

2

Lines, Lettering and Layout of Sheet

2.1 INTRODUCTION

This chapter deals with various types of lines, lettering and layout of sheet which are used in engineering drawing.

2.2 LINES

As the basis of engineering drawing is a line, a set of conventional symbols representing all the lines needed for different purposes may well be called an alphabet of lines. In the drawing each line has a specific measuring and functions. For use in technical drawing, the types of lines and their applications as recommended by Bureau of Indian Standards (BIS) are given in Table 2.1.

Table 2.1 Types of lines and their applications

S.No.	Type of Line	Conventional Representation	Applications or Uses
1.	Continuous thick		Visible outline and edges
2.	Continuous thin		Dimension lines, Extension lines, Construction lines, Leader lines, Section lines
3.	Continuous thin wavy		Short break lines or Irregular boundaries
4.	Continuous thin with zig-zag		Long break lines
5.	Short dashed thin		Hidden outlines and edges
6.	Long chain thin		Centre lines, Pitch circles, Locus lines
7.	Long chain thin but thick at the ends		Cutting plane lines
8.	Long chain thick		Indication of lines or surfaces to which a special treatment is applied
9.	Long chain thin with double dashed		Outline of adjacent parts, Alternative and extreme positions of movable parts

- Typical applications of these different types of lines are shown in Fig. 2.1.

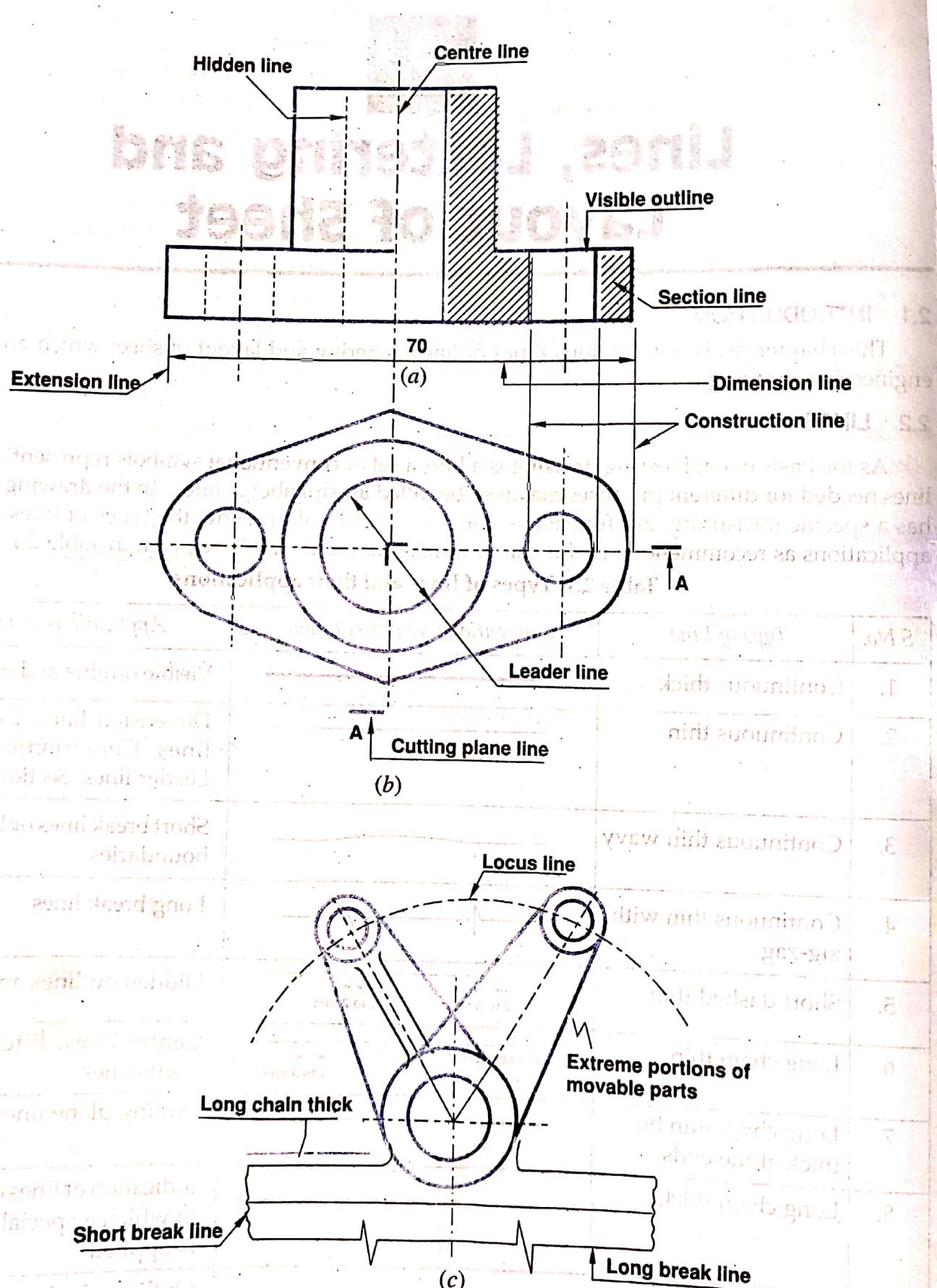


Fig. 2.1 Applications of different types of lines

Characteristic	Ratio	Dimensions (mm)							
Lettering height B (d = h/10)									
Height of capital letters	h	$\left(\frac{10}{10}\right) h$	2.5	3.5	5	7	10	14	20
Height of lower-case letters	c	$\left(\frac{7}{10}\right) h$	-	2.5	3.5	5	7	10	14
Spacing between characters	a	$\left(\frac{2}{10}\right) h$	0.5	0.7	1	1.4	2	2.8	4
Minimum spacing of base lines	b	$\left(\frac{14}{10}\right) h$	3.5	5	7	10	14	20	28
Minimum spacing between words	e	$\left(\frac{6}{10}\right) h$	1.5	2.1	3	4.2	6	8.4	12
Thickness of lines	d	$\left(\frac{1}{10}\right) h$	0.25	0.35	0.5	0.7	1	1.4	2

The height h of capital letters is taken as the base of dimensioning as shown in Fig. 2.2.

Diagram illustrating the dimensions of capital letters 'ENGINEERING'. The height of each letter is labeled h . The thickness of the lines is labeled d . The spacing between characters is labeled a . The minimum spacing of base lines is labeled b . The lettering height is labeled B .

Diagram illustrating the dimensions of capital letters 'DRAWING'. The height of each letter is labeled h . The thickness of the lines is labeled d . The spacing between characters is labeled a . The minimum spacing of base lines is labeled b .

Diagram illustrating the dimensions of lowercase letters 'engg.drg.'. The height of each letter is labeled h . The thickness of the lines is labeled d . The spacing between characters is labeled e .

Fig. 2.2 Dimensions of lettering

Table 2.3 Recommended Heights of Letters

S.No.	Purpose	Size in mm
1.	Main titles, drawing numbers	6, 8, 10 and 12
2.	Subtitles	3, 4, 5 and 6
3.	Dimensions and notes	3, 4 and 5
4.	Alteration entries and tolerances	2, 3

Lettering is generally done in capital letters. Different sizes of letters are used for different purposes as shown in Table 2.3.

Figs. 2.3 and 2.4 show single stroke vertical and inclined letters respectively.

LINES, LETTERING AND LAYOUT OF SHEET

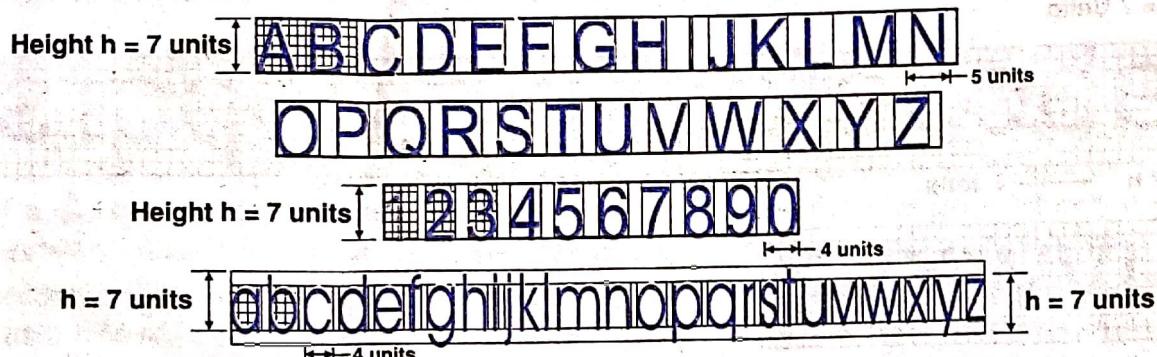


Fig. 2.3 Single stroke vertical letters

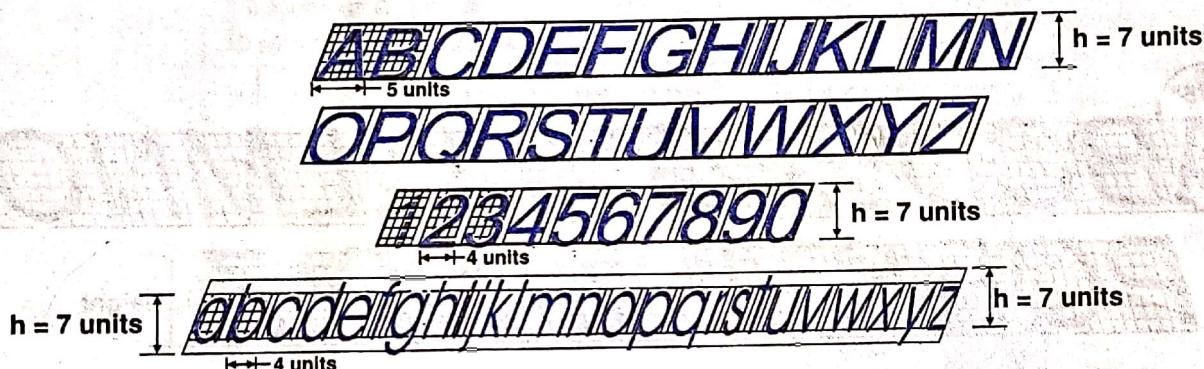
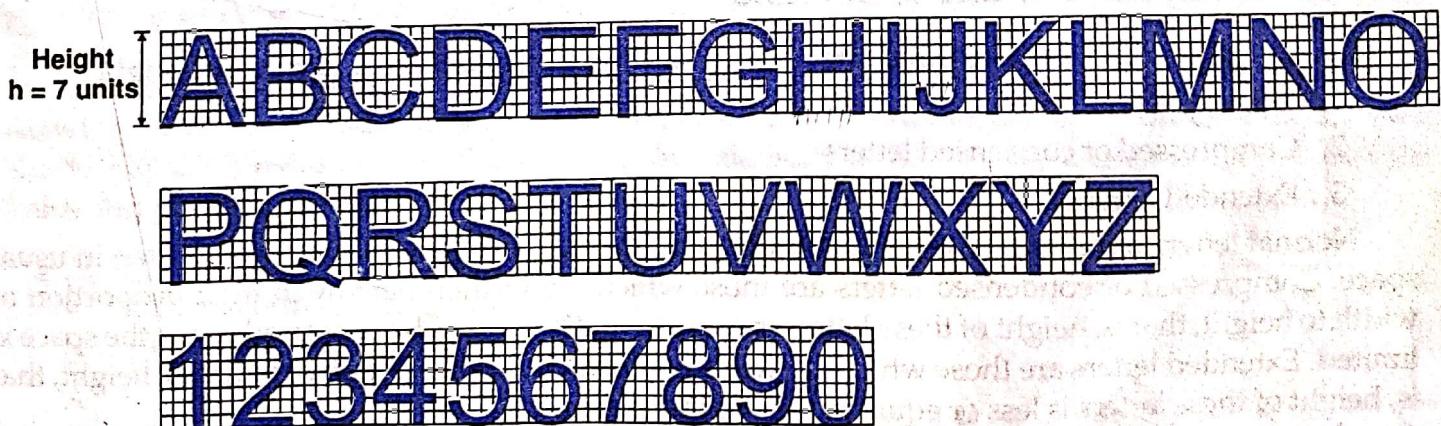


Fig. 2.4 Single stroke inclined letters.

For maintaining uniformity in size, thin and light guide lines may first be drawn and lettering may then be done between them.

2.5 GOTHIC LETTERS

It is similar to the single stroke letters with the only change that if the stems of single stroke letters are given more thickness, known as gothic letters. These are mostly used for main titles of ink drawings. The thickness of the stem may vary from $1/5$ to $1/10$ of the height of the letters. Figs. 2.5 and 2.6 illustrates vertical and inclined gothic letters respectively.



Height $h = 7$ Units



Fig. 2.5 Gothic vertical letters

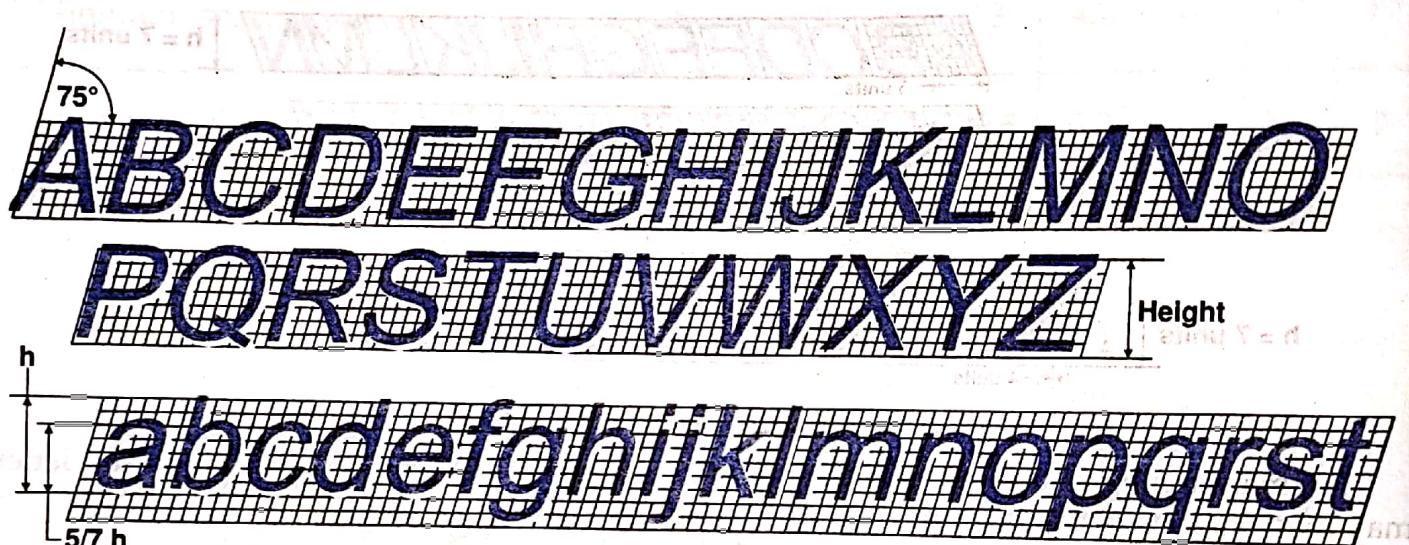


Fig. 2.6 Gothic inclined letters

2.6 GENERAL PROPORTIONS OF LETTERS

Letters may be divided into three categories according to proportion of width and height:

1. Normal letters
2. Compressed or condensed letters
3. Extended letters.

Normal letters have usual height and width, and are used for general purpose, written in usual space. Compressed or condensed letters are those which are written narrow in their proportion of width to height, that is, height of these letters is more than the width. They are used when the space is limited. Extended letters are those which are written wide in their proportion of width to height, that is, height of these letters is less or equal to the width. See Fig. 2.7.

NORMAL LETTERS
EXTENDED LETTERS
CONDENSED LETTERS

Fig. 2.7 Normal, Extended and Condensed letters

2.7 DRAWING SHEET LAYOUT

The preferred standard sizes for drawing sheets as specified by BIS have been discussed in chapter 1, article 1.10. The layout of drawing sheet will facilitate easy reading and understanding of the drawings presented there in. A standard arrangement should make sure that all the required information is included and facilitate easy filing and binding if required. Fig. 2.8 illustrates a typical layout of a drawing sheet, following the grid reference system. The grid reference system is recommended to permit easy location on the drawing of details, additions, modifications etc.

It is recommended that the borders have a minimum width of 20 mm for A_0 and A_1 sheet sizes and a minimum width of 10 mm for A_2 , A_3 , A_4 and A_5 sheet sizes. A filing margin of 20 mm of the left hand side has to be provided (including the border), irrespective of the size of the sheet.

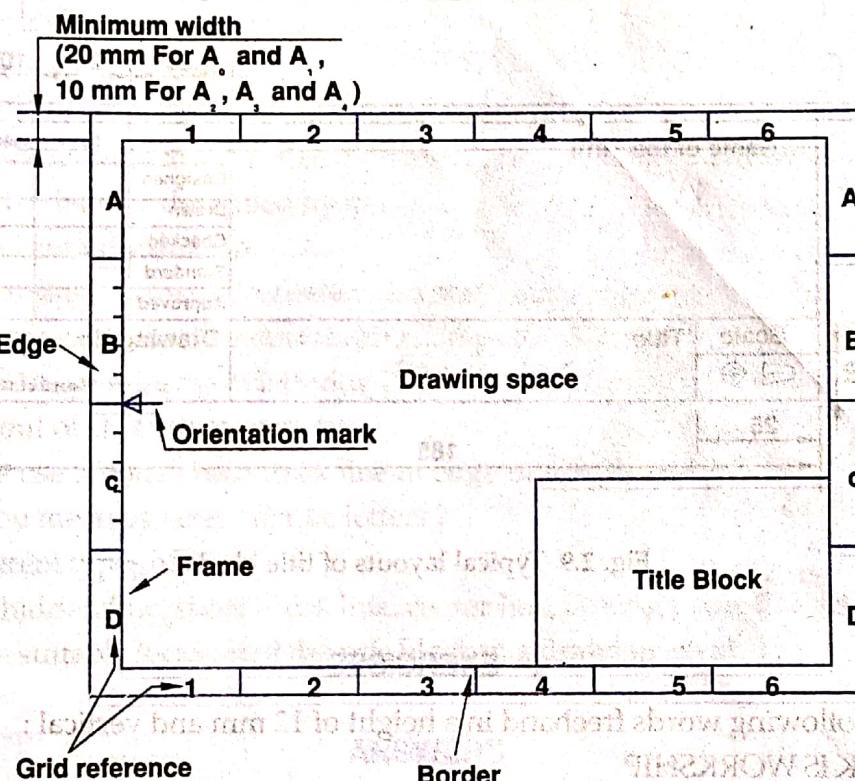


Fig. 2.8 Typical layout of a drawing sheet

2.8 TITLE BLOCK

The drawing sheet layout should also provide title block, which is an important feature in a drawing. Space for the title block should be provided in the bottom right hand corner of the drawing sheet. Fig. 2.9 illustrates typical layouts of the title blocks. All the title blocks contain atleast the following particulars as shown in Table 2.4.

Table 2.4 Particulars of title block

1. Name of firm.
2. Title of the drawing.
3. Scale.
4. Symbol for the method of projection.
5. Drawing number
6. Initials with dates of persons who have designed, drawn and checked.
7. No. of sheet and total number of sheets of the drawing of the object.

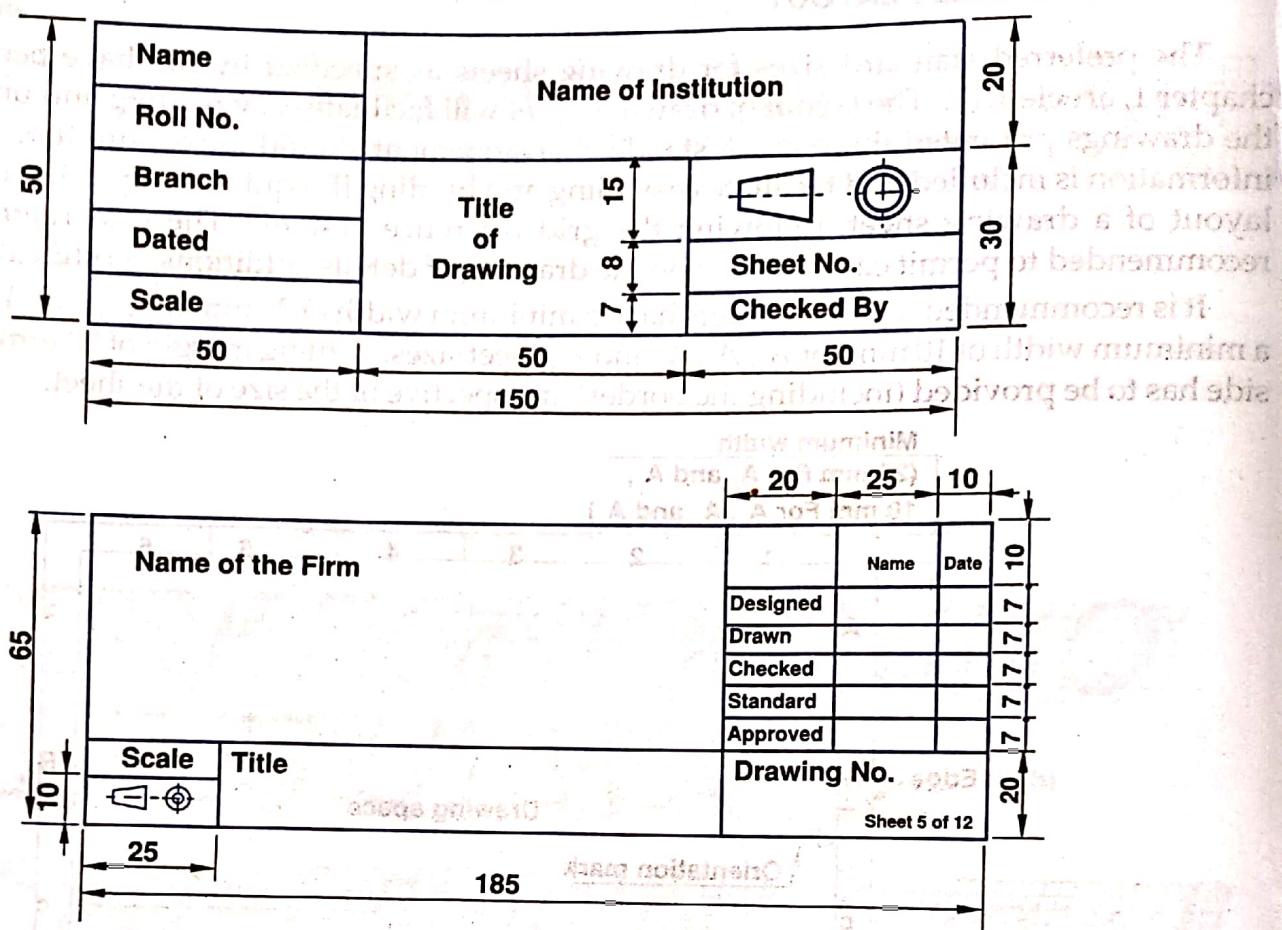


Fig. 2.9 Typical layouts of title blocks

EXERCISES

- 2.1 Print the following words freehand in a height of 12 mm and vertical :
 - (i) WORK IS WORKSHIP
 - (ii) ENGINEERING DRAWING
 - (iii) INDIAN SOCIETY FOR TECHNICAL EDUCATION
 - (iv) GOLDEN TEMPLE
 - (v) TIT FOR TAT
- 2.2 Print the following words freehand in a height of 12 mm and inclined at 75° :
 - (i) HONESTY IS THE BEST POLICY
 - (ii) MY BEST TEACHER
 - (iii) HEALTH IS WEALTH
- 2.3 Print freehand, in vertical and inclined lower case letters, taking height 9 mm and using ratio 7 : 4.
- 2.4 Print freehand, in vertical and inclined numerals, taking height as : 10 mm, 6 mm and 4 mm.
- 2.5 Draw the conventional representation of various types of lines used in engineering practice. Also mention its uses or applications.
- 2.6 List out the contents of title block. Also prepare a title block for use in class room.

- 2.7 Write freehand the following sentences using inclined capital letters of 8 mm size in single stroke using 7:5 ratio.
- (i) NATURE IS BEAUTIFUL
 - (ii) PRACTICE MAKES A MAN PERFECT
- 2.8 Write 'ENGINEER' using single stroke capital letters.

OBJECTIVE QUESTIONS

- 2.1 Outlines are drawn as
- 2.2 Dimension lines, hatching and construction lines are drawn as
- 2.3 The cutting plane line is shown by
- 2.4 Long break lines are shown by
- 2.5 Efficiency in the art of lettering is achieved by continuous
- 2.6 For maintaining uniformity in size, thin and light may be drawn.
- 2.7 The size of the letter is described by its
- 2.8 Lettering is generally done in
- 2.9 Two types of single stroke letters are and
- 2.10 What do you understand by normal and compressed letters ?
- 2.11 What are the requirements of lettering ?
- 2.12 Why is layout of sheet necessary ?
- 2.13 What is the use of long chain thick line in engineering drawing ?
- 2.14 What do you mean by single stroke letters ?
- 2.15 Name different types of lines.
- 2.16 Sketch the hidden line, short break line, center line, cutting plane line and long break line.
- 2.17 Provide the suitable location of the title block in a drawing sheet.

ANSWERS

- | | |
|---|----------------------------------|
| 2.1 Continuous thick lines | 2.2 Continuous thin lines |
| 2.3 Long chain thin but thick at the ends | 2.4 Continuous thin with zig-zag |
| 2.5 Practice | 2.6 Guide lines |
| 2.7 Height | 2.8 Capital letters |
| 2.9 Vertical, inclined | 2.17 Right hand bottom corner |