

## ME 111 Engineering Graphics 1 (TEP/TEPE)

### Lecture # 1: Introduction to drawing and it's preparation.

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#### Definitions:

- Graphic – Expression of idea in the form of linings or inspiration on surface.
- Drawing – A graphic that represent a real thing.
- Drafting – Graphical language that people with different native language can understand. It's a "Universal Language".
- CAD – Computer-Aided Design, the use of computer to design a part and produce engineering drawing.

#### Types of Drawing:

- Artistic Drawing – Artists have used it to express aesthetic, philosophic, or other abstract ideas. It can be interpreted differently by different person.
- Technical Drawing – Represent the design of objects to be built or construct. It must communicate same message to everyone.

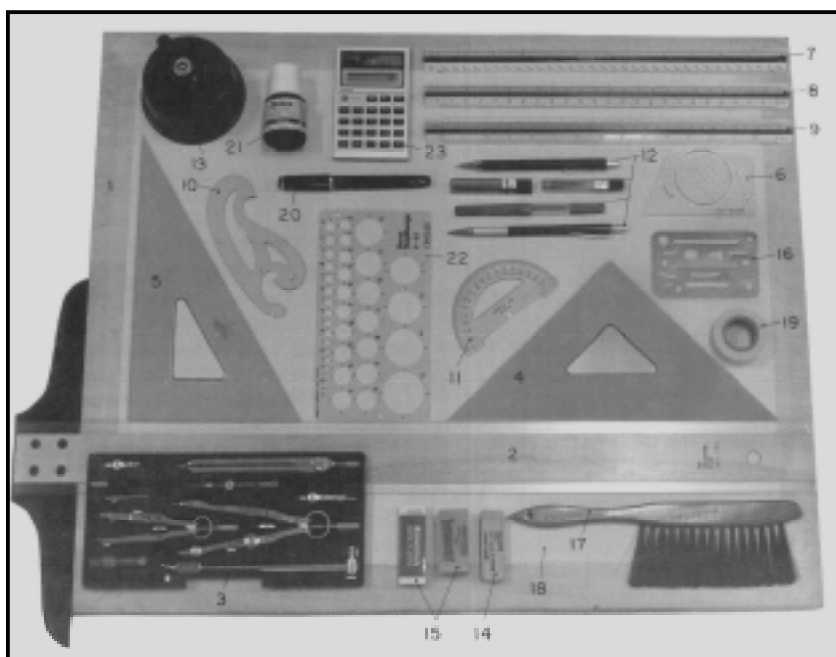
#### Why do engineers need to learn Graphics?

- To be able to communicate your idea with other people.

#### Objectives in drafting:

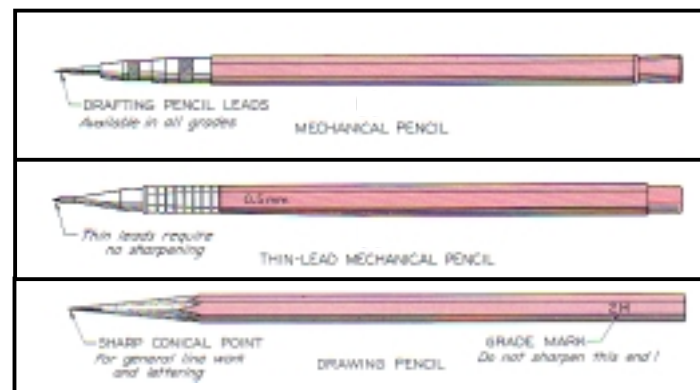
- Accuracy
- Speed
- Legibility
- Neatness

#### Typical equipment:



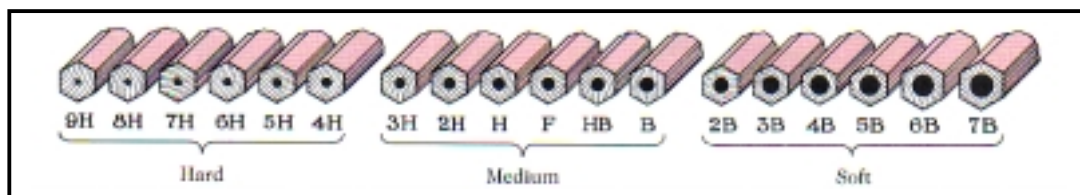
1. Drawing board
2. T-square
3. Compass set
4. 45 degree triangle
5. 30x60 degree triangle
6. Lettering guide
7. – 9. Scale
10. Irregular curve
11. Protractor
12. Pencils
14. – 15. Erasers
16. Erasing template
19. Drafting tape
23. Calculator

- Pencil



0.7 – B  
0.5 – HB

- Grades of pencil



Hard grade – Extreme accuracy as on charts and diagrams.

4H – 6H for line work on engineering drawing.

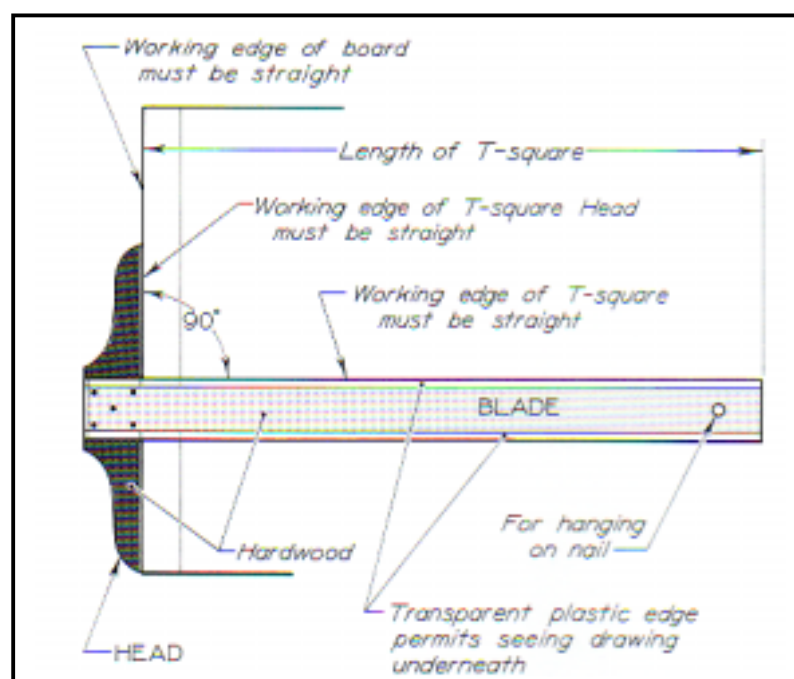
Medium grade – General propose work in technical drawing.

H – 3H for line work on machine and architectural drawings.

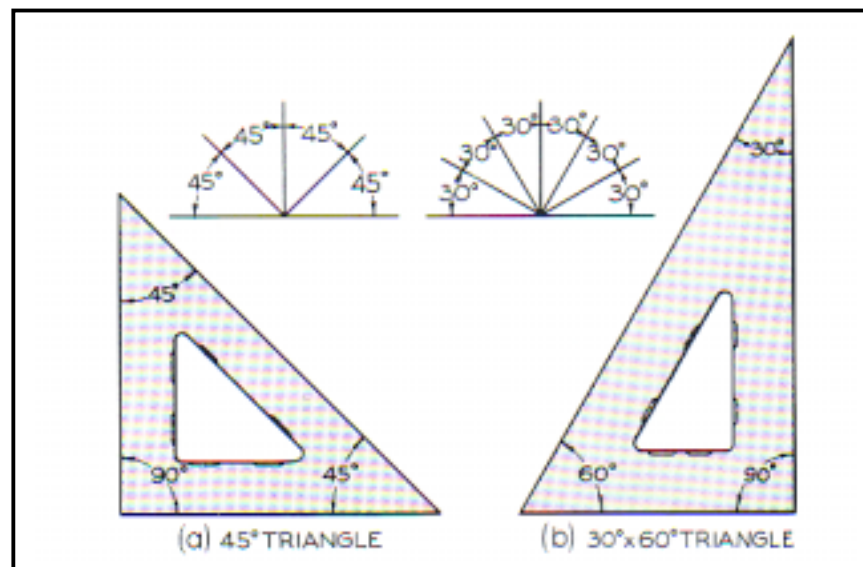
F, HB, B for sketching, lettering, arrowheads, and other freehand.

Soft grade – For rough lines, art work and architectural drawing.

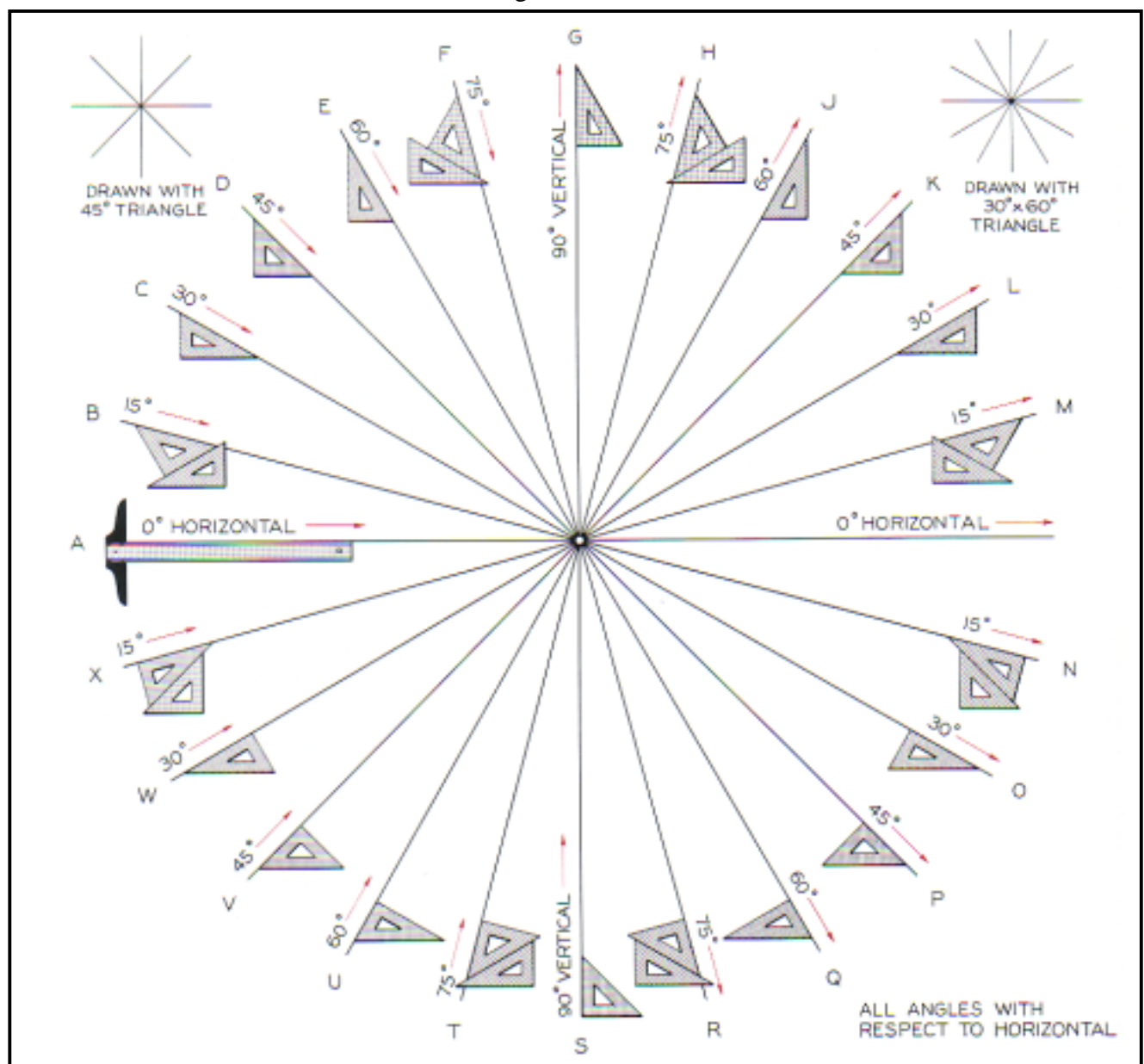
- T-square



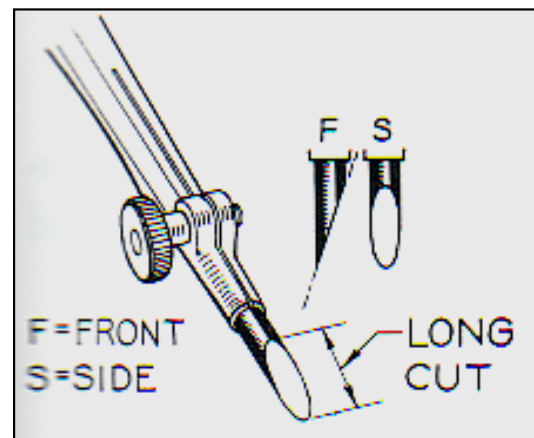
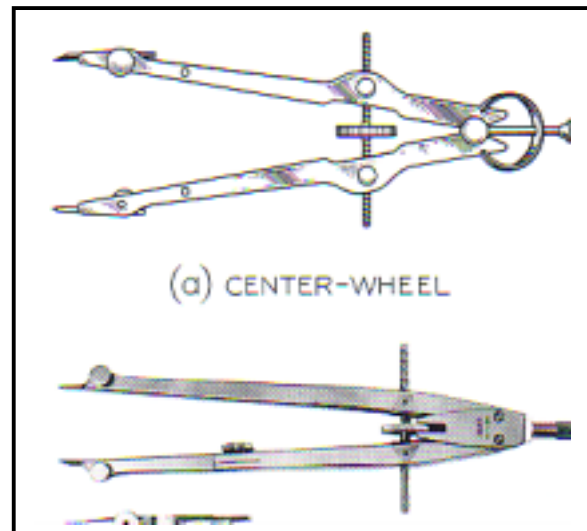
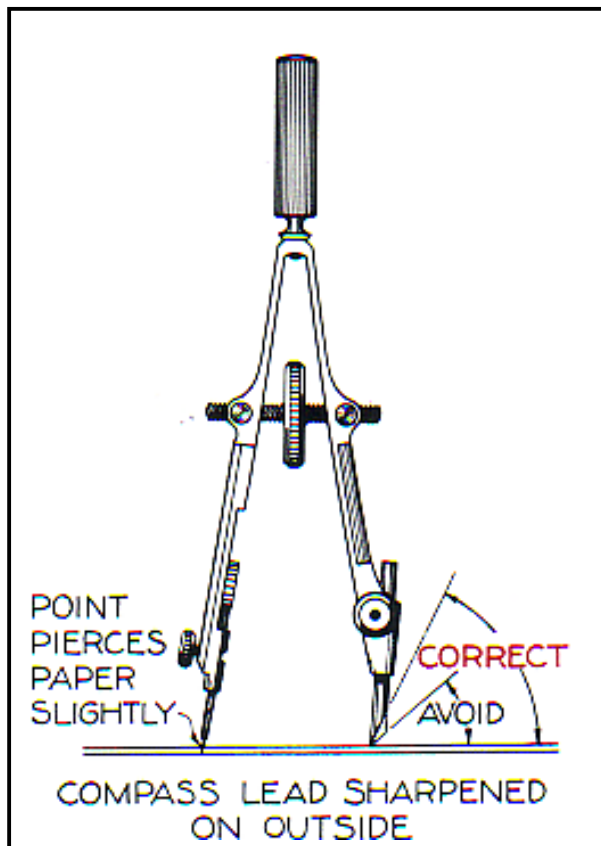
- Triangles



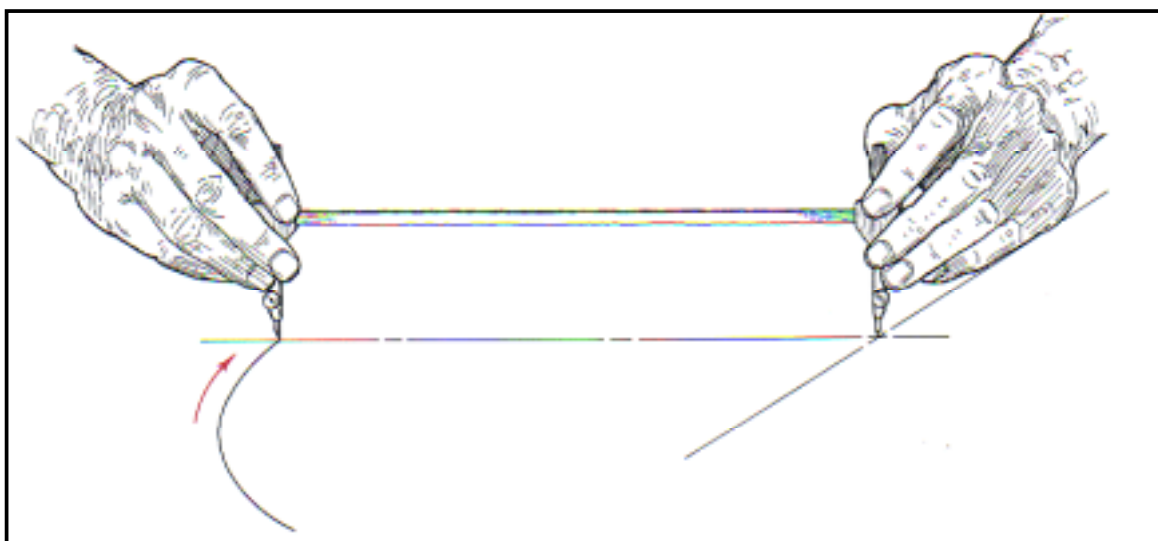
Triangle wheel



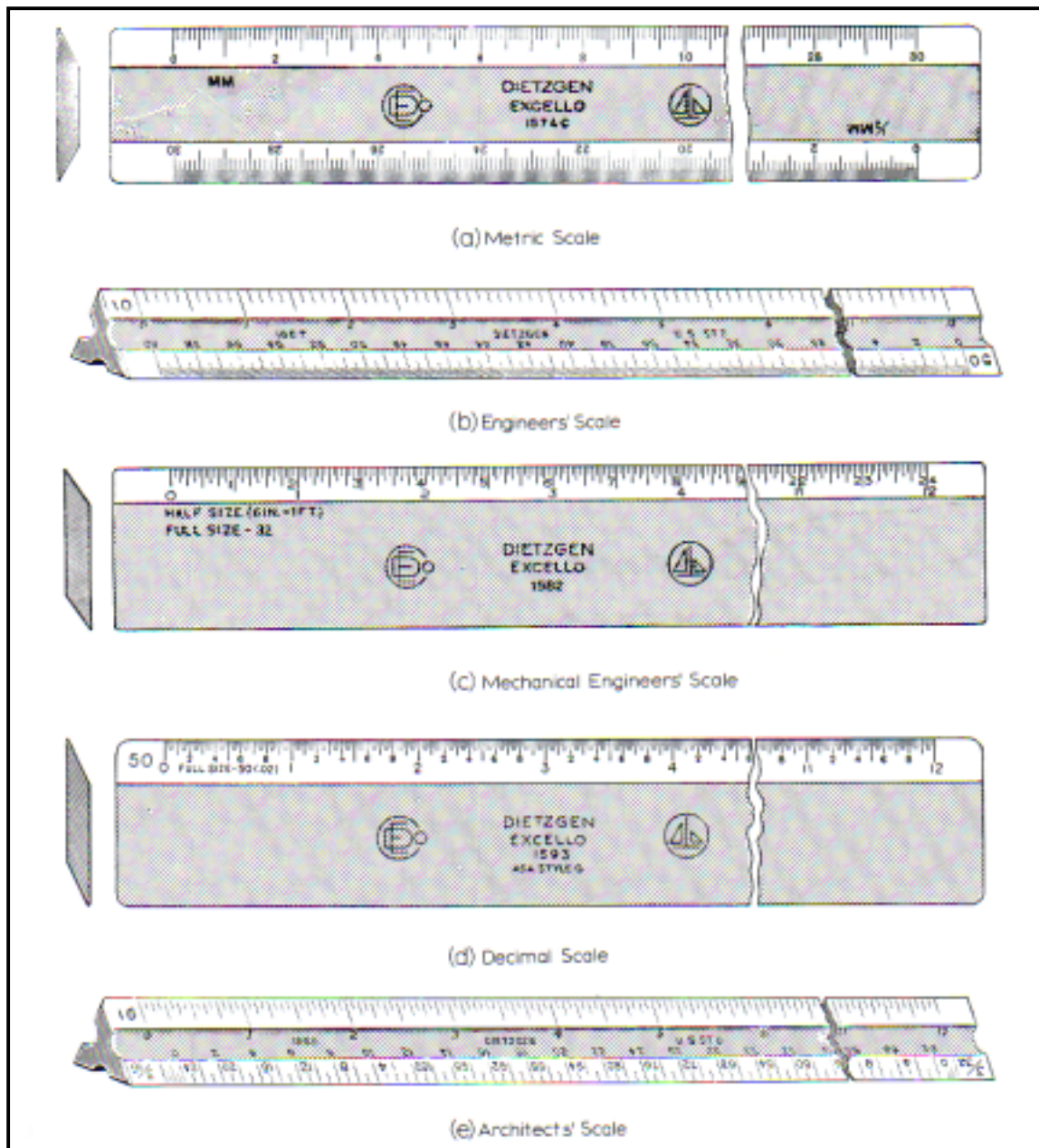
- Compass (Bow and beam compass)
  - Bow compass



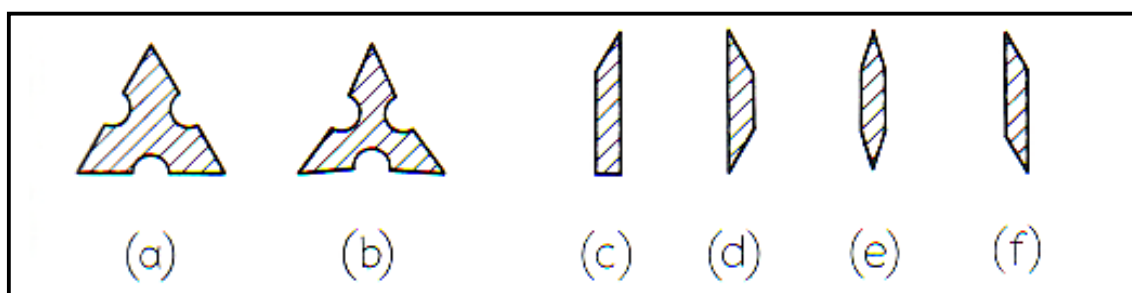
- Beam Compass



- Scaling

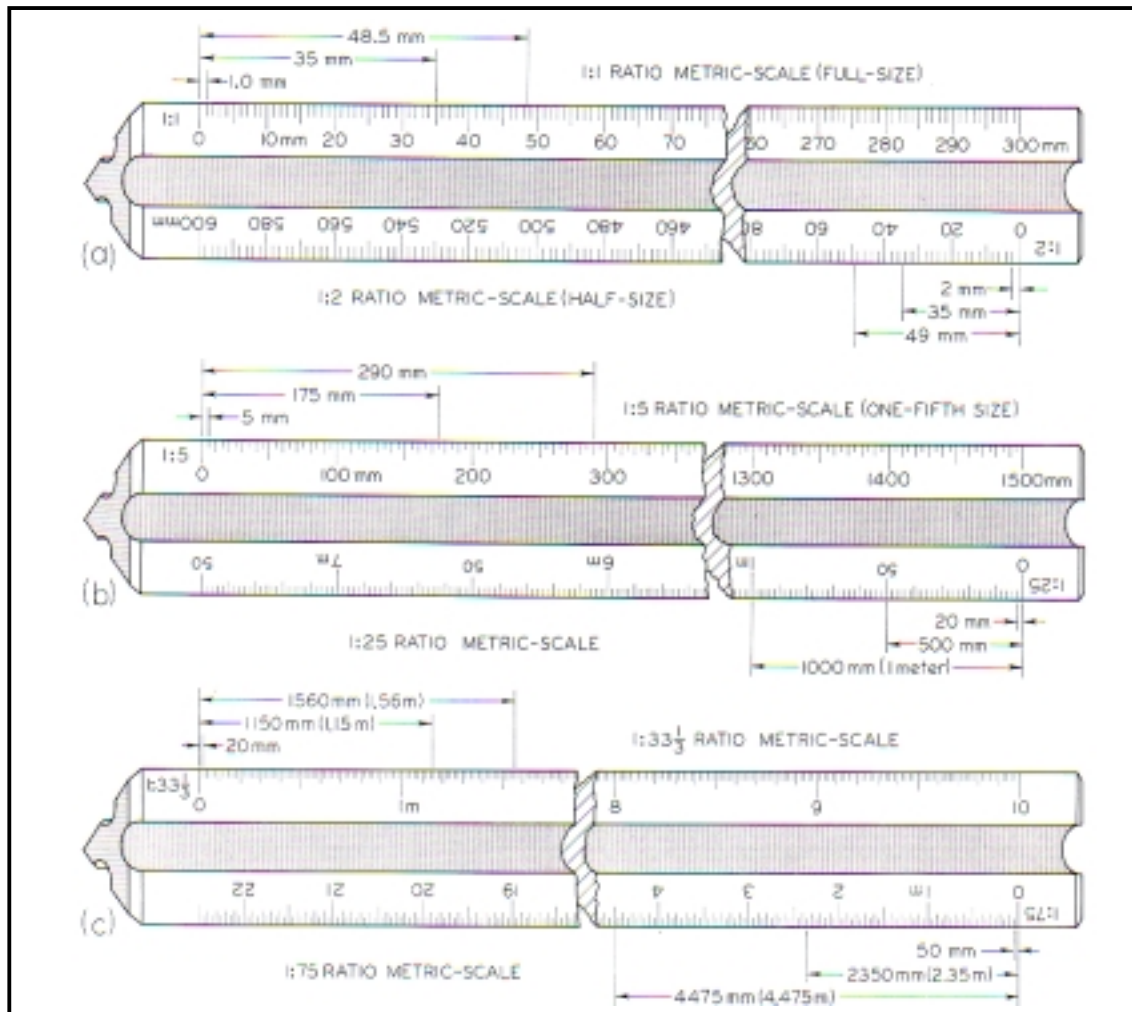


Type of Scales

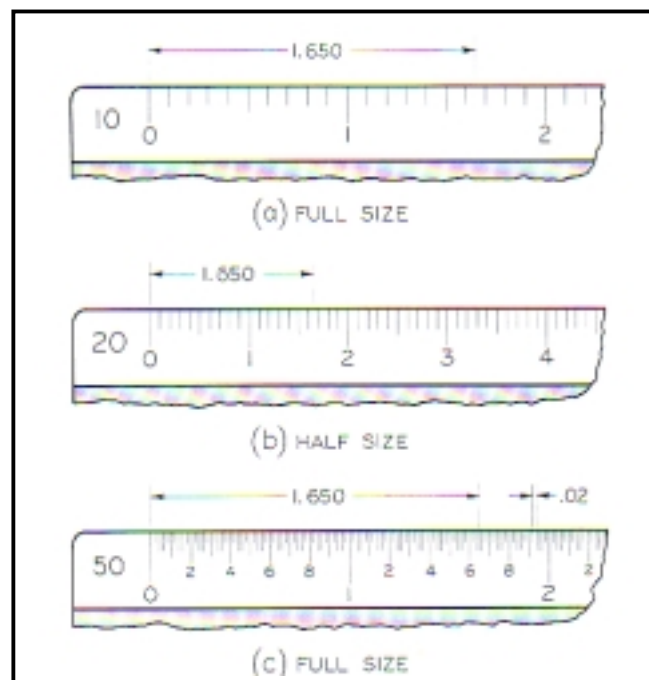


Sections of Scales



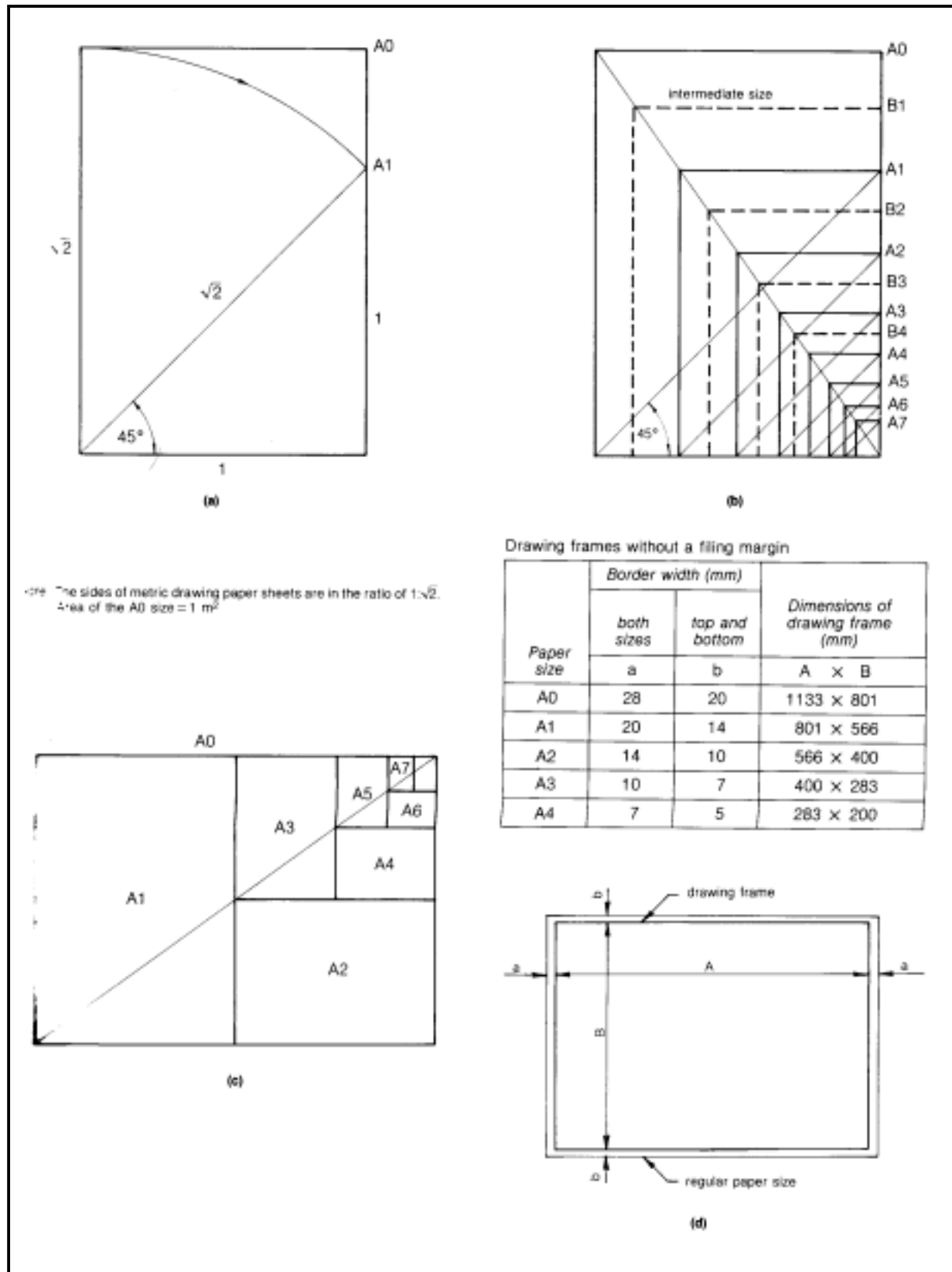


Metric Scales



Decimal Dimensions

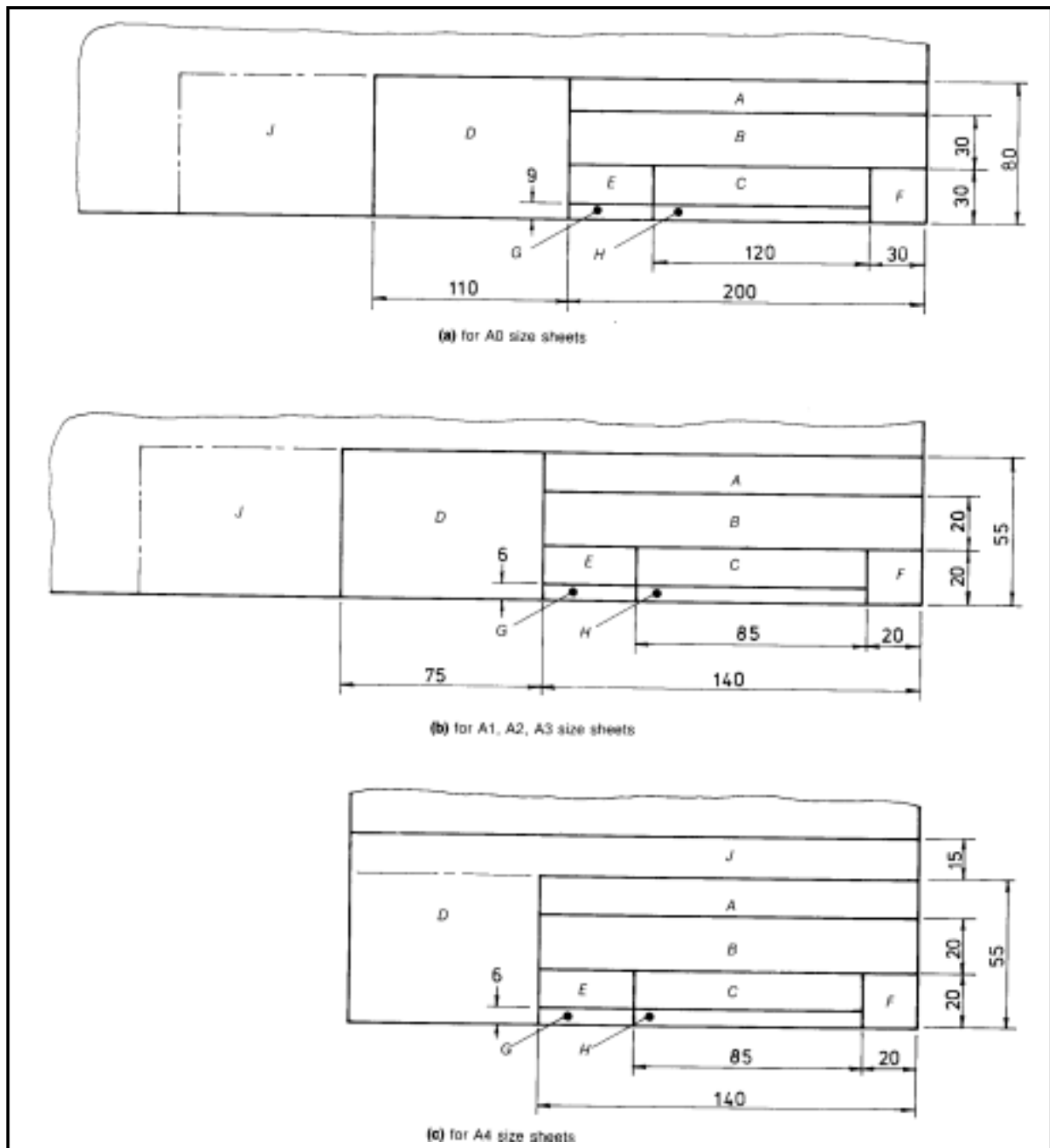
- Paper sizes







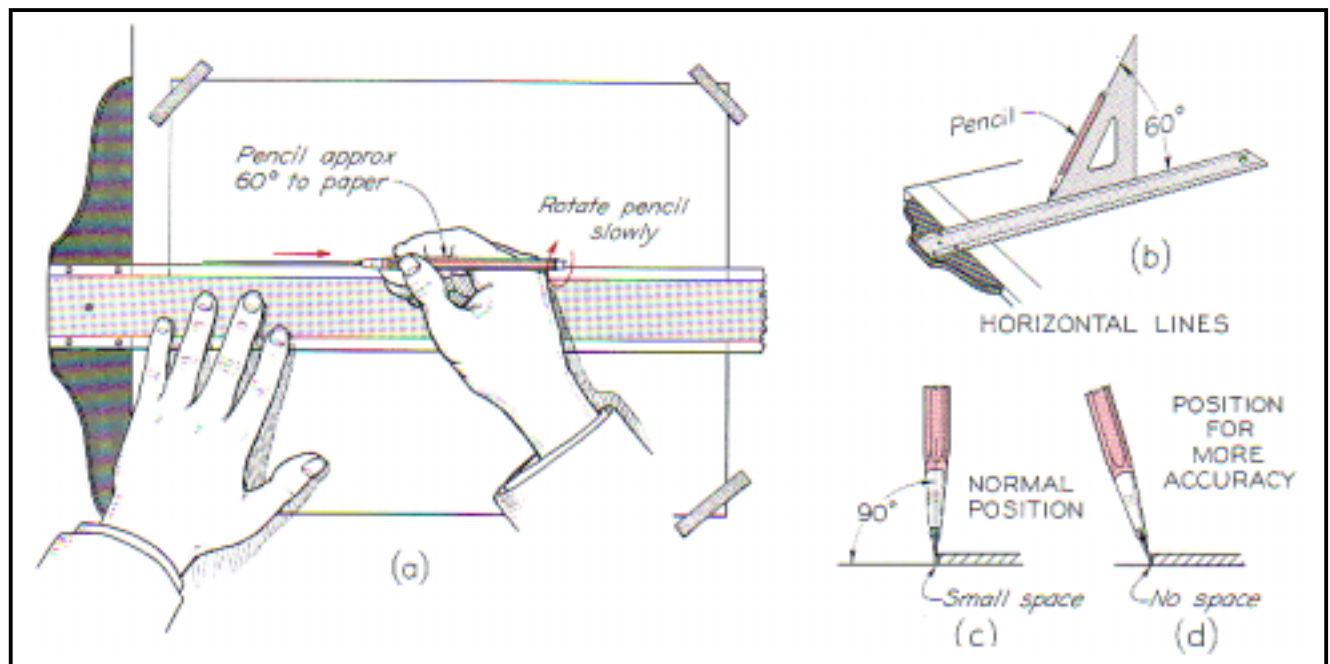
- Title block



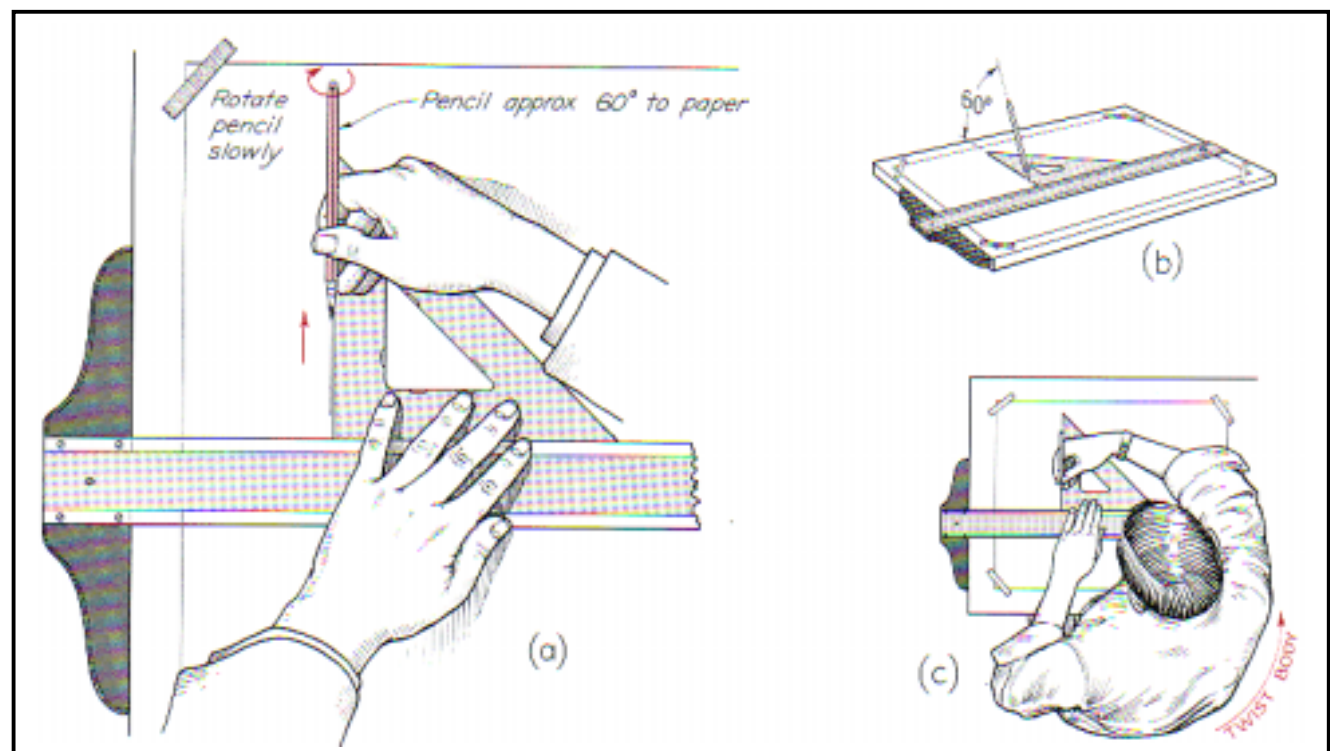
#### Schedule of information





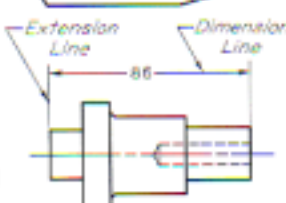

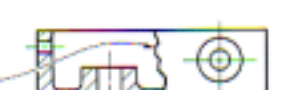




- A name of firm
- B drawing title
- C drawing number
- D information regarding drawing preparation, e.g. signatures of drafter, checkers, etc.
- E code identification number of the design authority (if required)
- F sheet size
- G scale of drawing
- H miscellaneous information
- J additional blocks for general information such as tolerancing, material, finish, etc.

- Lining
  - Draw horizontal line



- Draw vertical line

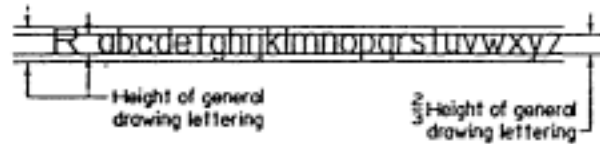


Lines	Width and Character of Lines	Applications
Visible line	THICK Approx. width 0.7 mm (.032")	
Hidden line	0.8 mm (.031") THIN 3.2 mm (.125") Approx. width 0.35 mm (.016")	
Section line	THIN	
Center line	19-38 mm (.75-1.50") 3.2 mm (.125") 1.6 mm (.062") THIN	
Dimension line, Extension line, Leaders	90.5 THIN	
Cutting-plane or Viewing-plane lines	1.6 mm (.062") THICK 3.2 mm (.125") 19-38 mm (.75-1.50")	
Short-break line	THICK Freehand	
Long-break line	THIN 19-38 mm (.75-1.50") Freehand	
Phantom line	3.2 mm (.125") 1.6 mm (.062") THIN 19-38 mm (.75-1.50")	
Stitch lines	THIN Width 0.38-0.55 mm (.015-.022") 1.6 mm (.062") THIN	
Chain line	THICK 13-29 mm (.5-1.125") 6 mm (.25") 1.6 mm (.062")	

Alphabet of Lines

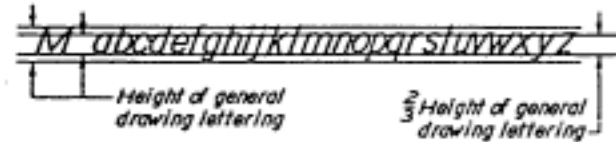
- Lettering

ABCDEFGHIJKLMNOPQRSTUVWXYZ  
 &  
 1234567890



ANSI Standard Vertical Upper- and  
Lowercase Lettering

*ABCDEFGHIJKLMNOPQRSTUVWXYZ*  
*&*  
*1234567890*



ANSI Standard Inclined Upper- and  
Lowercase Lettering

ABCDEFGHIJKLMNOPQRSTUVWXYZ  
 &  
 1234567890

ANSI Standard Microfont Alphabet

ANSI standard lettering



Basic lettering strokes



Examples of stroke sequence in lettering



Spacing of letters and words

CONDENSED LETTERING  
 NORMAL LETTERING  
 EXTENDED LETTERING  
*CONDENSED*  
*NORMAL*  
*EXTENDED*

Lettering variations

a b c d e f g h i j k l m n

o p q r s t u v w x y z

vertical

a b c d e f g h i j k l m n

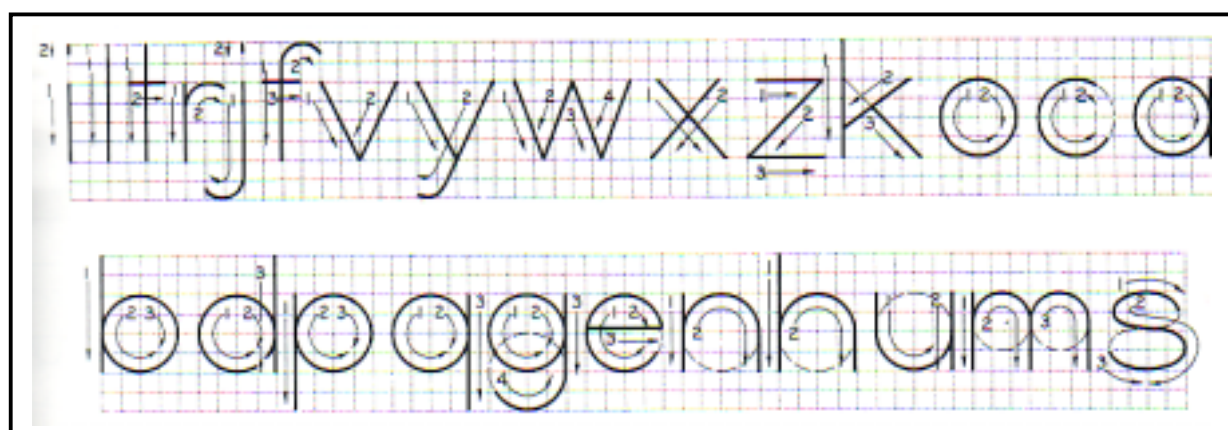
o p q r s t u v w x y z

*inclined (slanted)*



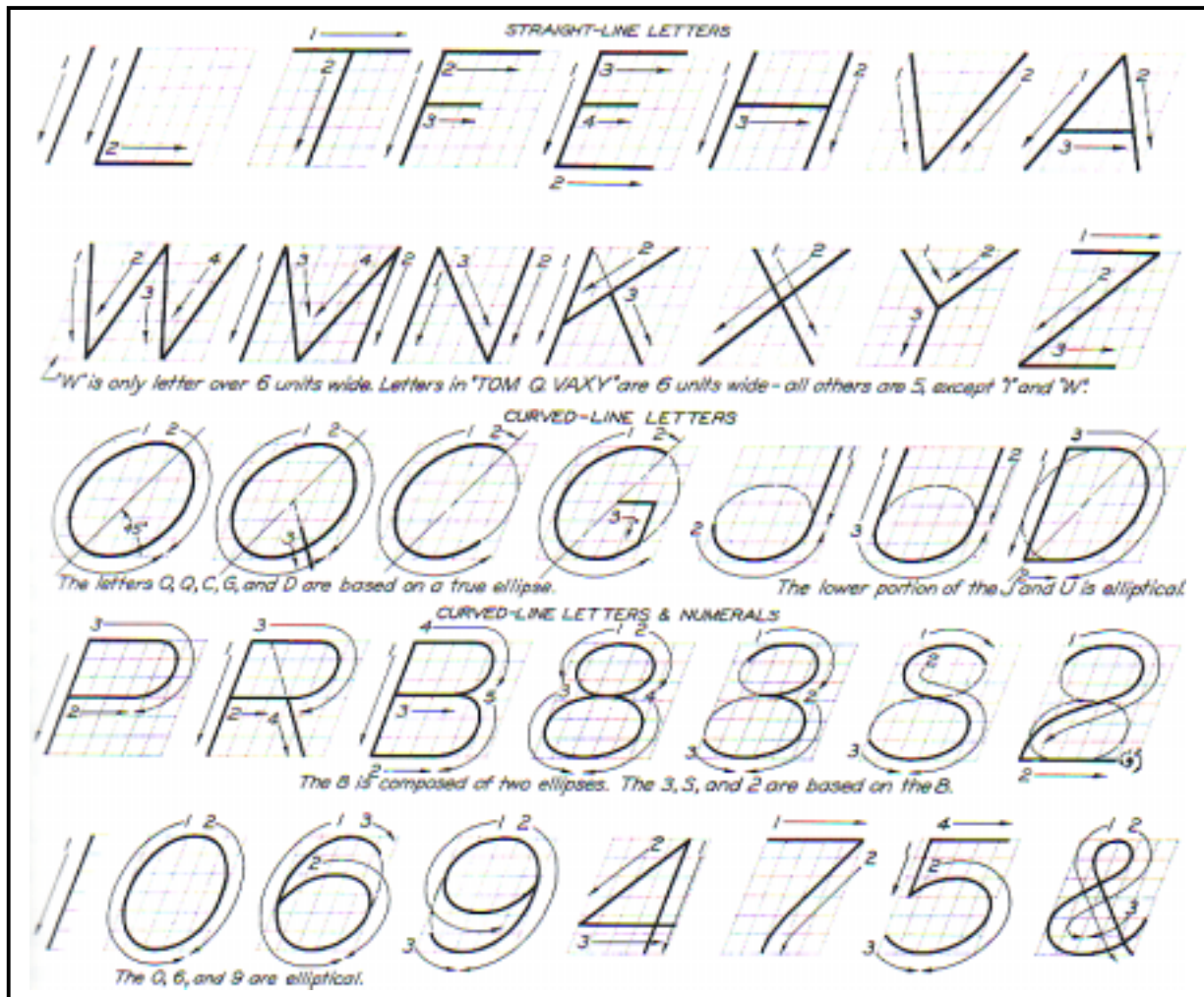


Vertical Capital Letters and Numerals

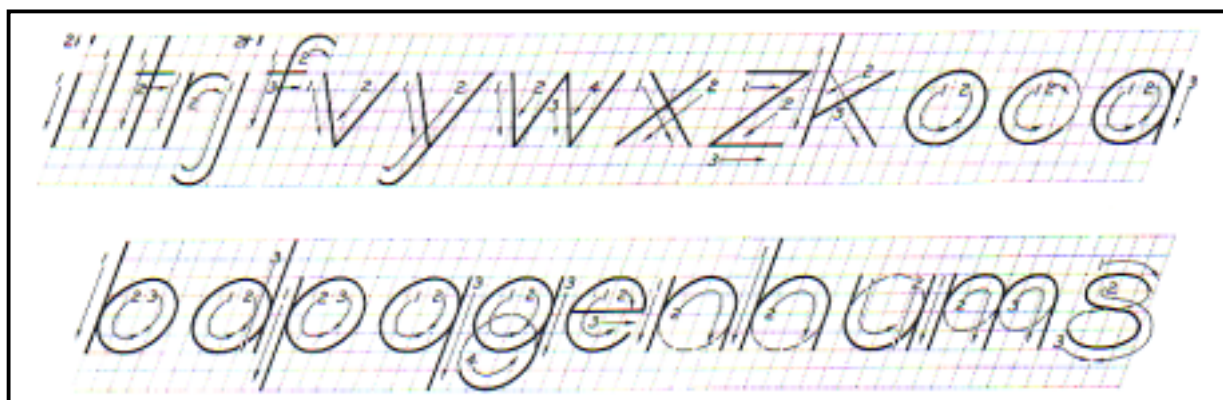


Vertical Lowercase Letters





Inclined Capital Letters and Numerals



Inclined Lowercase Letters

- Required equipment

