CHAPTER 3
FREEHAND SKETCHING AND LETTERING TECHNIQUES
Part I: Sketching Technique
Types of Projection

(a) MULTI-VIEW    (b) AXONOMETRIC

(c) OBLIQUE      (d) PERSPECTIVE
Supplies

• HB or other medium grade pencil
• 6H or other hard grade pencil
• Engineering markers
• 8.5 x 11 white paper
• Fade-out grid sketch paper
• Grid templates
• Letter guideline template
Freehand sketches are used to communicate with others, so they should be neat and correctly prepared.
Sketch Quality

• To create good quality sketches, use the correct grades of lead and keep your pencil sharpened.
• Sketches use different line weights (thicknesses) to show the relative importance of different lines.
• The object you are drawing should be thick and black in the sketch so that it stands out from the dimensions, notes, and other lines.
• It is the **subject** of your drawing and should be communicated clearly.
Sketched Lines

- Line patterns communicate what the line represents in the drawing
- Line patterns tell you information such as whether the line is hidden, visible, or a centerline
Visible line

THICK
Approx. width 0.7 mm (0.03")

Hidden line

0.8 mm (.03") THIN 3.2 mm (.12")
Approx. width 0.35 mm (.016")

Section line

THIN

Center line

19 - 38 mm (.75 - 1.50") THIN
3.2 mm (.12")
1.6 mm (.06")
Dimension line, Extension line, Leaders

Cutting-plane or Viewing-plane lines

90.5

1.6 mm (.06") THICK

6.4 mm (.25")

3.2 mm (.12")

1.6 mm (.06") THICK

19 - 38 mm (75 - 1.50")

86
Short-break line

Long-break line

Phantom line

Stitch lines

Chain line
Good Sketching Technique

(a) THICK, DARK
THIN, DARK
CONSTRUCTION LINES, VERY light!

(b) THICK, DARK
THIN, DARK

(c) THICK, DARK
THIN, DARK
\[ \frac{1}{2} \]
Sketching Circles

- Box in circles and sketch shape
- Use light 6H pencil, darken with HB when you are satisfied with appearance
- Carefully locate tangencies
- Sketch curves first and then add straight lines tangent to them. This is easier than trying to make a curve tangent to straight lines.
Scale

- Sketches are not usually made to a particular scale.
- It is important to keep the sketch in proportion.
- Use grid paper or estimate proportions by comparison.
Sketch Large Features, Then Add Small Details

- Look at overall dimensions first and lightly block in
- Block in secondary details lightly
- Add final details
- Darken sketch
Develop Sketch by Blocking In

1.

2.

3.

4.
Enlarging Proportions

• Lay a grid over existing picture
• Draw larger grid
• Look at each portion of the object. How does it enter and exit each grid box.
• Sketch in lightly in enlarged boxes
Summary

• Quality is one of the most important aspects of sketching.
• Sketched lines should be bold freehand lines.
• The subject of the sketch should stand out clearly.
• Using the correct lead grades and good techniques for sketching will help your sketches look their best.
Part II: Lettering
Basics

• Use HB or other medium grade pencil
• Typical lettering height is 1/8”
• Use guidelines to make uniform letters -- a guideline template makes it easy
• Lettering is usually UPPERCASE
Letter Shapes

1. You can think of each letter as being formed on a 6 x 6 grid.
2. Most letters are 5 units wide by 6 units tall.
3. T O M Q V A X and Y are all 6 units by 6 units.
4. Letter W is 8 units wide and 6 units tall.
5. Letter I and numeral 1 are only the width of a single stroke.
STRAIGHT-LINE LETTERS

L T E F H V A

W M N K X Y Z

LW* is only letter over 6 units wide. Letters in “TOM Q VAXY” are 6 units wide—all others are 5, except “I” and “W.”

CURVED-LINE LETTERS

O Q C G J U D

The letters Q, C, G, and D are based on a true circle. The lower portion of the J and U is elliptical.

CURVED-LINE LETTERS AND NUMERALS

P R B 8 3 8 8

The 8 is composed of two ellipses. The 3, 5, and 2 are based on the 8.

0 6 9 4 7 5 &

The 0, 6, and 9 are elliptical.
Letter Proportions

Equal upper and lower portion give letters a top heavy appearance.

Make the top portions smaller and the horizontal strokes slightly above the midline for a more balance appearance.
Spacing Lettering

- Space letters by eye so that the background areas appear equal, not so that the actual distance from one letter to the next is equal.
- Space letters within words relatively close together. Space words relatively far apart. A good rule of thumb is to space words the width of capital “O” apart.
Summary

• Neat legible lettering is used to add dimensions and notes to sketches.
• Poor lettering can ruin an otherwise good sketch.
• Engineering lettering is usually drawn with HB or other relatively soft lead.
• Use 1/8” uppercase single-stroke letters