

Beginning Engineering Graphics
6th Week Lecture Notes

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Topic: Types of Pictorial Drawings (Isometric, Oblique, and Perspective)

1st Subject: Types of Pictorial Drawings (Isometric, Oblique, and Perspective)

1. Types of pictorial drawings:

(2) Pictorial drawings: The word pictorial literally means “like a picture”. Among the three types of pictorial drawings, the simplest and least realistic is oblique, the most realistic and complicated is perspective, isometric is in the middle, and is the most common method used in industry:

a. Isometric: One corner of the object appears closest. The lines slanting away from this corner are 120 degrees apart, and are drawn true length. Isometric axis lines are 120° apart, receding lines are parallel, the three planes of an isometric axis are defined as left, right and top planes, isometric sketches may be sketched in different orientations to show as many of the object’s features as possible. To make an isometric drawing, sketch a “prism” first and “chop away” or add something to come up with the desired object. Other axonometric drawings include diametric and trimetric, they are difficult to draw and are not used as often as isometrics. Isometric drawings can be used for client presentation and product literature, in the forms of explosion and assembly drawings.

b. Oblique drawing: one side of the object appears closest. The top and one side slant away. Useful for circular objects. Oblique sketches are based on one perpendicular set of lines and one receding line, at any angle but with 30° or 45° as the most common. All receding lines are parallel. Oblique drawings include three types:

cavalier (true length for all sides);

cabinet (true length for front sides but half length for the sides on the top and the slanting side. Cabinet oblique looks more natural), and

general (3/4 scale for the receding axis, drawn at about 15° with horizontal).

c. Perspective drawing: the most realistic and natural type of pictorial drawing, but does not show the real dimensions of the object, therefore, can NOT be used as working drawings. All measurement in perspective drawings are “estimated”, NOT measured with a rule as in isometrics or oblique drawings. Perspective drawings are good for showing large objects such as buildings and highway in a realistic way, before things are actually built. The perspective drawings are sometimes beautifully rendered, look like photographs and show the object the way it actually appears; and are used in architecture, aircraft and automotive industries.

In perspective drawings, receding lines converge to one or two vanishing points (VP, located on a theoretical HORIZON LINE, or EYE LEVEL, abbreviated as EL, always at eye level). Parts farther away from the view are drawn smaller than those close by, therefore, things seem to get smaller in the distance. **The one-point perspective** is called “**Parallel perspective**”, has similar appearance as oblique drawing, but has two sets of parallel lines; with the “receding” lines converge to one vanishing point. **Two-point**

perspective is called “**Angular perspective**”, has similar appearance as isometric drawing, but has one set of parallel lines, and two sets of receding lines converge to two vanishing point. The drawing steps for one- and two-point perspectives are same as in isometric and oblique drawings. Sometime, **three-point perspective** can be used to draw tall buildings or objects rotated to a particular angle (the third vanishing point can be either above or below the horizon). The three-point perspective is more complicated and not used as often as one- and two-point perspectives.

To understand the construction of the grid system for perspectives, see handouts from **Perspective A Step-by-Step Guide for Mastering Perspective by using the Grid System, by Donald A. Gerds, 4th Edition, p5-7**). Ready-made grid system are available through the same author’s publication.

Study Questions

1. What is the most commonly used form of pictorial drawings in the presentation of consumer products?
2. What is the most realistic form of pictorial drawings?
3. Can perspective drawings be used as production drawings? Explain the reason for your answer.
4. What are the two most common types of perspective drawings? And what is their relationship with other types of pictorial drawings such as isometric and oblique drawings? Explain the way they are drawn.
5. What are three types of oblique drawings? Explain the way they are drawn.
6. Are all lines in isometric drawings drawn at true length? Please explain in detail.