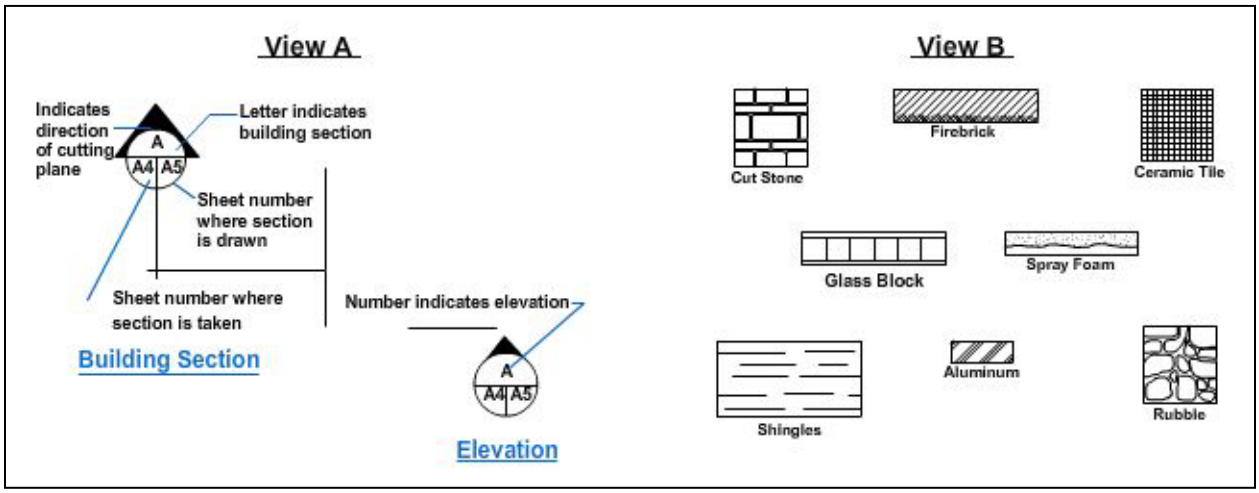
Process Abbreviations

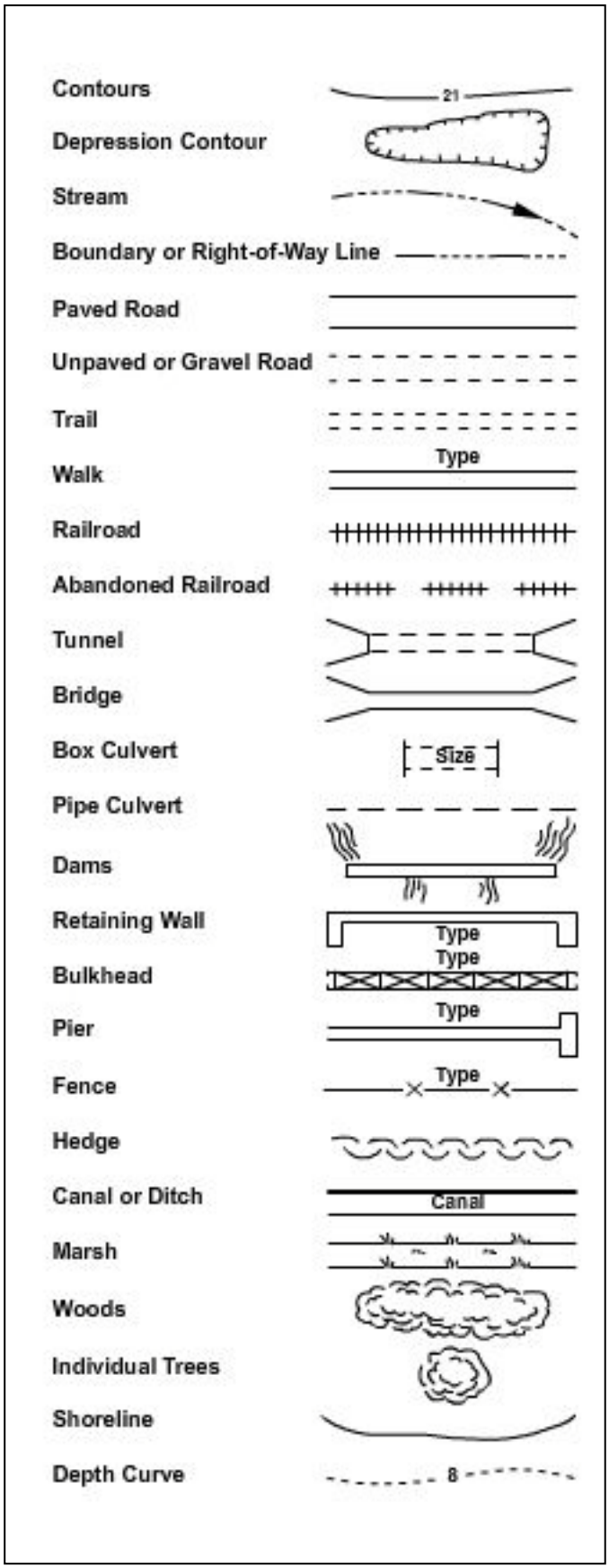
Where process abbreviations are to be included in the tail of the welding symbol, reference is made to Table 1. Designation of Welding and Allied Processes by Letters, of AWS A2.4-86.

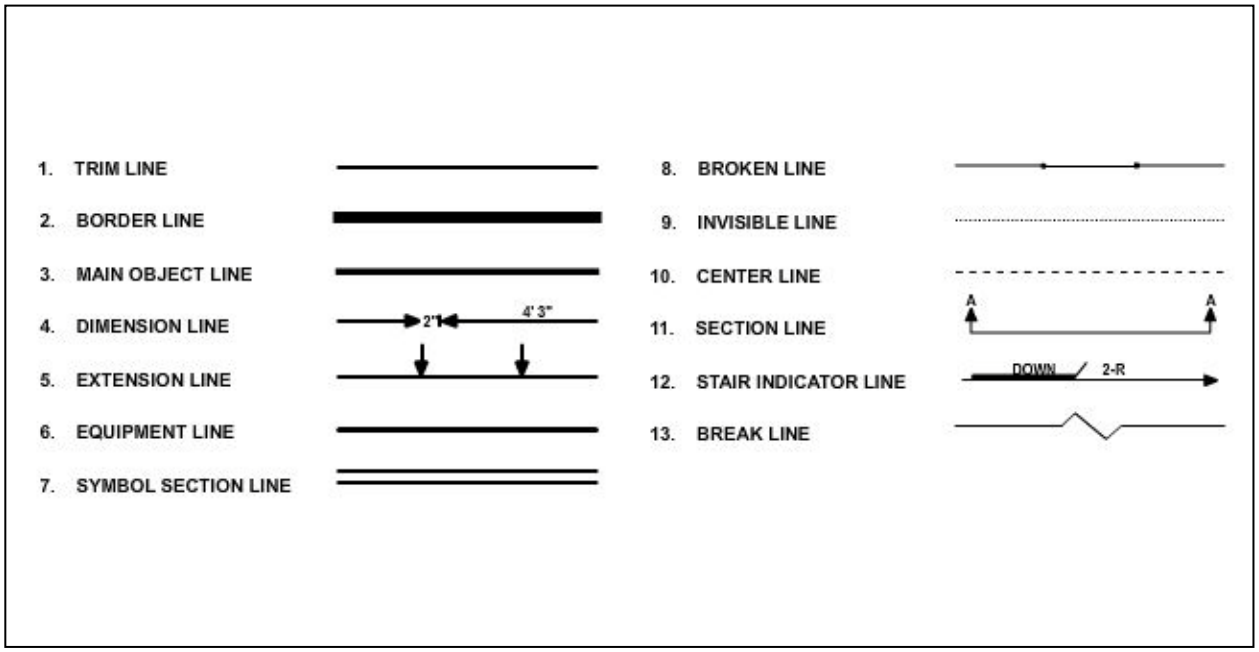
Architectural Symbols

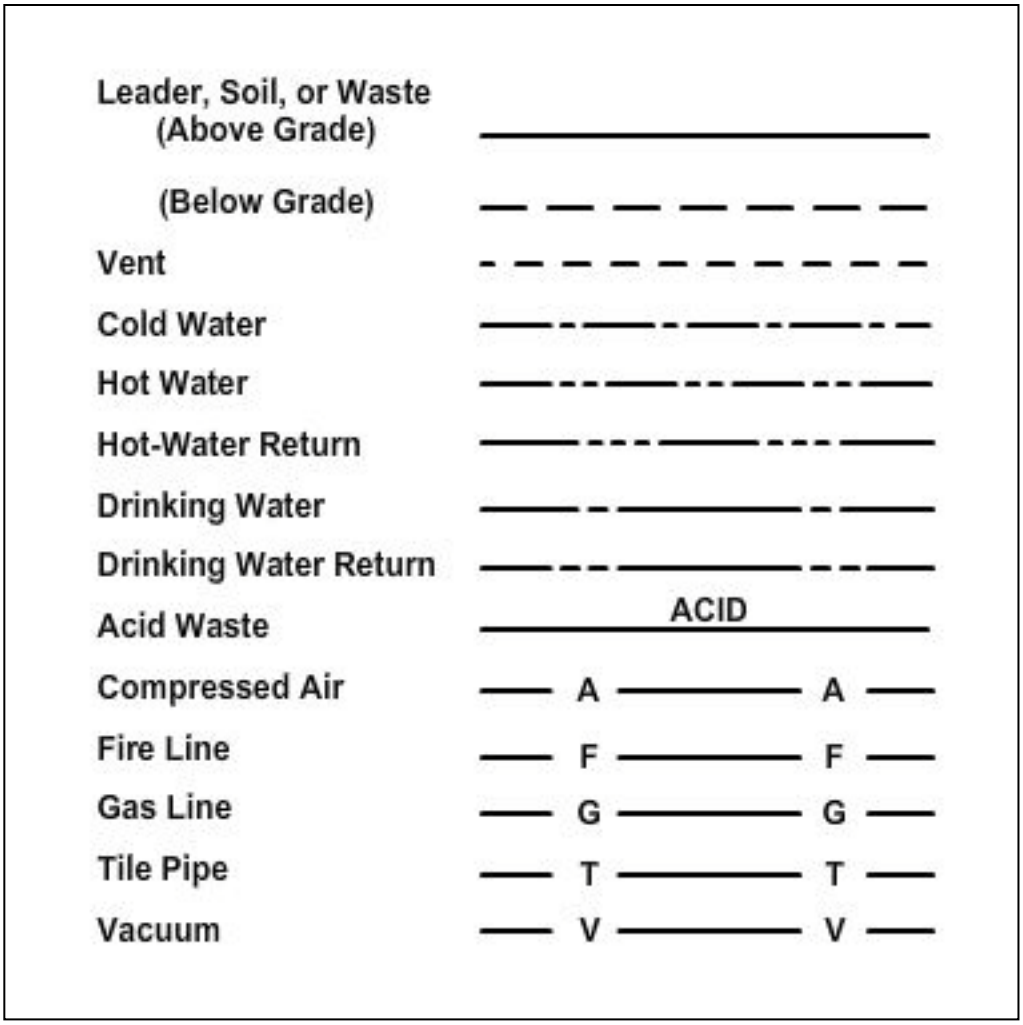
Material	Elevation	Plan	Section
Earth			
Brick	 With note indicating type of brick (common, face, etc.)	 Common or Face; Firebrick	Same as Plan Views
Concrete		 Lightweight; Structural	Same as Plan Views
Concrete Block		 Or	 Or
Stone	 Cut Stone; Rubble	 Cut Stone; Rubble; Cast Stone (Concrete)	 Cut Stone; Cast Stone (Concrete); Rubble or Cut Stone
Wood	 Siding; Panel	 Wood Stud; Display; Remodeling	 Rough Members; Finished Members; Plywood
Plaster		 Wood Stud, Lath, and Plaster; Metal Lath, and Plaster; Solid Plaster	 Lath and Plaster
Roofing	 Shingles	Same as Elevation View	
Glass	 Or; Glass Block	 Glass; Glass Block	 Small Scale; Large Scale
Facing Tile	 Ceramic Tile	 Floor Tile	 Ceramic Tile Large Scale; Ceramic Tile Small Scale
Structural Clay Tile			Same as Plan Views
Insulation		 Loose Fill or Batts; Rigid; Spray Foam	Same as Plan Views
Sheet Metal Flashing		Occasionally Indicated by Note	
Metals Other Than Flashing	Indicated by Note or Drawn to Scale	Same as Elevation	 Steel; Cast Iron; Small Scale; Aluminum; Bronze or Brass
Structural Steel	Indicated by Note or Drawn to Scale	 Or	 Small Scale; Rebars; Large Scale; L-Angles, S-Beams, etc.

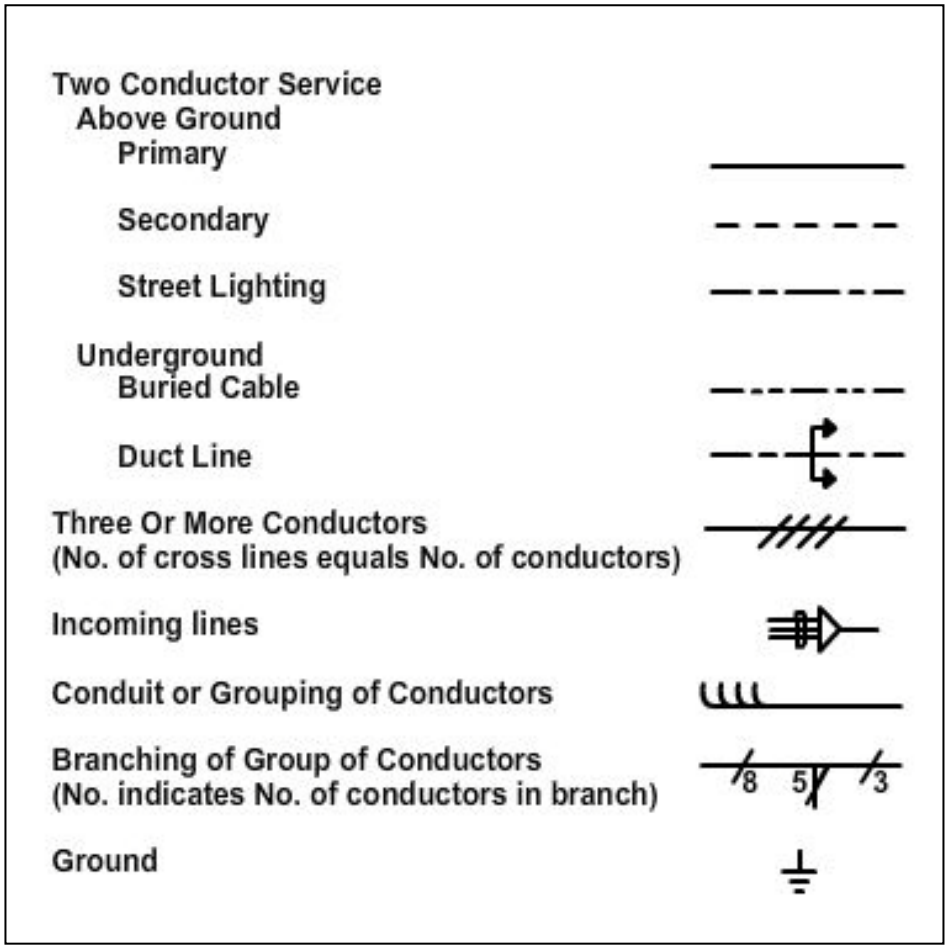

Plot Plan Symbols
North
Point of Beginning (POB)
Utility Meter or Valve
Power Pole and Guy
Light Standard
Traffic Signal
Street Sign
Fire Hydrant
Mailbox
Manhole
Tree
Bush
Hedge Row
Fence
Walk
Improved Road
Unimproved Road
Building Line
Property Line
Property Line
Township Line
E Or
Electric Service
G Or
Natural Gas Line
W Or
Water Line
T Or
Telephone Line
Natural Grade
Finish Grade
+ XX.00'
Existing Elevation

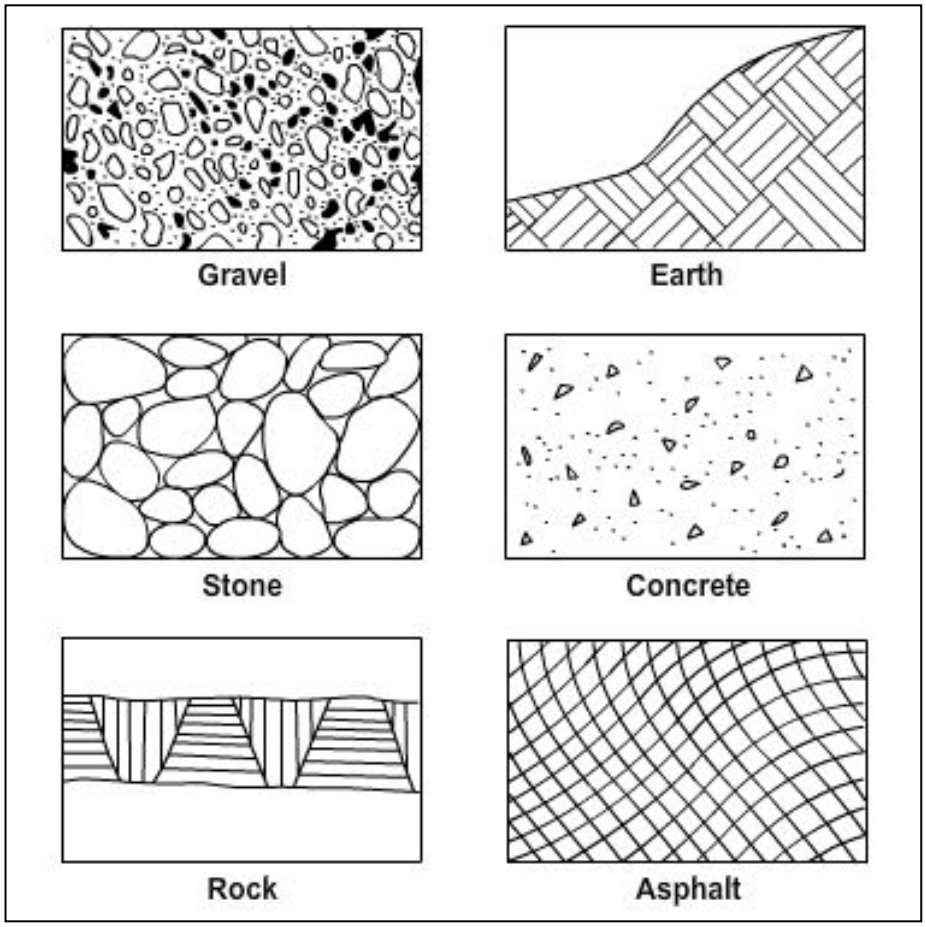

View A
Indicates direction of cutting plane
A
A4 A5
Letter indicates building section
Sheet number where section is drawn
Sheet number where section is taken
Building Section
Number indicates elevation
A
A4 A5
Elevation
View B
Cut Stone
Firebrick
Ceramic Tile
Glass Block
Spray Foam
Shingles
Aluminum
Rubble

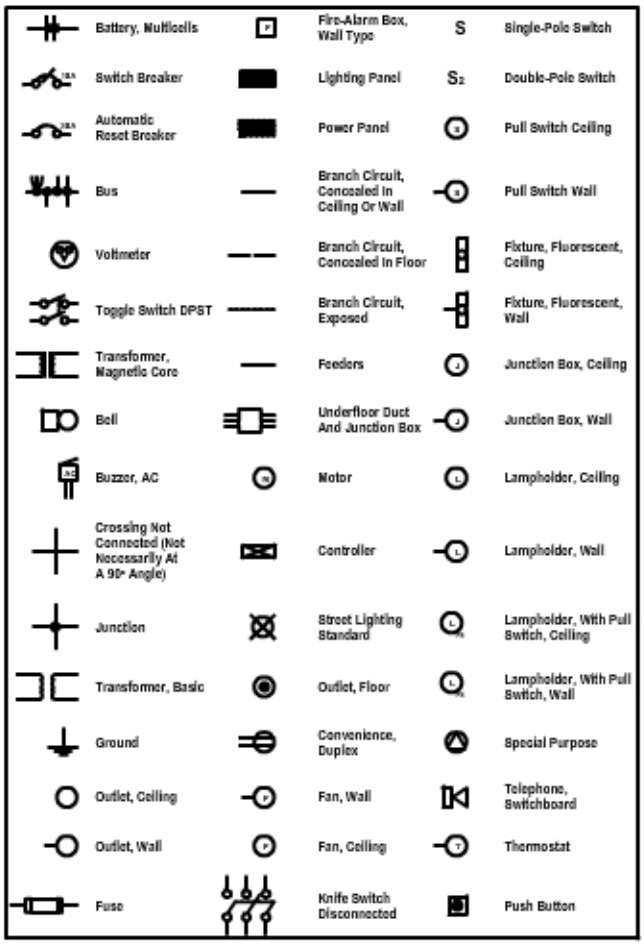

Contours
21
Depression Contour
Stream
Boundary or Right-of-Way Line
Paved Road
Unpaved or Gravel Road
Trail
Walk
Type
Railroad
Abandoned Railroad
Tunnel
Bridge
Box Culvert
Size
Pipe Culvert
Dams
Retaining Wall
Type
Bulkhead
Type
Pier
Type
Fence
Type
Hedge
Canal or Ditch
Canal
Marsh
Woods
Individual Trees
Shoreline
Depth Curve
8


1. TRIM LINE
2. BORDER LINE
3. MAIN OBJECT LINE
4. DIMENSION LINE
2'1
4' 3"
5. EXTENSION LINE
6. EQUIPMENT LINE
7. SYMBOL SECTION LINE
8. BROKEN LINE
9. INVISIBLE LINE
10. CENTER LINE
11. SECTION LINE
A
A
12. STAIR INDICATOR LINE
DOWN
2-R
13. BREAK LINE


Leader, Soil, or Waste
(Above Grade)
(Below Grade)
Vent
Cold Water
Hot Water
Hot-Water Return
Drinking Water
Drinking Water Return
Acid Waste
ACID
Compressed Air
A
A
Fire Line
F
F
Gas Line
G
G
Tile Pipe
T
T
Vacuum
V
V


Two Conductor Service
Above Ground
Primary
Secondary
Street Lighting
Underground
Buried Cable
Duct Line
Three Or More Conductors
(No. of cross lines equals No. of conductors)
Incoming lines
Conduit or Grouping of Conductors
Branching of Group of Conductors
(No. indicates No. of conductors in branch)
8
5
3
Ground


Gravel
Earth
Stone
Concrete
Rock
Asphalt


Battery, Multicells
Switch Breaker
Automatic Reset Breaker
Bus
Voltmeter
Toggle Switch DPST
Transformer, Magnetic Core
Bell
Buzzer, AC
Crossing Not Connected (Not Necessarily At A 90° Angle)
Junction
Transformer, Basic
Ground
Outlet, Ceiling
Outlet, Wall
Fuse
Fire-Alarm Box, Wall Type
Lighting Panel
Power Panel
Branch Circuit, Concealed In Ceiling Or Wall
Branch Circuit, Concealed In Floor
Branch Circuit, Exposed
Feeders
Underfloor Duct And Junction Box
Motor
Controller
Street Lighting Standard
Outlet, Floor
Convenience, Duplex
Fan, Wall
Fan, Ceiling
Knife Switch Disconnected
S
S2
Pull Switch Ceiling
Pull Switch Wall
Fixture, Fluorescent, Ceiling
Fixture, Fluorescent, Wall
Junction Box, Ceiling
Junction Box, Wall
Lampholder, Ceiling
Lampholder, Wall
Lampholder, With Pull Switch, Ceiling
Lampholder, With Pull Switch, Wall
Special Purpose
Telephone, Switchboard
Thermostat
Push Button