

RSSB-JE

2020

Rajasthan Staff Selection Board

Combined Junior Engineer Direct Recruitment Examination

Civil Engineering

AutoCAD and Civil Engineering Drawing

Well Illustrated **Theory** with
Solved Examples and **Practice Questions**



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AutoCAD and Civil Engineering Drawing

Contents

UNIT	TOPIC	PAGE NO.
1.	AutoCAD -----	1
1.1	Introduction -----	1
1.2	Display Technology -----	2
1.3	Introduction to Design and Drafting -----	3
1.4	Computer aided Drafting Using Auto CAD -----	4
1.5	Auto CAD Commands -----	5
1.6	Creating 3D Drawings -----	10
1.7	The Auto CAD Program Window -----	12
1.8	How to Understand Use of Tools in the Ribbon? -----	15
1.9	Tools Available in Navigation Bar -----	17
1.10	Coordinate System with Line Command -----	18
1.11	Draw panel Tools -----	19
1.12	Status Bar -----	27
1.13	Annotation Panel -----	33
1.14	Block Panel -----	35
1.15	Layers Panel -----	36
1.16	Practice Drawing -----	37
	Students Assignment -----	41
2.	Drawing Standards -----	48
2.1	Introduction -----	48
2.2	Title Block -----	48
2.3	North Point -----	49
2.4	Scale Indications -----	50
2.5	Lines of Drawings -----	50
2.6	Dimension, Extension and Hatching Lines -----	51
2.7	Lettering -----	51
2.8	Dimensioning -----	51
2.9	General Conventions for Showing Different Materials in Sections -----	52
	Students Assignment -----	52

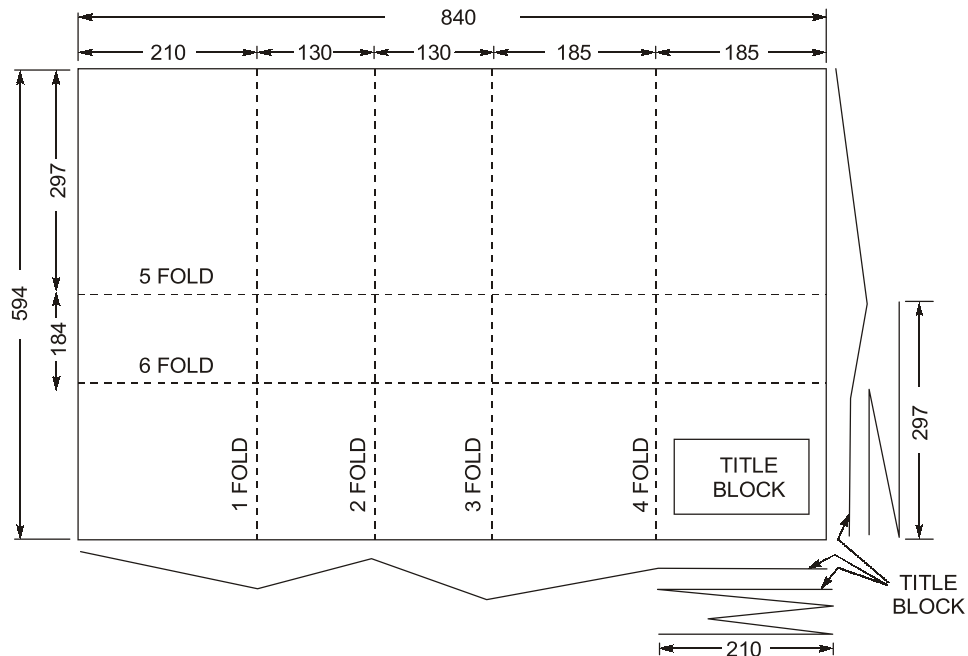
Drawing Standards

2.1 Introduction

The layout of drawings shall be such as to facilitate the reading of drawing and make it possible for essential reference to be located easily, especially when drawings are presented by several offices. The standard arrangements shall include all relevant informations and sufficient margins shall be left from the edges of finished drawings to facilitate filling missing and indication shall be given of this method of reproduction by inserting the word “photographic” below the border line at the bottom right hand corner.

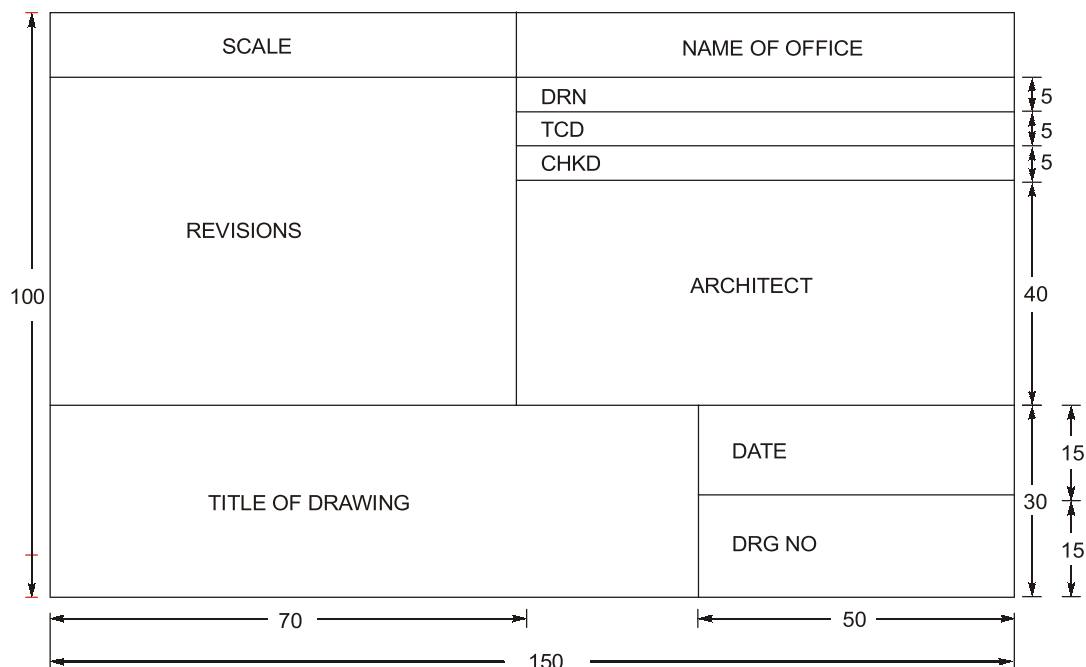
2.2 Title Block

The title block is an important feature in a drawing since it facilitates obtaining uniformity and present details like title of drawing, name of organization or firm, drawing number, scale, date of drawing etc. in a definite manner. The title block shall be placed at bottom right-hand corner of the sheet where it is readily seen when the prints are folded as indicated in figure below.



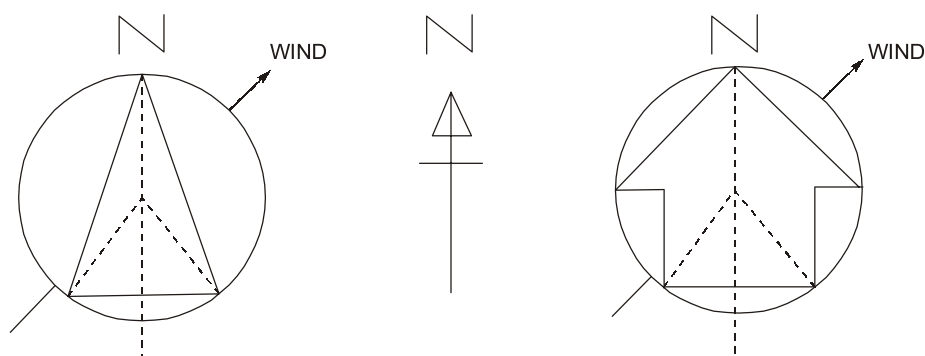
2.2.1 Size of Title Block

The size of the title block shall be 150 × 100 mm for A₁ (840 × 594 mm drawing sheet) size. Typical layout of the title block is illustrated in figure.



2.3 North Point

North point shall be clearly indicated. In cases where it may be necessary to make rough bearings from the north point, a suitable type shall be used in which the north point is placed in relation to the site plan or ground plan so that the bearing may be readily transferred. North point shall preferably be drawn on the right-hand top corner of the drawing. Specimens of north point are illustrated in figure. It is recommended wherever practicable, plans shall be drawn with north in the direction of the top of the sheet. The same orientation shall be adopted in all the drawings for a particular job.



2.4 Scale Indications

The scale of drawings shall be indicated in the appropriate place in the title block. If more than one details drawn to different scales occur on a sheet, the corresponding scale shall be shown under each relevant detail. Typical methods of expressing numerical scales on drawings are as follow:

$$1 \text{ cm} = 10 \text{ metres or } 1 : 1000 \text{ (more in practice)}$$

$$1 \text{ cm} = 2.5 \text{ km or } \frac{1}{250000}$$

Metric scales for architectural and building drawing shall preferably be as follows:

Working drawings, Plans, Elevation and Sections,

1 : 200

1 : 100

1 : 50

Large scale Drawing — General Details

1 : 20

1 : 10

2.5 Lines of Drawings

Centre Lines: Centre lines shall project for a short distance beyond the outline to which they refer but where necessary to aid dimensioning or to correlated views, they shall be suitably extended so that the dimension figures are clear of the drawing outlines. Alternate lines and short lines shall have a proportion ranging from 6 : 1 to 4 : 1 closely and evenly spaced but in any one drawing the ratio once adopted shall be maintained.

Hidden Outlines: The lines, consisting of short dashes, closely and evenly spaced, should be used to represent hidden lines and materials to be removed.

Uses	Illustration	Description
Outline of parts	 0.6, 0.8 and 1.0 mm thick	The outline to be outstanding in the drawing.
Dimension, extension, construction and hatching line.	 0.2 and 0.3 mm (thin)	For hatching, lines to be spaced evenly to make a shaded effect.
Hidden Lines	 0.4 and 0.5 mm (medium)	Short dashes, closely and evenly spaced.
Centre lines	 0.2 and 0.3 mm (thin)	Alternate long and short dashes in proportion ranging from 6 : 1 to 4 : 1 closely and evenly spaced in any one drawing : the ratio selected should be maintained.
Cutting Plane Lines	 0.2 and 0.3 mm (thin)	One long and two short dashes alternately and evenly spaced.
Break lines for short break	 0.6, 0.8 and 10 mm thick	Free hand lines
Break lines for long break	 0.2 and 0.3 mm (thin)	Ruled lines and free hand zig-zags

2.6 Dimension, Extension and Hatching Lines

Dimension, extension and hatching lines shall be thin full lines so as to contrast with the heavier outlines of the drawings and should be placed outside the figure wherever possible. Extension lines shall start a little away from the outline and extend a little beyond the dimension line. Hatching lines be spaced evenly to give a shaded effect.

2.7 Lettering

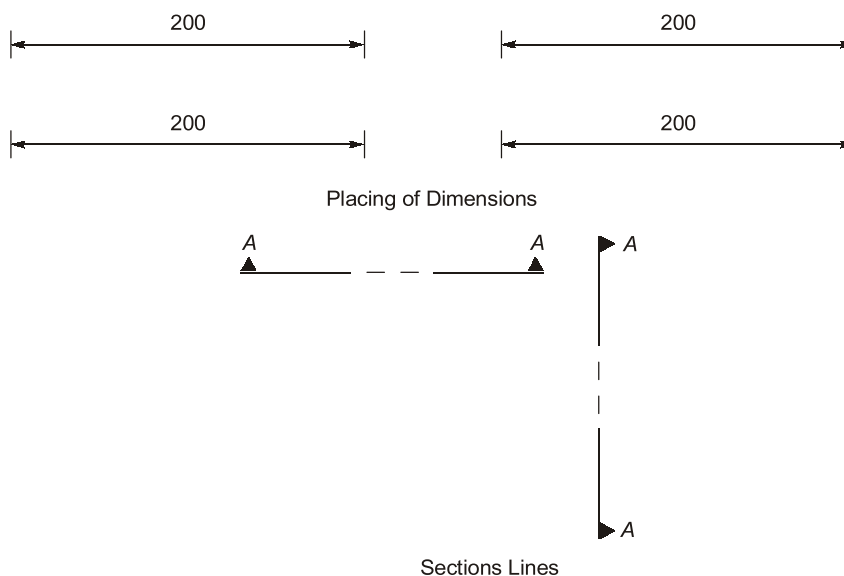
Lettering shall be done on the drawing in such a manner that it may be read when the drawing is viewed from the bottom edge. Lettering, which is required to be written in a direction at right angles to the bottom edge of the drawing shall be so written as to be read when viewed from the right-hand edge of the drawing.

2.7.1 Size of letters and numerals for drawings

Purpose	Size of Letters and Numerals (mm)				
Main title and drawing number	6,	8,	10	&	12
Sub-title and heading	3,	5	&	6	
Notes, such as legends, schedules, materials and dimensions	3,	4	&	5	

2.8 Dimensioning

Arrow heads or dots as shown in figure are used to terminate, dimension lines, the length of arrow head is about three times the depth. The space in arrow head should be filled in. When dot is used it should be placed at the intersection of the extension line and dimension line.



The dimension figures shall be placed near the centre either in the space of the broken line or immediately above the unbroken line. All dimensions should be so arranged that they may be read either from the bottom or right-hand edge of the drawing.

Q.3 Size or functional dimension does not indicate _____.

- (a) thickness (b) radius
(c) depth (d) position

Q.4 Guidelines for dimensions at international level on a drawing is controlled by

- (a) Bureau of Indian standards
(b) Corporate of drafting standards
(c) ANSI
(d) ISO

Q.5 Technically drawings typically serve one of three purposes

- (a) Visualization, communication or documentation
(b) Visualization, dimensioning or documentation
(c) Communication, Documentation or installation
(d) Documentation, Installation or Engineering

Q.6 PDM is the acronym for

- (a) Project drawing management
(b) Product drawing manipulation
(c) Product data management
(d) Project data manipulation

Q.7 The number of folding methods for folding of various sized of drawing sheet is

- (a) 1 (b) 2
(c) 3 (d) 4

Q.8 The size of the title block is ____ mmx ____ mm (as per BIS standard)

- (a) 25 × 10 (b) 100 × 25
(c) 65 × 185 (d) 185 × 65

Q.9 In which system of dimensioning the figures can read from the bottom only?

- (a) Aligned system
(b) Unidirectional system
(c) Non-aligned multidirectional system
(d) Parallel system

Q.10 If there is a need for the centre line, then it can be used as a _____.

- (a) Dimension line
(b) Leader line
(c) Extension line
(d) Section line

ANSWER KEY			STUDENT'S ASSIGNMENTS	
1. (d)	2. (a)	3. (d)	4. (c)	5. (a)
6. (c)	7. (b)	8. (d)	9. (b)	10. (c)

HINTS & SOLUTIONS	STUDENT'S ASSIGNMENT
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1. (d)

Centre lines, section lines, dimension lines, extension lines, construction lines, leader lines, short break lines and long break lines are drawn using 1 mm thickness lines.

8. (d)

The size of the title block is 185 mm × 65 mm which is recommended by BIS (Bureau of Indian Standards).

10. (c)

The center line can be used as an extension line.

