- B- For shading

Precautions in the use of instruments:

Following precautions should be taken while doing the drawing works,

1 The lower edge opposite to the working edge of the Tee-Square should not be used for drawing horizontal lines.

2 T- Square should not be used as hammer to drive to drawing board pins.

3 Measuring scales should not be used as hammer to drive to drawing pins.

4 Drawing sheets should never be cut by blade or knife with the T-Square blade as the guide.

5 All the instruments and drawing sheet etc. Should be throughly dusted off and cleaned before starting the work.

6 No end of the pencil should be kept in mouth.

7 No oiling should be done to the joints of the instruments; otherwise, oil will give stains or spots on the drawing sheets.

8 Only required instruments should be kept on the drawing board. All extra instruments should be kept away in drawer.

9 Divider should not be used as pincer.

10 Soaking paper should not be used for drying the ink.

11 After completing the work all the instruments should be properly cleaned.

Conclusions

One should practice handling and using drawing instruments before attempting complex drawing problems. Developing correct drawing habits will enable to make continuous improvement in the quality of drawings. Each drawing will offer an opportunity for practice. Later on, good form in the use of instruments will become a natural habit.

Layout of drawing sheet

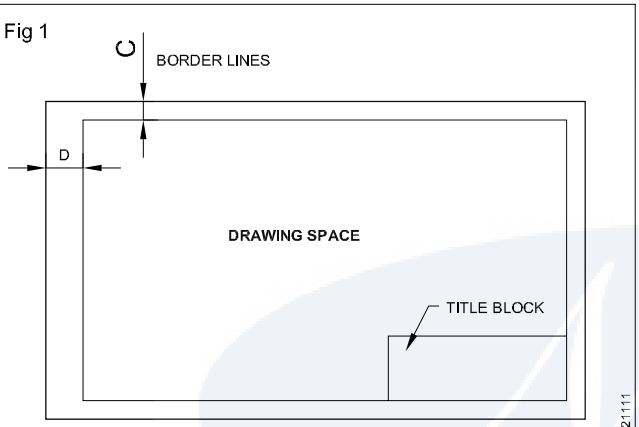
Objectives: At the end of this lesson you shall be able to
- **state the system of layout of drawing sheet**
- **list the different layout for designated drawing sheet**
- **explain the title block.**

Introduction

The details of layout showing frame with border lines, title block and margins around the frame as per Bureau of Indian Standards (B.I.S.) IS: 10711-1983 specifies the sizes and layout of drawing sheets.

Layout of drawing sheet (Fig.1)

Fig 1



LAYOUT OF DRAWING SHEET

After fixing drawing sheet on the drawing board, draw

- Border lines
- Title block

Border lines

All drawing requires a border. The standard line thickness of the border is 0.60 mm. The top, right and bottom margin should be 10mm and the left margin should be 20mm. This applies for all sheets sizes (A0, A1, A2, and A3). Notice that the left margins in larger to allow space for binding a drawing sheet. The title block place at right hand bottom of the sheet except A4 drawing sheet.

Borderline width : 0.60 mm

Top margin : 10 mm

Right margin : 10 mm

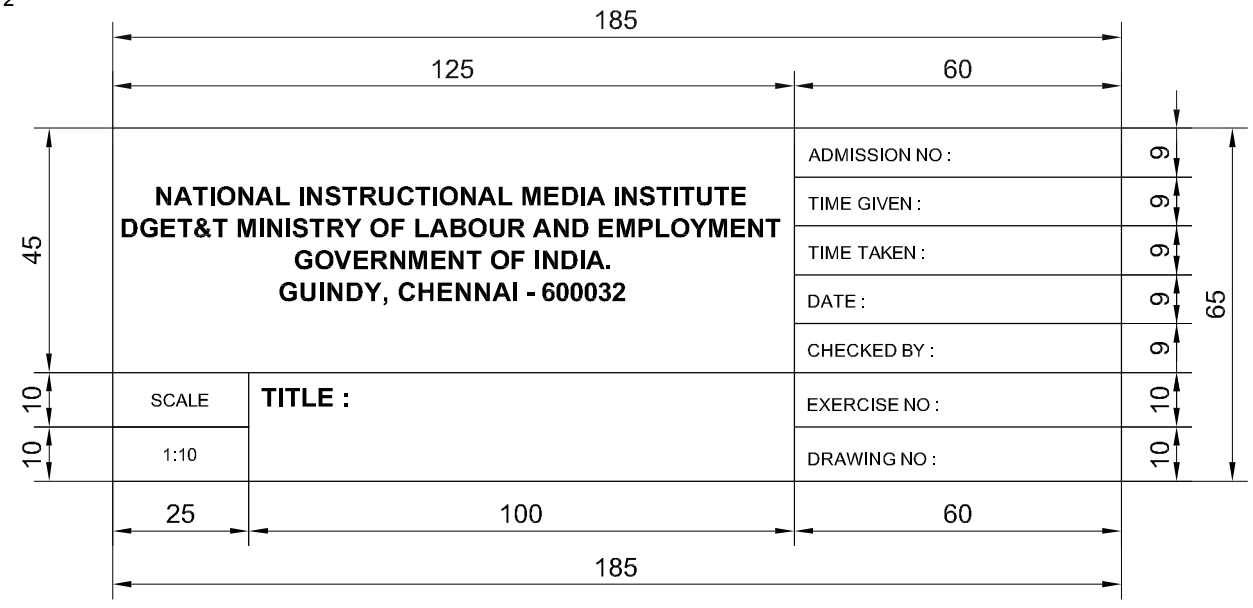
Bottom margin : 10 mm

Left margin : 20 mm

Title Block: (Fig.2)

A rectangular of 185 mm x 65 mm is draw at the bottom of the right-hand side on drawing sheets of all sizes, to furnish the details, namely name of the firm/institute, name of the Draughtsman /trainee, Roll number, title of the Drawing, scale of drawing and checked by architect/ engineer/trainer.

Fig 2

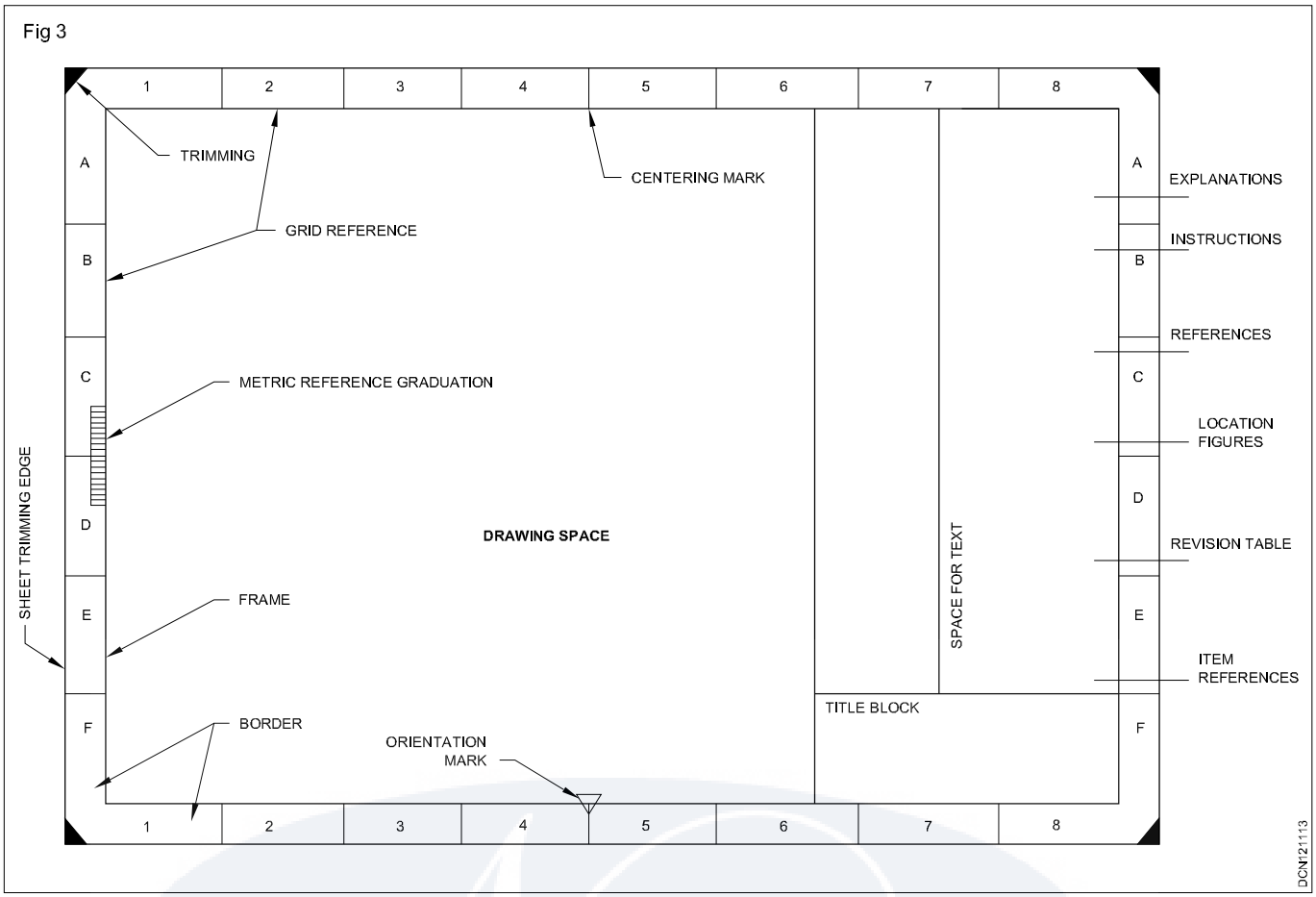


STANDARD FORMATE OF TITLE BLOCK

Spacing Drawing: (Fig.3)

When only one figure is to be drawn on a sheet it should be drawn in the centre of the working space. For more than one figure, the space should be planned and divided into suitable bocks.

Fig 3


1
2
3
4
5
6
7
8
A
B
C
D
E
F
TRIMMING
GRID REFERENCE
CENTERING MARK
METRIC REFERENCE GRADUATION
SHEET TRIMMING EDGE
FRAME
BORDER
ORIENTATION MARK
DRAWING SPACE
SPACE FOR TEXT
TITLE BLOCK
EXPLANATIONS
INSTRUCTIONS
REFERENCES
LOCATION FIGURES
REVISION TABLE
ITEM REFERENCES
DCN121113

Folding of drawing sheets

Objectives: At the end of this lesson, you shall be able to,
- **state the purpose of folding a drawing sheet**
- **explain the method of folding for drawing sheet.**

Introduction

After the completion of the drawing, the drawing should be folded properly according to IS: 11664-1986 recommended by Bureau of Indian Standards, and filed neatly for submission or for future revision / reference. All the maps and plans are folded to final size for convenience of record in office files.

The following proceduredure shall be adopted (Fig.1)

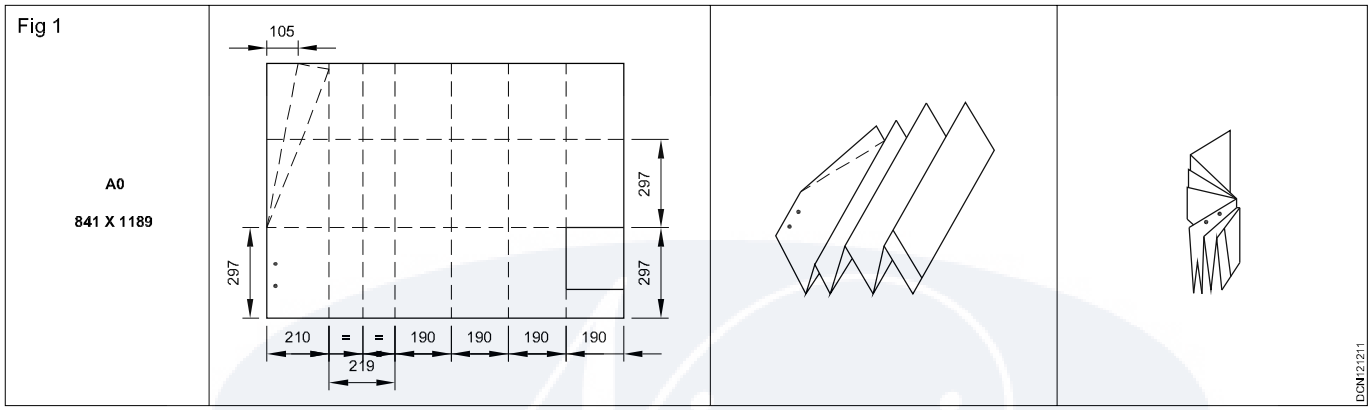
a) Always fold vertically first,

b) Fold horizontally next

c) Folded drawing to be size of file, and

d) It can see that the Title block of all the folded prints appears in topmost position for easy reference.

Fig 1



Free hand technical sketching of tools in civil work

Objectives: At the end of this lesson you shall be able to
- **state the importance of technical sketching**
- **state the types of sketches**
- **explain the methods of sketching pictorial views**
- **explain the various methods adopted in sketching**
- **multi-views of the object/civil working tools.**

Importance of technical sketching: The importance of free hand sketching of machine parts and components in engineering field cannot be over estimated. Free hand technical sketching is a drawing drawn with/without the use of any drawing instruments and drawn not to scale.

The presentation of the views should be in good proportion to the extent possibility and by visual identification. Free hand technical sketching helps the designer in reflecting his thoughts and recording his ideas. Most original ideas and thoughts are expressed first through the medium of free hand sketching. For verbal explanation free hand sketching plays a very important role.

Free hand sketching contains all necessary details such as shape and size description.

The Fig 1 shows a chuck key which records the importance of free hand sketching.

Fig 1a shows the `object' for layman's easy understanding and Fig 1b gives a free hand sketch for easy production with necessary dimensions.

The perfection and proficiency in free hand technical sketching can be obtained only by more practice.

Fig 1a

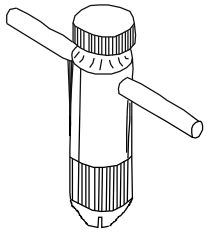
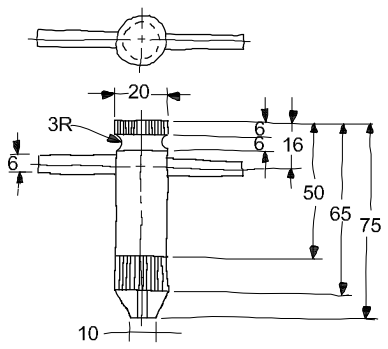


Fig 1b

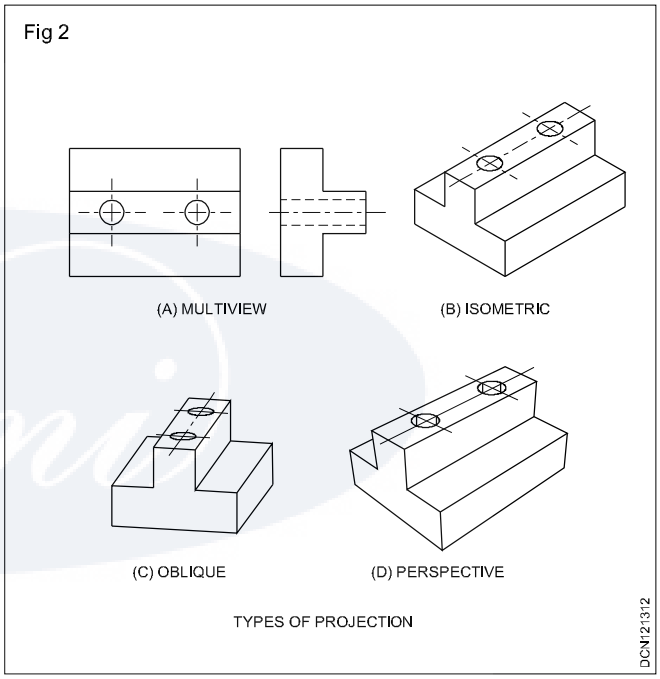


Note: The sketching materials are already explained in earlier lesson of module 1.

Type of sketches

In technical sketching the sketches are prepared from three dimensional objects. The form of the sketch determines approximately to any one of the following standard types of projections. (Fig 2)

Fig 2



– Multi-view
– Isometric
– Oblique
– Perspective

In multi-view (2A) the object is explained by its required views, which has been already discussed in earlier lesson. For ready reference find enclosed the comparative statement of two kinds of projection methods of representation in Fig 3.

The object may be shown in a single view by isometric (Fig 2B), oblique (Fig 2C) and by perspective (Fig 2D) projections.

Scale: Sketches, generally are made not to scale. In technical sketching object should be sketched in proportion to the nearest possible size.

Grid (Cross-section) paper provides a ready scale that may be employed to help in sketching to correct proportions.

The size of the sketch depends on the complexity of the object and the size of the paper.

Small objects can be sketched to an enlarged view to show the necessary details clearly.

Technique of Lines: The main difference between an instrumental technical bearing of a machine part/component and a free hand technical sketching lies in the character of technique of lines.

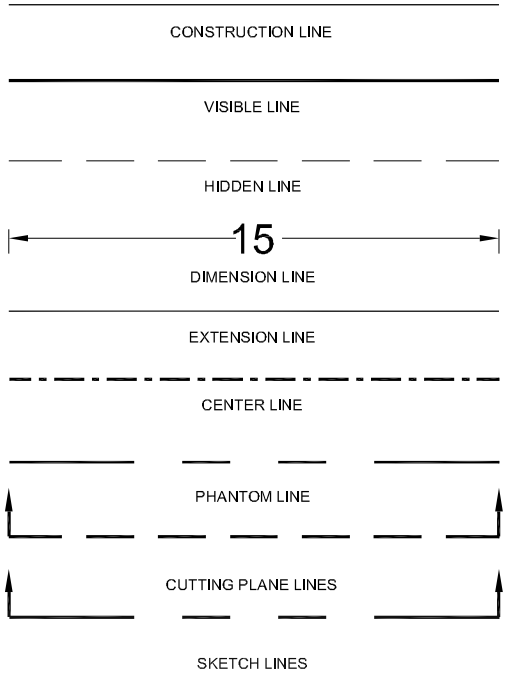
A good and perfect free hand line should not be rigidly straight or perfectly uniform as lines drawn with instruments. The quality of free hand sketch depends in its freedom and variety, whereas drawings done by using instruments lie in exact uniformity. (Fig 4)

Fig 4

DCN121314

Conventional lines drawn by using instruments are shown in earlier lessons and the corresponding free hand sketches are shown in Fig 5. The free hand construction line is very light rough line in which some strokes may overlap. In free hand technical sketching you should maintain a sharp contrast between the line thickness. In free hand technical sketching, sketch visible lines heavy so the outline will show out clearly, and make hidden lines, centre lines, dimension lines and extension lines thin.

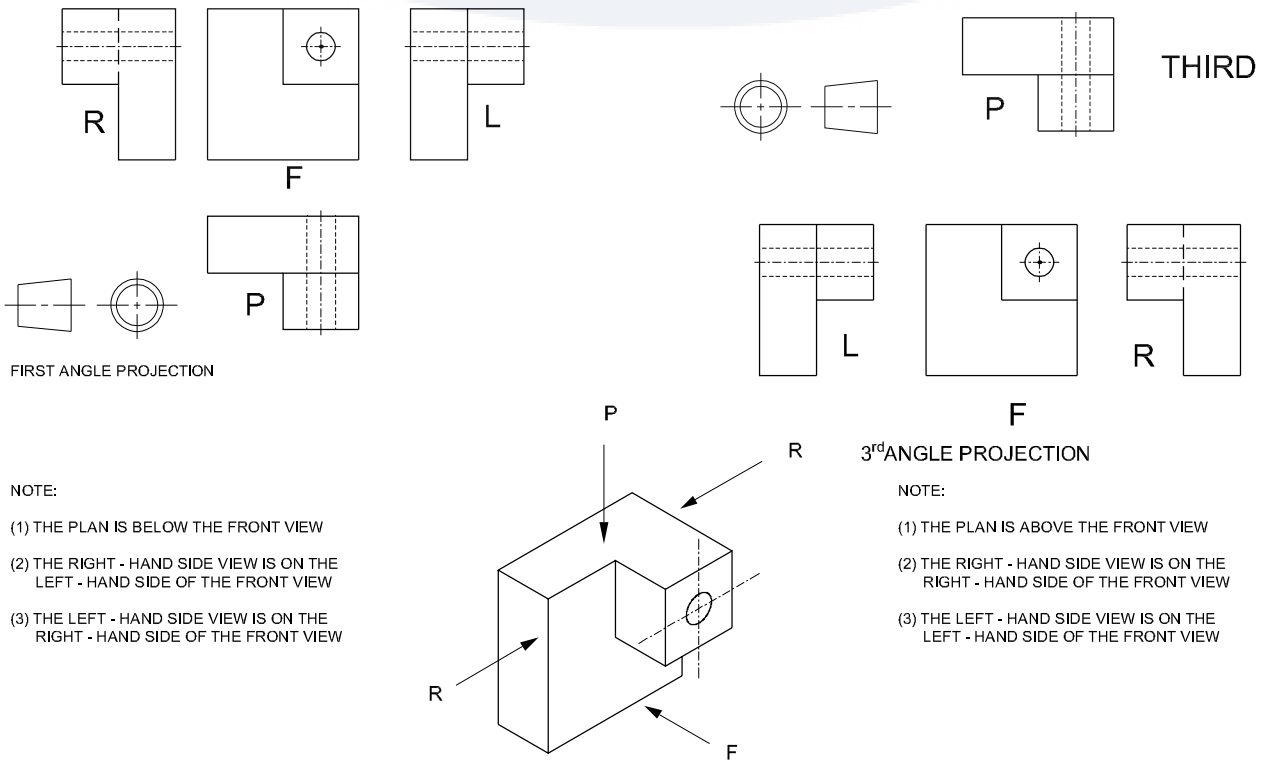
Fig 5



DCN121315

Pictorial sketching: There are several simple methods of preparing pictorial sketching which will be more helpfull in learning of principles of multi-view projection. The method of drawing pictorial views is explained in this module in Exercise 4 & 5.

Fig 3



DCN121313

Isometric sketching

– To make an isometric sketch from an actual object/ component hold the object/component in hand and tilt towards you as shown in Fig 6A.

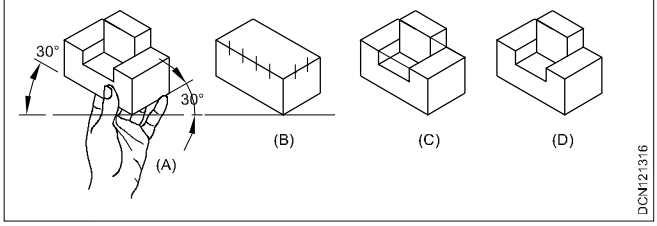
– In this position, the front corner will be vertical and in the other two receding bottom edges will be inclined about 30° to the horizontal.

– Sketch the enclosing box lightly as shown in Fig 6B.

– Block the recess and projecting block. (Fig 6C)

– Erase all construction lines with soft eraser. (Fig 6D)

Fig 6



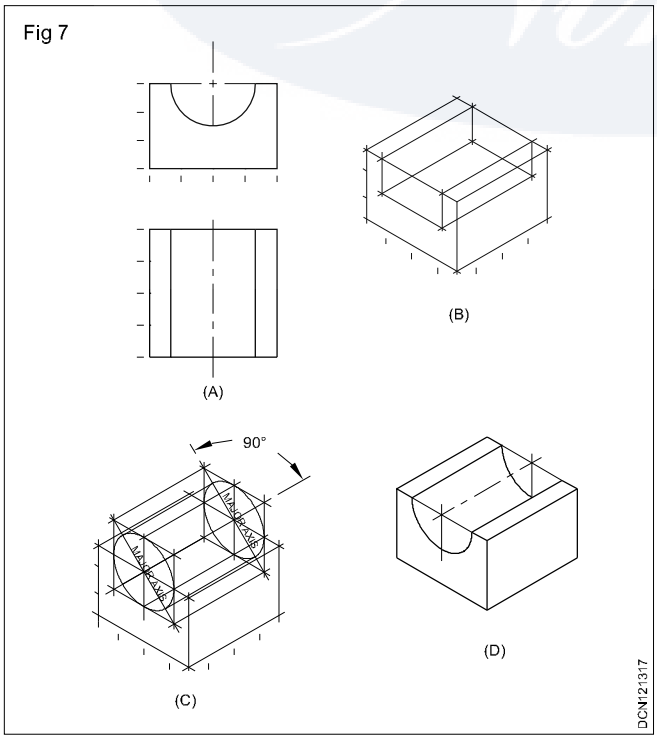
– Sketching an isometric view of a block when two views are given. (Fig 7A)

– Block the given object, including the rectangular space for semi-cylinder. (Fig 7B)

– Block in the box enclosing the full cylinder lightly as shown in Fig 7C.

– Remove all construction lines and dark the all final lines showing only the lower half of the cylinder. (Fig 7D)

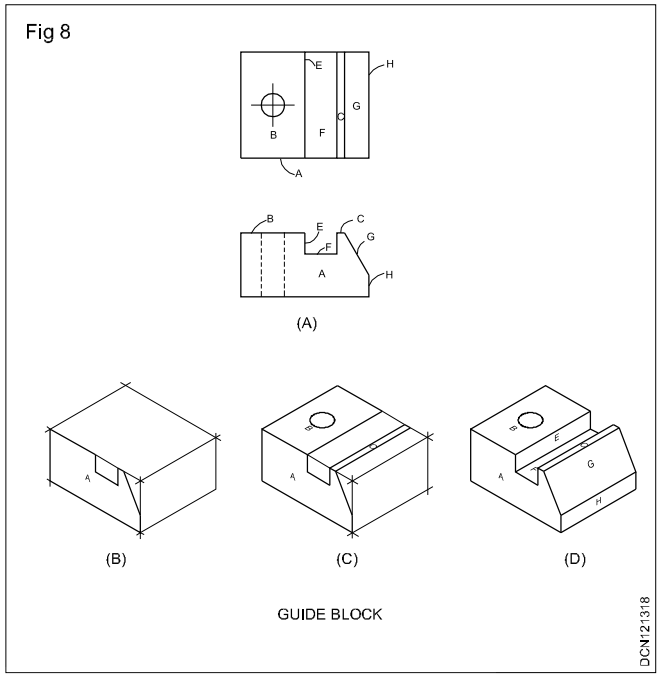
Fig 7



Sketching on isometric paper: Two views (plan and elevation) of a object are shown in Fig 8.

By using a isometric paper which gives perfect visual effect of the object.

Fig 8



By counting off the isometric grid spaces equal to the squares on the corresponding given views sketch the enclosing box and also the surface A. (Fig 8B)

Sketch the other surfaces B,C,E etc to complete the isometric views. (Fig 8C & 8D)

Oblique sketching: The another method of pictorial sketching. Fig 9 shows the method of sketching oblique view.

– Hold the object in your hand as shown in Fig 9A.

– Sketch the front view of the object as shown in Fig 9B.

– Sketch the receding lines parallel to each other and at any convenient angle.

The receding lines may be equal to the original length of the object or half of the original length.

If the length is full i.e equals to original length, the sketch is a Cavelier sketch. If half size, the sketch is a cabinet sketch. Sketch the receding lines equals to the full length of the object. (Fig 9C) Fig 9D shows the completed view of the object in Oblique view.

Oblique sketching in cross-section paper: Fig 10 explains that the given two views for a bearing bracket, an oblique view is sketched on a cross-section paper.

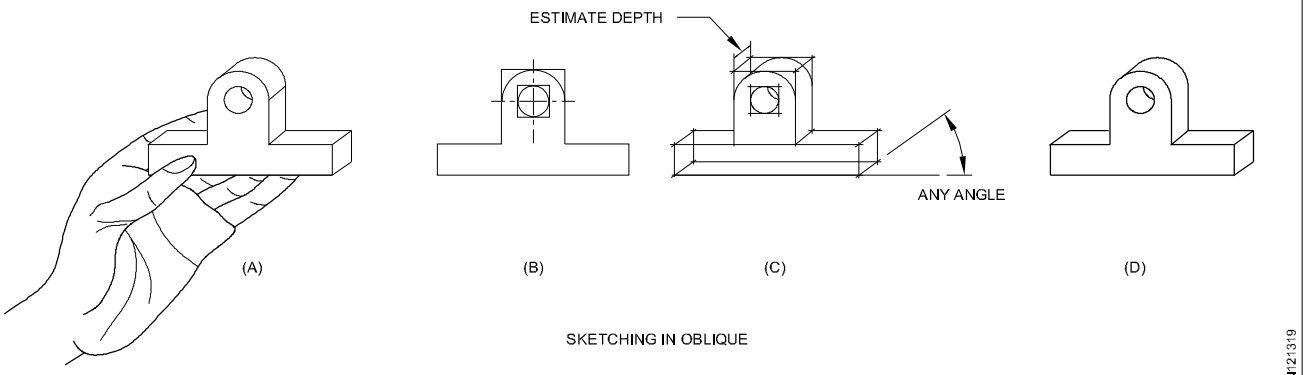
– In this methodthe dimensions are determined by counting the squares.

– The receding lines are drawn at 45° diagonally through the squares.

To sketch in a reduced scale, sketch the receding lines diagonally through half as many squares as ghe given numbers shown at Fig 10A.

Fig 10B, 10C, & 10D are steps or sequence of procedures in developing a oblique view of an object object on a cross-section paper.

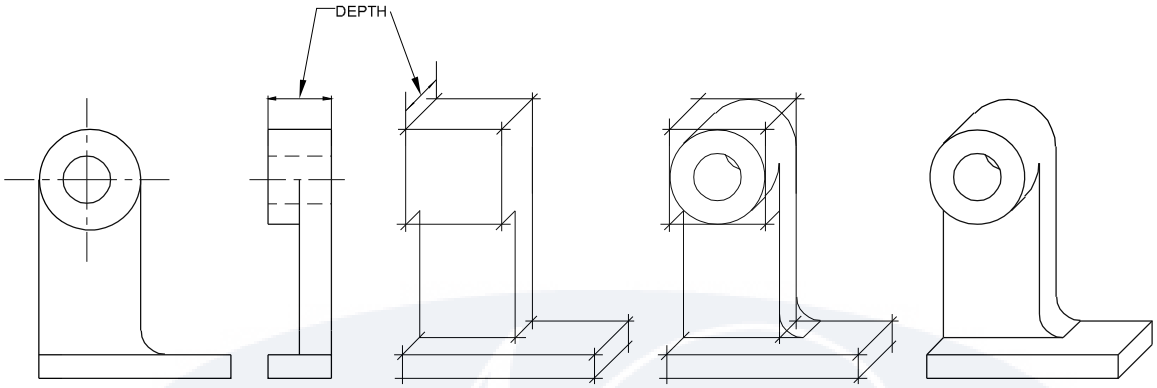
Fig 9



SKETCHING IN OBLIQUE

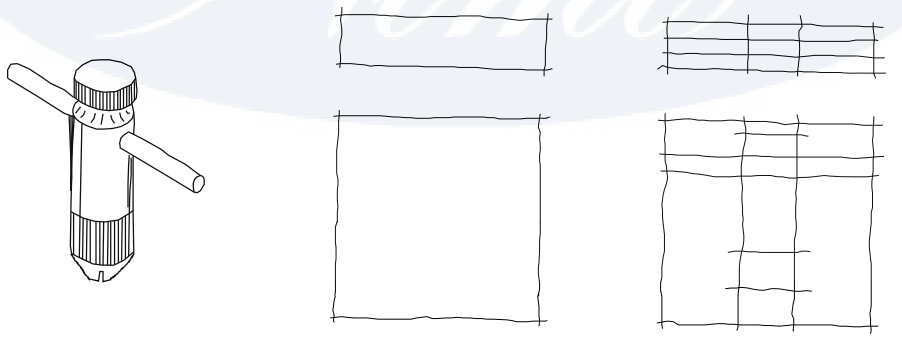
DCN121319

Fig 10



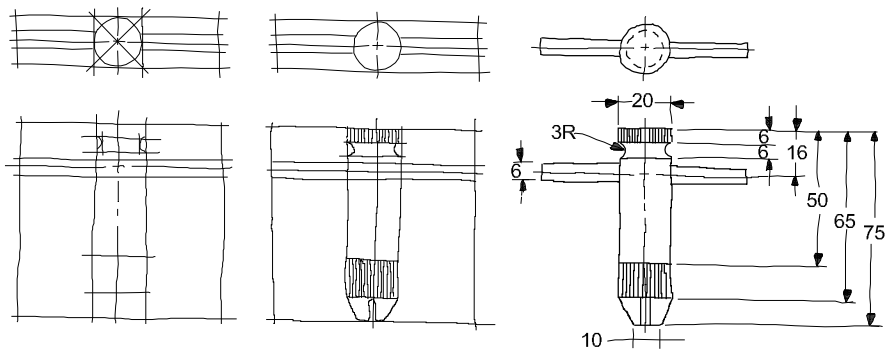
DCN12131A

Fig 11



1. BLOCK IN THE AREA NEEDED FOR EACH VIEW

2. BLOCK IN MAJOR FEATURES TO GET THEM IN PROPER PROPORTION



3. LOCATE CENTER LINES AND DRAW CIRCLES AND ARCS

4. SKETCH STRAIGHT LINES

5. DIMENSIONS

DCN12131B

Sketching multi-views of object: In sketching multi-views of the object the following steps are most important in this endevour.

- Visualisation of the object
- Determination of the views (whether 1st andle or 3rd angle)
- Determination of the size of the sketch.
- Location of centre lines
- Allocation of dimensions with proper dimension lines an arrow heads.
- Blocking the main outlines
- Writing titles and any other notes/details with dates
- Checking the drawings.

Before making a free hand technical sketch of a machine part/component the following points is to bear in the mind.

- Before a graphic idea can be developed it is essential that the mental image of it to be defiinite and clear.
- When making fee hand multi-views sketches, it has to begin by blocking the overall size of each view by using very light lines.
- Establish the length, height and width of each view.
- Locate the centre line of the cylindrical features.
- Locate the centres for arcs and circular parts.
- Circular parts and arcs are sketched first followed by horizontal and vertical lines.
- Additional separate views may be sketched rather than complicating views with added lines.
- A machine component can be represented right side up in its natural working position.
- If symmetrical about an axis mostly one half may be sketched.
- Choose a correct scale for the sketch, so that enough space is provided to show all details.
- The rules and methods are same as applicable to multi-views drawn by using instruments.
- Fig 11 shows a model of free hand sketch for the reference.

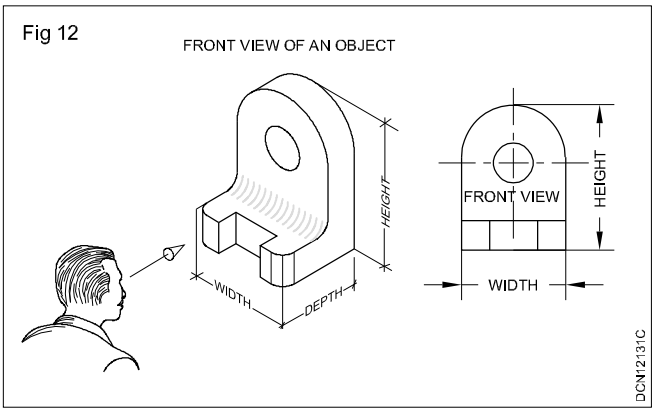
Views of objects: A pictorial representation of a drawing or a photograph representation shows an object as it appears to the observer, but not as it is. Hence such a representation cannot describe the object fully and also it does not show the exact shapes and sizes of the several parts.

In industry for the purpose of production, a complete clear description of the shape and size of an object to be made is essential, to sketch certain objects that to be manufactured as intended by the designer. So to provide such information perfectly and correctly a number of views and arranged in multi-views method of projection. In this method each view supplies a certain definite information.

When the view is projected in the direction perpendicular to a principle face or side of the object.

In Fig 12 the observer looks perpendicularly to the face of the object and obtains true shape and size of that side. This has shown in Figure. It is known that an object has three principle dimensions such as height, width and depth.

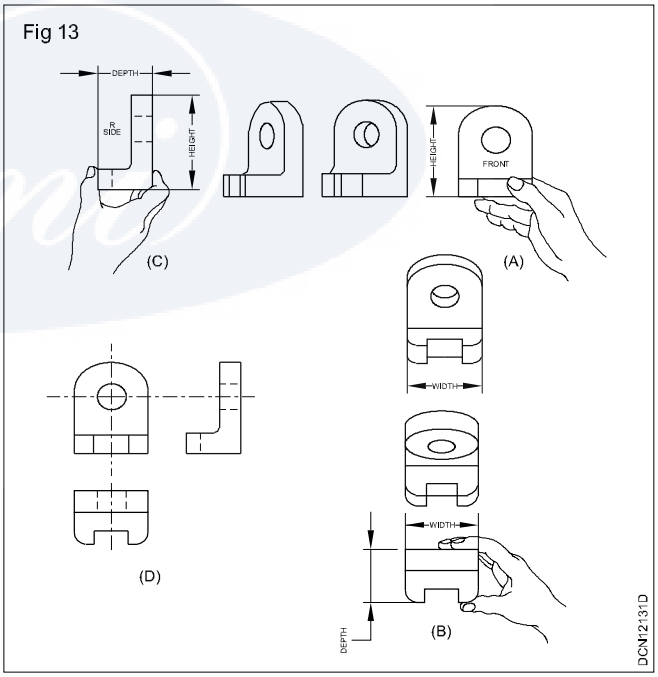
Fig 12



Note: In any one view of a three dimensional object can show only two dimensions, the third dimensions will be seen in an adjacent view.

To get the additional views, the object is revolved as shown in Fig 13.

Fig 13



Any object can be visualised from six mutually perpendicular directions as shown in Fig 14 and the arrangement of the views shown in Figure. The method of obtaining the views of the objects is discussed in earlier lessons.

Choice of views: It is more important that drawing of the object for use of production should have only such of those views needed for a clear and complete shape description of the object. Fig 15 has three distinctive features that need to be shown on the sketch/drawing and also shows the sketch of six views. The required distinctive features are rounded top hole, seen from front.

- Rectangular notch and rounded corners seen from the top.

Fig 14

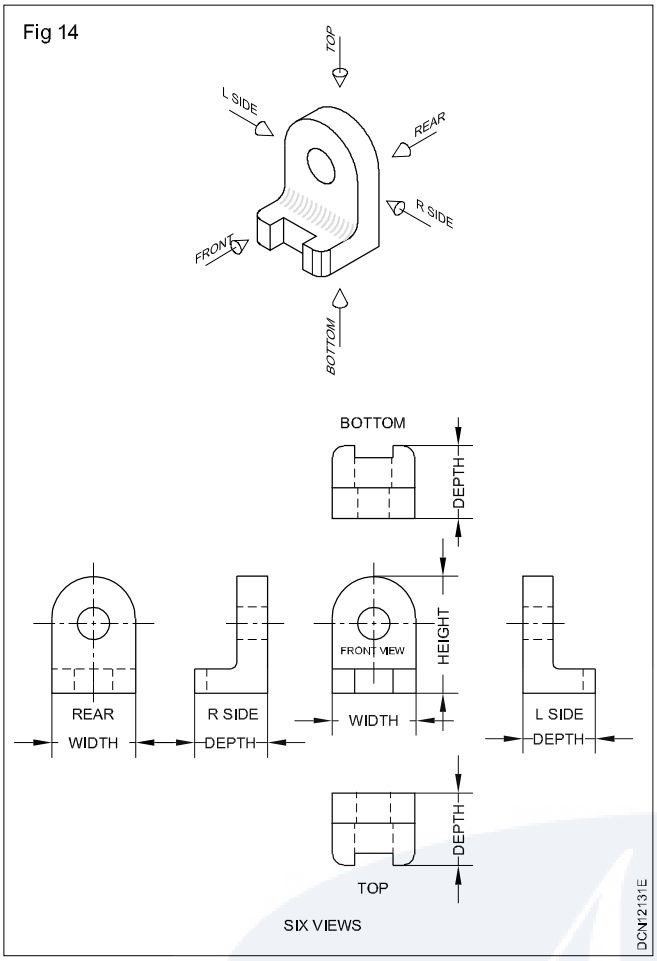
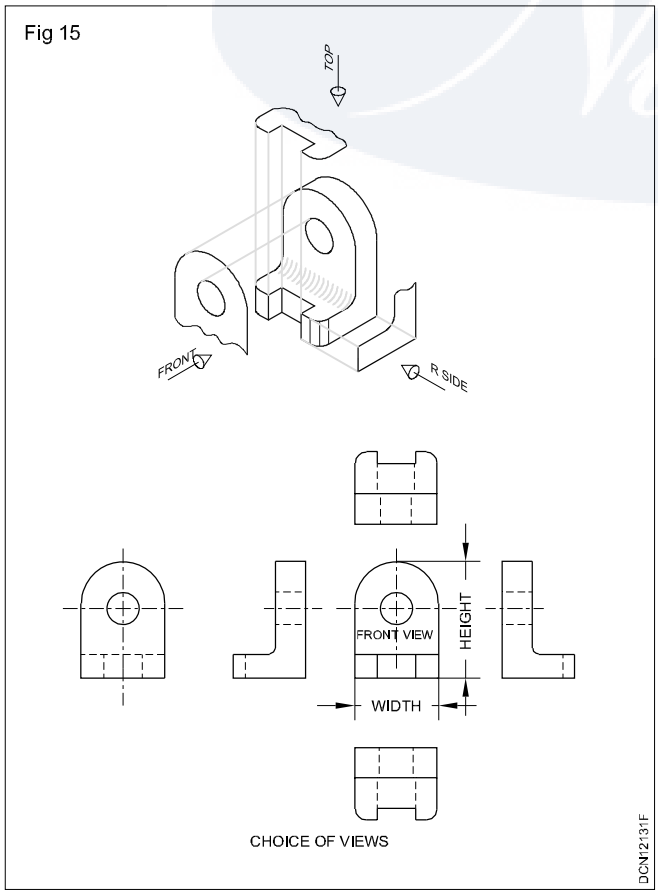


Fig 15

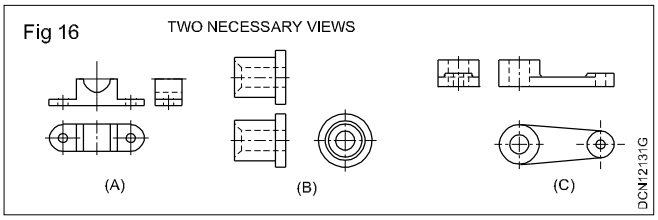


– Right angle with filleted corner, seen from the side.

The above features can be shown in three views by eliminating the unnecessary views which has shown in Fig 15.

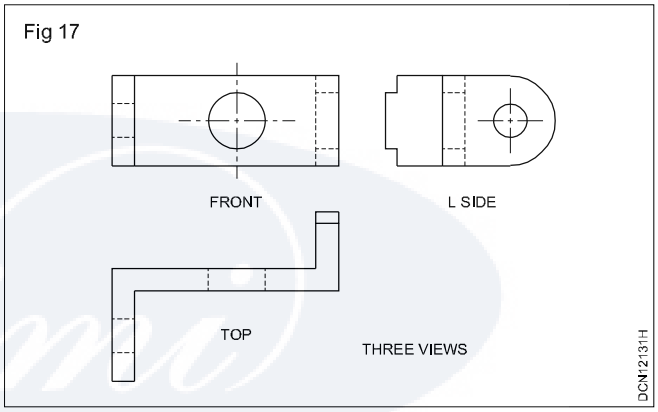
In same cases two views will be sufficient to furnish the features of the object. Fig 16A,B,C are the some examples for such cases.

Fig 16



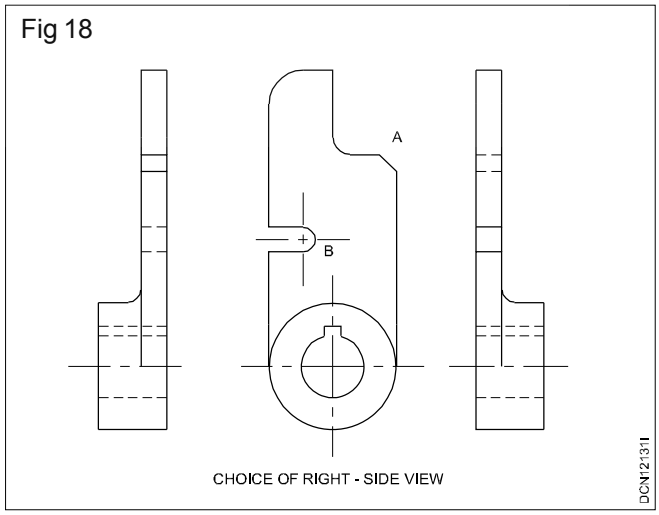
In some cases three views are compulsary. For example Fig 17 shows the three views of a bracket. In this case if the top view is omitted, providing the front and side view alone, it is difficult to understand the two views or visualise the object, because the characteristic `Z' shape of the top view is omitted and also the corners A & B are squares and not filleted. Hence in this example three views are necessary.

Fig 17



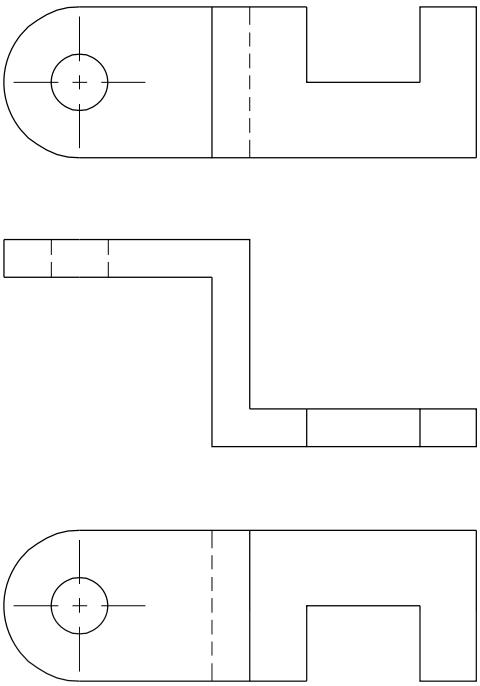
Similarly, it can be choosen the choose of side view on top view shown in Figs 18,19 & 20.

Fig 18



One view drawings: Often single view with a note or lettered symbols is so sufficient to explain the features of the object. Fig 21A one view of the slim, adding a note indicating the thickness is sufficient to explain the features. At Fig 21B one view of a stepped turning piece shown with a threaded portion at the end with additional notes, is sufficient to explain the features of the object.

Fig 19

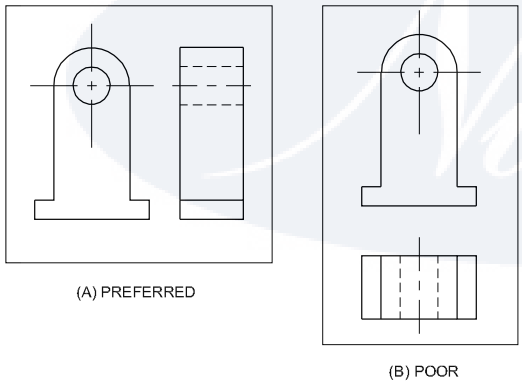


CHOICE OF TOP VIEW

DCN12131J

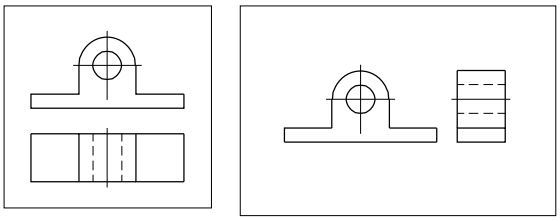
Fig 20

CHOICE OF VIEWS TO FIT PAPER



(A) PREFERRED

(B) POOR



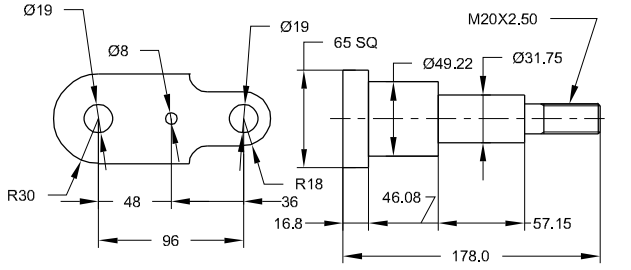
(C) PREFERRED

(D) POOR

DCN12131K

Fig 21

ONE - VIEW DRAWINGS



(A) MATL : 0.25 BRASS

(B) STOCK : 65 SQ CRS

DCN12131L

Hidden lines: Correct and incorrect method in sketching/ drawing hidden lines are shown in Fig 22.

The following rules can be adopted for the drawing of hidden lines.

– Leave a gap wherever a hidden line dash forms a continuation of a visible line. (Fig 22A)

– A hidden line should intersect to form `L' or `T' corners. (Fig 22B)

– A hidden line preferably should jump a visible line. (Fig 22C)

– Parallel hidden lines should be staggered. (Fig 22D)

– When two or three hidden lines meet at a point, the dashes should join. (Fig 22E)

– For showing the counter sunk hole. (Fig 22F)

– Correct and incorrect methods of hidden arcs. (Fig 22G & H)

Centre lines: Centre lines are used to indicate arcs of symmetrical objects or features. Fig 23 shows the typical applications of the centre lines in various features.

Meaning of lines: A hidden line or a visible line has the following meanings

– Intersection of two surfaces

– Edge view of a surface

– Contour view of a curved surface. (Fig 24)

Procedure line: Hidden lines, centre lines and visible lines often coincide with each other and it is needed for draughtsman to know which line should be shown. Fig 25 explains the same. A visible line is always precedence over (corners up) a centre line or hidden line A & B of Fig 25. A hidden line is always takes precedence over a centre line ab at c of Fig 25.

Note that at A and C of 25 the centre line are shown, but separated from the view by a short gap.

Fig 22

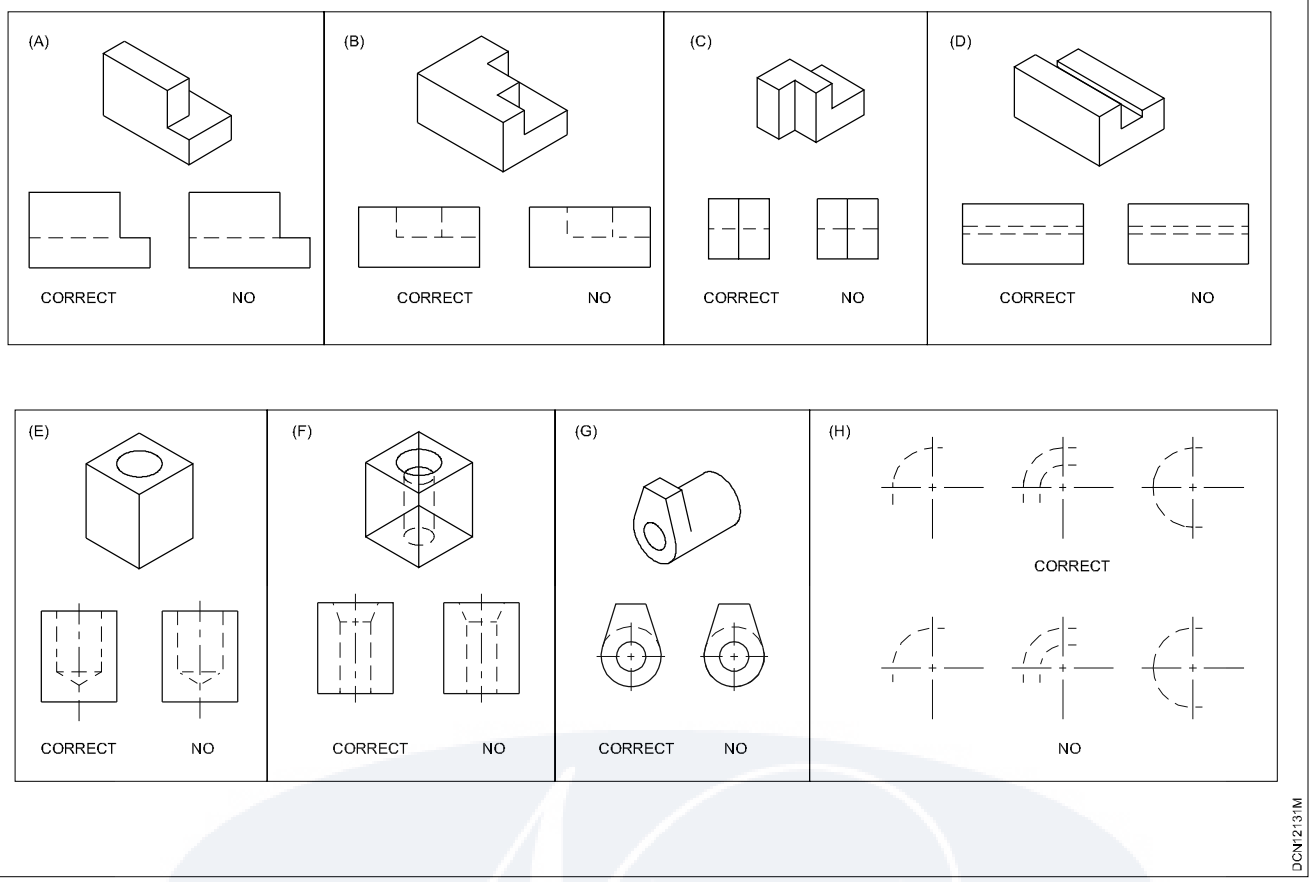

HIDDEN - LINE PRACTICES
(A)
CORRECT
NO
(B)
CORRECT
NO
(C)
CORRECT
NO
(D)
CORRECT
NO
(E)
CORRECT
NO
(F)
CORRECT
NO
(G)
CORRECT
NO
(H)
CORRECT
NO
DCN12131M

Fig 23

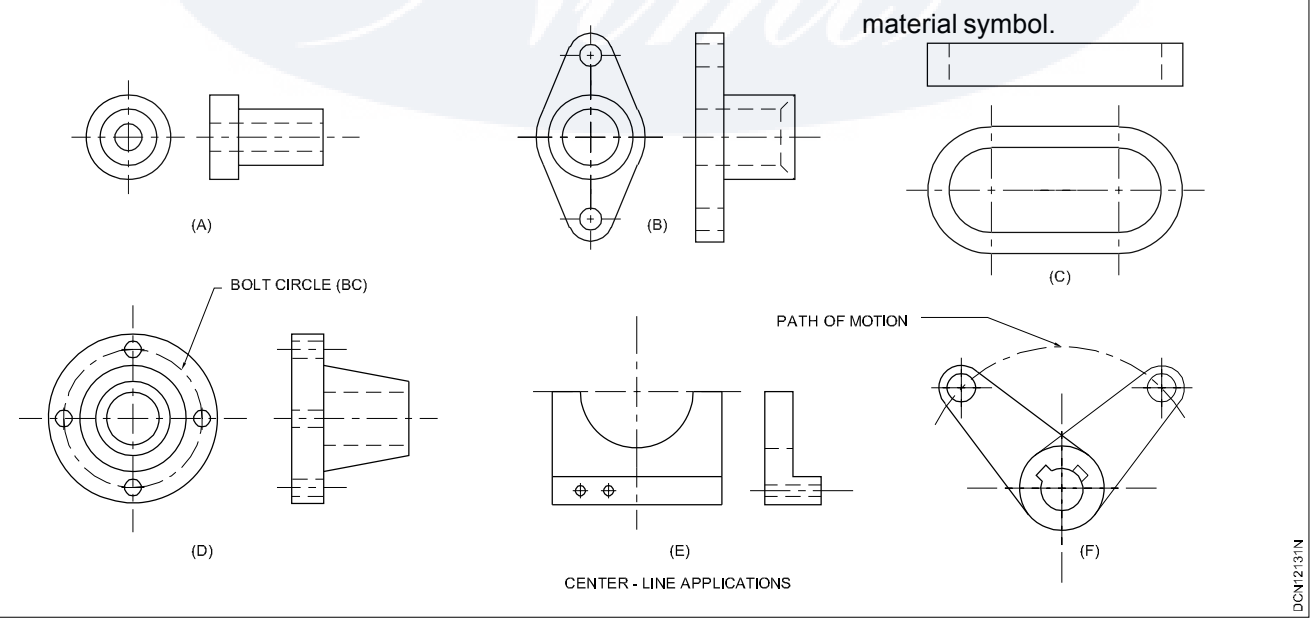
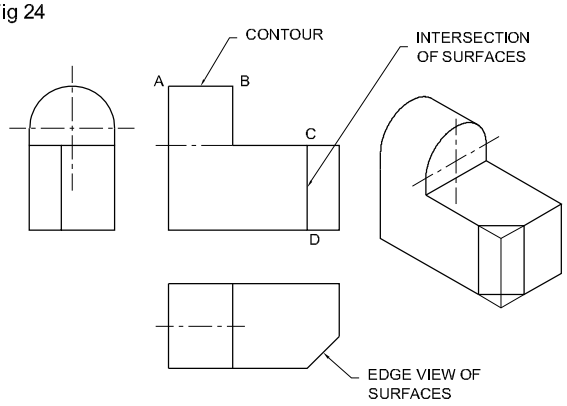

material symbol.
(A)
(B)
(C)
BOLT CIRCLE (BC)
(D)
PATH OF MOTION
(E)
(F)
CENTER - LINE APPLICATIONS
DCN12131N

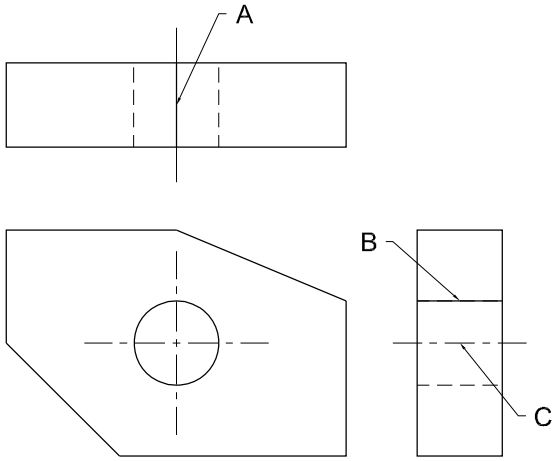
Fig 24



MEANING OF LINES

DCN121310

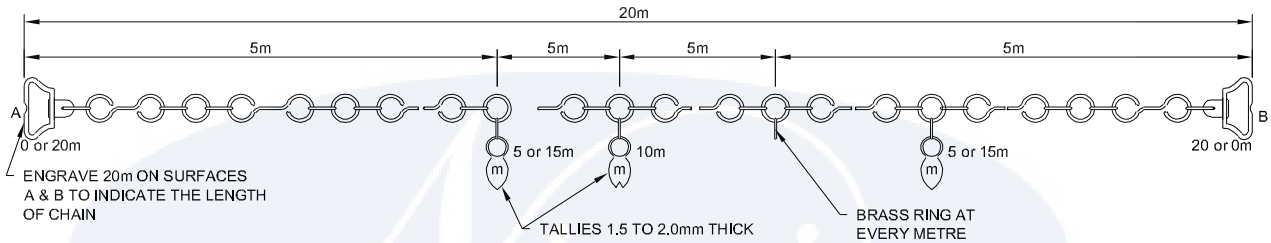
Fig 25



PRECEDENCE OF LINES

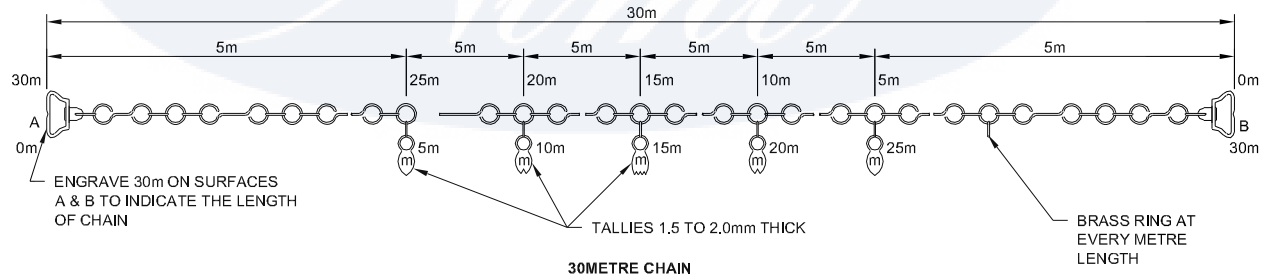
DCN121311P

Fig 1



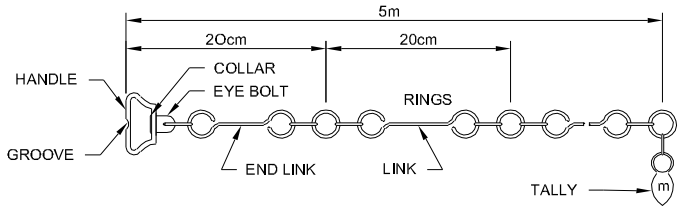
20 METRE CHAIN

Fig 2



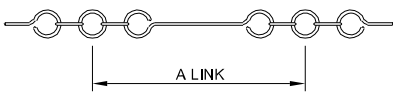
30METRE CHAIN

Fig 3



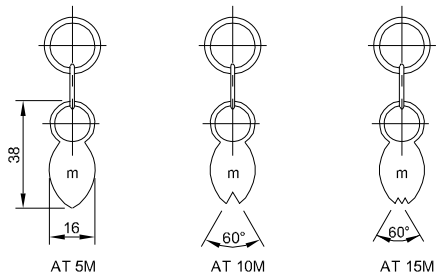
DETAILS OF A METRIC CHAIN

Fig 4



A LINK OF A CHAIN

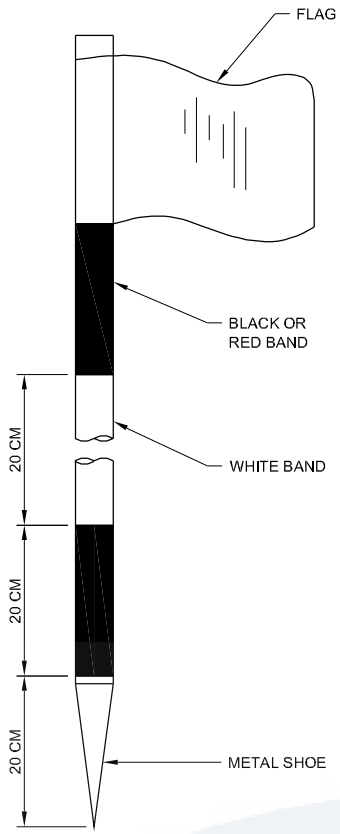
Fig 5



SHAPE OF TALLIES IN 30m METRIC CHAIN

DCN121321

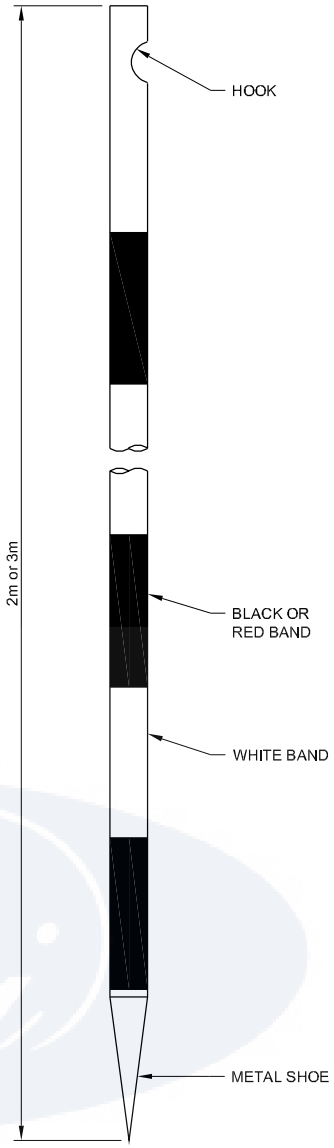
Fig 6



RANGING ROD

DCN121326

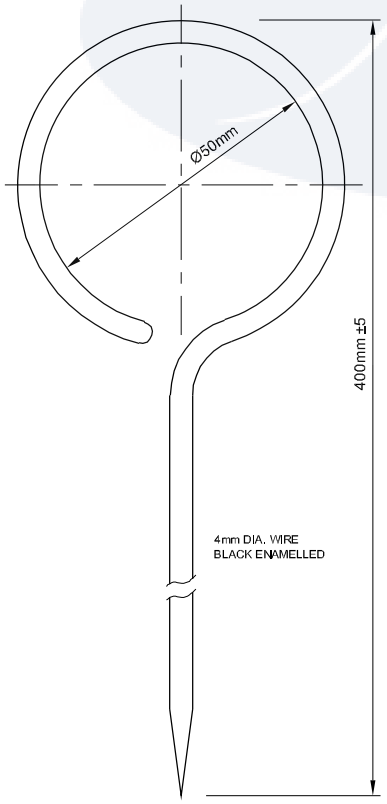
Fig 7



OFFSET ROD

DCN121327

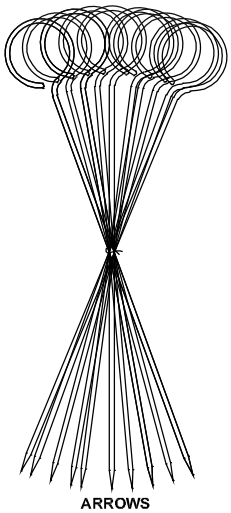
Fig 8



ARROW

DCN121328

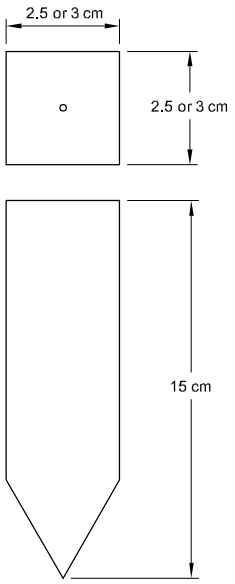
Fig 9



ARROWS

DCN121329

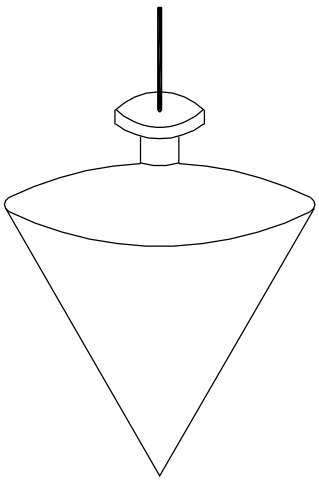
Fig 10



WOODEN PEG

DCN12132A

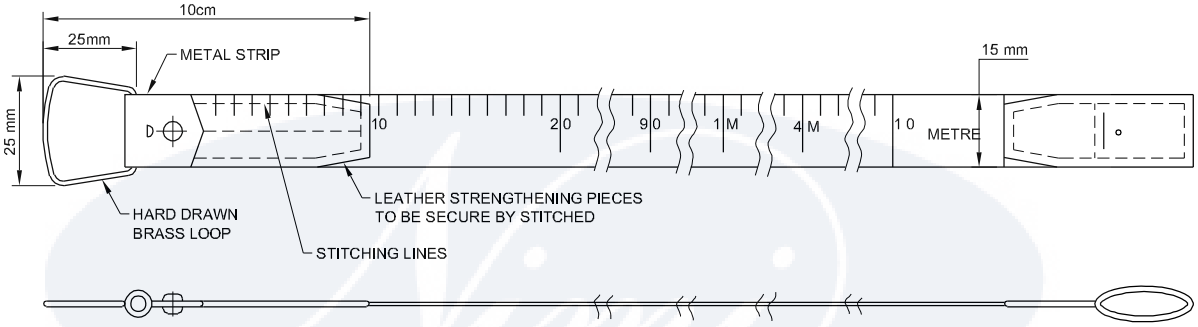
Fig 11



PLUMB BOB

DCN12132B

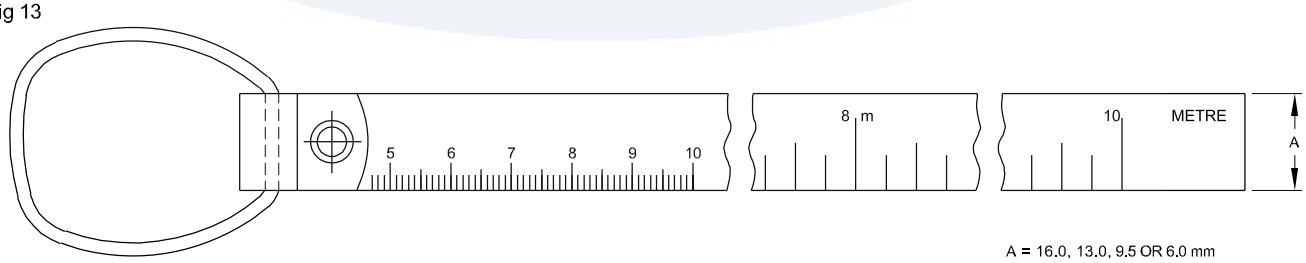
Fig 12



METALLIC TAPE

DCN12132C

Fig 13

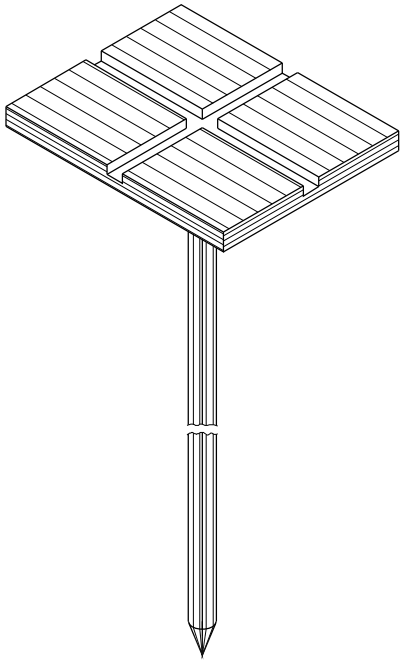


A = 16.0, 13.0, 9.5 OR 6.0 mm

STEEL TAPE

DCN12132D

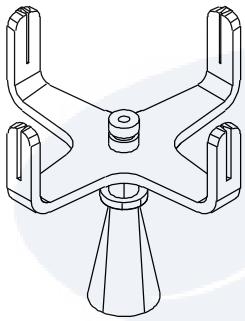
Fig 14



WOODEN CROSS STAFF

DCN12132E

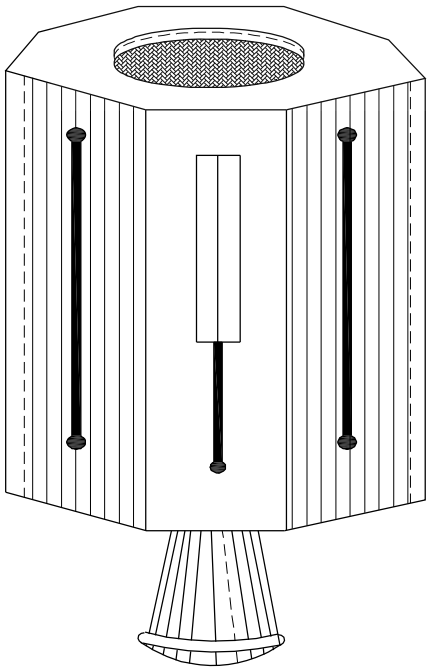
Fig 15



METAL ARM CROSS-STAFF

DCN12132F

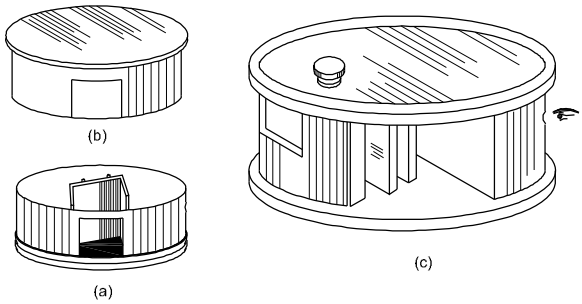
Fig 16



FRENCH CROSS-STAFF

DCN12132G

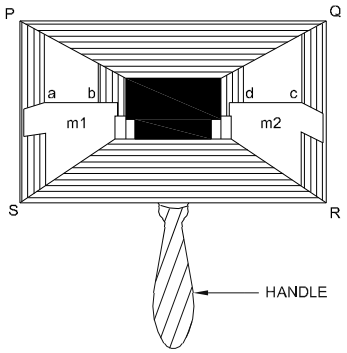
Fig 17



ROUND OR CYLINDERICAL OPTICAL SQUARE

DCN12132H

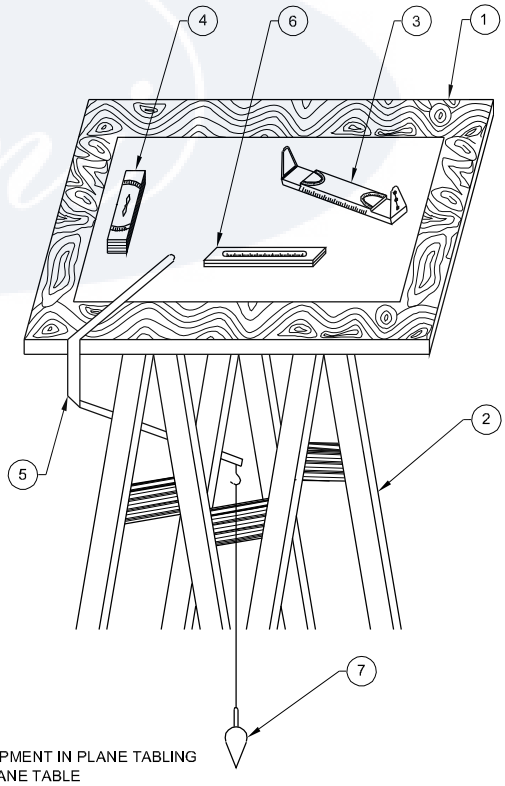
Fig18



INDIAN OPTICAL SQUARE

DCN12132I

Fig 19

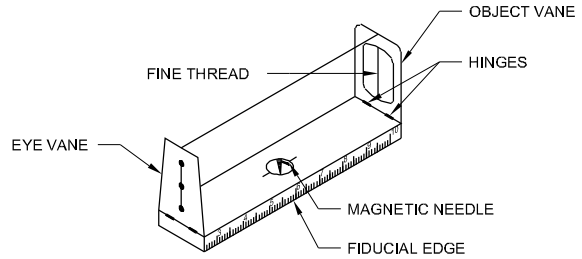


EQUIPMENT IN PLANE TABLING
1. PLANE TABLE
2. TRIPOD STAND
3. ALIDADE
4. TROUGH COMPASS
5. U-FRAME
6. SPIRIT LEVEL
7. PLUMB-BOB

PLANE TABLE

DCN12132J

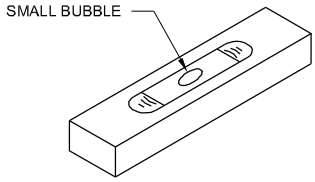
Fig 20



A PLAIN ALIDADE

DCN121132K

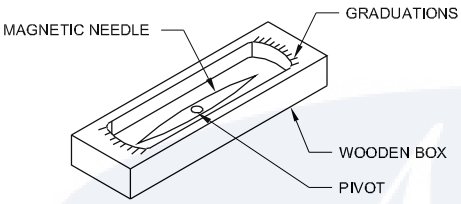
Fig 21



SPIRIT LEVEL

DCN121132L

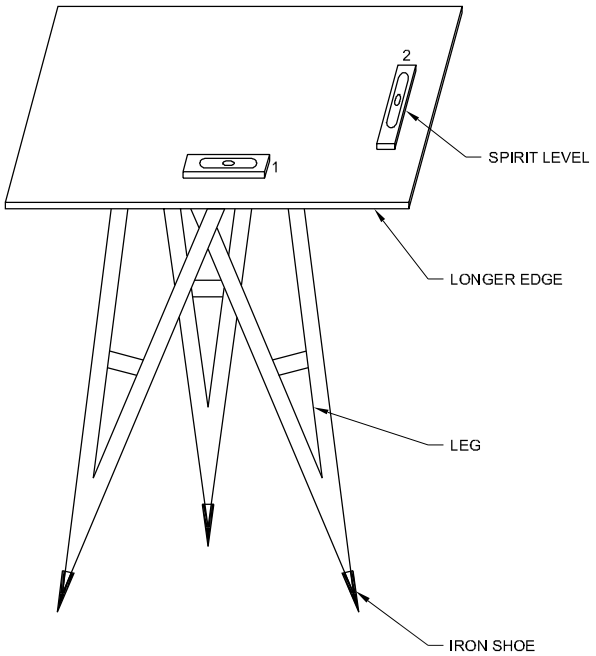
Fig 22



TROUGH COMPASS

DCN121132M

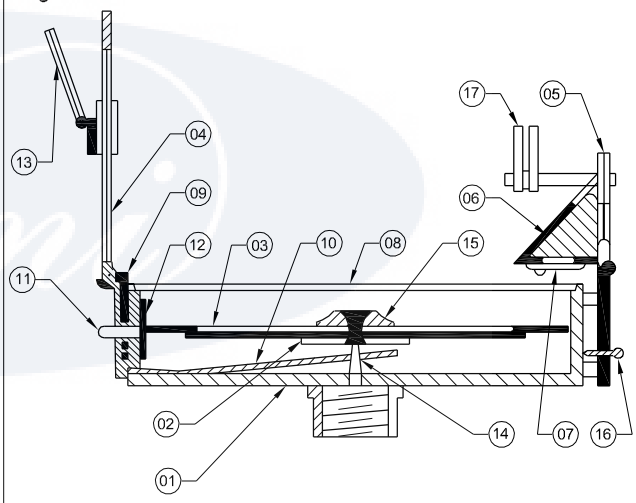
Fig 23



LEVELLING THE PLANE TABLE

DCN121132N

Fig 24

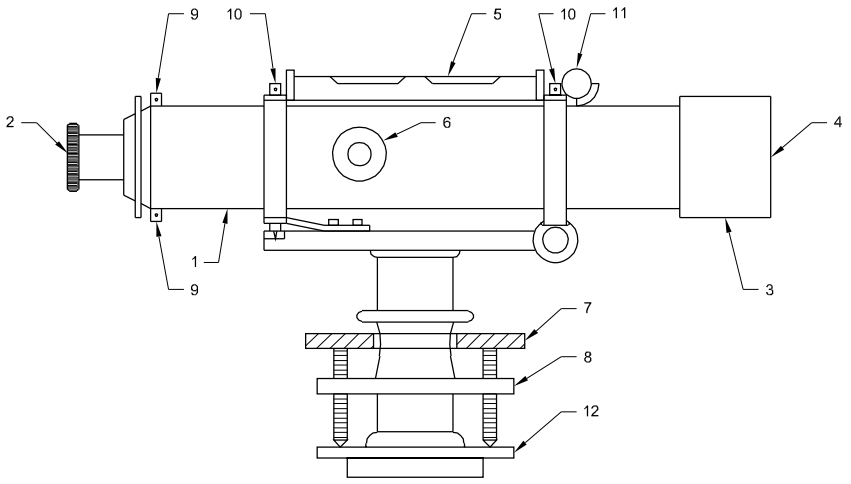


01. BOX
02. NEEDLE
03. GRADUATED RING
04. OBJECT VANE
05. EYE VANE
06. PRISM
07. PRISM CAP
08. GLASS COVER
09. LIFTING PIN
10. LIFTING LEVER
11. BRAKE PIN
12. SPRING BRAKE
13. MIRROR
14. PIVOT
15. AGATE CAP
16. FOCUSING STUD
17. SUN GLASS

THE PRISMATIC COMPASS

DCN121132O

Fig 25

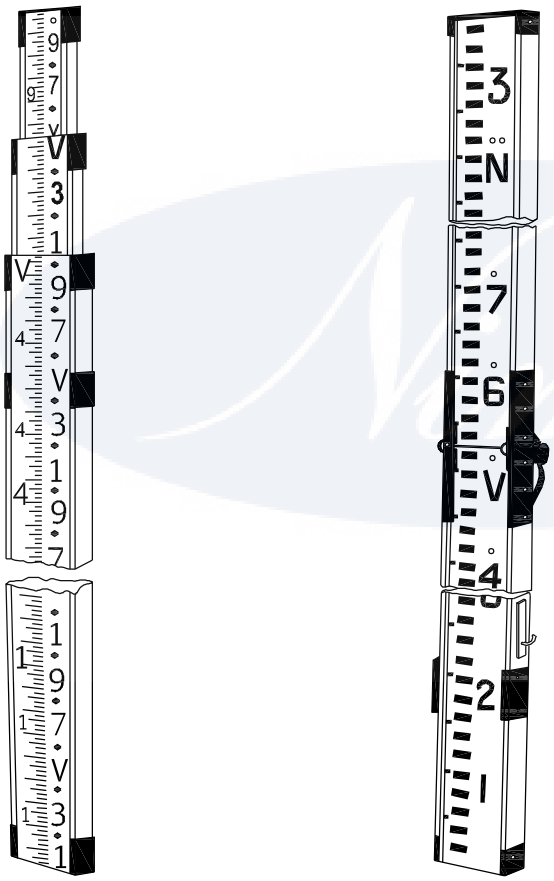


1. TELESCOPE
2. EYE-PIECE
3. RAY SHADE
4. OBJECTIVE END
5. LONGITUDINAL BUBBLE
6. FOCUSING SCREWS
7. FOOT SCREWS
8. UPPER PARALLEL PLATE (TRIBRACH)
9. DIAPHRAGM ADJUSTING SCREWS
10. BUBBLE TUBE ADJUSTING SCREWS
11. TRANSVERSE BUBBLE TUBE
12. FOOT PLATE (TRIVET STAGE)

DCN12132P

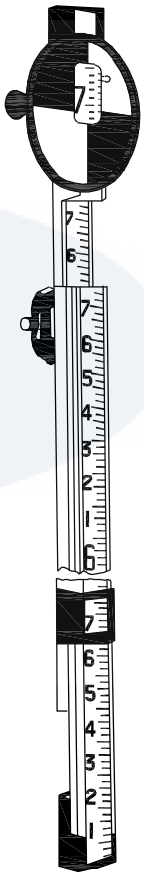
DUMPY LEVEL

Fig 26



TELESCOPIC STAFF

FOLDING STAFF



TARGET STAFF

DCN12132Q

Symbols for architectural & building drawings (IS 962 - 1989)

Objectives: At the end of this lesson you shall be able to
- **identify the symbols for building plan- bath kitchen.**

Symbols for building plan- bath kitchen

Building plan- bath kitchen- ready made symbols for building plan

Ready -made symbols for building plan

It is a fast and easy building plan software for creating great - looking office layout and commercial floor plans. It includes thousands of ready-made graphics that you simply stamp to create your drawing, including appliances, bath kitchen, building core, cabinets, electrical and telecom, furniture, garden accessories, wall shell and structure, cubicles, office accessories, office equipment, office furniture, planting, wall, door and window.

Home floor- bath kitchen

Free download building plan software and view all examples

Home plan & floor plan

Home plan - used for kitchen and bathroom design, architectural and construction documents, space plans, remodeling and planning additions.

Floor plan - used for commercial building design, space plans, architectural layout, construction documents, structural diagrams and facility planning.

More kitchen and bathroom symbols

The new version of symbols includes more kitchen and bathroom symbols for drawing floor plans.

Fig 1

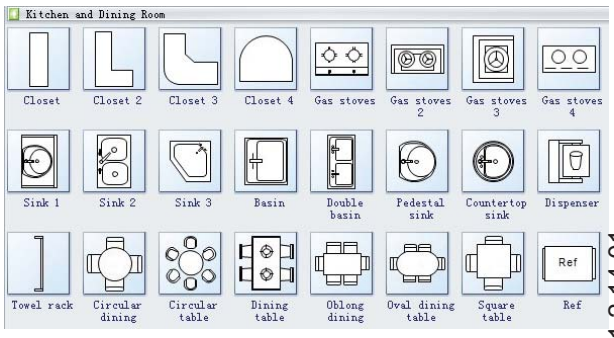


Fig 1.2.14.01

Fig 2

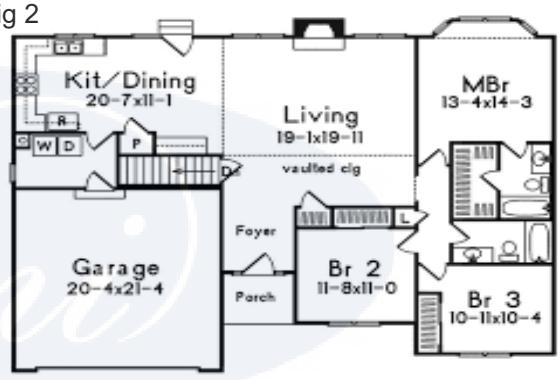


Fig 1.2.14.02

Fig 3

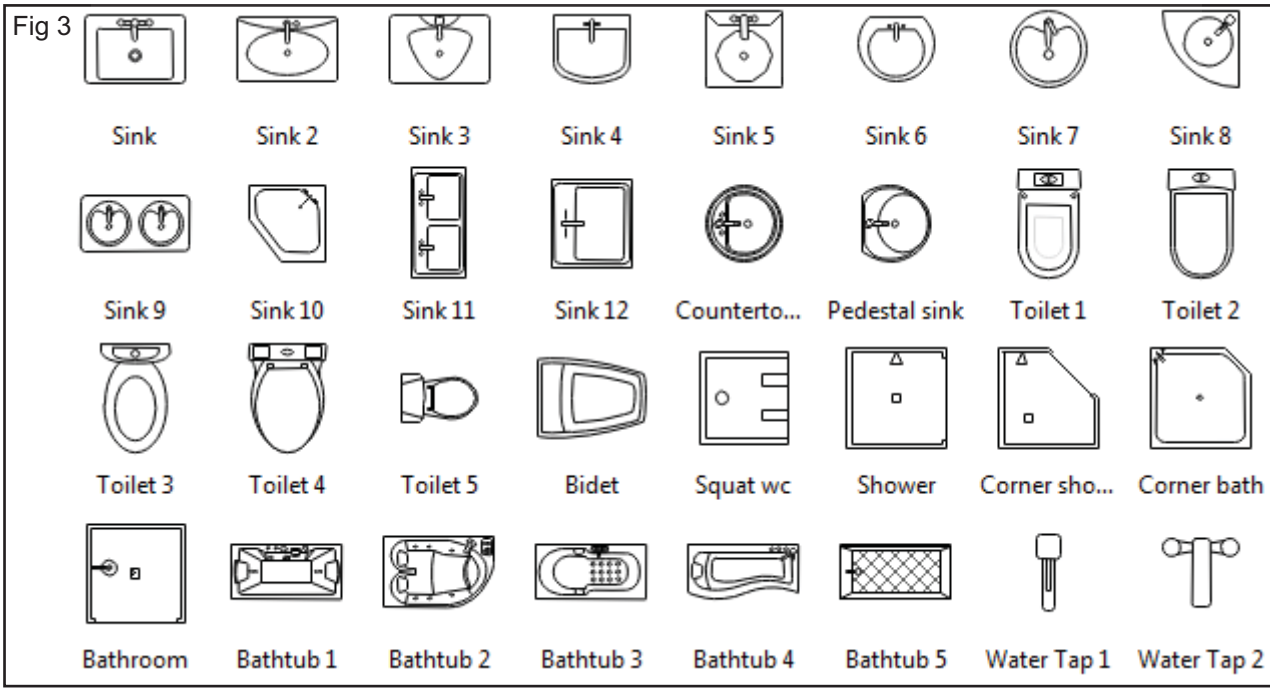


Fig 1.2.14.03

How to use appliances symbols for building plan

One of the obligatory documents that is included to design project of home, appartment, office center, or any other premise is the plan of arrangement of different appliances and home appliances. Creation the plan of such kind lets you to preplan the location of appliances, to make sure in convenience of their location and to envisage all nuances. Well though-out plan helps to avoid mistakes and future reworks, especially in relation to be location of major and large appliances. Concept draw PRO software extended with floor plans solution offers the perfect set of drawing tools, samples, examples, templates and ready-to-use vector objects that let you easily develop best layouts for your rooms, kitchen, bathroom, laundry etc. Ready-made symbols of appliances included to the appliances library are ideal and even indispensible for designing professional building plans and appliances layouts for homes, commercial and office premises. When designing your plans, you can make several variants and choose the best solution.

Fig 4

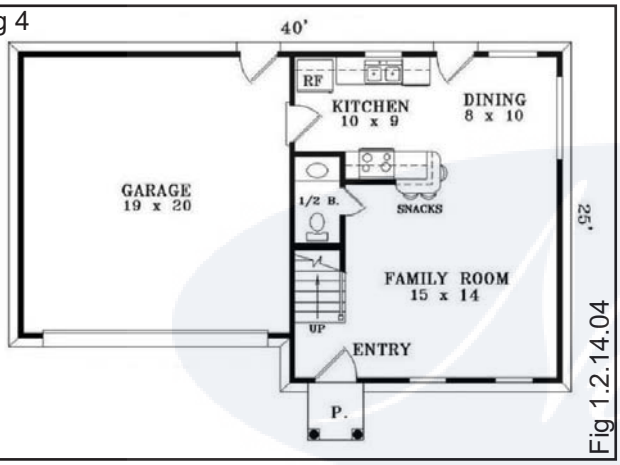
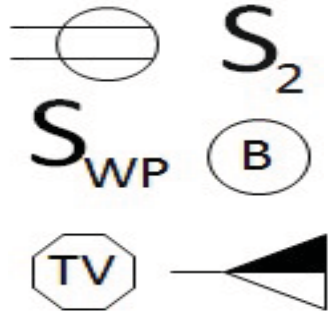
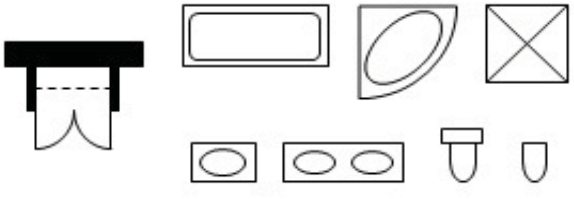


Fig 5



Blueprint Symbols

Fig 6

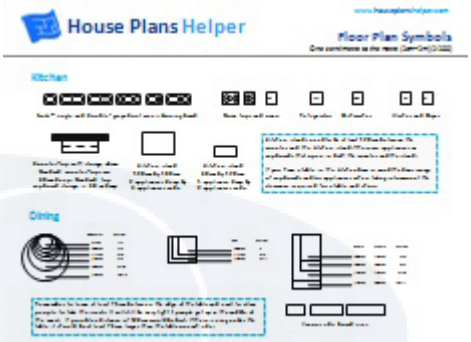


Floor plan symbols

Fig 7

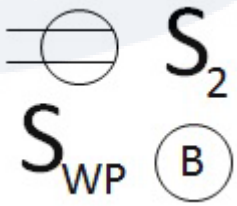
Free blueprint symbols

Fig 8



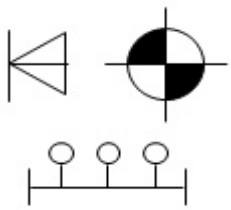
Free floor plan symbols

Fig 9



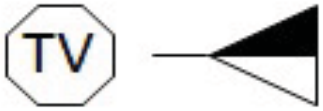
Electric symbols

Fig 10



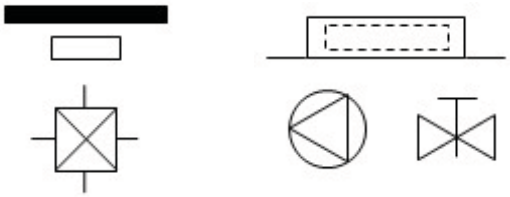
Lighting symbols

Fig 11



Data / Comms / TV symbols

Fig 12



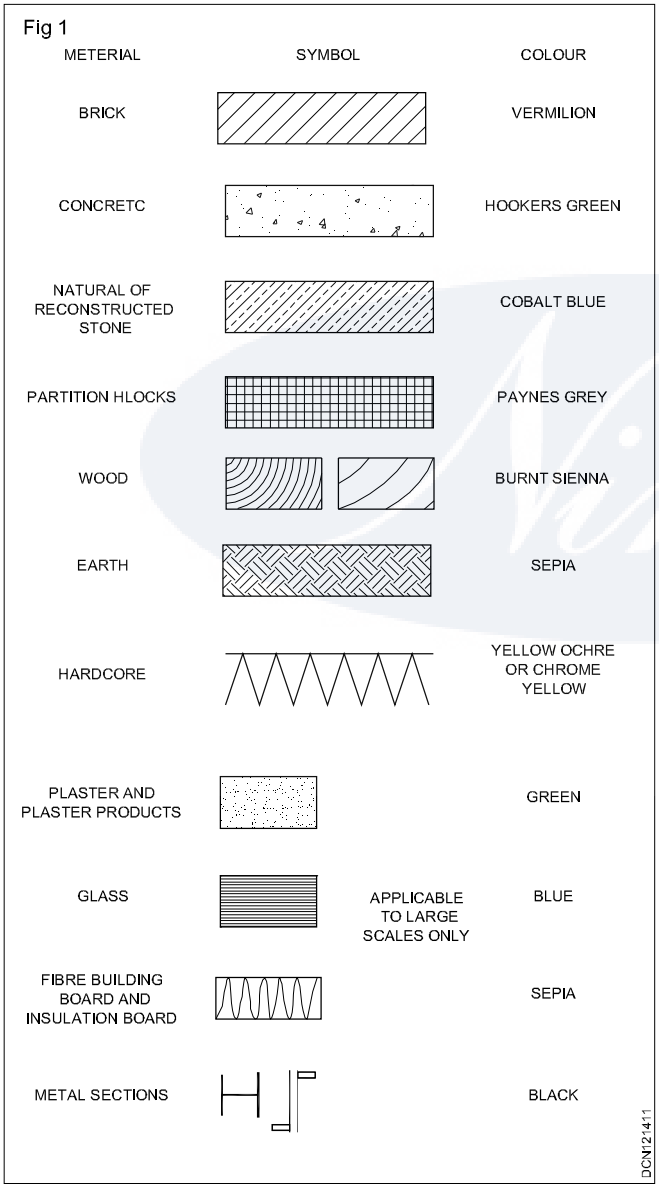
HVAC symbols

Plumbing symbols

Hatching pattern can be used as a means to broadly indicate the material of the part /object to differentiate difference material is sectional views BIS laid out standards ((IS:11663) on conventional representations of the materials and the some are given below.

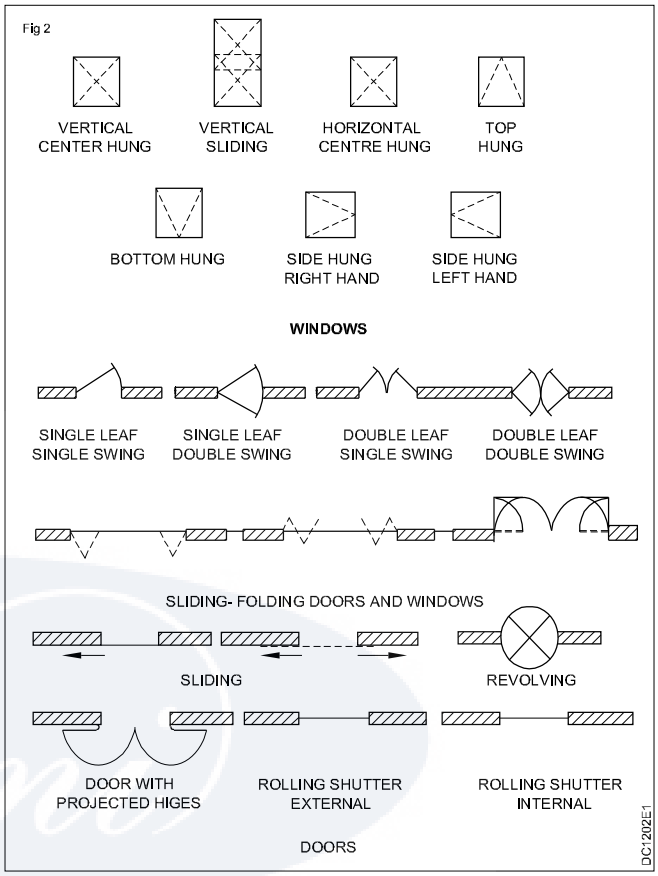
Material Symbol

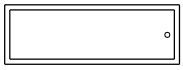
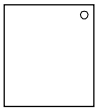
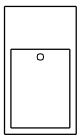
Fig 1



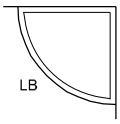
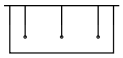
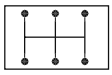
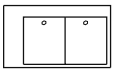
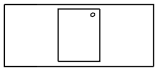
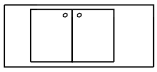
Symbols for doors & windows

- Layout on drawing area for showing signs and symbols of doors and windows.
- Illustrate signs and symbols of different types of doors and windows.
- Name the illustration drawn.

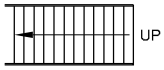
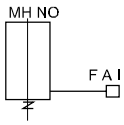
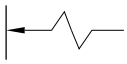
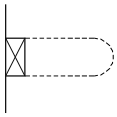
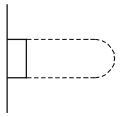
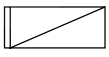
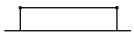


NAME	SYMBOL	NAME	SYMBOL
BATH		SHOWER TRAY	
BIDET		WASH BASIN	

SYMBOLS FOR SANITARY INSTALLATIONS-CONTD

NAME	SYMBOL	NAME	SYMBOL
CORNER LAVATORY BASIN		CLEANER'S SINK	
TROUGH LAVATORY, WALL TYPE		LAUNDRY SINK	
TROUGH LAVATORY, ISLAND TYPE		WC	
CIROULAR WASHING FOUNTAIN		URINAL BOWL	
SINGLE SINK, LEFT HAND DRAINER		URINALSTALLS	
DOUBLE SINK, LEFT HAND DRAINER		INDUSTRIAL WASHING TROUGH	
SINGLE SINK, WITH DOUBLE DRAIN BOARD		PEDESTAL DRINKING FOUNTAIN	
DOUBLE SINK, WITH DOUBLE DRAIN BOARD		DRINKING FOUNTAIN, WALL TYPE	
		FLOOR TRAP	

SYMBOLS FOR SANITARY INSTALLATIONS

NAME	SYMBOL	NAME	SYMBOL
MANHOLE OR INSPECTION CHAMBER		STAIR	
COLD WATER CISTERN		COOKER	
INTERCEPTING TRAP AND FRESH AIR INLET		REFRIGERATOR	
VENT INLET		WASH BOILER, 'G'GAS,'B'ELECTRIC	
VENT OUTLET		WASHING MACHINE, WRINGE TYPE	
RAIN-WATER OUTLET		WASHING MACHINE, AUTOMATIC	
RADIATOR		CENTRIFUGAL DRYER	
UNIT HEATER		CABINET DRYER	
CONVECTOR		RACK DRYER	
SURFACE PANEL, WALL TYPE		LAUNDRY TRAY, SINGLE	
SURFACE PANEL, WALL TYPE		LAUNDRY TRAY, DOUBLE	
EMBEDDED PANEL IN CAST-IN CEILING		IRONING MACHINE	
EMBEDDED PANEL IN SUSPENDED CEILING		BUILT-IN IRONING BOARD	
EMBEDDED PANEL IN CAST-IN FLOOR		SURFACING IRONING BOARD	
UNIT HEATER		BED	
TOWEL RAIL			

FITMENT SYMBOLS

DCN121413

SL. NO.	OBJECT	CONVENTIONAL SIGN	COLOUR
1.	CHAIN LINE		CRIMSON LAKE
2.	TRIANGULATION STATION	A	CRIMSON LAKE
3.	TRAVERSE STATION	A	CRIMSON LAKE
4.	BENCH MARK	OR B.M. 10.000	CRIMSON LAKE
5.	BUILDING (PUCCA)		CRIMSON LAKE
6.	BUILDING (KATCHA)		BURNT UMBER
7.	TEMPLE, CHURCH, MOSQUE		CRIMSON LAKE
8.	WALL & GATE		CRIMSON LAKE
9.	BOUNDARY WITH PILLARS		CRIMSON LAKE
10.	DAM		CRIMSON LAKE
11.	CITY OR TOWN		BUILDINGS - CRIMSON LAKE ROADS - BURNT SIENNA
12.	CEMETRY		BLACK
13.	RIVER		PRUSSIAN BLUE
14.	CANAL OR STREAM (PERENNIAL)		PRUSSIAN BLUE
15.	CANAL OR STREAM (NON-PERENNIAL)		EDGES - BLACK
16.	CANAL WITH LOCK		PRUSSIAN BLUE
17.	LAKE OR POND		PRUSSIAN BLUE
18.	WELL		PRUSSIAN BLUE
19.	DRAIN (KATCHA)		PRUSSIAN BLUE
20.	DRAIN (PUCCA)		DRAIN - PRUSSIAN BLUE DIRECTION - CRIMSON LAKE
21.	WIRE FENCING		BLACK
22.	WOOD FENCING		YELLOW
23.	PIPE RAILING		BLACK
24.	BOUNDARIES		BLACK
25.	HEDGE		HEDGE GREEN
26.	TREE	OR	HEDGE GREEN

SL. NO.	OBJECT	CONVENTIONAL SIGN	COLOUR
27.	JUNGLE		HEDGE GREEN
28.	ORCHARD		HEDGE GREEN
29.	CULTIVATED LAND		DRAINS - PRUSSIAN BLUE CULTIVATION - GREEN
30.	BARREN LAND		BLACK
31.	ROUGH PASTURE		BLACK
32.	MARSH OR SWAMP		BLACK
33.	SAND HILL		BLACK
34.	EMBANKMENT		BLACK
35.	CUTTING		BLACK
36.	FOOTH-PATH		BURNT UMBER
37.	VILLAGE CART-TRACK		BURNT UMBER
38.	UNMETALLED ROAD		BURNT SIENNA
39.	METALLED ROAD		BURNT SIENNA
40.	RAILWAY SINGLE LINE	OR	BLACK
41.	RAILWAY DOUBLE LINE		BLACK
42.	ROAD BRIDGE		BURNT SIENNA
43.	RAILWAY BRIDGE		BLACK
44.	ROAD & RAIL LEVEL CROSSING		RAIL - BLACK ROAD - BURNT SIENNA
45.	TELEPHONE OR TELEGRAPH LINE		BLACK
46.	ELECTRIC LINE		BLACK
47.	NORTH DIRECTION	N	BLACK
48.	DEMARCATED PROPERTY BOUNDARY		
49.	UNDEMARCATED PROPERTY BOUNDARY		
50.	CULVERT		
51.	ELECTRIC LINE		

DCN121414

Electrical symbols

- Layout on drawing area for showing signs and symbols of electrical points.
- Illustrate signs and symbols of different types of electrical points.
- Name the illustration drawn.

NAME	SYMBOL	NAME	SYMBOL
RELAY (AT 'N', INSERT THE NUMBER OF WAYS)		AERIAL	
SYNCHRONOUS CLOCK OUTLET		CEILING FAN	
IMPULSE CLOCK OUTLET		BRACKET FAN	
MASTER CLOCK		EXHAUST FAN	
FIRE ALARM PUSH		FAN REGULATOR	
AUTOMATIC CONTACT		COOKER CONTROL UNIT	
BELL CONNECTED TO FIRE ALARM		EARTH POINT	
FIRE ALARM INDICATOR (AT 'N' INSERT NUMBER OF WAYS)		SURGE DIVERTER	
AMPLIFIER		PILOT OR CORRIDOR LAMP	
CONTROL BOARD		INDICATOR (BUZZER MAY BE ADDED, IF REQUIRED)	
MICROPHONE OUTLET		RELAY	
LOUDSPEAKER OUTLET		RESET POSITION	
RECEIVER OUTLET		HORN OR HOOTER	
		SIREN	

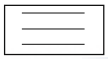
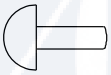
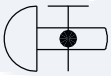
THIS GENERAL SYMBOL IS APPLICABLE TO ANY SYSTEM BY THE ADDITION OFAN IDENTIFYING SYMBOL (APPROPRIATE TO A PARTICULAR SYSTEM) IN THE UPPER HALF.FOR EXAMPLE,BELL SYSTEM RELAY.

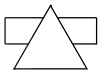
WHERE ITEMS OF OPERATIONS ARE COMBINED, THE SYMBOLS MAY BE COMBINED, FOR EXAMPLE,INDICATOR AND BELL.

DCN121415

NAME	SYMBOL	NAME	SYMBOL
MAIN FUSE- BOARD WITHOUT SWITCHES,LIGHTING		COUNTER WEIGHT PENDANT	C W
MAIN FUSE-BOARD WITH SWITCHES,LIGHTING		ROD PENDANT	R
MAIN FUSE- BOARD WITHOUT SWITCHES,POWER		CHAIN PENDANT	C
MAIN FUSE-BOARD WITH SWITCHES,POWER		LIGHT BRACKET	
LIGHT PLUGS		BATTEN LAMPHOLDER	BH
POWER PLUG		WATER-LIGHT LIGHT FITTING	W T
DISTRIBUTION FUSE-BOARD WITH OUT SWITCHES, LIGHTING		BULK-HEAD FITTING	
DISTRIBUTION FUSE-BOARD WITH SWITCHES, LIGHTING		POWER FACTOR CAPACITOR (WHEN INSTALLED REMOTE FROM THE LAMP UNIT)	
DISTRIBUTION FUSE-BOARD WITHOUT SWITCHES, POWER		FLUORESCENT LIGHT (SIGLE)	
DISTRIBUTION FUSE-BOARD WITH SWITCHES, POWER		FLUORESCENT LIGHT (DOUBLE)	
MAIN SWITCHES, LIGHTING		LIGHTING OUTLET CONNECTION TO AN EMERGENCY SYSTEM	
MAIN SWITCHES,POWER	P	CHOKE (WHEN INSTALLED REMOVE FROM THE LAMP UNIT)	
METER		ONE-WAY SWITCH	
SINGLE LIGHT PENDANT		TWO-WAY SWITCH	
PENDANT SWITCH	P	INTERMEDIATE SWITCH	
		PULL SWITCH	

DCN121415

NAME	SYMBOL
SOCKET-OUTLET,2 PIN 5 AMP	
SOCKET-OUTLET,3 PIN 5 AMP	
SOCKET-OUTLET AND SWITCHCOMBINED, 2 PIN 5 AMP	
SOCKET-OUTLET AND SWITCH COMBINED, 3 PIN 5 AMP	
SOCKET-OUTLET,2 PIN 15 AMP	
SOCKET-OUTLET,3 PIN 15 AMP	
SOCKET-OUTLET AND SWITCH COMBINED, 2 PIN 15 AMP	
SOCKET-OUTLET AND SWITCH COMBINED, 3 PIN 15 AMP	
CONVECTION HEATER	
ELECTRIC UNIT HEATER	
IMMERSION HEATER	
THERMOSTAT	
IMMERSION HEATER WITH INCORPORATED THERMOSTAT	

NAME	SYMBOL
SELF-CONTAINED ELECTRIC WATER HEATER	
HUMIDISTAT	
BELL PUSH	
BELL	
BUZZER	
INDICATOR (AT 'N' INSCRT NUMBER OF WAYS)	
TELEPHONE INSTRUMENT POINT PUBLIC SERVICE	
TELEPHONE INSTRUMENT POINT INTERNAL	
TELEPHONE CABLE DISTRIBUTION BOARD PUBLIC SERVICE	
TELEPHONE CABLE DISTRIBUTION BOARD INTERNAL	
TELEPHONE PRIVATE EXCHANGE PUBLIC SERVICE	
TELEPHONE PRIVATE EXCHANGE OR INTERNAL	

DCN121416

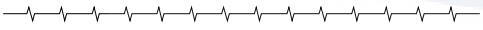
Line conventions

Objectives: At the end of this lesson you shall be able to
- **state the types of line**
- **explain the application of different types of lines.**

Introduction

The lines on engineering drawing differ in character and thickness to be read easily and to convey different appropriate messages to the trained eye.

Types of lines

Line	Description	General applications see figure and other relevant figure
A	Continuous thick	A1 Visible outlines A2 Visible edges
B	Continuous thin(straight or curved)	B1 Imaginary lines of intersection B2 Dimension lines B3 Projection lines or extension line B4 Leader lines B5 Hatching B6 Outline of revolved sections in place B7 Short centre lines B8 Thread lines B9 Diagonal line
C	Continuous thin free hand	C1 Limits of partial or interrupted views & sections, if the limit is not a chain thin
C		D1 Line (see figure)
D 	Continus thin (Straight) with zig-zags	
E	Dashed thick	E1 Hidden outlines E2 Hidden edges
F	Dashed thin	F1 Hidden outlines F2 Hidden edges
G	Chain thin	G1 Centre lines G2 Lines of symmetry G3 Trajectors
H	Chain thin, thick at ends & changes of direction	H1 Cutting planes
J	Chain thick	J1 Indication of lines or surfaces to which a special requirement applies
K	Chain thin double dashed	K1 Outlines of adacent parts K2 Alternative and extreme positions of movable parts K3 Centroidal lines K4 Initial outlines prior to forming K5 Parts situated in front of the cutting plane.