9

CITY SCHOOLS DIVISION OF DASMARIÑAS

TLE

TECHNICAL DRAFTING

TLE
Technical Drafting
QUARTER 2

Development Team of the Module

Author: Margie F. Rosanto

Editor: Merlyn B. Cuevas

Management Team:
Gemma G. Cortez, Ed.D., CID - Chief
Leylanie V. Adao, EPS - LR
Joel D. Salazar, EPS In-charge

SDO Dasmarinas City
Schools Division Superintendent: Celedonio B. Balderas, Jr.
Asst. Schools Division Superintendent: Bernadette T. Luna

Guide in Using Learner's Module

For the Parents/Guardian
This module is designed to assist you as the learning facilitator at home. It provides you with activities and lessons' information that the learners need to accomplish in a distance learning modality.

For the Learner

This module is designed to guide you in your independent learning activities at your own pace and time. This also aims to help you acquire the competencies required by the Department of Education (DepEd) at the comfort of your home.

You are expected to answer all activities on separate sheets of paper and submit the outputs to your respective teachers on the time and date agreed upon.

LESSON 1
Draft Roof Plan

I

What I need to know?

LO 5. Draft roof plans *(TLE_ICTTD912AL-IIa-c-5)*

- Indicate the dimensions of the roof plan based on the floor plan
- Draw roof plans according to drafting standards
- Use standard architectural symbols in drafting roof plans

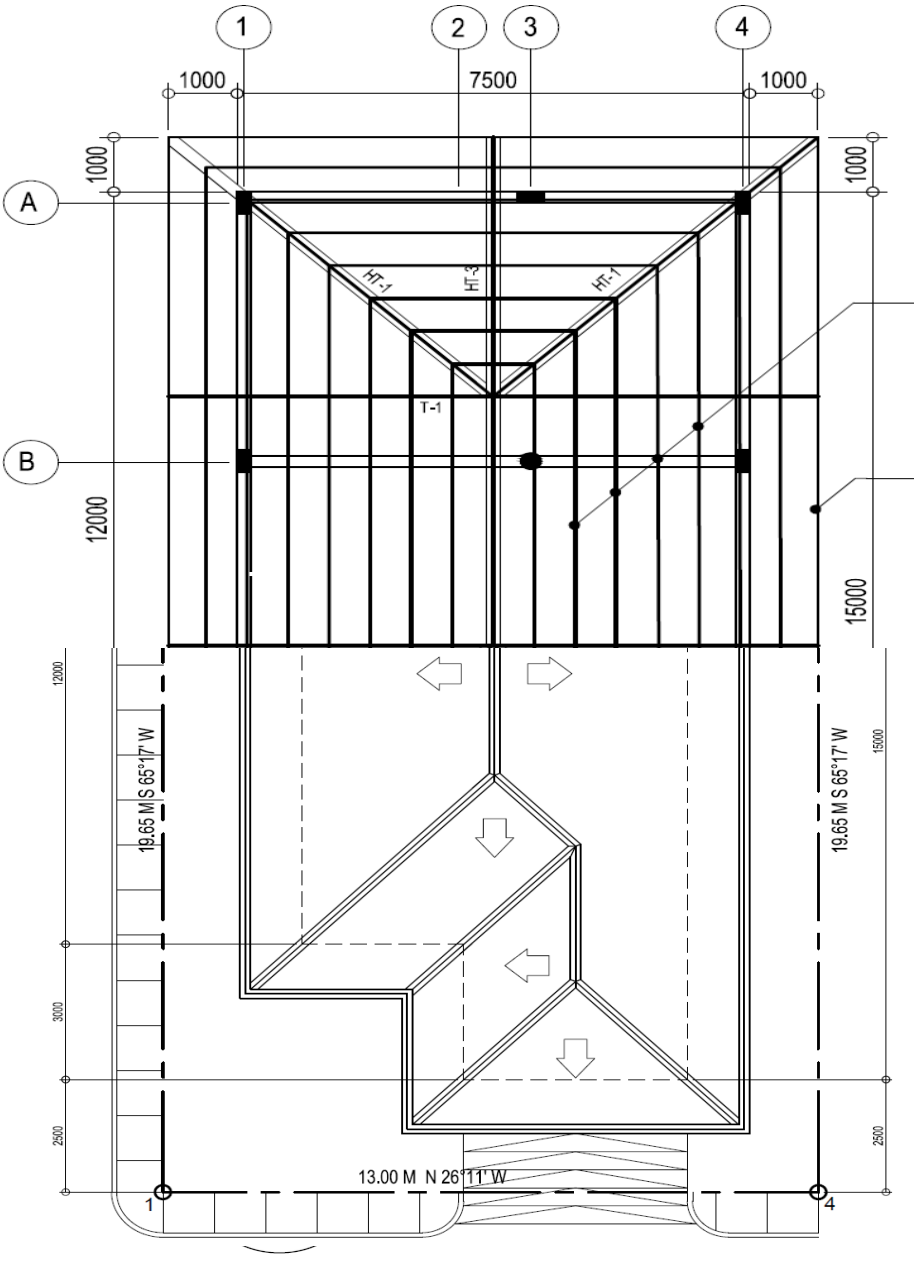
This lesson is designed to help you prepare a layout of a good roof plan design based on architectural drafting standards.

After going through this module, you are expected to:

1. identify the different types or styles of roofs;
2. recognize the basic components of a roof system;
3. enumerate various roofing materials available for roofing construction, and;
4. draft roof plan.

I What's new?

A **roof plan** is one showing the outline of the roof and the major object lines indicating ridges, valleys, hips, and openings. The roof plan is not a framing plan, but a plan view of the roof. To develop a roof framing plan, a roof must be stripped of its covering to expose the position of each structural member and each header. The roof plan can be used as the basic outline for the roof framing plan.



D What I know?

Learning Task 1: Pre-test

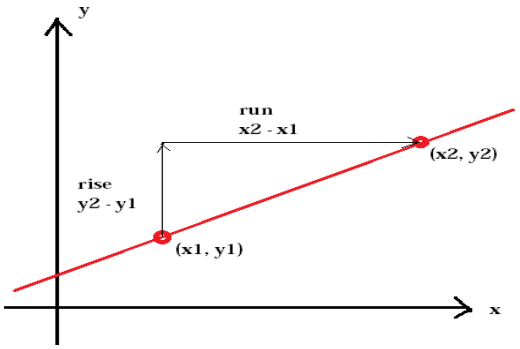
Choose the letter of the best answer. Write the letter of your answer on a separate sheet of paper.

1. A horizontal structural member which hold rafters together
   A. Rafter B. Purlin C. Rise D. Run
2. A prefabricated triangular shaped unit for supporting roof loads over long spans
   A. Truss B. Shingles C. Rise D. Ridge
3. The top edge of the roof where rafters meet
   A. Ridge B. Rafter C. Overhang D. Purlins
4. The internal angle formed by two slopes of a roof
   A. Ridge B. Rise C. Purlin D. Overhang
5. The angle between the top plate and the ridge board referred to as the rise over the run
   A. Pitch B. Slope C. Valley D. Truss
6. A roof with four sloping sides
   A. Shed B. Hip C. Gable D. Mansard
7. The part of a roof that projects over a wall
   A. Overhang B. Eave C. Fascia D. Gutter
8. A surface finish material used to cover another surface
   A. Flashing B. Fascia C. Overhang D. Dormer
9. A flat roof slanting in one direction
   A. Gable B. Hip C. Dormer D. Shed
10. The triangular end of an exterior wall above the eaves
    A. Gable B. Hip C. Overhang D. Mansard

D What is in?

Learning Task 2: Think and Connect

Look at the figure below and answer the essential questions.



1. What does the figure tell or reminds you of?
2. How do you define slope?
3. What part of the house can you relate the principle of slope?

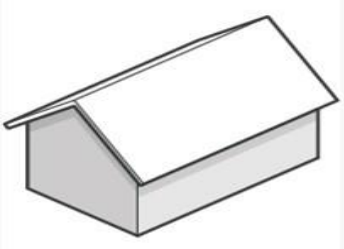
We have all learned that slope is the measure of the steepness of a line. A part of the house that displays this characteristic is the roof.

The **roof** is the external upper covering of a house or building. The primary purpose of a roof is to protect the interior of a building from direct exposure to the weather. The roof must be appropriate for the climate in which the house is to be built. Aside from that, the selections of roofs for buildings depend on several factors such as the type of the building and its foundation, roof load, aesthetics, and others.

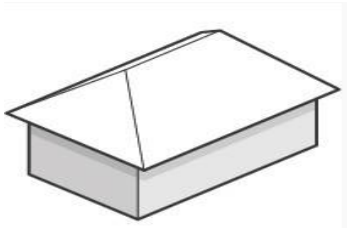
BASIC TYPES OF ROOFS

There are different types of roofing system that are commonly used in the building construction. The following are:

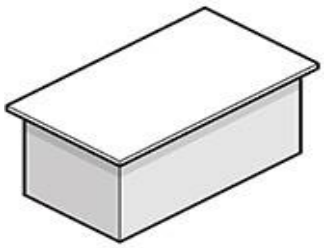
1. *A* ***Gable Roof*** is characterized by having a pitch on two sides but no pitch on the gable ends. This type of roof is used extensively in Philippine "*bahay kubo*" and row houses in subdivision. The pitch or angle of a gable roof varies from the high pitch roofs found on chalet A-frame style buildings to the low pitch roofs found on most ranch homes.



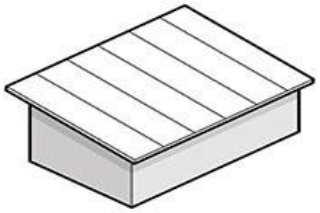
2. Hip Roofs are used when eave-line protection is desired around the entire perimeter of the building. Hip roofs are very popular in warm climates. These are commonly used on Regency and French Provincial homes.



3. Flat Roofs are used to create a low silhouette on modern homes. It also has a slight pitch to allow water to run-off and drain. Slightly heavier rafters are needed for flat roofs. Built-up asphalt construction is often used on flat roofs.



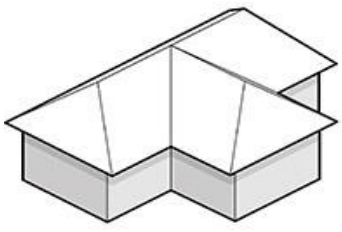
4. *A* ***Shed-Type Roofs / Skillion*** has a single fl surface pitched at a steep angle (higher at one en than the other) to allow water runoff. They may b used effectively when two levels exist wher additional light is needed. This type is extreme easy and cheap to construct as they are made simply one piece of roofing.



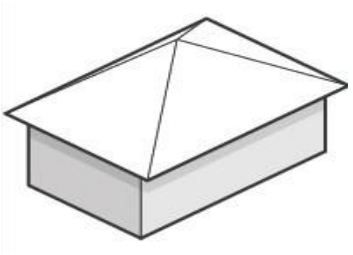
5. **Overhang** is a roof type where the pitch is low and extends on the side of the building perpendicular t the rafters' direction. It should provide additional protection from the sun and rain.

These five roofing systems are commonly used in the construction sector. However, there are other types of roofs that are rarely used in the construction.

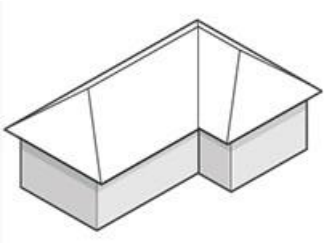
a. Hip and valley roof is a combination of hip and gable. It has a total of four sloping surfaces, with two joined on a common ridge, and the other two on either end of the central ridge.



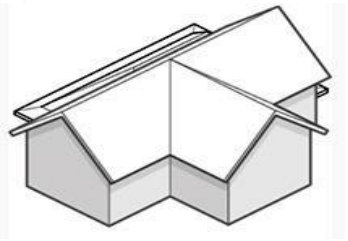
b. **P*yramid roof*** is a modification of a simple hip roof, but the walls are square rather than rectangular, making the shape of the building's roof slope come to a point in a pyramid shape at the top. This type of roof is extremely resistant to strong winds, so is ideal for high-wind or hurricane prone areas.



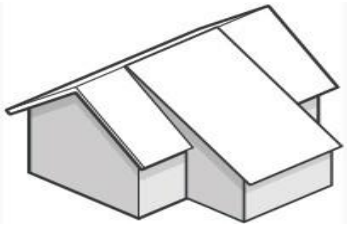
c. A **Cross-hipped** roof is a common roof type, with perpendicular hip sections that form an "L" or "T" shape in the roof hip. A great option for buildings with a more complex layout than a simple rectangle or square. In addition, this type will hold well in rain, snow or windy conditions.



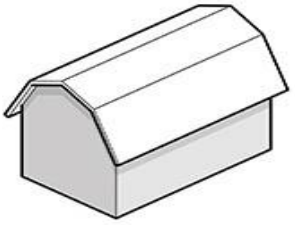
d. Cross-Gable Roof is a roof type design that consists of two or more gable roof ridges that intersect at an angle, most commonly perpendicular to one another. This type is often seen in buildings with a more complex layout, for example, homes with an attached garage.



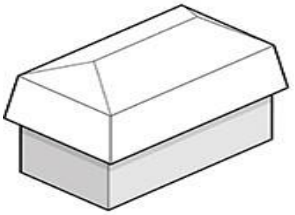
e. Gable Roof with Shed Roof Addition is a popular alteration to the standard gable roof, providing more headroom and space for an extension without having to completely alter the existing roof.



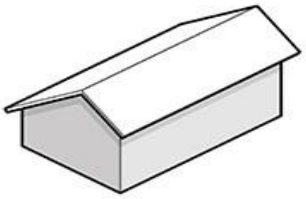
f. Gambrel roof is a modified gable roof having two slopes. This design maximizes on the space within the loft of a building but are mostly used on outhouses and barns due to their unsuitability in heavy wind or snowfall areas.



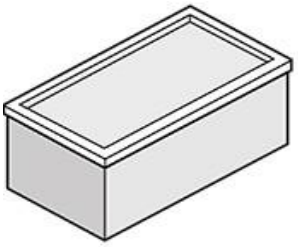
g. Mansard roof is a four-sided gambrel roof with each side sloping steeply. Mansard roofs are a popular option for buildings wishing to maximize the amount of living space in the building, providing the option to use the loft as an additional living space.



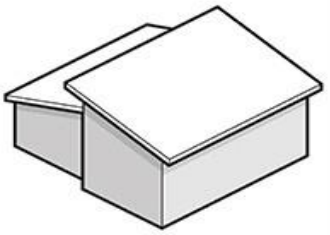
h. A ***Saltbox roof*** is characterized by having one side of sloping flat roof, with the other side more of a lean-to, creating a gable in the middle. More commonly seen in older colonial-style houses, this distinctive durable roofing style is often seen nowadays in industrial buildings and garages.



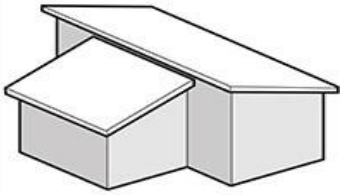
i. Parapet Roof is a flat roof with the walls of the building extending upwards past the roof by a few feet around the edges. The addition of a parapet makes a flat roof far safer, providing a small barrier that provides additional security to reduce the likelihood of anyone standing the roof falling over the edge.



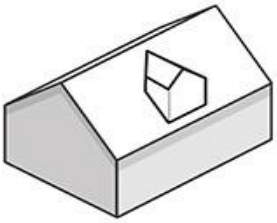
j. A ***Clerestory Roof*** has an interior wall built extending above one section of the roof, with this section of wall often lined with several windows, or one long window. The sections of roof either side of the vertical wall are typically sloping, allowing a large amount of natural light into the windows.



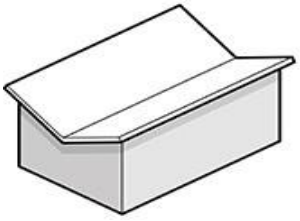
k. Lean-to-Roof is like a shed-type or skillion roof, only that it is composed of one angled pitch. The roof is supported at one end by a wall raised higher than the other, enabling the roof to be pitched at a steeper angle to allow runoff in a heavy rain



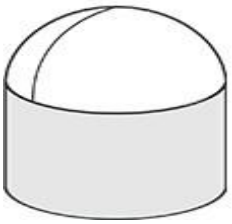
l. A ***Dormer Roof*** contains a window that projects vertically from a traditional pitched roof, creating an extended window in the roof. This type is most popular in loft conversions, providing an easy way of expanding the space and natural light in the converted loft room.



m. A ***Butterfly Roof,*** otherwise known as an inverted pitch roof, follows the wings of a butterfly with two tandem pieces of roofing angled upwards to form a V-shape. This style is eye-catching, modern look for buildings, and provides the added benefit of allowing larger walls and windows to a structure, with an easily managed way of harvesting rainwater through the middle channel in the roof.



n. Dome is a hemispherical type of roof commonly used in observatory buildings



o. Combination Roof is literally a combination of types of roofs. It often incorporates two or more designs for aesthetics and practical reasons, and can feature a range of styles, a clerestory and hip roof, for example. This type is a great option especially if you want to create a unique and interesting look to your house design.

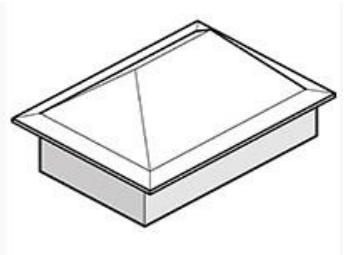


Image Source: JTC Roofing

D What is it?

BASIC COMPONENTS OF A ROOF

Just like any other parts of the house, a roof also has its own set of components. Each component has its special purpose and function to aid the whole roofing system serve its function.

The components that makes up a roof varies from one type to another. The illustration below displays the components of a typical

Image Source: S&K Roofing

Listed below are the basic components of a typical hip and valley roof together with its corresponding function.

- **Pitch** is the angle between the top plate and the ridge board. It is also referred to as the rise over the run.

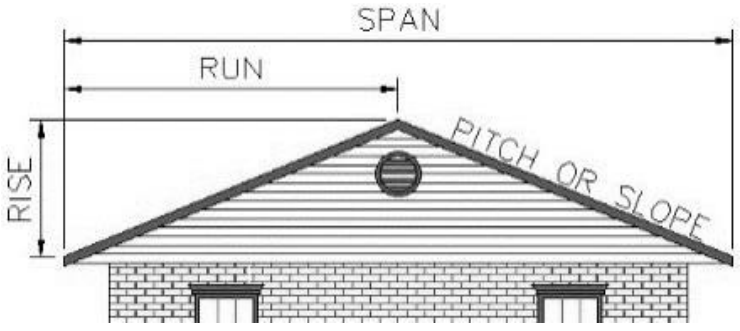


Image Source: Quora.com

- **Ridge** is the top edge of the roof where rafters meet.
- **Ridge cap** is a wood or metal cap used for roofing at the ridge.
- **Rafters** are supporting roof beams that are perpendicular to the ridge beam.
- **Eaves** is the lower portion of the inclined roof which is projecting beyond the outer face of the wall.
- **Gable** is the triangular upper part of the wall at the end of a ridge roof.

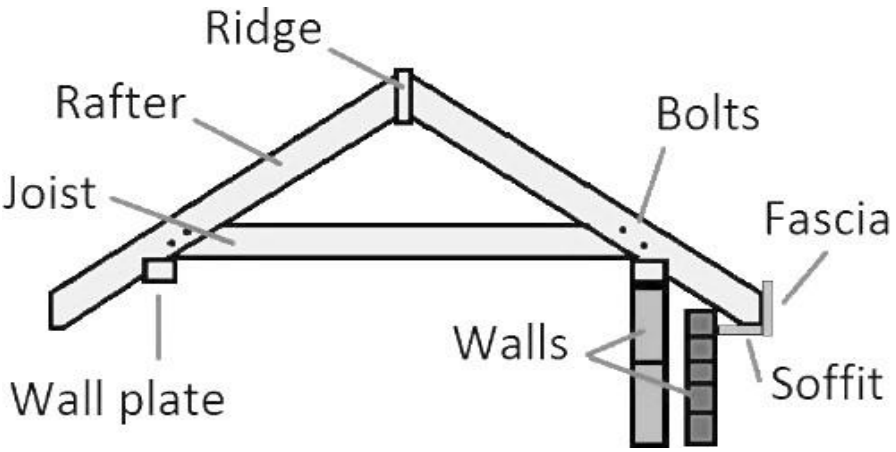


Image Source: Carpentry Tricks & Tips

- **Hip** is the outer angle (more than 180 degrees) formed by the inclined ridge between two intersecting roof slopes.
- **Wall Plates** are timber pieces provided over the top of a stone wall or brick wall to fix the feet of the common rafter
- **Flashing** is the strip of impermeable material, usually metal used to exclude water from the junction between a roof covering and another part of the structure. Flashings are provided to prevent moisture from entering the wall and roof through joint in copings, parapet wall and other penetrations through the roof plane.
- **Purlins** are horizontal members laid on principal rafters on wall-to-wall to support common rafter of a roof when the span is large. Purlins are made from wood or steel.
- **Fascia Board** is a wooden board fixed to the feet of the common rafter at eaves. The ends of the lower-most roof covering material rest upon it.
- **Battens** are thin strips of wood which are fixed on the common rafters or on the top of ceiling boards to support the roofing materials such as tiles, sheets, etc.
- **Rake** is the inclined sides of a gable end.
- **Gutter** is duct for water discharge system for a building.
- **Downspout** is the channel that transports rainwater from the gutter.
- **Collar Beams** are the horizontal beam connecting two rafters that intersect at the ridge
- **Valley** is the internal angle formed by two slopes of a roof.
- **Shingles** are thin pieces of wood or other materials that overlap each other in covering a roof.

KINDS OF COMMONLY USED ROOFING MATERIAL

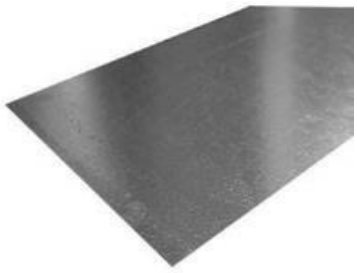
1. **Galvanized Iron Sheet** is a building material composed of sheets of hot-dip galvanized mild steel, cold-rolled to produce a linear corrugated pattern in them. It is the most common and widely used roofing material which is simply called as G.I. sheet. Generally, corrugated GI sheets are used in temporary roofing as well as permanent roofing (profile coated roof).

   The popularity of G.I. sheet is attributed to the following advantages it offers:

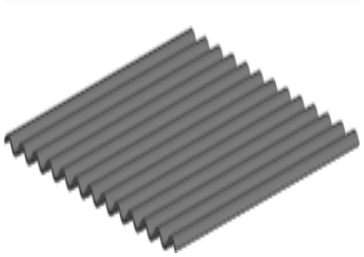
   a. Reasonable cost
   b. Availability
   c. Durability
   d. Ease of Installation and Repair

2 Type of G.I. Sheet

a. **Plain G.I. Sheet** – standard width of 90 cm by 240 cm or 3' x 8' long.
b. **Corrugated G.I. Sheet** – standard width of 80 cm (32") with various lengths from 1.50 m. to 3.60 m. (5 ft to 12 ft) and special length up to 6.00 meters (20') long.



Plain G.I. Sheet



Corrugated G.I. Sheet

The thickness of the sheet is measured in terms of gauge ranging from No. 24 to No. 30. The higher the number, the thinner is the sheet. For instance, gauge 26 is thinner than gauge 24.

2. **Tile Roofing** materials are either made of clay or cement

Spanish Type

Straight Barrel Mission

Interlocking

Roman Type

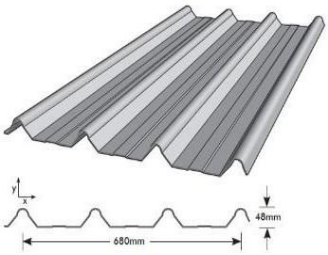
Greek Type

French Tiles

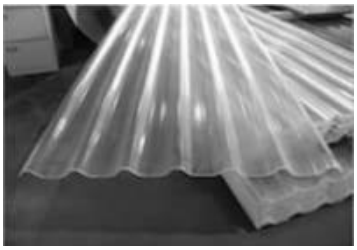
English Type

3. **Asbestos Cement Sheet Roofing (ACC)** consist of either corrugated sheets or semi-corrugated sheets as specified.

4. **Pre-painted Steel Ribbed Tray Roofing**



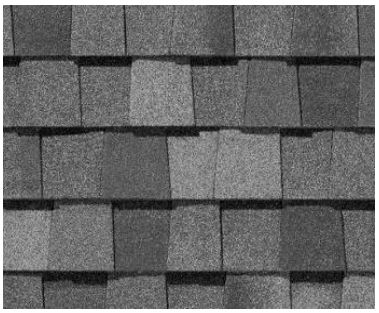
5. **Fiber Roofing** is a plastic or fiber sheet of particular length and width and thickness.



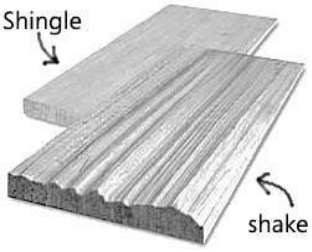
6. **Concrete Roofing** is a solid slab of concrete capping the top of the house. Concrete roof protects building from storm winds.

7. **Slates** are fine-grained, foliated, homogeneous metamorphic rock


8. **Asphalt Shingles is** a type of roof shingle widely used because of low cost and easy to install.

9. **Wood shakes and shingles** are thin, tapered pieces of wood

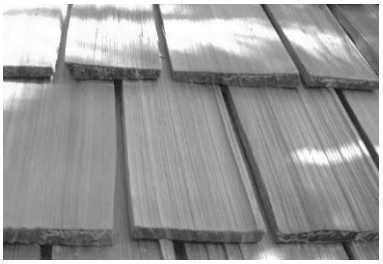
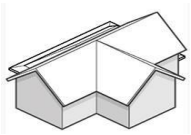
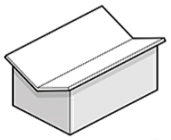
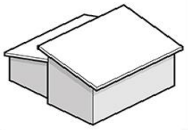
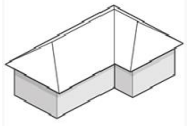
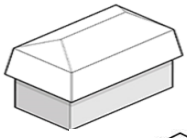
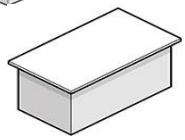
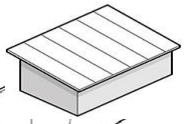
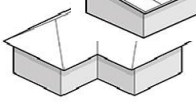
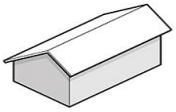
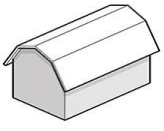


Image Source: Commons Wikimedia

E What is More?

Learning Task 3: Check this out!

I. Match the type of roof to its corresponding name. Write the letter of your answer in your notebook.

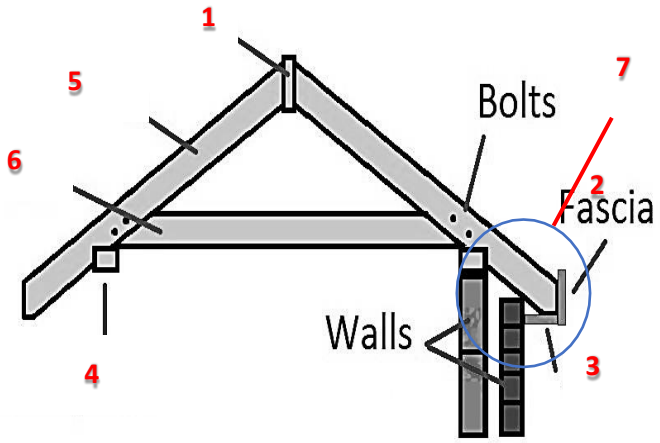
COLUMN A	COLUMN B
1. Shed-Type Roof	**A.** 
2. Cross-Gable Roof	**B.** 
3. Mansard Roof	**C.** 
4. Gambrel Roof	**D.** 
5. Butterfly Roof	**E.** 
6. Cross-Hipped Roof	**F.** 
7. Clerestory Roof	**G.** 
8. Hip and Valley Roof	**H.** 
9. Flat Roof	**I.** 
10. Saltbox Roof	**J.** 

II.

A. Fill in the blank of the appropriate word/phrase to complete each statement.

1. The_____is defined as the ratio between the rise and horizontal span of the roof.
2. _____ is the horizontal intersection at the apex of the two rising roof surfaces inclined in opposite directions.
3. The main purpose of a_____is to redirect rainwater towards a designated drainage area.
4. A_____is formed when two pitched roof slopes meets together.
5. The edges of the roof that normally projects beyond the side of a building is called__.
6. _____is the most common and widely used roofing material.
7. The standard available size of a plain GI sheet in feet is_____.
8. The standard available width size of corrugated sheet is_____.
9. _____ are a kind of roofing material made up of fine-grained, foliated, homogeneous metamorphic rock.
10. Fiberglass is a kind of roofing material that is made of either_____or fiber sheet.

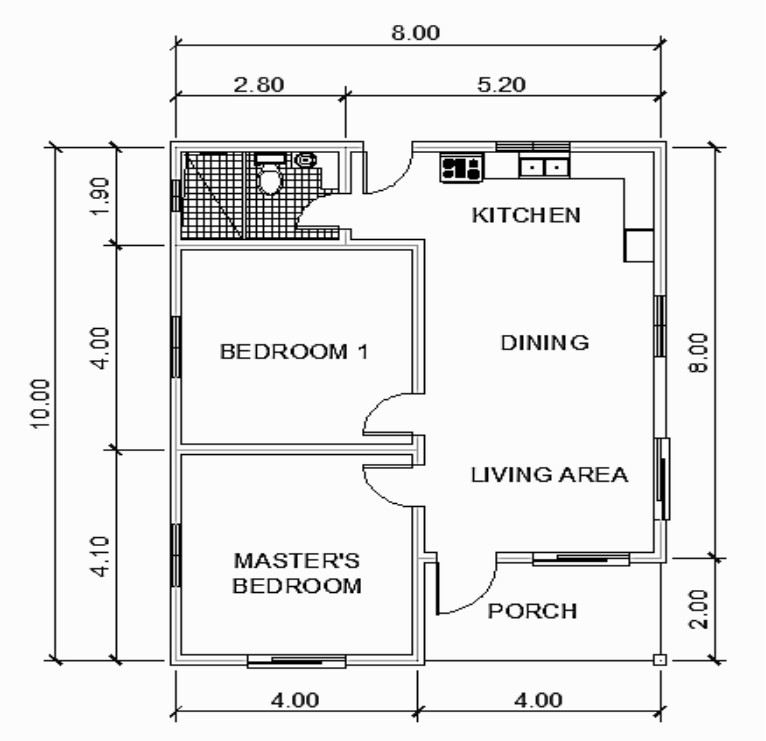
B. Name the parts of a typical roof system and state the function of each.



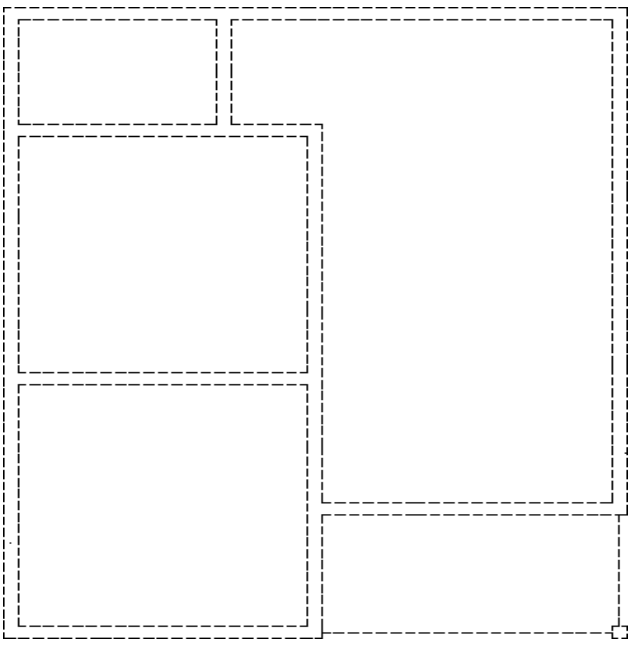
E What I can do?

The following are the steps in drawing a roof plan.

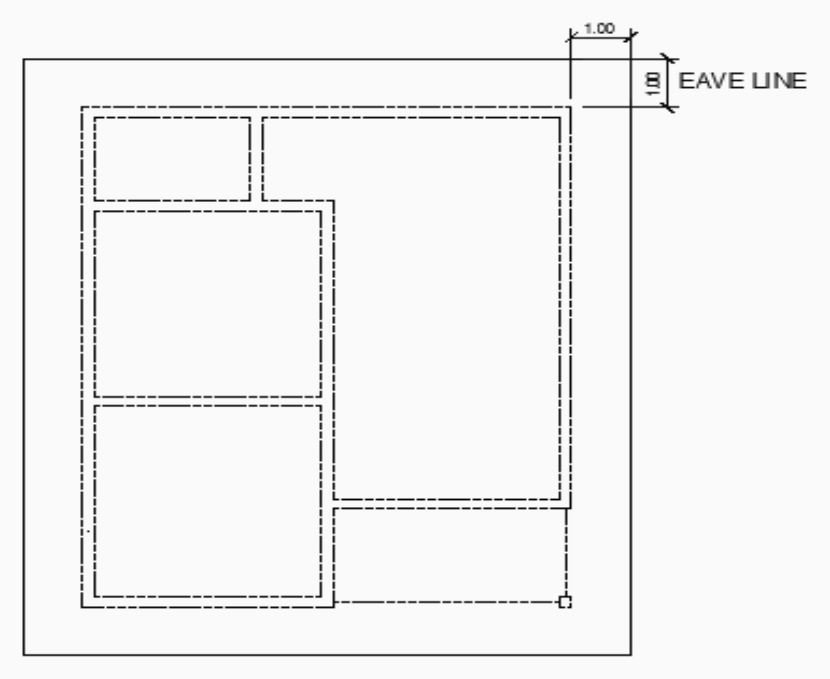
1. Given: A scaled floor plan.



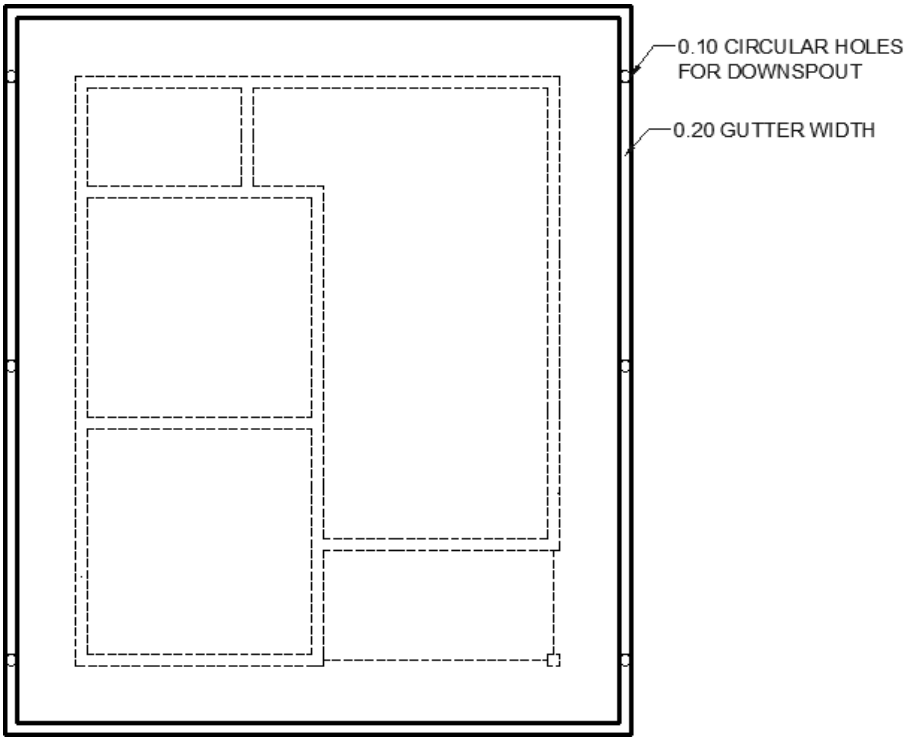
2. Draw or trace the given scaled floor plan using hidden lines without doors and windows.



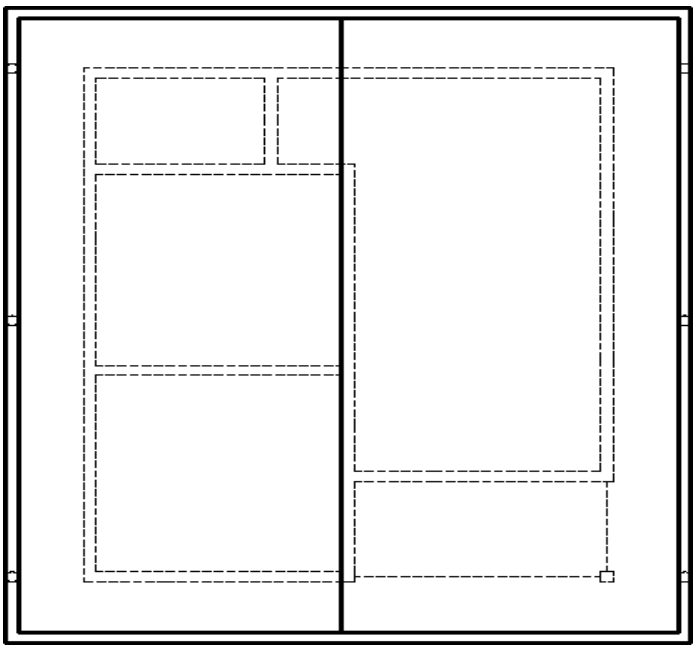
3. From end line of the floor plan, lay out a standard 1.00 m. eave line around the floor plan.



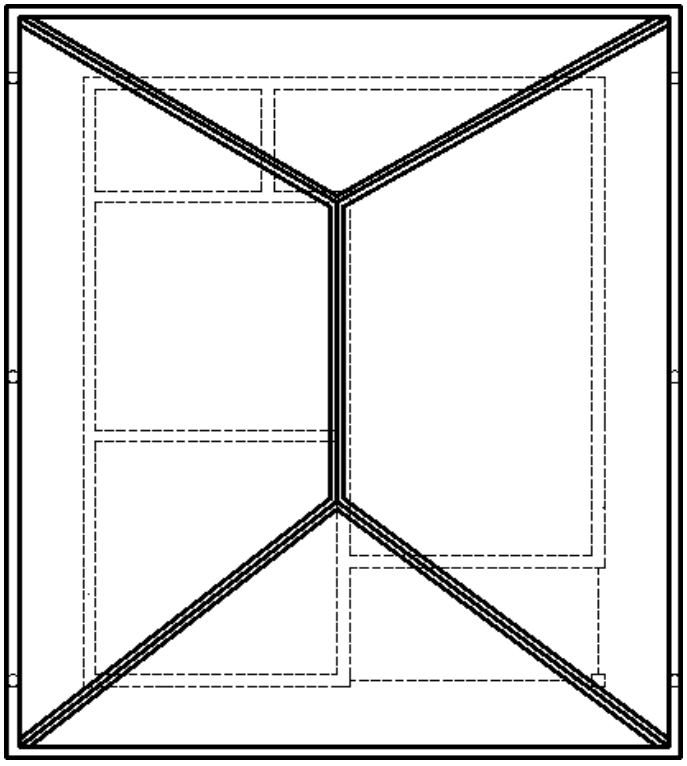
4. From eave lines, extend 0.20 m. lines for gutter width, and analyze how many and where to indicate 0.10 m. circular holes for the downspout.



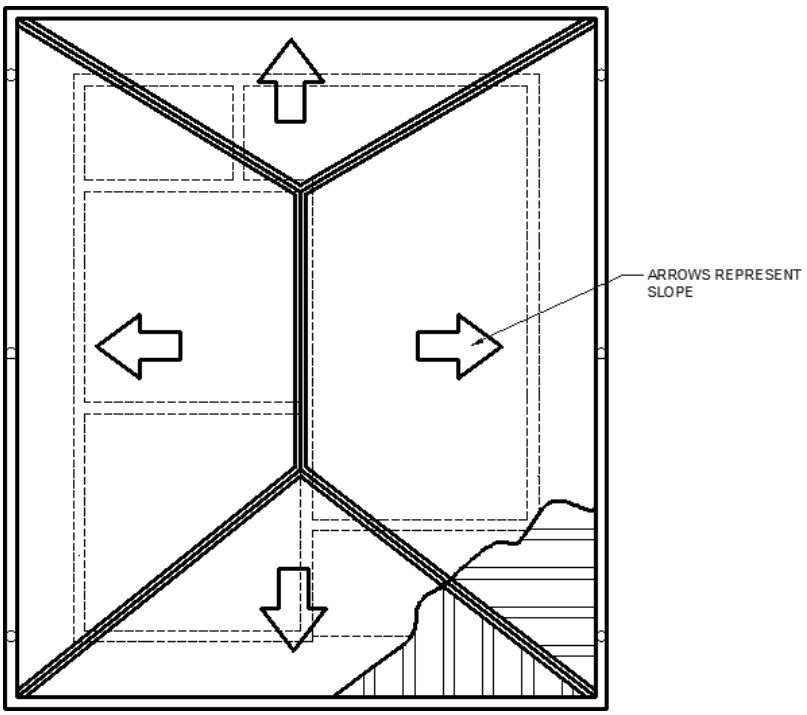
5. Select roof types required. From rectangular form of floor plan, get the center and project a line along the eave lines.



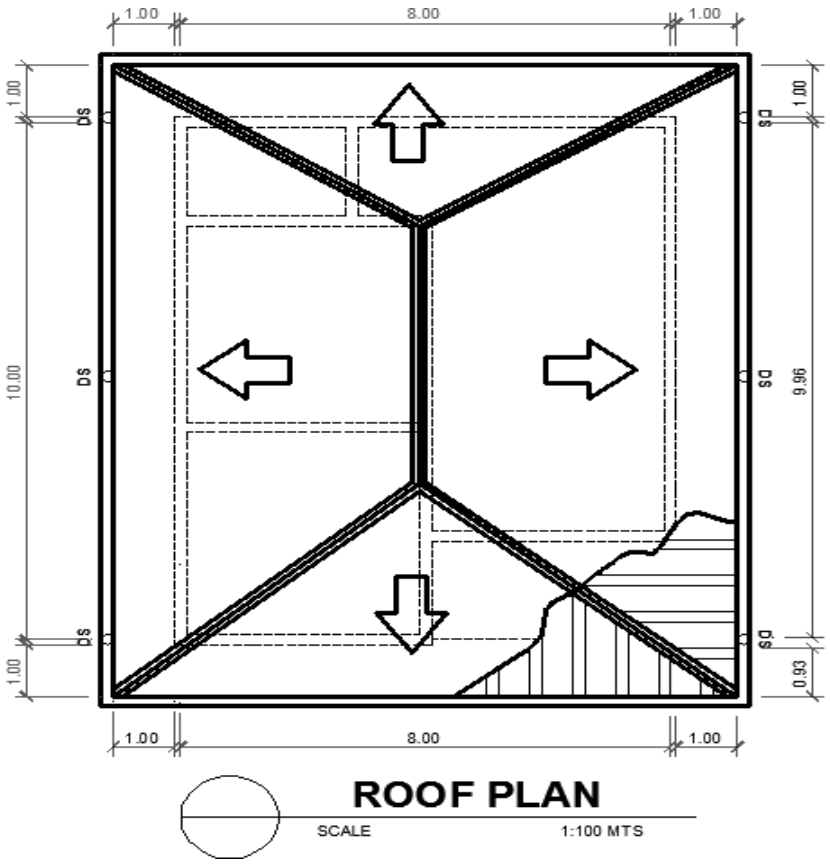
6. If hip roof types will be used, project a 45-degree angle in all corners of eave lines intersecting the center line to create a hip roof. From drawn hip roof layout, draw two lines at 0.10 m. width on both sides representing the ridge roll width.



7. Project a symbol (thin lines) for roof covering, indicate from the center of roof, the word “slopes” indicating a perpendicular line with arrowheads.



8. Complete the working drawing by supplying the required dimensions with proper dimensioning and labels, then finalize the drawing.



E What else can I do?

Learning Task 4: Draft a Roof Plan

Materials Needed:

- Oslo Paper
- Triangle/ruler/T-square
- Pencil and eraser
- Templates

Instructions:

1. Using the floor plan on page 46, draft a roof plan by following the steps previously discussed. Choose the appropriate roof type. Follow the given requirements and specifications below.
   - 0.20 m. lines for gutter width
   - 0.10 m. ridge roll width
   - 1.00 m. eave line
2. Use 1:100 scale.
3. Label and dimension your plan, as necessary.

Your output will be evaluated according to the following criteria.

Crit eria	7 points	5 points	3 points
Line Technique /Lay out	All lines were drawn according to standards and drawing was laid out properly	At least 3-5 lines were not drawn according to standards and drawing was laid out fairly well	More than 5 lines were not drawn according to standards and drawing was improperly laid out
Accuracy	All measurements and notations/symbols needed were accurately done	At least 3-5 measurements and notations/symbols needed were inaccurately done	More than 5 measurements and notations/symbols needed were inaccurately done
Criteria	**3 points**	**2 points**	**1 point**
Neat ness	Finished output was neatly done, with no erasures nor any smudges	Erasures/smudges are observable on the finished output	Finished output has so many erasures/ smudges present
Time Manage -ment	Finish the task ahead of the given time/date	Finish the task on the given time/date	Unable to finish the task on the given time/date

A What I have learned?

1. Roof is the external upper covering of a house or building.
2. The selections of roofs for buildings depend on several factors such as the type of the building and its foundation, roof load, aesthetics, and others.
3. There are five basic types of roof namely: gable, hip, shed, flat and overhang.
4. Other types of roof are variation of the five basic types. Some of them are used only depending on the location, purpose, and construction.
5. The components that makes up a roof varies from one type to another.
6. There are several kinds of roofing materials that can be used depending on various considerations such as the location, weather, availability of the material and others.
7. The kind of roofing material adds up to the outer design of a house.
8. Galvanized iron (GI) sheets are one of the most common roofing materials used in the Philippines considering its cost and availability.
9. The floor plan should be the main basis in planning and designing a roof plan.
10. The standard distance of the eave line from the outer wall is 1.0 meters.

A What can I achieve?

Learning Task 5: Posttest
Read each item carefully. Choose the letter of the best answer and write it on a separate sheet of paper.

1. Araneta Coliseum, situated in Cubao, is one of the largest indoor arenas in Asia. Which of the following roofing system is demonstrated by the coliseum?
   A. Clerestory C. Dome
   B. Hip and Valley D. Gambrel Roof

2. Mr. Taylor wants to create window openings in his roof plane for additional ventilation. What kind of roof can you suggest to him to comply with his needs?
   A. Clerestory C. Gable
   B. Dormer D. Hip

3. Chloe noticed that the water from the roof is not dripping or flowing properly. Which of the following is the possible reason?
   A. Clogged downspout C. Accumulated dirt in the gutter
   B. Improper roof slope D. All of the above

4. Which of the following will best describe a rafter?
   A. Structural members where roofing materials are fastened
   B. Framing members that support the ceiling joist
   C. Inclined members of the roof framework
   D. Extends the full length of the house

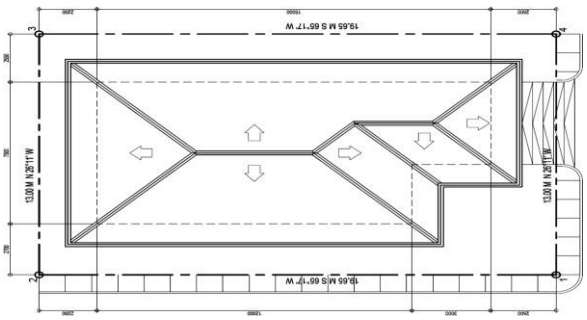
5. Arrange the steps in drafting a roof plan.
   I. Project a symbol for roof covering and draw arrows to indicate roof slope
   II. Draw or trace the given scaled floor plan using hidden lines without doors and windows
   III. Complete the working drawing by supplying the required dimensions with proper dimensioning and labels
   IV. From rectangular form of floor plan, get the center and project a line along the eave lines.
   V. From end line of the floor plan, lay out 1 standard 1.00 m. eave line around the floor plan.

   A. V, IV, III, II, I B. IV, I, III, V, II C. II, V, IV, I, III D. II, IV, V, I, III

6. How do you layout the plan for a hip roof?
   A. project a 30 degree angle in all corners of eave lines
   B. project a 35 degree angle in all corners of eave lines
   C. project a 40 degree angle in all corners of eave lines
   D. project a 45 degree angle in all corners of eave lines

7. Which of the following is the standard eave line?
   A. 0.80 M B. 0.90 M C. 1.00 M D. 1.10 M

8. What kind of roof is illustrated in the given roof plan?
   A. Hip Roof
   B. Clerestory
   C. Hip and Valley
   D. Cross Gable



9. What does the arrows represent in a roof plan?
   A. Ridge Cap
   B. Gutter
   C. Slope
   D. Downspout

10. Which of the following is NOT an example of a tile roofing material?
   A. Straight Barrel Mission
   B. B. French Type
   C. Slate
   D. Interlocking

LESSON 2

Draft Ceiling Plan

I What I need to know?

LO 6. Draft ceiling plans *(TLE_ICTTD912AL-IId-f-6)*

- Draw vertical heights from finish floor line to ceiling line according to architectural drafting standards
- Indicate lighting fixtures and fire protection devices on the ceiling plan based on architectural drafting standards

This lesson is designed to guide you to be familiar to the different features as well as the standards in drawing a ceiling plan.

After going through this module, you are expected to:

1. identify the different types of ceiling designs;
2. recognize materials available for ceiling construction; and
3. draft reflected ceiling plan.

I What's new?

Ceiling is one of the important functional components of a room and one of the commonly neglected part of a house. It primarily helps in controlling the diffusion of light and sound within the room. It helps control the diffusion of light and sound about the room.

Ceiling is designed for the following purpose:

- ✓ It prevents the penetration of the heat of the sun inside the building.
- ✓ Plays a role in preventing the passage of sound vertically between the rooms above and below, and horizontally between rooms on either side of a partition.
- ✓ It adds beauty inside the building especially when the ceiling is well-designed.
- ✓ Various lighting fixtures can be hanged or placed to highlight the interior design of the structure.

D What I know?

Learning Task 1: Sneak Peek

Identify the words described in each item. Answer by completing the words in each box[CJB1].

1. wood or any material projecting beyond the wall of the ceiling
2. the undersurface of a cornice, molding, or beam
3. process of supplying and removing air by natural mechanical means to or from any space
4. the science of sounds in housing
5. piece of electric or plumbing equipment which is a part of the structure.

C			N		C	

	O			I	

	E			I		A		I	O	

A				S		I	C

		X	T			E

D *What is in?*

Essential Questions:

1. What part of a house, hotel, or an establishment usually attracts or caught your attention whenever you visit it for the first time? Why?
2. Describe your dream ceiling design.

D What is it?

TYPES OF CEILING DESIGNS

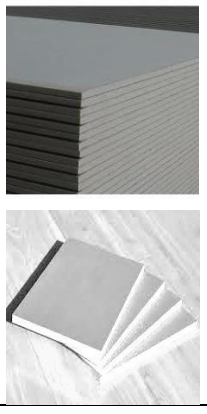
Conventional	- Most commonly use - Standard style typically 8 feet high to fit with standard construction material sizes. It has a simple flat surface with accessible height. - easy to decorate, but there is nothing so special about them.	
Suspended or Drop	- Commonly used in commercial and industrial buildings - allow you to easily install extra fittings, ducting and design elements, good for hiding wirings and other mechanical fixtures from the original old ceiling in a stylish way - consists of a lightweight, acoustic panel and a suspended metal grid.	
Beam	- a traditional style of ceiling in which the load-bearing beams are exposed in the inside of the house. - creates an interesting depth and contrast to the ceiling. - commonly installed in living rooms and dining rooms of spacious homes	
Vaulted	- generally found in first floor living or family rooms, dining rooms, master bedrooms, and master baths with a vault	
Barrel Vault	- also known as a tunnel vault or wagon vault, is not commonly seen in most homes, but can be a unique architectural feature in custom designs	
Tray	- Usually seen in dining rooms and kitchens - are built upwards in a cut out resembling a tray. It has a rectangular center that is either popped out or inverted to add an effect - gives a unique effect to the room, making a small one look taller. The “tray” can be 6 inches to one foot, or deeper, and sometimes	

	a series of steps are added for a more dramatic effect - Decorative moldings also look good on this ceiling style.	
Coffered	- creates a waffle-like pattern, since it's made up of a grid of sunken panels accented by molding - a classic ceiling style that are usually found in luxury and high-end homes.	
Cathedral	- this type of ceiling gives an open, spacious feel to a room and is usually found in the first floor living rooms and dining rooms.	
Cove	- characterized by a curved molding that starts from the main walls of the room up to the actual ceiling, creating a round concave surface at the side. - usually seen on formal rooms, and sometimes serves as arches separating one living space from another.	
Shed	- typically seen in homes with attic space, the shed ceiling has a slope that slants upward to one side. - provides better insulation and ventilation. The uneven wall height created by the rise of the ceiling gives the room a refreshing look. - looks better when it is covered in classic headboard.	
Panel		
Popcorn or Acoustic	- Installation can be very easy and require little skill and experience. - Main advantage is the ability to block noise between floors of a house.	

Image Source: Pinterest

The ceiling of a room provides an important style statement and brings a huge impact to the total ambience and effect of the house. It affects a person's look and feel of a room as well as in the delivery of comfort and safety. There are many available materials that are appropriate for ceiling construction, but some materials are more common or popular than the others.

Listed below are some of the common materials used for residential ceiling construction.

Wood a. Wood Molding b. Plywood c. Softboard d. Hardboard e. Planned wood	- commonly used for the general structure of a home and are thus typically a component of the ceiling.	
Plaster a. Gypsum or Plaster of Paris	- a traditional material for covering a ceiling that has been used for centuries. Creating a plaster ceiling involves applying several layers of a plaster paste over strips of wood. It creates a smooth, hard, attractive surface that is easily decorated with paints or more plaster. - High-end wall finish compared to drywall and higher quality finish	
Plasterboard / Drywall/wallboard / gypsum board/Sheetrock	- made from a similar material like plaster but is cheaper and easier to install because it does not require waiting for several coats of plaster to dry. - prefabricated into sheets that attach to the ceiling with screws or nails and then are sealed.	

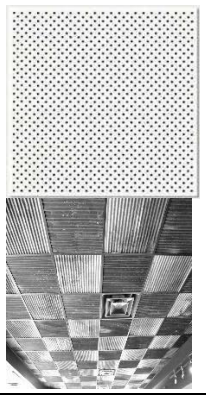
Metal a. perforated b. corrugated	- often used as both a structural and decorative component in a ceiling.	
Tiles a. Acoustical b. Styrofoam Panel	- are lightweight and made from a wide variety of materials, such as plastic, metal, fiberglass, mineral fiber, wood fiber, vinyl-coated gypsum and even cork. - Along with their decorative purpose, ceiling tiles are often designed to control noise levels in a room.	

Image Source: Hunker.com

The ceiling plan can be shown into two presentations:

1. The ordinary presentation of ceiling plan shows the following:
   a. Ceiling board
   b. Partitions
   c. Ventilation
   d. Label which indicates the type of ceiling materials
   e. Dimensions

2. Reflected ceiling plan. It is a drawing, which shows the items that are located on the ceiling of a room or space. It is referred to as a reflected ceiling plan since it is drawn to display a view of the ceiling as if it were reflected onto a mirror on the floor. This way the reflected ceiling plan has the same orientation as the floor plan associated with it.

   The following features that are shown in the reflected ceiling plan:
   a. Lighting fixtures
   b. Ventilation
   c. Smoke detector
   d. Wood molding
   e. Ceiling board

In accordance with the National Building Code of the Philippines (PD 1096) Section 805, ceiling heights should be

a. Habitable rooms provided with artificial ventilation have ceiling heights not less than 2.40 meters. which is measured from the floor to the ceiling; provided that for buildings of more than one-storey, the minimum ceiling height of the first storey shall be 2.70 meters. And that for the second storey 2.40 meters, and succeeding storey, shall have an unobstructed typical head-room clearance of not less than 2.10 meters above the finished floor.

Mezzanine Floor

b. Mezzanine floors shall have a clear ceiling height of not less than 1.80 meters above and below it.

Learning Task 2: Check this out!

Write your answers in a separate sheet of paper.

A. Identify what is being described in each statement.

1. A ceiling design that has a rectangular center that is either popped out or inverted to add an effect
2. A wood or any material projecting beyond the wall of the ceiling
3. A traditional style of ceiling in which the load-bearing beams are exposed in the inside of the house
4. A classic ceiling style that creates a waffle-like pattern
5. It is a term used to primarily describe any material that block noise between floors of the house
6. Minimum ceiling height for a habitable room
7. Minimum ceiling height for the first-storey
8. Minimum ceiling height for the second storey
9. Minimum ceiling height for succeeding storey
10. Minimum ceiling height for a mezzanine floor

B. Provide what is asked in each question.

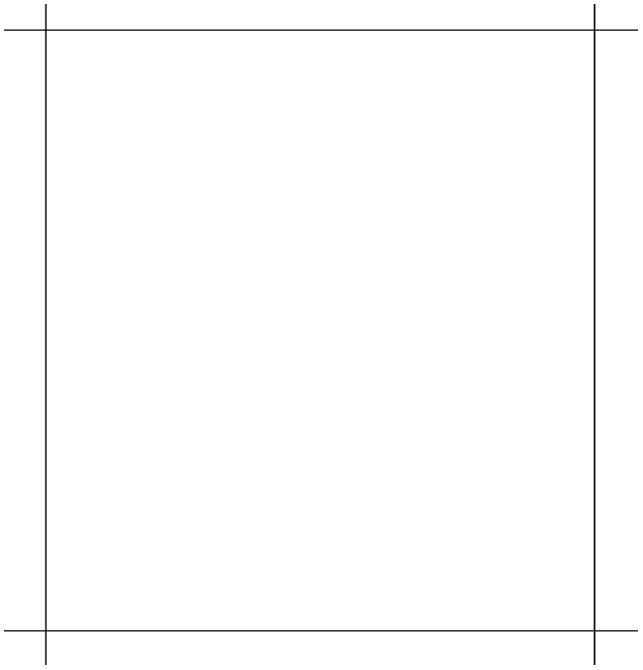
1. Give the different wood materials for ceiling finishes.
2. Differentiate a plaster ceiling material to a plasterboard/drywall.
3. What are the two types of metal ceiling materials?
4. Provide pros and cons of using tiles for ceiling materials.
5. Give 3 features shown in a reflected ceiling plan.

E What I can do?

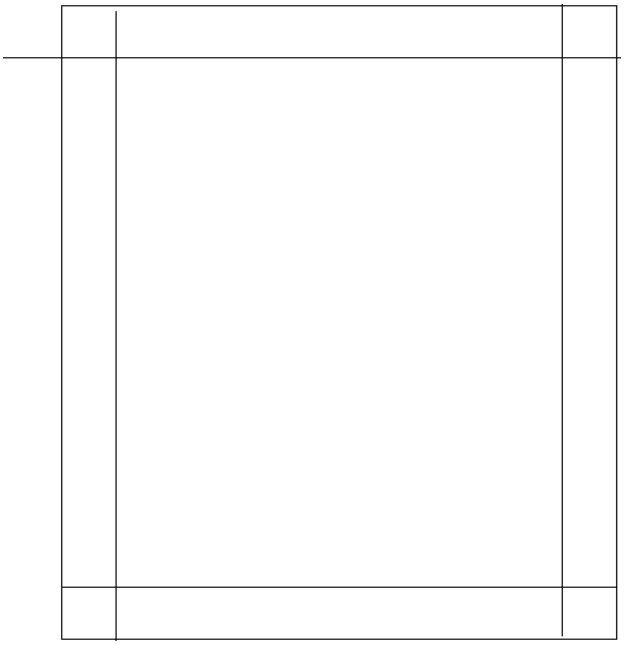
The following are the steps in drafting a reflected ceiling plan.

1. Prepare and set the floor plan.

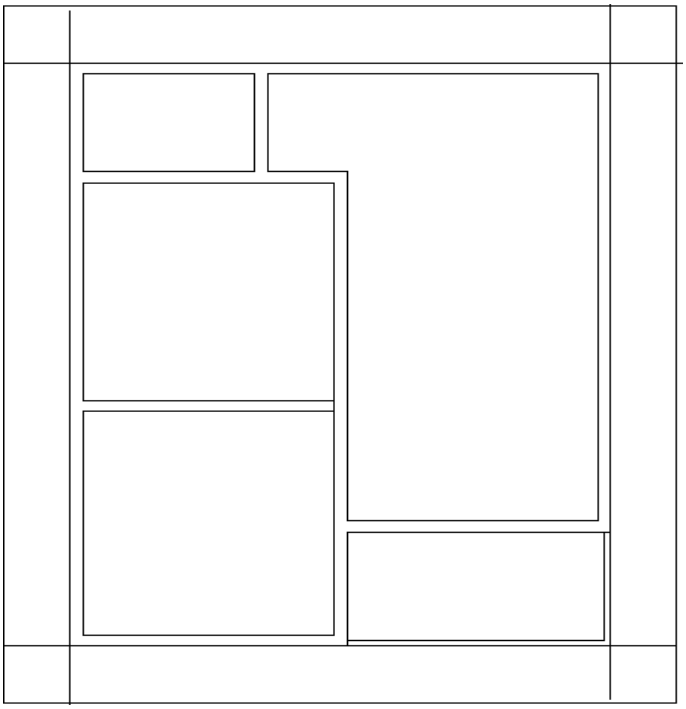
2. Sketch the ceiling area based on the general measurement of the floor plan.



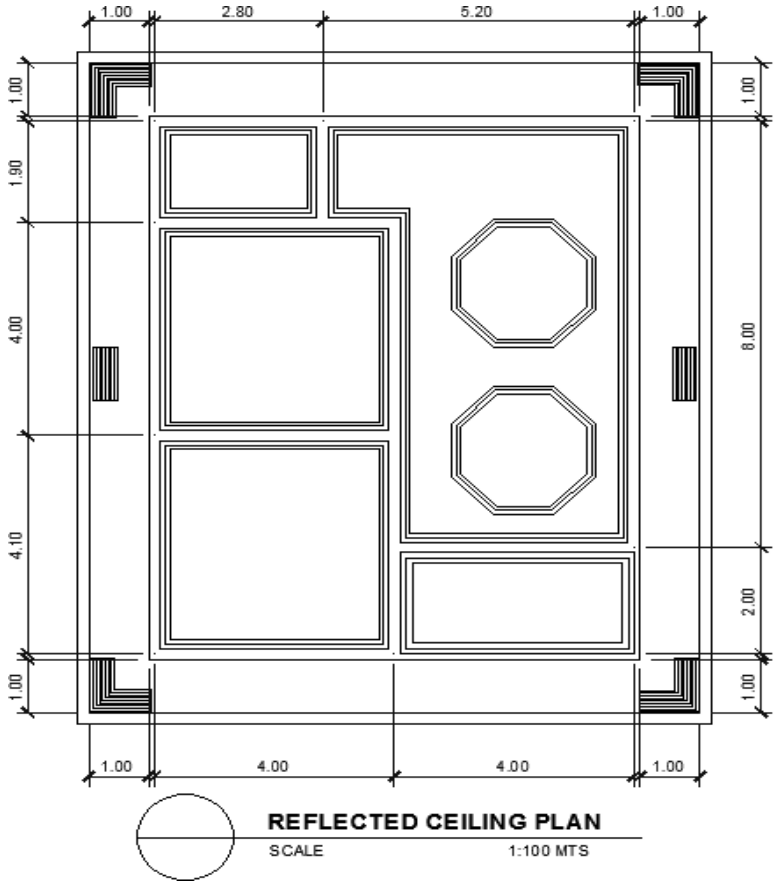
3. Provide space for the overhang for the four sides according to your desired size.



4. Sketch the partitions based on the measurements in the floor plan.



5. Darken all the visible edges, indicate the dimensions, and label the necessary information.



E What else can I do?

Learning Task 3: Draft Reflected Ceiling Plan

After discussing all the necessary knowledge and skills required to draft a reflected ceiling plan, it is now the right time for you to showcase and apply what you have learned.

Materials Needed:

- T-square/Triangles/Ruler
- Circular Template
- Oslo Paper
- Pencil and Eraser

Instructions:

1. Draw the corresponding reflected ceiling plan of the floor plan on page 46. Locate the necessary ceiling parts such as the cornice and soffit. Follow the given requirements and specifications below.
   - Use 1.0 m distance of overhang from the wall
   - Locate the necessary ceiling parts such as the cornice, soffit, and roof vent.
2. Indicate the dimensions and label the necessary information.
3. Your output will be evaluated according to the following criteria below.

Criteria	7 points	5 points	3 points
Line Technique/ Layout	All lines were drawn according to standards and drawing was laid out properly	At least 3-5 lines were not drawn according to standards and drawing was laid out well	More than 5 lines were not drawn according to standards and drawing was improperly laid out
Accuracy	All measurements and notations/symbols needed were accurately done	At least 3-5 measurements and notations/symbols needed were inaccurately done	More than 5 measurements and notations/symbols needed were inaccurately done
Criteria	**3 points**	**2 points**	**1 point**
Neatness	Finished output was neatly done with no erasures nor any smudges	Erasures/smudges are observable on the finished output	Finished output has so many erasures/ smudges present
Time Management	Finish the task ahead of the given time/date	Finish the task on the given time/date	Unable to finish the task on the given time/date

A What I have learned?

1. Ceiling is one of the important components of a room/house.
2. The primary purpose of ceiling is to prevent the penetration of the heat of the sun inside the building.
3. Ceiling designs adds up to the overall beauty and elegance of a house.
4. Various ceiling designs can be utilized depending on the owner's desire and purpose.
5. There are many available materials that are appropriate for ceiling construction, but some materials are more common or popular than the others.
6. A ceiling plan can be presented by either using the ordinary method or through a reflected ceiling plan.
7. Reflected ceiling plan is drawn in such a way that it displays a view of the ceiling as if it was reflected onto a mirror on the floor.
8. Section 805 of the National Building Code recommends the following minimum ceiling heights:

		Minimum Ceiling Height
One-Storey (Habitable Room)		Not less than 2.40 m
More than one-storey	First-storey	2.70 m
	Second storey	2.40 m
	Succeeding storey (3rd and up)	Not less than 2.10 m
	Mezzanine Floor	Not less than 1.80 m above and below

9. Ceiling plan is shown in outline form. It is made with the floor plan as its reference outline.

A What can I achieve?

Learning Task 4: Posttest

Read each item carefully. Choose the letter of the best answer and write it on a separate sheet of paper.

1. Cardo was invited by Alyana in their house for the first time. Upon arrival, Cardo noticed that the load-bearing beams in Alyana's house are exposed. What kind of ceiling design was applied in Alyana's house?
   A. Cathedral B. Suspended C. Beam D. Tray

2. If a coffered ceiling design resembles like a waffle, then what ceiling design resembles like a rectangular dish?
   A. Cathedral B. Suspended C. Beam D. Tray

3. Which of the following ceiling design will create a round concave surface from the main wall?
   A. Cathedral B. Suspended C. Cove D. Tray

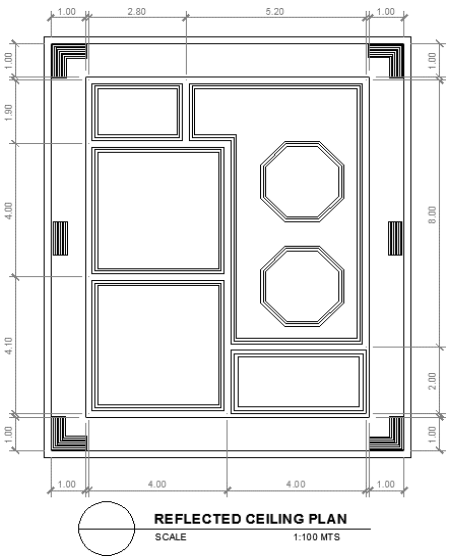
4. Ceiling is an important functional component of a room. Which of the following depicts the purpose of ceiling?
   A. Prevents the penetration of the heat of the sun inside the building
   B. Adds beauty inside the building especially when the ceiling is well-designed
   C. Helps control the diffusion of light and sound about the room
   D. All of the above

5. Which of the following is the minimum ceiling height for the first-storey of a building?
   A. 1.80 m. B. 2.10 m. C. 2.40 m. D. 2.70 m.

6. Your task is to prepare an architectural layout of a bungalow house. Which of the following ceiling height can you use to conform to the standards?
   A. 1.80 m. B. 2.10 m. C. 2.40 m. D. 2.70 m.

7. A mezzanine floor is often low-ceilinged and projects in the form of a balcony. Which of the following is the minimum ceiling height for a mezzanine floor?
   A. 1.80 m. B. 2.10 m. C. 2.40 m. D. 2.70 m.

8. In the given reflected ceiling plan, what are the different ceiling designs that were used?
   A. Coffered and Tray
   B. Conventional and Tray
   C. Conventional and Cove
   D. Coffered and Cove



9. Which of the following drawing plan can be used as a basic outline for a reflected ceiling plan?
   A. Floor Plan C. Roof Framing Plan
   B. Roof Plan D. Elevation

10. The purpose of a roof vent is to_____.
   A. allow escape of heat and moisture
   B. allow cold air to enter the building
   C. allow moisture to enter the building
   D. allow cold air to exit the building

LESSON 8

Draft Elevation and Sections

What I need to know?

LO 7: Draft elevations and sections *(TLE_ICTTD912AL-IIg-i-7)*

- Draw vertical heights from grade line according to architectural drafting standards
- Project offsets from right, left, and rear sides of floor plan according to architectural drafting standards
- Draw roof eaves and pitch on all elevations and sections according to architectural drafting standards
- Project doors and windows in all elevations and sections
- Project cross and longitudinal section views from the floor plans and elevations
- Indicate various material symbols and specifications in all elevations and sections

This lesson is designed to familiarize you on how to present a plan of the different elevations and sections. Techniques on how you can properly indicate dimensions on elevation and section drawings will also be discussed.

After going through this module, you are expected to:

1. Determine the different architectural elevation drawings;
2. Draft elevation projections based on architectural standards;
3. Identify types of sections used in architectural drawing; and
4. Draft sectional drawings based on architectural standards.

What's new?

An **architectural elevation** is a view of a building showing its height dimension. When elevations show the exterior of a residential unit, these are simply called *elevations*. Interior elevations show the inside of a building. They are necessary in as much as they show the height of the building and its appearance on each side. Normally, the four elevations are sufficient to describe the appearance of the residential building.

Elevation drawings are orthographic drawings. These show the exterior of a building. An elevation drawing is a view of a building seen from one side, a flat representation of one façade.

Normally, the design of the floor plan precedes the designs of the elevation because both have a continual relationship in the entire design process. Revision is possible in the design of elevations, even those designed from the same floor plan.

As a designer, you should keep in mind that only horizontal distances can be established on the floor plan, while that of the vertical distances such as height of doors, windows, and roofs must be shown on the elevation.

Standard height for vertical clearances of roof, ceiling, windows, doors must be observed. The appearance of the outside and functioning of heights as well as the internal functioning of the building must be considered.

On the other hand, Section drawings are prepared to show the interior details of a structure. They are needed to guide the construction. Interior elevation drawings give the builders an idea on how to construct and install special features of a home. These features include closets, cabinets, bathtubs, and other special details.

A sectional view is obtained making an imaginary cut through the part, and by drawing the features on the cut surface.

Techniques for preparing interior elevation drawings are the same as for exterior elevations. Use a floor plan to locate key vertical lines after horizontal dimensions have been indicated.

The scale of a section drawing will depend on the size of the building being drawn and the level of detail that needs to be shown. Sections may show the entire building, or may focus on a particular component, junction, or assembly.

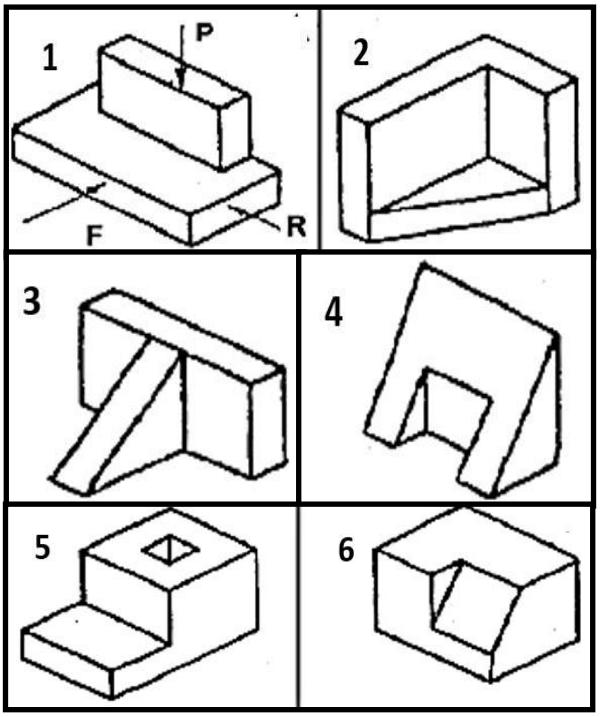
D What I know?

Learning Task 1: Find the view

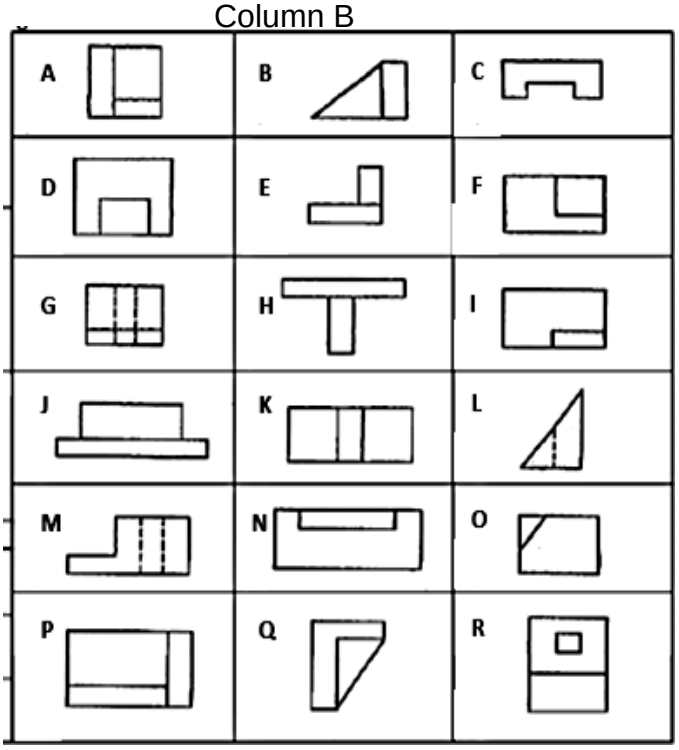
Complete the table below by matching the figures found in Column A to its corresponding views on Column B. Write your answers on a separate sheet of paper. Figure 1 was already use as an example.

Drawing	**1**	2	3	4	5	6
FRONT VIEW	**J**					
RIGHT – SIDE VIEW	**E**					
TOP VIEW	**N**					

Column A



Column B



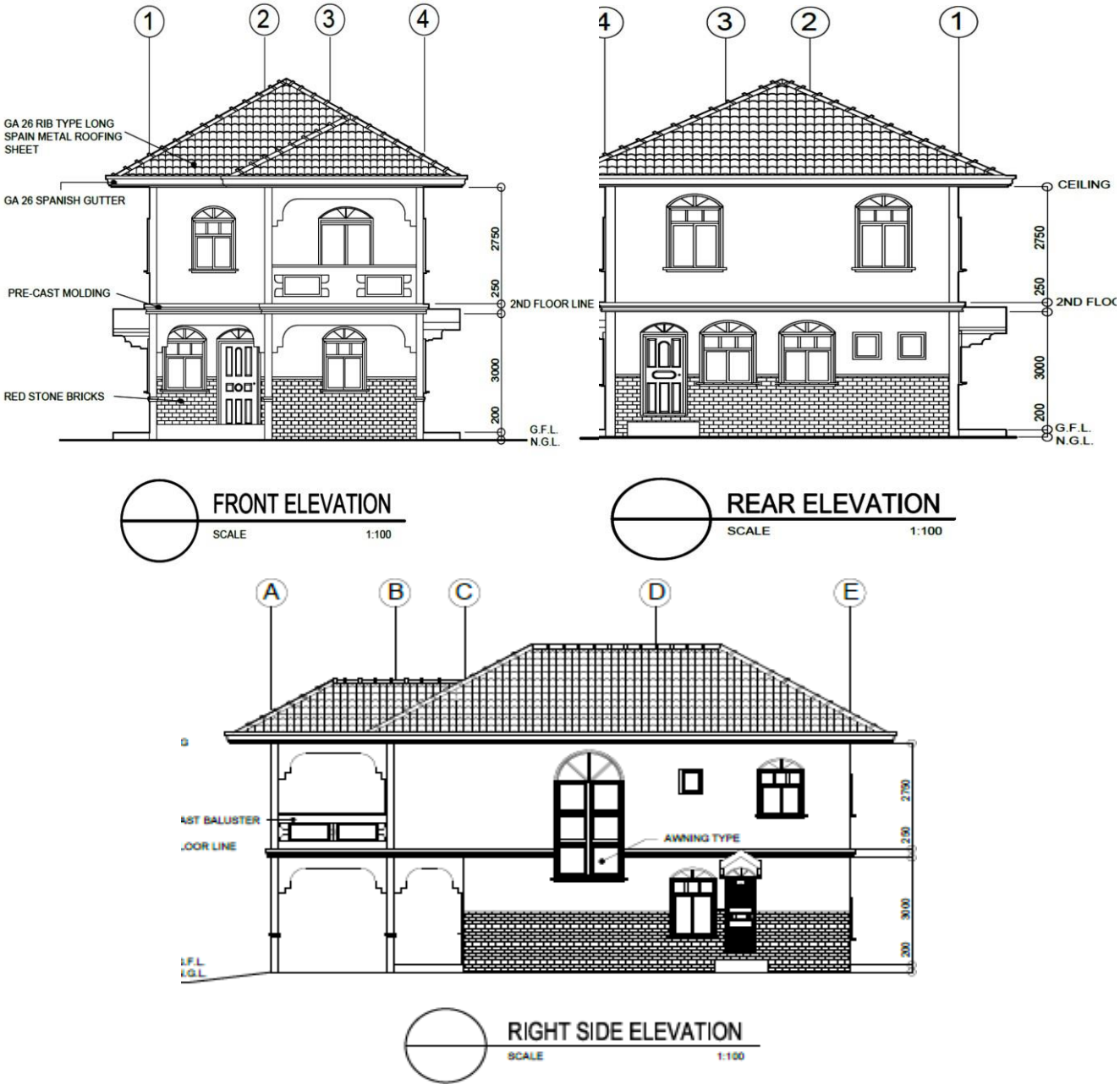
D What is in?

Elevation Projection

Elevation drawings are projected from the floor plan of an architectural drawing.

Elevations can be projected from the four sides of a floor plan.

The front view of the building is always referred to as the front. The other elevations are named according to their position in relation to the front, i.e., right elevation, rear or back elevation, left elevation.



Dimensions on elevation show the vertical distance from a datum line, which is a reference line that remains constant. Dimensions on elevation show the height above the datum or the ground line. Dimensioning elevations must conform to basic standards to ensure consistency of interpretation

Here are some of the rules in dimensioning:

1. Vertical elevation dimensions should be read from the right of the drawing.
2. Levels to be dimensioned should be labeled with a note, term, or abbreviation.
3. Room heights are shown by dimensioning from the floor line to the ceiling line.
4. The depth of footings (“footer”) is dimensioned from the ground line.
5. Heights of windows and doors are dimensioned from the floor line to the top of windows or doors.
6. Elevation dimensions show only vertical distances (height). Horizontal distances (length and width) are shown in the floor plan.
7. Windows and doors may be indexed to a door or window schedule. The style of the windows and doors may be shown on the elevation drawing.
8. The roof pitch is shown by indicating the rise over the run.
9. Dimensions for small, complex, or obscure areas should be indexed to a separate detail.
10. Ground-line elevations are expressed as heights above the datum point.
11. Heights of chimneys above the ridge line are dimensioned.
12. Floor and ceiling lines are shown using hidden lines.
13. Heights of planters and walls are dimensioned from the ground line.
14. Thickness of slabs are dimensioned.
15. Overall height dimensions are placed on the outside of sub-dimensions.
16. Thickness of footings are dimensioned.
17. Where space is limited, the alternative method in Figs.38 1-2 can be used to show feet and inches.

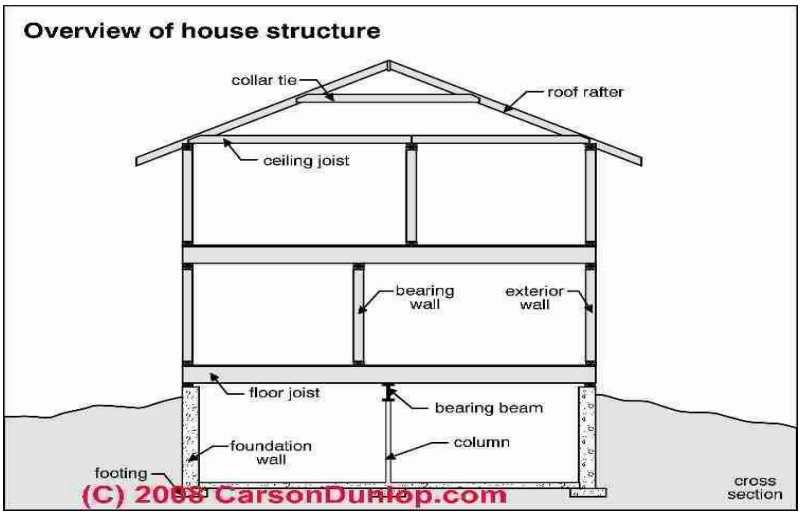
D What is it?

SECTIONING

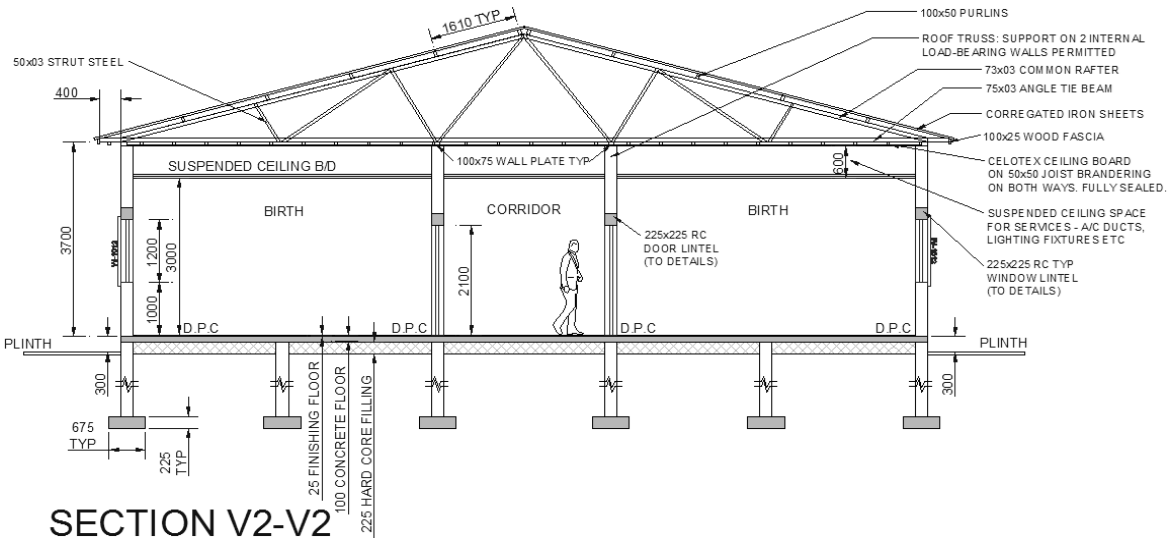
The designer shows the internal construction of a building by means of a section.

Types of Sections used in Architectural Drafting

1. ***Structural section***- shows the entire building construction. This is useful in planning for structural strength and rigidity, determining the length of members and specifying sizes.

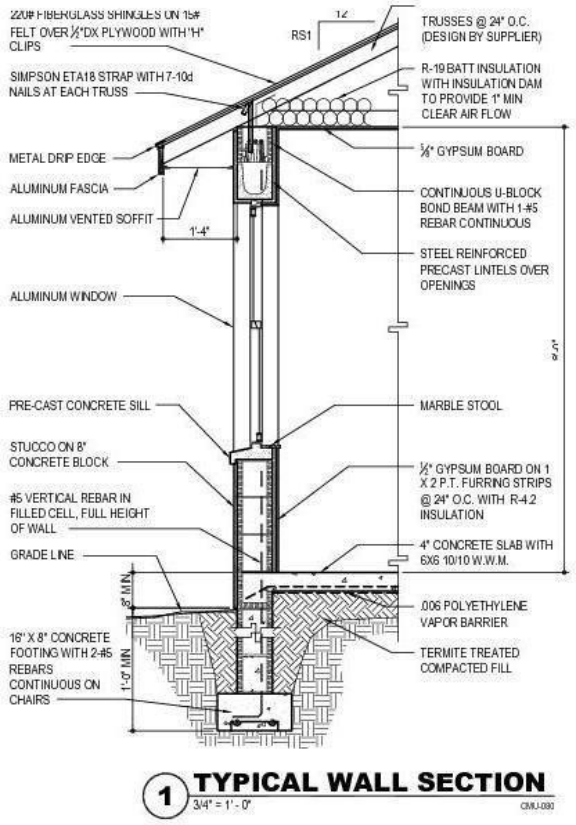


2. ***Detail section***- shows any deviation from a typical section. It is drawn to a larger scale.



Sample Structural Section of a Residence

3. ***Wall section***- shows the construction of a typical wall. This section is useful in determining sizes and material specification for all rough members



Sample Wall Section

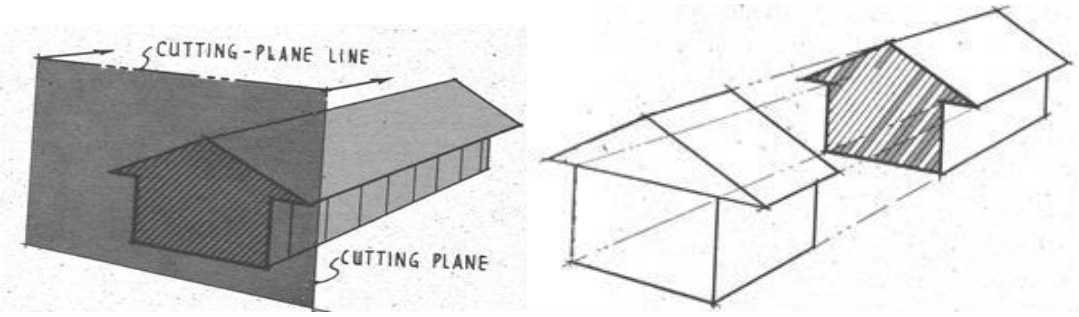
Full Sections

Architects prepare drawings that show the building cut into half to show the internal structure.

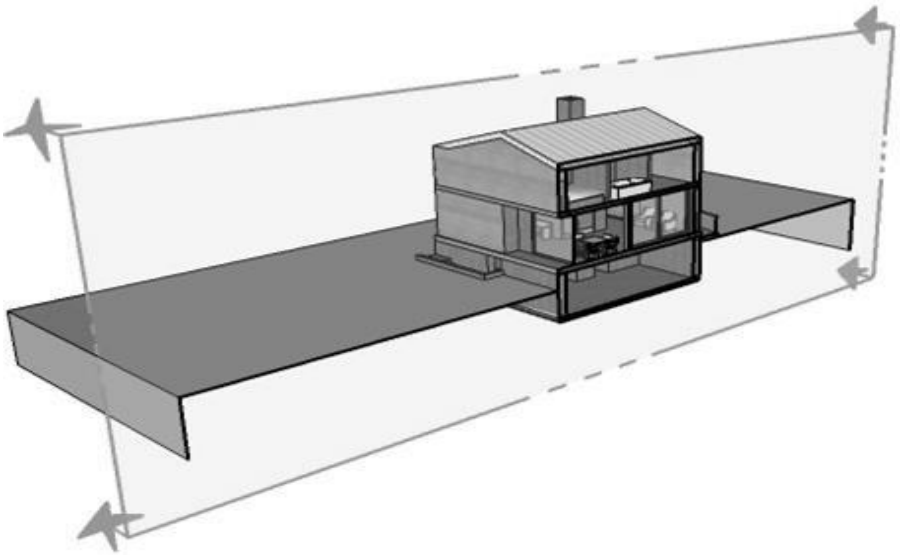
1. CROSS or TRANSVERSE SECTION - is a type of section where the cutting-plane line is drawn *horizontally*.

2. LONGITUDINAL SECTION- is a type of section where the cutting-plane is drawn
vertically.

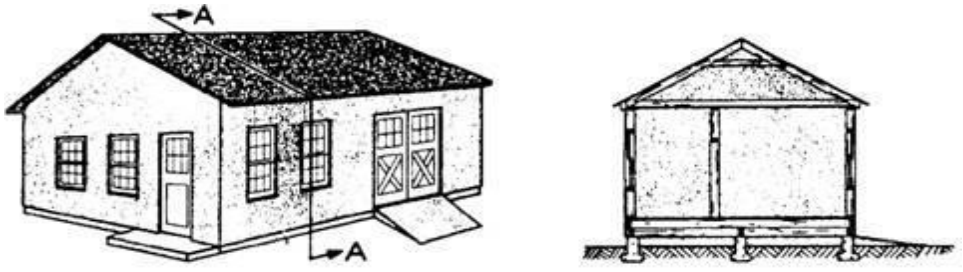
There are different ways of drawing the cutting plane line, most especially if it interferes with dimensions as shown in these figures:



Traverse (Cross) Section



Longitudinal Section



TYPICAL SMALL BUILDING SHOWING CUTTING PLANE A–A AND SECTION DEVELOPED FROM THE CUTTING PLANE

Take note of the direction of the cutting plane lines. Arrowheads show the line of sight of the observer and the portion or view to be presented in the drawing.

What is More?

Learning Task 2: Check it Out!

A. Read each statement about dimensioning an elevation drawing carefully. Write **A** if the statement is correct and **B** if it is wrong.

1. Dimensions on elevation show the height above the datum or the ground line.
2. Vertical elevation dimensions should be read from the left of the drawing.
3. Ceiling heights are shown by dimensioning from the floor line to the ceiling line
4. Heights of windows and doors are dimensioned from the floor line to the top of windows or doors.
5. The length and width of the drawing can be shown in the elevation.
6. Normally, the design of the floor plan precedes the designs of the elevation.
7. Hidden lines are used to indicate the location of footings.
8. Overall height dimensions are placed on the inside of sub-dimensions.
9. The roof pitch is shown by indicating the run over the rise.
10. Levels to be dimensioned should be labeled with a note, term, or abbreviation.

B. Fill in the blanks with the correct term that will complete each sentence. Write your answers on a separate sheet of paper.

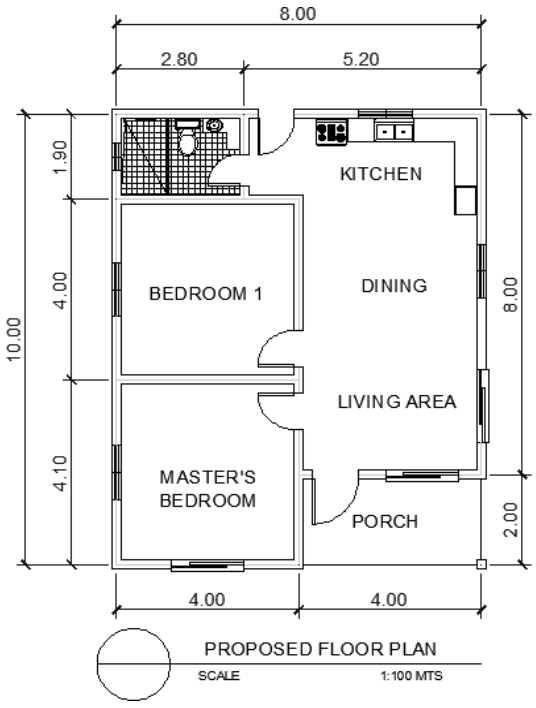
1. Sections are types of drawings which show the _____ of a building or structures.
2. A _____ heavy line which shows the exact location where the object is cut.
3. A _____ is a type of section where the cutting plane is drawn horizontally.
4. A _____ is a type of section where the cutting plane is drawn vertically.
5. The _____ is the plan where the cutting plane line is drawn.
6. A _____ section that shows the construction of a typical wall.
7. The _____ section shows the entire building construction.
8. The _____ show the line of sight of the observer and the portion or view to be presented in the drawing.

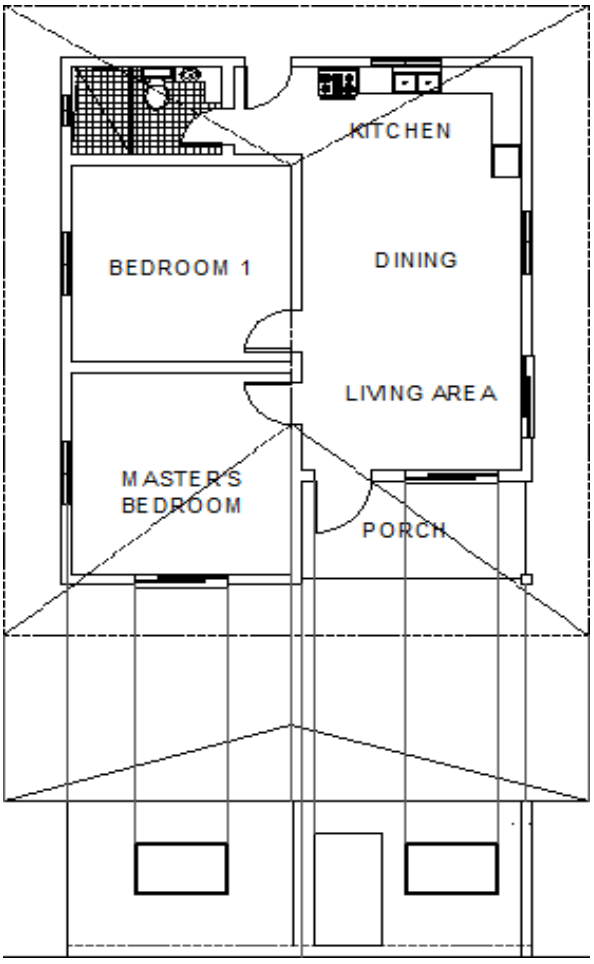
E What I can do?

Below are the steps in drafting an elevation and section drawings:

A. Elevation Drawings

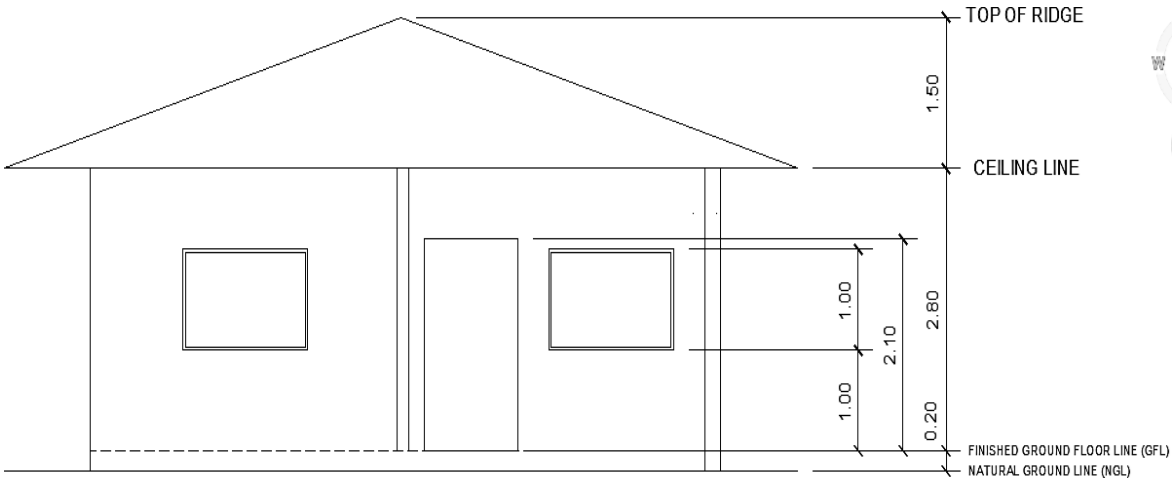
1. Layout the elevation very lightly using a sharp, hard pencil. Using a divider or a scale, transfer horizontal dimensions from the floor plan. A scale of 1: 100 or 1:50 meter is used and indicated in the title block or near the drawing. If the plan and section are drawn to the same scale as the required elevation, the floor plan may be taped in position, and the dimension projected directly using triangle, and a T-square.



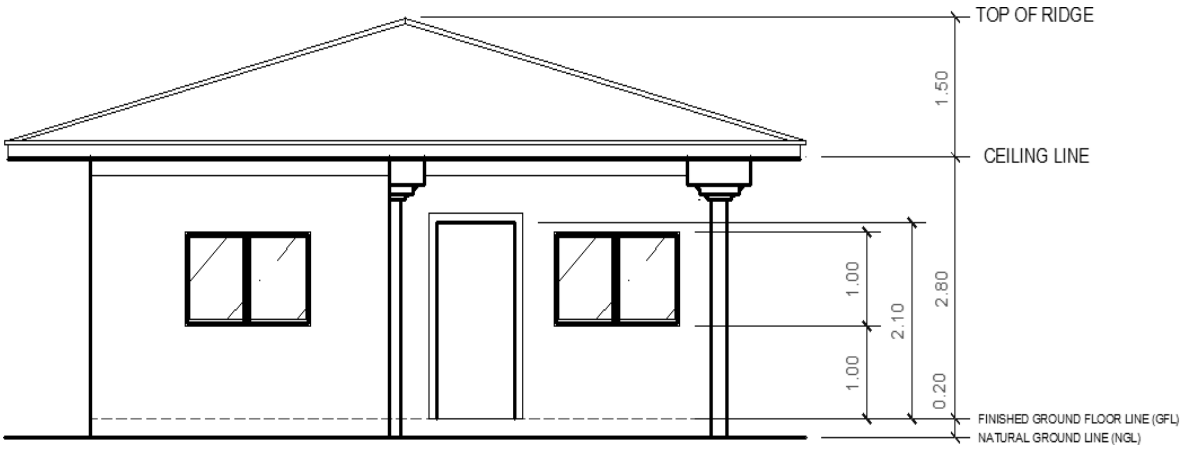


Windows and door are located horizontally by projecting from the plan, these are located vertically by projecting from the window and door details or simply by aligning the top of the window with the top of the door.

2. Locate the vertical distance of ceiling from floor line, ridge to ceiling line and natural ground to finished ground line. Indicate also the height of doors and windows.



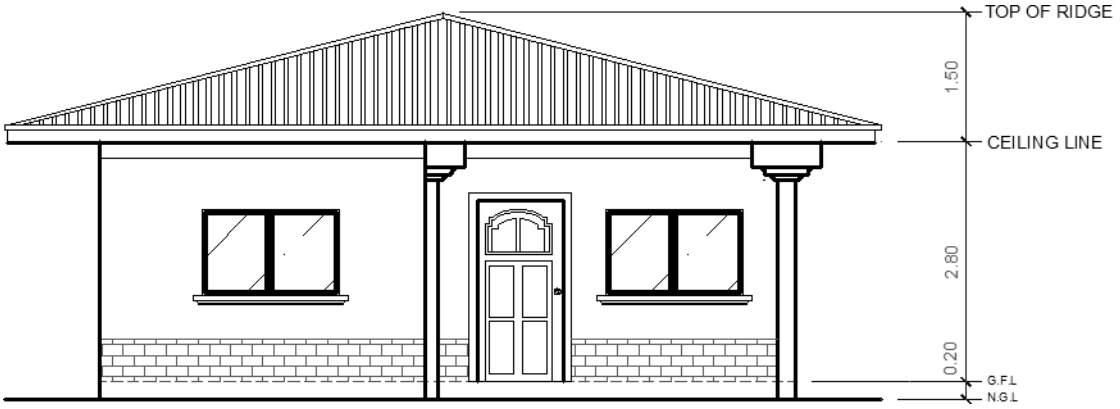
3. Indicate the thickness of walls, fascia board, and other materials seen on elevation and darken the lines to highlight these.



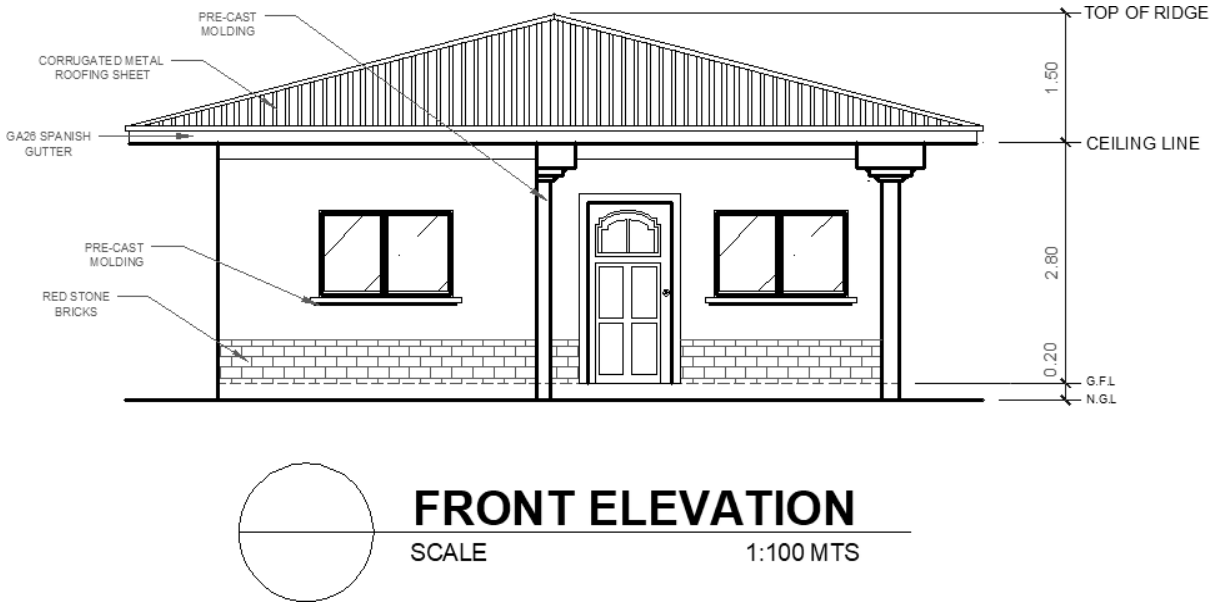
4. Draw the elevation details and other architectural materials.

The elevation details to be included will vary depending on the style of the house. In the case of a residence, the following details are added:

- 4.1 roof fascia
- 4.2 window representation
- 4.3 grade lines
- 4.4 material representation
- 4.5 finishing materials, doors and windows, moldings, rain gutters



5. Indicate the dimension of the vertical distance from the natural ground line to the floor line and the floor line ceiling, and ceiling line to ridge line.



FRONT ELEVATION

SCALE 1:100 MTS

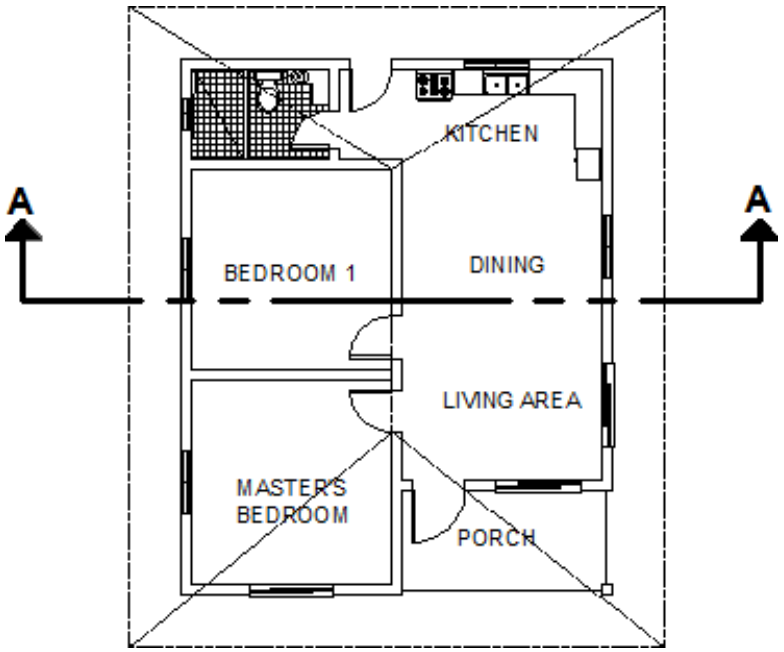
Added elevation dimensions and notes are:

5.1 height of roof
5.2 height of other features, such as masonry wall
5.3 height of wall
5.4 roof slope indication
5.5 window schedule
5.6 title and notes indicating materials

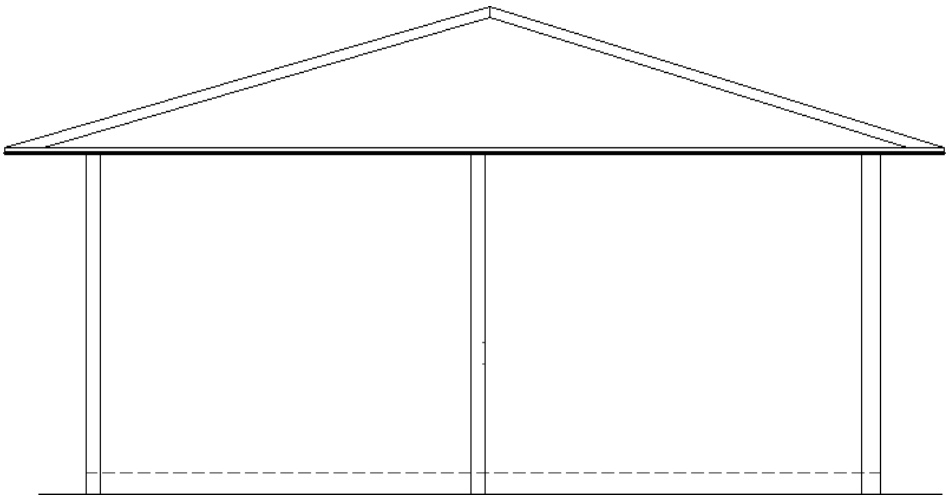
6. Repeat the same procedure for the remaining elevation drawings (as necessary), rear, and right and left-side elevation.

B. Sectional Drawings

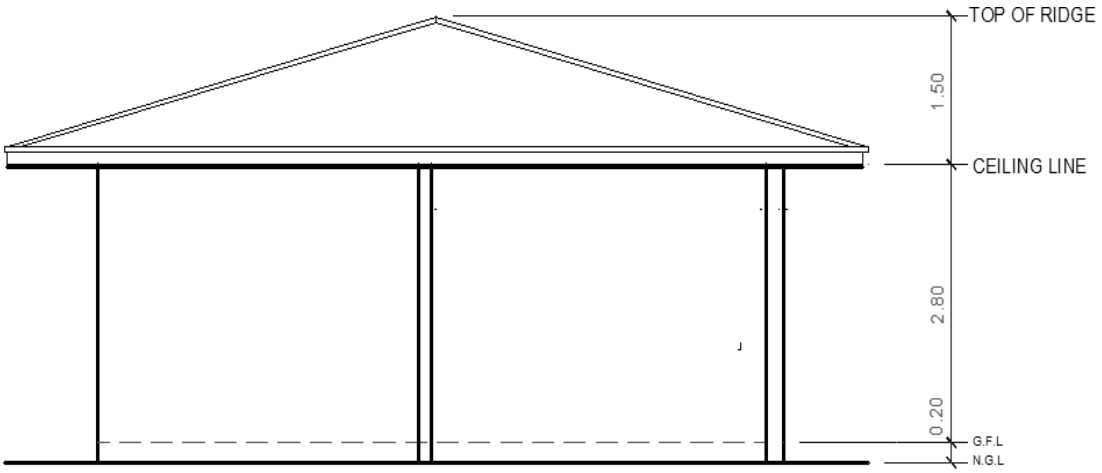
1. From the given plan, indicate the path of the imaginary cutting plane along the floor plan. Indicate the position of the line of sight or viewing by means of arrow heads (Section "A-A").



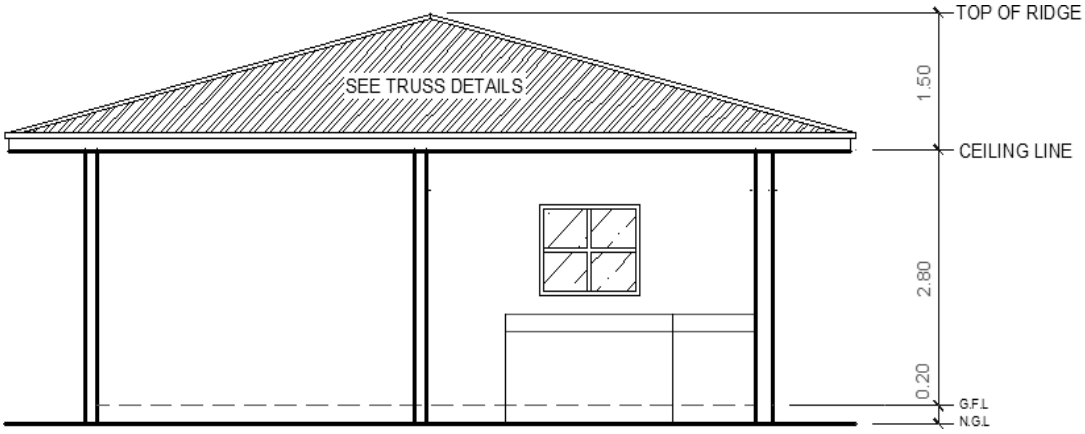
2. Transfer horizontal dimension from the floor plan to the section using a metric scale with appropriate scale ratio.



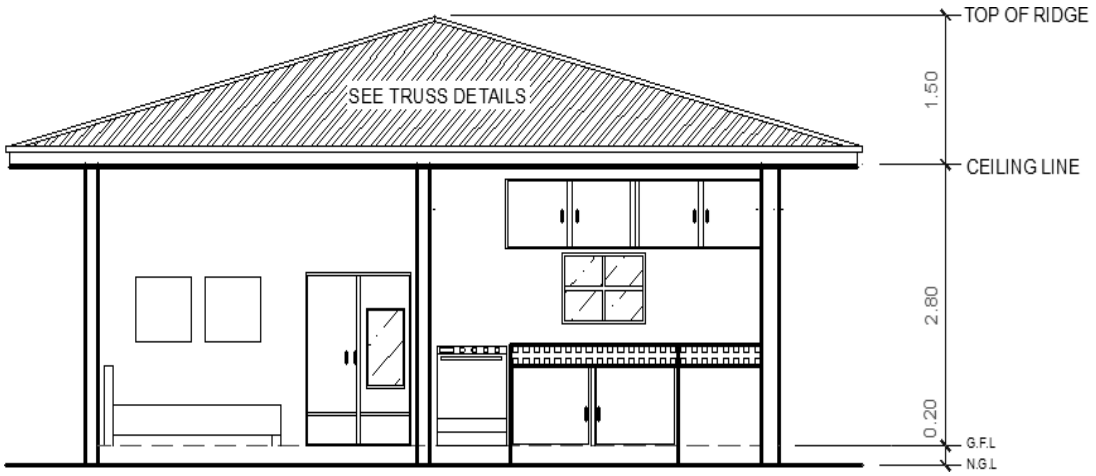
3. Indicate the vertical dimensions from the ground line to the floor line, the ceiling line and the ridge line using the standard vertical dimension as provided in the low cost housing regulations. The standard dimensions are 2.80 m. from the floor line to ceiling line and 1.20 m. to 1.80 m. from ceiling line to the top of the ridge.



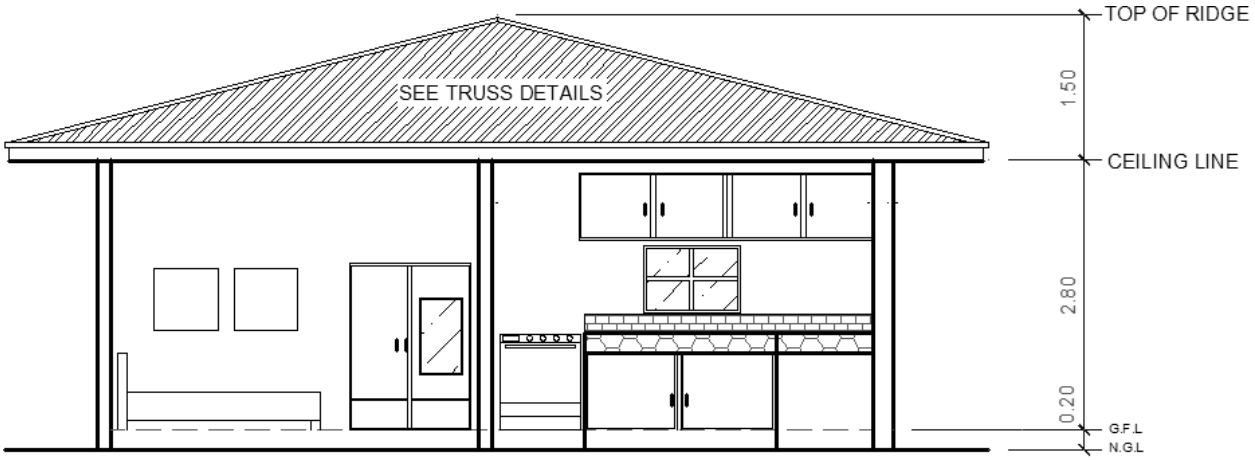
4. Draw the outline of the building using the measurements as marked on the paper.



5. Darken the outline and draw section lines on portions of the building that come in contact with the cutting plane.



6. Finalize the drawing by labeling it.



SECTION "A-A"

SCALE 1:100 MTS

7. Repeat the same procedure for the cross section drawing. Change the position of the cutting-plane line (use Section "B-B"). Use the same floor plan below.

E What Else Can I Do?

Learning Task 3: Draft Elevation Drawings

After discussing all the necessary knowledge and skills required to draft an elevation drawing, it is now the right time for you to showcase and apply what you have learned.

Materials Needed:

- T-square/Triangles/Ruler
- Circular Template
- Oslo Paper
- Pencil and Eraser

Instructions:

1. Draw the four corresponding elevation drawing of the floor plan on page 46. Follow the given requirements and specifications below.
    - Use 1:50 scale.
    - 2.80 m - 3.0 m vertical distance from the floor line to ceiling line
    - 1.20 m – 1.80 m vertical distance from ceiling line to the top of the ridge
    - 0.20 m distance from natural ground line to finish ground floor line
    - 2.1 m height of doors from the finish ground floor line
    - 0.9 m – 1.1 m vertical distance from the finish ground floor line
    - 0.10 m thickness for ceiling material
2. Include necessary architectural details such as windows, doors and materials representation and finishing materials.
3. Indicate the dimensions and label the essential information.
4. Your output will be evaluated according to the following criteria below.

Criteria	7 points	5 points	3 points
Line Technique/ Layout	All lines were drawn according to standards and drawing was laid out properly	At least 3-5 lines were not drawn according to standards and drawing was laid out well	More than 5 lines were not drawn according to standards and drawing was improperly laid out
Accuracy	All measurements and notations/symbols needed were accurately done	At least 3-5 measurements and notations/symbols needed were inaccurately done	More than 5 measurements and notations/symbols needed were inaccurately done
Criteria	**3 points**	**2 points**	**1 point**
Neatness	Finished output was neatly done with no erasures nor any smudges	Erasures/smudges are observable on the finished output	Finished output has so many erasures/ smudges present
Time Management	Finish the task ahead of the given time/date	Finish the task on the given time/date	Unable to finish the task on the given time/date

Learning Task 4: Draft Cross and Longitudinal Section Drawings

Materials Needed:

- T-square/Triangles/Ruler
- Circular Template
- Oslo Paper
- Pencil and Eraser

Instructions:

2. Using the same floor plan described on page 46, draw the corresponding cross and longitudinal section drawings. Follow the given requirements and specifications below.
    - Use 1:50 scale.
    - 2.80 m - 3.0 m vertical distance from the floor line to ceiling line
    - 1.20 m – 1.80 m vertical distance from ceiling line to the top of the ridge
    - 0.20 m distance from natural ground line to finish ground floor line
    - 2.1 m height of doors from the finish ground floor line
    - 0.9 m – 1.1 m vertical distance from the finish ground floor line
    - 0.10 m thickness for ceiling material
3. Include necessary architectural details such as windows, doors and materials representation and finishing materials.
4. Indicate the dimensions and label the essential information.
5. Your output will be evaluated according to the following criteria below.

Criteria	**7 points**	**5 points**	**3 points**
Line Technique/ Layout	All lines were drawn according to standards and drawing was laid out properly	At least 3-5 lines were not drawn according to standards and drawing was laid out well	More than 5 lines were not drawn according to standards and drawing was improperly laid out
Accuracy	All measurements and notations/symbols needed were accurately done	At least 3-5 measurements and notations/symbols needed were inaccurately done	More than 5 measurements and notations/symbols needed were inaccurately done
Criteria	**3 points**	**2 points**	**1 point**
Neatness	Finished output was neatly done with no erasures nor any smudges	Erasures/smudges are observable on the finished output	Finished output has so many erasures/ smudges present
Time Management	Finish the task ahead of the given time/date	Finish the task on the given time/date	Unable to finish the task on the given time/date

A What I Have Learned?

1. An elevation drawing shows the exterior views of a building while a sectional drawing shows the interior or inside of a building or structure.
2. Elevation can be also described as the horizontal orthographic projection of a building on a vertical plane.
3. Horizontal distances are established in the floor plan, while vertical distances must be presented in an elevation drawing.
4. Labeling of the views in an elevation drawing can be done in two methods: views as in front, rear, left, and right side elevations, or by using compass orientation as in north, south, east, and west directions.
5. Elevation drawings are projected from the floor plan of an architectural drawing. Elevations can be projected from the four sides of a floor plan.
   A sectional view is obtained making an imaginary cut through the part, and by drawing the features on the cut surface.
6. There are several guidelines that must be followed in order to establish a clear and precise measurement for elevation drawings.
7. There are three types of section used in architectural drafting: structural, detail, and wall section.
8. Cross or transverse section is a type of section where the cutting-plane line is drawn horizontally whereas in a longitudinal section, the cutting-plane line is drawn vertically.
9. The process of doing a sectional drawing is almost the same with the process of preparing elevations.
10. The number of sectional drawings is dependent on the complexity of the building design.

A What Can I Achieve?

Learning Task 5: Posttest

Read each item carefully. Choose the letter of the best answer and write it on a separate sheet of paper.

1. One of the competencies in Technical Drafting is to draw the sectional layout of a prepared floor plan. Which of the following will best define a sectional view?
   A. It is the inside or interior view of a building
   B. It is the outside or exterior view of a building
   C. It is the top cross-sectional view of a building
   D. It is the side view of a building

2. Which of the following will indicate the position of an imaginary cut in a sectional drawing?
   A. Hidden Line
   B. Cutting-Plane Line
   C. Long-Break Line
   D. Section Line

3. What kind of sectioning will you use if were to show the entire building construction?
   A. Wall Section B. Detail Section C. Structural Section D. Cross Section

4. How do you indicate the position of line of sight or viewing in a sectional drawing?
   A. through the use of architectural ticks
   B. through the use of notes
   C. through the use of legends
   D. through the use of arrowheads

5. Arrange the steps in drafting sectional drawing.
   I. Darken the outline and draw section lines on portions of the building that come in contact with the cutting plane.
   II. Indicate the vertical dimensions from the ground line to the floor line, the ceiling line and the ridge line.
   III. Finalize the drawing by labeling.
   IV. Indicate the path of the imaginary cutting plane along the floor plan.
   V. Transfer horizontal dimension from the floor plan to the section using a metric scale with appropriate scale ratio.

   A. V, IV, III, II, I B. IV, V, II, I, III C. III, V, IV, I,II D. II, IV, V, I, III

6. Which of the following is the standard vertical dimension from the ceiling line to the top of the ridge based on the low-cost housing regulation?
   A. 1.0 – 1.6 M B. 1.1 – 1.7 M C. 1.2 – 1.8 M D. 1.3 – 1.9 M

7. The ends of the cutting-plane line are bent at how many degrees?
   A. 30 degrees B. 45 degrees C. 60 degrees D. 90 degrees

8. Ringo was given a floor plan that shows a cutting-plane line drawn vertically. What kind of sectioning should he prepare?
   A. Wall Section
   B. Longitudinal Section
   C. Cross Section
   D. Transverse Section

9. Which of the following is the minimum ceiling height for the first-storey of a building?
   A. 1.80 m B. 2.10m C. 2.40m D. 2.70 m

10. Your task is to prepare an architectural layout of a bungalow house. Which of the following ceiling height can you use to conform to the standards?
    A. 1.80 m B. 2.10m C. 2.40m D. 2.70 m

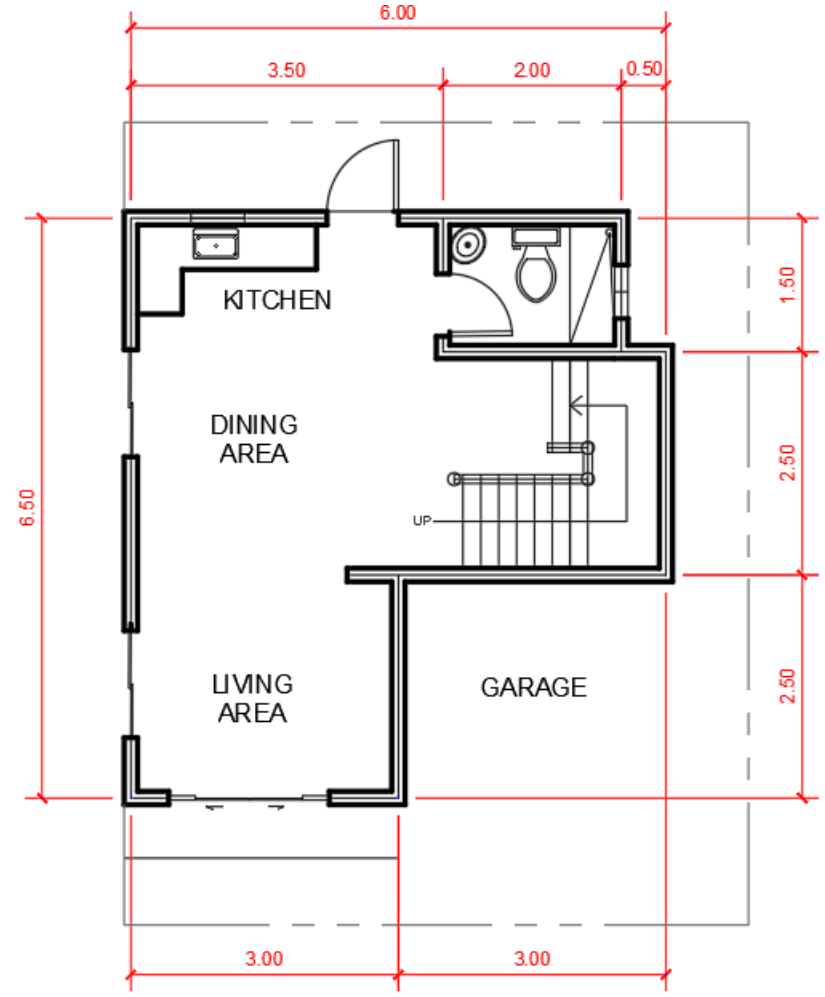
11AA mezzanine floor is often low-ceilinged and projects in the form of a balcony. Which of the following is the minimum ceiling height for a mezzanine floor?
    A. 1.80 m B. 2.10m C. 2.40m D. 2.70 m

12. What type of line is used to indicate floor and ceiling lines?
    A. Visible line B. Long-break lines C. Hidden Line D. Center Line

13. Horizontal distances: Floor Plan = Vertical distances: _____
    A. Roof Plan B. Section C. Elevation D. Ceiling Plan

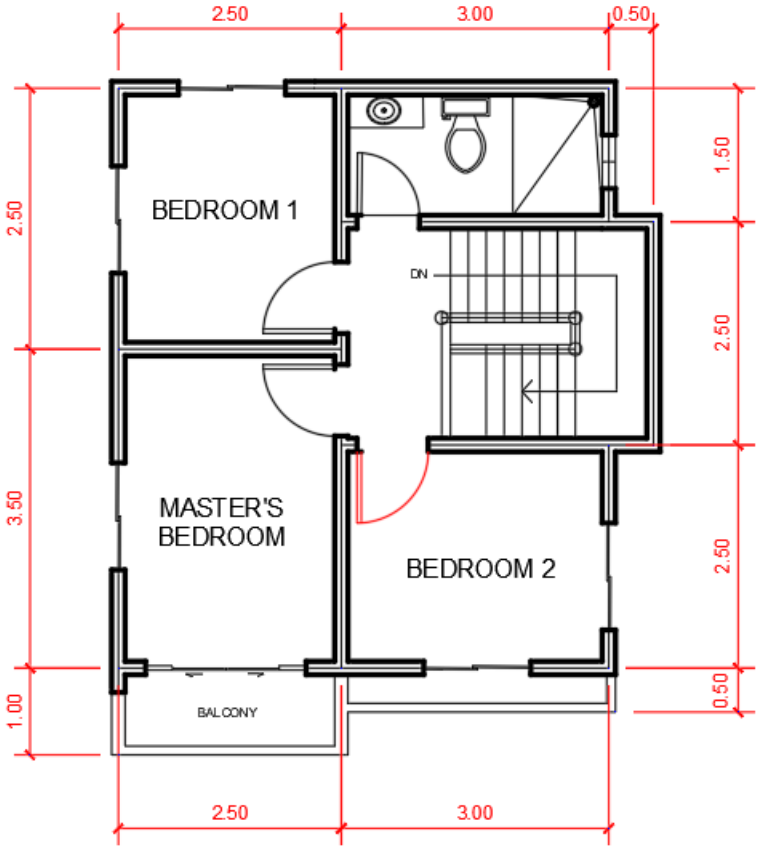
14. Which of the following details does not describe an elevation drawing?
    A. Exterior design of the house C. Interior design of the house
    B. Height dimensions D. Materials finish

15. Which is the following is TRUE about elevation?
    A. Elevation drawings are orthographic drawings.
    B. Front elevation is sufficient to describe the appearance of the residential building.
    C. The design of the elevation precedes the designs of the floor plan.
    D. View of a building showing its width dimension.



GROUND FLOOR PLAN

SCALE 1:100



SECOND FLOOR PLAN

SCALE 1:100

Answer

LESSON 1 – DRAFT ROOF PLAN

Learning Task 5: Posttest

1. C
2. B
3. D
4. C
5. C

6. D
7. C
8. C
9. C
10. C

Learning Task 3: Check this out!

A.		B.		C.	
1. G		1.	Pitch	1.	Ridge
2. A		2.	Rafters	2.	Fascia
3. E		3.	Downspout	3.	Soffit
4. J		4.	Valley	4.	Wall plate
5. B		5.	Eaves	5.	Rafter
6. H		6.	GI Sheets	6.	Ceiling joist
7. C		7.	90 cm x 240 cm		Eaves
8. D		8.	80 cm x 1.50 to 3.60 m		
9. F		9.	Slate		
10. I		10.	plastic		

Learning Task 1: Pre-test

1. B
2. A
3. A
4. A
5. A

6. B
7. B
8. B
9. D

Learning Task 4: Posttest

1. C
2. D
3. C
4. D
5. D
6. C
7. A
8. B
9. A
10. A

LESSON 3 – DRAFT ELEVATION AND SECTIONS

Learning Task 1: Find the view

1	2	3	4	5	6
J	F	K	D	G	F
E	P	B	L	M	O
N	Q	H	C	R	I

Learning Task 2: Check this out

A.	B.
1. A	1. Interior or Inside
2. A	2. Cutting-plane line
3. A	3. Cross or Transverse
4. B	4. longitudinal
5. B	5. floor plan
6. A	6. wall section
7. A	7. structural section
8. B	8. arrowheads
9. B	
10. A	

Learning Task 4: Posttest

1. A		11. A	
2. B		12. C	
3. C		13. C	
4. D		14. C	
5. B		15. A	
6. C			
7. D			
8. B			
9. C			
10. D			

References

- *TLE Learner's Module*. Department of Education, n.d.
- Fajardo Jr, Max B. *Simplified Methods on Building Construction*, 2000.
- "Drafting Learning Modules," n.d. http://shsph.blogspot.com/2016/06/drafting-learning- modules.html.
- "How to Draw Cross Sections." Accessed November 17, 2020. http://www.the-house-plans-guide.com/how-to-draw-cross-sections.html.
- Integrated Publishing. *Drawing Symbols.* Retrieved July 24, 2018 from http://www.tpub.com/engbas/10-6.htm.
- *Introduction to Architecture (Arch1101).* The OpenLab at City Tech. New York City College of Technology City University of New York. Retrieved April 2, 2020 from https://openlab.citytech.cuny.edu/architecture-oer/course-by-week/lesson-4-introduction-to-architectural-drawings-plans-and- elevations/
- Madsen, David A., Jefferis, Alan, Madsen, David P., Jefferis, Tereasa. *Print Reading for Architecture and Construction Technology*. Cengage Learning 2013 page 56-58 Retrieved July 1, 2018 from. https://books.google.com.ph/books
- *Reading Architectural Drawings 101 – Part A.* LeaDesign Studio. Retrieved March 26, 2020 from https://leadesign.com.au/architect/reading-architectural-drawings- 101-part-a/
- *Section Drawing.* Designing Buildings Wiki. (2019). Retrieved October 22, 2018 from https://www.designingbuildings.co.uk/wiki/Section_drawing.
- ProfDrafting. *How to Draft an Architectural Section View*. 2017. https://www.youtube.com/watch?v=AkmaXL5faLo
- Themodmin. *Sections For Architectural Sketches - Architecture Daily Sketches*. https://www.youtube.com/watch?v=98PALn 5XG0U
- JTC Roofing Contractors. "Roof Types," n.d. https://www.jtcroofing.co.uk/roof-types/.
- S&K Roofing. "Roofing Terminology," n.d. https://www.skroofing.com/roofing-maryland/roofing-terminology/.
- Quora. https://www.quora.com/What-is-the-formula-for-calculating-the-angle- of-a-roof-valley-and-the-angles-of-its-component-planes.
-
- Carpentry Tricks & Tips.com https://www.carpentry-tips-and-tricks.com/how- to-build-a-roof.html.
-
- Sheehan Inc. http://www.sheehan.com.ph/corrugated-roof.html.
- Commons Wikimedia
- Hunker.com https://www.hunker.com/13411730/ceiling-finish-material