Graphics Introduction

Dr. Hodge Jenkins
MAE 205
Tools

Figure 1.6 Traditional Tools
Tools

Figure 1.5  CAD Workstations
Typical Engineering Documentation
Title Blocks
# Paper Sizes

## Table 1.1  ANSI Standard Sheet Sizes

<table>
<thead>
<tr>
<th>Metric (mm)</th>
<th>U.S. Standard</th>
<th>Architectural</th>
</tr>
</thead>
<tbody>
<tr>
<td>A4 210 × 297</td>
<td>A-Size 8.5” × 11”</td>
<td>9” × 12”</td>
</tr>
<tr>
<td>A3 297 × 420</td>
<td>B-Size 11” × 17”</td>
<td>12” × 18”</td>
</tr>
<tr>
<td>A2 420 × 594</td>
<td>C-Size 17” × 22”</td>
<td>18” × 24”</td>
</tr>
<tr>
<td>A1 594 × 841</td>
<td>D-Size 22” × 34”</td>
<td>24” × 36”</td>
</tr>
<tr>
<td>A0 841 × 1189</td>
<td>E-Size 34” × 44”</td>
<td>36” × 48”</td>
</tr>
</tbody>
</table>
Line types

- CENTER – THIN
- SHORT BREAK LINE – THICK
- LONG BREAK LINE – THIN
- DIMENSION & EXTENSION LINE – THIN
- SECTION LINE – THIN
- PHANTOM LINE – THIN
- STITCH LINE – THIN
- VISIBLE LINE – THICK
- HIDDEN LINE – THIN
- CUTTING PLANE LINE – THICK
- CUTTING PLANE LINE – THICK
- CHAIN LINE – THICK
- SYMMETRY LINE
Use of different line types

- Arrowhead: 0.35 mm
- Dimension line: 0.3 mm
- Extension line: 0.3 mm
- Center line: 0.3 mm
- Phantom line: 0.3 mm
- Hidden line: 0.3 mm
- Cutting plane line: 0.6 mm
- Center line: 0.3 mm
- Chain line: 0.6 mm
- Short break line: 0.6 mm
- Section line: 0.3 mm
- Visible line: 0.6 mm
- Leader: 0.3 mm
- Note: 0.5 mm
- Diameter: 1.5 mm
- Section A-A
Interpretation of sketches
Sketching: Outline and Modify

**Figure 2.11** Contour Sketch
A contour sketch is created by carefully observing the outline of an object while sketching. This technique is used to improve your sketching ability. In this example, the contour sketch was created without looking at the paper.

**Figure 2.12** Modified Contour Sketch
This contour sketch was created by looking at the object, then looking at the paper as the sketch was produced.
Sketching goal:
Smooth, straight lines

Figure 2.16 Examples of Good and Bad Straight Line Technique
Sketched lines should be straight and dark and should have a consistent thickness.
Sketching a Circle

(A)  (B)  (C)  (D)

Figure 2.19 Sketching a Circle
Use ruler and construction lines

Object

Step 1

Step 2

Step 3

Final sketch

Step 4
Sketching approaches

(A) Multiview  (B) Axonometric

(C) Oblique  (D) Perspective

Figure 2.23 Classification of Sketches
Isometric
Engineers use

- Design Documentations
- Isometric sketches
- Orthographic Projections

For simple hand sketches
- Oblique sketches