

# SYMBOLS AND ABBREVIATIONS

Standardized abbreviations and symbols for the various trades have been developed by numerous professional organizations. These standard abbreviations and symbols are generally used by architects and engineers; however, architects and engineers sometimes create their own symbols and abbreviations to represent materials and equipment on drawings. If symbols and abbreviations are not standard, they are usually noted on the drawing.

Some abbreviations for materials, equipment, and titles are called *acronyms*. An acronym is an abbreviation formed by using the first letter of each word. Some examples of acronyms are CFM (cubic feet per minute), FPM (feet per minute), BTU (British thermal unit), and GPM (gallons per minute). ASHRAE is an acronym for the American Society of Heating, Refrigeration and Air Conditioning Engineers.

## VARIATIONS IN ABBREVIATIONS

Some single letter abbreviations are used to represent several different words. The letter “R” stands for *radius*, *Rankine*, *road*, *room*, and *thermal resistance*. Generally speaking, the location of the single letter abbreviation indicates what that particular abbreviation stands for.

Some words have more than one abbreviation. The word *DOWN* can be written as *DWN* or *DN*. Either abbreviation is correct, but the drafter should choose one and then use it throughout the drawing.

Some abbreviations (single letter or several letters) have a period after the last letter to eliminate confusion for the reader. It is not necessary to place a period after an acronym.

## VARIATIONS IN SYMBOLS

When symbols are drawn by hand, templates are usually used. Templates are commercially prepared patterns made of sheets of plastic with the shapes of various symbols cut out of the plastic. To insert a symbol at the proper place on the drawing, the drafter draws around the cut-out portion of the template. If the symbol is a complicated one, two or more templates may be required.

Computer-aided design (CAD) systems have a library of symbols from which the exact symbol can be selected and plotted on the drawing. This library contains symbols for various materials and pieces of equipment in each section of drawings (architectural, plumbing, mechanical, and electrical sections).

In some cases, there is no standard symbol for a material or piece of equipment. For example, there is no standard symbol for *EARTH* when shown on the plan view of a drawing. When there is no standard symbol, the drafter notes on the drawing what the material or equipment is.

Some symbols for the same material are shown differently on different drawings. For example, when brick is shown on the elevation views of a building, the drafter usually shows the brickwork as it will look when the wall is complete. The mortar joints and the brick are shown in true perspective. When drawn on the floor plan, this brick wall is shown with crosshatching (parallel lines drawn close together at a 45-degree angle). It is important for the reader of the drawings to keep these variations in mind.

## **LEGEND AND SYMBOL SCHEDULES**

In most cases, the architect and engineer include a listing of symbols used on the drawings called the “Legend and Symbol Schedule.” It is usually placed on the first drawing of each section of the set of drawings (architectural, mechanical, plumbing, and electrical). When this schedule is present, each symbol used in that section is shown on the schedule whether it is a standard symbol or one created by the drafter.

## **ABBREVIATIONS AND SYMBOLS USED TOGETHER**

Abbreviations and symbols are combined on working drawings to relate information to the builder. Abbreviations and symbols are used jointly to describe the sidewall supply register. The arrow indicates the discharge of supply air from the register. The air quantity is shown on the arrow with the abbreviation CFM (cubic feet per minute). A circle, square, or other symbol is placed at the arrowhead to indicate which register to look for in the Register and Grille Schedule. This kind of combination of symbols and abbreviations is often found on mechanical plans.

**Equipment Schedules**—several equipment schedules are always provided on construction jobs, including the following:

- a. Door schedule—shows all doors used on the job. The door schedule shows the door size (dimensions), door type, materials used to construct the door, hardware (hinges and door locks), door finish, door frames, and other information needed for ordering doors.
- b. Window schedule—like the door schedule, information required for ordering the windows includes the size, type of glass, type of window, information as to the window frame, and so forth.
- c. Room finish schedule—each room in the building is included on this schedule. Such items are listed as the type of ceiling, baseboard, wall treatment (paint or wall covering), and floor finish (hardwood, treated, painted, carpet, etc.). Special notations give instructions on the finishes in each room.
- d. Symbol schedule—shows symbols and describes them.
- e. Abbreviations schedule—lists the abbreviations used in the general construction area along with an explanation of each abbreviation.
- f. Other schedules—include kitchen equipment, hospital equipment, laundry equipment, and special equipment installed in the building under the general construction contract.

## SYMBOLS

Without the use of symbols, architects cannot show all necessary information regarding materials, methods, and location of components.

### Types of Symbols

The types of symbols used include those used in elevation views and those in sectional views. Elevation symbols are easily recognized, as they look very much like the actual material or object. An *elevation view* is a vertical picture of an object showing the front, side, or rear view of an object, room, or structure as one would view it while facing it.

The materials shown in an elevation view appear differently in a sectional view. A *sectional view* shows the object as if it were sliced vertically, showing of what the object would be composed. For example, a sectional view of a masonry wall would show the thickness of the joints and the units, how the wall ties are installed, and, many times, the exact height of the wall.

The mason should be familiar with some of the more common symbols for the mechanical trades, as they may affect the work when building in or around certain equipment. For example, it may be necessary

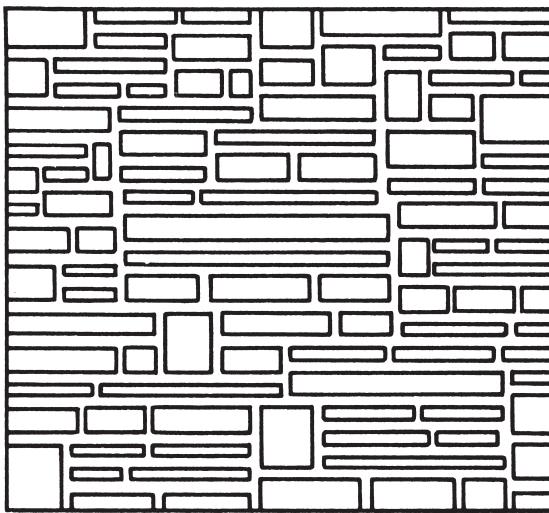
for the mason to provide for electrical switch boxes, heating units, or built-in plumbing fixtures. **Symbols and Abbreviations** Figure 3 shows typical electrical and plumbing symbols.

## SCHEDULES

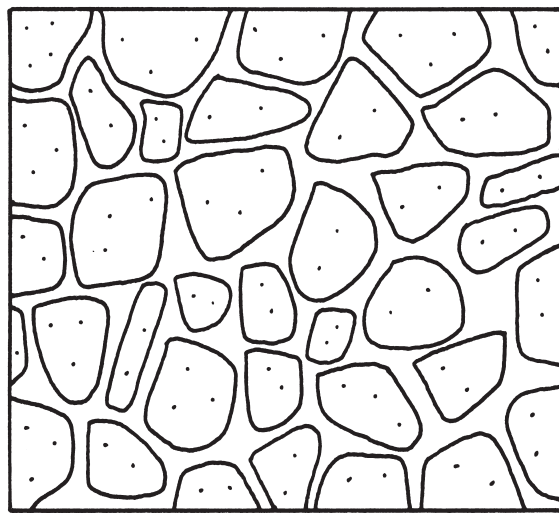
A *schedule*, in a set of plans, is a list added separately to the plans that describes such items as windows, doors, floors, and wall finishes. The mason must be able to recognize and interpret schedules correctly, or great expense could result from necessary changes made at the conclusion of the job so that the job conforms to the finished schedule.

As mentioned before, windows and doors are designated by a number or letter on plans. The same letter or number is duplicated in the schedule, with a brief description of the item. Typical door and window schedules must show their relationship to the floor plan.

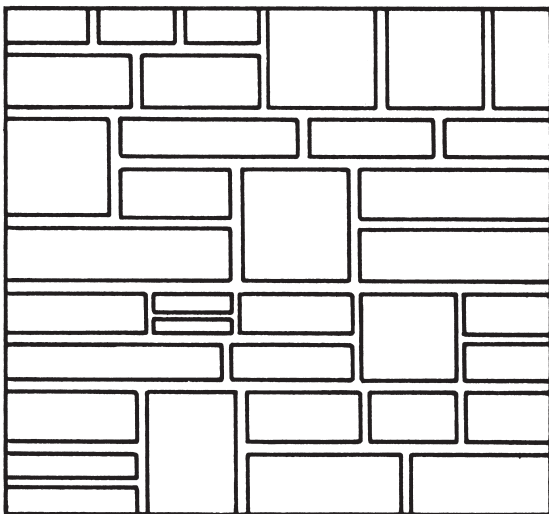
It should be remembered that schedules consist of brief descriptions; workers must also consult the drawings and specifications to obtain all the necessary information. Schedules help greatly in estimating the cost of a job.



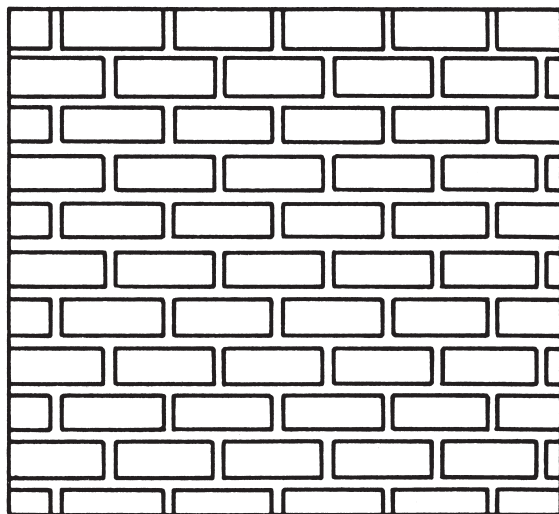
SQUARE – STONE MASONRY



RANDOM




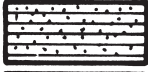
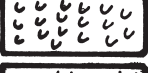

















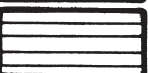

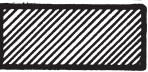




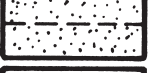







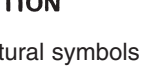


RANDOM RANGE



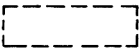
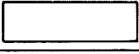










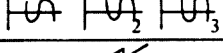

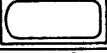

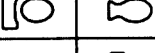







RANGE

**SYMBOLS AND ABBREVIATIONS** Figure 1. Elevation masonry symbols. Notice both materials used and construction details.




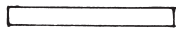
	EARTH		CUT STONE
	STONE		RUBBLE STONE
	CINDERS		CAST STONE
	SAND		MARBLE
	CONCRETE (STONE)		SLATE
	CONCRETE (CINDERS)		MARBLE ON CONCRETE
	CONCRETE		TILE ON CONCRETE
	CONC. BLOCK		WOOD FINISH ON STUD
	STEEL		FINISHED WOOD
	CAST IRON		ROUGH WOOD
	BRASS		PLASTIC ON PLYWOOD
	ALUMINUM		STUD WALL (PLAN)
	COMMON BRICK		PLYWOOD
	FACE BRICK		PLASTER
	FACE BRICK WITH COMMON BRICK		BLOCK PLASTER
	CLAY TILE		PLANK PLASTER
	FACING TILE		GLASS
	FACE TILE		GLASS BLOCK
	CLAY TILE FLOOR UNITS		STRUCTURAL GLASS




IN SECTION

SYMBOLS AND ABBREVIATIONS Figure 2. Architectural symbols showing materials in the sectional view.

	RECESSED FLUORESCENT FIXTURE
	STEM MOUNTED FLUORESCENT FIXTURE
	PANELBOARD
	INCANDESCENT FIXTURE
	WALL MOUNTED INCANDESCENT FIXTURE
	DUPLEX CONVENIENCE OUTLET
	PUSH BUTTON
	BELL
	FLOOR OUTLET
	CLOCK OUTLET
	MOTOR -- FAN
	TELEPHONE OUTLET
	ONE POLE SWITCH / TWO POLE SWITCH / THREE WAY SWITCH
	EXTERIOR LIGHT FIXTURE
<b>PLUMBING SYMBOLS</b>	
	BATHTUB
	SHOWER STALL
	COMMODOES
	URINALS
	LAVATORY
	SINK
	SINK WITH DRAINBOARD
 F.D.	FLOOR DRAIN
 WH	WATER HEATER
 HB	HOSE BIBB

SYMBOLS AND ABBREVIATIONS Figure 3. Typical electrical and plumbing symbols.

WINDOW SCHEDULE			MATERIAL LEGEND	
NO.	SIZE	TYPE		
①	3'-9" x 2'-9"	STEEL SECURITY SASH		CONCRETE
②	1'-9" x 2'-9"	STEEL SECURITY SASH		BRICK
③	2'-2'-8" x 4'-6"	WOOD DOUBLE HUNG		CINDER BLOCK
				WOOD STUD PART.

DOOR SCHEDULE			LINTEL SCHEDULE	
NO.	SIZE	TYPE	NO.	TYPE
Ⓐ	3'-0" x 6'-8"	KALAMEIN - SELF CLOSING WITH FIRE CODE LABEL	L-1	4 - 3/4" $\phi$ RODS
Ⓑ	3'-0" x 7'-0" x 1 3/4"	WOOD - PL. GLASS PANEL	L-2	3 L <sub>s</sub> - 4" x 3 1/2" x 5/16" 
Ⓒ	3'-0" x 7'-0" x 1 3/4"	WOOD - OBSCURE WIRE GL. PNL.	L-3	1 L - 4" x 4" x 5/16" 2 L <sub>s</sub> - 4" x 3" x 5/16" 
Ⓓ	3'-0" x 6'-8" x 1 3/4"	WOOD - OBSCURE GL. PNL.	L-4	3 L <sub>s</sub> - 3" x 3" x 1/4" 
Ⓔ	2'-8" x 6'-8" x 1 3/8"	WOOD		
Ⓕ	2'-4" x 6'-8" x 1 3/8"	WOOD		
Ⓖ	2'-4" x 6'-8" x 1 3/8"	WOOD - LOUVERED LOWER PNL.		

**SYMBOLS AND ABBREVIATIONS Figure 4.** Schedule for a small job, including information on windows, doors, and lintels.

## WORDING NOTATIONS FOR CONSTRUCTION PRINTS

The architect, engineer, and drafter are responsible for relaying design information to the workman or installer. Plans show where the work is to be performed and what materials are to be used, but additional instructions are often needed. This information is covered by notes. To save space and keep the plan from becoming cluttered, notes must be written in precise language.

It is also important to locate the notation in a logical place on the drawing. The note should be close to the area where it applies. Notes are written instructions that tell the types of materials, sequence of installation, how different members fit together, equipment usage, how to operate the equipment, and other pertinent information.

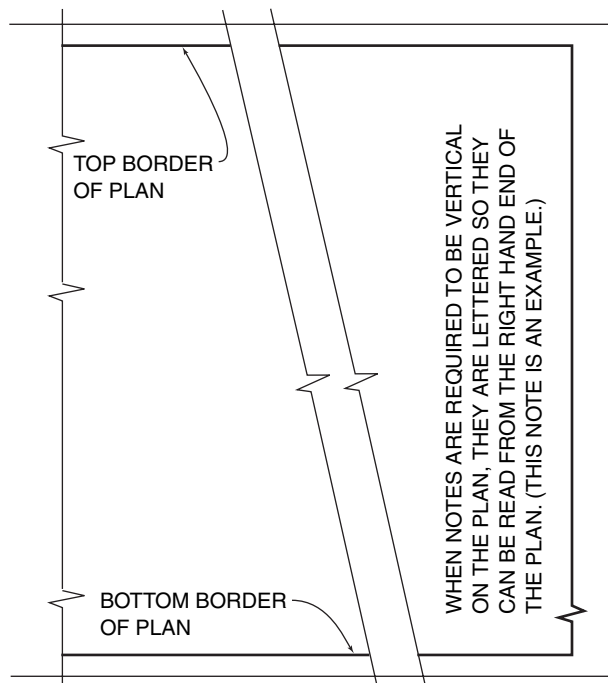
To link the note to the object it is referred to, a thin line called a leader is extended from the beginning or the end of the notation to the place where the note applies. The leader usually starts near the notation and extends to the reference object, terminating with an arrowhead. The leader is usually drawn straight out from the note and then turned at an angle to the reference object and arrowhead. Notes should always be located so that the leader lines do not cross. Some architects and engineers draw a freehand leader.

In some cases, notes are too long to place in the location where they are needed. In that case, the drafter will insert brief instructions such as "See Note No. 1." These long notes are then lettered on a blank space on the plan so that the floor plan is not cluttered.

Most notes are lettered horizontally, but sometimes it is advantageous to letter the note vertically. When vertical notes are used, they should be readable from the right-hand side of the plan (Symbols and Abbreviations Figure 5).

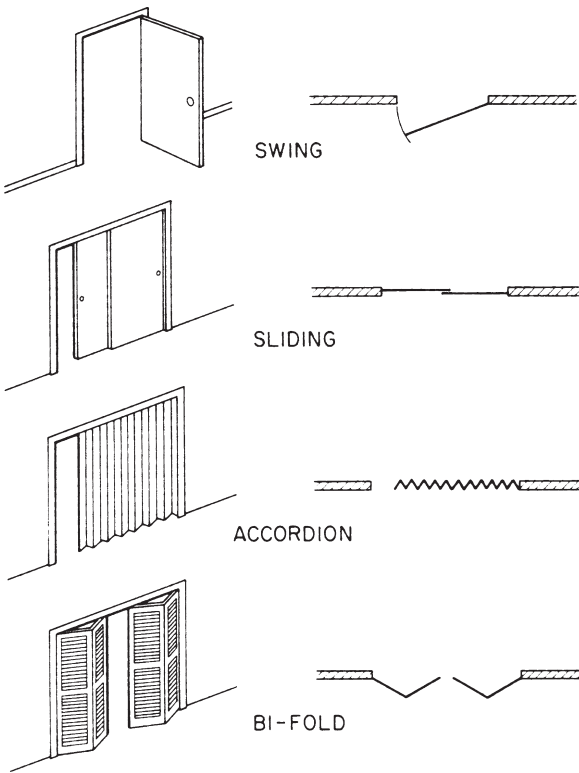
THIS IS AN EXAMPLE OF  
A NOTE AND A LEADER

Typical note with leader



SYMBOLS AND ABBREVIATIONS Figure 5. A vertical note on a plan.





**SYMBOLS AND ABBREVIATIONS** Figure 6. Types of doors and their plan symbols.

## MATERIALS SYMBOLS

The drawing of an object shows its shape and location. The outline of the drawing may be filled in with a material symbol to show what the object is made of, **Symbols and Abbreviations** Figure 9. Many materials are represented by one symbol in elevations and another symbol in sections. Examples of such symbols are concrete block and brick. Other materials look pretty much the same when viewed from any direction, so their symbols are drawn the same in sections and elevations.

When a large area is made up of one material, it is common to only draw the symbol in a part of the area, **Symbols and Abbreviations** Figure 10. Some drafters simplify this even further by using a note to indicate what material is used and omitting the symbol altogether.

## ELECTRICAL AND MECHANICAL SYMBOLS

The electrical and mechanical systems in a building include wiring, electrical devices, piping, pipe fittings, plumbing fixtures, registers, and heating and air conditioning ducts. It is not practical to draw these items as they would actually appear, so standard symbols have been devised to indicate them.

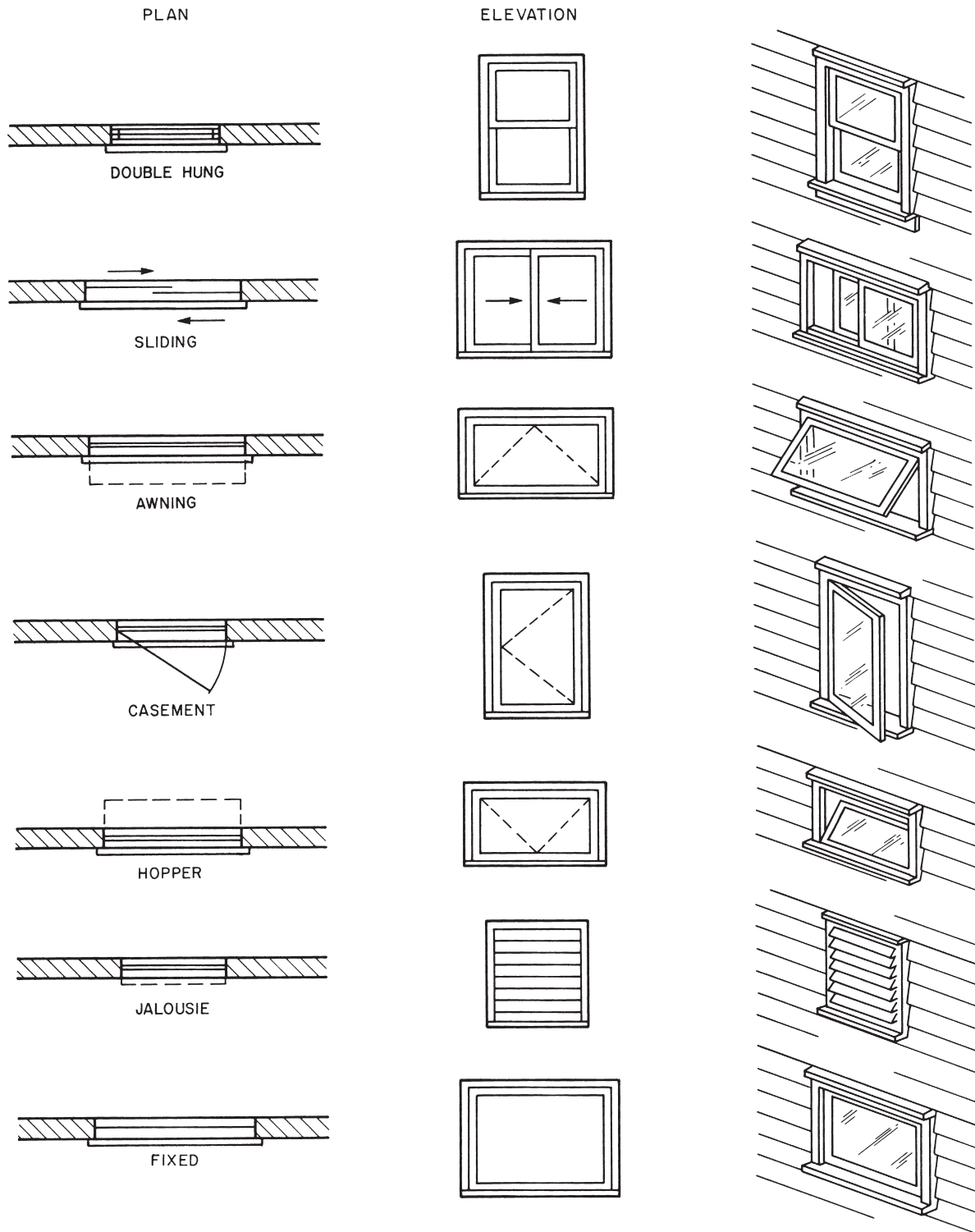
The electrical system in a house includes wiring as well as devices such as switches, receptacles, light fixtures, and appliances. Wiring is indicated by lines that show how devices are connected. These lines are not shown in their actual position. They simply indicate which switches control which lights, for example. Outlets (receptacles) and switches are usually shown in their approximate positions. Major fixtures and appliances are shown in their actual positions. A few of the most common electrical symbols are shown in **Symbols and Abbreviations** Figure 11.

Mechanical systems—plumbing and HVAC (heating, ventilating, and air conditioning)—are not usually shown in much detail on drawings for single-family homes. However, some of the most important features may be shown. Piping is shown by lines; different types of lines represent different kinds of piping. Symbols for pipe fittings are the same basic shape as the fittings they represent. A short line, or *hash mark*, represents the joint between the pipe and the fitting. Plumbing fixtures are drawn pretty much as the actual fixture appears. A few plumbing symbols are shown in **Symbols and Abbreviations** Figure 12.

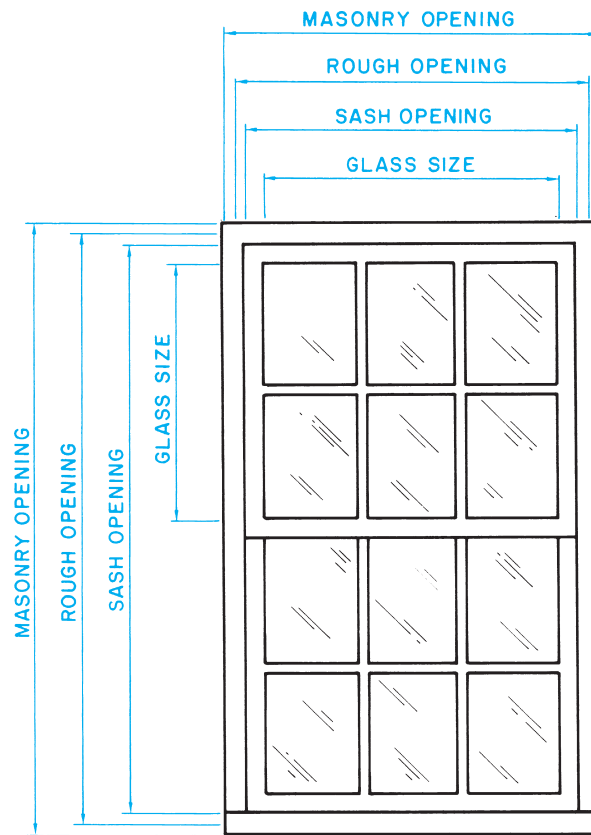
## REFERENCE MARKS

A set of drawings for a complex building may include several sheets of section and detail drawings. These sections and details do not have much meaning without some way of knowing what part of the building they are meant to show. Callouts, called *reference marks*, on plans and elevations indicate where details or sections of important features have been drawn. To be able to use these reference marks for coordinating drawings, you must first understand the numbering system used on the drawings. The simplest numbering system for drawings consists of numbering the drawing sheets and naming each of the views. For example, Sheet 1 might include a site plan and foundation plan; Sheet 2, floor plans; and Sheet 3, elevations.

On large, complex sets of drawings the sheets are numbered according to the kind of drawings shown. Architectural drawing sheets are numbered A-1, A-2, and so on for all the sheets. Electrical drawings are numbered E-1, E-2, and E-3. A view number identifies each separate drawing or view on the sheet.



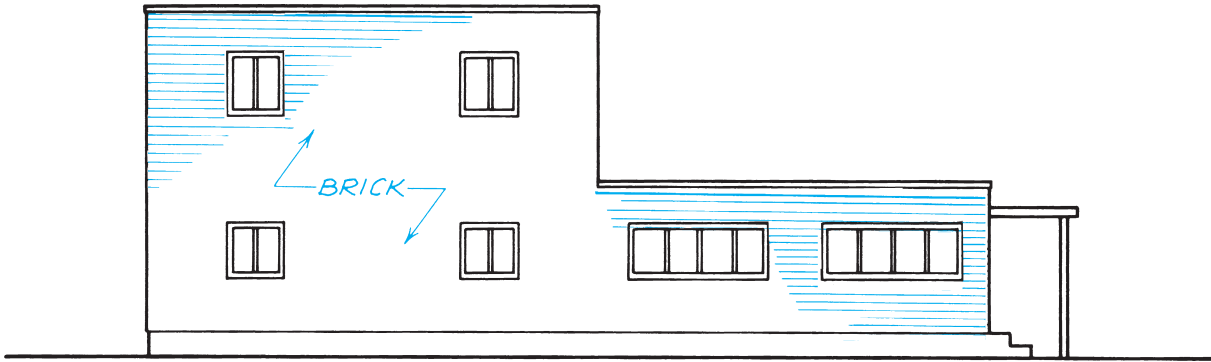
SYMBOLS AND ABBREVIATIONS Figure 7. Window symbols.




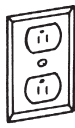


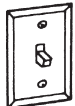





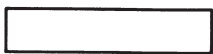




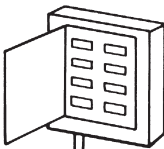
**SYMBOLS AND ABBREVIATIONS Figure 8.** Windows and doors can be measured in several ways.

PLAN AND SECTION SYMBOLS						
<b>EARTH ETC.</b>					<b>CONCRETE</b>	
EARTH	ROCK	STONE FILL	REINFORCING BARS	STRUCTURAL CONCRETE	LT. WEIGHT CONCRETE	BLOCK
<b>METAL</b>						
STEEL, IRON	ALUMINUM	STRUCTURAL STEEL	PLYWOOD	FINISH	ROUGH	STUD WALL & PARTITION
<b>STONE</b>						
CUT STONE	RUBBLE	CAST STONE (CONCRETE)	SLATE, BLUESTONE SOAPSTONE	COMMON	FACE	FIRE BRICK ON COMMON
<b>GYPSUM</b>					<b>INSULATION</b>	
PLASTER ON MASONRY	BLOCK	METAL STUD & PLASTER PARTITION	PLASTER BOARD & PLASTER PARTITION	LOOSE FILL OR BATTS	BOARDS OR QUILTS	SHEET & PLATE
ELEVATION SYMBOLS						
RUBBLE STONE	SQUARED STONE	RUNNING BOND MASONRY	STACK BOND MASONRY	SHEET METAL	GLASS	CONCRETE PLASTER
SHINGLES	BRICK	CERAMIC				


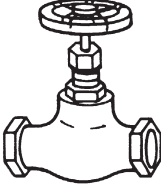




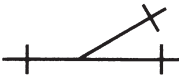




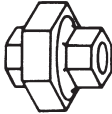
**SYMBOLS AND ABBREVIATIONS Figure 9.** Material symbols.








**SYMBOLS AND ABBREVIATIONS Figure 10.** Only part of the area is covered by the brick symbol, although the entire building will be brick.

	CONVENIENCE OUTLET	
	RANGE OUTLET	
S OR S <sub>3</sub> (3-WAY)	WALL SWITCH	
 OR 	CEILING LIGHT FIXTURE	
	WALL LIGHT FIXTURE	
	FLUORESCENT LIGHT FIXTURE	
	THERMOSTAT	
	POWER PANEL	

**SYMBOLS AND ABBREVIATIONS Figure 11.** Some common electrical symbols.

	VALVE	
	90° ELBOW	
	45° ELBOW	
	WYE	
	TEE	
	UNION	

	SOIL WASTE ( BELOW GRADE )
	SOIL WASTE ( ABOVE GRADE )
	COLD WATER
	HOT WATER
	GAS

PIPING SYMBOLS











**SYMBOLS AND ABBREVIATIONS Figure 12.** Some common plumbing symbols.

<b>CIRCUITING</b>	
	BRANCH-CIRCUIT HOME RUN TO PANEL
	THREE WIRES IN CABLE OR RACEWAY
	FOUR WIRES IN CABLE OR RACEWAY, ETC.
	SOME DRAWINGS SHOW THIS METHOD OF CONDUCTOR IDENTIFICATION: EQUIPMENT GROUNDING CONDUCTOR: LONG LINE WITH DOT. NEUTRAL CONDUCTOR: LONG LINE. PHASE CONDUCTOR WITH SWITCH LEGS: SHORT LINE.
	WIRING CONCEALED IN CEILING OR WALL
	WIRING CONCEALED IN FLOOR
	WIRING EXPOSED
	WIRING TURNED UP
	WIRING TURNED DOWN
	CONDUIT ONLY (EMPTY)
	SWITCH LEG INDICATION. CONNECTS OUTLETS WITH CONTROL POINTS.
<p>AN ARROW INDICATES A BRANCH-CIRCUIT HOME RUN TO PANEL.                  THE NUMBER OF ARROWS INDICATES THE NUMBER OF CIRCUITS.                  IF THERE ARE NO CROSSHATCHES, THEN IT IS ASSUMED THAT THE RACEWAY CONTAINS TWO WIRES.</p>	

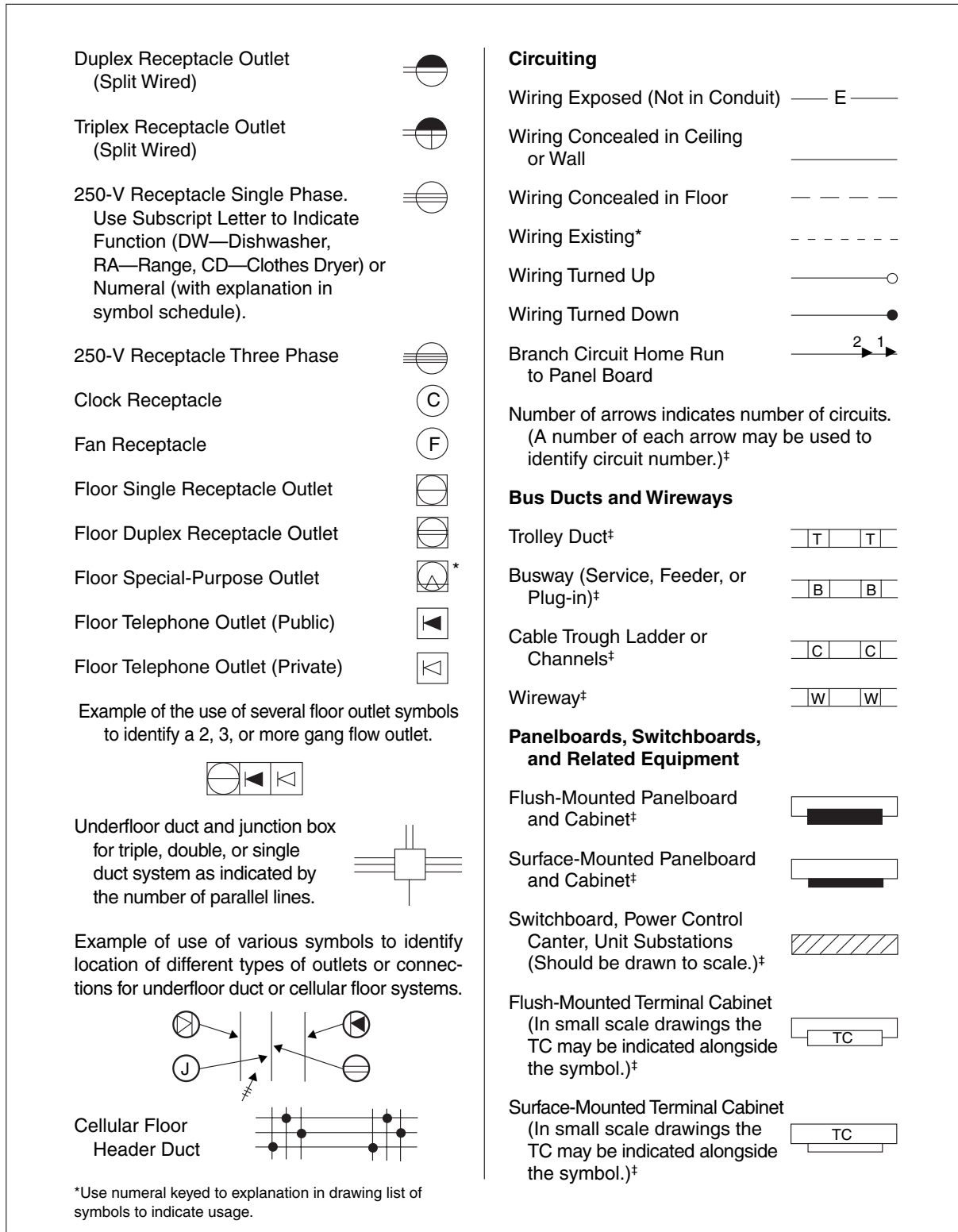
Electric *symbols* are used to simplify the drafting and later the interpreting of the drawings. Electrical symbols *are not standardized* throughout the industry. Most drawings will have a symbol legend or list. You must be knowledgeable of the symbols specifically used on each project, since designers modify basic symbols to suit their own needs. Many symbols are similar (circle, square, etc.). The addition of a line, dot, shading, letters, numbers, and so forth gives the specific meaning to the symbol. Learning the basic form of the various symbols is the best starting point in developing the ability to interpret the drawings and their related symbol meanings. **Symbols and Abbreviations Figure 14** lists the most common and recommended electrical symbols.

The School Addition drawing E-1, Symbol Legend A-4 contains an electrical symbol list for the project. From the symbol list, it can be seen that there are duplex receptacles, switches, telephone outlets, special purpose outlets, and fire alarm devices mounted at various heights. Then there is the General Note in the Symbol Legend that specifies that all mounting heights are to be verified and “modified as directed.” This is an example of why the installer must become familiar with the drawings and specifications far in advance of the installation scheduled time. The installer must request clarification or direction and give the designers reasonable time to clarify the questionable specified instructions.

**SYMBOLS AND ABBREVIATIONS Figure 13.** Circuiting symbols.

Electrical Reference Symbols		
<b>ELECTRICAL ABBREVIATIONS</b> (Apply only when adjacent to an electrical symbol.)		
Central Switch Panel	CSP	Switch and Fusestat Holder SFH
Dimmer Control Panel	DCP	Switch and Pilot Lamp SP
Dust Tight	DT	Fan Switch SF
Emergency Switch Panel	ESP	Switch for Low-Voltage Switching System SL
Empty	MT	Master Switch for Low-Voltage Switching System SLM
Explosion Proof	EP	Switch and Single Receptacle  S
Grounded	G	Switch and Duplex Receptacle  S
Night Light	NL	Door Switch SD
Pull Chain	PC	Time Switch ST
Rain Tight	RT	Momentary Contact Switch SMC
Recessed	R	Ceiling Pull Switch 
Transfer	XFER	“Hand-Off-Auto” Control Switch 
Transformer	XFRMR	Multi-Speed Control Switch 
Vapor Tight	VT	Push Button 
Water Tight	WT	
Weather Proof	WP	
<b>ELECTRICAL SYMBOLS</b>		
Switch Outlets		
Single-Pole Switch	S	
Double-Pole Switch	S <sub>2</sub>	
Three-Way Switch	S <sub>3</sub>	
Four-Way Switch	S <sub>4</sub>	
Key-Operated Switch	S <sub>K</sub>	
		<b>Receptacle Outlets</b>
		Where weather proof, explosion proof, or other specific types of devices are to be required, use the upper-case subscript letters. For example, weather proof single or duplex receptacles would have the uppercase WP subscript letters noted alongside of the symbol. All outlets should be grounded.
		Single Receptacle Outlet 
		Duplex Receptacle Outlet 
		Triplex Receptacle Outlet 
		Quadruplex Receptacle Outlet 

**SYMBOLS AND ABBREVIATIONS Figure 14.** Recommended electrical symbols.




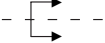
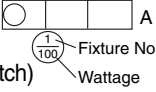



















**SYMBOLS AND ABBREVIATIONS Figure 14 (continued).** Recommended electrical symbols.



Pull Box (Identify in Relation to Wiring System Section and Size.)		Neutral wire may be shown longer. Unless indicated otherwise, the wire size of the circuit is the minimum size required by the specification. Identify different functions of wiring system, e.g. signaling system by notation or other means. ‡ Identify by notation or schedule.	
Motor or Other Power Controller (May Be a Starter or Contactor.)†			
Externally-Operated Disconnection Switch		<b>Remote Control Stations for Motors or Other Equipment</b>	
Combination Controller and Disconnection Means			
<b>Power Equipment</b>		Push Button Station	
Electric Motor (hp As Indicated)		Float Switch (Mechanical)	
Power Transformer		Limit Switch (Mechanical)	
Pothead (Cable Termination)		Pneumatic Switch (Mechanical)	
Circuit Element (e.g., Circuit Breaker)		Electric Eye (Beam Source)	
Circuit Breaker		Electric Eye (Relay)	
Fusible Element		Temperature Control Relay Connection (3 Denotes Quantity.)	
Single-Throw Knife Switch		Solenoid Control Valve Connection	
Double-Throw Knife Switch		Pressure Switch Connection	
Ground		Aquastat Connection	
Battery		Vacuum Switch Connection	
Contactor		Gas Solenoid Valve Connection	
Photoelectric Cell		Flow Switch Connection	
Voltage Cycles, Phase Ex: 480/60/3		Timer Connection	
Relay		Limit Switch Connection	
Equipment Connection (As Noted)		<b>Lighting</b>	
*Note: Use heavy weight line to identify service and leaders. Indicate empty conduit by notation CO (conduit only). ‡ Note: any circuit without further identification indicates two-wire circuit for a greater number of wires, indicate with cross lines, e.g.:		<b>Ceiling</b>	<b>Wall</b>
	3 wires	<b>TYPE</b>	<b>SWITCH</b>
	4 wires	Surface or Pendant Incandescent Fixture (PC = Pull Chain)	
			WATTS PC CIRCUIT
		Surface or Pendant Exit Light	
		Blanked Outlet	
		Junction Box	











SYMBOLS AND ABBREVIATIONS Figure 14 (continued). Recommended electrical symbols.

Recessed Incandescent Fixtures		Underground Direct, Burial Cable (Indicate type, size, and number of conductors by notation or schedule.)	
Surface or Pendant Individual Fluorescent Fixture		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.)	
Surface or Pendant Continuous-Row Fluorescent Fixture (Letter Indicating Controlling Switch)		Street Light Standard Feed From Underground Circuit <sup>‡</sup>	
Bare-Lamp Fluorescent Strip*		<sup>‡</sup> Identify by notation or schedule.	
*In the case of continuous-row bare-lamp fluorescent strip above an area-wide diffusing means, show each fixture run using the standard symbol; indicate area of diffusing means and type by light shading and/or by light shading and/or drawing notation.			
<b>Electric Distribution or Lighting System, Aerial</b>			
Pole <sup>‡</sup>		Signaling System Outlets	
Steel or Parking Lot Light and Bracket <sup>‡</sup>		<b>Institutional, Commercial, and Industrial Occupancies</b>	
Transformer <sup>‡</sup>		I. <u>Nurse Call System Devices</u> (Any Type)	
Primary Circuit <sup>‡</sup>		Basic Symbol	
Secondary Circuit <sup>‡</sup>		(Examples of individual item identification. Not a part of standard.)	
Down Guy		Nurses' Annunciator (Adding a number after it indicates number of lamps, e.g., +①24.)	+①
Head Guy		Call Station, Single Cord, Pilot Light	+②
Sidewalk Guy		Call Station, Double Cord, Microphone Speaker	+③
Service Weather Head <sup>‡</sup>		Corridor Dome Light, 1 Lamp	+④
<b>Electric Distribution or Lighting System, Underground</b>			
Manhole <sup>‡</sup>		Transformer	+⑤
Handhole <sup>‡</sup>		Any Other Item on Same System (Use Numbers as Required.)	+⑥
Transformer Manhole or Vault <sup>‡</sup>		II. <u>Paging System Devices</u> (Any Type)	
Transformer Pad <sup>‡</sup>		Basic Symbol	












SYMBOLS AND ABBREVIATIONS Figure 14 (continued). Recommended electrical symbols.




















ALL PIPING RELATED SYMBOLS ARE GENERIC AND DO NOT REPRESENT A CONNECTION OR MATERIAL TYPE. MANY PLAN VIEWS ARE ALSO USED ON SECTION AND SIDE VIEW DRAWINGS

	CHECK VALVE (ARROW INDICATES FLOW DIRECTION)
	GATE VALVE (HANDLE ILLUSTRATED IS OPTIONAL)
	GLOBE VALVE (HANDLE ILLUSTRATED IS OPTIONAL)
	BALL VALVE (HANDLE ILLUSTRATED IS OPTIONAL)
	TEE UP (PLAN VIEW)
	TEE DOWN (PLAN VIEW)
	90 DEGREE FITTING UP (PLAN VIEW)
	90 DEGREE FITTING DOWN (PLAN VIEW)
	45 DEGREE OFFSET (PLAN VIEW)
	P-TRAP (PLAN VIEW)












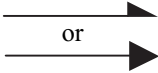



**SYMBOLS AND ABBREVIATIONS Figure 15.** Common plumbing symbols.

	COLD WATER (SINGLE DOT)
	HOT WATER (DOUBLE DOT)
	HOT WATER RETURN (TRIPLE DOT)
	VENT (CONTINUOUS DOTTED LINE)
	TANK TYPE TOILET (WATER CLOSET)
	BATHTUB
	LAVATORY
	KITCHEN SINK
	SHOWER
	URINAL
	HOSE FAUCET
	CAP
	REDUCER

**SYMBOLS AND ABBREVIATIONS Figure 16.** Common plumbing symbols.

	CONDUCTOR OR WIRE
	CROSSING CONDUCTORS (NOT CONNECTED)
	CROSSING CONDUCTORS (CONNECTED)
	TERMINAL OR BINDING POST
	SINGLE POLE SINGLE THROW (SPST) SWITCH
	MOTOR
	GROUND
	CIRCUIT BREAKER
	CEILING OUTLET
	CEILING OUTLET, RECESSED FIXTURE
	JUNCTION BOX
	DUPLEX RECEPTACLE
	WEATHERPROOF RECEPTACLE
	RANGE RECEPTACLE
	FLOOR RECEPTACLE
	SINGLE POLE SWITCH
	THREE-WAY SWITCH

**SYMBOLS AND ABBREVIATIONS Figure 17.** Common electrical symbols.

	COMBINATION SWITCH AND RECEPTACLE
	DISTRIBUTION PANEL
	SERVICE PANEL
	SWITCH, DOUBLE THROW (GENERAL)
	FUSE
	POSITIVE
	NEGATIVE
	2 POLE DOUBLE THROW SWITCH (TERMINALS SHOWN)
	LAMP
	SINGLE RECEPTACLE
	FAN (MOTOR)
	HOMERUN
	EXIT SIGN
	PULL CHAIN
	THERMOSTAT

**SYMBOLS AND ABBREVIATIONS Figure 18.** Common electrical symbols.

SYMBOLS FOR RECEPTACLES HAVING AN ATTACHED ABBREVIATION  
 INDICATE DESIGNATION OF RECEPTACLE











WP = WEATHERPROOF      GF = GROUND FAULT      REF = REFRIGERATOR  
 W = WASHING MACHINE      R = RANGE      D = DRYER

AMPERAGE RATING MAY ALSO BE ATTACHED TO RECEPTACLE SYMBOLS.  
 EXAMPLE: 20 = 20 AMPS AND WP = WEATHERPROOF

THIS SYMBOL INDICATES A 20 AMP WEATHERPROOF DUPLEX RECEPTACLE

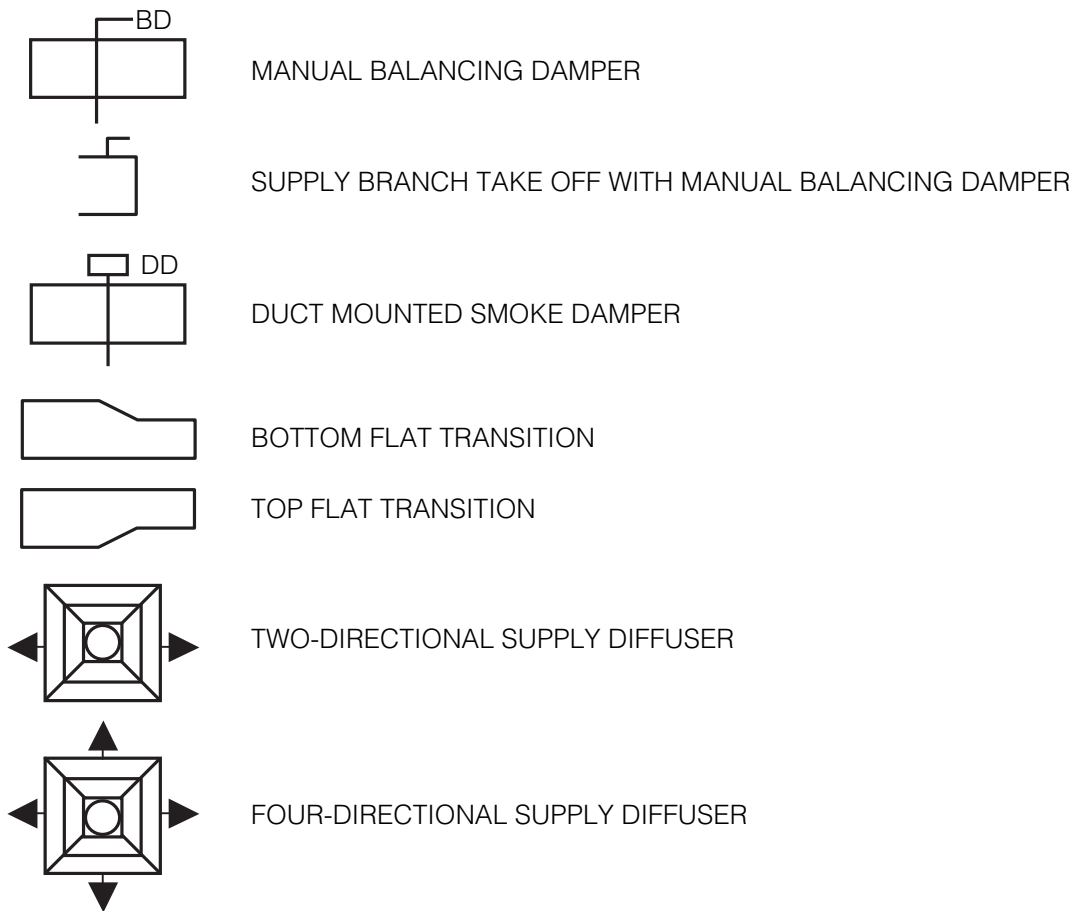


**SYMBOLS AND ABBREVIATIONS Figure 19.** Common electrical symbols.

	SUPPLY AIR DIFFUSER
	RETURN AIR DIFFUSER
	FLEXIBLE DUCT
	90° ELBOW WITH TURNING VALVES
	SQUARE TO ROUND TRANSITION
	EXHAUST FAN
	PNEUMATIC THERMOSTAT
	ELECTRICAL THERMOSTAT
	HUMIDISTAT
	4' x 2' (1.22 M x 60.96 CM) TROFFER DIFFUSER

**SYMBOLS AND ABBREVIATIONS Figure 20.** Common HVAC symbols.





**SYMBOLS AND ABBREVIATIONS Figure 21.** Common HVAC symbols.

## WELDING SYMBOL

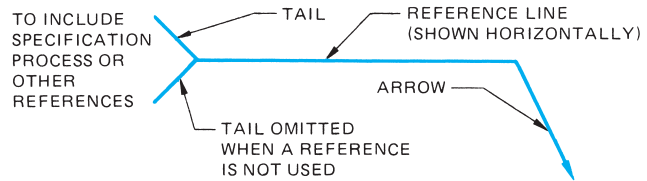
A standard welding symbol and weld symbols have been developed by the American Welding Society. The symbols developed by the American welding Society are covered in detail in the units that follow. The standard welding symbol **Symbols and Abbreviations Figure 22** consists of reference line, an arrow, and a tail. Each component has a particular function. The reference line is used to apply weld symbols and other data, and the arrow connects the reference line to the joint or area to be welded. The tail is added only when needed for the purpose of including a specification process or other reference.

The phrase **welding symbol** refers to the total symbol including all information added to it to specify the weld(s) required. **Weld symbol** on the other hand, refers to the symbol for a specific type of weld. The weld symbol is only part of the total information that may be contained in the welding symbol.

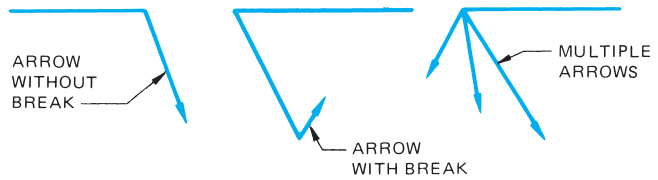
The arrow of the welding symbol may be shown with or without a break. When shown with a break, the break is made toward the member of the joint that is to be prepared or shaped, **Symbols and Abbreviations Figure 23**. Note that if there is no preference as to which joint member is to be prepared, or it is obvious which member is to be prepared, the arrow need not be shown with a break. The arrow is always drawn at an angle to the reference line. It is never drawn parallel (horizontal) to or in the same plane as the reference line.

Multiple arrows may be added to the reference line to show the same weld required in several different locations, as in the case of a group of spot or fillet welds, **Symbols and Abbreviations Figure 23**.

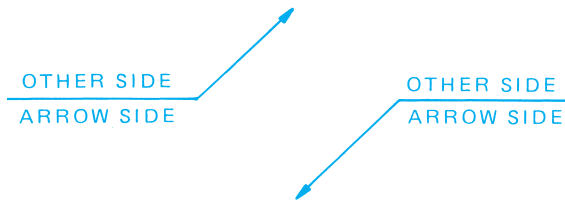
The reference line of the welding symbol also has a particular significance that remains the same regardless of the elements added to it, and it is always drawn horizontal to the bottom of the print. The lower side of the reference line is termed the arrow side and the upper side is termed the **other side**, **Symbols and Abbreviations Figure 24**. It should be noted that the terms, “arrow side” and “other side” apply to the location of the weld with respect to the joint. The direction of the arrow has no bearing on the significance of the reference line (refer to **Symbols and Abbreviations Figure 25(a)**). The arrow simply indicates a point to which the significance of the reference line and its elements are applied.



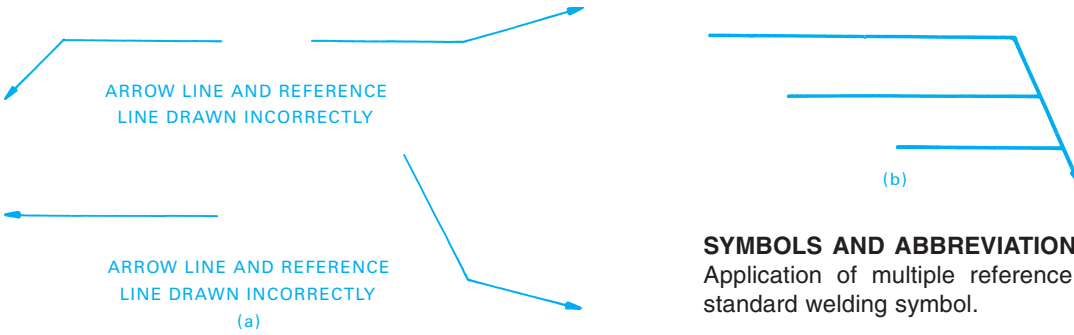
**SYMBOLS AND ABBREVIATIONS Figure 22.** Standard welding symbol.



**SYMBOLS AND ABBREVIATIONS Figure 23.** Variations in the application of the arrow.



**SYMBOLS AND ABBREVIATIONS Figure 24.** Arrow side, other side locations.



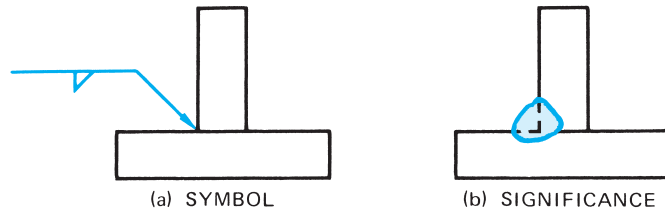
**SYMBOLS AND ABBREVIATIONS Figure 25.** Application of multiple reference lines to the standard welding symbol.

Multiple reference lines may also be used within the basic welding symbol, Symbols and Abbreviations Figure 25(b). Additional information on multiple reference lines is presented later in this unit.

## LOCATION OF WELD SYMBOL

When a weld symbol is placed on the reference line on the lower side of the line, the weld must be made on the arrow side of the joint.

Symbols and Abbreviations Figure 26(a) illustrates the application of a welding symbol. The element shown on the reference line is the weld symbol for fillet  $\nabla$  or  $\triangleleft$ . The symbol is located within the length of the reference line. In this case, the weld is to be made on the arrow side of the joint. The significance of the symbol is illustrated in Symbols and Abbreviations Figure 26(b). Note that the vertical leg of the fillet weld symbol is *always* shown drawn to the left of the slanted side of the symbol.

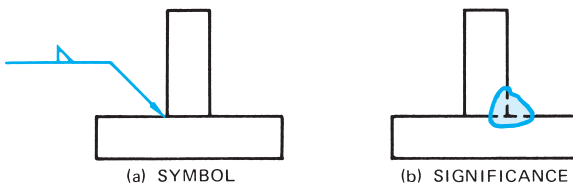


**SYMBOLS AND ABBREVIATIONS Figure 26.** Fillet weld, arrow side.

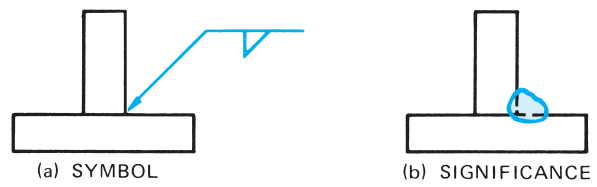
If the fillet weld symbol is placed on the other side of reference line, the welding symbol is made as shown in Symbols and Abbreviations Figure 27(a). Its significance is shown in Symbols and Abbreviations Figure 27(b).

To summarize, Symbols and Abbreviations Figure 28(a) and Symbols and Abbreviations Figure 29(a) illustrate the alternate positions of the weld symbol on the reference line. The significance of the welding symbol in each case is illustrated by Symbols and Abbreviations Figure 28(b) and Symbols and Abbreviations Figure 29(b).

When weld symbols are placed on both sides of the reference line, the welds must be made on both sides of the joint Symbols and Abbreviations Figure 30 and Symbols and Abbreviations Figure 31.



**SYMBOLS AND ABBREVIATIONS Figure 27.** Fillet weld, other side.



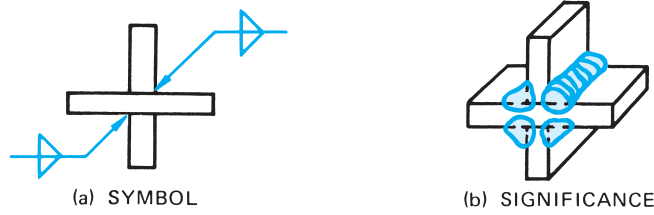
**SYMBOLS AND ABBREVIATIONS Figure 28.** Fillet weld, arrow side.



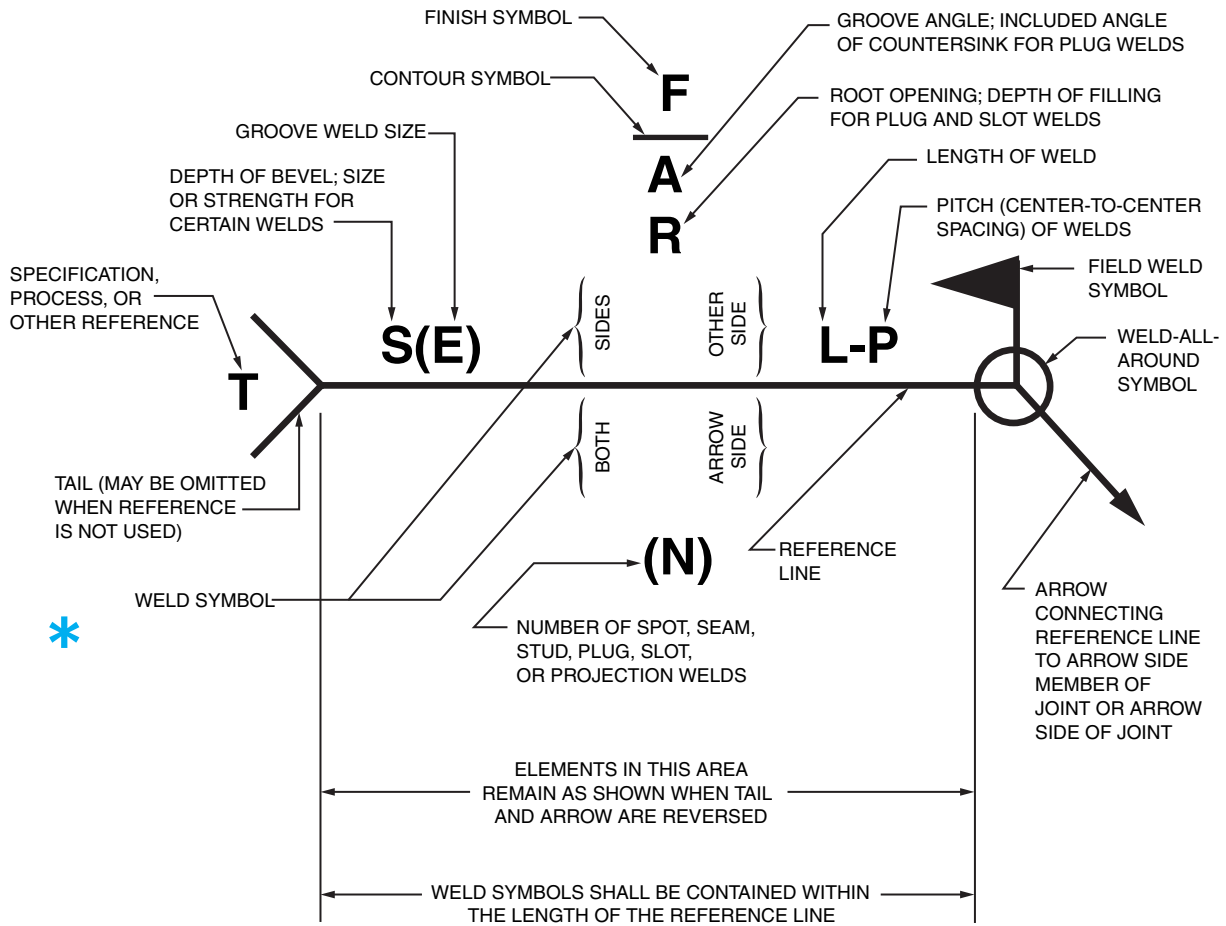
**SYMBOLS AND ABBREVIATIONS Figure 29.** Fillet weld, other side.



**SYMBOLS AND ABBREVIATIONS Figure 30.** Fillet weld, both sides.



**SYMBOLS AND ABBREVIATIONS Figure 31.** Two-joint fillet weld (both sides of joints).



**SYMBOLS AND ABBREVIATIONS Figure 32.** The welding symbol, its elements, and their locations.

## ADDITIONAL WELDING SYMBOL ELEMENTS

A knowledge of the other elements added to the welding symbol and their placement is required before welding symbols on prints can be interpreted properly.

Each element applied to the basic welding symbol has a standard location with reference to the components of the welding symbol and to the other elements that are added to it. **Symbols and Abbreviations Figure 32** illustrates the different elements that may be added to the welding symbols and where they are located with respect to the arrow tail and reference lines.

GROOVE WELD SYMBOLS							
SQUARE	SCARF	V	BEVEL	U	J	FLARE-V	FLARE BEVEL

FILLET	PLUG OR SLOT	STUD	SLOT OR PROJECTION	SEAM	BACK OR BACKING	SUR-FACING	EDGE

NOTE:----- (DASHED LINE) REPRESENTS REFERENCE LINE

**SYMBOLS AND ABBREVIATIONS Figure 33.** Basic weld symbols.

CONTOUR			MELT-THRU	CON-SUM-ABLE INSERT	BACKING OR SPACER	WELD ALL AROUND	FIELD WELD
FLUSH	CONVEX	CONCAVE					

\*WITH REFERENCE TO THE BACKING MATERIAL SYMBOL, THE LETTER "R" IS PLACED WITHIN THE BACKING MATERIAL SYMBOL TO SPECIFY REMOVAL OF BACKING MATERIAL UPON COMPLETION OF WELDING.

**SYMBOLS AND ABBREVIATIONS Figure 34.** Supplementary symbols.

The specific elements to be applied to the welding symbol to denote the types of welds are illustrated in **Symbols and Abbreviations Figure 33**.

A standard set of supplementary symbols may also be added to the basic welding symbols, **Symbols and Abbreviations Figure 34**.

**Symbols and Abbreviations Figure 35** shows the kinds of basic weld symbols applied to a welding symbol and their location with respect to the reference line of the basic welding symbol. Note that all symbols do not have an arrow side, other side, or both sides application. Also note that an arrow with a break is generally necessary with bevel and J-groove symbols. In cases where it is obvious which joint member is to be prepared, an arrow with a break is not required.

LOCATION SIGNIFICANCE	FILLET	PLUG OR SLOT	SPOT OR PROJECTION	STUD	SEAM	BACK OR ** BACKING	SURFACING	EDGE
ARROW SIDE								
OTHER SIDE				NOT USED			NOT USED	
BOTH SIDES		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

LOCATION SIGNIFICANCE	GROOVE							
	SQUARE	V	BEVEL	U	J	FLARE-V	FLARE-BEVEL	SCARF
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

\*Used for ESW and EGW

\*\*Back or backing is specified in tail of welding symbol having a single reference line.

**SYMBOLS AND ABBREVIATIONS Figure 35.** Basic weld symbols and their location significance on the reference line.

## OBSOLETE WELD SYMBOLS

Weld symbols are periodically revised to simplify the shape of the symbol, to consolidate several symbols into one, or to create a symbol to specify a newly developed welding technique.

The weld symbols illustrated in **Symbols and Abbreviations Figure 36** are called obsolete symbols because they have been replaced by new symbols. These symbols are not used on current prints; however, they are included for reference in older prints.

EDGE FLANGE	CORNER FLANGE	PLUG OR SLOT	ARC-SEAM OR ARC SPOT	RESISTANCE SPOT	PROJECTION	RESISTANCE SEAM	FLASH OR UPSET	FIELD WELD

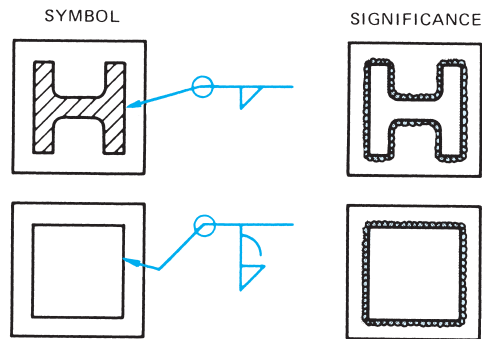
**SYMBOLS AND ABBREVIATIONS Figure 36.** Obsolete weld symbols.

## PREFERRED SYMBOLS

### Field Weld, Weld-All-Around Symbols

Welds extending continuously around the joint are indicated by placing the weld-all-around symbol at the break of the reference arrow line, **Symbols and Abbreviations Figure 37**.

Welds not made in the shop are identified as field welds and are indicated by placing the field weld symbol or at the break in the reference arrow line. Note that the flag of the field weld symbol may point in either direction with respect to the arrow of the welding symbol, **Symbols and Abbreviations Figure 38**. A field weld symbol and the weld-all-around symbol may be used together, **Symbols and Abbreviations Figure 38**.



**SYMBOLS AND ABBREVIATIONS Figure 37.** Application of weld-all-around symbol.

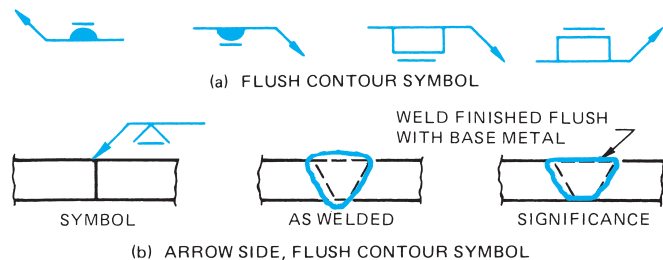


**SYMBOLS AND ABBREVIATIONS Figure 38.** Weld-all-around and field weld symbol.

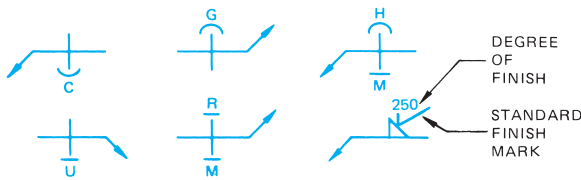
## CONTOUR AND FINISH SYMBOLS

Supplementary contour symbols are used with the weld symbols to indicate how the face of the weld is to be finished, **Symbols and Abbreviations Figure 39**. In addition finish symbols may be used with contour symbols to indicate the method to be used for forming the contour of the weld. Letter designations are used for this purpose: “C” for chipping, “G” for grinding, “M” for machining, “R” for rolling, “H” for hammering, and “U” for unspecified. Applying the letter “U” to a contour symbol signifies any method of finish may be used. A standard finish mark or may be applied to the contour symbol with a numerical degree of finish shown above the finish mark, **Symbols and Abbreviations Figure 40**.

Note that contour and finish symbols are placed on the same side of the reference line as the weld symbol. They are located directly above the weld symbol when the weld symbol is on the other side of the reference line, and directly below the weld symbol when it is located on the arrow side of the reference line.



**SYMBOLS AND ABBREVIATIONS Figure 39.** Contour symbols.




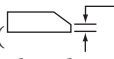
**SYMBOLS AND ABBREVIATIONS Figure 40.** Finish symbols.

The finish symbols commonly used are shown in Symbols and Abbreviations Figure 40 and Symbols and Abbreviations Figure 41. However, manufacturers may use their own designations for finishing. Although the degree of finish is not included in the AWS standards, many manufacturers do indicate a desired finish, particularly in the case of flush welds. An example of such a specification is the 250-microinch finish requirement shown in Symbols and Abbreviations Figure 40. The method of obtaining this finish may or may not be indicated.

## MULTIPLE WELD SYMBOLS

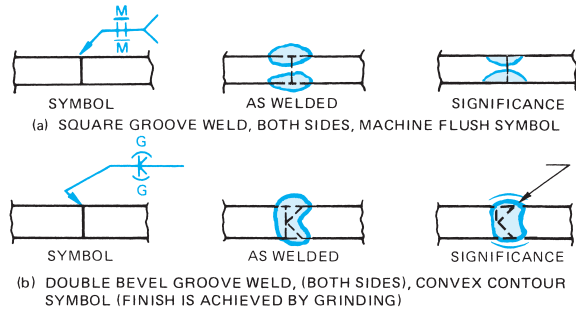
When more than one weld is required for a joint, a symbols is shown for each weld, Symbols and Abbreviations Figure 42.

## DESIGNATION OF MEMBER TO BE BEVELED

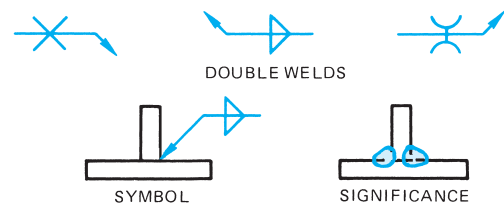
Certain welds require that one of the members of the joint be beveled before the weld is actually made. To be precise, a bevel describes an edge preparation with a sharp or “feather” edge (  ), or with a root face or “land” (  ), Machinists make a clear distinction between bevel and chamfer, but weld fabricators often simply apply the term “bevel” to both. When a bevel or J-groove weld symbol (either single or double) is used, the arrow will point with a definite break toward the member to be shaped. In Symbols and Abbreviations Figure 43(a) and (c), the break in the arrow indicates that the upper member of the joint is to be beveled. In Symbols and Abbreviations Figure 43(b), the right-hand member of the joint is to be prepared.

## DIMENSIONS ON WELDING SYMBOLS

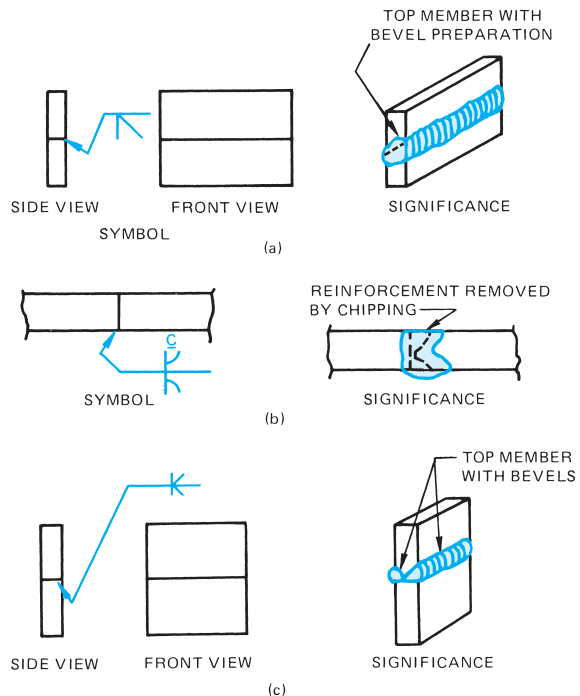
There are definite locations on the welding symbol for designations of size or strength of the weld, length of the weld, pitch (center-to-center-spacing), and the number of welds (in the case of plug, slot, spot, or projection welds). These locations are determined by the side of the reference line on which the weld symbol is placed,



**SYMBOLS AND ABBREVIATIONS Figure 41.** Application of finish symbols.



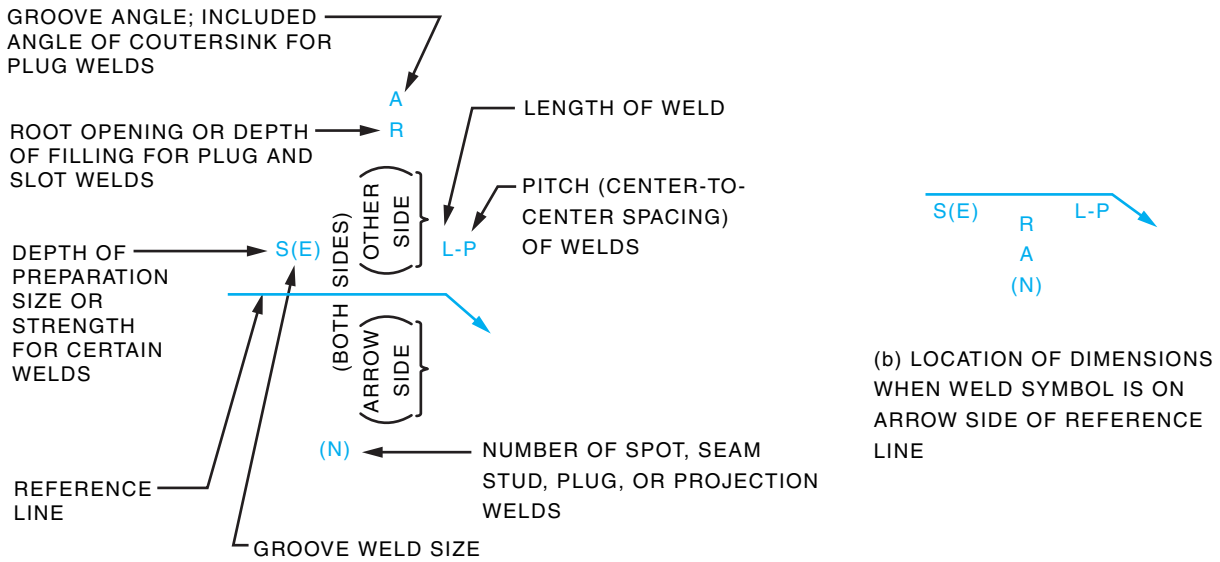
**SYMBOLS AND ABBREVIATIONS Figure 42.** Specifying more than one weld.



NOTE: BREAK IN ARROW POINTS TO MEMBER TO BE SHAPED

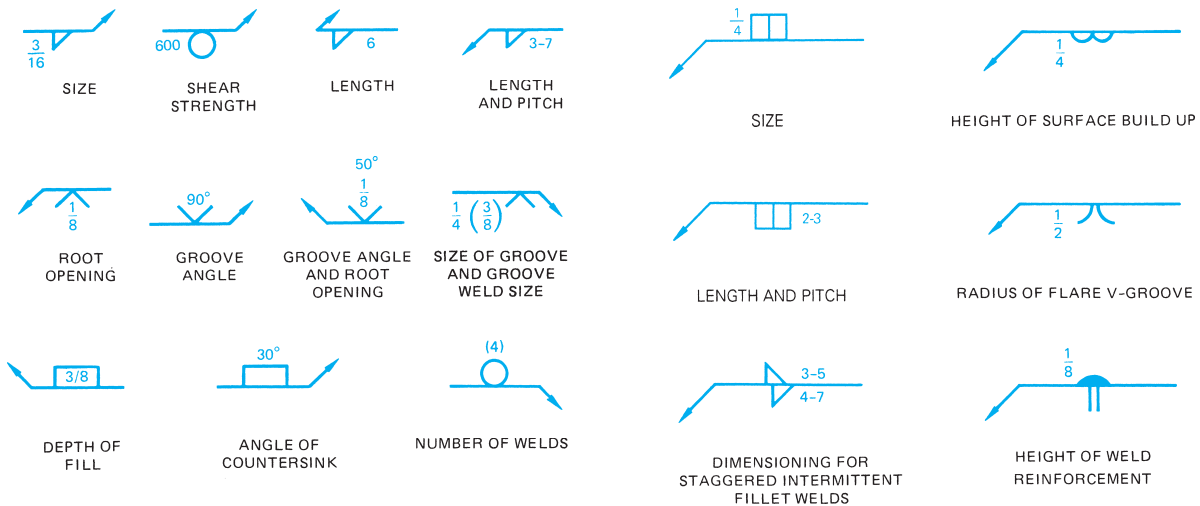
**SYMBOLS AND ABBREVIATIONS Figure 43.** Designation of weld on chamfered or beveled members.





(a) LOCATION OF DIMENSION WHEN WELD SYMBOL IS ON OTHER SIDE OF REFERENCE LINE

**SYMBOLS AND ABBREVIATIONS Figure 44.** Location of dimensions.



**SYMBOLS AND ABBREVIATIONS Figure 45.** Size dimensions applied to weld symbols.

Symbols and Abbreviations Figure 44(a) and (b). The location for the number of spot or projection welds may be either above or below the symbol since there may be no arrow side or other side significance for these symbols.

Symbols and Abbreviations Figure 45 shows how dimensions are applied to symbols. A detailed explanation of their application is presented in later units which refer to specific welds.

## DESIGNATION OF SEPCIAL INFORMATION

Certain operations require a specific welding process, a particular type of electrode, or other information necessary to complete the weld. In this case, a note can be placed in the tail of the reference line (using standard welding abbreviations), Symbols and Abbreviations Figure 46.

Note that the term “back gouge” indicates removal of weld metal and base metal from the other side of a partially welded joint. This ensures complete joint penetration when welding the gouged side of the joint.

There are circumstances when weld symbols are not added to the reference line of a welding symbol. This may occur when the drawing permits optional joint preparation with only complete penetration specified. This is so indicated by placing the letters “CJP” in the tail of the arrow and omitting the weld symbol, **Symbols and Abbreviations Figure 46B**. A note is added to the print that signifies this option.

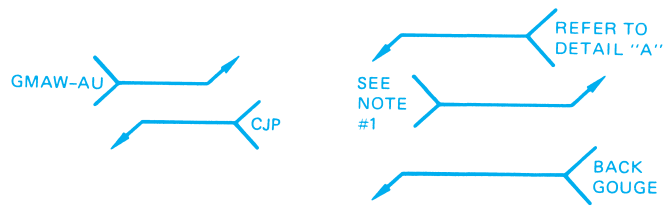
It should be noted that when the letters “CJP” are found in the tail of the arrow, a complete joint penetration weld is required regardless of the type of weld or joint preparation that is used.

The welding symbol may not always be adequate to denote the weld required, such as for skewed joints (joints that deviate from a straight line). When this is the case, a cross section or detail drawing of the joint and shape of the weld is shown on the print. Data, in the form of notes, may be added to the drawing to further clarify the joint or weld required. Reference is made to the detail or section drawing by a note or notes added to the reference line of the welding symbol with an arrow side, other side, or both sides significance, **Symbols and Abbreviations Figure 46B** and **Symbols and Abbreviations Figure 46C**. In such cases, a weld-symbol is not shown on the reference line.

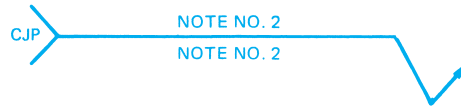
A weld symbol may be omitted from the reference line if the type of joint preparation is not specified. The weld size is indicated on the desired side(s) of the reference line, **Symbols and Abbreviations Figure 46D**.

## LOCATION OF THE WELDING SYMBOL ON ORTHOGRAPHIC VIEWS

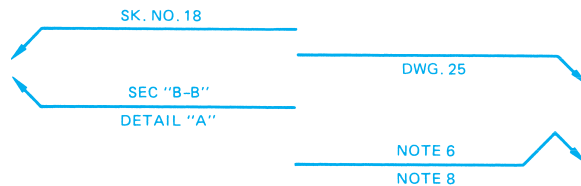
The welding symbol can be placed on any of the orthographic views, but is generally shown on the view that best illustrates the joint. The location of the welding symbol on each view is illustrated in **Symbols and Abbreviations Figure 47**. However, when the symbol is shown on one view, it is not necessary to include it on any of the other views. In **Symbols and Abbreviations Figure 47**, note that the front view gives the best indication of the joint; therefore, the symbol should be added to this view.



**SYMBOLS AND ABBREVIATIONS Figure 46A.** Specifying additional information in the tail of the welding symbol.



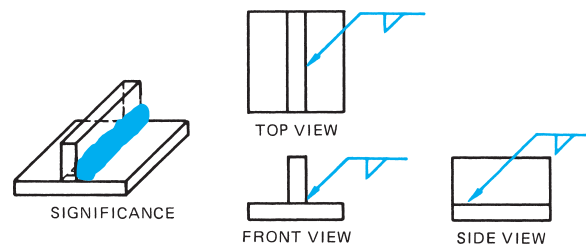
**SYMBOLS AND ABBREVIATIONS Figure 46B.** Specifying “Complete Joint Penetration” (CJP) in the tail of the welding symbol.



**SYMBOLS AND ABBREVIATIONS Figure 46C.** Application of information to reference line of welding symbol.



**SYMBOLS AND ABBREVIATIONS Figure 46D.** Size of groove weld applied to welding symbol without reference to a weld symbol.



**SYMBOLS AND ABBREVIATIONS Figure 47.** Symbol may be placed in any view in the orthographic projection.

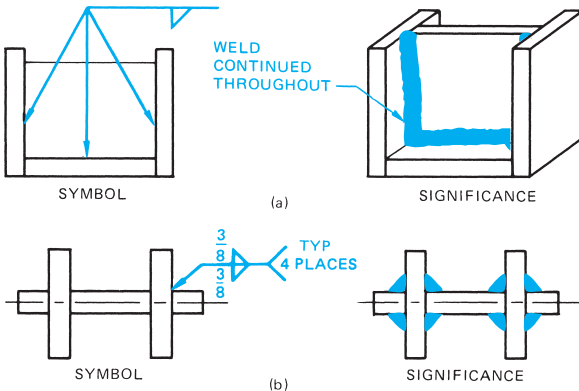
## DUPLICATE WELDS

To save drafting time and to reduce drafting costs, it is common practice to designate similar welds by additional (multiple) arrows, Symbols and Abbreviations Figure 48(a), or by an indication placed in the tail or the symbol, Symbols and Abbreviations Figure 48(b). It should be noted, however, that any indication such as “4 places” must refer to obvious welds. If there is any doubt where these “4 places” are on the print, separate symbols for each weld should be applied. Note that the abbreviation “TYP” for typical may be used to indicate a repetition of identical welds and is shown in the tail of the welding symbol.

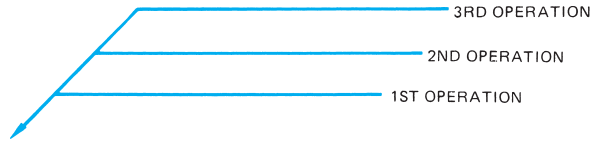
## MULTIPLE REFERENCE LINES AND THEIR APPLICATIONS

Additional reference lines may be applied to the basic welding symbol to show: (1) a sequence of welding operations where the first operation must be completed before the next can be performed and (2) supplementary data applicable to the weld symbol shown on the first reference line. Note that the first reference line is the one located closest to the arrow, Symbols and Abbreviations Figure 48(a, b, and c).

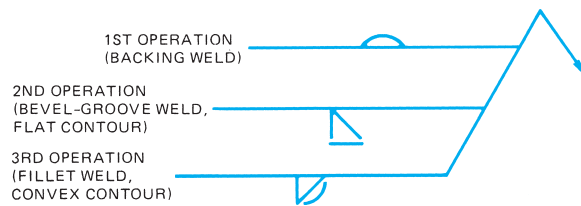
When multiple reference lines are applied to the basic welding symbol, the weld-all-around and field weld symbols may be added to one or all of the reference lines. Tails may be added similarly, Symbols and Abbreviations Figure 49.



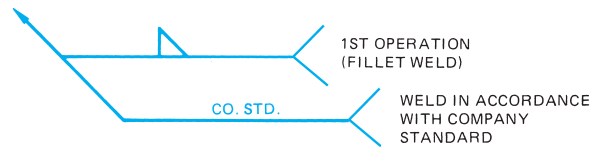
**SYMBOLS AND ABBREVIATIONS Figure 48.** Duplicate welds.



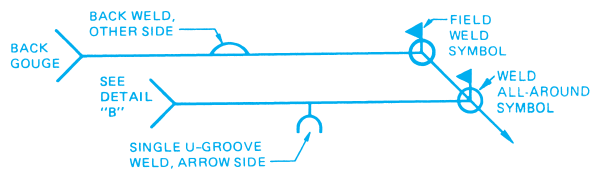
**SYMBOLS AND ABBREVIATIONS Figure 48A.** Sequence of operations signified by multiple reference lines.



**SYMBOLS AND ABBREVIATIONS Figure 48B.** Application of weld symbols to multiple reference lines.



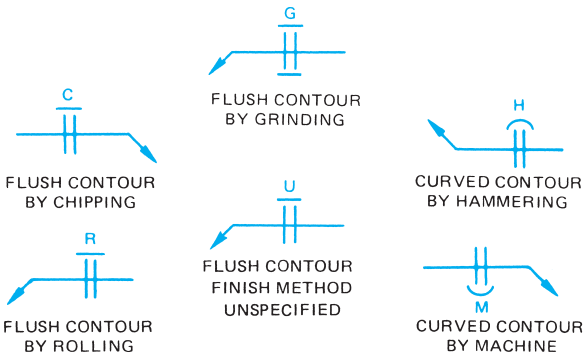
**SYMBOLS AND ABBREVIATIONS Figure 48C.** Application of supplementary data to second reference line.



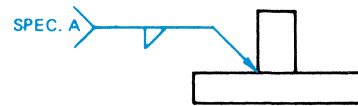
**SYMBOLS AND ABBREVIATIONS Figure 49.** Application of field weld symbol and tails to multiple reference line.

## WELD SYMBOL DIMENSION TOLERANCE

A tolerance applicable to a weld may be shown as a dimension within the tail of the welding symbol, Symbols and Abbreviations Figure 50A–D.



**SYMBOLS AND ABBREVIATIONS Figure 50A.** Finish abbreviations, also called finish symbols.

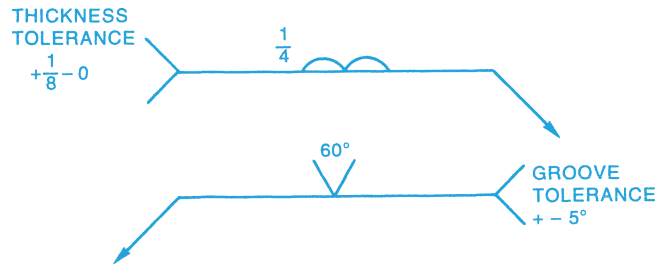


**SYMBOLS AND ABBREVIATIONS Figure 50B.** Letter "A" used for identification.













**SYMBOLS AND ABBREVIATIONS Figure 50C.** Suffixes indicating method of applying welding process.

Note: AW = ARC welding process  
 MA = Method used to do welding



**SYMBOLS AND ABBREVIATIONS Figure 50D.** Application of weld symbol dimension tolerance.

Electrical Reference Symbols	
<i>ELECTRICAL SYMBOLS</i>	
<b>Switch Outlets</b>	
Single-Pole Switch	S
Double-Pole Switch	S <sub>2</sub>
Three-Way Switch	S <sub>3</sub>
Four-Way Switch	S <sub>4</sub>
Key-Operated Switch	SK
Switch and Fusestat Holder	SFH
Switch and Pilot Lamp	S <sub>P</sub>
Fan Switch	SF
Switch for Low-Voltage Switching System	SL
Master Switch for Low-Voltage Switching System	SLM
Switch and Single Receptacle	 S
Switch and Duplex Receptacle	 S
Door Switch	SD
Time Switch	ST
Momentary Contact Switch	SMC
Ceiling Pull Switch	
“Hand-Off-Auto” Control Switch	
Multi-Speed Control Switch	
Push Button	
<b>Receptacle Outlets</b>	
Where weather proof, explosion proof, or other specific types of devices are to be required, use the upper-case subscript letters. For example, weather proof single or duplex receptacles would have the uppercase WP subscript letters noted alongside of the symbol. All outlets should be grounded.	
Single Receptacle Outlet	
Duplex Receptacle Outlet	
Triplex Receptacle Outlet	
Quadruplex Receptacle Outlet	

SYMBOLS AND ABBREVIATIONS Figure 51. Electrical symbols.

Duplex Receptacle Outlet (Split Wired)		<b>Circuiting</b>	
Triplex Receptacle Outlet (Split Wired)		Wiring Exposed (not in conduit)	
250-V Receptacle Single Phase, Use Subscript Letter to Indicate Function (DW—Dishwasher; RA—Range, CD—Clothes Dryer) or Numeral (with explanation in symbol schedule).		Wiring Concealed in Ceiling or Wall	
250-V Receptacle Three Phase		Wiring Concealed in Floor	
Clock Receptacle		Wiring Existing*	
Fan Receptacle		Wiring Turned Up	
Floor Single Receptacle Outlet		Wiring Turned Down	
Floor Duplex Receptacle Outlet		Branch Circuit Home Run to Panel Board.	
Floor Special-Purpose Outlet		Number of arrows indicates number of circuits. (A number of each arrow may be used to identify circuit number.)†	
Floor Telephone Outlet (Public)		<b>Bus Ducts and Wireways</b>	
Floor Telephone Outlet (Private)		Trolley Duct ‡	
Example of the use of several floor outlet symbols to identify a 2, 3, or more gang flow outlet		Busway (Service, Feeder, or Plug-in) ‡	
Underfloor duct and junction box for triple, double, or single duct system as indicated by the number of parallel lines.		Cable Trough Ladder or Channel ‡	
Example of use of various symbols to identify loca- tion of different types of outlets or connections for underfloor duct or cellular floor systems		Wireway ‡	
Cellular floor Header duct		<b>Panelboards, Switchboards, and Related Equipment</b>	
* Use numeral keyed to explanation in drawing list of symbols to indicate usage.		Flush Mounted Panelboard and Cabinet ‡	
		Surface Mounted Panelboard and Cabinet ‡	
		Switchboard, Power Control Center, Unit Substations (Should be drawn to scale.) ‡	
		Flush-Mounted Terminal Cabinet (In small scale drawings the TC may be indicated alongside the symbol.) ‡	
		Surface-Mounted Terminal Cabinet (In small scale drawings the TC may be indicated alongside the symbol.) ‡	

SYMBOLS AND ABBREVIATIONS Figure 51 (continued). Electrical symbols.
































Pull Box (Identify in relation to Wiring System Section and Size.)		<p>Neutral wire may be shown longer. Unless indicated otherwise, the wire size of the circuit is the minimum size required by the specification. Identify different functions of wiring system, e.g., signalling system by notation or other means.                      ‡Identify by notation or schedule.</p> <p><b>Remote Control Stations for Motors or Other Equipment</b></p>															
Motor or Other Power Controller (may be a starter or contactor)†																	
Externally Operated disconnection Switch†																	
Combination Controller and Disconnection Means†																	
<b>Power Equipment</b>																	
Electric Motor (hp as indicated)																	
Power Transformer																	
Pothead (Cable Termination)																	
Circuit Element (e.g., Circuit Breaker)																	
Circuit Breaker																	
Fusible Element																	
Single-Throw Knife Switch																	
Double-Throw Knife Switch																	
Ground																	
Battery																	
Contactor																	
Photoelectric Cell																	
Voltage Cycles, Phase	Ex: 480/60/3																
Relay																	
Equipment Connection (as noted)																	
<p>*Note: Use heavy-weight line to identify service and feeders. Indicate empty conduit by notation CO (conduit only).                      †Note: Any circuit without further identification indicates two-wire circuit. For a greater number of wires, indicate with cross lines, e.g.:</p>																	
	3 wires		4 wires														
		<p><b>Lighting</b></p> <table border="0"> <thead> <tr> <th></th> <th>Ceiling</th> <th>Wall</th> </tr> </thead> <tbody> <tr> <td>Surface or Pendant Incandescent Fixture (PC = pull chain)</td> <td>TYPE  WATTS</td> <td>SWITCH  PC CIRCUIT</td> </tr> <tr> <td>Surface or Pendant Exit Light</td> <td></td> <td></td> </tr> <tr> <td>Blanked Outlet</td> <td></td> <td></td> </tr> <tr> <td>Junction Box</td> <td></td> <td></td> </tr> </tbody> </table>		Ceiling	Wall	Surface or Pendant Incandescent Fixture (PC = pull chain)	TYPE WATTS	SWITCH PC CIRCUIT	Surface or Pendant Exit Light			Blanked Outlet			Junction Box		
	Ceiling	Wall															
Surface or Pendant Incandescent Fixture (PC = pull chain)	TYPE WATTS	SWITCH PC CIRCUIT															
Surface or Pendant Exit Light																	
Blanked Outlet																	
Junction Box																	

SYMBOLS AND ABBREVIATIONS Figure 51 (continued). Electrical symbols.

Recessed Incandescent Fixtures		Underground Direct Burial Cable (Indicate type, size, and number of conductors by notation or schedule)	
Surface or Pendant Individual Fluorescent Fixture		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.)	
Surface or Pendant Continuous-Row Fluorescent Fixture (Letter indicating controlling switch)		Street Light Standard Feed From Underground Circuit‡	
Bare-Lamp Fluorescent Strip*		*Identify by notation or schedule.	
*In the case of continuous-row bare-lamp fluorescent strip above an area-wide diffusing means, show each fixture run using the standard symbol; indicate area of diffusing means and type by light shading and/or by light shading and/or drawing notation.			
<b>Electric Distribution or Lighting System, Aerial</b>			
Pole‡		Signalling System Outlets	
Steel or Parking Lot Light and Bracket‡		<b>Institutional, Commercial, and Industrial Occupancies</b>	
Transformer‡		I. <u>Nurse Call System Devices</u> (any type)	
Primary Circuit‡		Basic Symbol	
Secondary Circuit‡		(Examples of individual item identification. Not a part of standard.)	
Down Guy		Nurses' Annunciator (Adding a number after it indicates number of lamps e.g., +① 24)	
Head Guy		Call Station, Single Cord, Pilot Light	
Sidewalk Guy		Call Station, Double Cord, Microphone Speaker	
Service Weather Head‡		Corridor Dome Light, 1 Lamp	
<b>Electric Distribution or Lighting System, Underground</b>			
Manhole‡		Transformer	
Handhole‡		Any other item on same system (use numbers as required).	
Transformer Manhole or Vault‡		II. <u>Paging System Devices</u> (any type)	
Transformer Pad‡		Basic Symbol	

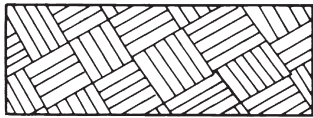

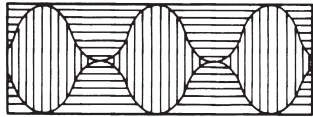
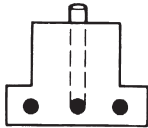
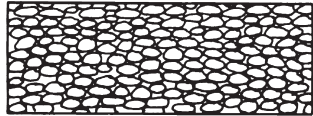
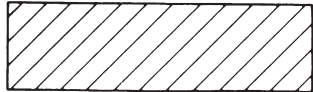
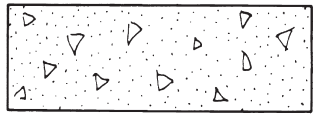

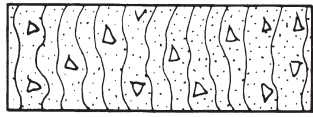

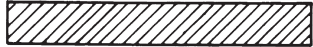

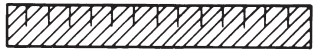


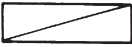

SYMBOLS AND ABBREVIATIONS Figure 51 (continued). Electrical symbols.



(Examples of individual item identification. Not a part of standard)		Basic Symbol 	
Keyboard		(Examples of individual item identification. Not a part of standard)	
Flush Annunciator		Master Clock	
Two-Face Annunciator		12" Secondary (flush)	
Any other item on same system - use numbers as required		12" Double Dial (Wall Mounted)	
<b>III. Fire Alarm System Devices</b> (any type) including Smoke and Sprinkler Alarm Devices		18" Skeleton Dial	
Basic Symbol		Any other item on same system (use numbers as required).	
(Examples of individual item identification. Not a part of standard)		<b>VI. Public Telephone System Devices</b>	
Control Panel		Basic Symbol	
Station		(Examples of individual item identification. Not a part of standard)	
10" Gong		Switchboard	
Presignal Chime		Desk Phone	
Any other item on same system (use numbers as required).		Any other item on same system (use numbers required).	
<b>IV. Staff Register System Devices</b> (any type)		<b>VII. Private Telephone System Devices</b> (any type)	
Basic Symbol		Basic Symbol	
(Examples of individual item identification. Not a part of standard)		(Examples of individual item identification. Not a part of standard)	
Phone Operators' Register		Switchboard	
Entrance Register (flush)		Wall Phone	
Staff Room Register		Any other item on same system (use numbers as required).	
Transformer		<b>VIII. System Devices</b> (any type)	
Any other item on same system (use number as required).		Basic Symbol	
<b>V. Electric Clock System Devices</b> (any type)		(Examples of individual item identification. Not a part of standard)	












SYMBOLS AND ABBREVIATIONS Figure 51 (concluded). Electrical symbols.

## Material Symbols in Sections







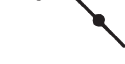
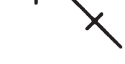



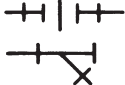


EARTH		STRUCTURAL STEEL	
ROCK		REINFORCING BARS	
GRAVEL OR CRUSHED STONE		GENERAL METAL	
CONCRETE		BATT INSULATION	
CONCRETE BLOCK		RIGID INSULATION	
FACE BRICK OR COMMON BRICK		PLASTER OR GYPSUM BOARD	
FIRE BRICK		THIN SHEET MATERIALS (PLASTIC FILM, SHEET METAL, PAPER, ETC.)	
ROUGH WOOD-CONTINUOUS			
WOOD BLOCKING			
FINISH WOOD			

## Plumbing Symbols











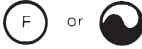






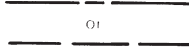




### PIPING

DRAIN OR WASTE ABOVE GROUND	
DRAIN OR WASTE BELOW GROUND	
VENT	
COLD WATER	
HOT WATER	
HOT WATER HEAT SUPPLY	
HOT WATER HEAT RETURN	
GAS	
PIPE TURNING DOWN OR AWAY	
PIPE TURNING UP OR TOWARD	
BREAK—PIPE CONTINUES	

### FITTINGS

	SOLDERED	SCREWED
TEE		
WYE		
ELBOW — 90°		
ELBOW — 45°		
CAP		
UNION CLEANOUT		
STOP VALVE		

## Electrical Symbols

CEILING FIXTURE		TELEPHONE	
CEILING FIXTURE WITH PULL SWITCH		INTERCOM	
WALL MOUNTED FIXTURE		TELEVISION ANTENNA	
RECESSED CEILING FIXTURE – OUTLINE SHOWS SHAPE		SMOKE DETECTOR	
FLOURESCENT FIXTURE		DISTRIBUTION PANEL	
FAN OUTLET		JUNCTION BOX	
CONVENIENCE DUPLEX OUTLET		SINGLE-POLE SWITCH	S
SPLIT WIRED DUPLEX OUTLET		THREE-WAY SWITCH	S <sub>3</sub>
WEATHERPROOF OUTLET		SWITCH WITH PILOT LIGHT	S <sub>p</sub>
OUTLET WITH GROUND FAULT INTERRUPTER		WEATHERPROOF SWITCH	S <sub>WP</sub>
SPECIAL-EQUIPMENT OUTLET		SWITCH WIRING	
RANGE OUTLET			
PUSH BUTTON			
CHIME			
TRANSFORMER			

# ARCHITECTURAL SYMBOLS

NOTE: The following are architectural symbols that are frequently used on construction drawings. Note that the architectural symbols for the same material are often different in the elevation view, plan view, and section view.


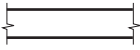


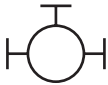





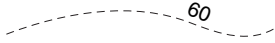
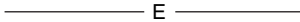



## Building Materials

	Elevation	Plan	Section
EARTH			
BRICK			
CONCRETE			
CONCRETE BLOCK			
WOOD	 SIDING STUD	 STUD  STUD	 OR 
GLASS	 OR 		
GLASS BLOCK			
INSULATION	 OR 		


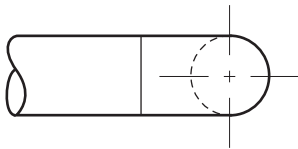

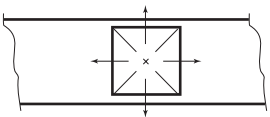

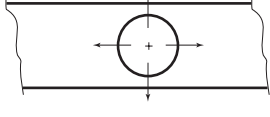

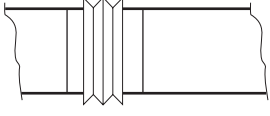
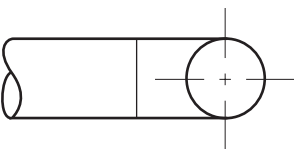

*Exterior Walls*

	<b>Elevation</b>	<b>Plan</b>	<b>Section</b>
FACE BRICK ON RUBBLE			
FACE BRICK ON CONCRETE BLOCKS			
FACE BRICK ON STUD WALL			
PLASTER ON MASONRY			
METAL STUD WALL			
STUD PARTITION WALL			

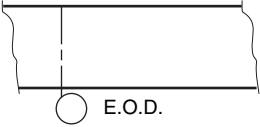
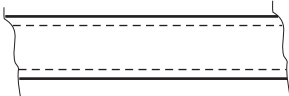

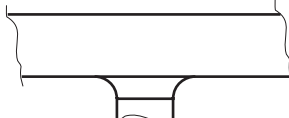
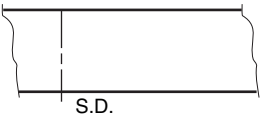

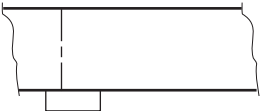
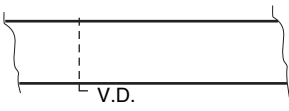
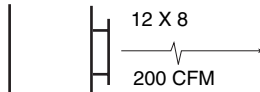

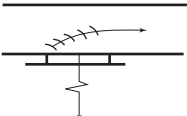
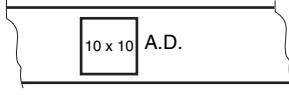
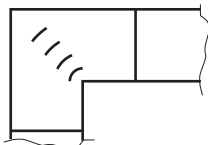

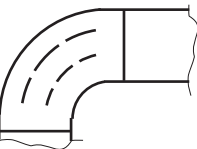
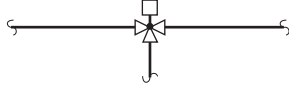
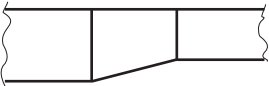

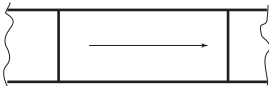
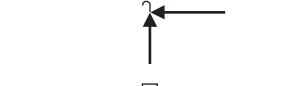



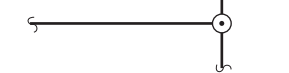
## SITE PLAN SYMBOLS

Description	Symbol	Description	Symbol
NORTH ARROW		WALK	
GRADE POINT		PROPERTY LINE	
FIRE HYDRANT		FUEL GAS LINE	
MANHOLE		CONTOUR LINE	
TREE		POWER POLE WITH GUY	
NATURAL GRADE (CONTOUR LINE) NUMBER INDICATES ELEVATION IN FEET ABOVE SEA LEVEL		ELECTRICAL SERVICE LINE	
		WATER LINE	
		FIRE LINE	
		FINISHED GRADE LINE	

## MECHANICAL SYMBOLS

Description	Symbol	Description	Symbol
RECTANGULAR OR SQUARE SUPPLY DUCT TURNED UP		ROUND SUPPLY DUCT TURNED DOWN	
RECTANGULAR OR SQUARE SUPPLY DUCT TURNED DOWN		RECTANGULAR CEILING DIFFUSER	
RECTANGULAR OR SQUARE EXHAUST DUCT TURNED UP		ROUND CEILING DIFFUSER	
RECTANGULAR OR SQUARE EXHAUST DUCT TURNED DOWN		FLEXIBLE CONNECTION	
ROUND SUPPLY DUCT TURNED UP		TRANSITION: FOT = FLAT ON TOP	

# MECHANICAL SYMBOLS (CONTINUED)

Description	Symbol	Description	Symbol
ELECTRIC OPERATED DAMPER		ACCOUSTICAL LINING INSIDE INSULATION	
FIRE DAMPER		BRANCH TAP IN DUCT	
SMOKE DAMPER		SPLITTER FITTING WITH DAMPER	
ELECTRIC HEATER IN DUCT		VOLUME-DAMPER	
SUPPLY OUTLET WITH SIZE AND AIR QUANTITY SHOWN		BACKDRAFT DAMPER	
DEFLECTOR IN DUCT BEHIND REGISTER OR GRILLE (ARROW INDICATES DIRECTION OF FLOW)		ACCESS DOOR IN DUCT 10" X 10" SIZE	
TURNING VANES IN A SQUARE THROAT ELBOW		PNEUMATIC OPERATED DAMPER	
TURNING VANES IN A ROUND THROAT ELBOW		THREE-WAY VALVE	
PLAN VIEW OF TRANSITION		PRESSURE REDUCING VALVE	
OFF-SET UP IN DIRECTION OF ARROW		PRESSURE RELIEF VALVE OR SAFETY VALVE	
DUCT DIMENSIONS—FIRST FIGURE IS THE SIDE OF DUCT SHOWN (12 X 10)		SOLENOID VALVE	
		PIPE TURNED UP (ELBOW)	
		PIPE TURNED DOWN (ELBOW)	
		TEE (OUTLET UP)	



## MECHANICAL SYMBOLS (CONCLUDED)

Description	Symbol	Description	Symbol
TEE (OUTLET DOWN)		ANGLE GATE VALVE	
BACKFLOW PREVENTER		ANGLE GLOBE VALVE	
UNION		PLUG VALVE	
REDUCER		FLEXIBLE CONNECTOR	
CHECK VALVE		FLOW SWITCH	
GATE VALVE		PRESSURE GAUGE AND COCK	
GLOBE VALVE		PRESSURE/TEMPERATURE PLUG	
BALL VALVE		STRAINER, BLOW DOWN	
BUTTERFLY VALVE		THERMOMETER	
DIAPHRAGM VALVE		THERMOMETER WELL	

## PIPING SYMBOLS

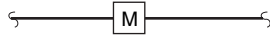
Description	Symbol	Description	Symbol
LOW PRESSURE STEAM		REFRIGERANT SUCTION	
LOW PRESSURE CONDENSATE		REFRIGERANT LIQUID	
PUMPED CONDENSATE		REFRIGERANT HOT GAS	
FUEL OIL SUPPLY		CONDENSATE DRAIN	
FUEL OIL RETURN		FUEL GAS	
HOT WATER SUPPLY		CHILLED WATER SUPPLY	
HOT WATER RETURN		CHILLED WATER RETURN	
COMPRESSED AIR			

# PLUMBING SYMBOLS

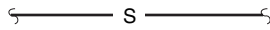
**Description**

**Symbol**

METER



SPRINKLER PIPING



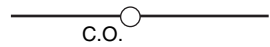
SPRINKLER HEAD



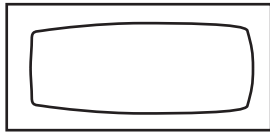
FLOOR DRAIN



CLEAN-OUT



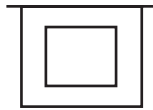
TUB



TANK-TYPE WATER CLOSET



WALL-MOUNTED LAVATORY



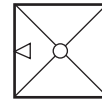
URINAL



**Description**

**Symbol**

SHOWER



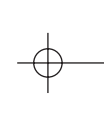
WATER HEATER



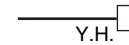
MANHOLE



WALL HYDRANT



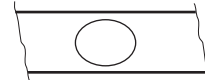
YARD HYDRANT



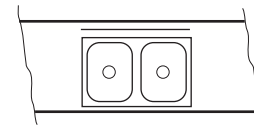
FLUSH VALVE WATER CLOSET



COUNTER-TYPE LAVATORY



KITCHEN SINK (DOUBLE BOWL)



# PLUMBING PIPE SYMBOLS

**Description**

**Symbol**

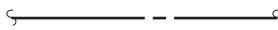
SOIL, WASTE OR DRAIN LINE



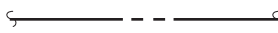
PLUMBING VENT LINE



COLD WATER (DOMESTIC)



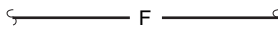
HOT WATER (DOMESTIC)



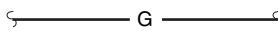
HOT WATER RETURN (DOMESTIC)



FIRE LINE



FUEL GAS LINE



**Description**

**Symbol**

ACID WASTE LINE



VACUUM LINE



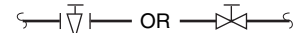
COMPRESSED AIR LINE



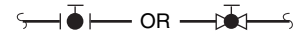
BACKFLOW PREVENTER



GATE VALVE



GLOBE VALVE



CHECK VALVE (ARROW INDICATES DIRECTION OF FLOW)










## PLUMBING PIPE SYMBOLS (CONCLUDED)

Description	Symbol	Description	Symbol
UNION		TEE OUTLET DOWN	
PIPE TURNED DOWN		TEE OUTLET TO SIDE	
PIPE TURNED UP		REDUCER	
TEE OUTLET UP		PIPE SLEEVE	

## ELECTRICAL SYMBOLS

Description	Symbol	Description	Symbol
SINGLE CONVENIENCE OUTLET		FUSED SWITCH	
DOUBLE CONVENIENCE OUTLET		GANG OUTLET	
CONVENIENCE OUTLET OTHER THAN DUPLEX, TRIPLEX, OR DOUBLE DUPLEX, ETC.		SWITCH AND CONVENIENCE OUTLET	
SPECIAL PURPOSE OUTLET (DESCRIBE IN SPECIFICATIONS)		JUNCTION BOX	
FLOOR OUTLET		LAMP HOLDER	
FAN OUTLET		WALL-MOUNTED LAMP HOLDER	
GENERATOR		CLOCK OUTLET	
SINGLE-POLE SWITCH		LIGHTING PANEL	
DOUBLE-POLE SWITCH		POWER PANEL	
THREE-WAY SWITCH		BRANCH CIRCUIT	
FOUR-WAY SWITCH		HOME RUN TO PANEL (NUMBER INDICATES THE NUMBER OF THE CIRCUIT BREAKERS IN PANEL)	
KEY-OPERATED SWITCH		BRANCH CIRCUIT (HASH MARKS INDICATE NUMBER OF WIRES)	
SWITCH WITH PILOT LIGHT		MOTOR	
WATERPROOF SWITCH		ISOLATING SWITCH	
		BELL	
		OUTSIDE TELEPHONE OUTLET	
		FIRE ALARM BELL	

## ELECTRICAL SYMBOLS (CONCLUDED)

Description	Symbol	Description	Symbol
FIRE ALARM STATION		TELEPHONE SWITCHBOARD	
TRANSFORMER		BATTERY	
FUSED ISOLATING SWITCH		GROUND POINT	
INSIDE TELEPHONE OUTLET			

# ABBREVIATION

<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
°C	Celsius or Degrees Centigrade	ASHVE	American Society of Heating and Ventilating Engineers
°F	Degrees Fahrenheit	ASME	American Society of Mechanical Engineers
A	Area	ASPH	Asphalt
AAC	Air Carbon Arc Cutting	ASRE	American Society of Refrigeration Engineers
AAW	Air Acetylene Welding	ASSOC	Associate, Association
AB	Arc Brazing or Anchor Bolt	ASTM	American Society for Testing Materials
ABS	Acrylonitrile Butadiene Styrene	AT	Acoustical Tile
AC	Air Conditioning, Arc Cutting, or Alternating Current	AVE	Average
AD	Access Door or Area Drain	AW	Acid Waste or Arc Welding
ADA	Americans with Disabilities Act	AWG	American Wire Gauge
ADD	Addendum	AWWA	American Water Works Association
AFF	Above Finished Floor	B	Bath, Brine, or Brazing
AG	Aboveground	B & S	Bell and Spigot
AGA	American Gas Association	B PL	Base Plate
AGGR	Aggregate	B to B or B – B	Back to Back
AHU	Air Handling Unit	BA	Bathroom
AHW	Atomic Hydrogen Welding	BB	Baseboard or Block Brazing
AIIE	American Institute of Electrical Engineers	bb1 or BBL	Barrel
AIR COND	Air Conditioning	BD	Balancing Damper, Board, or Building Drain
AISI	American Iron and Steel Institute	BET	Between
AL or ALUM	Aluminum	BF	Back Feed
ALM	Alarm	BFP	Backflow Preventer
AMP	Ampere	BH	Boiler House
AOC	Oxygen Arc Cutting	BID	Bidet
AP	Access Panel	BK SH	Book Shelves
API	American Petroleum Institute	BKR	Breaker
APPD	Approved	BL or BLD LIN	Building Line
APPROX	Approximate	BLD, BLDG	Building
ARCH	Architect, Architectural	BLK	Black or Block
ASA	American Standards Association	BLKG	Blocking
ASB	Asbestos	BLO	Blower
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers	BLR	Boiler
		BM	Beam or Bench Mark
		BMAW	Bare Metal Arc Welding
		BO	Blow-Off
		BOD	Bottom Of Duct

<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
BOP	Bottom of Pipe	CHWS	Chilled Water Supply
BOT or BOTT	Bottom	CI or C. I.	Cast Iron
BP	Blueprint or Bypass	CI or CU IN	Cubic Inch
BR	Bedroom or Boiler Room	CIR	Circle
BRK	Brick	CIR BKR	Circuit Breaker
BRM	Broom Closet	CK	Cast Iron
BS	Building Sewer or Bureau of Standards	CKT	Circuit
BSMT	Basement	CLG HT	Ceiling Height
BT	Bathtub	☉	Center Line or Centerline
BTR	Better	CLKG	Caulking
BTU	British Thermal Unit	CLNG or CLG	Ceiling
BV	Ball Valve or Butterfly Valve or Branch Vent	CLR	Clear
BVL	Beveled	CM	Centimeter
BWV	Back Water Valve	CMU	Concrete Masonry Unit (concrete block)
C	Centigrade, Hundred, Center, Courses, or Thermal Conductance	CND	Conduit
C or CL	Centerline, Center Line, or Closet	CNTR	Center or Counter
C to C or C – C	Center to Center	CO	Cleanout, Clean-Out, or Carbon Monoxide
C to F	Center to Face	CO <sub>2</sub>	Carbon Dioxide
C × C	Copper by Copper	COD	Cleanout Door
C × C × C	Copper by Copper by Copper	COL	Column
C × F	Copper by Female	COM	Common
C × M	Copper by Male	COMP	Composition, Compression, or Companion
C <sub>2</sub> H <sub>2</sub>	Acetylene	CONC	Concrete
C <sub>4</sub> H <sub>10</sub>	Butane	COND	Conductor
CAB	Cabinet	CONN	Connection
CAC	Carbon Arc Cutting	CONST	Construction
CAW	Carbon Arc Welding	CONT	Contact or Continuous
CAW-G	Gas Carbon Arc Welding	CONTR	Contractor
CAW-S	Shielded Carbon Arc Welding	CONV	Convactor
CAW-T	Twin Carbon Arc Welding	CONV ENCL	Convactor Enclosure
CB	Catch Basin or Cinder Block	COP	Copper
CC	Cubic Centimeter	CORRUG	Corrugated
CEM	Cement	COV	Cover
CEM FL	Cement Floor	COV PL	Cover Plate
CEM MORT	Cement Mortar	CP	Cesspool, Chrome Plated, or Control Point
CEM PLAS	Cement Plaster	CPM	Cycles Per Minute
CEW	Coextrusion Welding	CPVC	Chlorinated Polyvinyl Chloride
CF or CU FT	Cubic Foot/Feet	CR PL	Chrome Plated
CFLG	Counter Flashing	CRNRS	Corners
CFM	Cubic Feet Per Minute	CS	Cast Steel, Cast Stone, or Carbon Steel
CFS	Cubic Feet Per Second	CSG	Casing
CHAN	Channel	CSP	Central Switch Panel
CHW	Chilled Water	CTR	Center
CHWR	Chilled Water Return	CU	Copper
		CU FT	Cubic Foot
		CU IN	Cubic Inch

<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
CUR	Current	EDR	Equivalent Direct Radiation
CV or CK V	Circuit Vent or Check Valve	EF	Exhaust Fan
CW	Cold Water or Cold Welding	EGW	Electrogas Welding
CWP	Circulating Water Pump	el or EL	Elevation
CY or CU YD	Cubic Yard	ELEC	Electric
CYL	Cylinder	ELEV	Elevation or Elevator
d	Penny (nail size)	EME	Emergency
D	Diameter or Dryer	ENCL	Enclosure
D S, DS	Downspout	ENGR	Engineer
DBL	Double	ENT	Entrance
DC	Direct Current	EP	Explosion Proof
DCP	Dimmer Control Panel	EQ	Equal
DEG, °	Degree	EQUIP	Equipment
DET	Detail	ESP	Emergency Switch Panel
DF	Drinking Fountain	EST	Estimate
DFB	Diffusion Brazing	ESW	Electroslag Welding
DFU	Drainage Fixture Unit	EWC	Electric Water Cooler
DFW	Diffusion Welding	EWH	Electric Water Heater
DH	Double Hub	EXC	Excavate
DIA, DIAM, or Ø	Diameter	EXIST	Existing
DIAG	Diagram	EXP	Exposed or Expansion
DIF	Diffuser	EXP JT	Expansion Joint
DIM	Dimension	EXT	Exterior
DISC	Disconnect	EXW	Explosion Welding
DMPR	Damper	F DR	Fire Door
DN	Down	F EXT	Fire Extinguisher
DO	Ditto	F to F or F – F	Face to Face
DP	Dampproofing, Deep, Depth, or Dip Brazing	FAB	Fabricate
D R	Dining Room	FACP	Fire Alarm Control Panel
DR	Door, Drain, or Drainage	FAI	Fresh Air Intake
DS	Downspout	FB	Fixture Branch or Furnace Brazing
DT	Dust Tight	FBRK	Firebrick
DW	Dishwasher or Dry Well	FCAW	Flux Cored Arc Welding
DWG	Drawing	FCO	Floor Cleanout
DWN, DN	Down	FCU	Fan Coil Unit
DWV	Drainage Waste and Vent	FD	Fire Damper, Floor Drain, or Fixture Drain
E	East	FDR	Feeder
E to C or E – C	End to Center	FDT	Foundation
E to E or E – E	End to End	FF	Finished Floor
EASP	Electric Arc Spraying	FG	Fuel Gas
EBC	Electron Beam Cutting	FHY	Fire Hydrant
EBW	Electron Beam Welding	FIG	Figure
EBW-HV	Electron Beam Welding—High Vacuum	FIN	Finish
EBW-MV	Electron Beam Welding—Medium Vacuum	FIN FL	Finished Floor
EBW-NV	Electron Beam Welding—Nonvacuum	FIP	Female Iron Pipe
ECO	End Cleanout	FL	Flashing
		FL or FLR	Floor
		FLB	Flow Brazing
		FLG	Flange

<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
FLGD	Flanged	GYP BD	Gypsum Board
FLOW	Flow Welding	HB	Height (see HGT), Hose Bib (Bibb), or Horizontal Branch
FLR	Floor	HC	Hollow Core Door
FND	Foundation	HCW	Hollow Core Wood
FOB	Flat On Bottom	HD	Heavy Duty or Hub Drain
FOC	Chemical Flux Cutting	HDR	Header
FOT	Flat On Top	HG	Mercury
FOUND or FDN	Foundation	HGT	Height (see HB)
FOW	Forge Welding	HHW	Heating Hot Water
FP	Fireplace or Full Port	HHWR	Heating Hot Water Return
FPM	Feet Per Minute	HHWS	Heating Hot Water Supply
FPRF	Fireproof	HM	Hollow Metal
FPS	Feet Per Second	HOR or HORIZ	Horizontal
FR	Font	HP	High Point, High Pressure, or Horse Power (Horsepower)
FRW	Friction Welding	HPW	Hot Pressure Welding
FS	Floor Sink	HT or HGT	Height
FT, '	Feet or Foot	HTG	Heater or Heating
FTG	Footing or Fitting	HVAC	Heating Ventilation and Air Conditioning
FU	Fixture Unit	HW	Hot Water
FURN	Furnish	HWH	Hot Water Heater
FV	Flush Valve	HWM	High Water Mark
FW	Flash Welding	HWR	Hot Water Return
G	Gas, Ground, or Grounded	I	I Beam or Insulation (see INS)
GA	Gauge	IB	Induction Brazing
GAL	Gallon	ID	Inside Diameter
GALV	Galvanized	IE	Invert Elevation
GAR	Garage	IN, "	Inch or Inches
GFCI	Ground Fault Circuit Interrupter	INC	Increaser
GFI	Ground Fault Interrupter	INFO	Information
GI	Galvanized Iron	INS	Insulate, Insulation
GL	Glass	INSUL	Insulation
GL BL	Glass Block	INT	Interior
GMAC	Gas Metal Arc Cutting	INV	Invert
GMAW	Gas Metal Arc Welding	IPC	International Plumbing Code
GMAW-P	Gas Metal Arc Welding—Pulsed Arc	IPS	Iron Pipe Size
GMAW-S	Gas Metal Arc Welding—Short Circuiting Arc	IRB	Infrared Brazing
GND	Ground	IW	Indirect Waste or Induction Welding
GP	Gauge Pressure	J	Junction Box
GPF	Gallons Per Flush	JCL	Janitor's Closet
GPH	Gallons Per Hour	JS	Janitor Sink
GPM	Gallons Per Minute	JSTS	Joists
GPS	Gallons Per Second	JT	Joint
GR or GRD	Grade	K	Kelvin, Kitchen, or Kilopound (See KIP)
GT	Grease Trap		
GTAC	Gas Tungsten Arc Cutting		
GTAW	Gas Tungsten Arc Welding		
GTAW-P	Gas Tungsten Arc Welding—Pulsed Arc		
GTV or GV	Gate Valve		



<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
KIP	Kilopound	MAX	Maximum
KG	Kilogram	MECH	Mechanical
KM	Kilometer	MED	Medium
KO	Knock Out	MEZZ	Mezzanine
KS	Kitchen Sink	MFG	Manufacturing
KVA	Kilovoltage Amperes	MFR	Manufacturer
KW	Kilowatt	MH	Manhole
KWHR	Kilowatt Hour	MI	Malleable Iron and Mile
L	Angle, Left, or Length (see LGTH)	MIN, '	Minimum or Minute
L or LGTH	Length	MISC	Miscellaneous
LAD	Ladder	MLDG	Moulding
LAU	Laundry	MM	Millimeter
LAV	Lavatory	MN	Main
LB	Pound	MO	Masonry Opening
LB, #	Pound	MOD	Modular
LB/CU/FT	Pounds Per Cubic Foot	MR	Marble, Mop Receptor
LBC	Laser Beam Cutting	MRR	Men's Rest Room
LBC-A	Laser Beam Cutting—Air	MS	Mop Sink
LBC-EV	Laser Beam Cutting— Evaporative	MSS	Manufacturer's Standardization Society
LBC-IG	Laser Beam Cutting— Inert Gas	MT	Empty, Men's Toilet
LBC-O	Laser Beam Cutting— Oxygen	MTG	Mounting
LBW	Laser Beam Welding	MTL	Metal
LDG	Landing	MV	Millivolt
LEV	Level	N	North
LH	Left-Handed	N/F	Now or Formerly
LIB	Library	N <sub>2</sub>	Nitrogen
LIN	Linen Closet	NAT	Natural
LIN FT	Linear Feet	NC	Normally Closed
LIQ	Liquid	NEC	<i>National Electric Code</i> ®
LKR R	Locker Room	NFPA	National Fire Protection Association
LOC	Oxygen Lance Cutting	NFHW	Non Freeze Wall Hydrant
LP	Low Pressure	NG	Natural Gas
LPG	Liquid Petroleum Gas	NH	No Hub
LPS	Liters Per Second	NIC	Not In Contract
LR	Living Room	NIP	Nipple
LT	Light	NL	Night Light
LV	Loop Vent, Low Voltage, or Louver	NO	Normally Open or Number
LW	Light Weight	NOM	Nominal
LWC	Light Weight Concrete	NPS	National Pipe Size
M	Meter, Motor, or Thousand	NT or NTS	Not To Scale
MAC	Metal Arc Cutting	O	Offset
MAINT	Maintenance	O.H. Door	Overhead Door
MALL	Malleable	o/	Overhead or Over
MANUF	Manufacturer	O <sub>2</sub>	Oxygen
MAS	Masonry	OAW	Oxyacetylene Welding
MATL	Material	OC	On Center or Oxygen Cutting
		OD	Outside Diameter
		OFC	Oxyfuel Gas Cutting
		OFC-A	Oxyacetylene Cutting

<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
OFC-H	Oxyhydrogen Cutting	PW	Projection Welding
OFC-N	Oxynatural Gas Cutting	PWR	Power
OFC-P	Oxypropane Cutting	QTY	Quantity
OFF	Office	R	Radius, Range, Recessed, or Risers
OFW	Oxyfuel Gas Welding	R & L	Right and Left
OHW	Oxyhydrogen Welding	RA	Return Air
OPG	Opening	RAD	Radiator
OS&Y	Outside Screw and Yoke	RAG	Return Air Grille
OSB	Oriented Strand Board	RB	Resistance Brazing
OVLD	Overload	RCP	Reinforced Concrete Pipe
OZ	Ounce	RD	Road or Roof Drain
P&T	Pressure and Temperature	RECIR, RECIRC	Recirculate
PAC	Plasma Arc Cutting	RED	Reducing or Reducer
PAN, PAL	Panel	REF	Refrigerator
PAW	Plasma Arc Welding	REG	Register
PB	Lead	REINF	Reinforcement or Reinforced
PC	Plumbing Contractor, Pre-cast Concrete, or Pull Chain	REM	Remove
PCF	Pounds Per Cubic Foot	REP	Repair
PE	Plain End or Polyethylene	REQ	Requirement
PERF	Perforated	RET	Return
PEW	Percussion Welding	REV	Revision
PEX	Cross Linked Polyethylene	RF	Roof or Roof Flashing
PG	Pressure Gauge	RGH	Rough
PGW	Pressure Gas Welding	RGH OPNG	Rough Opening
PH	Phase or Power House	RH	Right-Hand
PI	Pressure Indicator	RI	Rough-in
PL	Plate	RL	Roof Leader
PLAS	Plaster	RM	Room
PLG, PLMG, or PLUMB	Plumbing	ROB	Run of Bank (gravel)
PL GL	Plate Glass	ROW	Right of Way or Roll Welding
PLYWD	Plywood	RPM	Revolutions Per Minute
POC	Point of Connection	RPS	Revolutions Per Second
PORT	Portable	RPZ	Reduced Pressure Zone Valve
PRCST	Precast	RSEW	Resistance Seam Welding
PREFAB	Prefabricated	RSEW-HF	Resistance Seam Welding—High Frequency
PRES	Pressure	RSEW-I	Resistance Seam Welding—Induction
PROP	Proposal	RSW	Resistance Spot Welding
PRV	Pressure Reducing Valve	RT	Rain Tight or Right
PS	Pipe Shaft	RTU	Roof Top Unit
PSF	Pound Per Square Foot	RV	Relief Vent or Relief Valve
PSI	Pounds Per Square Inch	RW	Resistance Welding
PSIA	Pounds Per Square Inch Absolute	RWL	Rain Water Leader
PSIG	Pounds Per Square Inch Gauge	S	Sink, Sewer, South, or Switch
PT	Pint or Pressure-Treated Lumber	S&P	Shelf and Pole
PTD	Painted		
PTN	Partition		
PVC	Polyvinyl Chloride		

<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
SA	Shock Absorber or Supply Air	SUP	Supply
SAG	Supply Air Grille	SUPT	Superintendent
SAN	Sanitary	SV	Stack Vent, Safety Valve, or Service Weight Pipe
SAW	Submerged Arc Welding	SW	Stud Arc Welding or Switch
SAW-S	Series Submerged Arc Welding	SWBD	Switchboard
SCD	Screwed	SY	Square Yard
SCH or SCHED	Schedule	SYS	System
SCM	Square Centimeter	T	Toilet or Travel
SCRND	Screened	T&G	Tongue and Groove
SD	Split Damper or Storm Drain	T&P	Temperature and Pressure
SEC	Second	TB	Torch Brazing
SEW	Sewer	TBM	Temporary Bench Mark
SF	Square Foot or Square Feet	TC	Thermal Cutting
SH	Shower or Single Hub	TCAB	Twin Carbon Arc Brazing
SHT	Sheet	TD	Trench Drain
SHTG	Sheathing	TEMP	Temperature
SHR or SHWR	Shower	TG	Temperature Gauge
SIM	Similar	TH	Thermostat (see TSTAT)
SIN	Square Inch	THD	Threaded
SK	Sketch or Sink	THERM	Thermometer
SL	Slate or Sliding	THK	Thick
SLD	Solder	T'HOLD	Threshold
SM	Square Meter	TI	Temperature Indicator
SMAC	Shielded Metal Arc Cutting	TLT	Toilet
SMACNA	Sheet Metal and Air Conditioning Contractors National Association	TOC	Top of Concrete
SMAW	Shielded Metal Arc Welding	TOD	Top Of Duct
SO	Side Outlet	TP	Trap Primer or Tie-in Point
SOV	Shut-Off Valve	TSTAT	Thermostat (see TH)
SP	Soil Pipe or Static Pressure	TW	Thermit Welding
SPEC	Specifications	TYP	Typical
SPKR, SPR	Sprinkler	UG	Underground
SQ or $\square$	Square	UH	Unit Heater
SQ FT	Square Foot	UL	Underwriter's Laboratories
SQ IN	Square Inch	UNFIN	Unfinished
SQ YD	Square Yard	UNO	Unless Noted Otherwise
SS	Stainless Steel (See SST), Sanitary Sewer, Soil Stack, or Service Sink	UR	Urinal
SST	Stainless Steel	USS	United States Standard
SSW	Solid-State Welding	USSG	U.S. Standard Gauge
STD	Standard	USW	Ultrasonic Welding
STL	Steel	UW	Upset Welding
STY	Story	UW-HF	Upset Welding—High Frequency
		UW-I	Upset Welding—Induction
		V	Volt, Vent, or Valve
		VA	Voltage Amperes
		VAC	Vacuum
		VAV	Variable Air Volume

<i>Abbreviation</i>	<i>Description</i>	<i>Abbreviation</i>	<i>Description</i>
VB	Vacuum Breaker, Valve Box, or Vapor Barrier	WI	Wrought Iron
VCP	Vitrified Clay Pipe	WM	Washing Machine or Water Meter
VCT	Vinyl Composite Tile	WP	Water Pump, Waterproof, Weatherproof, or Weatherproofing
VD	Volume Damper	WRR	Women's Rest Room
VEL	Velocity	WS	Waste Stack
VERT	Vertical	W/	With
VEST	Vestibule	WSFU	Water Supply Fixture Unit
VIF	Verify In Field	WT	Water Tight, Weight, Women's Toilet
VOL	Volume, Volt	WV	Wall Vent
VS	Vent Shaft	WWP	Water Working Pressure
VT	Vapor Tight	X SECT	Cross Section
VTR	Vent Through Roof	XFER	Transfer
W	West, Watt, Wire, Width, or Washing Machine	XFRMR	Transformer
W & D	Washer and Dryer	XH or XHVV	Extra Heavy
WARD	Wardrobe	XS	Extra Strong
WB	Washer Box	X-SECT	Cross Section
WC	Water Closet	XXH	Double Extra Heavy
WCO	Wall Cleanout	XXS	Double Extra Strong
WD	Wood	YD	Yard
WDW	Window	YDI	Yard Drain Inlet
WH	Water Heater, Wall Hydrant, Weatherhead, or Weephole	YH	Yard Hydrant
		YLW	Yellow
		YR	Year