

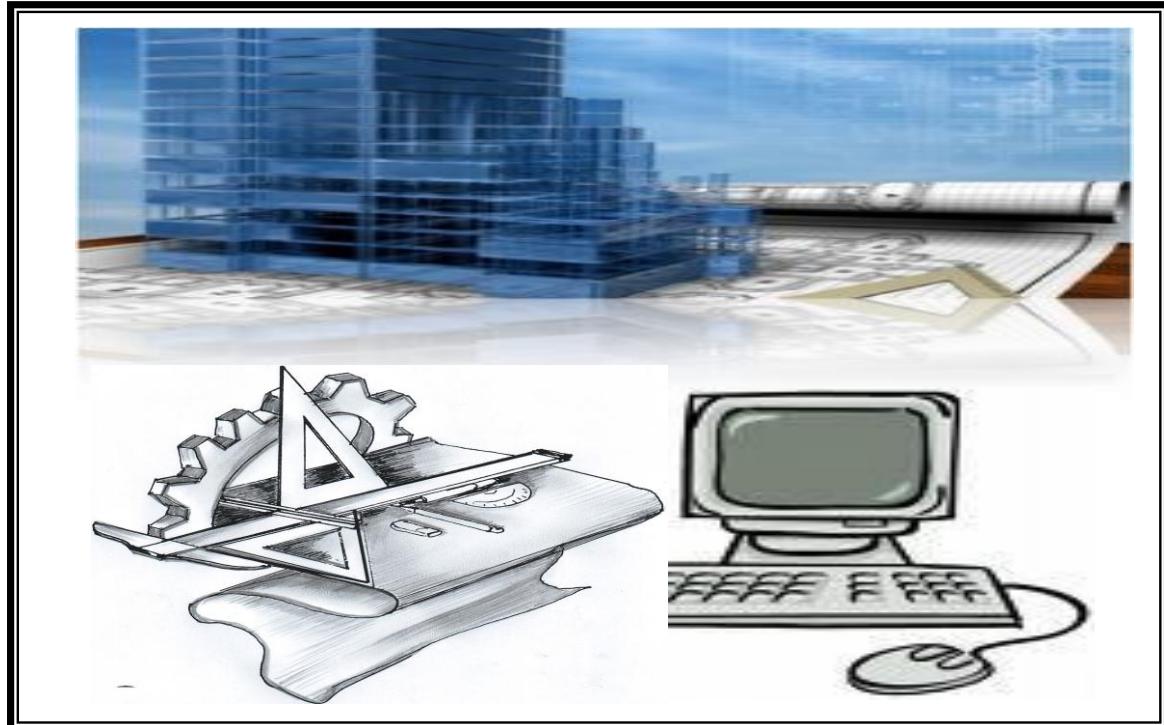


Republic of the Philippines  
Department of Education  
PUBLIC TECHNICAL-VOCATIONAL  
HIGH SCHOOLS



# COMPETENCY-BASED LEARNING MATERIAL

## THIRD YEAR



# DRAFTING TECHNOLOGY

Unit of Competency: *Draft Architectural Layout and Details*

Module No.: 1

Module Title: *Drafting Architectural Layout and Details*

## **AKNOWLEDGEMENT**

We, the teachers assigned to work on the **Competency Based Curriculum (CBC) and Contextual Learning Material (CLM) and Competency - Based Learning Modules (CBLM)** particularly in **TECHNICAL DRAFTING**, wish to express our gratitude and appreciation for having been given the chance to take part in this educational breakthrough. With high hopes we look forward to the improvement of the Technical-Vocational Education of the country through the development of functional materials such of these kinds.

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## **HOW TO USE THIS MODULE**

Activities are properly arranged in this module to help you work at your own pace. This module also covers the knowledge, skills, and proper attitude you need in Technical Drafting.

A pre-assessment precedes the learning activities in each module to determine your level and need.

The learning activity page gives the sequence of the learning task. This page serves as the road map in achieving the desired objectives.

After you accomplished all the tasks required, a post assessment is given to check if you are already competent with the specified learning outcome/s and be ready for the next task.

Definitions of terms are provided in this module for your better understanding.

**Program/ Course** : **DRAFTING TECHNOLOGY**  
**Unit of Competency** : **DRAFT ARCHITECTURAL LAYOUT  
AND DETAILS**  
**Module Title** : **Drafting Architectural Layout and Details**

## **INTRODUCTION**

Architectural layout and detail drawings are designed to develop the technical skills and technical know-how of the students in architectural drafting works. Students will learn to interpret and fully understand the standard procedure in layouting and detailing of architectural working plans and drawings.

This module covers how to prepare students learn to draw a complete set of architectural working drawings.

## **SUMMARY OF LEARNING OUTCOMES**

Upon completion of this module, you should be able to:

- LO1** Plan and prepare for work
- LO2** Prepare and set up tools and materials for drawing
- LO3** Draft Site Development Plans
- LO4** Draft Floor Plans
- LO5** Draft Roof Plans
- LO6** Draft Ceiling Plans
- LO7** Draft Elevations and Sections
- LO8** Prepare Presentation Drawings

## TECHNICAL TERMS

**Blueprint** is a reproduced drawing of architectural plans and layout.

**Ceiling** is the overhead surface of a room or the material used to line the surface.

**Code** is a system of accepted laws and regulations that govern procedure or behavior in particular circumstances or within a particular profession

**Elevation drawing** is the exterior and interior works of a building. It is a perpendicular or upright projection from the floor plan to show vertical architectural or design details

**Floor Plan** is an orthographic projection of the floor of a building or a house.

**Perspective** is a drawing angle from which an object or structure is viewed.

**Plan** is a drawing or diagram on a horizontal plane of the layout or arrangement of something.

**Revision** is an act of changing or revising.

**Roof Plan** is a roofing plan presenting roof types used.

**Scaling** refers to enlarging or reducing the drawing using architect's scale.

**Sections** are drawings of an object as though they were cut in order to expose the interior construction.

**Site** is an area of land available for construction or the lot on which a building is constructed. A building sites maybe a single lot, a series of *lots*, or a subdivision. A *lot* is a piece of ground of specific size. A *subdivision* is a large tract of land that is being developed.

**SITE DEVELOPMENT PLAN or Lot Plan** refers to the position and the location of the building with property line, setbacks, approaches, grade contours, landscape and other pertinent data in relation to the site.

**Working drawing** is a finished plan drawing containing complete information for the workmen.

**Program / Course** : **DRAFTING TECHNOLOGY**  
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**Module Title** : **Drafting Architectural Layout and Details**

**Learning Outcome 1** **Plan and prepare for work**

**Assessment Criteria:**

1. Drawing tools, materials, and equipment are identified based on job requirements.
2. Elements of architectural working drawings are identified and explained.
3. Work instruction is secured following standard operating procedures.
4. Blueprint is interpreted according to architectural layout, drawing or job requirements.

**References:**

Earnest R. Weidhaas. Architectural Drafting and Design 4<sup>th</sup> Edition

Paul I. Wallach. Basic Architectural Drafting, 1982

French and Vierck. Engineering Drawing; MacGraw, Hill Book Company, 10<sup>th</sup> Edition: 1960

Emmanuel P. Cuntapay. Implementing Rules and Regulation of the National Building Code of the Philippines (PD 1096), 2005

German M. Manaois. Drafting 1 and 2; Phoenix Publishing: 1983

Norman Stirling. Introduction to Technical Drawing, Delmar Publishing, 1977

## **LEARNING EXPERIENCES/ ACTIVITIES**

<b>Learning Outcome 1: Plan and Prepare for Work</b>	
<b>Learning Activities</b>	<b>Special Instruction</b>
<p>1. Read information sheet no. 1.1 about drawing tools, materials and equipment.</p> <p>2. Answer Self-Check no 1.1</p> <p>3. Read information sheet no. 1.2 about architectural working drawings</p> <p>4. Answer Self-Check 1.2</p> <p>5. Read Operation Sheet no. 1.2-1.</p> <p>6. Answer Self-Check 1.2-1</p> <p>7. Read information sheet no. 1.2-2 to 1.2-12 about architectural working drawings</p> <p>8. Answer Self-Check 1.2-2 to 12</p> <p>9. Read information sheet no. 1.3. about company rules and regulations and Standard Operating Procedures (SOP)</p> <p>10. Answer Self-Check no. 1.3</p>	<ul style="list-style-type: none"> <li>• Remember important tools, materials and equipment</li> <li>• Try to answer the self-check</li> <li>• Take note of the details of the drawings</li> <li>• Remember architectural abbreviations and symbols</li> <li>• Interpret blueprint reading</li> <li>• Determine tools and materials used in working drawings</li> <li>• Try to answer the self-check 1.2</li> <li>• Determine tools and materials used in working drawings</li> <li>• Try to answer the self-check 1.2-1</li> <li>• Remember architectural abbreviations and symbols</li> <li>• Interpret blueprint reading</li> <li>• Determine tools and materials used in working drawings</li> <li>• Try to answer the self-check 1.2-2 to 12</li> <li>• Try to answer the self-check</li> </ul>

## **INFORMATION SHEET 1.1**

**LO1** Plan and prepare for work

### **Review on drafting tools, materials and equipment, their uses and care**

Most architectural drafting works generally consist of freehand and mechanical drawings. As such, the learner must know how to plan and prepare carefully all drafting tools, materials, and equipment needed for the required work or job.

It is presumed that all students are already aware on the tools and materials needed in drafting works considering their prior learning in the previous year level. However, it is necessary to review their previous learning to prepare them for higher drafting activity.

### **Architectural drafting tools, materials and equipment**

#### **A. Tools:**

1. Drawing pencil
2. Mechanical Pencil
3. Erasing shield
4. Protractor
5. Triangular Scale
6. French curve
7. Penknife or Pencil Sharpener
8. Compass
9. Dusting brush
10. Technical Pen
11. Templates
12. Leroy lettering pen
13. Tape rule/Pull-push rule

**B. Materials:**

1. T-square Parallel rule
3. Triangle Drawing paper
4. Tracing paper
5. Masking tape
6. Eraser
7. Sandpaper Block

**C. Equipment:**

1. Drawing board/table
2. Drawing stool

The importance, uses and maintenance procedure of these tools, materials and equipment has been discussed in the previous modules. It is presumed therefore that you are now ready for a series of drafting activities.

## **ACTIVITY SHEET # 1.1**

### **LO1. Plan and prepare for work**

#### **Situation:**

Group the students into four and allow each group to assign its leader and reporter. Each group must be provided with one (1) sheet manila paper and a piece of pentel pen. Gather all the drafting tools and materials and display them on the table.

#### **Activity:**

1. Give 10 minutes to each group to list down on the manila paper all the displayed tools and materials according to its classifications. Allow them to discuss its importance and uses in drafting and drawing activity considering their prior learning in the previous modules.
2. Another 5 minutes is allotted to each group to report its respective outputs.
3. Each group is required to evaluate and give comments on the output of the assigned reporter according to the following criteria:
  - a. Identification of tools according to each classification.....40%
  - b. Presentation.....30%
  - c. Delivery.....30%

## **SELF CHECK 1.1**

### **LO1. Plan and prepare for work**

Directions: Identify what is referred to in each number. Write your answer on a separate sheet of paper.

- \_\_\_\_\_ 1. An instrument used for drawing vertical and oblique lines.
- \_\_\_\_\_ 2. An instrument used for dividing lines or distance into equal parts.
- \_\_\_\_\_ 3. Used for marking out distances, as well as, measuring purposes.
- \_\_\_\_\_ 4. A flat piece of plastic with standard symbols and used as guide for drawing images on plans.
- \_\_\_\_\_ 5. Used to hold and fasten drawing paper on the drawing board.
- \_\_\_\_\_ 6. Most common grade of pencil used in architectural drawing.
- \_\_\_\_\_ 7. Used to draw arcs and circles.
- \_\_\_\_\_ 8. Used to draw horizontal lines and serves as guide for triangles.
- \_\_\_\_\_ 9. A thin transparent paper used for reproduction in blueprint.
- \_\_\_\_\_ 10. Instrument used to reduce or enlarge measurement and distances and for transferring measurement to the drawing paper.
- \_\_\_\_\_ 11. Used in place of the standard drawing board and T-square.
- \_\_\_\_\_ 12. A high technology machine for drawing purposes.
- \_\_\_\_\_ 13. Used to remove smears of pencil and ink lines.
- \_\_\_\_\_ 14. A pen used for inking mechanical lines.
- \_\_\_\_\_ 15. Instrument used for measuring degree angle.
- \_\_\_\_\_ 16. Used to sharpen pencils into desired lead point.
- \_\_\_\_\_ 17. A thin sheet of metal used when erasing pencil and inked lines to protect other drawing lines.
- \_\_\_\_\_ 18. It helps pencil lead into a conical shape points.
- \_\_\_\_\_ 19. It is used in setting a line degree angle.
- \_\_\_\_\_ 20. Serves as substitute instrument in sharpening a pencil into desired points.

## **INFORMATION SHEET 1.2**

### **LO1. Plan and prepare for work**

#### **ARCHITECTURAL WORKING DRAWINGS**

The architectural working drawings together with the specifications are the most important parts of the documents constituting the contract. Information on the designs, locations, and dimensions of the elements of a building is found on the architectural working drawings while information on the quality of materials and workmanship is found in the specifications. A good architectural working drawing gives the contractor the exact information he needs. It should be clear, simple, and orderly arranged, and accurately drawn so that scaled measurements will match with dimensions.

The finished drawings made by the architect, or draftsman and used by the contractor are called architectural working drawings. The architectural working drawings, together with the specifications and the general conditions, form the legal contract between the owner and the contractor. Since the working drawings are a major portion of the contract documents, they should be very carefully drawn.

Students will be able to interpret, identify tools and materials used in working drawings and fully understand the standard procedure in layouting and detailing architectural working plans and drawings.

## **Elements of Architectural working drawing**

A complete architectural working drawing of a house generally includes the following:

### *1. Architectural sheets*

- a. Sheet # 1** - Title page and index (Exterior perspective, site development plan or plot plan, and vicinity map or location plan is often included in the plan).

**PERSPECTIVE** is the view as seen by the eyes or it shows the appearance of the finished building. This drawing represents the actual form of the proposed building. (*See perspective on the next page*).

**SITE DEVELOPMENT PLAN** is the outline and measurements of the proposed building and its placement on the property. It shows the position and the location of the building with property line, setbacks, approaches, grade contours, landscape and other pertinent data in relation to the site. A site development plan is drawn using a scale not smaller than 1:200 meters. (*See site development plan on the next page*.)

**LOCATION PLAN** is the top view of the site or lot where the proposed house will be built. It shows the position of the house inside the lot, the number of the adjacent lots, streets or lanes before or beside the lot, and the North sign. The location plan is usually located near the title block. The main line symbol of the North sign is generally parallel to the side border line of the drawing paper and points upward.

*Sheet # 1*

# **SAMPLE BLUEPRINT OF A ONE-STOREY HOUSE**

**Title Page and Index** generally includes title block, table of contents, labels, and the name of the duly licensed and registered Geodetic Engineer who approves the lot survey plans.

### **Title Block in House Plan**

The title block in house plans includes the following information:

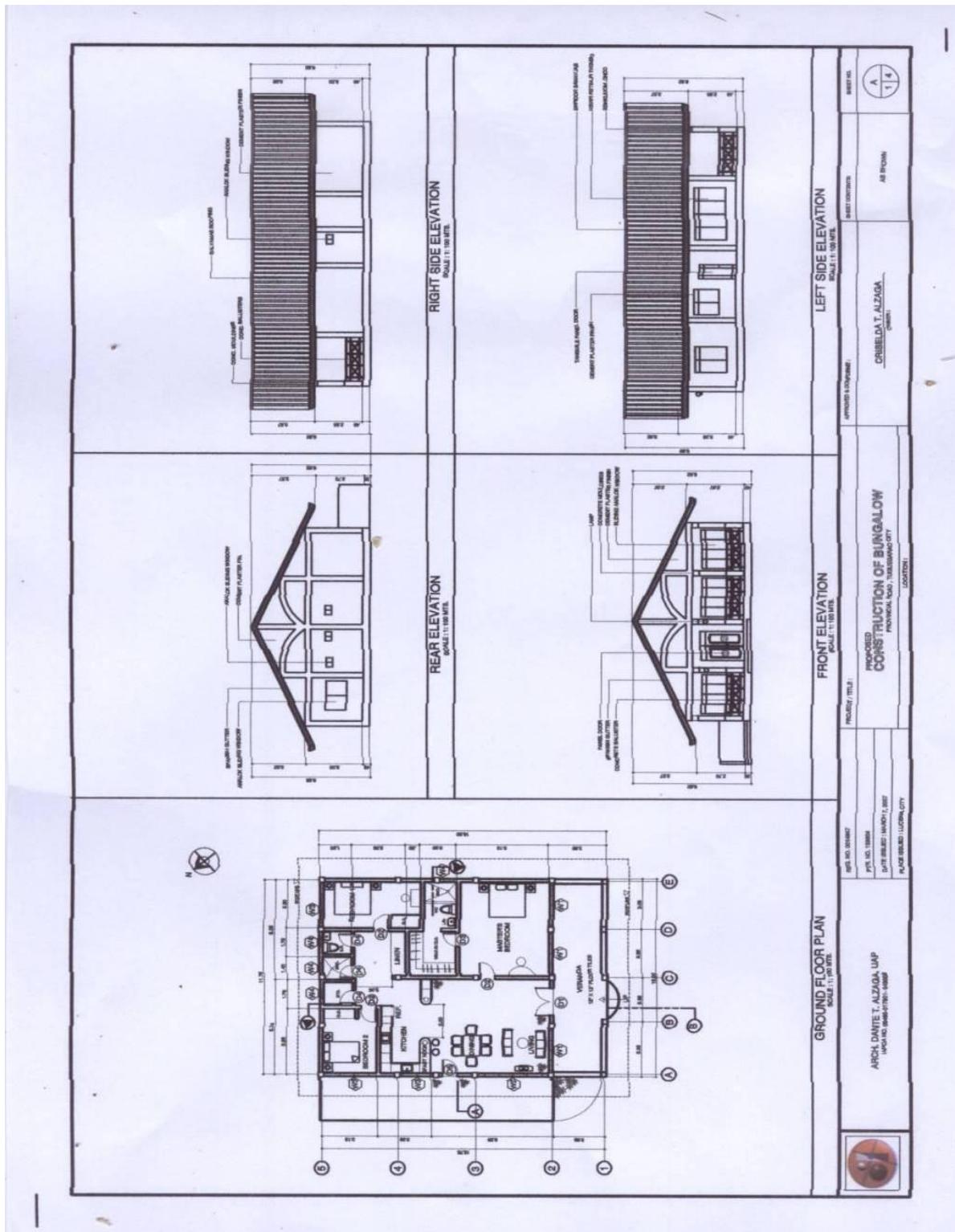
1. Owner's name
2. Location or address of the proposed house
3. Lot and block numbers
4. Signature of architect or civil engineer who approves the plan
5. Draftsman's name or initials
6. Date when plan was drawn or completed
7. Scale as shown

*(See title block in sheet #1)*

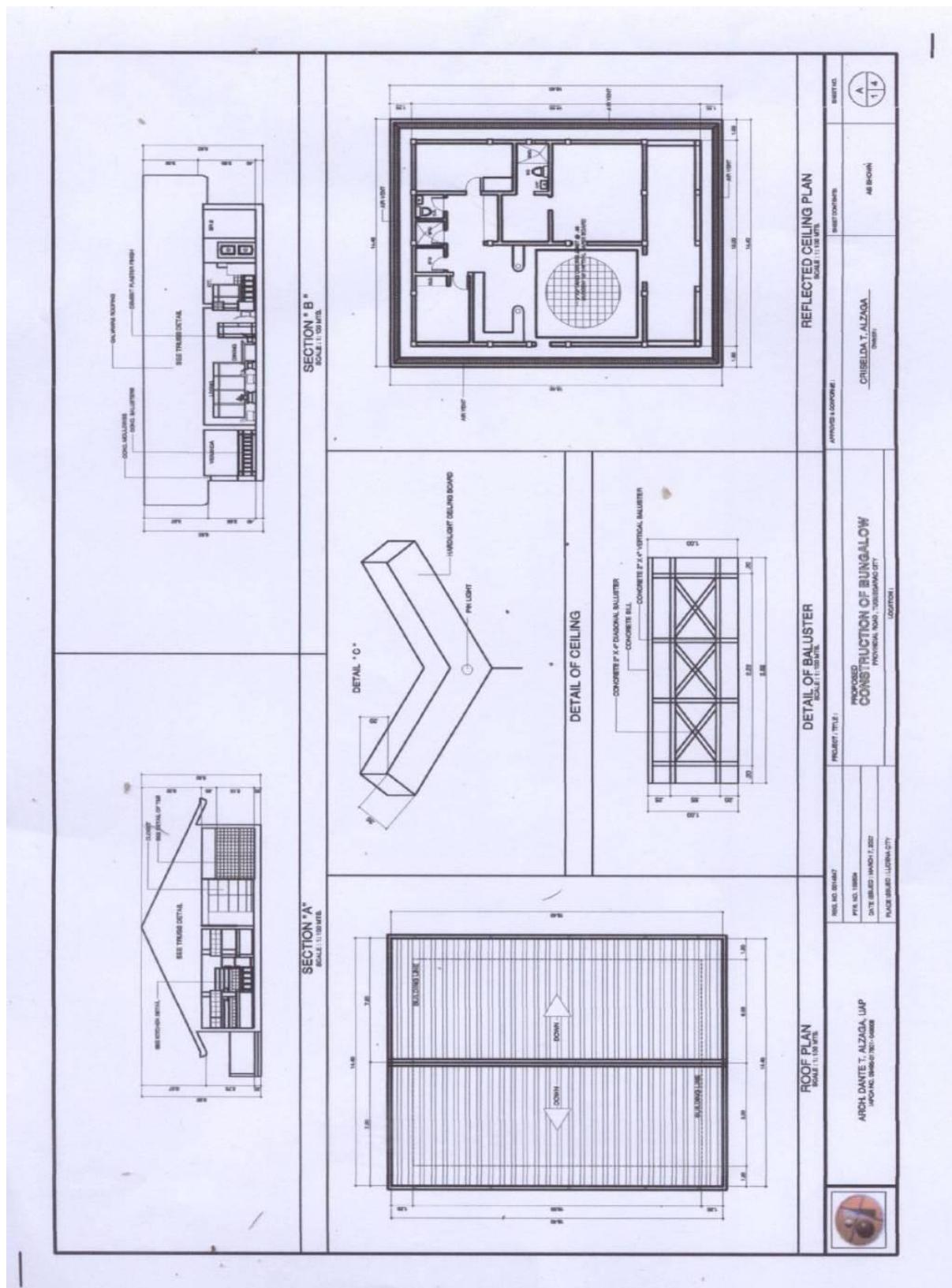
**b. Sheet # 2 – Floor plan, of a 2 Storey House. It includes the Ground Floor Plan and Second Floor Plan) with complete Elevation.**

**FLOOR PLAN** is the top view of the floor area of a house. The cutting plane line for this top view passes between the upper and lower window sills. It represents the arrangement of rooms, doors, windows and other features located in the floor plan.

**ELEVATION** is the front or side view of a building. It shows the design of the house, height dimension, materials finish and complete information on specification.



### Sheet # 3 - Sections, Roof Plan, and Reflected Ceiling Light



**SECTION** is the view showing the inside part of the building either in cross- section or longitudinal section.

**ROOF PLAN** is one showing the outline of the roof and the major object lines indicating ridges, valleys, hips, and openings.

**REFLECTED CEILING PLAN** is the complete plan design of house ceiling.

**BALUSTER DETAIL** is the detail of the vertical railing along a staircase or balcony railing.

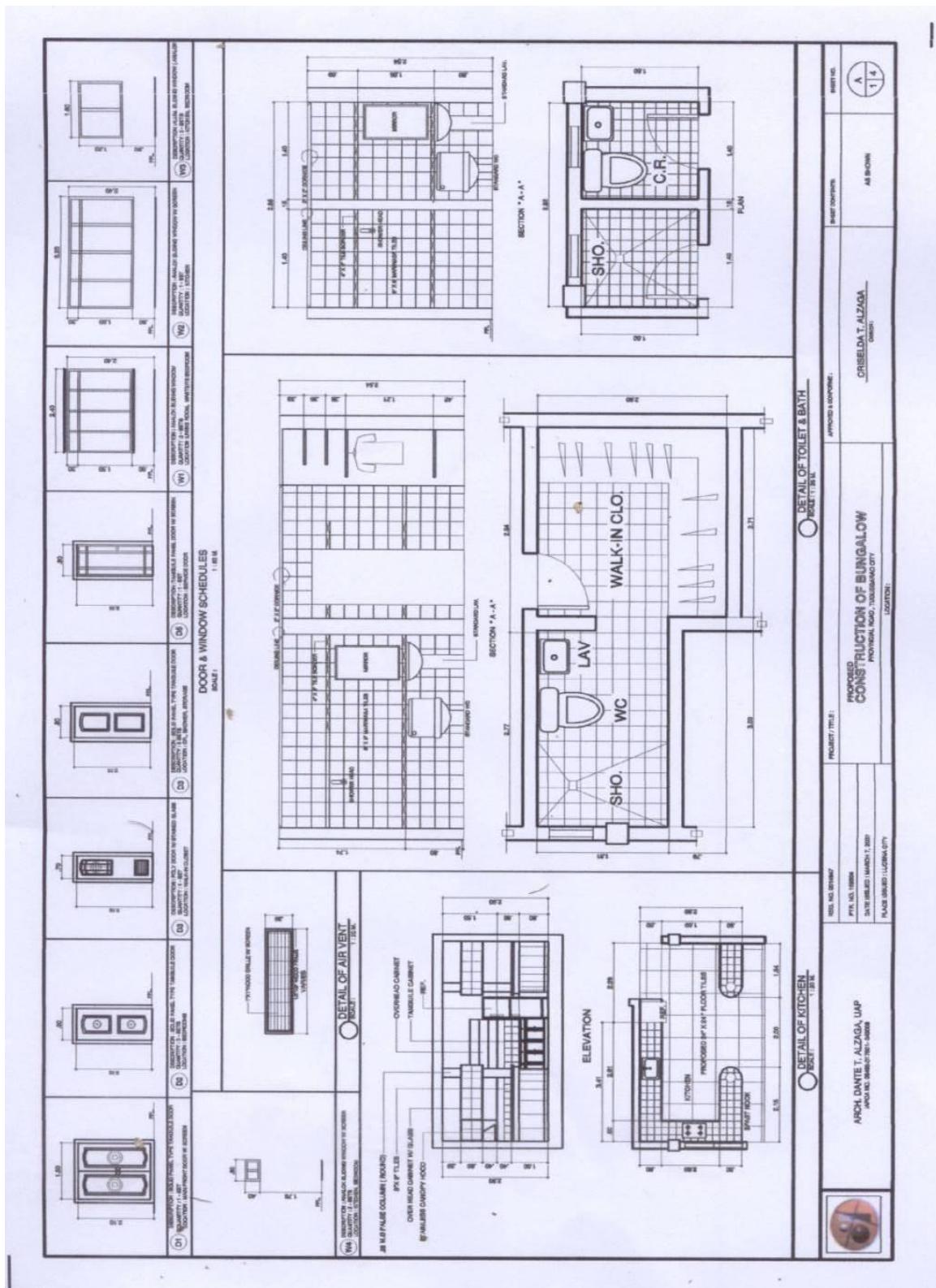
d. **Sheet # 4** - Doors and Windows Schedule, Detail of kitchen, and Detail of Toilet and Bath

**DOORS and WINDOWS SCHEDULE** is a complete specification of doors and windows in terms of width, height, types, materials and quantity.

**KITCHEN DETAIL** is a drawing of kitchen floor plan with complete specifications.

**TOILET and BATH DETAIL** is a drawing of toilet and the floor plan that shows complete features of toilet and bath.

**d. Sheet # 4 - Doors and Windows Schedule, Detail of kitchen,**



## ARCHITECTURAL ABBREVIATIONS:

BALCONY - BALC	CEILING LINE - CL	METER - M
BATHROOM - B	ELEVATION - ELEV.	MILIMETER - MM
BEDROOM - BR	SECTION - SEC.	AT - @
MASTER BEDROOM - MBR	FLOOR - FLR	DOWN SPOUT - DS
LIVING ROOM - LR	CONCRETEHOLLOW	VERTICAL - VERT.
DINING ROOM - DR	BLOCKS - CHB	NOT TO SCALE - NTS
KITCHEN - K	CORRUGATED - CORR	FLOOR LINE - FL
LAVATORY - LAV	CEMENT - CEM	GROUND LINE - GL
TOILET & BATH - T & B	BOTH WAYS - B.W.	FINISH FLOOR LINE -
BUILDING - BLDG	ON CENTER - OC	FFL
BUILT-IN - BLT-IN	DOWN - DN	FINISH GROUND LINE-
CABINET - CAB		FGL

## Architectural Symbols

Familiarizing all the architectural symbols is a prerequisite for all students in architecture and drafting technology programs considering that their future works will be on the architectural activity. It would be difficult for them to interpret drawing or blueprint unless they have familiarized all the architectural symbols.

The following illustrations are the architectural symbols:

- a. Doors and windows symbols that are shown in the floor plan.

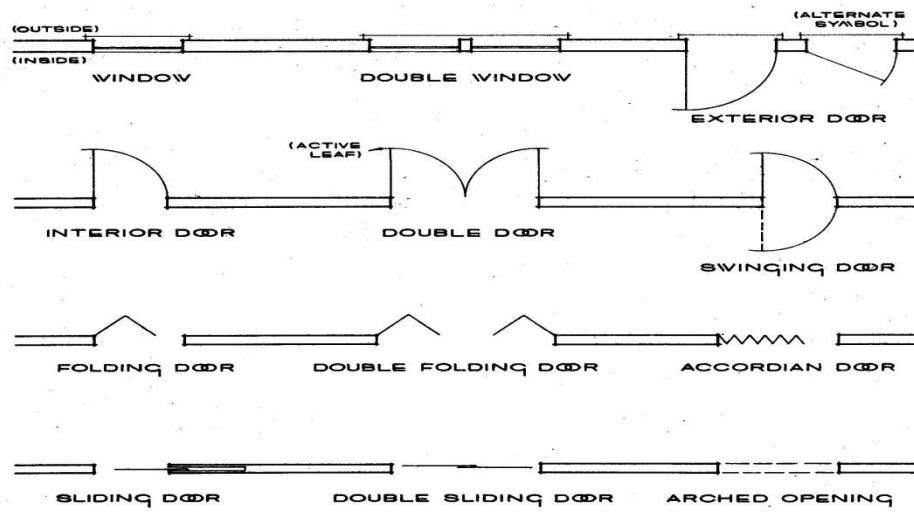
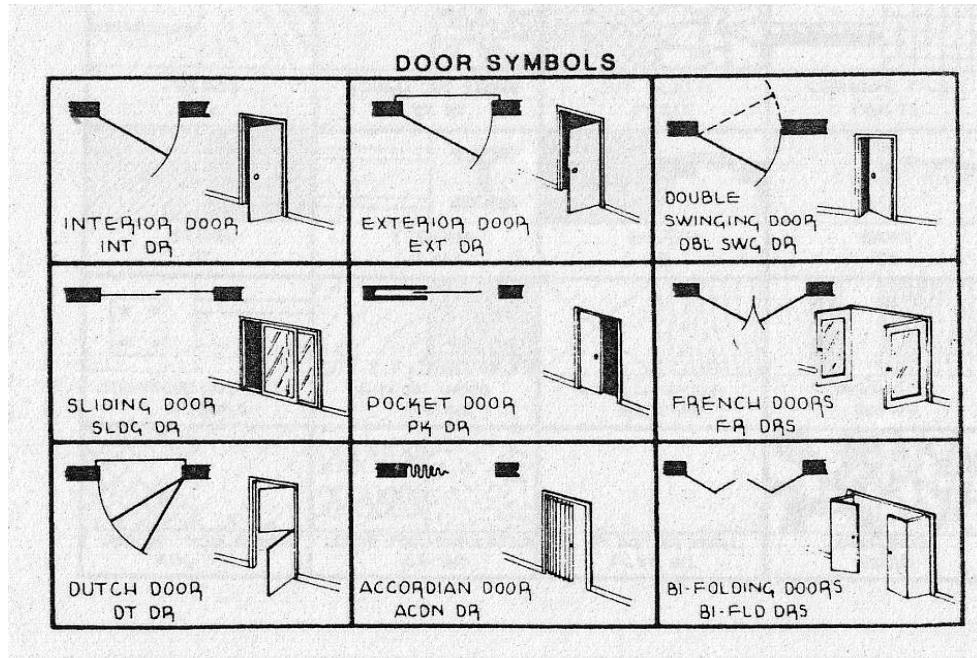
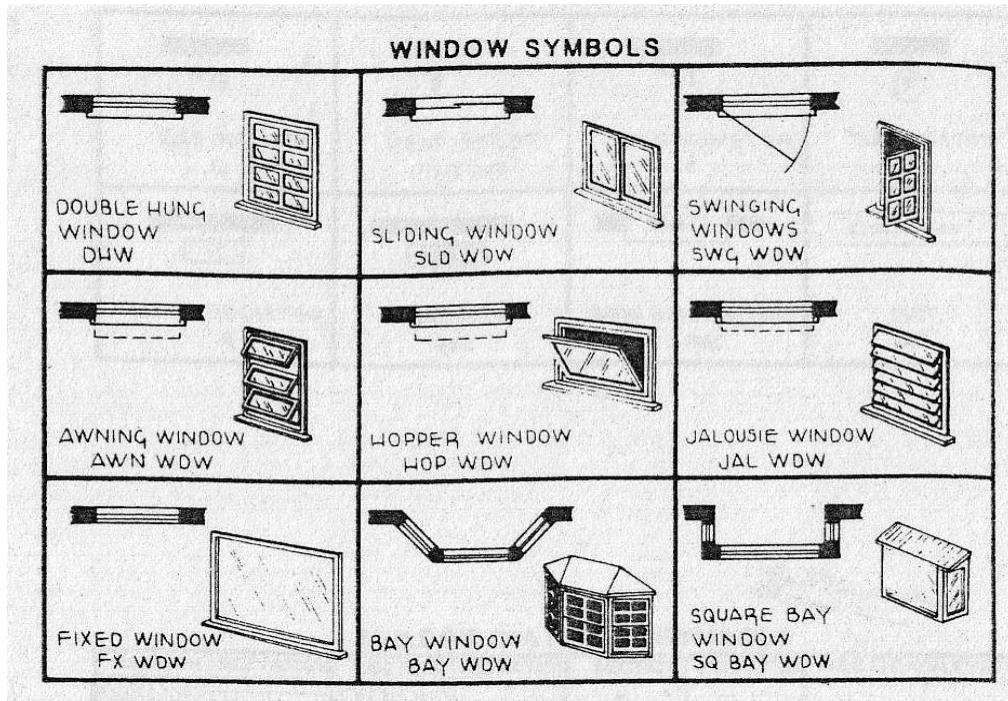
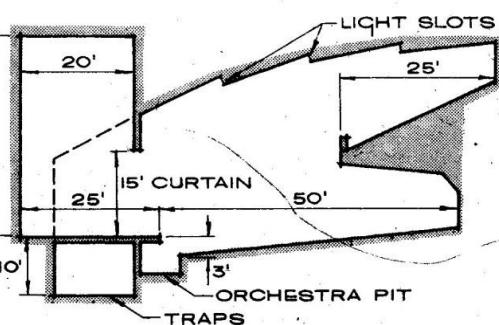
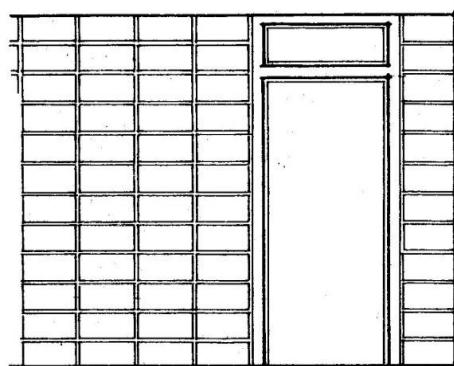
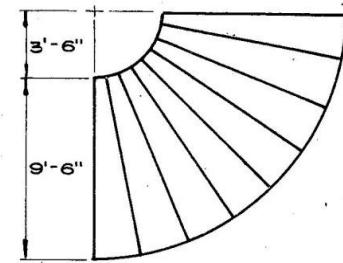
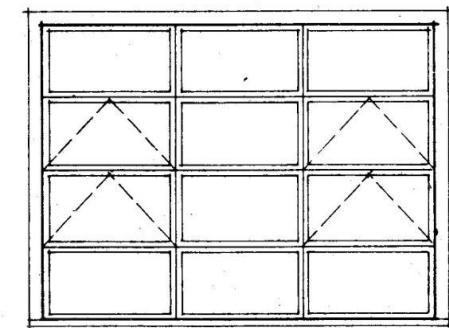


Figure 10    Frame wall openings.

- b. Doors and windows symbols that used to represent doors on floor plans and elevation drawings

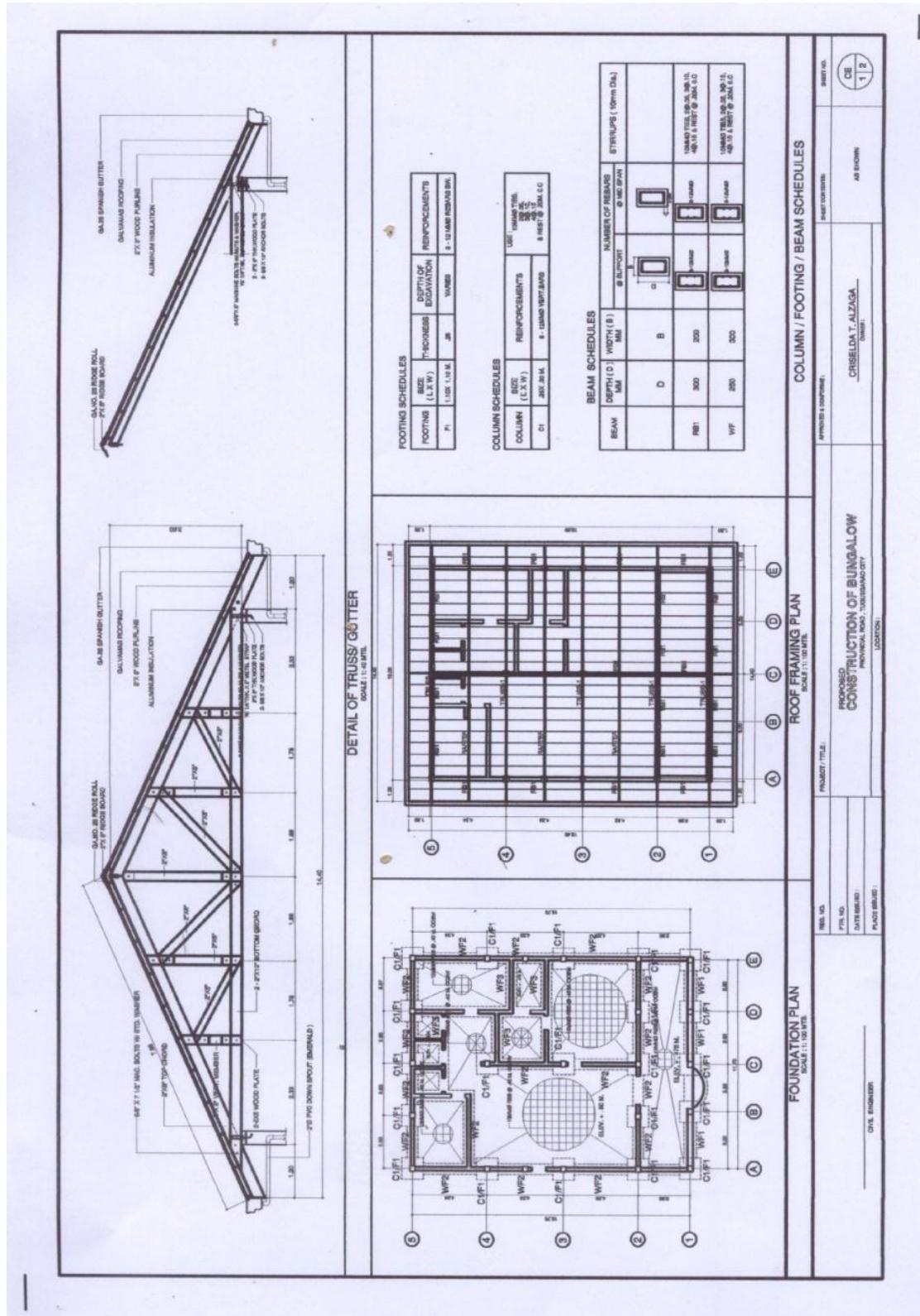


c. Door, window and staircase symbols that are shown in the elevation plans.



## 2. Structural Sheet

### a. Sheet # 5 - Foundation plan, Roof Framing Plan, Truss Detail, and Column/Footing/Beam Schedules



**FOUNDATION PLAN** a structural excavation plan of footings and walls of a building.

**ROOF FRAMING PLAN** a structural framing plan of the roof plan with complete specification.

**TRUSS DETAIL** a complete structural detail of a common or typical truss of a building.

**COLUMN/FOOTING/BEAM SCHEDULE** a complete specification of column, footings, and beam in terms of sizes, materials and quantity.

**b. Sheet # 6** - Detail of Footings, Construction Notes and General Notes

**FOOTINGS** a part of foundation directly supporting the column or post of a house. A detail drawing of building footings with specific requirements.

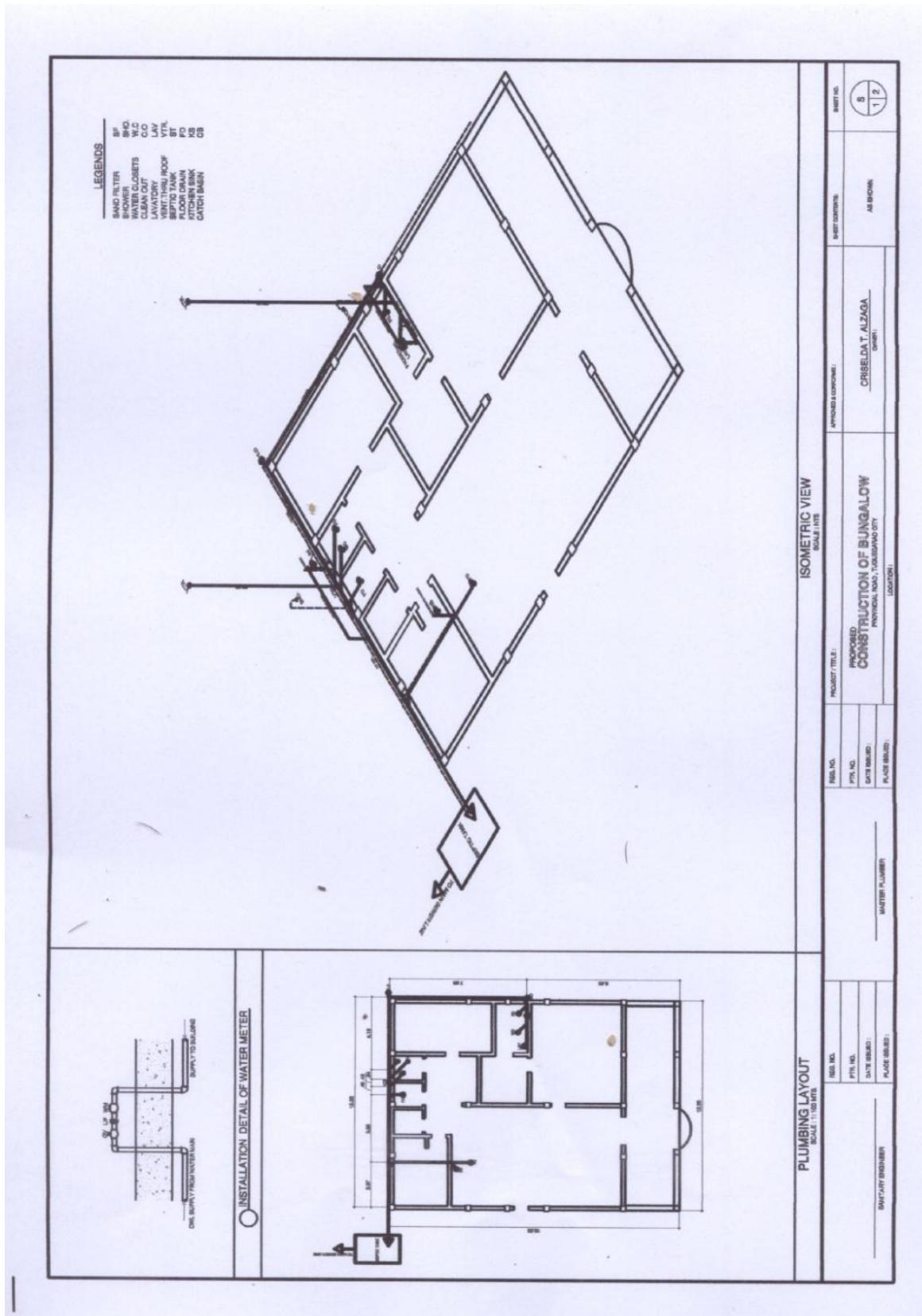
**CONSTRUCTION NOTES** a sub-complete detail of wall footings, lintels, beams, and other required structural features to present in the plan.

**GENERAL NOTES** a complete specification and legend of structural features presented in the plan.

Sheet # 6 - Detail of Footings, Construction Notes and General Notes

### **3. Plumbing Plan/Layout**

**a. Sheet # 7 - Water and Sewage System Plan**

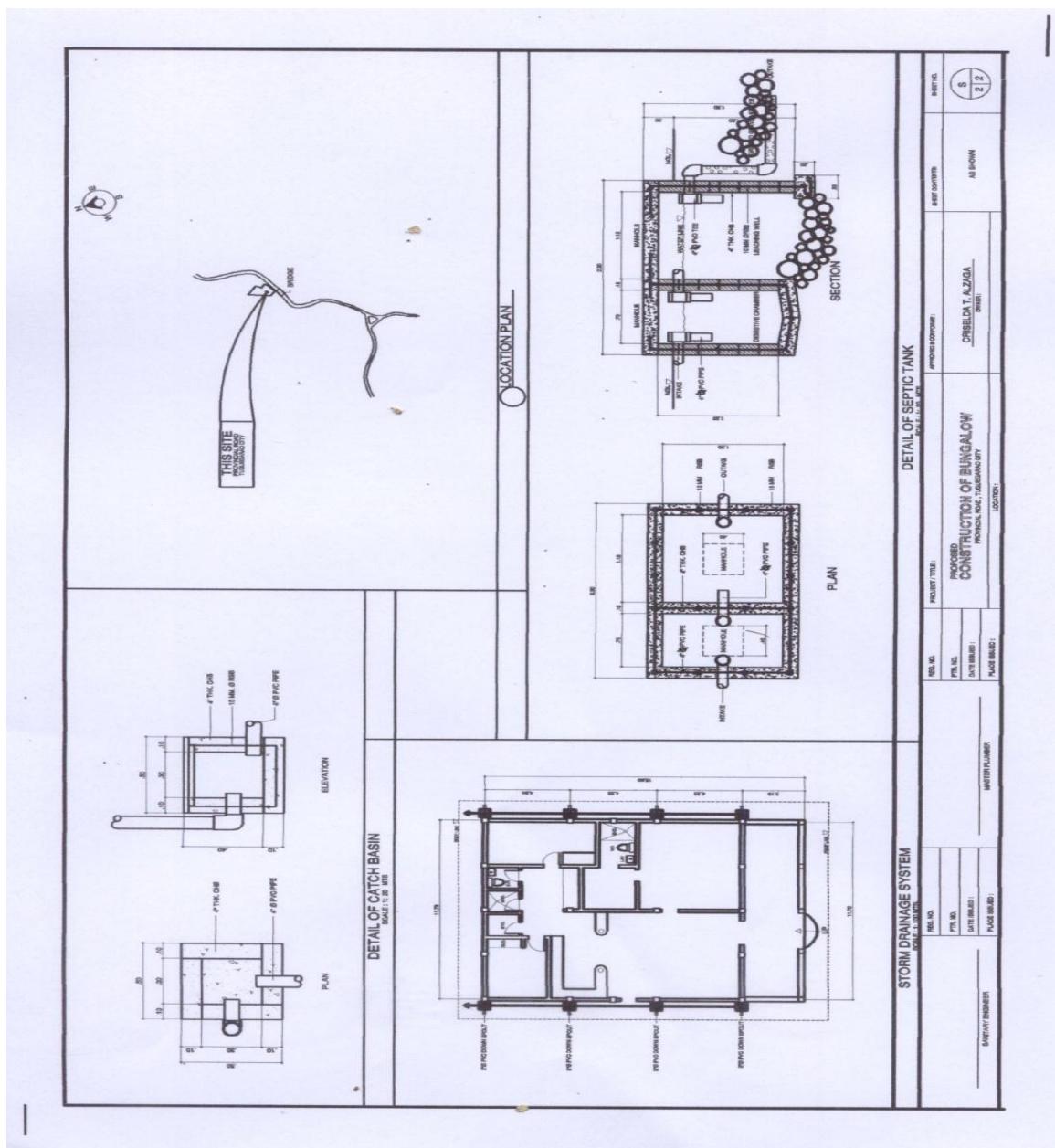


**Plumbing Plan** is the complete drawing detail of water and sewage distribution.

**Water System Plan** is the drawing of flow of water in the house from main water source.

**Sewage System Plan** is the drawing flow of sewage from the house to main canal and septic tank.

### Sheet # 8 - Storm Drainage System, and Septic Tank Detail



**Storm Drainage System** shows the flow of water waste from the lavatory, floor drain, and downspout from roof to storm drainage.

**Septic Tank** it is the depository of human excreta and a drainage reservoir for all washing done in the kitchen and bathroom. The main section of septic tank is the *digestive chamber* and the *leaching well*.

#### **4. Electrical Plan**

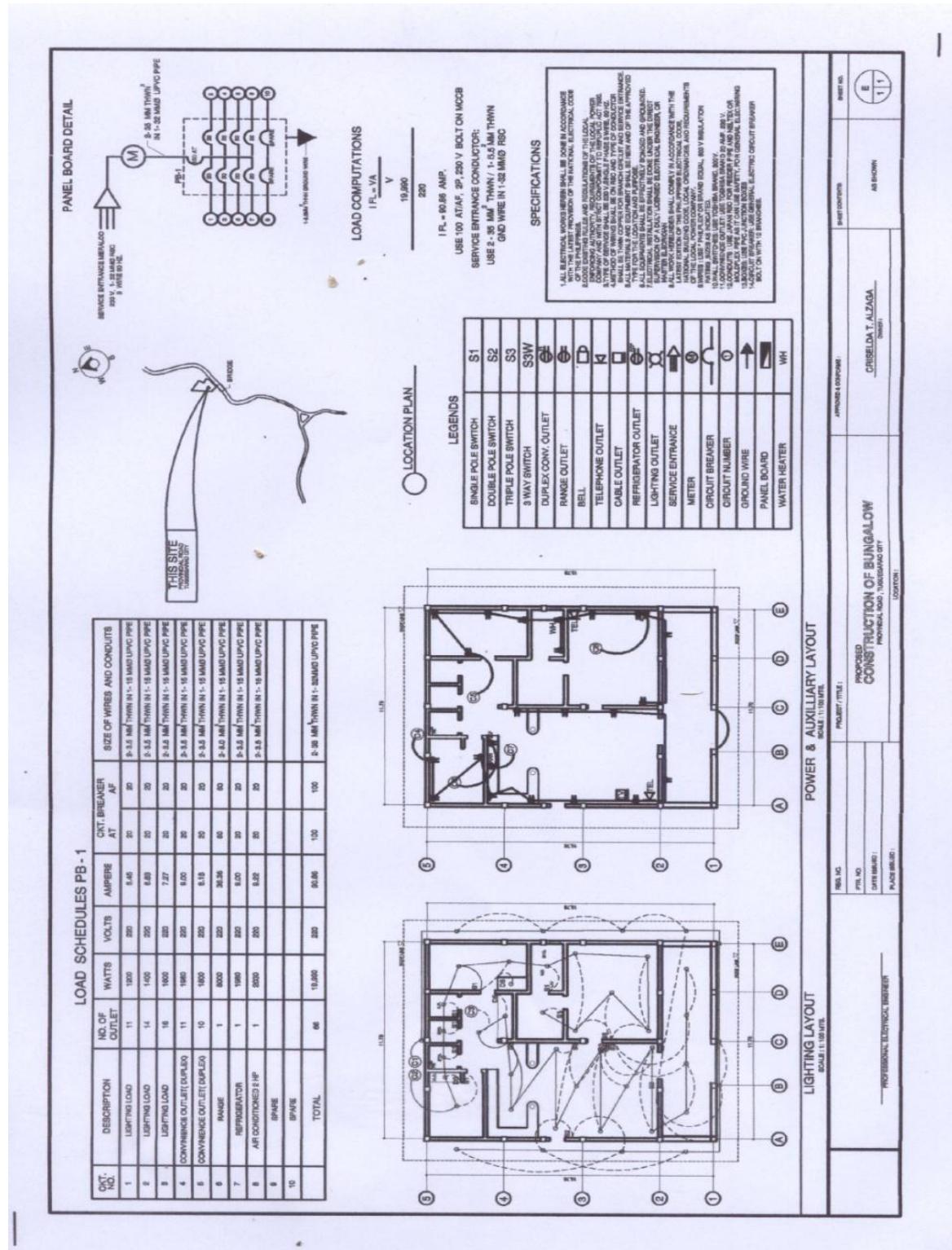
**Sheet # 9** - Lighting layout, Power and Auxiliary layout, Location plan, Panel board Detail, Load Schedules and Specifications

**Electrical Plan** a plan consists of lighting plan, power layout and specification details of the house.

**Lighting layout** an electrical plan that shows the flow of house lightings

**Power & auxiliary layout** an electrical plan that shows the flow of convenience outlet and other auxiliary outlet in the floor plan.

## **Sheet # 9 - Lighting layout, Power and Auxiliary layout, Location plan, Panel board Detail, Load Schedules and Specifications**



**ELECTRICAL SYMBOLS AND ABBREVIATIONS USED:**

- **ACU - AIR CONDITIONING UNIT**
- **WHEATHER PROOF OUTLET - **
- **M -METER - **
- **CB - CIRCUIT BREAKER/ PANEL BOARD - **

	INCANDESCENT LIGHT OUTLET
	CONVENIENCE OUTLET
	ELECTRIC STOVE
	AIR CONDITIONING OUTLET
	DOOR BELL
	PUSH BUTTON
	CIRCUIT HOMERUN
	SAFETY SWITCH
	FUSE CUT OUT
	FUSE
	KILOWATT HOUR METER
	SERVICE ENTRANCE
<b>S</b>	SINGLE POLE SWITCH
<b>S<sub>2</sub></b>	2-GANG WALL SWITCH, 2-SINGLE POLE SW.
<b>S<sub>3</sub></b>	3-GANG WALL SWITCH, 3-SINGLE POLE SW.
<hr/>	LINES OVERHEAD
<hr/>	----- LINES UNDERGROUND/INSIDE CONCRETE

## **SELF-CHECK 1.2**

### **LO1. Plan and prepare for work**

A. Identification.

Directions. Identify what is referred to in each number and write your answer on a separate sheet of paper.

- \_\_\_\_\_ 1. A drawing sheet that contains perspective, site development title, page and sheet index.
- \_\_\_\_\_ 2. A drawing of the lot showing the setback and development of the house in relation to the lot.
- \_\_\_\_\_ 3. The top view of the site or lot where the proposed house will be built.
- \_\_\_\_\_ 4. Generally includes title block, table of contents, and labels for signs and sealed of the duly licensed and registered professionals in the plans.
- \_\_\_\_\_ 5. He signs in the lot survey plans.

## **OPERATION SHEET 1.1**

### **LO1. Plan and prepare for work**

#### **ARCHITECTURAL WORKING DRAWINGS**

After all the drawings are performed, it is also necessary to expose the student in tracing activity. This activity is commonly applied in industry especially in the reproduction of the architectural plans. All drafting works must be done first in the preliminary process using sketching sheet. The final outputs are those drawings which are done through tracing activity.

Below is a activity on tracing the drawing.

Steps in tracing architectural working drawing sheet no. # 1:

1. Prepare all tools and materials needed.
2. Fasten sheet #1 and tracing paper on drawing board. Be sure it is aligned horizontally by the T-square and aligned vertically with the triangle.
3. Trace border lines using T-square,  $30^{\circ} \times 60^{\circ}$  triangle, and technical pen point 0.8-1.0.
3. Trace all the labels in title block and index using technical pen point 0.3 – 0.6.
4. Trace first all vertical lines using big triangle  $30^{\circ} \times 60^{\circ}$ . Follow all horizontal lines using T-square before tracing all the curved and irregular curved lines using French curved instrument or templates.
5. Trace all the labels and dimensions using technical pen point 0.1-0.4.
6. Finalize the drawing by checking and erasing all unnecessary lines.

### **SELF CHECK 1.3**

#### A. Identification

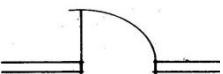
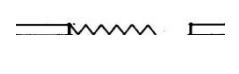
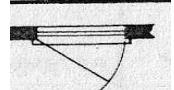
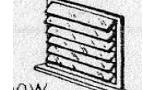
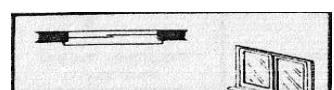
Direction: Identify the following architectural abbreviations:

- |                |               |
|----------------|---------------|
| 1. Elev. _____ | 6. FLR. _____ |
| 2. FFL. _____  | 7. GL. _____  |
| 3. DN _____    | 8. NTS _____  |
| 4. O.C _____   | 9. FL _____   |
| 5. CHB _____   | 10. @ _____   |

#### B. Enumeration

1. Give at least 2 specification features found in the roof plan, 6 features in sections, and 2 features from reflected ceiling plan.  
Write your answer on a separate sheet of paper.
2. Give at least 3 specification features in drawing doors and windows schedule, 3 main features in kitchen detail, and 4 features from toilet and bath details. Write your answer on a separate sheet of paper.
3. Give at least 5 specification features in foundation plan, 5 features in roof framing plan, and 5 features from truss detailing, and 5 features in column/footings/beam schedules.  
Write your answer on a separate sheet of paper.

#### C. Direction: Identify the following architectural symbols:

- |  |   |   |
|--|---|---|
| 1. <br>_____  | 2. <br>_____ | 3. <br>_____  |
| 4. <br>_____  | 5. <br>_____ | 6. <br>_____ |
| 7. <br>_____  | 8. <br>_____ | 9. <br>_____ |
| 10. <br>_____ |   |   |

## Performance Assessment

### Scoring Rubrics

<b>Criteria</b>	<b>Score</b> <small>(Tick the corresponding pts.)</small>
Accuracy	
50	
45	
40	
Speed	
10	
6	
8	
Neatness	
25	
20	
15	
Lettering/Labeling	
15	
12	
10	
8	
Total	

### **Performance Criteria:**

- **Accuracy**

- 50 pts. - the output is accurately done.  
 45 pts. - two to five errors are observed on the output.  
 40 pts. - six to ten errors are observed on the output.

- **Speed**

- 10 pts. - the output is done 2 hours before the time.  
 8 pts. - the output is done on time.  
 6 pts. - the output is done after the allotted time.

- **Neatness**

- 25 pts. - has no error.  
 20 pts. - has two to three erasures.  
 15 pts. - has four or more erasures

- **Lettering/Labeling**

- 15 pts. - all pieces of information are completely indicated and legibly printed in gothic letters or mechanical lettering.  
 12 pts. - all pieces of information are legibly printed but some are missing.  
 10 pts. - all pieces of information are legibly printed but some are missing and misspelled.  
 8 pts. - pieces of information are not legibly printed and words are missing misspelled.

**Program / Course** : **TECHNICAL DRAFTING**  
**Unit of Competency** : **DRAFT ARCHITECTURAL LAYOUT AND DETAILS**  
**Module Title** : **Drafting Architectural Layout and Details**

**Learning Outcome 2.** **Prepare and set up tools and materials for drawing**

**Assessment Criteria**

1. Drawing tools, materials, and equipment are selected and prepared according to job requirements
2. Working drawing tools, materials and equipment are properly set up according to standard procedure.
3. Company rule, regulations and SOP are properly discussed.

**References:**

Earnest R. Weidhaas. Architectural Drafting and Design 4<sup>th</sup> edition

Paul I. Wallach. Basic Architectural Drafting, 1982

French and Vierck. Engineering Drawing; MacGraw, Hill Book Company, 10<sup>th</sup> editon: 1960

Emmanuel P. Cuntapay. Implementing Rules and Regulations of the Philippines (PD 1096), 2005

German M. Manaois. Drafting 1 and 2; Phoenix Publishing: 1983

Norman Stirling. Introduction to Technical Drawing; Delmar Publishing: 1977

## **LEARNING EXPERIENCES/ ACTIVITIES**

<b>Learning Outcome 2: Prepare and set-up tools and materials for drawing</b>	
<b>Learning Activities</b>	<b>Special Instruction</b>
<ol style="list-style-type: none"><li>1. Read information sheet no. 2.1 about drawing tools, materials and equipment</li><li>2. Answer Self-Check 2.1</li><li>3. Read information sheet no. 2.2 about procedure for setting-up drawing equipment</li><li>4. Answer Self Check 2.2</li></ol>	<ul style="list-style-type: none"><li>• Take note of the details</li><li>• Remember important tools, materials and equipment</li><li>• Try to answer the self check</li><li>• Answer the self check</li></ul>

## **INFORMATION SHEET 2.1**

### **LO2.1 Drawing tools, materials and equipment**

This lesson is only a review of your prior learning in technical drawing particularly on the proper use and care of drawing tools, materials and equipment. The purpose of this discussion is to allow the students review and recall its importance in the Drafting Technology works.

#### **The Importance of Drawing tools, materials and equipment**

##### **a. Drawing/Drafting tools**

These refer to the sets of tools that are used in all drafting works or activities especially if the activity requires mechanical presentation. Prior to the start of drafting activity, it is expected therefore that all drawing tools needed must be available in the work station to ensure that the assigned task can be accomplished according to customers or client's standard.

The following are the common drafting tools

1. Drafting Table/Drawing Board (24" x 36" /0.61cm x 0.91cm)
2. T-Square (36" / 0.915 cm. length)
3. Triangles - $30^{\circ}$  x  $60^{\circ}$  and  $45^{\circ}$  x  $45^{\circ}$  ((@ least 0.30 each length))
4. Triangular Scale – 1:100, 1:75 in range
5. Technical Pens/G-Tech pen/Pilot pen – (From point: 0.0, 0.1, 0.2, 0.3, 0.5, 0.6, 0.8, 1.0)
6. Pencil Sharpener or Pen knife
7. Drawing Templates – Circular templates, Furniture template, Ellipse template,
8. Protractor (medium size)
9. Dusting Brush
10. Sand paper pad (fabricated fine coarse sand paper attached to wood or board pad)

11. Erasing shield
12. Pull-push rule
13. Drafting Light

**b. Drawing/Drafting Materials**

These are sets of consumable items that are specifically used in drafting works or activities. The draftsman cannot perform his drafting task without these items.

The following are the required materials needed in drafting works:

1. Bond Paper (short and Long)
2. Tracing paper
3. A4 drawing paper
4. Drawing pencil – HB, F, 2H
5. Mechanical pencil – point 0.3, 0.5
6. Pen and Ink Eraser
7. Masking Tape
8. Ink (Staedler/Rotring)
9. Cartolina Paper

**c. Equipment**

These items are also essential in producing quality drafting output especially if the assigned task requires mechanical manipulation. Although, these items are so expensive, however, these are important in making the drawing output presentable and convincing to the clients.

The following are some of the equipment needed in drafting task:

1. Drafting machine
2. Leroy Lettering Pen
3. Computer

## **ACTIVITY SHEET # 1.1**

### **LO1. Plan and prepare for work**

#### **Situation:**

Randomly select fifteen (15) students from the class for a required activity relative to tools, materials and equipment identification. Group them into three (3) groups and allow them to choose their respective group leader. Put a long table that could conveniently accommodate several sets of drawings tools and materials in drafting.

#### **Activity:**

1. In line formation, let the three groups to fall in line at least 2 meters distance from the table where sets of tools and materials are displayed.
2. Give 10 minutes for each group to perform the activity by requiring each member of the three group to come forward as fast as he can and immediately pick any tools from the table.
3. Demonstrate a non-verbal description that best explains the use of such tools or materials. (See to it that all members are given the opportunity to do the same as what had been done by the first member).
4. The students who were not included in the activity shall evaluate the performance of each group.

**Note:** The group that will be declared champion shall be given 25 points credit per member. While the second and third placers shall be given 20 and 15 points respectively.

### **SELF CHECK 2.1**

Direction. Enumerate the following. Write the answer on a separate sheet of paper.

A. Five most common tools in drafting architectural layout and details

- 1.
- 2.
- 3.
- 4.
- 5.

B. Four most needed materials in architectural layout and details.

- 1.
- 2.
- 3.
- 4.

C. List three important equipment needed in layouting Architectural details

- 1.
- 2.
- 3.

## **INFORMATION SHEET 2.2**

### **LO1. Plan and prepare for work**

#### **Procedure in Setting up Drawing tools, Materials and Equipment and standard procedure**

In preparation for a required task in drawing architectural layout and details, a draftsman should plan, prepare, and select tools and materials for a particular planning layout. This is to ensure the correct setting of standard procedure and accuracy of drawing plans. Some of the key tools used in drafting architectural plans are described and illustrated in this learning Outcome.

The drawing tools, materials and equipment are very expensive items, however these are important in all drafting tasks. Considering its cost and value in drafting activity, it is also important to take care and maintain its usability.

With this, the following considerations are strictly emphasized as Standard Operating Procedure during and after the utilization of the drafting tools, materials and equipment:

##### **a. Before the start of drafting activity:**

1. Select the tools, materials and equipment which are needed in the assigned task.
2. Properly set up the required tools and materials in a place which is convenient for you to move and execute your work.
3. Clean the table and tools, see to it that these are free from the dust and other elements that would cause damage to your work.
4. Wash your hand with clean water.

**b. Activity proper:**

1. Perform the activity by following the standard operating procedure per job requirement.
2. Properly manipulate all the tools and equipment that are used in the activity.
3. In case of meeting an errors or mistakes along the way of activity ( for instance misprinting of lines, letters, and other forms of mistakes) use appropriate eraser for a particular mistakes.

**c. After the activity:**

1. Submit your output to your teacher for checking
2. Check all the tools and materials to ensure that nothing has lost.
3. Return the tools and materials to the assigned tool keeper for safekeeping.
4. Withdraw your borrower's card from the tool keeper to as document that you have returned the borrowed tools and materials.
5. Clean your work station before leaving.

**Other important Practices that must be observed in the work station or work place**

There are important practices that must be observed in the work setting. The following are:

1. Observe safety precautions:
  - a. Never smoke inside the work station
  - b. Never use any tools and equipment without having it clean first.
  - c. Avoid talking with your co-students during working period.
  - d. Always turn off the lights, air condition, ceiling fan, computer units, and other equipment before leaving the work station.

- e. Maintain cleanliness in the work station.
  - f. Use tools and equipment properly.
2. Observe punctuality of attendance.
  3. Avoid making quarrel with your co-students.
  4. Observe and practice the value of respect.
  5. Return the borrowed tools and equipment on time.
  6. Observe and practice proper disposal of waste.

## **SELF CHECK 2.2**

Directions: Enumerate the following. Write the answers on a separate sheet of paper

- A. Identify five drafting tools and materials to be prepared before drawing.
  - 1.
  - 2.
  - 3.
  - 4.
  - 5.
- B. Give at least five steps for fastening the drawing paper.
  - 1.
  - 2.
  - 3.
  - 4.
  - 5.
- C. Cite at least five steps in setting-up drafting tools, materials and equipment.
  - 1.
  - 2.
  - 3.
  - 4.
  - 5.

**Program/ Course** : **DRAFTING TECHNOLOGY**  
**Unit of Competency** : **DRAFT ARCHITECTURAL LAYOUT AND DETAILS**  
**Module Title** : **Drafting Architectural Layout and Details**  
**Learning Outcome 3** : **Draft Site Development Plan**  
**Nominal Duration** : **10 hours**

**Assessment Criteria:**

1. Technical description of lot is drawn according to approved lot survey.
2. Building blueprint is drawn according to architectural drafting standards
3. National Building Code and Architectural Standards are properly observed according to job specification
4. Dimension lines, dimensions and drawing titles are indicated according to architectural drafting standards.
5. Drafting tools and equipment are used according to architectural drafting standards.

**References:**

- Earnest R. Weidhaas. Architectural Drafting and Design, 4<sup>th</sup> edition, 1987  
Paul I. Wallach. Basic Architectural Drafting, 1982  
French and Vierck. Engineering Drawing, 10<sup>th</sup> edition; MacGraw, Hill Book Company, 10<sup>th</sup> editon: 1960  
Emmanuel P. Cuntapay. Implementing Rules and Regulations of the National Building Code of the Philippines (PD 1096), 2005  
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Norman Stirling. Introduction to Technical Drawing; Delmar Publishing; 1977

## **LEARNING EXPERIENCES/ ACTIVITIES**

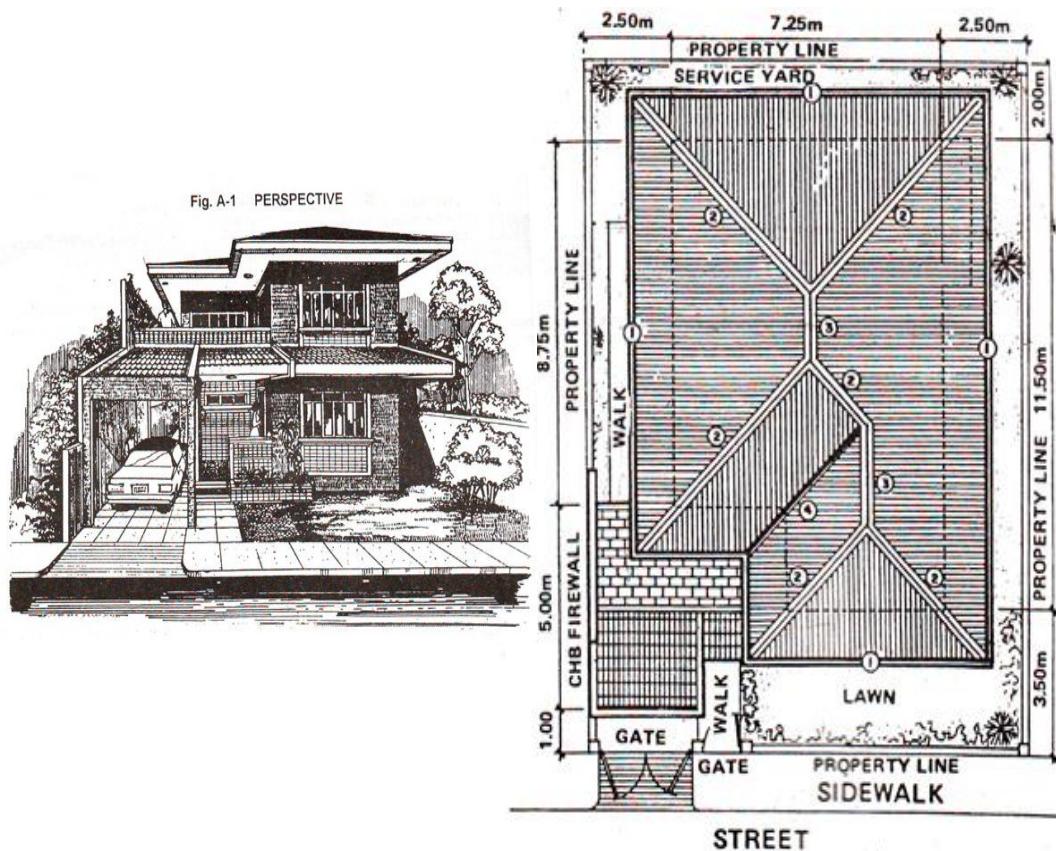
<b>Learning Outcome 3. Draft Site Development</b>	
<b>Learning Activities</b>	<b>Special Instruction</b>
<ol style="list-style-type: none"><li>1. Read Information Sheet no. 3.1 about site development plan</li><li>2. Answer Self Check no 1</li><li>3. Read Information Sheet no. 3.2 about lot mensuration and plotting</li><li>4. Answer Self Check no 3.2.</li><li>5. Read Operation 3.2</li><li>6. Answer Self-Check no. 3.3</li></ol>	<ul style="list-style-type: none"><li>• Try to answer the self-check</li><li>• Try to answer the self-check</li><li>• Try to answer the self-check</li><li>• Perform operation 3.1</li></ul>

## INFORMATION SHEET 3.1

### LO3 DRAFT SITE DEVELOPMENT PLAN

**SITE DEVELOPMENT PLAN** is the outline and measurements of the proposed building and its placement on the property.

This shows the position and the location of the building with property line, setbacks, approaches, grade contours, landscape and other pertinent data in relation to the site. A site development plan is drawn using a scale not smaller than 1:200meters.



**SITE DEVELOPMENT PLAN**

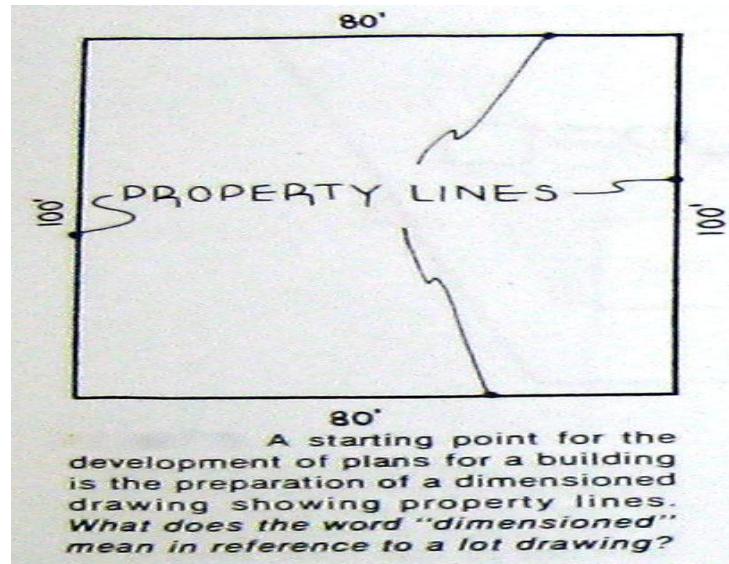
**SITE** is an area of land available for construction or the lot on which a building is constructed. Building site maybe a single lot, a series of *lots*, or a subdivision. A *lot* is a piece of ground of specific size. A *subdivision* is a large tract of land that is being developed.

## PLANNING CONSIDERATION IN DEVELOPING THE SITE

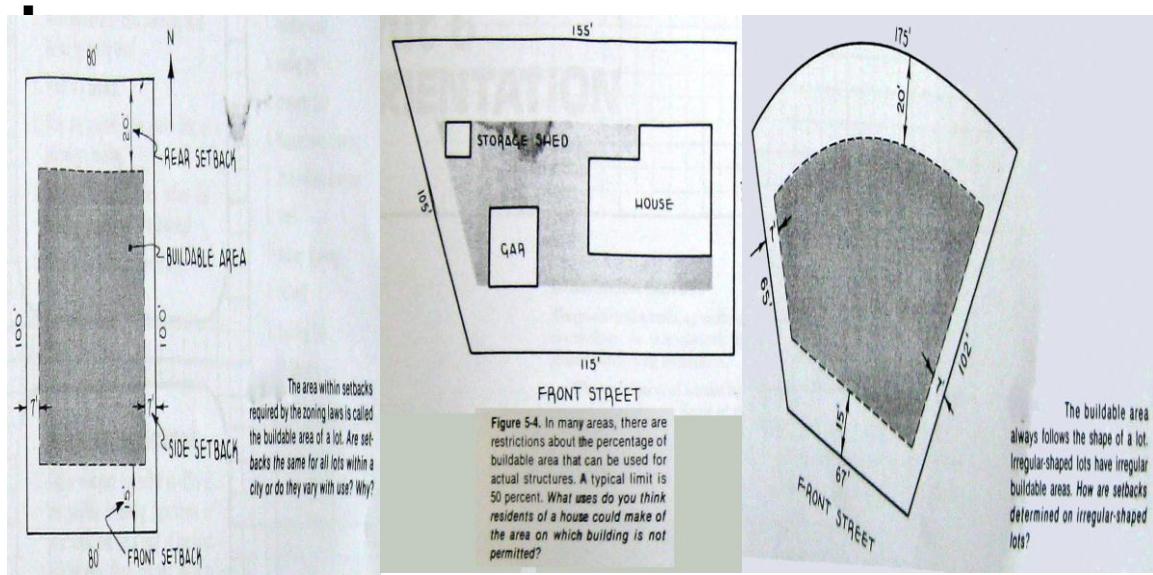
- **Location of a proposed house on the lot.** The location of the house must be considered in order to determine the locations of the rooms and the house itself on the lot. Some lots are located on swampy grounds and others on hilly or rugged terrain. Still others are sited near rivers, highways, streets and squatter areas. The front part of the house generally faces the street or away from ugly views like the back parts of neighboring houses, a swampy area, and thick bushes.
- Many want their bedrooms to face the sunrise – which is, on the eastern side of the lot. Others, especially those who work at night, prefer their bedrooms located on the west side. The breeze at the site may determine the location of the living room and toilet or bathrooms. The *height of the flood waters* in the locality should also be considered in determining the distance of the first floor from the ground. This is especially true in low areas. In high locations the floor may be 20 cm. only from the ground level.
- As earlier mentioned the house may be located at the center of the lot. Or one of its sides may be exactly on a lot line or fence. In this case, a firewall which is made of concrete, adobe, and concrete hollow blocks should be constructed on this side of the house.
- **Like and dislikes of the family member.** This factor is usually considered when the family is rich and can afford to pay for the services of an architect or draftsman. Before he designs the house, the architect or draftsman has to first interview the members of the family to get information about their interests, hobbies, and the like. From such interviews, he will get to know whether the family wants a library or study room, a social hall, a playroom, a music room, a swimming pool, a

carport or garage, servant's quarters, a driver's room, a landscaped garden, a balcony, and a roof garden.

**Property Lines** are those lines working outside of the lot area.



**Setback** refers to the distance at how far a building can be built within the property lines.



**Zoning** refers to the legal restrictions on size, location, and type of structures to be built on a designated area.

## **Zoning Laws**

One major area covered by building code is the zoning laws. *Zoning laws* are designed to keep different areas of a community from interfering with each other. In some cities or towns, separate areas are set aside for specific uses. Examples are residential, commercial, and industrial. These are established and protected by zoning laws.

In addition, zoning laws establish standards for construction in different sizes and uses.

One of the first things an architect must do before designing a building is to read the building codes. The intended use of the building has to be within the limits of zoning laws. Also, the size of the lot must be large enough to meet the requirements.

**Building Code** are local laws that set standard for structural design within the community.

This is a collection of local laws that regulate the building of homes and other structures. These legal requirements are intended to protect the safety and health of the people who live and work in the buildings. They regulate restrictions concerning the construction of buildings to provide safety to the occupants.

All constructions in an area must meet the requirements of building codes. Some of the designs and construction features covered by building codes include:

- Qualifications of persons who can design building within the area.
- Structural design that can be used
- Lot sizes for certain types of buildings
- Types and sizes of materials that can be used.

**National Building Code Rules:**

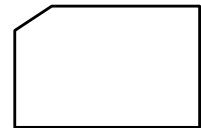
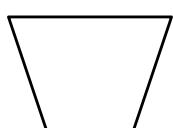
1. For one-storey wooden or frame house, the height of the floor plan from the ground should not be less than 1.50 m.
2. Walls with window opening should not be less than 2.00 m. from the lot line of fence. In other words, adjacent houses should not be at least 4.00 m. from each other.
3. The front part of a house should not be less than 3.00 m. from the lot line along the street.
4. No windows should be constructed along a wall of a house if this wall is flush with or exactly on the lot line.

## ACTIVITY SHEET # 3.1

### **LO3. DRAFT SITE DEVELOPMENT PLAN**

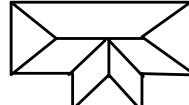
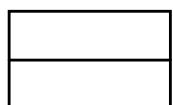
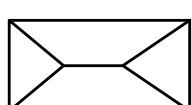
#### **Situation:**

Group the students into four. Assign leader to each group. Each group must be provided with  $\frac{1}{2}$  sheets of manila paper, T-square, triangle, pencil and a piece of pentel pen. Leader of the group will draw lots for different shapes;



#### **Activity:**

1. Each group will draw the assigned shape in a  $\frac{1}{2}$  sheet of manila paper using the provided tools. Imagine that it is a big drawing of a residential lot. All the side lines will be labeled as property lines.
2. As a residential lot, it needs to put the following inside and outside of the lot:
  - a. A setback space from all the sides of the lot to produce lot occupancy.
  - b. One or two streets along the sides of the lot.
  - c. Pick an appropriate roofing's for the lot occupancy.



- d. Draw the gate entrance assuming the front of the lot adjacent to the street constructed.
3. Each group is required to evaluate and give comments on the output of the assigned leader according to the following criteria:
  - a. Functionality.....40%
  - b. Presentation.....30%
  - c. Reporting.....30%

Total

100%

### **SELF CHECK 3.1**

Directions: Identify what is referred to in each number. Write your answer on a separate sheet of paper.

- \_\_\_\_\_ 1. The outline and measurements of the proposed building and its placement on the property.
- \_\_\_\_\_ 2. It refers to the legal restrictions on size, location, and type of structures to be built on a designated area.
- \_\_\_\_\_ 3. A piece of ground of specific size.
- \_\_\_\_\_ 4. These local laws that set standard for structural design within the community.
- \_\_\_\_\_ 5. These are designed to keep different areas of a community from interfering with each other.
- \_\_\_\_\_ 6. It is a space requirement from the lot line along the street.
- \_\_\_\_\_ 7. It refers to the distance at how far a building can be built within the property lines.
- \_\_\_\_\_ 8. It is a space requirement of walls with window opening from the lot line of fence.
- \_\_\_\_\_ 9. It is a space requirement to each other of adjacent houses according to NBC.
- \_\_\_\_\_ 10. Lines which are working the outside of the lot area.

## INFORMATION SHEET 3.2

### **LO3 DRAFT SITE DEVELOPMENT PLAN**

- **LOT MENSURATION AND PLOTTING**

#### Types of Lot

1. **Inside lot** Is a lot surrounded on each side by other lots
2. **Through lot** is a lot having frontage on two public streets or highways
3. **Corner lot** is a lot with at least two adjacent sides meeting on a corner of two streets.
4. **Open lot** is a lot bounded on all sides by streets or pathways

#### **Percentage of Lot Occupancy**

1. Every building, except those especially mentioned in the building ordinance, shall be limited in its occupancy.

#### **Limitation of Lot Occupancy**

- a. To secure natural light and ventilation
- b. For better fire protection

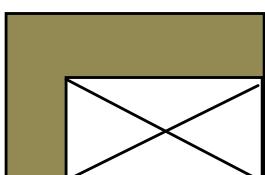
2. Limits of Lot Occupancy

Domestic building on inside lot -	70%
Domestic building on corner lot -	90%
Non-Domestic building on inside lot -	90%
Non-domestic building on corner lot -	95%

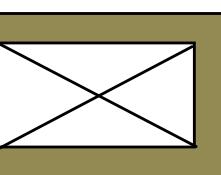
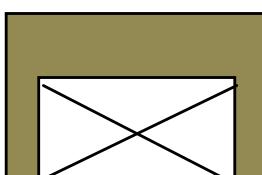
#### **Measurement of Lot Occupancy**

1. Measurement of lot occupancy shall be taken at ground level
2. Items not included in measurements:
  - a. Court
  - b. Yard
  - c. Light well

(Light Well - same as close court only, it has no passages it is used only for illumination and ventilation. Doors are used only for maintenance.)



**Open Court**

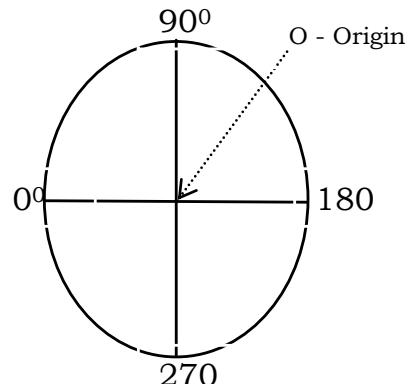
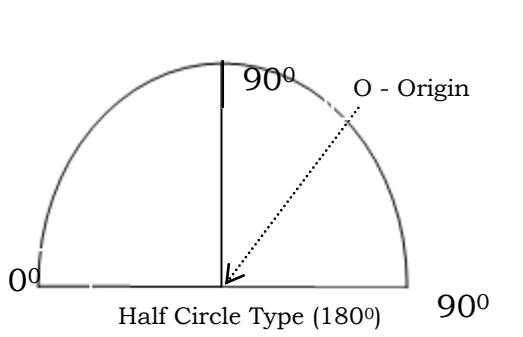


**Close Court**

## **Lot Plotting**

Protractor is an instrument graduated in angular degrees for measuring and laying out angles.

### **Types of Protractor**



Half Circle Type (360°)

Note: It is suggested that diameter of protractor is not less than 4".  
Bigger protractors are naturally accurate.

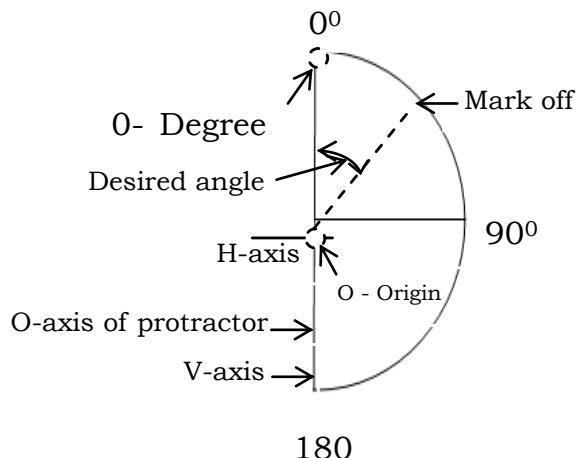
### **Units of Protractor**

Full Circle contains 4 quadrants  
One quadrant -  $90^{\circ}$  (degrees)  
One degree –  $60'$  (minutes)  
One minute –  $60''$  (seconds)

### **How to use Protractor**

1. ZERO CENTER the protractor on given point of desired angle.
2. ALIGN 0-AXIS (base of protractor) against one side of desired angle.
3. MARK OFF desired angle at the edge of protractor (start reading from 0-degree)

## **Setting the Protractor**



## **Procedure in Lot Plotting**

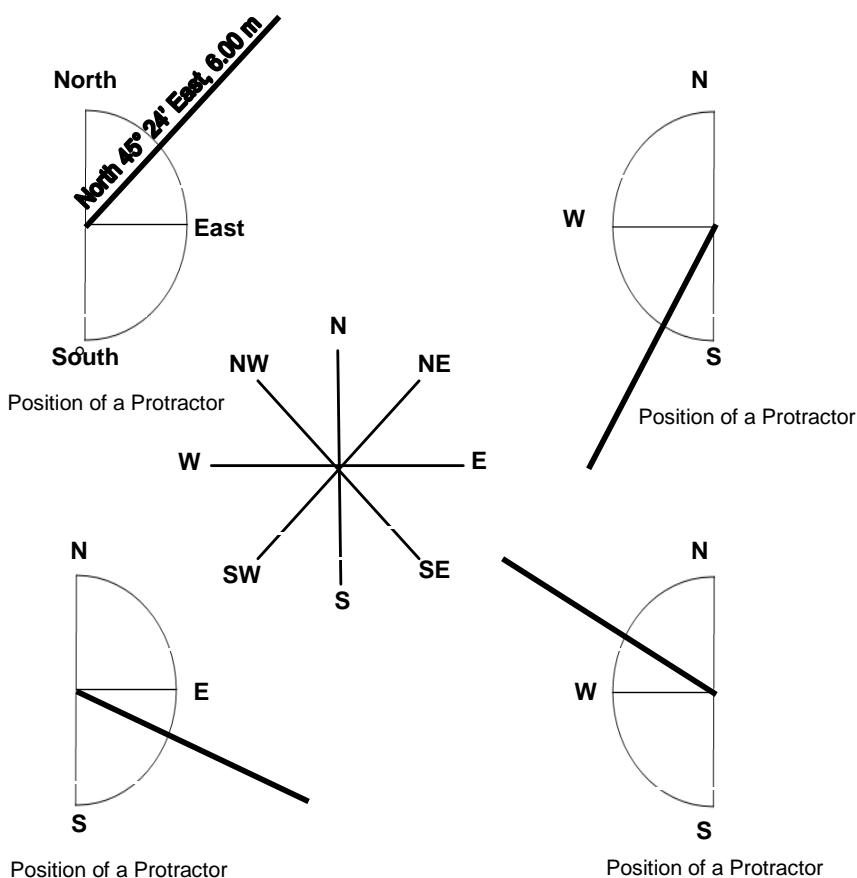
1. NORTH is always to be pointed vertical up with respect to the paper.
2. Bearing is read, plotted and marked off directly as, DUE NORTH, DUE SOUTH, DUE WEST, or DUE EAST
3. PLOTTING starts with point 1 and ends with point 1
4. Compass axes North-South and West-East are zeroed in each point and bearing marked off.
5. DRAFTING PRACTICES IN LOT PLOTTING
  - a. All drawings and labels are inked.
  - b. Use only standard plotting paper if submitted as part of Contract Document
  - c. Lot points are represented by small circle and point no. indicated near it within the lot whenever possible
  - d. Bearing and Magnitude are centered to lot line and within the lot whenever possible  
NOTE: Bearing and Magnitude must be written and readable from South West quadrant.
  - e. Lot No. and Block No. are written at the center of lot.
  - f. Subdivision streets are indicated as Street Lot No. \_\_\_\_\_. It is directly centered and parallel to respective streets
  - g. Scale is indicated under the NORTH symbol for non-documentary work and proper position for documentary Plotting Paper

## ACTIVITY SHEET # 3.2

### LO3. Lot mensuration and Plotting

**Direction:** A. Given the following diagram. Mark-off bearings using protractors by applying the procedures in lot plotting and measure the lot line using ruler.

Scale: 1cm : 1m



Direction:B. Draw the following bearing magnitude with corresponding distance using ruler and protractor. Scale: 1cm.=1m.

- N  $15^{\circ}30'$  E, 7m
- E  $48^{\circ}40'$  S, 11m
- W  $25^{\circ}20'$  N, 7m
- S  $49^{\circ}50'$  W, 9m
- Start at point 1, N $15^{\circ} 30'$  E, 7m., point 2, E  $15^{\circ} 25'$  S, 9m, point 3, S  $45^{\circ} 36'$  W, 8m., point 4 connect to point 1. Get the measurement and bearing magnitude of pt. 1-4.

### **SELF CHECK 3.2**

Directions: Enumerate the following. Write the answer on a separate sheet of paper.

A. Different types of lot.

1.

2.

3.

B. Three (3) steps in using protractor in plotting the lot.

4.

5.

6.

C. Units of protractor in drawing a Lot Plan.

10.

11.

12.

D. Three (3) drafting practices in lot plotting

13.

14.

15.

## OPERATION SHEET 3.2

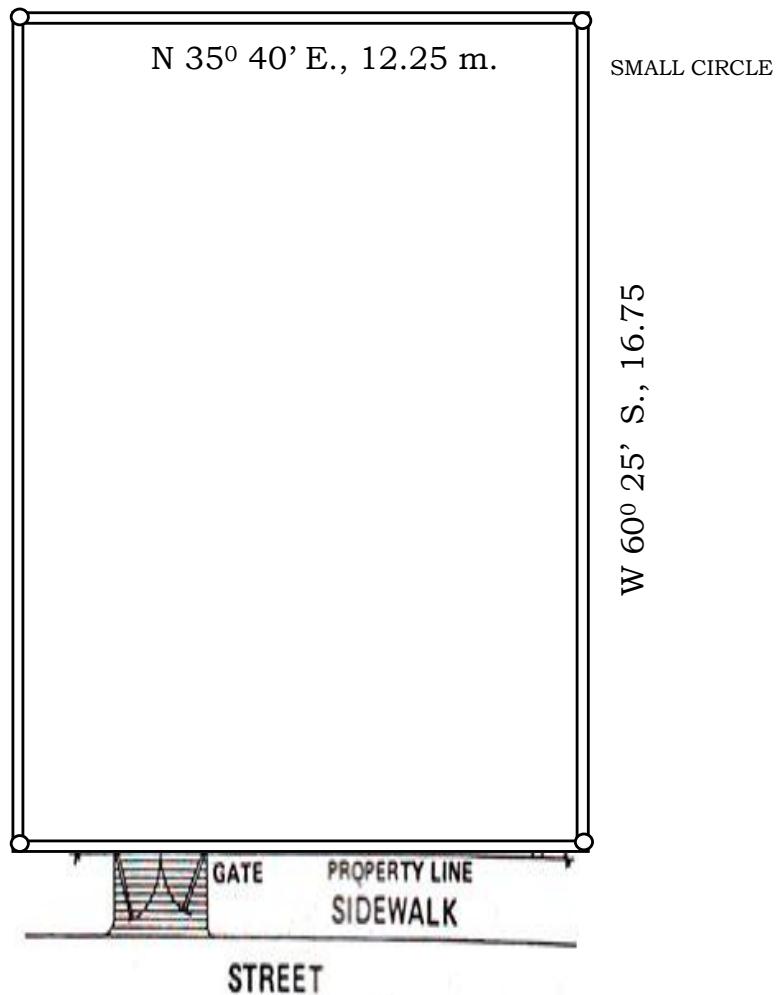
### **LO3. Procedure in drawing a Site Development Plan:**

1. Draw the given property lines of the lot using T-square, triangles, triangular scale and protractor.

Given: 12.25 m. x 16.75 m.

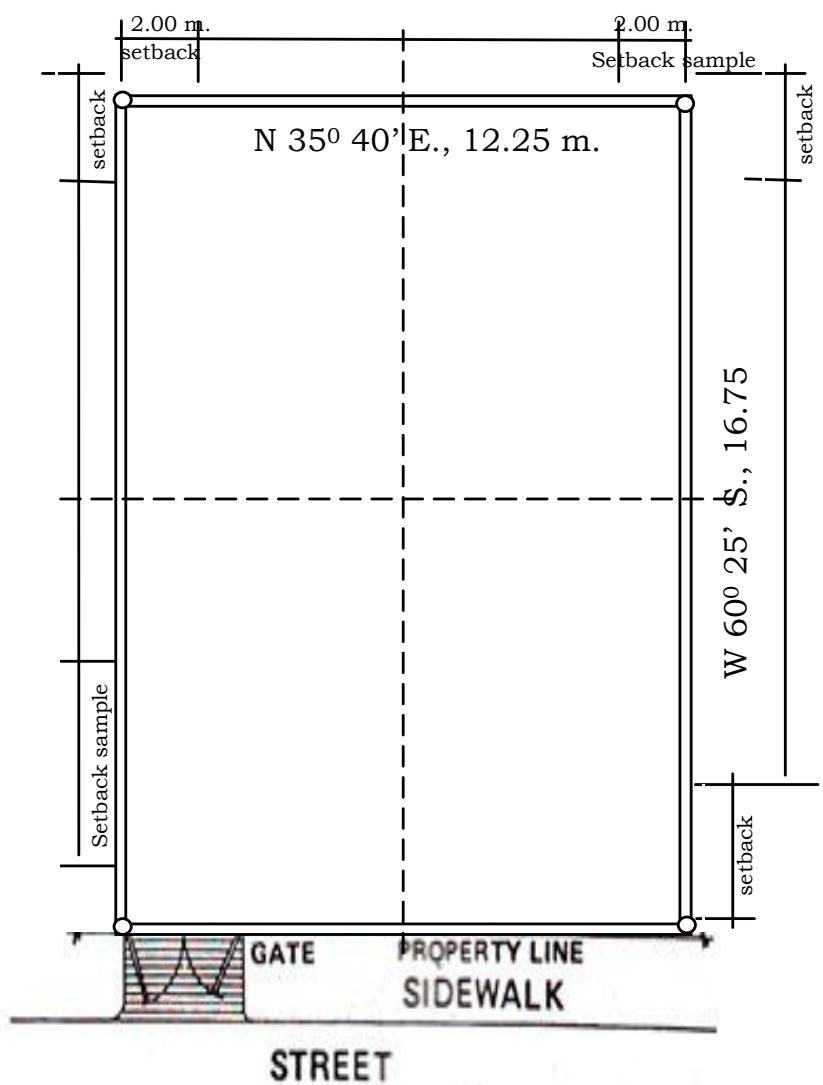
Scale: 1: 100m.

2. Indicate dimensions of lot including bearing magnitude.
3. Lot points are represented by small circle and point no. indicated within the lot whenever possible.

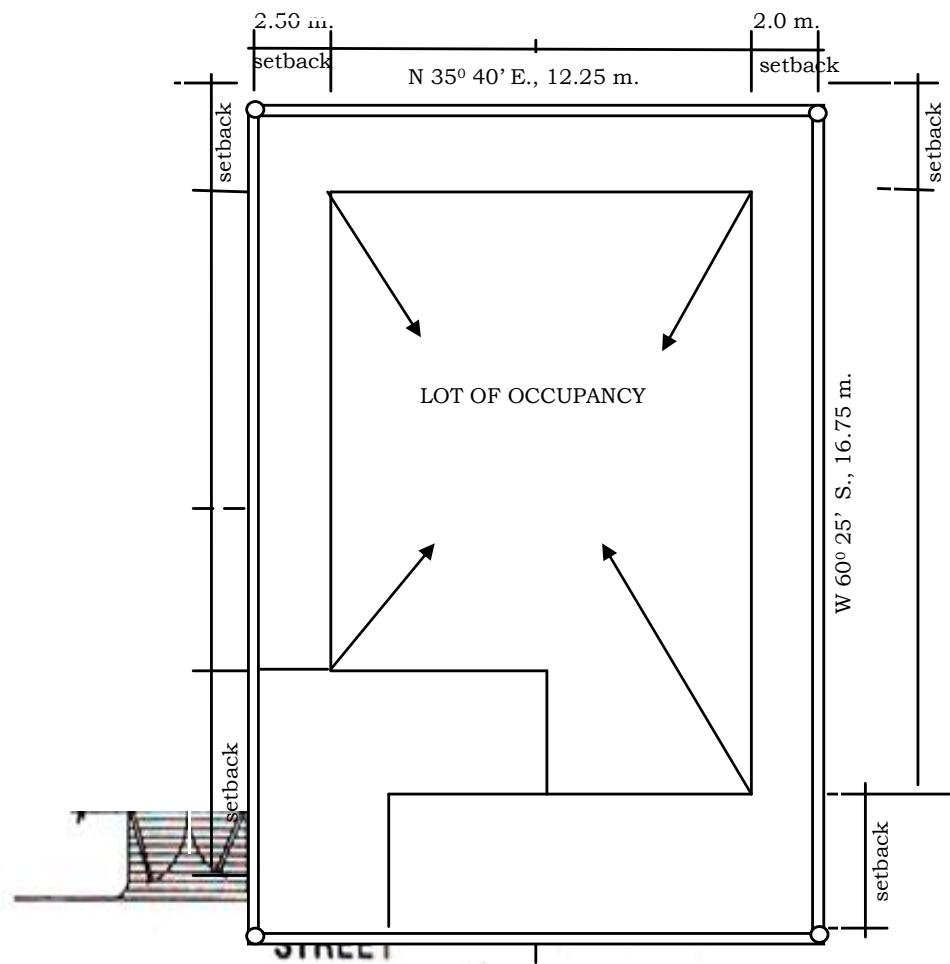


4. Locate lot center. Analyze the lot shapes, streets, adjacent lots and consider the lot plan guides when designing areas of occupancy.

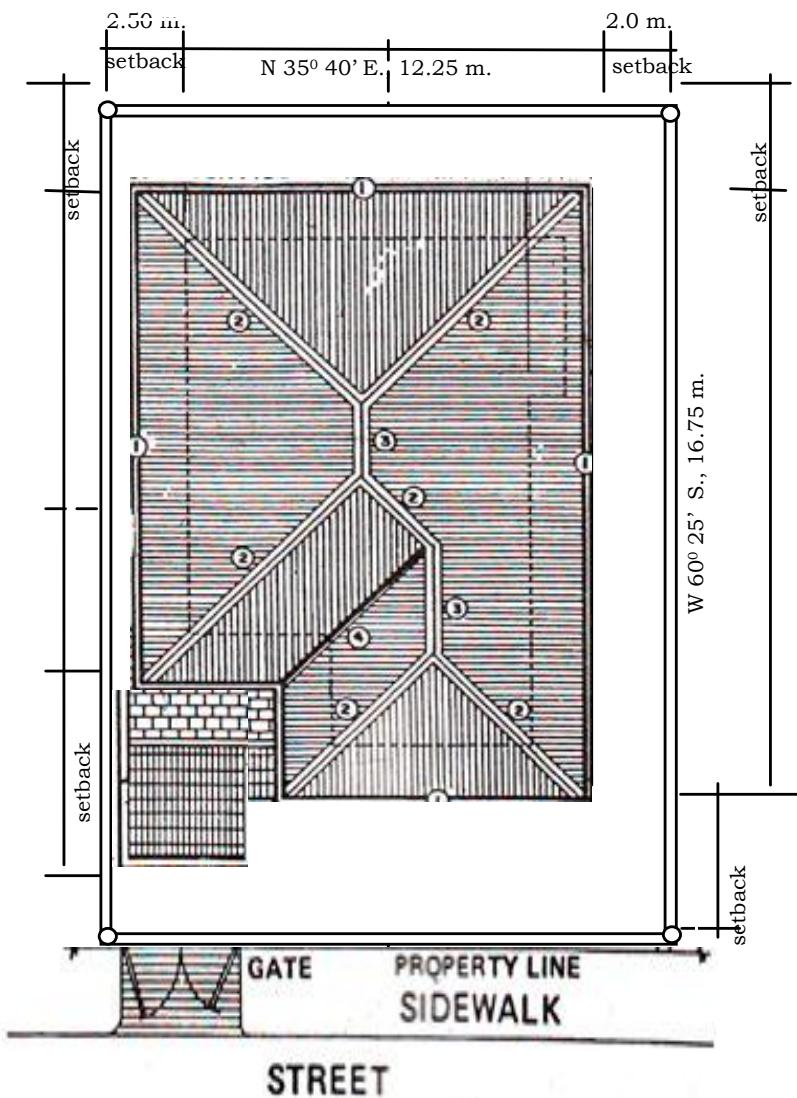
5. Plan and measure the setbacks of all corners of the lot plan



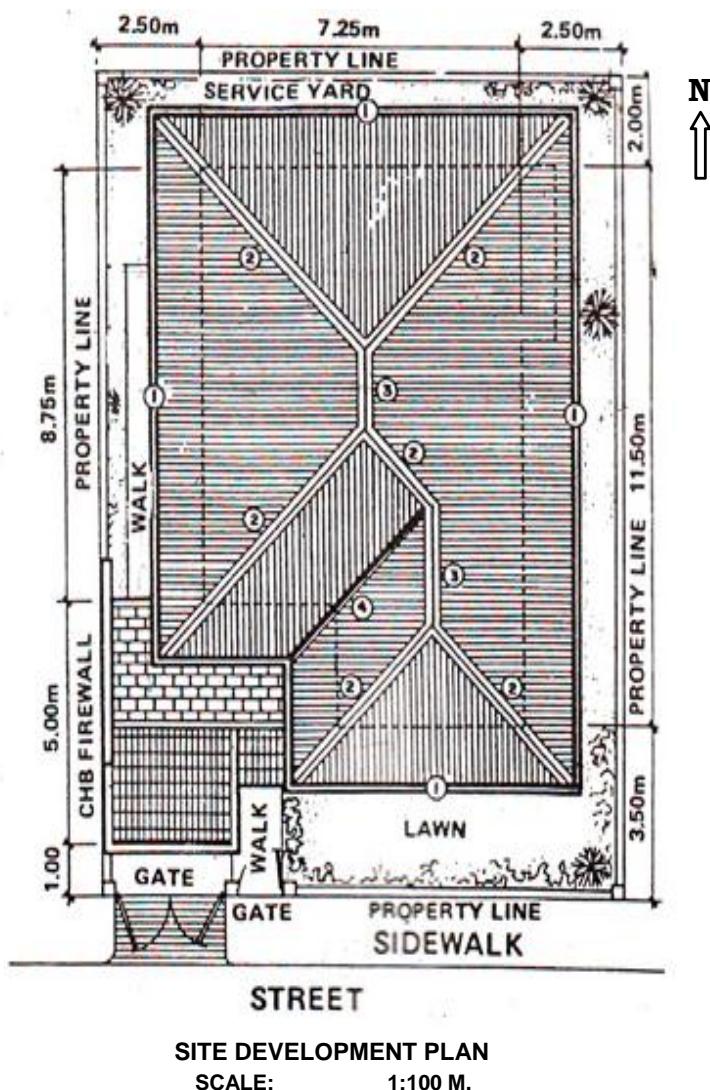
6. Draw and finalized design of occupancy plan.



7. Draw the desired roof type on the occupancy plan.



10. Indicate all symbols required in the plot plan.
  11. Indicate the perimeter dimensions including compass direction.
  12. Indicate the necessary utility line to be shown in the plot plan.
  13. Letter all the labels required.
  14. Indicate the scale used.
  15. Finalize the drawing.



### A. Drawing Problem

Directions: Draw the site of a given survey lot below. Use appropriate tools and materials.

Given:

Use scale 1:100 meter.

Start from point no. 1, N  $44^{\circ} 33' E$ , 197.38M., from point 1., S $79^{\circ} 00' W$ ; 6.55 M. point 2, from 2, N  $10^{\circ} 21' W$ ; 17.04M. point 3, from point 3, N $78^{\circ} 25' E$ ; 6.51 M. point 4, point 4, S  $10^{\circ} 30' E$ ; 17.11 M. point 5.

### Performance Assessment

#### Scoring Rubrics

Criteria	Score <small>(Tick the corresponding pts.)</small>
Accuracy	
50	
45	
40	
Speed	
10	
6	
8	
Neatness	
25	
20	
15	
Lettering/Labeling	
15	
12	
10	
8	
Total	

#### Performance Criteria:

- **Accuracy**

- |         |   |  |
|---------|---|--|
| 50 pts  | - | the output is accurately done.                 |
| 45 pts  | - | two to five errors are observed on the output. |
| 40 pts. | - | six to ten errors are observed on the output.  |

- **Speed**

- |        |   |   |
|--------|---|---|
| 10 pts | - | the output is done 2 hours before the time. |
| 8 pts  | - | the output is done on time.                 |
| 6 pts. | - | the output is done after the allotted time. |

- **Neatness**

- |         |   |                            |
|---------|---|----------------------------|
| 25 pts. | - | has no error.              |
| 20 pts  | - | has two to three erasures. |
| 15 pts  | - | has four or more erasures  |

- **Lettering/Labeling**

- |         |   |   |
|---------|---|---|
| 15 pts. | - | all pieces of information are completely indicated and legibly printed in gothic letters or mechanical lettering. |
| 12 pts. | - | all pieces of information are legibly printed but some are missing.   |
| 10 pts. | - | all pieces of information are legibly printed but some are missing and misspelled.                                |
| 8 pts.  | - | pieces of information are not legibly printed and words are missing and misspelled.                               |

**Unit of Competency : DRAFT ARCHITECTURAL LAYOUT AND DETAILS**

**Module Title : Drafting Architectural Layout and Details**

**LO4 Draft Floor Plan**

### **ASSESSMENT CRITERIA**

1. Drafting tools are used according to architectural practices
2. Walls, windows and doors, fixtures and fittings are drawn according to architectural design standards
3. Grid and dimension lines are drawn according to architectural design standards
4. Metric scale is used according to the magnitude of plans to be drafted.
5. Letterings and labels are indicated according to drafting standards.

### **References:**

Giesecke, Mitchell, and Spencer. Technical Drawing, Macmillan Company, 1999.

Donald Hepler, Paul I. Wallach, Architecture Drafting and Design, fifth edition, 1986

Donald Hepler, Paul I. Wallach, Architecture Drafting and Design, fourth edition, 1988

French and Vierck. Engineering Drawing, 10<sup>th</sup> edition, MacGraw, Hill Book Company, 1988

German M. Manaois. Drafting 1 and 2, Phoenix Publishing, 1983

Max B. Fajardo Jr., Planning and Designers Handbook, Second Edition

The National Building Code of the Philippines and its Implementing Rules and Regulations.

### **LEARNING EXPERIENCES/ ACTIVITIES**

#### **Learning Outcome 4: Draft Floor Plan**

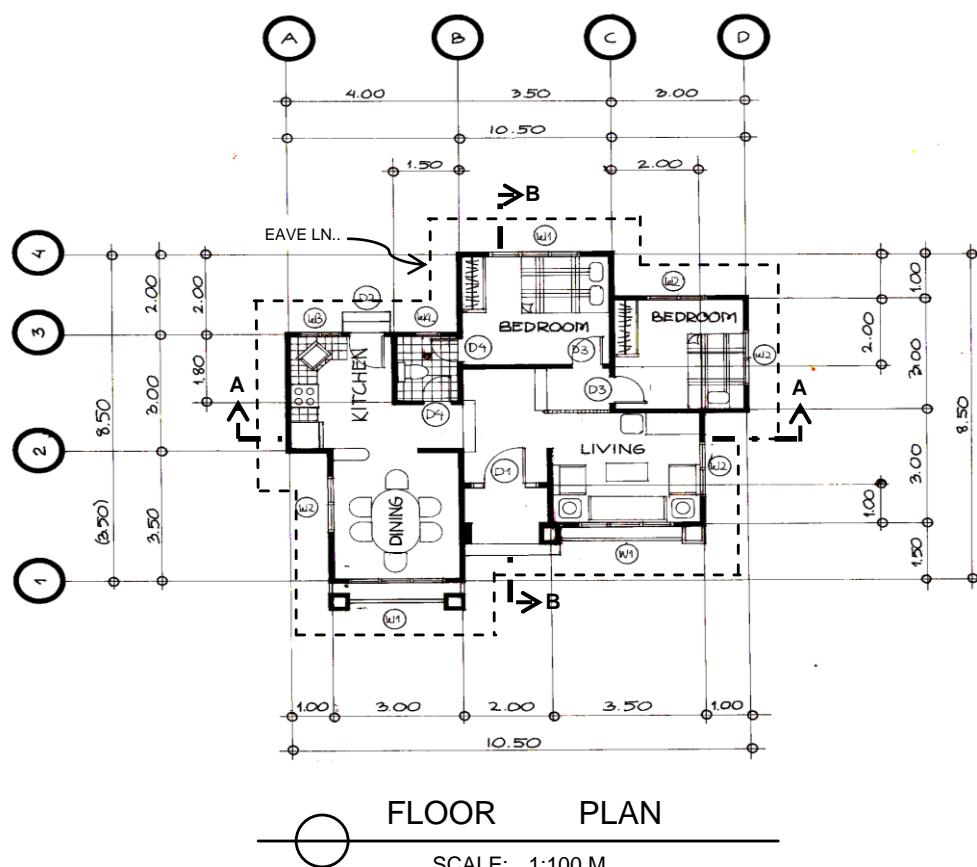
<b>Learning Activities</b>	<b>Special Instruction</b>
<p>1. Read information sheet no. 4.1 about floor plan features.</p> <p>2. Answer self-check no. 4.1 to test your knowledge about floor plan features.</p> <p>3. Read information sheet no. 4.2 about use of appropriate scale.</p> <p>4. Answer self-check no. 4.2 to test your knowledge about the use of appropriate scale.</p> <p>5. Read information no. 4.3 to test your knowledge about architectural drafting standards</p> <p>6. Answer self-check no. 4.3 to test your knowledge about architectural drafting standards.</p> <p>7. Read operation sheet no. 4.1 about the steps in drawing a floor plan.</p> <p>8. Answer self check no. 4.4.</p>	<ul style="list-style-type: none"> <li>• Try to answer the self check.</li> <li>• Try to answer the self check.</li> <li>• Try to answer the self check.</li> <li>• Try to perform the self check.</li> </ul>

#### **INFORMATION SHEET 4.1**

## L.4. FLOOR PLAN FEATURES

### Floor Plan

Floor plan is the top cross-sectional view of the floor area of a house. The horizontal cutting plane line for this top view passes between the upper and lower window sills or one meter above the floor line. It shows the size and arrangement of the rooms. It also presents the sizes and locations of the stairs, door and windows openings, and partitions and walls. Sometimes it includes the kind of furnishings in each room. However, the materials required for constructing permanent or integral parts of each room such as bedroom closets, kitchen cabinets, etc., should also be accounted for in the bill of materials.



In multi-storey buildings, a *separate floor plan* is drawn for each floor level when the layout of the room is not in each floor. However, when two or

more floor levels have the same arrangement and features, one typical floor plan representing all the identical floors will suffice to be drawn.

### **Room Requirements and pointers in planning a floor plan**

- 1. Living Room** is the center of the living area in most homes. It should be centrally located and should be adjacent to the outside entrance and to the dining area, but the entrance should not lead directly into the living room. Recommended sizes should be at least 2.00m x 3.00 small, 3.7m. x 5.5m. average or optimum size would be 6.1 x 7.9 m. in rectangular shape.
- 2. Bedroom** is a room for sleeping and taking rest of the family. Ideal number of rooms for low cost housing should be two bedrooms, master's bedroom and bedroom. Preferably, there should be a toilet and bath in master' bedroom and a built-in cabinets or closets.
- 3. Dining Area** is the area where greatly depend on eating habits of the occupants. This should be located between the living room and kitchen. Its size and shape are determined by the size of the family.
- 4. Kitchen** is the place for preparation of food and connecting the work triangle area for *storage and mixing center, preparation and cleaning center* and *cooking center*. There should be a storage hanging kitchen cabinet with a minimal width of 0.60 meter.

### **Types of Kitchen**

1. U-shaped kitchen

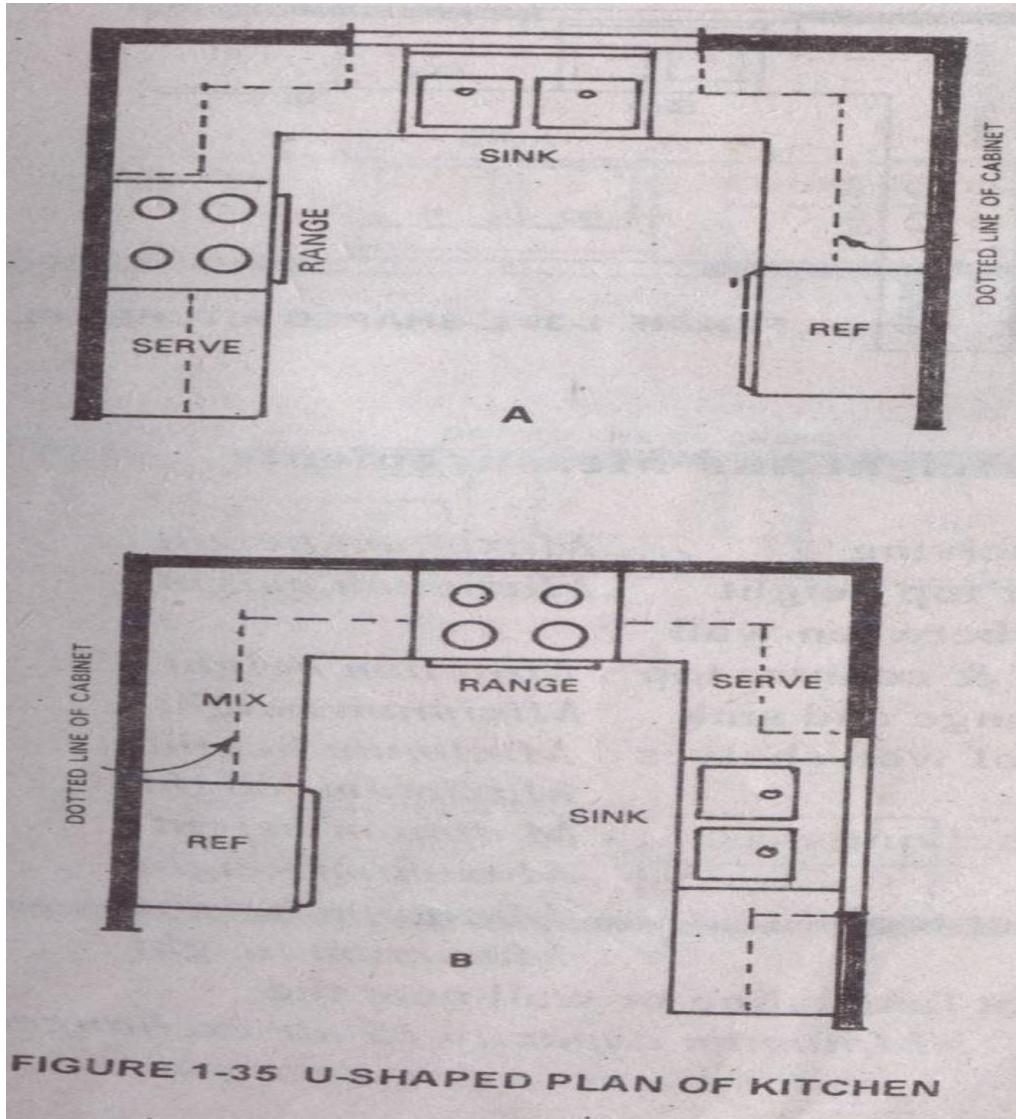
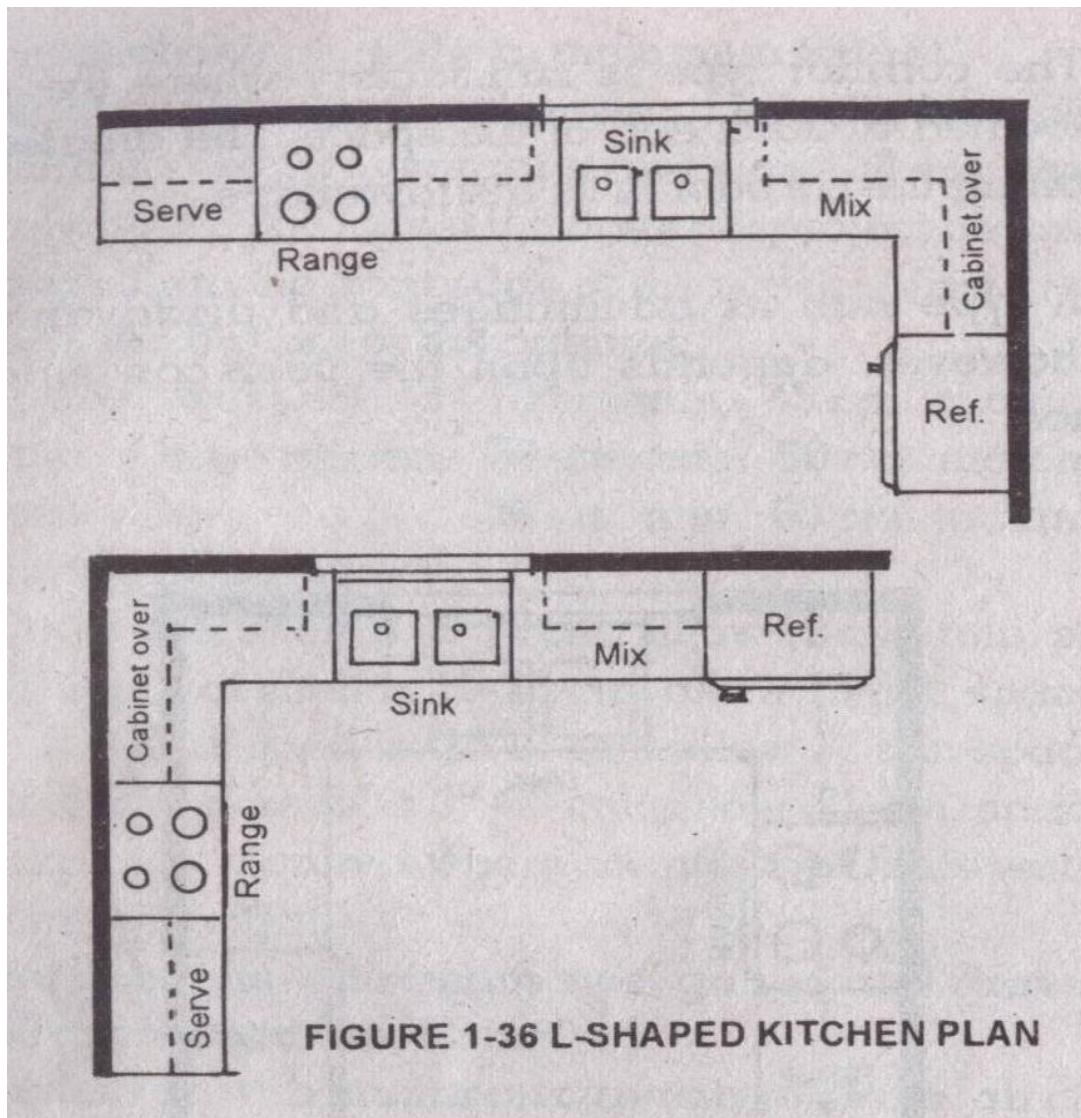


FIGURE 1-35 U-SHAPED PLAN OF KITCHEN

2. . L-shaped type



3. Corridor type

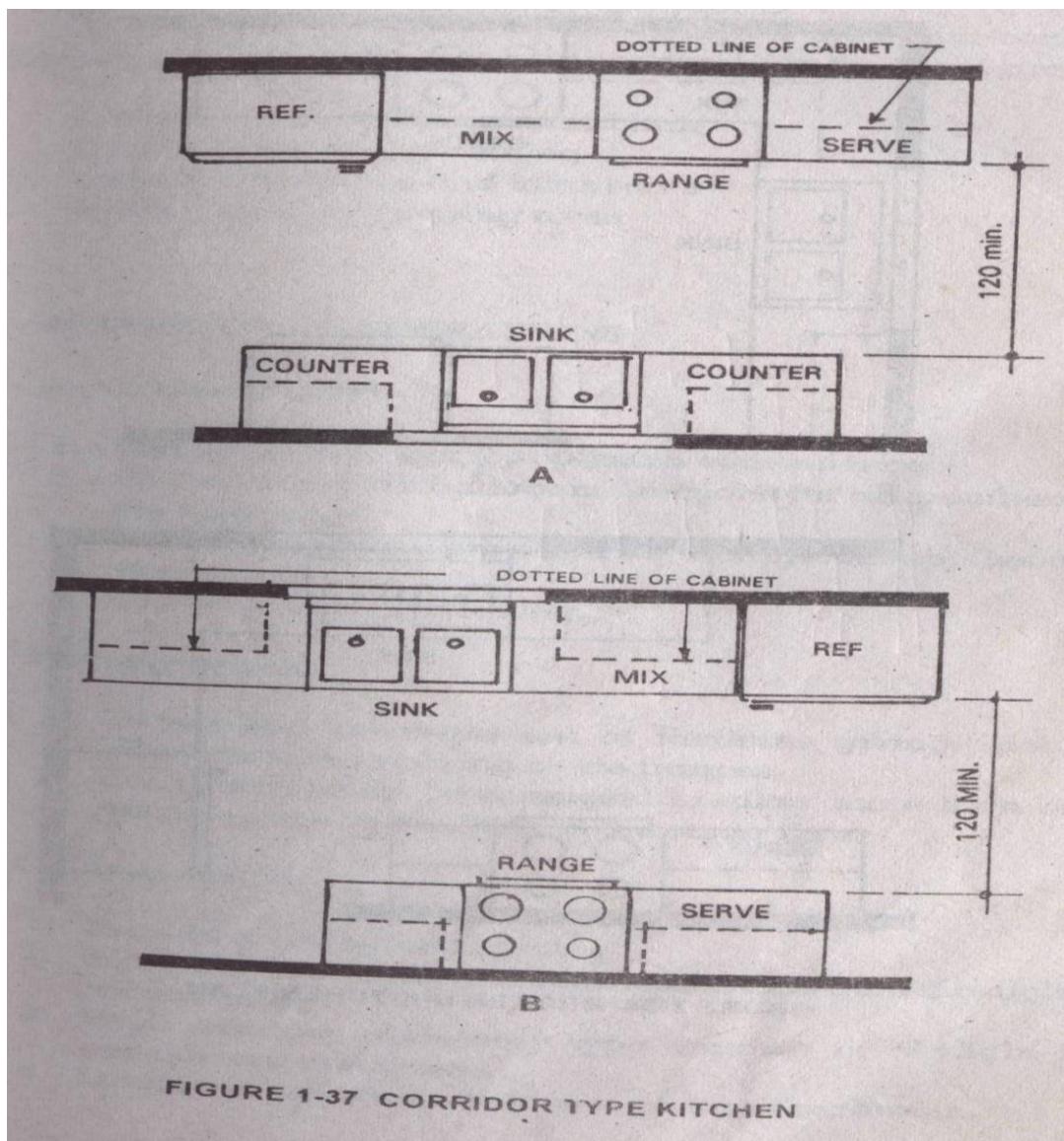


FIGURE 1-37 CORRIDOR TYPE KITCHEN

**5. Bathroom** is where the toilet and tub or shower are separated to save economically in plumbing. As much as possible keep the toilet near

the kitchen. The bath and toilet must be near the bedrooms, accessible to the living room even without passing through other rooms. The toilet and bath are generally located between bedrooms. In a two-storey residential house, the bedrooms, toilet, and bath are often located on the second floor. In this case, the stair must go up from the living room or hall if there is any. The stair is generally L or U-shaped and has a landing.

**Bathroom Doors and Windows** Bathroom door could be small as 55-60 cm. except for utility bathroom which requires not less than 70.cm. wide to allow passage of equipment as required. In general, bathroom wall contain only one door.

**6. Entrances** Entrance is divided into several different types; the *main entrance, the service entrance, and the special-purpose entrance*. The entrance is composed of an outside waiting area like the porch, marquee or lanai and an inside waiting area like foyer or entrance hall. It provides for and controls the flow of traffic into and out of a building.

The *main entrance* provides access to the house. It is the one through which guests are welcomed and from which all major traffic patterns radiate. The main entrance should be readily identifiable. It should provide shelter to anyone awaiting entrance.

The *service entrance* provides access to the house through which supplies can be delivered to the service areas going through other parts of the house. It should also provide access to parts of the service area like the garage, laundry or workshop.

The *special-purpose entrances and exits* do not provide for outside traffic. Instead they provide for movement from the inside living area of the house to the outside living areas. A sliding door from the living area to the patio is

a special-purpose entrance. It is not an entrance through which street, drive, or sidewalk traffic would have an access.

## **7. Garage and Carports.**

A *garage* is an enclosed structure designed primarily to shelter an automobile. It maybe used for many secondary purposes – as a workshop, as a laundry, or for storage space. It is usually attached to the house in some manner to provide a sheltered entry.

A *carport* is a garage with one or more of the exterior walls removed. It may consist of a free-standing roof completely separate from the house, or it may be built against the existing walls of the house.

## **SELF CHECK 4.1**

### **LO4.1 Floor Plan features**

Direction: A. Multiple Choice: Read each item carefully. Choose the letter of the answer and write it on a separate sheet of paper.

1. A part of the house where sometimes used for eating and relaxing.
    - a. porch b. living area c. bedroom d. dining area
  2. It provides for and controls the flow of traffic into and out of a building.
    - a. special purpose exit b. door c. entrance d. exit door
  3. This room is generally located between the bedrooms.
    - a. Bathroom b. dining area c. kitchen d. foyer
  4. This has an access to kitchen and living room.
    - a. Bathroom b. dirty kitchen c. dining hall d. dining area
- B. Enumeration: Identify the following.
- a. Types of kitchen
  - 5.
  - 6.
  - 7.
  - b. Fixtures in kitchen “work triangle”.
  - 8.
  - 9.
  - 10.

### **INFORMATION SHEET 4.2**

## LO4. Use of appropriate scale in drawing a Floor Plan

### Scales

The architectural draftsman normally uses an architect's scale for reducing and enlarging the scale size measurement. There are two system of measurement, Metric system and English system.

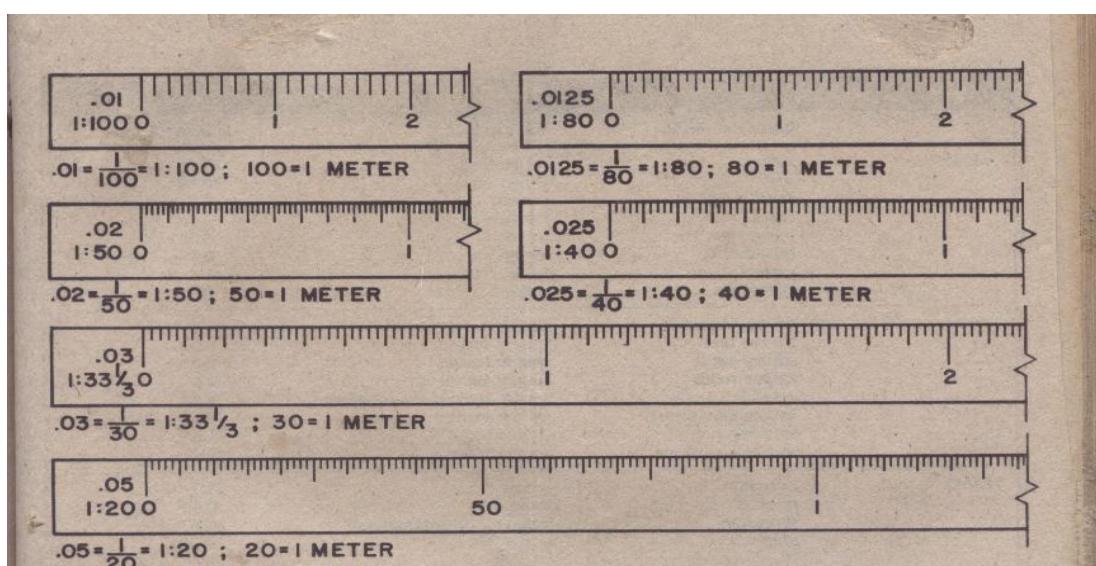


Fig 25-9 Typical metric ratios.

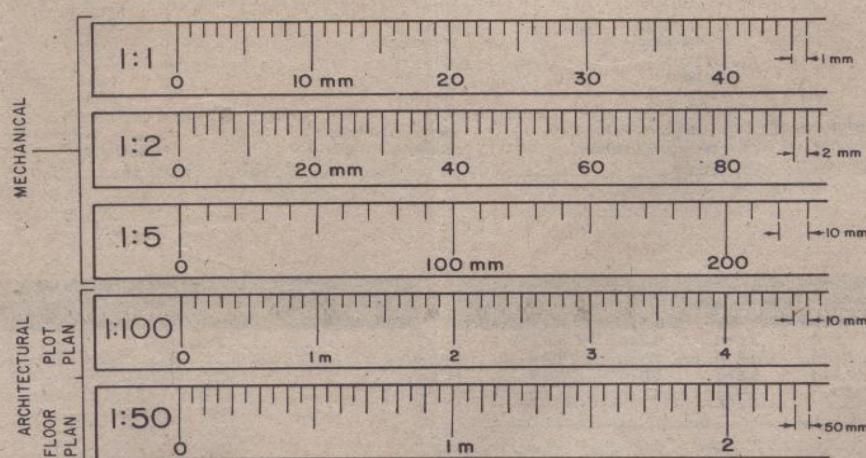


Fig 25-10 Architectural and mechanical metric scales.

### Metric System

Always remember that the smallest the number used in metric scale, the bigger the size in the triangular scale whereas, the largest the number used the smallest size of actual measurement.

1:05 m.	1: 100 m.
1:10 m.	1: 200 m.
1:20 m.	1: 300 m.
1: 30 m.	1: 400 m.
1: 40 m.	1: 500 m.
1: 50 m.	1: 600 m.
1:75 m.	1:1000m.

Note: The scale of 1:1000 m. or more is being used in Lot Plan and other topographical drawings.

### **Full size scale**

The 1:1 is a full size scale and each division measures 1 mm. in width with the numbering of the calibrations at 10mm intervals. This same scale is convenient for ratios of 1:10, 1:100, and 1:1000

### **Half size Scale**

The 1:2 is one-half size scale and each division is equals to 2 mm. with the calibration numbering at 20-unit intervals. In addition, this scale is convenient for ratios of 1:20, 1:200, and 1:2000.

## **ARCHITECTURAL USE OF METRIC SCALE**

<b>USE</b>	<b>RATIO</b>	<b>COMPARISON TO 1 METER</b>
CITY MAP	1:2500	0.4 mm. equals to 1 M.
	1:1250	0.8 mm. equals to 1 M.
PLAT PLANS	1:500	12 mm. equals to 1 M.
	1:200	5 mm. equals to 1 M.
PLOT PLANS	1:100	10 mm. equals to 1 M.
	1: 80	12.5 mm. equals to 1M.
FLOOR PLANS	1:75	13.3 mm. equals to 1 M.
	1:50	20 mm. equals to 1 M.
	1:40	25 mm. equals to 1M.
DETAILS	1:20	50 mm. equals to 1M.
	1:10	100 mm. equals to 1 M.
	1:5	200 mm. equals to 1 M.

#### **SELF CHECK 4.2**

#### **LO4. Use of appropriate scale**

Directions: A. Multiple Choice: Choose the letter of the best answer and write it on a separate sheet of paper.

1. It is the appropriate scale for plot plan.
  - a. 1:2500 and 1:1250
  - b. 1:75, 1:50, 1:40
  - c. 1: 5, 1:10, 1:20
  - d. 1 :100, 1:80
2. Its equivalent is ten millimeters in metric figures.
  - a. 0.0010
  - b. 0.010
  - c. 0.100
  - d. 0.10
3. It is equal to one hundred centimeters.
  - a. 0.100
  - b. 0.0100
  - c. 1.00
  - d. 10.0
4. It is also equivalent to one half kilometer.
  - a. 1,000 meters
  - b. 50 meters
  - c. 500 meters
  - d. 500 decimeters
5. It is a kind of scale equivalent to 1:1.
  - a. half scale
  - b. full scale
  - c. metric scale
  - d. none of the above

#### **B. Metric figures.**

Directions: Convert the following into metric figures.

1. One meter and five centimeters. \_\_\_\_\_
2. Ten meters and two decimeters. \_\_\_\_\_
3. Ninety centimeters. \_\_\_\_\_
4. Seventy five centimeters. \_\_\_\_\_
5. One kilometer. \_\_\_\_\_

#### **INFORMATION SHEET 4.3**

## **LO4. Architectural drafting design standards**

### **Legal Provisions:**

- **Section 806 of the National Building Code (NBC). Size and Dimension of Rooms:**

- a. Room for human habitations should be 6.00 square meters with at least a dimension of 2.00 meters.
- b. Kitchens should be 3.00 square meters with at least a dimension of 1.50 meters.
- c. Bath & Toilet – 1.20 square meters with at least dimension of 0.90 meters.

- **Section 1207. Stairs, Exit, and Occupant Loads.**

**Width and Height.** Every required exit doorway shall have a size to permit the installation of a door not less than 900 millimeters in width and not less than 2.00 meters in height.

**Stairways width.** Stairway serving an occupant load of more than 50 shall not be less than 1.10 meters. While stairway serving an occupant load of 50 or less shall be 900 millimeters wide.

**Rise and run.** The rise of every step in a stairway shall not exceed 200 millimeters and the run shall not be less than 250 millimeters.

### ***Other guidelines must be observed in the arrangement of rooms in drawing floor plan:***

1. Built-in cabinets or closets are usually found in the bedrooms, kitchen, and dining room. Open shelves may be constructed in the kitchen and dining room.
2. In some one-storey houses, the bedrooms toilet, and bath are elevated from the other rooms. In this case, the stairs leading to these rooms must be indicated on the floor plan. Two or three steps, each has 18 or 19 cm high from each other and 25 cm wide,

may be shown in the plan. All these measurements must be drawn to scale.

3. Since most of the time is spent by the members of a family in the bedrooms at home, these rooms must be located far from noise, dust, and polluted air coming from garbage pits or from the kitchens and toilets of the neighboring houses.
4. If furnitures and house appliances are to be shown in each room, these furnishings should be drawn on the same scale in the floor plan.
5. If the floor plan will be traced on tracing paper in order to indicate the electrical or water connections, these furnishings should not be shown on the tracing.
6. In presentation drawings, the landscaping around the floor plan may be added.
7. It is on the floor plan where the cutting plane lines for at least two full-sectional elevations (cross and longitudinal) are indicated. These sectional elevations are usually labeled as Section A-A and Section B-B, depending on the capital letter used at the extremities of the cutting plane lines. These cutting plane lines need not be continuous or straight. They are often drawn in colored ink. ( see illustration)
8. Windows and Doors symbols should be indicated in the outer walls of the floor plan opposite to door and windows openings to determine the total number and specification.

*Entrance and Exit.* There shall be at least one entrance and another one for exit. Windows opening should be 10% of the total floor square area according to the National Building Code.

Example:

Bedroom size of  $3.00m \times 40.00 = 12$  square meters  $\times 10\% = 1.20m$  window width opening.

## **Concrete Hollow Blocks (CHB) for walling and partitions**

### **Sizes:**

- CHB - 0.10 T x 0.40 W. x 0.20 H. (4" T x 16"W x 8"H) is used for interior walls or sometimes exterior wall with no heavy loads.
- CHB - 0.15 x 0.20 x 0.40 (6" x 8" x 16") is used for exterior wall sometimes for interior wall.
- Plastering of CHB wall should not be less than 0.015 mm. or not more than to 0.05 cm in thickness.

Note:

In lay outing floor plan walls, it should be scaled with same sizes of all actual materials to be used. If the occupancy wants to use 0.10 x 0.20 x 0.40 CHB plus plastering of 0.015 mm thickness on both side walls, the total thickness of the wall is 0.13 cm. On the other hand, likes to use 0.15 x 0.20 x 0.40 CHB plus plastering of 0.015 mm thickness on both sides a total average is 0.018 cm. since it is very hard to layout the accurate scale of 0.18 wall thickness, so most draftsman prefer to use 0.20 cm. wall in lay outing floor plan.

### **Wall Openings**

Entrance door is preferably with 0.90 cm. to 1.00 m. width.

Bedroom door has a minimum width of 0.80 cm.

Toilet and Bath door have a minimum width of 0.70 cm. to 0.80 cm.

**Minimal width of windows** is preferably 0.60 cm.

**Other appliances and fixtures** are required to be drawn in the floor plan  
for space requirements

**Eave lines** are hidden roof lines which also indicated in the floor plan.

**Trees, Plants symbols** are required to be drawn in the development of site  
plan if needed.

## Architectural Symbols used in drawing floor plan

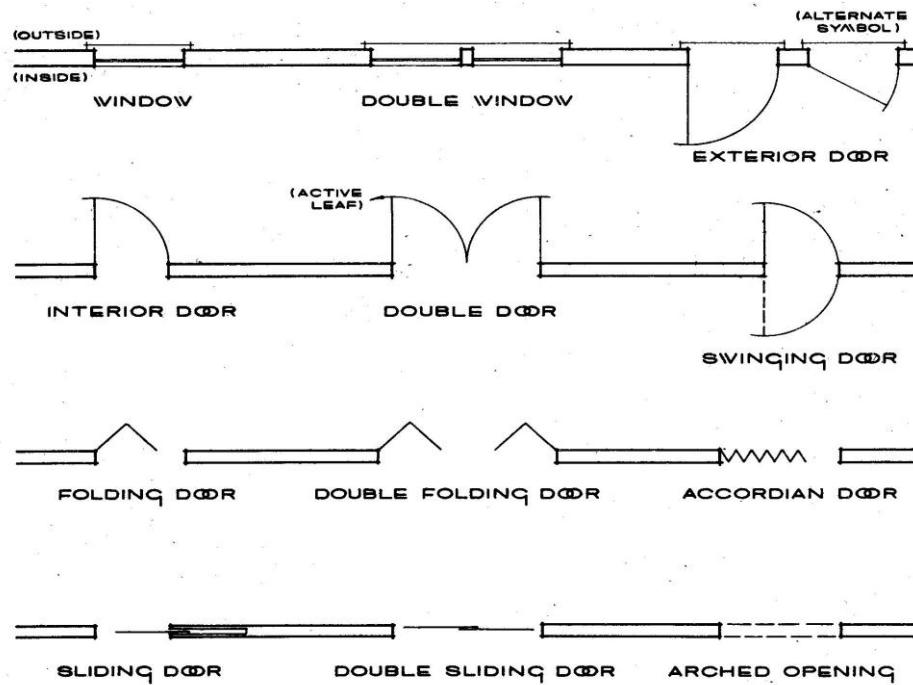
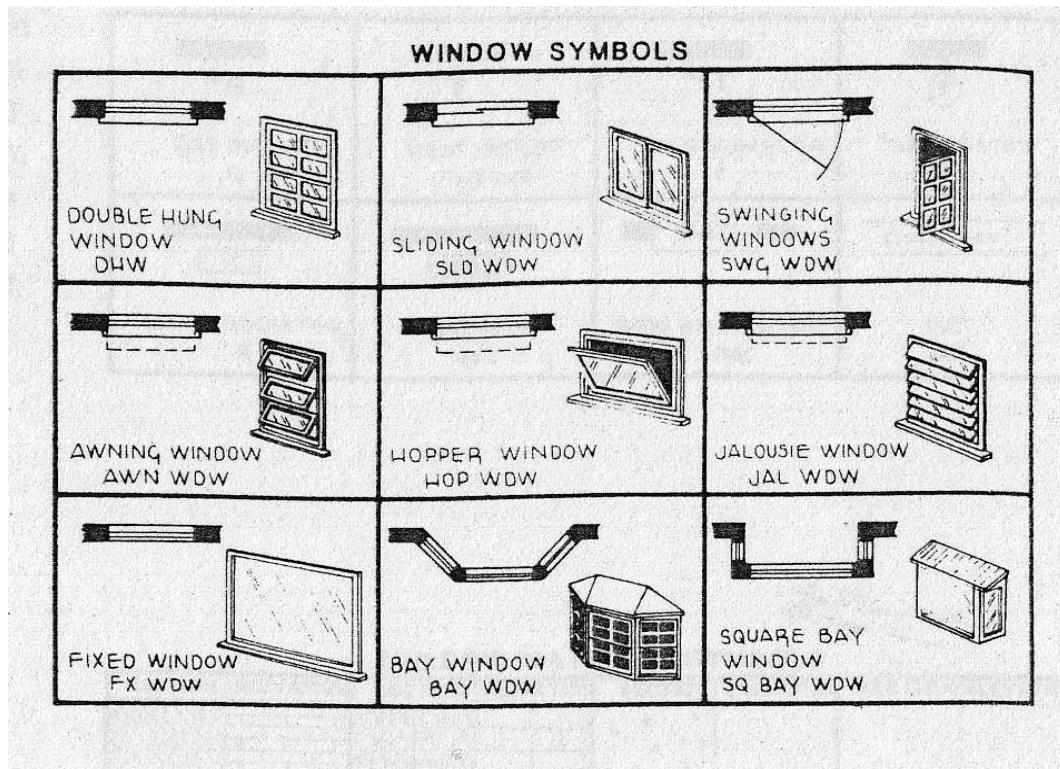
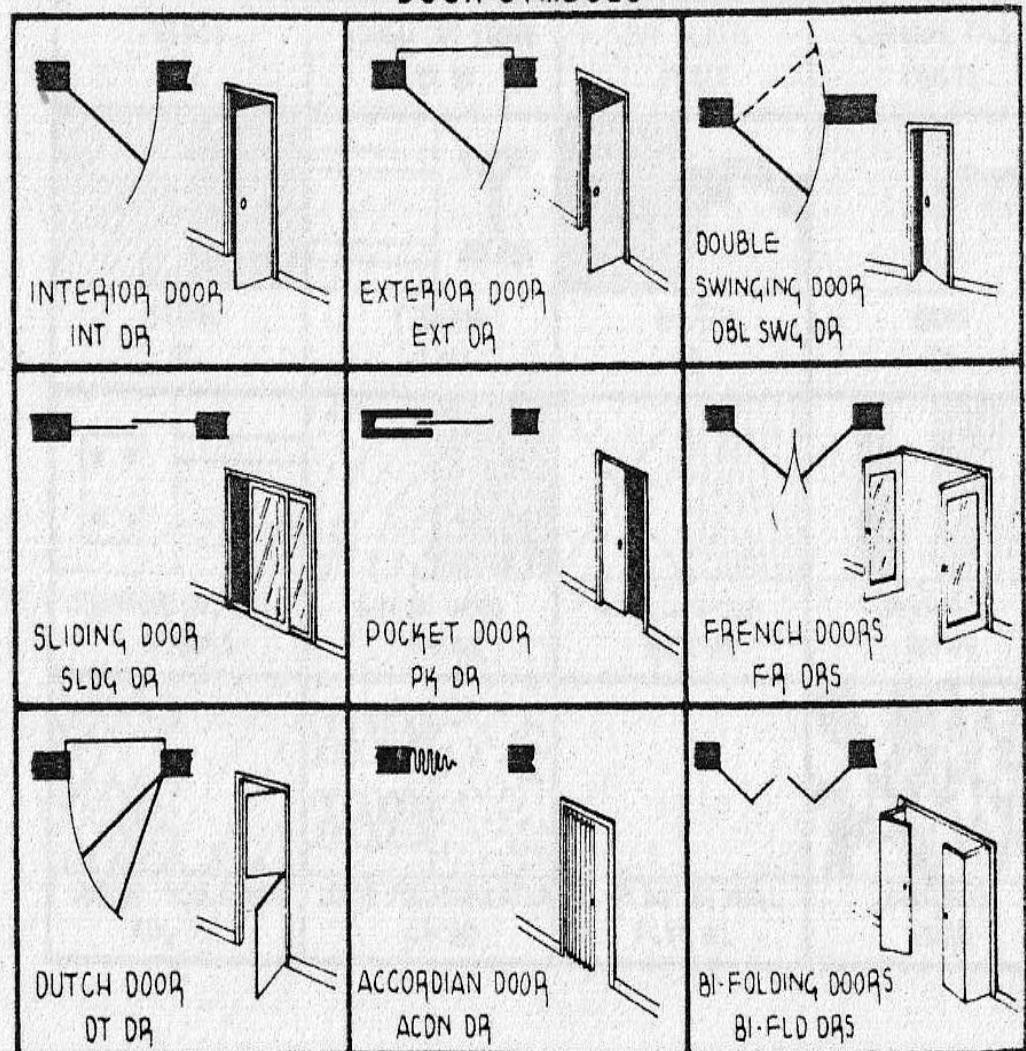


Figure 10 Frame wall openings.



## DOOR SYMBOLS



## **SELF CHECK 4.3**

### **LO4. Architectural drafting design standards**

Directions: A. Multiple Choice: Choose the letter of the best answer and write it on a separate sheet of paper.

1. It is the standard thickness of wall in meter using 4" x 16" x 8" CHB .
  - a. 0. 20 m. b. 0.10 m. c. 0.18 m. d. 0.13 m.
2. Standard thickness of wall in meter using 6" x 16" x 8" CHB.
  - a. 0. 20 m. b. 0.10 m. c. 0.20 m. d. 0.18 m.
3. It is the standard size of an entrance door opening.
  - a. 0.90 m. b. 0.80 m. c. 0.75 m. d. 1.00 m.
4. They are overhang roof lines in hidden lines form of floor plan. a. dormer b. canopy c. eave line d. shed line
5. It is a minimum area of Kitchen.
  - a. 4.00 sq.m. b. 3.00 sq.m. c. 5.00 sq.m. d. 7.00 sq.m.

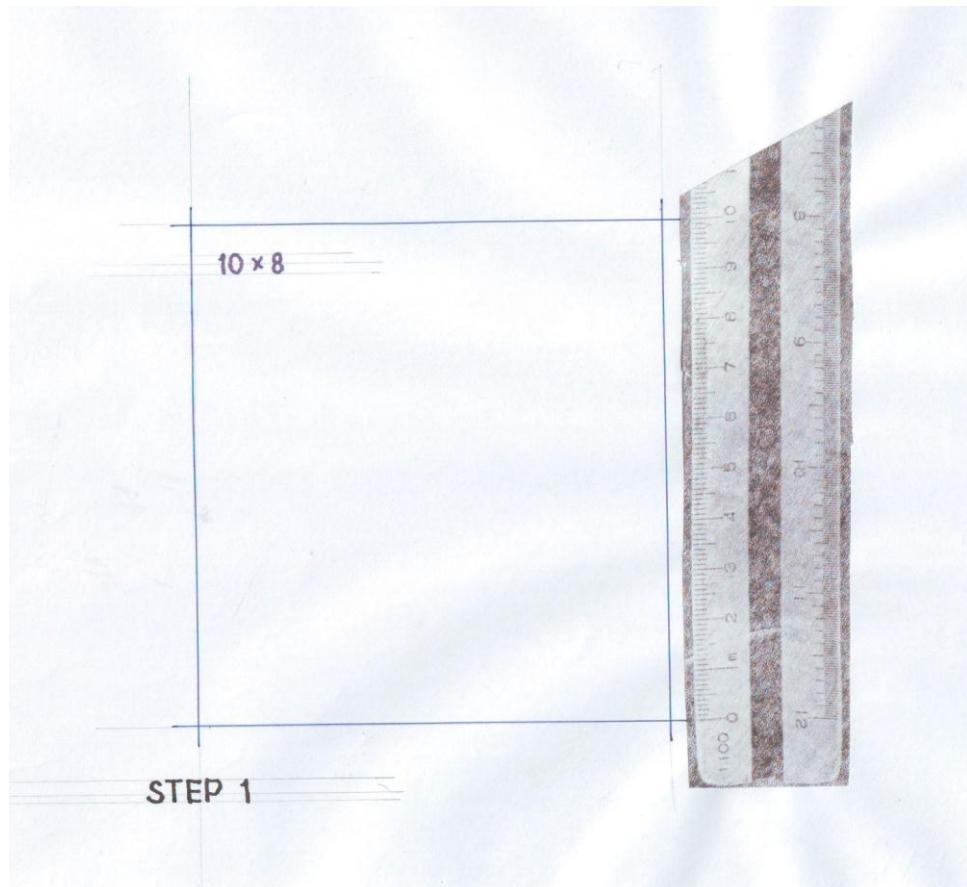
B. Draw the symbols of the following:

6. Interior door –
7. Swinging door –
8. Double door –
9. Accordion door –
10. Bay window -

## OPERATION SHEET 4.1

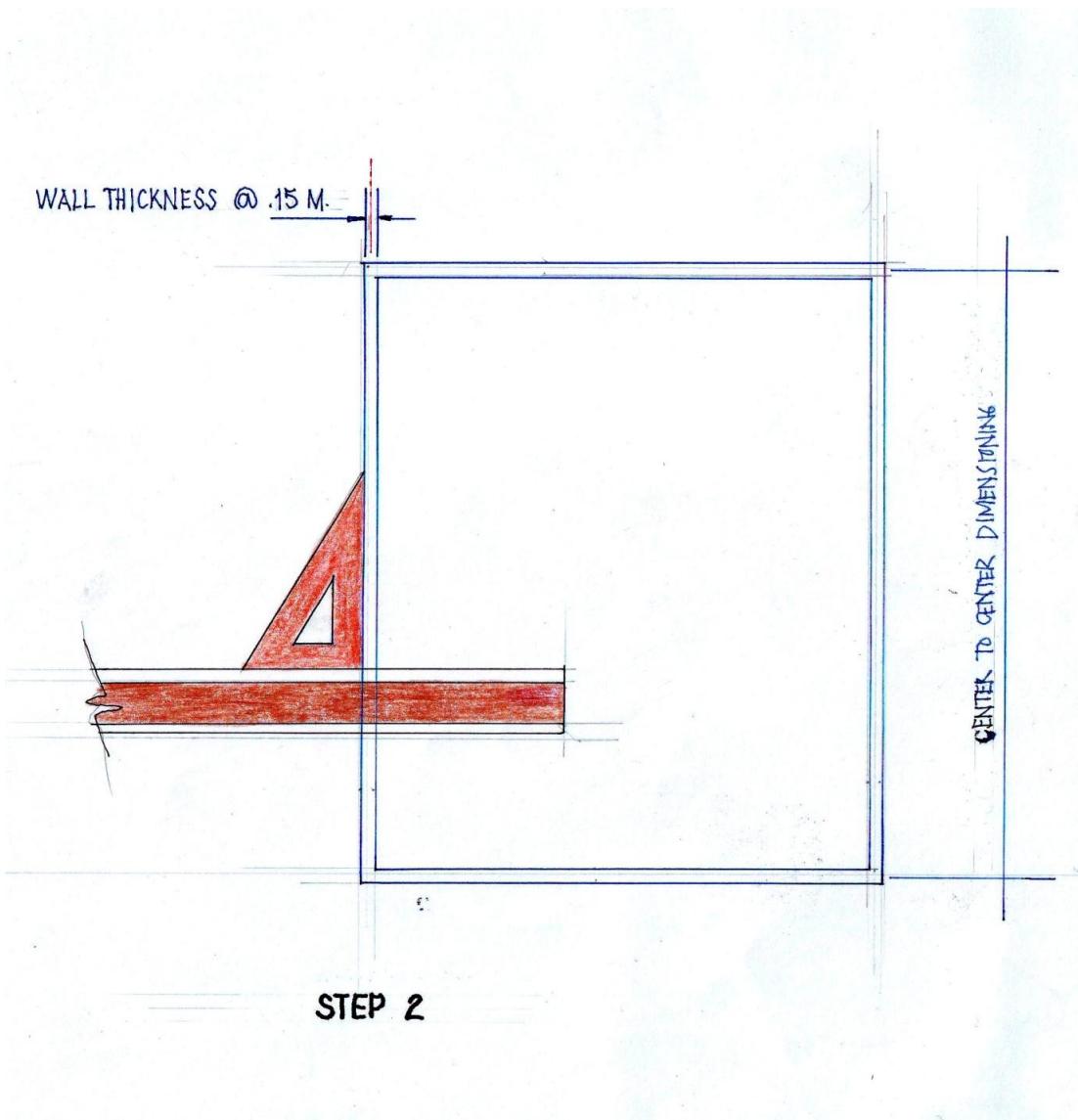
### LO4. Steps in drawing a Floor Plan

1. Prepare the needed tools and materials.
2. Use the correct scale.

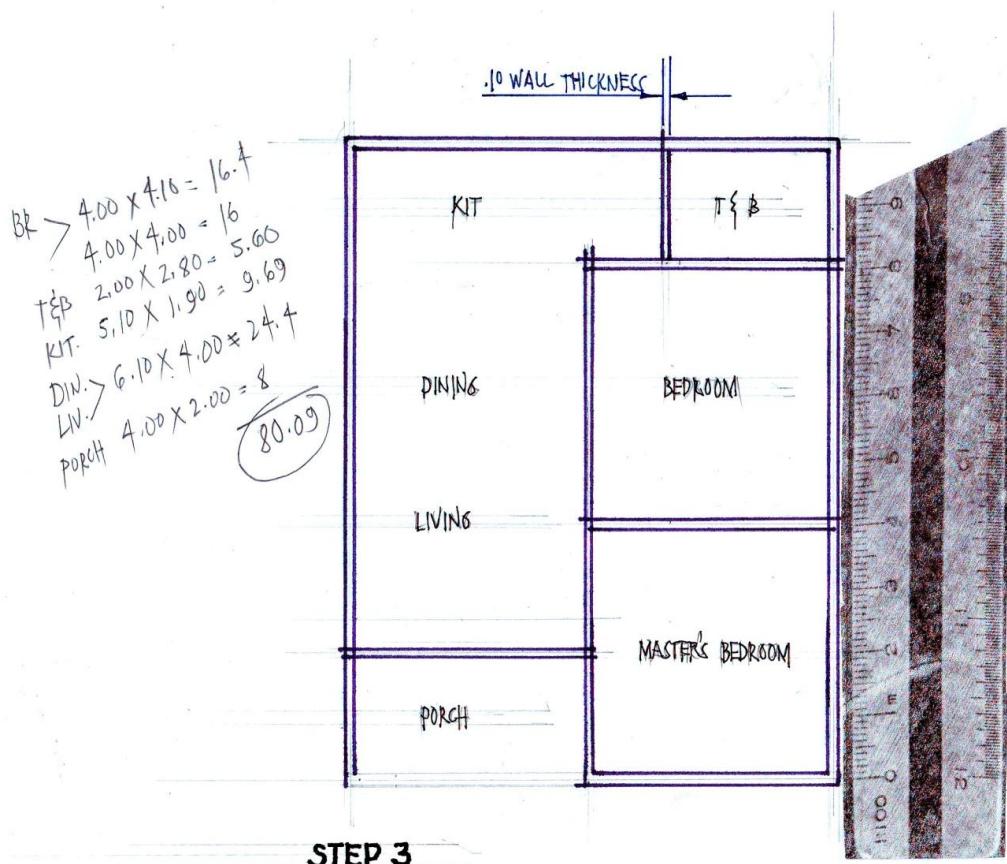


3. Construct the wall thickness. Use 0.15cm. CHB for the major walls.

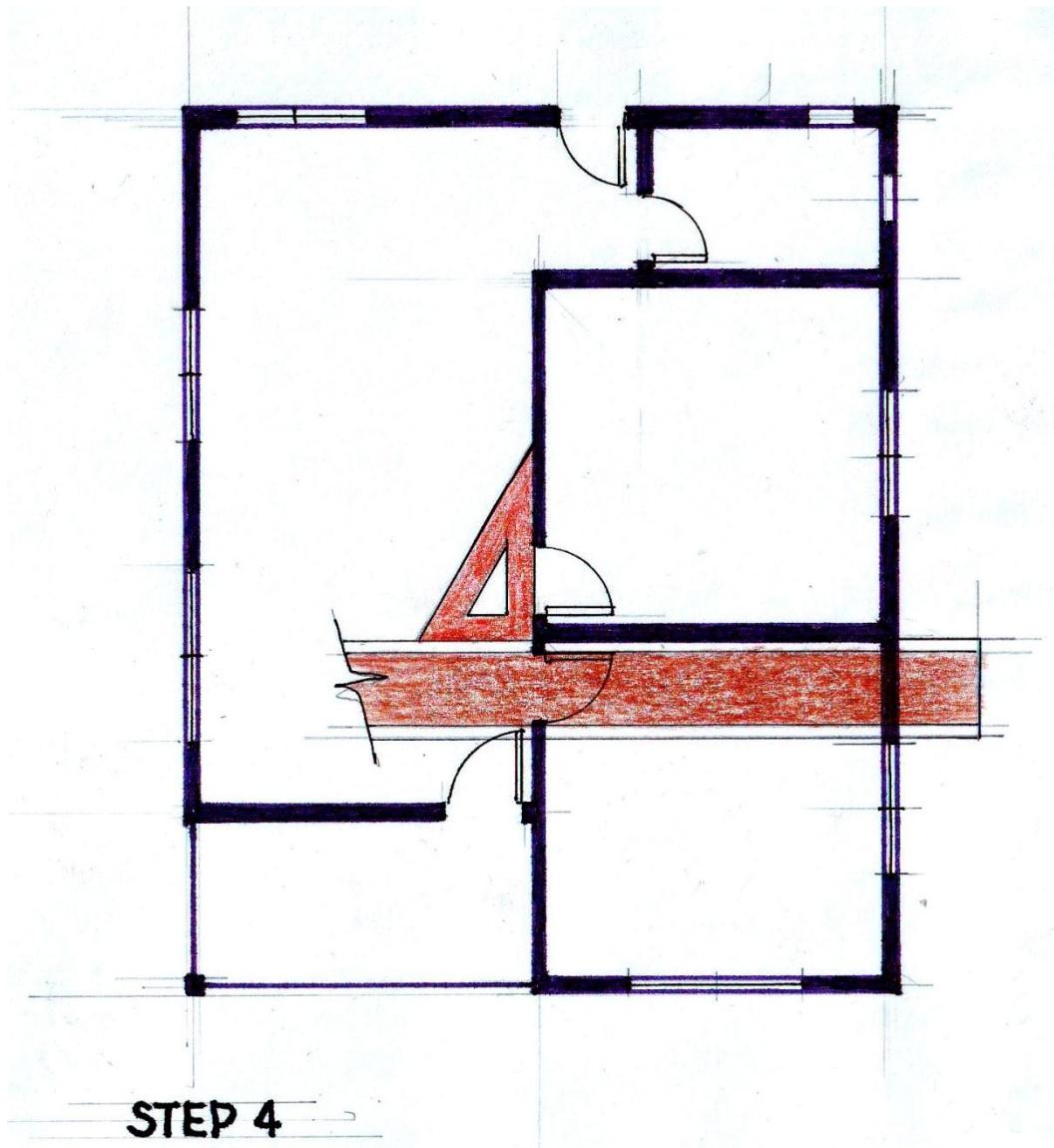
Start from the center of the wall.



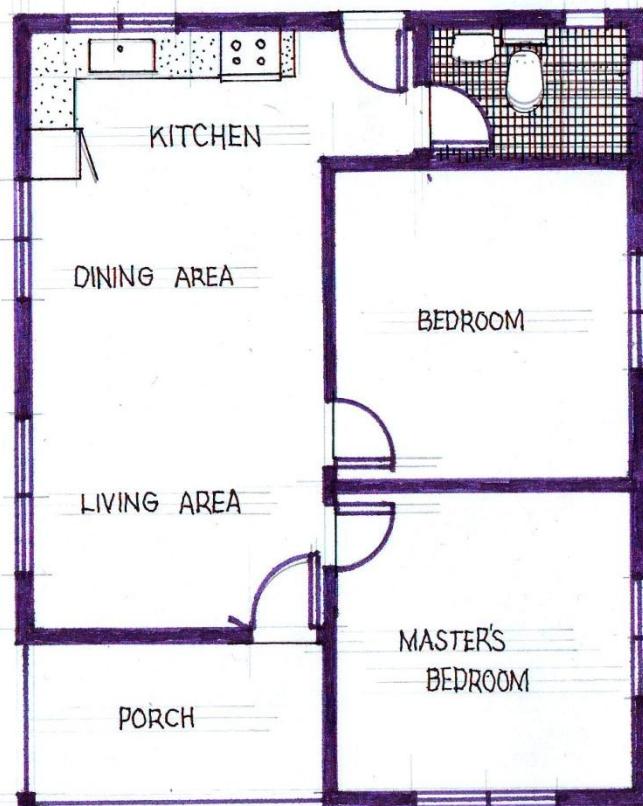
4. Divide the floor area to other areas of the house. Use a 10 cm interior wall partitions. Compute each area of the house, then check the total floor area



5. Lay out the position of doors and windows by center line and by their widths with a 4H pencil. The standard width of doors is 90-95 centimeters like the main entrance door. While 80 centimeters for bedrooms and service doors and 0 .75 centimeters for toilet and bath doors.

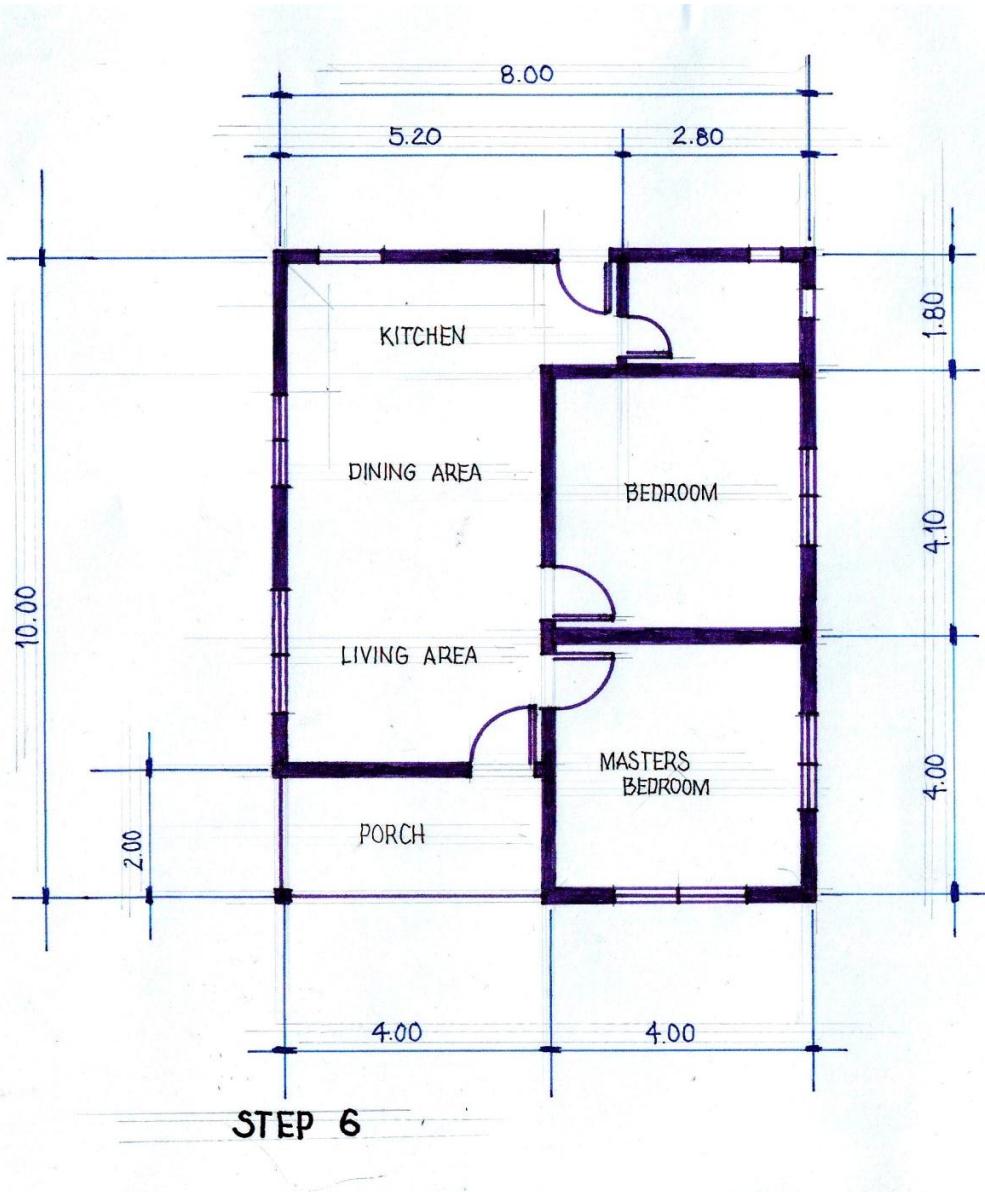


6. Label each part of the floor plan. Draw the kitchen and apply the work triangle principle in designing the kitchen. Draft the toilet and bath draw the fixtures properly.

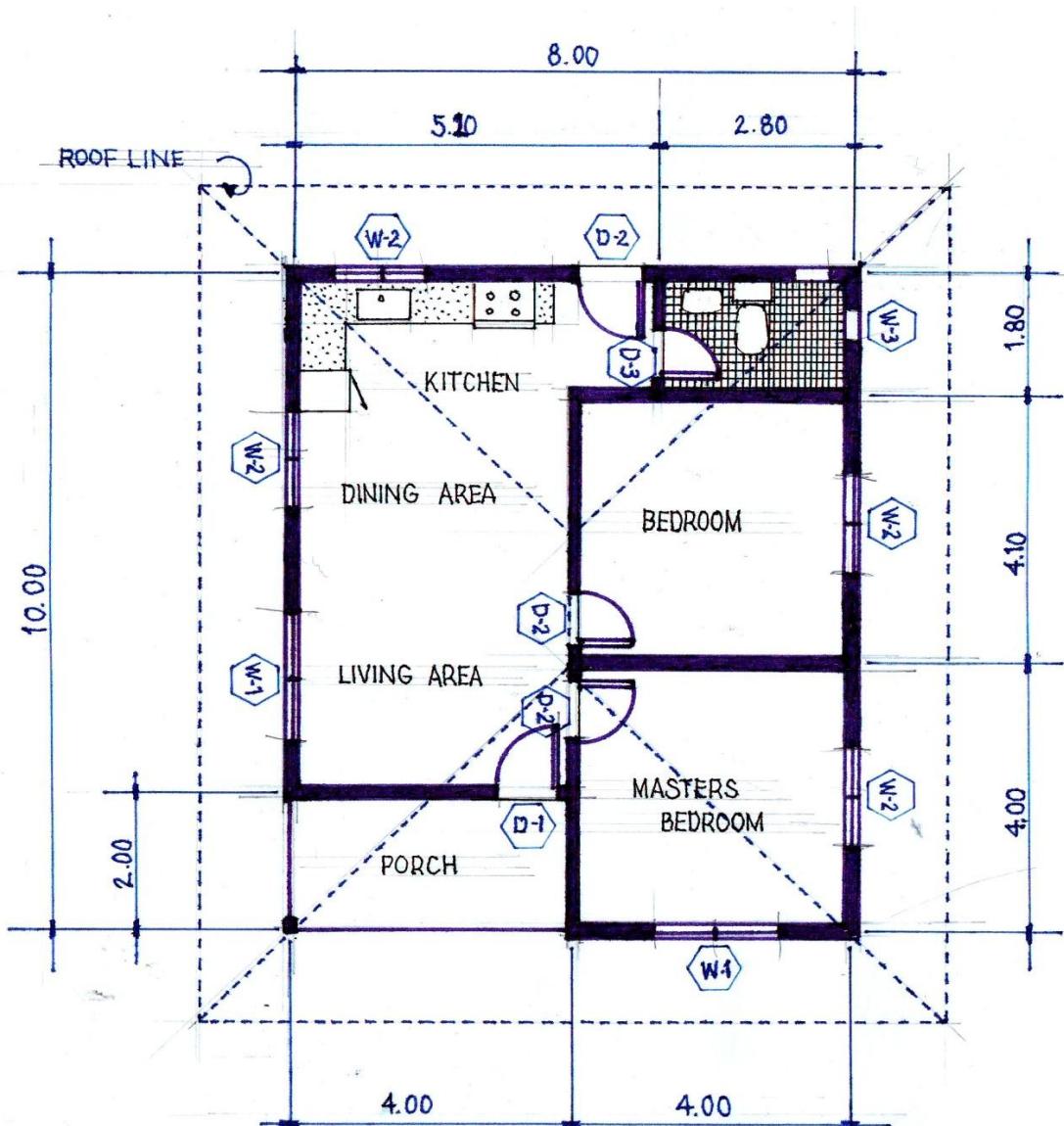


**STEP 5**

7. Lay-out extension lines. Use any dimension limits and lay out dimensions legibly and never repeat dimensions.



8. Draw the schedule of doors and windows. Name doors and windows by sizes. Finally, draw the roof line of the floor plan.



**STEP 7**

## **SELF CHECK 4.4**

### **LO4.6. Procedure in drafting floor plan**

Directions: Using the same operation. Draw the floor plan area

Given: A floor plan of 6.00 x 9.00 m. with two bedrooms. Use a scale of 1:100. Use correct tools for the right job.

### **Performance Assessment**

#### **Scoring Rubrics**

<b>Criteria</b>	<b>Score</b> <small>(Tick the corresponding pts.)</small>
Accuracy	
50	
45	
40	
Speed	
10	
6	
8	
Neatness	
25	
20	
15	
Lettering/Labeling	
15	
12	
10	
8	
Total	

## **Performance Criteria:**

- **Accuracy**

- 50 pts - the output is accurately done.
- 45 pts - two to five errors are observed on the output.
- 40 pts. - six to ten errors are observed on the output.

- **Speed**

- 10 pts - the output is done 5 minutes before the time.
- 8 pts - the output is done on time.
- 6 pts. - the output is done after the allotted time.

- **Neatness**

- 25 pts. - no errors made on the output.
- 20 pts - has two to three erasures.
- 15 pts - has four or more erasures

- **Lettering/Labeling**

- 15 pts. - all pieces of information are completely indicated and legibly printed in gothic letters or mechanical lettering.
- 12 pts. - all pieces of information are legibly printed but some are missing.
- 10 pts. - all pieces of information are legibly printed but some are missing and misspelled.
- 8 pts. - pieces of information are not legibly printed and words are misspelled.

<b>Program/Course</b>	<b>: DRAFTING TECHNOLOGY</b>
<b>Unit of Competency</b>	<b>: DRAFT ARCHITECTURAL LAYOUTS AND DETAILS</b>
<b>Module Title</b>	<b>: DRAFTING ARCHITECTURAL LAYOUTS AND DETAILS</b>

### **LO5. - Draft Roof Plans**

#### **Assessment Criteria**

1. Different types of roofs are correctly identified.
2. Elements of roofs are properly discussed.
3. Dimensions of roof plan are indicated and should match floor plan dimensions.
4. Lines are drawn according to drafting standards
5. Architectural standard symbols are used.
6. Drawings are laid out according to sheet contents
7. Roof plan and framing details are drawn according to architectural drawing standards.

#### **References:**

Giesecke, Mitchell and Spencer. Technical Drawing Macmillan Company, 1982

Donald Hepler, Paul I. Wallach, Architecture Drafting and Design, fifth edition 1999

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French and Vierck. Engineering Drawing 10<sup>th</sup> edition MacGraw Hill Book Company 1987

German M. Manaois. Drafting 1 and 2 Phoenix Publishing 1983.

Max B. Fajardo Jr., Planning and Designers Handbook, Second Edition, 1980

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