There are several types of dimensioning practices. Some concern themselves exclusively with manufacturing, while others deal with architectural practices. The manufacturing arena is outside the realm of this course, so here; we'll concentrate solely on dimensioning as it pertains to the preparation of architectural working drawings. The following discussion of dimensioning was obtained from a textbook titled Architectural Drawing and Light Construction, by Edward J. Muller, published by Prentice-Hall, Inc., 1967. While the date may lead you to think the material is dated, I can assure you, dimensioning practices in the field of architecture have not changed radically, it at all, between then and now. I have taken the liberty to embellish the words of the author in an effort to make the intent current with respect to CAD applications.

Make the dimensions Easy to Read

The usefulness of a working drawing depends to a large extent upon the correctness and manner of placement of its dimensions. If the dimensions are orderly and have been determined with the builder’s needs in mind, information is readily obtained from the drawing. Numerous expensive mistakes are often the result of faulty dimensions. Regardless of the scale of a drawing, numerical dimensions always indicate the actual size of the structure or feature. For example, if the side of a carport is represented by a line 5 inches long on a plan plotted at a scale of \( \frac{1}{4}'' = 1'-0'' \), the numerical dimension shown on the drawing should be 20'-0", which is the dimension workmen must use to build the wall.

Extension lines are thin lines drawn from the extremities of a feature requiring a dimension (see Fig. 8.5C). Extension lines should not touch the feature, but rather they should begin one-half the distance away from the object, as the dimension text is tall. They should also extend beyond a dimension line by a distance equal to the height of the dimension text in your drawing. If features within a drawing are best dimensioned outside of the view, extension lines pass through the object lines and are unbroken.

Dimension lines are also thin lines and have arrowheads or architectural ticks on each end, indicating the exact extremities of the dimension (see Fig. 8.5C). On architectural and structural drawings, dimension lines are made continuous, and the numerical dimension is placed just above the line, by a distance equal to one-half the height of the text. When placing a numerical dimension above adjacent parallel dimension lines, be careful to place it closer to the line it identifies. On shop or engineering drawings, the dimension line is broken near its center, and the numerical dimension is centered in the opening.

Arrowheads are drawn at the ends of dimension lines. Various types of arrowheads are seen on drawings (Fig. 8.5D), but the student should learn to make conventional arrowheads well before trying other types. Make them neat and uniform, with their points just touching the extension lines. A sharp, narrow arrowhead whose length is equal to the height of the dimension text is the most appropriate. Avoid clumsy arrowheads made with dull pencils.
**Dimensions** should be neatly lettered, and they should be made to read from the bottom and right side of the drawing—never from the top or left side. Dimensions under 12” are usually specified in inches, such as 6”, 3 5/8”, 11 ½”, etc. Dimensions that are 12” or greater are specified in feet and inches, such as 3'-4", 25'-7 ½", 12'-0", etc. However on detail drawings, some features that are well over 12 “ in size are commonly expressed in inches only. For example, joist spacing is usually indicated as 16” on center, kitchen base cabinets as 36” high, minimum crawl space as 18”, etc. When lettering dimensions, never place the dimension directly on line-work nor allow the numbers to touch lines on the drawing; it often obscures the numeral, and after a print is made of the drawing, the dimension is usually misread.

**Place Dimensions for Obvious Association with Their Features**

Dimension lines should be placed outside the view or drawing, if possible. On large plans however, features such as partitions that are well inside the exterior walls must be dimensioned inside the view for obvious association. Dimensions that are too remote from their features are difficult to find, and the excessively long extension lines which are then necessary, make the drawing confusing. The placement of dimensions within a drawing should be studied carefully to be sure they do not interfere with other lines on the view. Avoid a dimension line that coincides with an object line at the arrowhead; offset the dimension slightly. Judgment must also be used in placing dimensions around the periphery of a plan or detail. If they are too close, they interfere with the outline of the view, and the numerical dimensions often become crowded; if they are too far away, they give the impression of pertaining to features other than their own.

**Line Up Dimensions in Series for Simplicity**

If possible, a series of dimensions should be “lined-up” so that they can be quickly drawn with one setting of the ruling edge, even if the view has offset edges (see Fig. 8-6). With arrowheads at each extension line intersection, the continuous dimension-line effect simplifies the appearance of the drawing. The smallest dimensions are placed nearest, and the larger ones are placed farther away from the view. On a floor plan, for example, which often has many features requiring complex dimensions, similar features requiring should be brought to each series for unity. The location of window and door center lines can be dimensioned along one series, closest to the plan; the offsets in the exterior wall and abutting partitions can be dimensioned along another series about ½” farther out; and the overall length of the building can be shown as a single dimension at a distance of ½” farther out again. Almost each dimensioning situation requires a different solution. Be sure to check the total of a series, arithmetically, to verify the overall dimension. Occasionally it becomes necessary to cross extension lines, but avoid crossing dimension lines.
Do Not Duplicate Dimensions

Basically, dimensions are either size dimensions or location dimensions. Only those that contribute to the construction of the building or feature should be shown—needless repetition only clutters the view. Often the method of construction dictates their correct choice. For example, in frame wall construction, the window and door openings are located to their centerlines on the plan, whereas in solid masonry construction, they are dimensioned to their edges (see Fig. 8-1). In frame partitions, the location of doors is often superfluous, inasmuch as their symbol indicates and obvious placement. Correct dimensioning eliminates the need for workmen to make unnecessary addition or subtraction calculations on the jobsite.

Use Leaders to Avoid Overcrowding

Leaders are straight or curved lines leading from a numerical dimension or note to the applying feature (see Fig. 8-7A). Usually an arrowhead or dot is drawn on the feature-end of the leader. Draftsmen have devised various leader techniques, but the most effective leaders are those that identify themselves as leaders and do not become confused with object lines or other lines on the drawing. Leaders should appear as connectors only and should not be misinterpreted. This is the purpose for using angular or offset-curve leaders. Standards for modern-day CAD systems, usually do not allow for offset-curve leaders. It is common practice to add leaders to the drawing after dimension lines have been completed, then satisfactory uncrowded spaces can be found for the leader-dimension or note, without placing this information too far from the feature. If a series of leaders must identify a number of materials or features, on section views for example, be certain the notes are arranged in a logical sequence so that the leaders do not cross (Fig. 8-7A). For readability, bring the leader to the beginning of a note. Leaders with circles or “balloons” attached are effective for identifying parts of an assembly or similar drawing requiring a sequence of letters or numbers (see Fig. 8-2).

Use angular leaders also to label circular shapes and holes. Place the leader indicating a diameter dimension on the exterior (circumference) of the circle, with the arrowhead touching the circumference and pointing toward its center. A regular, angular dimension line can be used to label large circles; dimension cylinders on their rectangular view. Draw the leaders indicating the radii of arcs form their radiating points to the arcs, with the arrowhead of the leader on the inner side of the curvature (Fig. 8-7B) and the letter R following the numerical radius.

Use Notes Sparingly on A Drawing

Unless a note clarifies the graphic representation, chances are it can be better included in the written specifications and thereby save the draftsman’s time. If a note is needed, however, use small lettering and make it clear and
concise. If a note, such as, “SEE DETAIL A-A” is used, be sure there is a detail A-A to which the reader can refer. Check spelling carefully—even draftsmen need a dictionary occasionally. Extensive notes should be organized in neat blocks away from linework. These lettered areas of unusually long notes (if they definitely must be on the drawing) should be considered in the sheet layout planning. Allow “breathing space” around a note, regardless of size, so the reader can understand it.

**Abbreviations Save Time, But They Are Often Confusing**

Even though the American Standards Association has established abbreviation standards for the construction industry, many variations still exist throughout the country. Some architectural offices insist on abbreviating every word possible on their drawing, mainly to economize; other offices, knowing the inconsistencies and chances for misinterpretation, will not tolerate the use of abbreviations. The draftsman must use discretion and abbreviate only those words that have commonly identified abbreviations and use them in such a way that they cannot possibly be misconstrued. Capital lettering is usually employed as a rule; the period at the end is omitted. If it becomes necessary to use unusual abbreviations throughout a set of drawings, indicate their meanings on a legend.