Finishing Construction Work Level II

Learning Guide-12

Unit of Competence: Use Maps, Plans, Drawings And Specifications

Module Title: Using Maps, Plans, Drawings And Specifications

LG Code: EIS FCW2 M04 LO3-LG-12

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LO 3: Draw a map or plan

Instruction Sheet	Learning Guide 12

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying and determining Requirements and purpose of drawing.
- Preparing a simple maps or plan.
- Using Field notes and measures to draw a local area map.
- Interpreting and locating Legend on project drawings, and symbols and abbreviations.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- Identify and Determine Requirements and purpose of drawing from customer and/or work specification and associated documents collect all data necessary to produce the drawing.
- Prepare a simple map or plan, including selecting tools and equipment and a workable scale, key and abbreviations.
- Use Field notes and measures to draw a local area map.
- locate Legend on project drawings, and interpret symbols and abbreviations correctly.

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the information Sheet
4. Accomplish the “Self-check

Information Sheet-1	Identifying and determining Requirements and purpose of drawing

3.1Determine drawing requirements

3.1.1. Check requirements and purpose of *drawing* from work order or similar

Checking drawing requirements and purpose of *drawing* from work (customer) order is very essential for any person who read drawing.

Among the drawing requirement

- Necessary drawing equipment to prepare the drawing
- Necessary dimensions, symbols, and all information that complete the drawing.
- Any information which used for production of the given project including working (detail) drawing.

Document Control Functions

The typical document control function does the following:

- Assign all part numbers, change numbers, and document revision levels.
- Control master design document after the appropriate point of initial release (master file, either hard copy or electronic).
- Change request monitoring.

It is important, however, to assure that certain elements are present on drawing formats. It is also very important to emphasize that certain data elements should not be on those formats.

Document Formats and Standards

Keep as few formats active as possible. A well thought out drafting standard will help in this area. Use the commercially available *Drawing Requirements Manual* (DRM) as a

guideline for your own standard, taking care to assure that all the following rules and guidelines have been taken into account as well. In other words, don't just invoke one of these standards, read and modify it according to the parts of this text that you wish to adopt, deleting those parts that are not applicable to your business.

Some general definition of the parts of design documents, regardless of size; drawings, specs, lists, and other documents, should have a common format. They should all have a *Body*, *Title Block*, and *Revision Block,* as seen in Fig. 1.

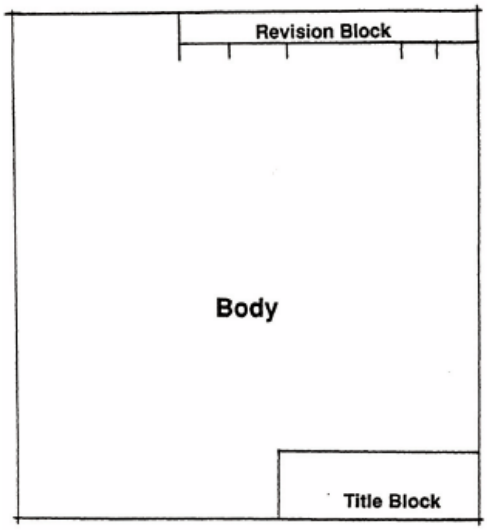


Fig.1.drawingformat

Drawing Requirements

When used in the field of the drawing, item numbers shall be enclosed in circular-shaped 1/2-inch-diameter balloons.

The same find or item number shall be used for any group of reference designations assigned to items of identical characteristics.

The item or find numbers on any drawing shall be assigned independently of those on any other drawing. Find numbers assigned to subassemblies shown on an

assembly drawing shall be distinguished from those assigned to parts by adding a letter suffix to the subassembly find number.

Purpose and Scope

Purpose

- Purpose is to describe the specification process, which defines the desired project result and enumerates the project requirements.

Engineering departments document their agreements with other organizations in the form of engineering specifications detailing the technical and project requirements of the system to be provided.

It is important to note that managers and project leaders may introduce additional requirements, such as further reviews or documentation, outside the technical specifications described in manual. The design engineer must fulfill these requirements during the implementation of the engineering project.

3.1.2. Source required information from workshop manuals, customer specifications, product suppliers, and designers or similar.

Item Specifications

Specifications are words that describe an item. They are generally in a text format, but may have text, charts, graphs, envelope drawings, or combinations of these and other techniques. They are generally prepared to describe the end product, but may be defining a sublevel of the product.

The definition, therefore, becomes fairly general.

Definition: Specifications define the critical characteristics of an items form (appearance), physical, or functional nature.

Specification Control Drawings are item specifications. Certain assemblies may be described by a specification, whether made or purchased.

An assembly that is tested is usually defined by a test specification. There is one level of the product that must have at least one specification that is the end product itself. These take various forms and names. They will be called *product specifications* in this text.

Whatever they are called, they are so important that they need to be a released document and under change control. When several products are combined into a system, the product specification may be referred to as a System Integration Specification.

Product specifications requirements vary depending upon whether you are in a make to stock make to order, or make to print environment.

Make-to-Stock Product Specifications

The single most important of all Design Documents is the Product Specification. This document must be agreed upon by key company management. This agreement must occur very early in the product definition phase.

All Sources required information should be obtained from workshop manuals, customer specifications, product suppliers, and designers or similar sources.

3.1.3. Plan Scope of drawing including layout, additional required information and resources

Scope; is limit or span or range of the project to be to be produced.

Project Standards and Specification which should be regarded as a Recommended Practice, specifies the minimum requirements for handling of a project in the detail design and procurement stages.

However, depending on the nature and extent of the contract between the Company and Contractor, some parts/sections may be added, modified or deleted as required.

The main activities for implementation of the detailed engineering, procurement services and supply of equipment and materials are covered in this Standard Specification.

The Project Standards and Specification does not deal with the construction/production activities and/or efforts which normally should be made after or in parallel with the engineering phase for completion of the project in the site.

Self-Check -1	Written Test

Directions: answer all the questions listed below. Use the answer sheet provided in the next page:

Instruction1 Choose the best answer

1. _____are words that describe an item.
   A. Specifications
   B. Symbols
   C. Scope
   D. All of the above
2. _____is limit or span or range of the project to be to be produced.
   A. Scope
   B. Symbols
   C. Specifications
   D. All of the above
3. Drawing Requirements
   A. When used in the field of the drawing, item numbers shall be enclosed in circular-shaped 1/2-inch-diameter balloons.
   B. The same find or item number shall be used for any group of reference designations assigned to items of identical characteristics.
   C. The item or find numbers on any drawing shall be assigned independently of those on any other drawing.
   D. All of the above
4. *One of the following is not true about* Specifications
   A. define the critical characteristics of an items form (appearance), physical, or functional nature
   B. define the critical prices of an items form (appearance), physical, or functional nature
   C. define the critical quantities of an items form (appearance), physical, or functional nature
   D. All of the above

Information Sheet-2	Preparing a simple maps or plan

3.1. Preparing a simple maps or plan

A sketch map is a drawing of your study area. A sketch map helps you document the location of a study site relative to the surrounding area, as well as provide location information about important features within your study site. A sketch map can be as detailed as you like, and can be a rough sketch based on estimated distances or the distances can be measured using meter tapes and a compass. Sketch maps should form an important part of your field notebook.

Equipment Needed:

- Pencils with erasers (colored pencils are nice, but optional)
- Paper template (Rite-in-the-Rain paper provides a durable long-lasting map, but regular copy paper is fine)
- Clipboard 25m or 50m Tape
- Pin flags (optional, but nice to help provide a boundary to your site and mark important features that should be mapped & measured)
- Compass (a sighting compass with a mirror is best)
- GPS Unit Base map or aerial photo (optional, but nice)

How to Draw a Sketch Map

1) **First walk the entire study site** that you plan to map. Notice any features that are important to include in your map. Major natural and artificial features should be mapped. These may include slopes, landforms, streams, large rocks, buildings or even trees. Slopes can be identified with arrows.
2) **Place Pin Flags** (optional) at the four corners of the area you are mapping to help you contain the boundaries of your map. Also mark any important feature you want to remember to map or make measurements to.

3) **Measure or pace the distance between corners**. Mark these distances (or approximations) on the edges of your map. It is good to draw a rectangular boarder to your map to help you contain the sketch map of your study site.
4) Pick a location where you want to draw from. This location should give you a good perspective of the whole study site. Also consider the compass direction you want the map oriented, often we orient maps with north facing up on the map, but as long a you add a north/compass arrow on your map you can orient it in which-ever direction is most appropriate for your perspective.
5) Draw major land forms and feature. These include such features as buildings, large trees or boulders or streams first then add in minor features. Make observations or map legend items for major vegetation types/covers.
6) Add distances on map. If you make measurements you can include these distances directly on your map, or just use them to help you place features on the map.
7) Annotate your map as appropriate, for example you can note "Grassy area", "Exposed soil", or descriptions of other feature which are difficult to draw.
8) Add Map Elements: these include title, legend, scale bar (apprx.) north/compass arrow, date, study team names.
9) Add notes & observations. These can be written at the bottom of the map, on the back, or in a separate field notebook which are relevant about the site or current conditions. This can include location of study site relative to your school building or nearby streets or ball fields, the purpose for the study site, the current weather, and any other observations, such as animal activity or litter, etc.

Plan your layout

It is important to plan your drawing and consider placement as a whole, before you start. A presentation drawing should first have been drafted in order to calculate the placement of all the views before transcribing them onto a final sheet. An isometric view may also be positioned in the top right-hand corner to provide a connection between the

two-dimensional shapes of orthogonal and more visually representative three-dimensional isometric form.

Appropriate scales

The actual size of the object and the scale of its representation will determine the size of the drawing. A scale is expressed as a ratio where the first number refers to the drawn view and the second to the actual object. For example, the scale 1:50 means the size of the drawing is fifty times smaller than the object.

In this study, the following scales are used for industrial design drawings:

- Where objects are too big to fit on a sheet choose from 1:2, 1:5, 1:10, 1:20, 1:50 and 1:100.
- Where objects are too small to be drawn in detail choose from 2:1, 5:1 or 10:1.

The views

Third-angle orthogonal drawings can include six views to communicate the features of an object. In practice only the views required to describe the object clearly are drawn.

The views are known as:

- top view
- front view
- left side view or right side view
- base view
- back view

The conventions of this drawing method dictate that the FRONT VIEW is chosen as the view that communicates the most information about the object.

Placement of views

The top view is always directly above the front view and the side views are always 'next to' and 'aligned to' the front view. At times the views can be placed apart equidistantly.

However, the views can be placed at different distances from the front view, depending on what information, such as dimensions, needs to be included.

If you want to place your views equidistantly then you can use the 45-degree method to place and project your views. The following steps describe the process.

1. The front view must be drawn first, then vertical lines should be projected up to give the width/
1. Length of the top view.
2. Measure and complete the top view.
3. Project the horizontal lines from the front view to give the height of the side view.
4. Where the maximum width and height projection lines on the front view meet, a 45 degree line is drawn.
5. Project horizontal lines from the top view to meet the 45 degree line, then where they cross that line, draw them vertically down, until they return to the base line of the drawing. This method will create the width of the side view.
6. All line types should now be present on the top view.
7. Referring to the front and side view the various lines will need to be defined and drawn using the correct line type.
8. Once completed all views will be equidistant.

Types of drawing lines (Alphabet of Lines)

Each line on a drawing has a special meaning. In order to help make and read drawings, standard line symbols were developed. The line symbols in Fig. 2.1 are the actual thickness they should be on a finished drawing.

There are two thicknesses of lines: **thick and thin**.

The thick lines: are used for visible, cutting-plane, and short break lines.

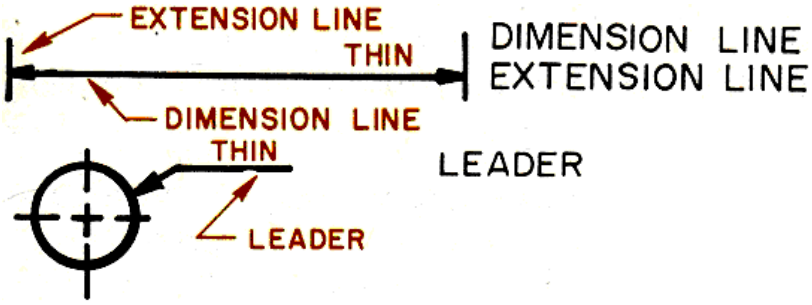
The thin lines: are used for long break, hidden, center, section, extension, and dimension.

Objects line (**Visible lines**): are used to show the main outline of a building and all interior walls. They are used for porches, patios, driveways, and construction details. All outlines of any major part which should stand out on the drawing should use a visible line.

Hidden line Hidden lines: show edges and surfaces which are not visible to the eye but are hidden below a visible surface. They are made of short dashes about (3 mm) long. The spacing between dashes is about (1 mm).

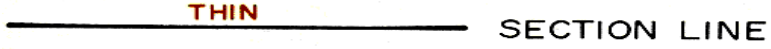
Dimension lines: are thin, solid lines. They are used to show the distance represented by a size dimension. They usually have arrowheads on each end.

Extension lines: are thin, solid lines used with dimension lines. They extend to a point on a drawing to which the dimension line refers.

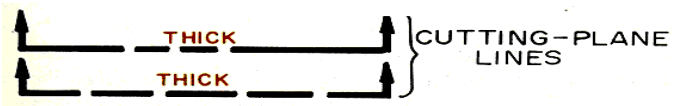


Center lines: are thin lines used to locate the center of holes or cylindrical solids. They are made of long and short dashes. The long dashes can be from (19 mm) to (38 mm). The short dashes are about (1.6 mm) long.

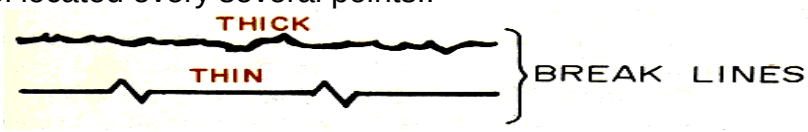
Section lines: are used to show a surface that has been cut in a section view. They are thin lines drawn parallel and spaced (1.6 mm) to (3 mm) apart.



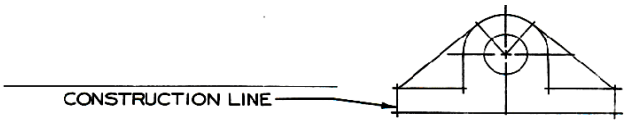
Cutting-plane lines: show where a section has been taken on a drawing. They are thick lines with arrows on the end to show the direction in which the section was taken. Two symbols are in use. One is a series of dashes of equal length and the other is a series of long and short dashes.



Break lines: are used to show the edge where part of the drawing has been removed. Short breaks are made with a thick, freehand, jagged line. Long breaks are made with a thin, solid line with a **z** symbol located every several points..



Construction lines: are thin lines which can easily erase after construction of the desired object.



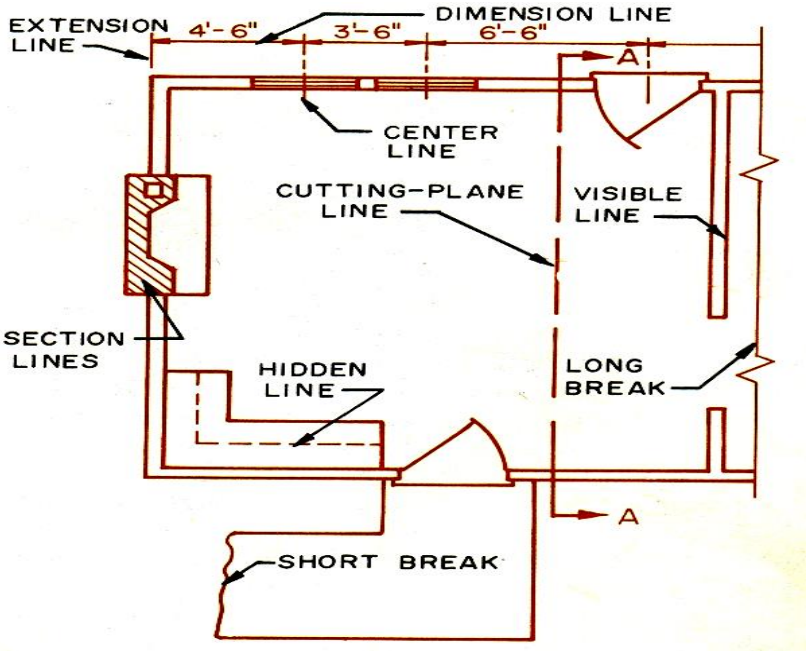


Fig. 2.1 Floor Plan

How to Manually Draft a Basic Floor Plan

These instructions will aid you in creating your very own floor plan. The ability to create floor plans is a vital part of what it means to be a civil engineer or architect. Follow these instructions carefully to get the most out of what they offer. The design of a simple floor plan requires little technical skill. Use of architectural or engineering scales is required, but other than that all you need is an imagination. A quick video tutorial on the use of an engineering scale is included in these instructions. Depending on the complexity of the design, this can take anywhere from 2 to 5 hours.

List of Supplies:
Pencil
Eraser
Engineering Paper
Engineering Scale

Teacher Notes

Teachers! Did you use this instruct able in your classroom?
Add a Teacher Note to share how you incorporated it into your lesson.

Step 1: Engineering Scale Tutorial

Here's a quick tutorial on how to use an engineering scale

Step 2: 1. Sketch Exterior Walls

To begin manually drafting a basic floor plan, start by lightly laying out your exterior walls with the shape and dimensions desired for the house. For the sake of simplicity, the example shown here is going to use a basic rectangular shape. It is also important to choose an appropriate scale for the drawing. The scale for this particular floor plan is 1 inch: 20 feet.

Step 3: Draw Reference Lines

Once the exterior walls are up it is helpful to add reference lines to the drawing for scaling purposes. Generally these lines are put through the midpoints of the vertical and horizontal walls of the house. This is demonstrated in the example.

Step 4: Interior Walls

Now it's time to lay out the interior walls of the proposed house using light lines. It is important to predetermine the thickness of these walls. Six inches is a typical thickness for a house, the purpose being to leave room for plumbing and electrical tubing. It is at this stage that the number of rooms and closets needs to be determined.

Step 5: Locate Doors

The next step is to determine the location of the doors to both enter the house, the rooms within the house, and all of the closets using light lines. Standard door dimensions are 2 foot 8 inches, as used in the example. Placement on the wall will be dimensioned from the center of the door, so be sure to measure accordingly.

Step 6: Add Windows

Windows are the next addition to the existing floor plan. Similar to the doorways, windows will be dimension from their center. It is important to keep in mind realistic spacing and size of the windows as well. All of the windows in this example are 3 feet wide for the sake of simplicity, but feel free to make them any size.

Step 7: Place Cabinets, Kitchen Appliances and Bathroom Fixtures

Now it's time to add cabinets, kitchen appliances and bathroom fixtures to the plan. Lower kitchen cabinets are typically 2 feet deep and upper cabinets are generally 1 foot deep. Lower cabinets are given a solid line while upper cabinets are dashed. The refrigerator and stove are deeper than cabins and also drawn with solid lines, however they will be labeled later on. Bathroom fixtures are drawn similarly, as is shown in the example.

Step 8: Dimension the Plan

It's finally time to add dimensions to the floor plan. Make sure to thoroughly label dimensions throughout the plan. All walls, doors, windows, cabinets and appliances need to be dimensioned to ensure that their proper location is known. Reference the example to see a basic demonstration of what dimensioning should look like.

Step 9: Label Rooms

Once dimensioning is complete it is time to label the rooms and add any specific notes thought to be appropriate. Bedrooms should be labeled by number with the master bedroom being number one.

Step 10: Clean It Up

The next step in finishing up the floor plan is to clean it up and make it look nice. Make sure all mistakes are completely erased and look nice and clean cut. When you feel absolutely sure that everything is correctly in place it is time to darken in all of the construction lines. This should be done with a straight edge and NOT free hand.

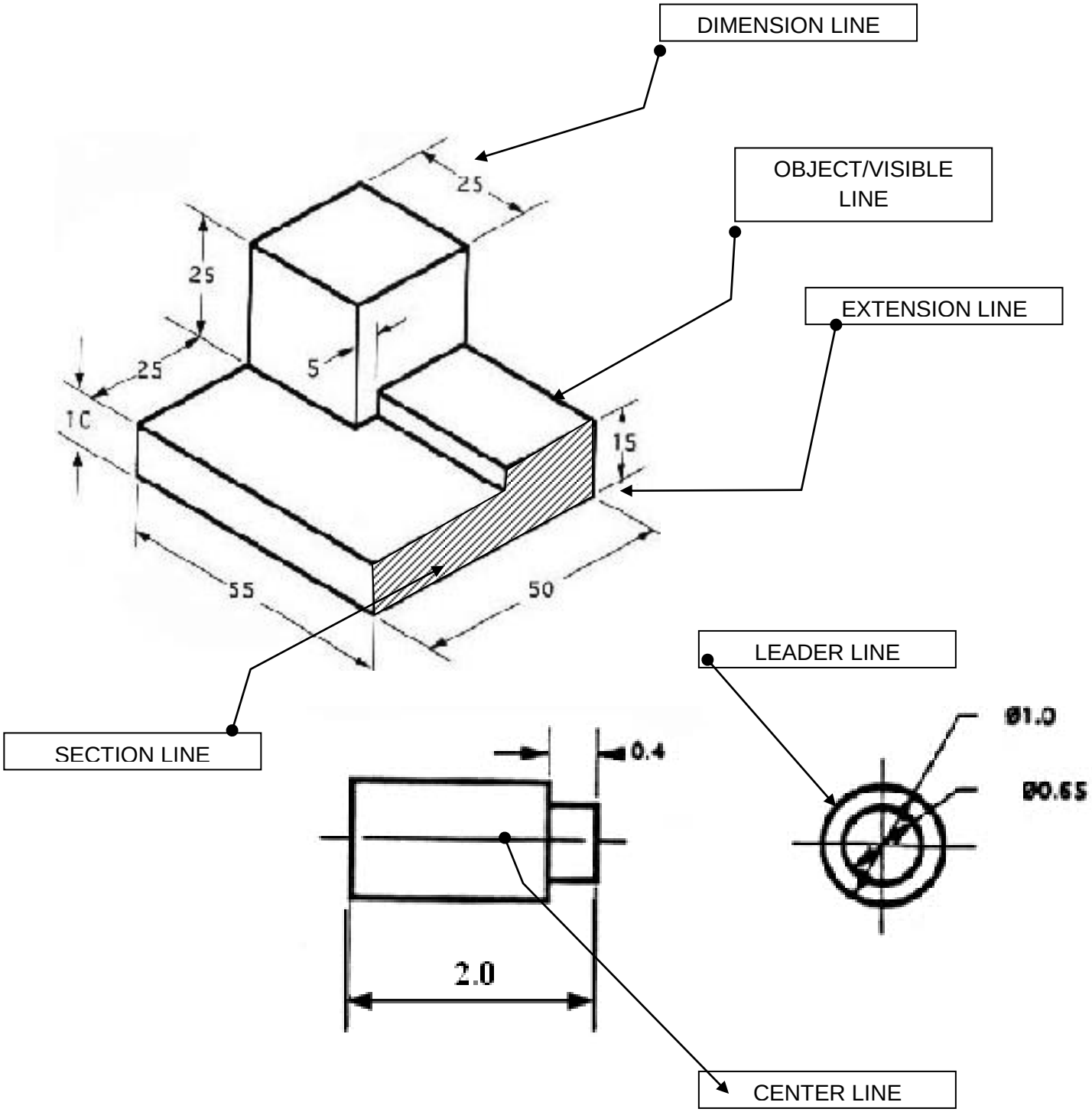
Step 11: Add Title Block

The final thing needed on the floor plan is a title block. The title block should be on the bottom right hand corner of your floor plan. It should include the name of your house, your name and the size of the scale you used to draw it for future reference.

The floor plan is finally complete! It is now possible to look into further aspects of designing the house and bringing it to life. You're floor plan should be fully dimensioned and other viewers should be able to easily comprehend your ideas.

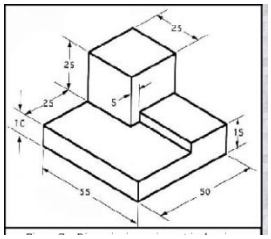
Be the First to Share

Did you make this project? Share it with us!

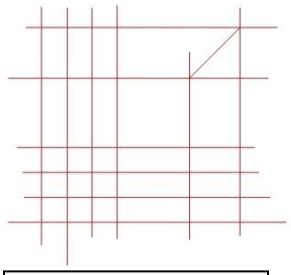


PROJECTION BOX

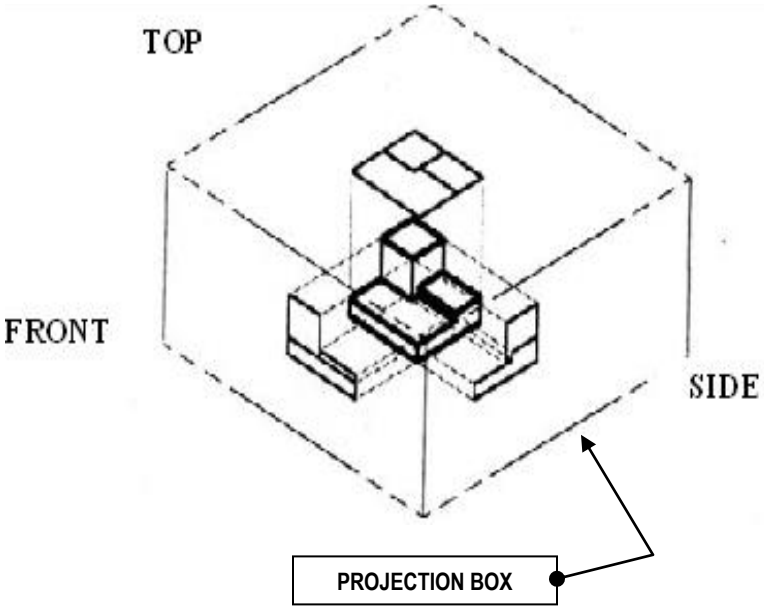
The projection box is an imaginary box wherein the object shall be placed in to easily identify the three principal views needed the **TOP, FRONT** and **SIDE Views. (**shown in the figure /illustration below**)**



PERSPECTIVE



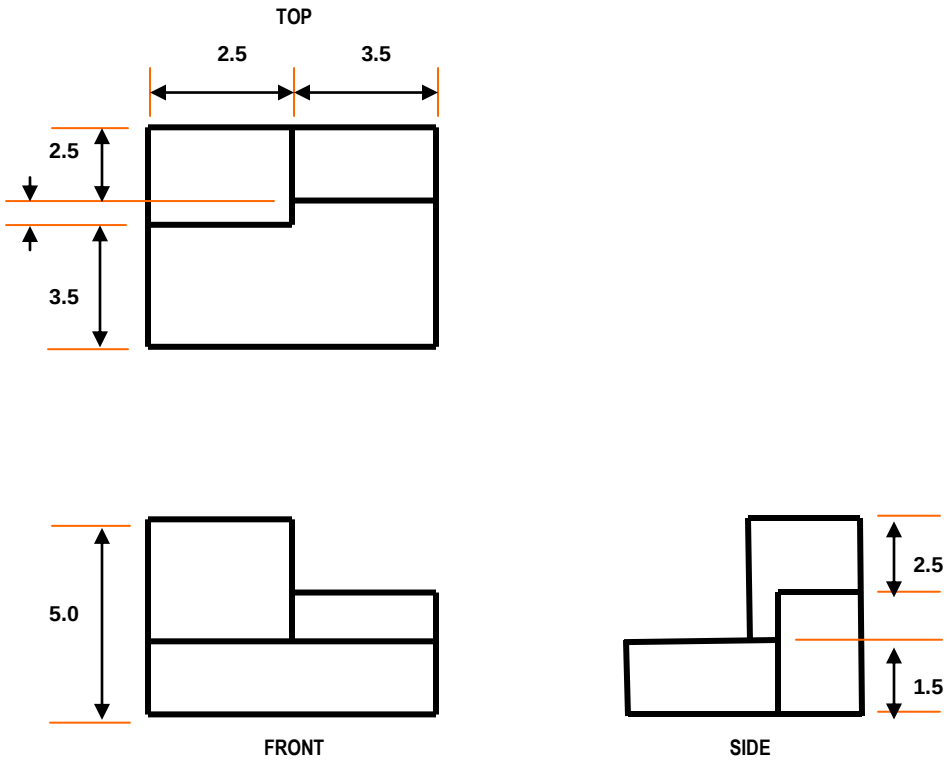
Projection Lines



STEPS IN PROJECTING

Step 1: Identify and illustrate the front view of the object from the base line and project all the lines of the drawn figure.

Step 2: Write all the details needed (measurements and names of the figures), write all the details outside, do not put it in the projection area then erase all the projected lines.

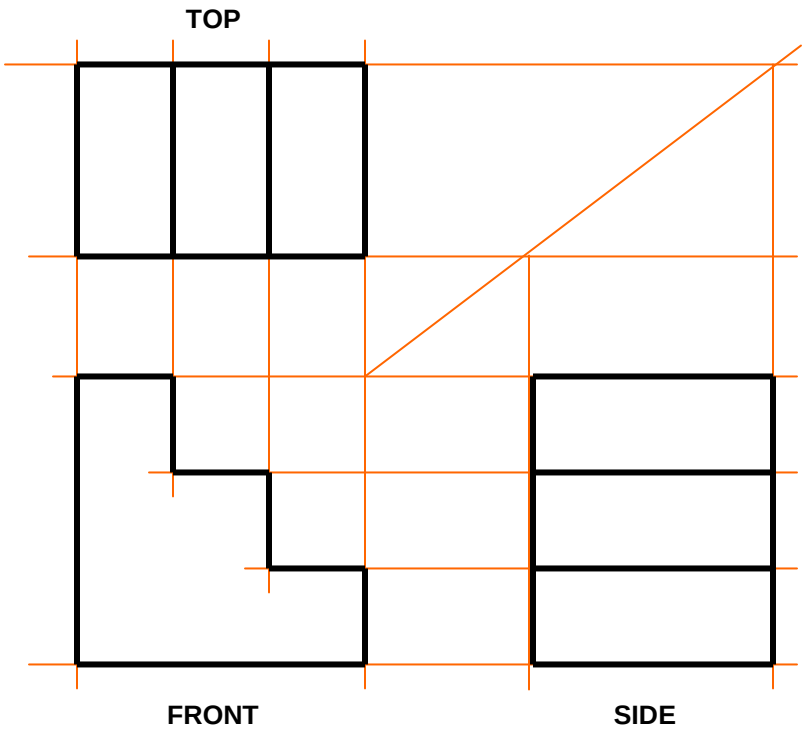


Some measurements are not written, since it may be included in the whole measurement of the object side. An example is on the front and side view. The whole measurement of the height is 5 centimeters; you can use your math for the measurement of the middle section. 1.5 + 2.5 = **4.0,** therefore 5.0 – 4.0 = **1.0** which is the measurement of the middle section of the side view. This system is used to avoid over crowding the area of the details like in the top view.

If the area for writing in the detail of a section, instead of using the inside arrow line you may use the outside arrow line as shown in the top view.

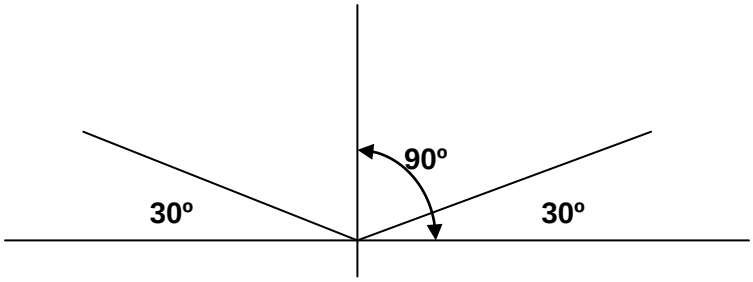
ASSEMBLING THE PARTS

Sometimes there are given parts of an object using the orthographic illustration, your concern will be identifying the perspective figure to complete a task. An example figure below is given to find the perspective.

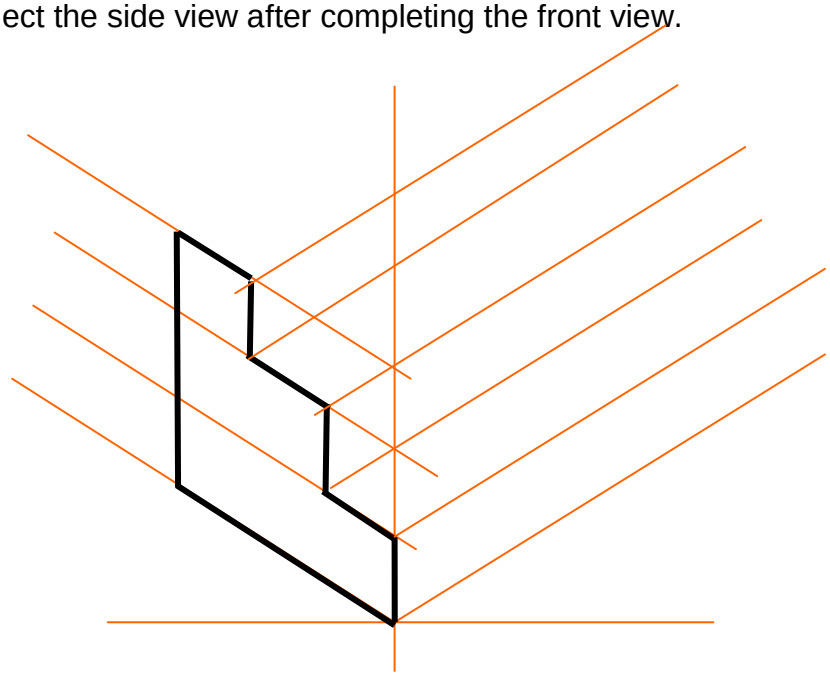


Steps in assembling the parts:

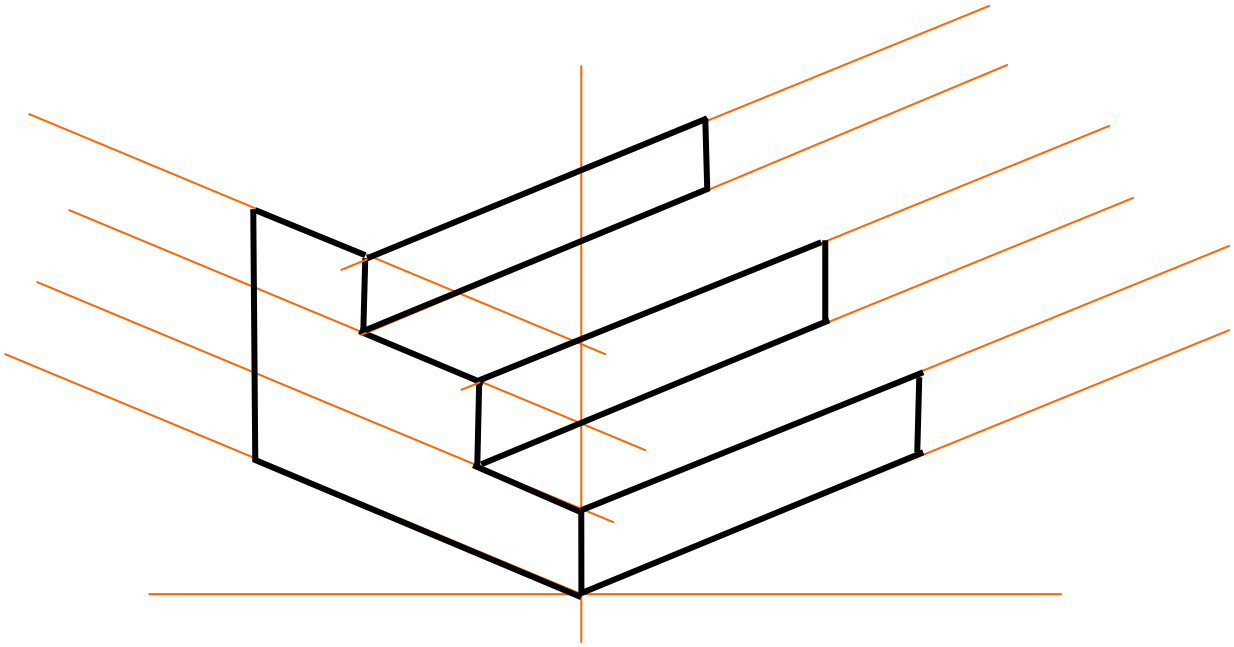
Step 1: Follow the procedures of Isometric drawing. Create first the 30º angles used in creating isometric figures.



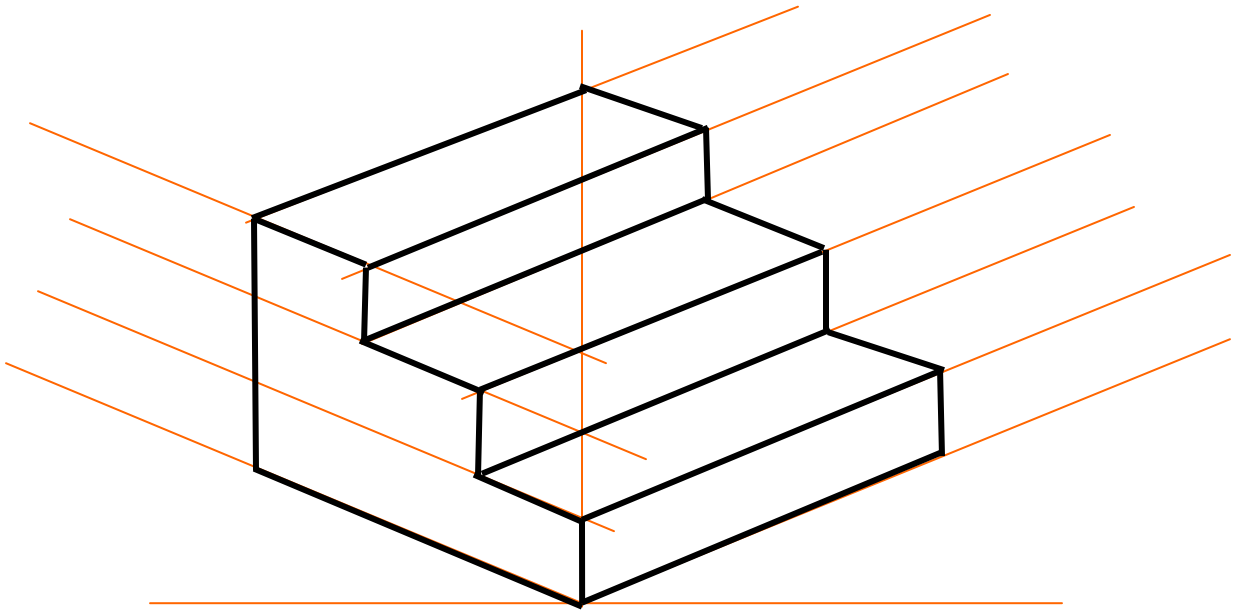
Step 2: Illustrate or draw the FRONT view first, following the given measurements. Project the side view after completing the front view.

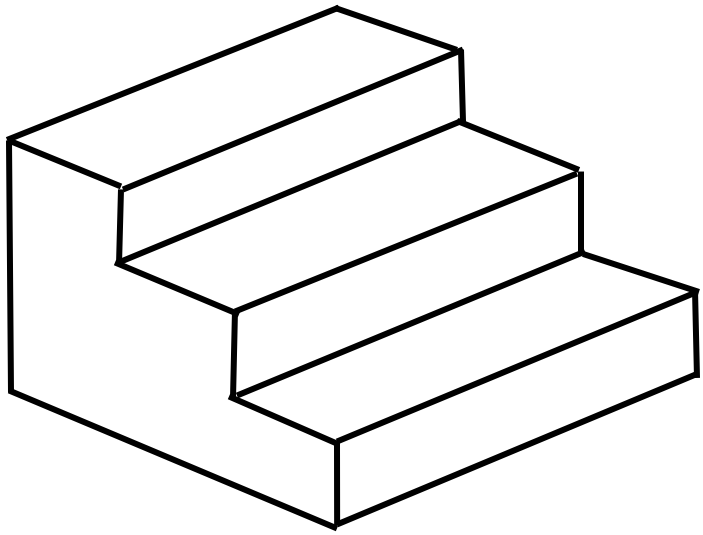


Step 3: Illustrate or draw the SIDE view according to the details or measurements given.



Step 4: Project the remaining lines that will complete the top view. After completing the figure, erase all unnecessary lines or the projection lines.





Self-Check -1	Written Test

Directions: Answer all the questions listed below.

Instruction1:- Identify the Following Lines; write the names of each line in the opposite blank box

Note: **Satisfactory rating - 5 and 10 points Unsatisfactory - below 5 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Operation Sheet 1	Draft a Basic Floor Plan

Procedures for Draft a Basic Floor Plan

Step 1: Engineering Scale Tutorial

Step 2: 1. Sketch Exterior Walls

Step 3: Draw Reference Lines

Step 4: Draw Interior Walls

Step 5: Locate Doors

Step 6: Add Windows

Step 7: Place Cabinets, Kitchen Appliances and Bathroom Fixtures

Step 8: Add Dimension on the Plan

Step 9: Label Rooms

Step 11: Add Title Block

Step 10: Clean It Up

Information Sheet-3	Using Field notes and measures to draw a local area map

This chapter is intended to provide a reference and to act as guidance for the project office in the keeping of Construction Contract Records. While there may be differing needs or circumstances that must also be met within each project office, it is intended that this guidance be used to help identify the minimum requirements that are necessary in order to establish an adequate method of record keeping. These minimum requirements also help to establish a basic level of uniformity among all project offices statewide. This can help to facilitate the review of records by others and promotes greater efficiency when engineering personnel are transferred or reassigned between different projects or even different project offices. If a clear method of record keeping can be identified prior to the beginning of work, then original field notes and records can be easily prepared and maintained as the work progresses. This will also help to reduce the effort required to produce the final contract records upon completion of the project. Successful contract documentation requires that measurements and calculations supporting contract payments are accurate and that records of these actions are complete. Contract records and documentation must be sufficiently detailed and maintained in a manner that will withstand an audit and be clear enough to be read and understood by anyone unfamiliar with the project. The Project Engineer is responsible to ensure that these accurate and complete records are maintained for all construction project work. If questions arise or assistance is needed, the statewide Documentation Engineer and the Regional Documentation Engineer are both available as resources for the Construction Project Office's use.

It is recommended that original field notes be kept in a form that can be filed and retained as basic documentation. Field notes taken on scratch paper and then passed to the office should not be considered as acceptable documentation. Transcription of field notes to final record form should be avoided due to the possibilities of error and the

unnecessary cost of duplication. All personnel are responsible to ensure that notes are made correctly and are complete with all pertinent information. Sample notes have been included with this chapter and are intended as a guide or reference in preparing final record notes. Facsimile machines, scanned documents, and electronic mail are normal business practices in most state and private offices. It is acceptable to take action on these types of correspondence; however, in order to properly document and follow the conditions noted in the contract, exchanging or mailing original copies of the documents should follow up all facsimile, scanned documents, and electronic mail. This is especially true for any item that requires a commitment by either the Contractor or the Washington State Department of Transportation (WSDOT). Follow-up mail copies are required for all issues that require an original signature. Documents which must stand up in a court of law or meet the requirements of a State or Federal Audit require a signature.

Requirements for Notes Documentation of contract items that are not specifically covered by the sample field notes can, in most instances, be created using the examples as a guide for similar items. The following notations should be carefully observed for correct procedure:

1) Each set of notes should contain the date when they were made and the initials of the persons making them.

2) Each set of notes, except staking notes, should contain the date when the phases of work are accomplished, the initials of the persons who compute and check the quantities noted, the dates when the quantities were computed, the dates when the computations were subsequently checked, the locations where the work was performed, and the corresponding group number.

3) When field notes are used as the basic source document in supporting a payment to the Contractor, they must include the date and initials of the person

making the entry into the project ledger, the person verifying the entry, and the six-digit entry number.

4) Each pay quantity identified in the field notes should be designated with the corresponding item number and correct item name listed in the contract.

5) It is recommended that the correct field book or loose leaf sheet always be used for the particular kind of work being staked or measured.

6) The degree of accuracy required for computing unit quantities should be consistent with standards established in Section.

7) It is recommended that sets of field notes and field books be numbered and titled in order to prevent their loss and to aid in tracking payments and their supporting information

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

Instruction1.saytrue

_____ 1. Each set of notes should contain the date when they were made and the initials of the persons making them. (2points) true/false

_____2. It is recommended that the correct field book or loose leaf sheet always be used for the particular kind of work being staked or measured. (2points) true/false

Note: **Satisfactory rating - 2 and 4 points** **Unsatisfactory - below 2outof 4 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Information Sheet-4	Interpreting and locating Legend on project drawings, and symbols and abbreviations.

3.1. Legend on projects

Ensure that civil construction plans and specifications can be interpreted correctly, a legend is necessary to explain all the symbols and abbreviations at have been used. The legend will be clearly displayed with its title, usually a corner of the drawing sheet or where appropriate, sometimes it appears on multiple pages or sheets. May appear in color or plain text, depending on the sign of the drawings

Some plans and drawings may include other features of the site
Other buildings may be shown along with tanks, landmark objects or built-up areas.

Drawings may also show the sections of land subject to inundation, or roads under construction.

These features will all be indicated by a symbol in the legend along with its corresponding meaning.

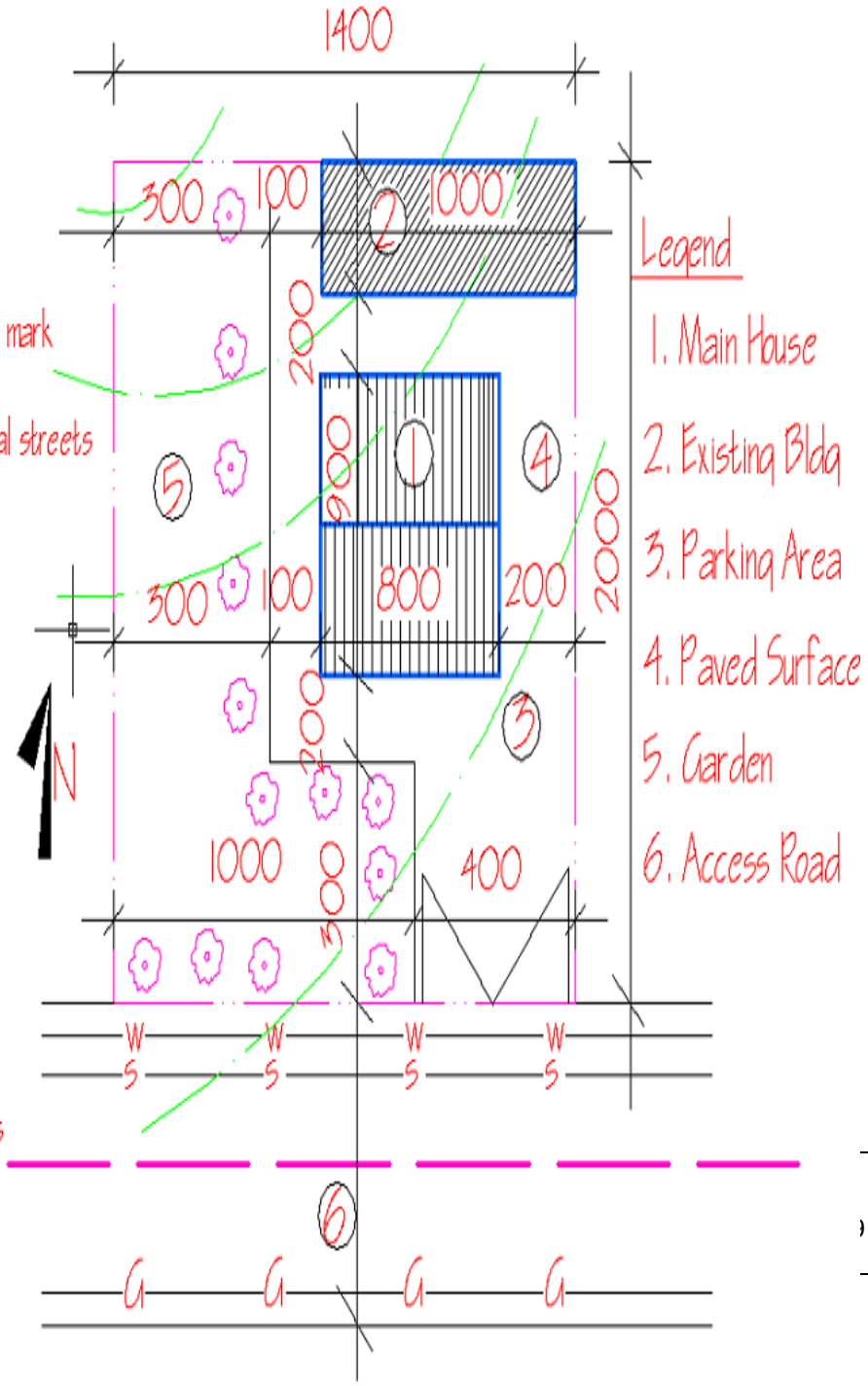
Legends on projects must contain

- The name of the company, organization or design authority from which the drawing originates.
- The title or name of the drawing.
- The drawing number.
- A record of the information relative to the preparation of the drawing. This information could include the names of the draftsperson, checker and approving authority. It might also include a contractor's name and reference number.
- A code number identifying the particular division or department within the design authority responsible for the drawing.
- The drawing sheet size.
- The predominant scale of the drawing.

- This space is reserved for miscellaneous information such as modification number, the sheet number for multi sheet drawings, or the estimated mass of the item.
- Additional blocks for other general information such as dimensions and tolerances notes, material notes, or surface finish requirements, should be placed in this area.

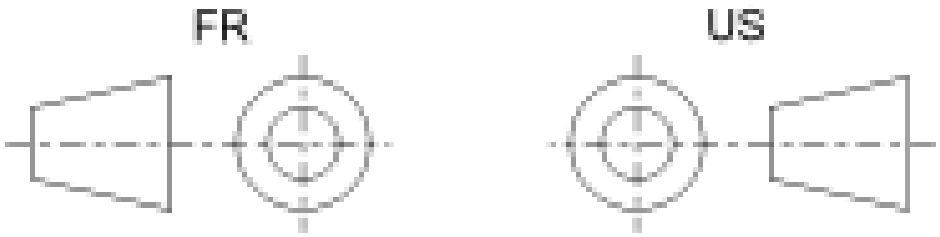
Check list :

- site boundary
- north arrow & scale
- location and description for bench mark
- identification and dimension of local streets
- dimension:
  - site boundary
  - among blocks on site
  - set backs
  - local street
- contour lines
- utility lines
- site pedstrian and vehicular roads
- site plants
- site water features



. **Construction terminology**

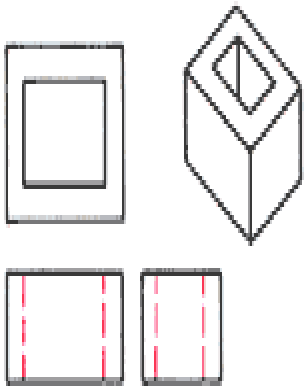
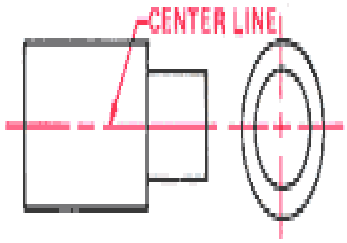
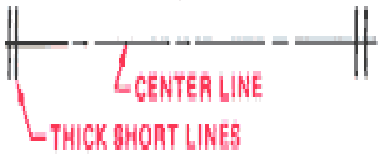
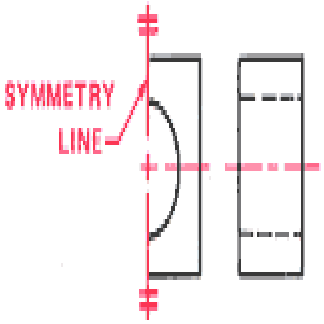
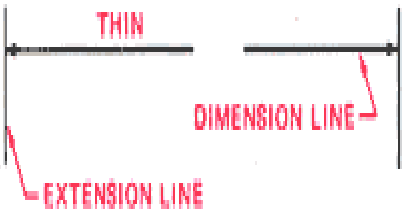
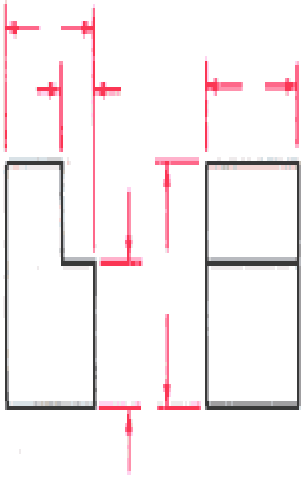
- **Projections Symbols**

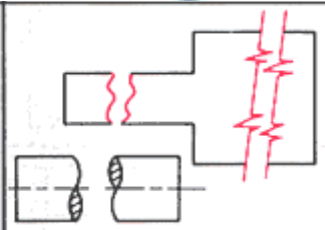
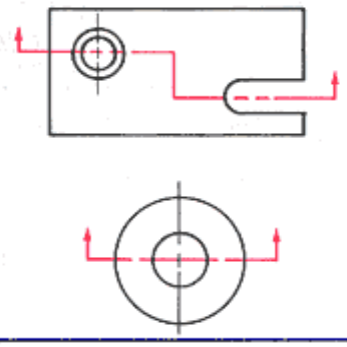
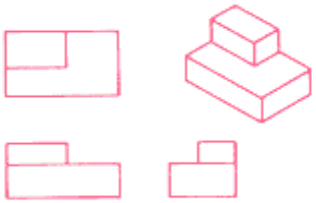
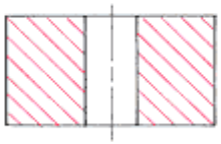
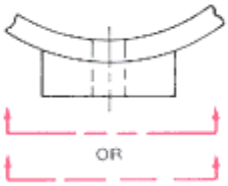
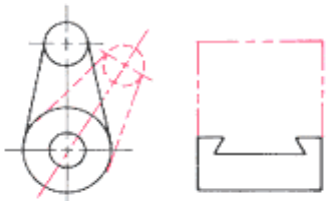


Symbols used to define whether a projection is either Third Angle (right) or First Angle (left).

- **<u>Line symbol</u>;**

To ensure correct communication between people of drawings, standards must be established. Standards include projection methods, terminology, dimensioning and symbols. Line has a definite meaning and sense to convey.

TYPE OF LINE	APPLICATION	DESCRIPTION
HIDDEN LINE THIN		THE HIDDEN OBJECT LINE IS USED TO SHOW SURFACES, EDGES, OR CORNERS OF AN OBJECT THAT ARE HIDDEN FROM VIEW.
CENTER LINE THIN ALTERNATE LINE AND SHORT DASHES		CENTER LINES ARE USED TO SHOW THE CENTER OF HOLES AND SYMMETRICAL FEATURES.
SYMMETRY LINE 		SYMMETRY LINES ARE USED WHEN PARTIAL VIEWS OF SYMMETRICAL PARTS ARE DRAWN. IT IS A CENTER LINE WITH TWO THICK SHORT PARALLEL LINES DRAWN AT RIGHT ANGLES TO IT AT BOTH ENDS.
EXTENSION AND DIMENSION LINES 		EXTENSION AND DIMENSION LINES ARE USED WHEN DIMENSIONING AN OBJECT.
LEADERS		

BREAK LINES THIN LONG BREAK THICK SHORT BREAK		BREAK LINES ARE USED WHEN IT IS DESIRABLE TO SHORTEN THE VIEW OF A LONG PART.
CUTTING-PLANE LINE THICK OR		THE CUTTING-PLANE LINE IS USED TO DESIGNATE WHERE AN IMAGINARY CUTTING TOOK PLACE.
VISIBLE LINE THICK		THE VISIBLE LINE IS USED TO INDICATE ALL VISIBLE EDGES OF AN OBJECT. THEY SHOULD STAND OUT CLEARLY IN CONTRAST TO OTHER LINES SO THAT THE SHAPE OF AN OBJECT IS APPARENT TO THE EYE.
SECTION LINES THIN LINES		SECTION LINING IS USED TO INDICATE THE SURFACE IN THE SECTION VIEW IMAGINED TO HAVE BEEN CUT ALONG THE CUTTING-PLANE LINE.
VIEWING-PLANE LINE THICK OR		THE VIEWING-PLANE LINE IS USED TO INDICATE DIRECTION OF SIGHT WHEN A PARTIAL VIEW IS USED.
PHANTOM LINE THIN		PHANTOM LINES ARE USED TO INDICATE ALTERNATE POSITION OF MOVING PARTS, ADJACENT POSITION OF MOVING PARTS, ADJACENT POSITION OF RELATED PARTS, AND REPETITIVE DETAIL.

1.2 construction Symbols and Abbreviations

Symbols: the representation of actual object by some notation which convey the necessary information.

- **Architectural symbol & Abbreviation**

HCB – Hollow concert block

GIS – Galvanized iron sheet

T—Double shutter
W—Window
CB—Concert Block
CIS-- Corrugated iron sheet

S—Single shutter
D—Door
FF—Floor Finishing
Ar= architectural

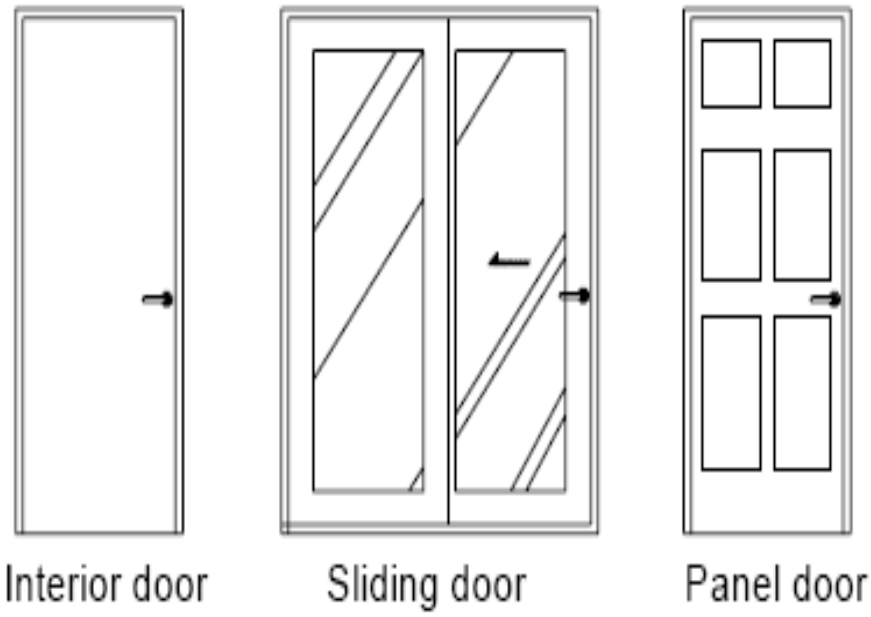


Figure 9. Examples of door symbols in plan view

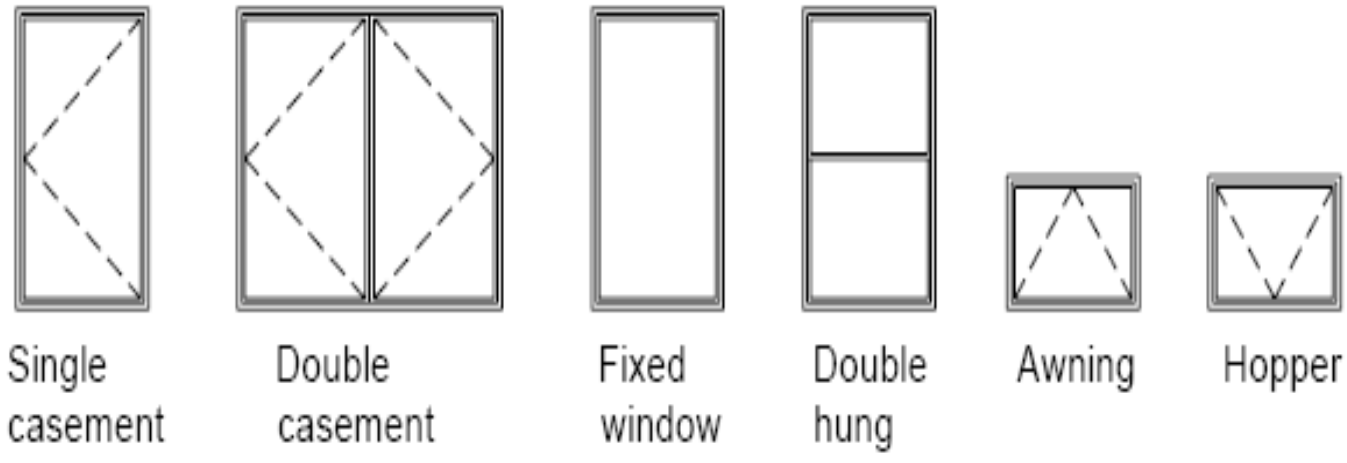
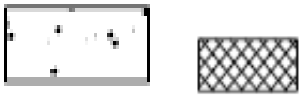


Figure 10. Examples of window symbols in elevation view

- **Structural symbol & abbreviation**

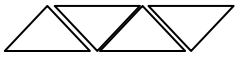
= no of bar,

Ø = diameter,



Column, beam & lintel

———— Bottom bar



Hard core symbol

F=footing C=column IB= intermediate beam

UB=upper tie beam GB= grade beam S=slab L=lintel

FC= footing column J= joists C/C= center to center

RCC-—reinforcement cemented concert

- Saniterial symbol & abbreviation

SN=sanitary	PVC—Poly Vinyl Chloride	V—ventilation
WC- Water Close	BT - Bath Tub	D- Dryer
BD- Bidet	AV- Air Vent	UR - Urinal
S- Sink	KS- Kitchen Sink	SH- Shower
RCP- Reinforced Concert Pipe	FD- Floor Drain	B- Boiler

HWB- Hand Wash Basin CW- Cold Water HW- Hot Water
WH- Water Heater MH- Man Hole ST - Septic Tank
W – Washer

SYMBOLS FOR PIPE LINES AND OTHER

PIPE LINE AND ATHER	SYMBOLS
COLD WATER SUPPLY PIPE	
HOT WATER SUPPLY PIPE	
HOT &COLD WATER SUPPLY LINE	
SEWERAGE PIPE	
GAS LINE	G G
CHANGE OF PIPE DIAMETER	20|25
PIPE SLEEVED	
COUPLING	
THREE WAY VALVE	
HOSE BIB	
VENT PIPE	
RAIN WATER PIPE	RWP
Vent pipe or soil and vent pipe	S&VP VP
Discharge pipe	DP
Rodding eye or cleaning eye	RE/CE
Cold water storage tank	CWST
Gas water heater	GWH
Gully	G
Intercepting trap	IT
Fresh air inlet	FAI
Calorifier(indirect)cylinder	
Draining tap	DT
Cold and hot water drawoff	
Water pump	
Boiler	B
Man hole	MN
Floor drain	OR
Water meter	M

- **Electrical Symbol & abbreviations**

Shown below are some symbols currently found on plans? Common abbreviations are listed in *below*.

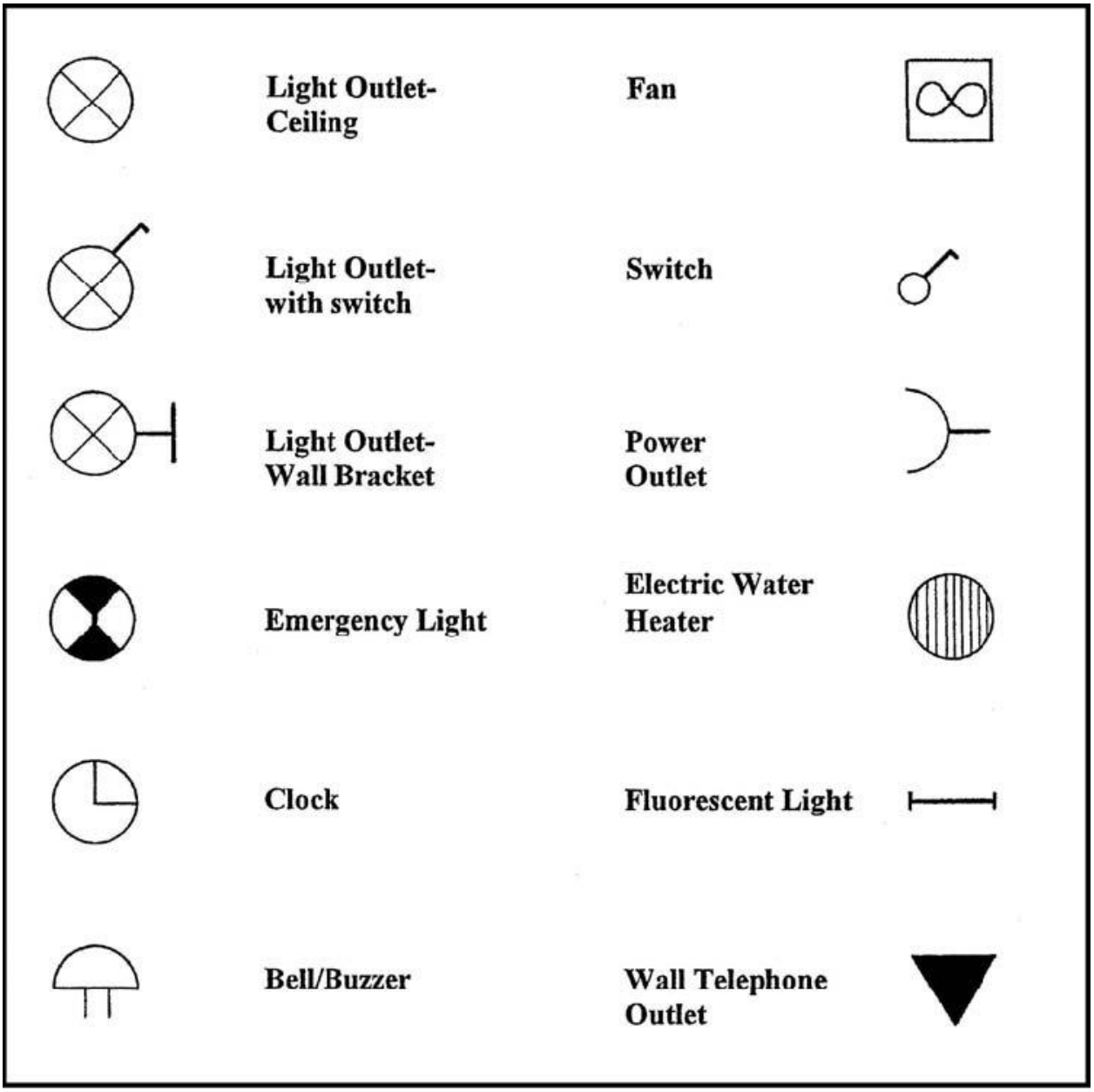


Figure 39: Electrical Symbols

Self-Check -4	Written Test

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

_____ 1.Which one of the following the symbol of Concert Block? (2points)

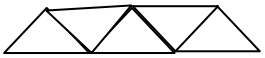
A. CIS C. CB

B. HCB D. C

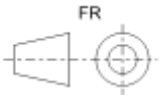
_____2.Which one of the following is the symbol of diameter? (2points)

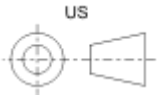
a) # B. Ø C.  D. 

_____3. Which one of the following is the symbol of Bottom bar? (2pints)

A. B.  C.  D. 

_____4. One of the following is the symbol of third angel projection? (2points)

A. 

B. 

C.  D.  E .all

5. One of the following is not included in legend of projects? (2points)

A. The drawing sheet size. B. The predominant scale of the drawing

C. The title or name of the drawing. D. The drawing number. E.none.

Note: **Satisfactory rating - 5 and 10 points** **Unsatisfactory - below 5outof 10 points**

You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____

Rating: _____

Module answer Self check #2

Self check #1

1. A
2. A
3. D
4. A

Self check #2

1. Center line
2. Short break
3. Cutting plane
4. Phantom line
5. Steel
6. Dimension line
7. line White metal
8. line Leader line
9. Long break line
10. Extension line

Self check #3

1. False

2. true

Self check #4

1. B

2. B

3. A

4. B

5. A