Carpentry

Level-II

Learning Guide-16

Unit of Competence: Read and Interprets plans and specifications

Module Title: Reading and Interpreting plans and specifications

LG Code: EIS CRP2 M05 LO1-LG-16

TTLM Code: EIS CRP2 M05 TTLM 0919v1

LO 1: Identify types of drawings and their functions

Instruction Sheet	Learning Guide 16

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

- Identifying main types of plans &drawing
- Identifying key features and functions of drawings
- Recognizing and adhering quality requirements of operations company
- Identifying environmental requirements and control

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

1.1 Identify main types of plans and drawings used in the construction sector of the industry.

1.2 Identify key features and functions of each type of drawing.

1.3 Recognize and adhere quality requirements of company operations.

1.4 Identify environmental requirements and controls are from job plans, specifications and environmental plan

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1 to Sheet 4”.
4. Accomplish the “Self-checks respectively.
5. If you earned a satisfactory evaluation from the “Self-checks” proceed to “Operation Sheet**.**
6. Do the “LAP test” (if you are ready).

Information Sheet-1	Identifying main types of plans &drawing

1.1. Identifying main types of plans &drawing

1.1.1. Introduction to plans and drawings

Plans are a set of drawings or two-dimensional diagrams used to describe a place or object, or to communicate building or fabrication instructions. Usually plans are drawn or printed on paper, but they can take the form of a digital file.

These plans are used in a range of fields from architecture, urban planning, landscape architecture, mechanical engineering, civil engineering, industrial engineering to systems engineering

Plans are often for technical purposes such as architecture, engineering, or planning. Their purpose in these disciplines is to accurately and unambiguously capture all the geometric features of a site, building, product or component. Plans can also be for presentation or orientation purposes, and as such are often less detailed versions of the former. The end goal of plans is either to portray an existing place or object, or to convey enough information to allow a builder or manufacturer to realize a design.

The term "plan" may casually be used to refer to a single view, sheet, or drawing in a set of plans. More specifically a plan view is an orthographic projection looking down on the object, such as in a floor plan.

1.1.2. Technical terms of plans and drawings

The followings are commonly used technical terms for using construction plans and drawings.

1. **Block identification**. When land is subdivided, each block is given a lot number. The street number is allocated later.
2. **Boundary**. The boundary is the imaginary line that defines the block of land. At each corner is a small wooden peg with the numbers of the adjacent lots stamped onto a metal plate. If a boundary changes direction, a peg is located at that point too.
3. **Road identification**. The name of the road shows where the front of the block is.
4. **Verge**. The verge is the area of land between the block and the road. It is not part of the block and must not be built on (apart from a crossover) or damaged in any way. It usually has services running beneath it (water, telephone, etc).
5. **North point**. The direction of north is shown to assist in orientating the drawing with the block when on-site.
6 **Proposed building**. The location of the proposed house is shown, usually just as an outline.
7. **Finished floor level**. The level of the finished floor of the house is given.
8. **Adjacent properties**. The adjacent lot numbers are shown, and sometimes indications of existing structures are given.
9. **Existing fences**. Any existing boundary fences should be shown.

10. **Easement**. An easement is a part of the land over which another party has some sort of legal right. In this case, a strip near the rear of the block is an easement for a council storm water line to be laid. It still belongs to the landowner but the council has the right to lay and maintain a storm water pipe there, so no structure is allowed to be built over this area.
11. **Existing trees**. If there are any features on the block that are to be left undisturbed they are clearly indicated.
12. **Contour lines**. These are imaginary level lines that indicate the shape of the land (you might have seen these on maps.) In this site plan, they indicate that the land slopes down from the north corner to the south corner.
13. **Contour level**. This indicates the 'reduced level' of the contour (reduced levels are explained in Section 3 Dimensions of this guide). In this case, they are shown at one-meter intervals, but this varies depending on the steepness of the land.
14. **Datum**. This is a point on or near the block that all heights for the project are measured from..
15. **Angle of boundary intersection**. This indicates at what angle the boundaries meet. It is not always shown, especially if the block has square corners.
16. **Location of power connection**. This indicates to the electrician where the electrical connection will be made. In this case, the block has underground power, but if overhead lines pass the block, the nearest power pole may be shown.
17. **Boundary length**. This indicates the length of each boundary.
18. **Setback**. This is the distance from the front boundary to the nearest part of the building. A minimum distance for this is set by the local authority (council) and varies depending on the zoning of the land.
19. **Offset**. Similar to the setback, the offset indicates how far from the side boundary the building is to be. There are by-laws regulating the minimum distance for this, mainly to minimize the spread of fire.
20. **Driveway**. This indicates where and how wide the driveway should be.
21. **Crossover**. This is the continuation of the driveway across the verge.
22. **Path**. Any paving included in the contract is shown.
23. **Clothes hoist**. The position of the clothes hoist is indicated

1.1.3. Types of construction plans and drawings

The process of producing plans, and the skill of producing them, is often referred to as technical drawing. A working drawing is a type of technical drawing, which is part of the documentation needed to build an engineering product or architecture. Typically in architecture these could include civil drawings, architectural drawings, structural drawings, mechanical drawings, electrical drawings, and plumbing drawings. In engineering, these drawings show all necessary data to manufacture a given object, such as dimensions and angles

Drawings play an important role in the construction field to convey the ideologies and perspective of the designer to the layman at site. The drawings may be used to indicate the overall appearance, inside or outside the structure, or they may be used to indicate precise measurements and other details for construction

There are different types of drawing used for the construction process. Depending upon the purpose they serve, construction drawings are divided into 5 types

1.Architectural Drawing

Architectural drawing can be termed as the mother drawing for all the other drawings used for construction. It contains all the details of the project such as location site plan, setting out plan, elevations, sections and other details.

- Site Plan

This is primary drawing used for marking out the plan on the ground. It represents the location, orientation and information about the site's topography, landscaping utilities, and site work.

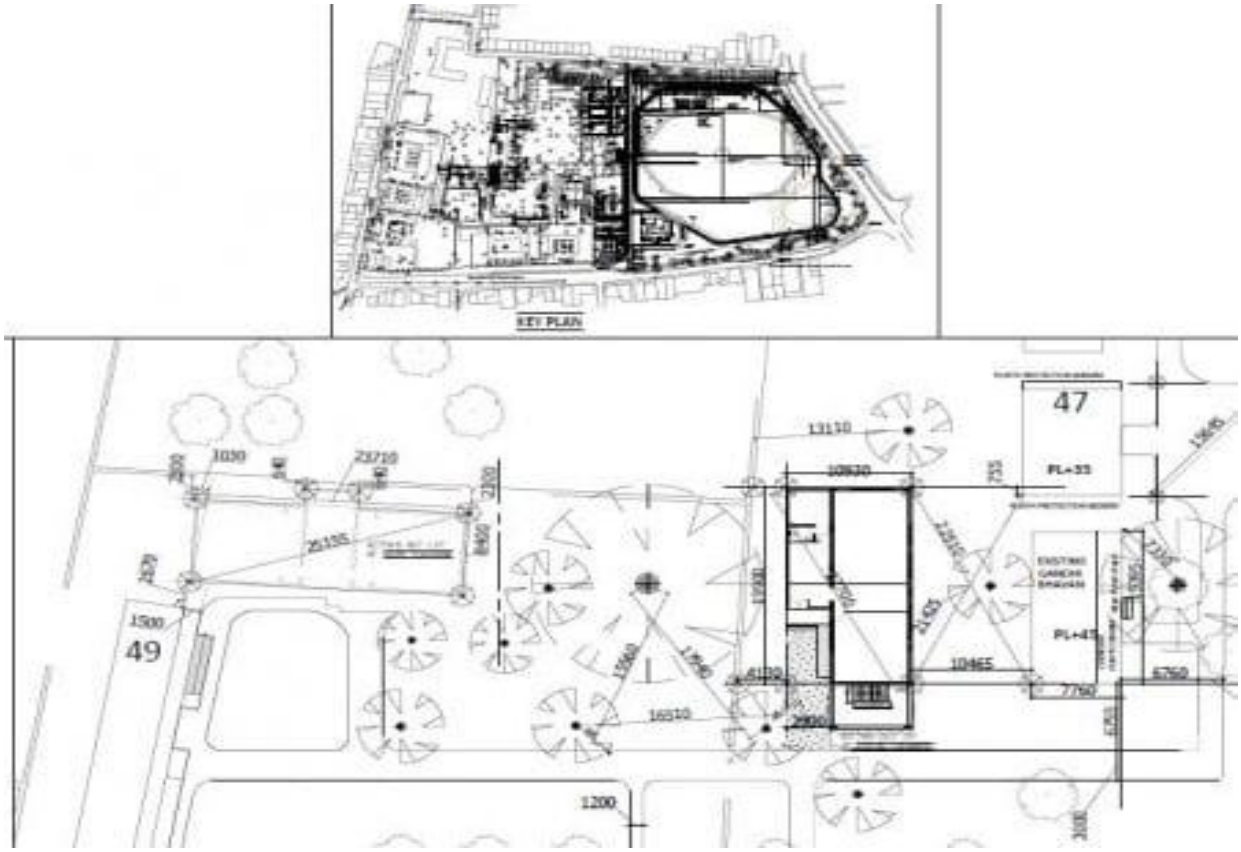

Fig 1: Layout Plan

- Working Plan

This drawing gives the information of horizontal dimensions of the building, thickness of walls, clear spaces inside the building and column locations. it also shows the openings required in the building such as doors, windows and ventilators.

- Section Drawings

Section drawings represents the material of construction to be used, heights and measurement of the different components of buildings, type of structural components such as type of slab , etc. Its represents the drawing when the building is cut through a vertical plane.

- Elevation Drawing

Elevation drawing represents the information of openings, size and shape of external surface, height of building and finish of the building after completion. These drawings are made by having a aesthetic view of the building.

2. Structural Drawing

Structural drawings can be termed as the backbone drawing of the building. It consists all the information about the structural intervention that are coming on a building. It contains many type of drawing with very minute details and description.

- **General Note**

This is more of a codes and by laws of the buildings. No drawing is found in this, but the details of all the structural drawings are mention in this such as concrete mix, lapping length, curing time, abbreviation, codes and other work procedures.

- **Excavation Drawing**

This drawing represents the footing excavation dimension, column position, footing plan and grid lines of column.

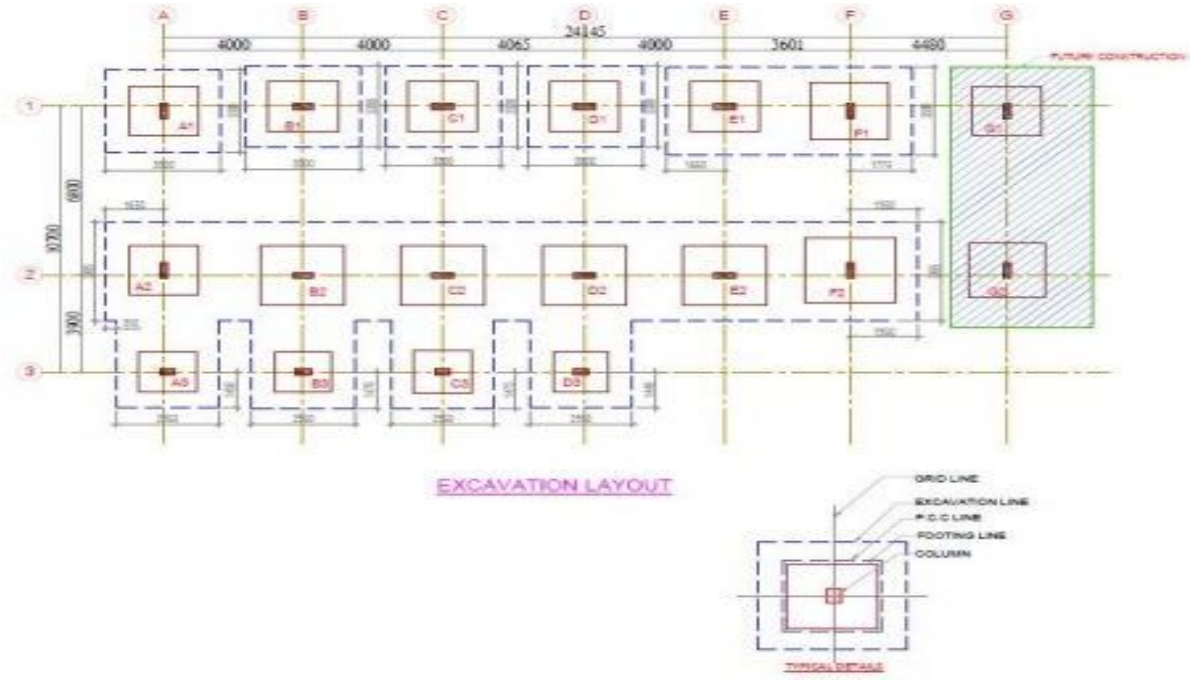

Fig 2: Excavation Layout

- Column layout

This drawing represents the position and orientation of column and column reinforcement detail

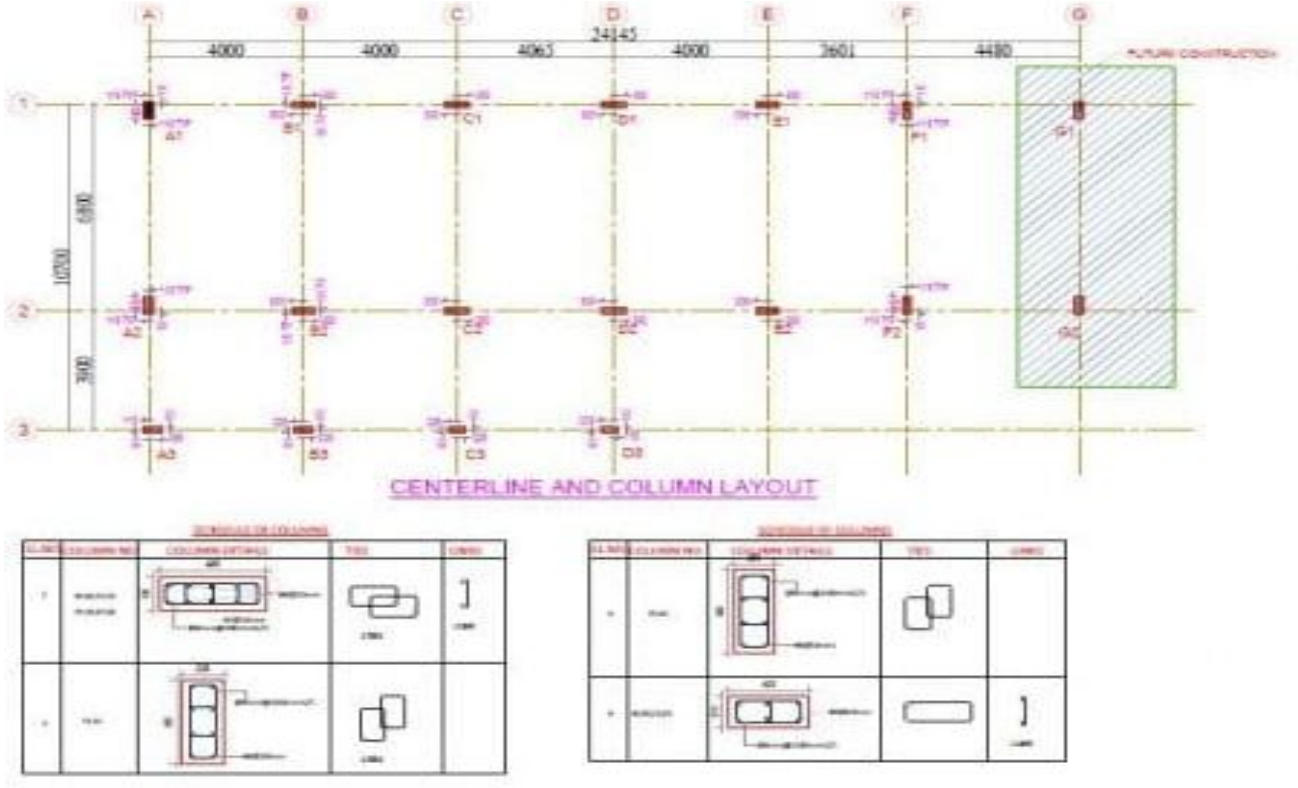

Fig 3: Column Layout

- Plinth beam lay out

This drawing represents the dimensions, positions, and sections of plinth beam the details of reinforcement in plinth beam

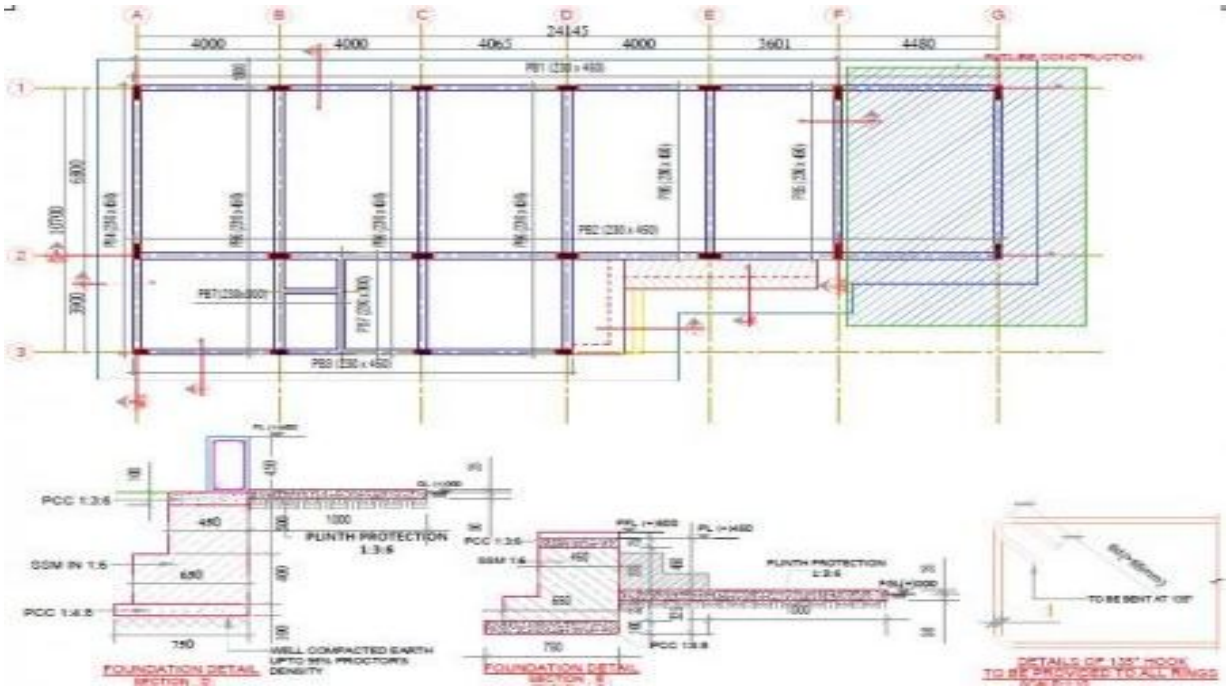

Fig 4: Plinth Beam Layout

- Roof beam and shuttering layout

This drawing represent the detail of reinforcement of roof beam, its section and shuttering details

Fig 6: Roof Beam and Shuttering Layout

- Roof slab layout

This drawings represents the details of reinforcement of roof slab, its section and opening in the roof for various purpose such as stairs or sky light

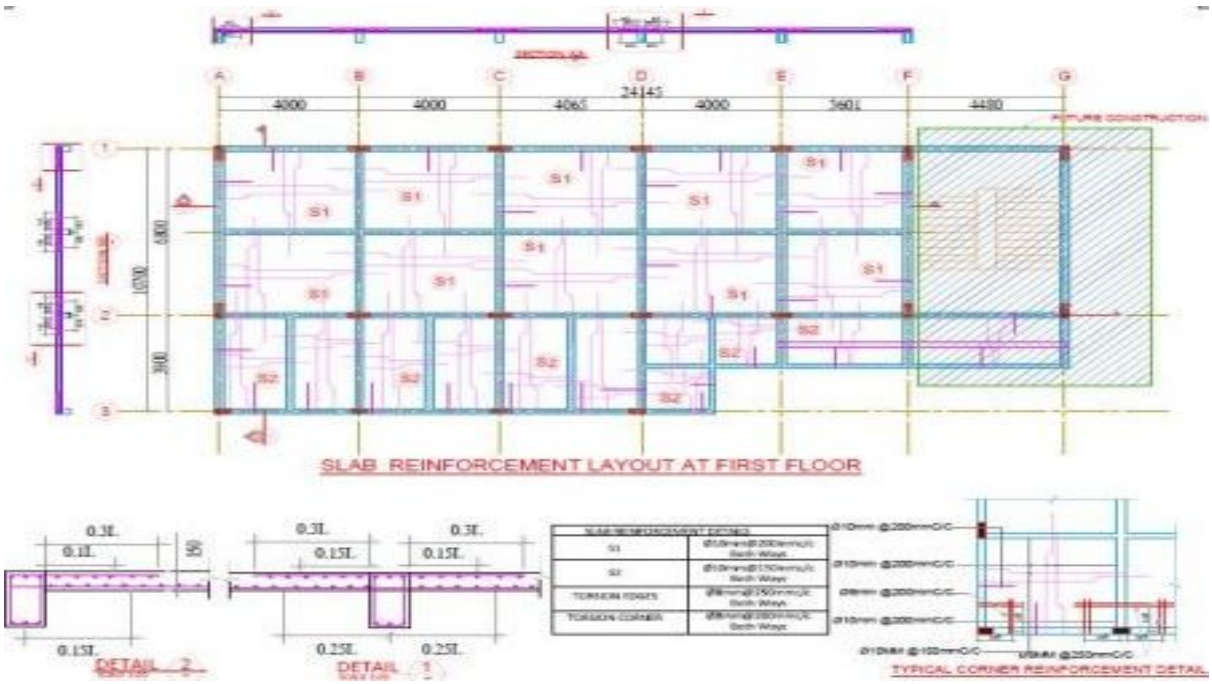

Fig 7: Roof Slab Layout

3. Electrical drawing

Electrical drawing represent the details of electrical fixtures, location of switches , fan, light and others. It also represents the load calculation, tapping for electricity, wiring path and other interventions such as AC and UPS and its components.

Fig 8: Electrical Drawing

4. Plumbing drawing

Plumbing drawing gives the location of sanitary, piping for water supply system, fixture and the process to connect every fixture

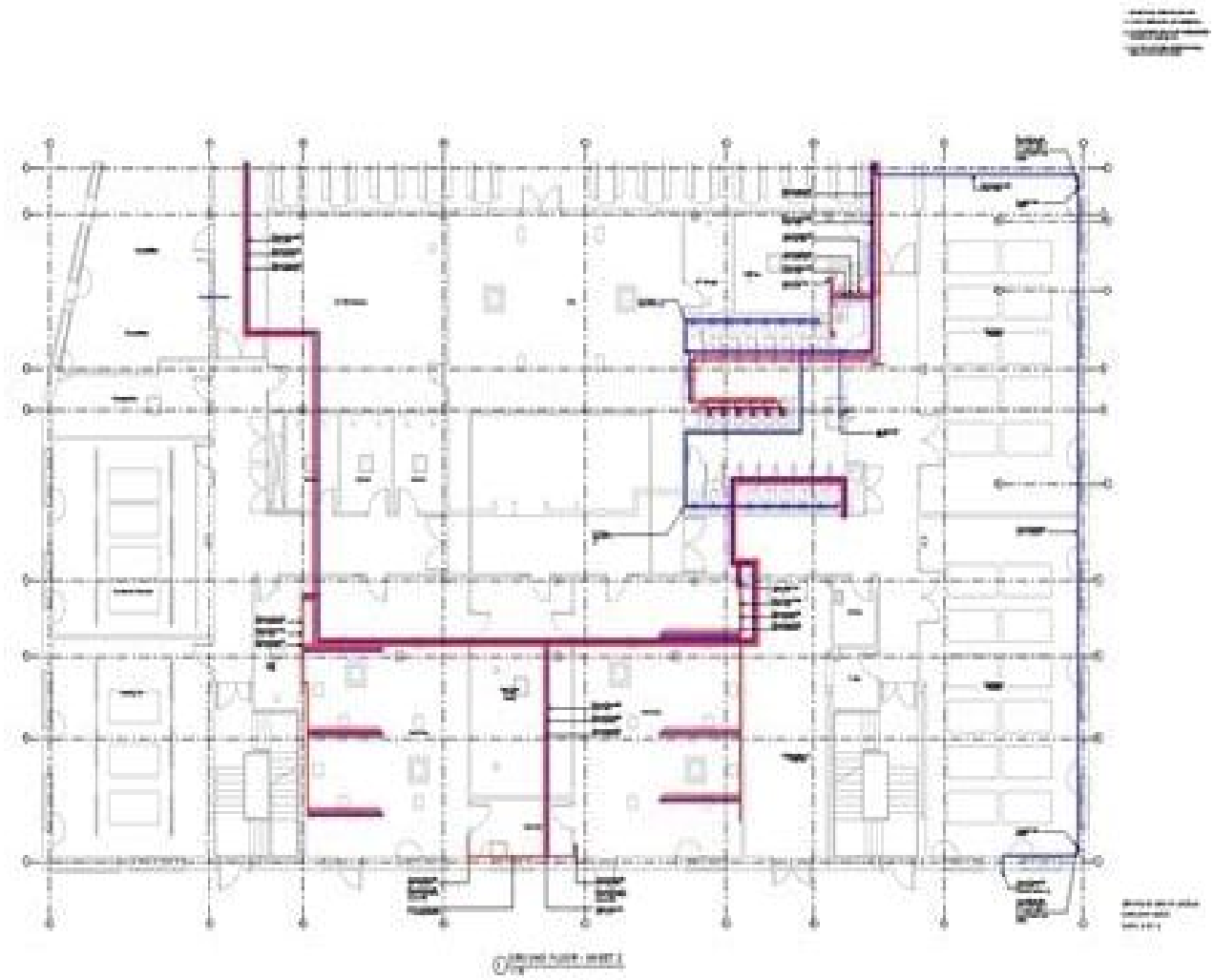

Fig 9: Plumbing Drawing

5. Finishing Drawings

Finishing drawings represents the finish type of every component of the building such as flooring pattern, painting color, false ceiling shape, plastering texture and elevation design. These details are sometime given in elevation drawings also.

- **NOTE**: There is no standard rule of drawings required for a project. Depending upon the type of building and requirement, types of drawings are made and issued

- **Cross Section plan**

Cross section drawings show views of the home as though you had sliced down through the house from the top with a saw and looked in from the resulting opening. This view will help the builder better understand your interior and exterior construction details.

The more complex the home design, the more cross sections you should provide. These drawings are used to show such things as wall and roof framing details, exterior wall layers, stair construction and even interior details such as variances in floor and ceiling heights, soffits, moldings and cabinetry. Cross sections also show window details such as dimensions, exact locations with respect to interior walls and their heights relative to the ceiling or floor. Cross sections in general do not show finished wall or flooring materials aside from sections that specifically detail wall or floor layers

The cross section plan is a plan taken from a cross section of the floor plan. The cross section line in the floor plan is marked by flags.
The cross section plan shows construction, timber sizes and room heights and also a lot of specification data.

In general, you should create cross sections for the following:

- Exterior wall layers
- Structural walls, posts or beams
- Stair framing details
- Floor and ceiling heights and variances
- Molding and trim work (only one is required for the house interior if all doors, windows and baseboards are to be trimmed in the same way)
- Cabinetry or custom built furniture (even if the construction crew is not responsible for this work it is good to include these so that they understand where cabinetry or furniture will need to be attached to the framing)
- Any other details that will help the builder understand the home design

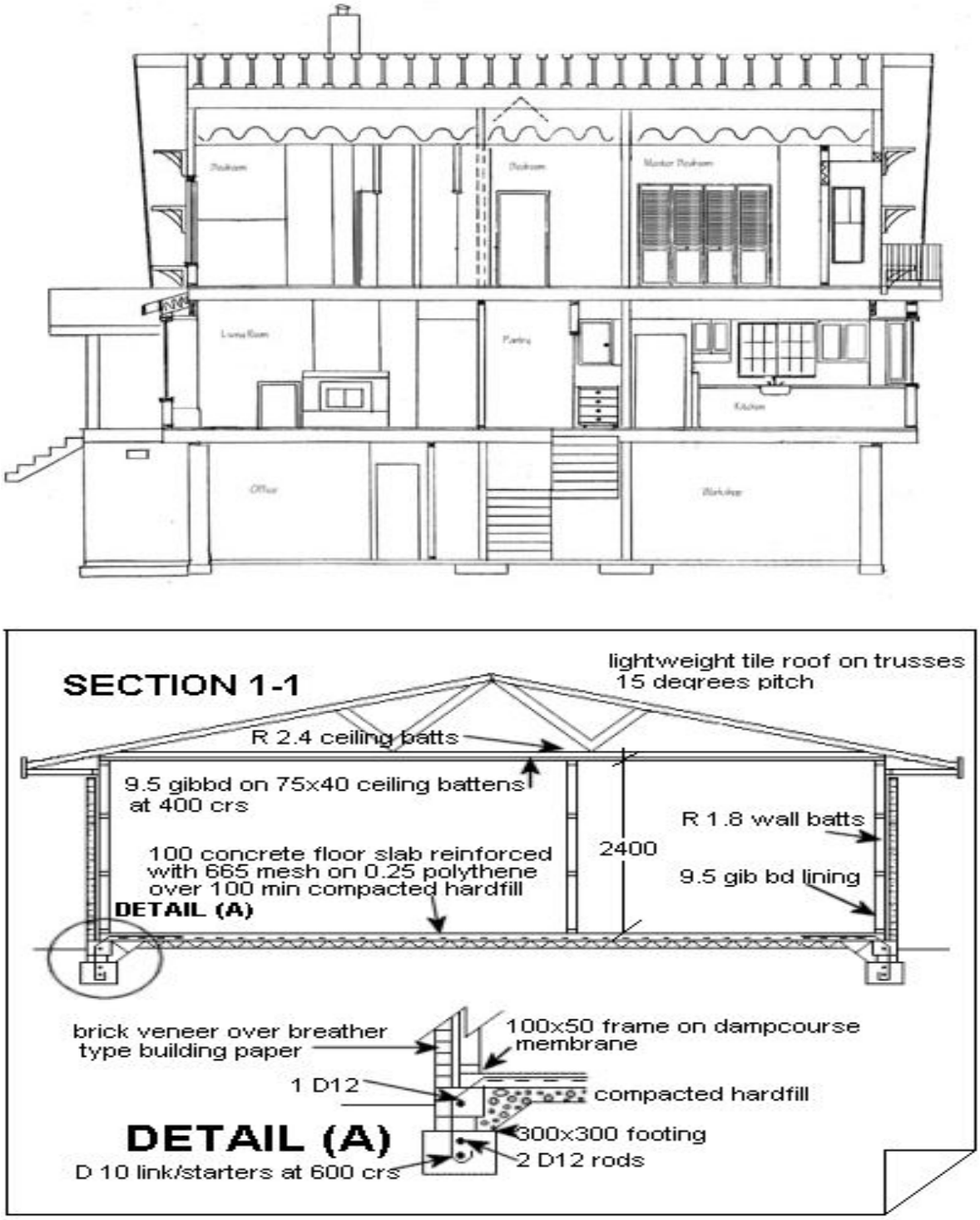

Fig 10: cross sectional plans

Structural section:-

Shows the entire building construction and also the interior space in elevation.
Structural section can be:-

- ❖ Longitudinal section:- section taken on long side of building
- ❖ Building cross section:- section across in narrower dimensions
- ❖ Wall section:-shows wall in a bigger scale
- ❖ Detail section:-section through small segment of building

1.1.4. Dimensions and notes

It defines the size, location, finish and other requirements to fully define what you want manufactured.
Even if you make a drawing to scale, it would be difficult to determine the exact precision that is needed. It would be time consuming to measure each of the lines to determine measurement. The basis for modern part dimensioning is the need for interchangeable parts (being able to buy something off the shelf that fits what you already have)

Generally, dimensioning involves: - Identifying the size and Location dimensions

- Size Dimensions:- determine the overall size and shape of a drawing
- Location Dimensions: - typically determine where different entities are located within the drawing.

Location Dimensions when locating an item within the drawing (locating a hole or other object) always give the horizontal and vertical position as it relates to the object. Then give the size of the object E.g. Where is the object located and how big is it?

Most dimensions consist of three types of lines

- Dimension lines.
- Extension lines
- Centerlines

A Dimension Line: - is a thin, dark, solid line that is terminated by an arrowhead.Dimension1.0Dimension Line Arrow Head
An Extension Line: - is a thin, dark, solid line that extends from a point on the drawing to which a dimension refers.1/8 beyond Extension Line5.01/16 gap

A Centerline: - is a thin, dark line alternating a long and short dash that is commonly used as an extension line in location holes or other symmetrical objects.

- **Illustration**

An illustration is a visual explanation of a text. It can also be a decoration or an interpretation of a text. At the same time, illustration can be a process or a concept. Generally, an illustration is for its integration in published media such as magazines, books, posters, animations, teaching materials, flyers, video games, and films.
Therefore, the job of an illustrator is to provide a visual representation of an associated text or idea. So, we can say that an illustration is a drawing or a picture. It can be an act of creating the drawing, or an example to prove or explain something. For example, a picture accompanying a magazine article is an illustration

- **Views**

Construction drawings belong to one of four types of view: – plan, elevation, section and detail. This refers to the point a drawing seems to be viewed and drawn from.

- **Plan view** – a view from above, looking down

A plan view shows the layout of the proposed building or the site. It can show the length and width of things (for example, rooms) and where things are positioned.

A plan view could be a plan of:

• the block of land the building is to be built on – a site plan

• just the building itself – a floor plan

• specific parts of the building (that might also be shown on a floor plan); for example, an electrical plan showing positions of lights etc

- **Elevation** – a view from the side An elevation shows the proposed building as viewed by someone standing on the ground, looking straight at the building.

Usually an elevation drawing is done for each side of the building, so for a typical house there will be four, but a hexagonal house would require six elevations. They are often labelled 'North elevation', 'West elevation', etc. Alternatively they can be labelled 'Elevation 1', 'Elevation 2', or 'Elevation A', 'Elevation B', and so on. Drawing offices, where plans are drafted, have their own standard procedures which include things like how elevations are to be named and labelled. Employees are required to follow these procedures to ensure clear quality drawings are produced, to company standards. Whichever way they are labelled, the same labelling is shown on the floor plan (this is known as 'referencing').

Elevations can show things that can't be shown in plan view; for example, the height of the windows and how far the sills are from the floor. This would be difficult to show clearly on the floor plan

- **Section a slice through the building** A section shows a view of the building as though it has been sliced through with a giant chainsaw so that the inside of the building is exposed, including the inside of things like walls, door frames and roof members. This helps the builder and contractors know how parts of the building go together. One floor plan may have several section views related to it so that various features inside the building can be shown. Sections are usually labelled 'A-A', 'B-B' and so on, indicating each end of the 'slice'. The floor plan shows where each 'slice' comes from.

. The floor plan is marked with the symbols W W to show that the section is taken through bedrooms 3 and 4 and the garage. The two W symbols are offset, to show that the section was not taken in a straight line through the house.

- **Detail – a close-up view**

A detail is a view that shows important details of certain parts of the building, hence its name. Details are drawn at a large scale so that the builder can see exactly how that part of the job is to be done.

Self-Check -1	Written Test

Directions: choose the correct Answer for the questions listed below. Use the Answer sheet provided in the next page:

1. ---------- is the mother drawings of all other drawing
   A. Structural drawing
   B. Architectural drawing
   C. Electrical drawing
   D. Plumbing drawing
2. Which of the following is used for marking out the plan on the ground
   A. Site plan
   B. Section plan
   C. Foundation plan
   D. Roof plan
3. The back bone drawing of the building
   A. Elevation drawing
   B. Working drawing
   C. Technical drawing
   D. Structural drawing
4. Painting color, ceiling shape and plastering texture are represented by
   A. Electrical drawing
   B. Plumbing drawing
   C. Finishing drawing
   D. Roof plan
5. ---------- is a view that shows important details of certain parts of the building.
   A. Detail plan
   B. Section plan
   C. Site plan
   D. All of the above

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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

Information Sheet- 2	Identifying key features and functions of drawings

1.2. Identifying key features and functions of drawings

1.2.1. Common features of drawings

Drawings express the following critical information:

- Geometry – the shape of the object; represented as views; how the object will look when it is viewed from various angles, such as front, top, side, etc.
- Dimensions – the size of the object is captured in accepted units.
- Tolerances – the allowable variations for each dimension.
- Material – represents what the item is made of.
- Finish – specifies the surface quality of the item, functional or cosmetic. For example, a mass-marketed product usually requires a much higher surface quality than, say, a component that goes inside industrial machinery.

1.2.1.1 Sizes of drawings

Sizes of drawings typically comply with either of two different standards, ISO (World Standard) or ANSI/ASME Y14.1 (American).

The metric drawing sizes correspond to international paper sizes. These developed further refinements in the second half of the twentieth century, when photocopying became cheap. Engineering drawings could be readily doubled (or halved) in size and put on the next larger (or, respectively, smaller) size of paper with no waste of space. And the metric technical pens were chosen in sizes so that one could add detail or drafting changes with a pen width changing by approximately a factor of the square root of 2. A full set of pens would have the following nib sizes: 0.13, 0.18, 0.25, 0.35, 0.5, 0.7, 1.0, 1.5, and 2.0 mm. However, the International Organization for Standardization (ISO) called for four pen widths and set a color code for each: 0.25 (white), 0.35 (yellow), 0.5 (brown), 0.7 (blue); these nibs produced lines that related to various text character heights and the ISO paper sizes.

All ISO paper sizes have the same aspect ratio, one to the square root of 2, meaning that a document designed for any given size can be enlarged or reduced to any other size and will fit perfectly. Given this ease of changing sizes, it is of course common to copy or print a given document on different sizes of paper, especially within a series, e.g. a drawing on A3 may be enlarged to A2 or reduced to A4.

The U.S. customary "A-size" corresponds to "letter" size, and "B-size" corresponds to "ledger" or "tabloid" size. There were also once British paper sizes, which went by names rather than alphanumeric designations.

American Society of Mechanical Engineers (ASME) ANSI/ASME Y14.1, Y14.2, Y14.3, and Y14.5 are commonly referenced standards in the U.S.

1.2.1.2. Units and terms

In Australia, the metric system is used for all construction dimensions. Dimensions on drawings are shown either as millimeter or as meter, although the suffixes for these (mm or m) are rarely shown. This doesn't cause confusion, as it should be obvious which is meant –

a bedroom shown as 3200 wide is not going to be 3200 meter! Centimeter isn't used in plans, with the exception that a tree may be shown on the site plan as '40 cm girth'. (It may be a requirement of the contract that some existing trees on the block are to be left untouched.) Dimensions in millimeters can be shown with or without a thousand separators, such as a comma or space. For example 3200, 3 200 or 3,200 can be used. Meter is shown with a decimal point. They may show one, two or three decimal places. For example, the width of the building block may be shown on the site plan as 35.0, 35.00 or 35.000 (which all mean the same thing).

Occasionally other ways of showing sizes may be used. For example, windows in a brick building can be shown as brick courses high × bricks wide, such as 12 c × 4.5. This will make perfect sense to a bricklayer (and to you when you're more familiar with the jargon used in the industry). 'Length', 'width' and 'height' are terms used as usual, but the term 'depth' can have a different meaning when used with building sizes. It can mean the distance from the front to the back of something. For example, a block of land that measures 35.0 m by 55.0 m would be described as 35.0 wide by 55.0 deep, although we would also say that the side boundary is 55.0 long. Depth is also used to describe fitments such as cupboards and wardrobes – a 600 deep cupboard indicates that it is 600 mm from front to back

1.2.1.3. Representing dimensions

At first glance, the rows of dimensions on the floor plan of a house may look confusing. Look at Figure 3.1. To make the dimensions easier to find and read, the draftsperson has labeled some of them. Buildings with a simpler layout may show just the dimensions without the labels. If you're not sure which dimension a wall lines up with, use a ruler or other straight edge to make it easier to check. Note that the dimension style used in Figure 3.1 uses large dots as the terminators of a dimension (to show where it starts and stops). Other drawings might use arrows or slashes as terminators, as shown here.

←----------→ /_____/

1.2.1.4. SCALE

It is not generally feasible to draw buildings, or parts of buildings, to their actual size.
Instead they are drawn in proportion to the actual measurement of the object.
This proportion is known as the scale of the drawing.
Common scales are 1:1, 1:5, 1:10, 1:20, 1:50, 1:100, 1:200, 1:500, 1:1000, 1:1250, 1:2500, 1: 10000.
If the scale is 1:5, the object is drawn a fifth of its actual size; in other words the object is five times larger than shown on the drawing.
If the drawing is 1:10, the object is drawn a tenth of its actual size, and so on.
A 1:50 and 1:100 scales can be used for the floor plan of a building, both in architectural and structural layouts.

A 1:200 scale can be used for the floor plan of a large building, or the site plan of a small building project.

1.2.1.5. Quantity

Quantity in a general sense is the amount of something that there is, was or will be. This amount may be measured in terms of number, weight, length, area, volume and time. For example, there were 50 accidents last year, or 2kg of flour will be required to make the cake. The same general sense may be applied to construction: the estate when completed will comprise 250 dwellings housing a maximum of 1,000 people

- **Bill of quantity**

The bill of quantities (sometimes referred to as 'BoQ' or 'BQ') is a document prepared by the cost consultant (often a quantity surveyor) that provides project specific measured quantities of the items of work identified by the drawings and specifications in the tender documentation.
The quantities may be measured in number, length, area, volume, weight or time. Preparing a bill of quantities requires that the design is complete and a specification has been prepared.
The bill of quantities is issued to tenderers for them to prepare a price for carrying out the works. The bill of quantities assists tenderers in the calculation of construction costs for their tender, and, as it means all tendering contractors will be pricing the same quantities (rather than taking off quantities from the drawings and specifications themselves), it also provides a fair and accurate system for tendering.
The contractor tenders against the bill of quantities, stating their price for each item.
This priced bill of quantities constitutes the tenderer's offer. As the offer is built up of prescribed items, it is possible to compare both the overall price and individual items directly with other tenderers' offers, allowing a detailed assessment of which aspects of a tender may offer good or poor value. This information can assist with tender negotiations.

1.2.1.6. Elevation plan

An elevation drawing is an orthographic projection drawing that shows one side of the house. The purpose of an elevation drawing is to show the finished appearance of a given side of the house and furnish vertical height dimensions. Four elevations are customarily drawn, one for each side of the house. An elevation plan ordinarily includes the following:

- Identification of the specific side of the house that the elevation represents
- Grade lines
- Finished floor and ceiling levels
- Location of exterior wall corners
- Windows and doors
- Roof features
- Porches, decks and patios
- Vertical dimensions of important features
- Material symbols

1.2.2. Functions of drawing

The 3 main functions of drawings are perception, communication, and manipulation

1.2.2.1 Perception: Drawings that assist the ordering of sensations, fallings, ideas and thoughts

- Observe
- Record
- Investigate
- Examine
- Experiment
- Analyze
- Synthesize
- Contemplate
- Remember
- Reflect
- Respond emotionally

1.2.2.2. Communication: Drawing that assist the process of making ideas, thoughts and feelings available to others

- Symbolize
- Narrate
- Illustrate
- Interpret
- Explain
- Negotiate
- Instruct
- Specify
- Codify

1.2.2.3. Manipulation: Drawings that assist the creative manipulation and development of thought:

- Dream
- Imagine
- Fantasies
- Visualize
- Hypothesis
- Test an idea
- Transform
- Plan
- Solve a problem

Self-Check -2	Written Test

Directions: Saying True or False for the questions listed below. Use the Answer sheet provided in the next page:

1. Geometry is one of critical information that expressed by drawing.
2. The metric size of drawing is corresponds to international paper sizes.

3. It is possible to draw buildings or parts of building to their actual size.
4. Abbreviations save space on the drawing and also save time.
5. Amount of something that there is, was or will be is known as Specification.

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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

Information Sheet-3	Recognizing and adhering quality requirements of operations company

1.3.Recognizing and adhering quality requirements of operations company

1.3.1 Ethiopian standard Building lows

Ethiopian Building Proclamation No. 624/2009

PART THREE No 30 describe about LAND USE, RELATED STUDIES AND DESIGNS

“Whereas, it has been found necessary to determine the minimum national standard for the construction or modification of buildings or alteration of their use in order to ensure public health and safety;

Whereas, sub-article (3) of Article 51 of the Constitution of the Federal Democratic Republic of Ethiopia empowers the Federal Government to establish and implement national standards and basic policy criteria for public health, education, as well as science and technology;

Now, therefore, in accordance with Article 55 (1) of the Constitution of the Federal Democratic Republic of Ethiopia it is hereby proclaimed as follows

Designs

1/ any building shall have designs required for the category it belongs.

2/ any building or components thereof shall be designed according to acceptable building design codes to ensure safety, comfort and unconstrained services.

3/ any building shall be designed and constructed in such a way that it ensures safety for people, other constructions and properties.”

1.3.1.1. Building cods

The Proclamation to define the powers and duties of the Central and Regional Executive Organs of the Transitional Government of Ethiopia No. 41/1993 empowers the Ministry of Works and Urban Development to prepare the Country's Building Code, issue Standards for design and construction works, and follow up and supervise the implementation of same. In exercise of these powers and in discharge of its responsibility, the Ministry is issuing a series of Ethiopian Building Code Standards (EBCS) of general application. So according to the proclamation of EBCS-1-1995 implies about basic designs

This Chapter provides the basis and general principles for the structural design of buildings and 1:.1/1 civil engineering works including geotechnical aspects and shall be used in conjunction with, the other parts of EBCS 1. This Chapter relates to all Circumstances in "which a structure IS required to give adequate performance, including fir and seismic events.

1.3.1.2. Internal company quality policy and standards

- **Quality policy**

A quality policy is a brief statement that aligns with your organization's purpose and strategic direction, provides a framework for quality objectives, and includes a commitment to meet applicable requirements (ISO 9001, customer, statutory or regulatory) as well as to continually improve. Often, the quality policy incorporates an organization's vision or mission statement and core values. Standard Stores has created a form to help you answer "How to write an ISO 9001 Quality Policy".

Quality Policy is a requirement defined in the ISO 9001:2015 Standard. Section 5.2 Quality Policy has two sub clauses: 5.2.1 Establishing the Quality Policy and 5.2.2 communicating the Quality Policy. If you are on the track to becoming ISO 9001:2015 Certified, save time and money with our Quality Manual & Procedures.

The Company is committed to providing complete customer satisfaction to the best of its abilities and to ensuring that all internal procedures and practices are suitable for that purpose. In addition, the Company complies with applicable legislation and regulations as well as the recommendations and ethics of industry bodies to which it subscribes. This commitment extends to the continual improvement of quality and environmental performance together with the prevention of pollution. To achieve this result the Company has adopted a policy of operating a co-ordinate Quality Management System meeting the requirements of the ISO 9001:2000 standard, by providing the framework for setting and reviewing management objectives and targets. It is the Company's policy to maintain an electronic communications network covering all aspects of the services provided that links all offices and the ships being operated. While standard formats are used, the facility exists to adjust the format to suit the specific requirements of an individual contract. The Company appreciates and emphasizes to staff that the use of standard formats is a means of ensuring that quality standards are maintained to a consistent level thus meeting the needs and expectations of customers. The aim of standardization is not to remove flexibility, which is certainly a requirement in our industry, but to provide a medium of documentation and communication relevant to the business in general and to a specific contract in particular. This ensures that the work undertaken can be monitored and audited in order to confirm compliance with the contract and the ISO standard.

Directors and Managers have the responsibility of ensuring that the policy is communicated and understood by all personnel engaged in tasks that can influence quality matters, that they are aware of their obligations under the standard and are provided with adequate, suitable resources.

The Quality Manager is authorised to monitor and maintain the Quality Management System and to report to the Company's Management Review Meeting on the continued suitability and achievement of quality objectives.

The Company is aware of its responsibility to provide resources for the control of the Quality Management System including, where appropriate, competence, technology and finance. Maximum effort is directed towards providing satisfactory services whilst ensuring that any problems that do arise are resolved in an expedient and professional manner. The Company's Quality Management System policy, procedures and where appropriate instructions, are documented, controlled, implemented, maintained and communicated to all employees of the Company

- **project quality requirement**

Quality requirement is a common term in project management. It is defined as the condition used to assess the conformance of the project by validating the acceptability of an attribute or characteristic for the quality of a particular result.

In a nutshell, the quality requirement defines the expectations of the customer for quality, the internal processes as well as the attributes of products that indicate whether the quality factors are satisfied or not.

The quality requirements in project management are defined in terms of the quality criteria, quality factors, and quality metrics. The quality criteria document the internal process and attributes of the product that will be monitored all throughout the project life cycle. The quality factors document the perceived aspects of the user regarding the deliverables of the project to determine if the project satisfies the expectations from customers. Lastly, the quality metrics document the indicators used to measure the quality of the product.

The quality requirement is used by different project management processes particularly the Quality Management Plan to create the risk register, requirements documentation, and cost-benefit analysis.

Quality requirements are specifications of the quality of products, services processes or environments. Quality is any element, tangible or intangible, that gives things value beyond their functionality and features. The following are illustrative examples of quality requirements.

1. **Reliability**: durable and consistent performance in real world conditions. For example, a drum designed to maintain its sound for at least 150,000 strikes
2. **Consistency**: the requirement that units be the same or those units is internationally consistent. For example, apples that is mostly the same size with similar appearance and tastes.
3. **Availability**: the availability of services. For example , a requirement for a software service to be up 99.99% of the time
4. **Usability**: requirements related to ease of use such as a can of coffee that is easy for everyone to open and reseal.
5. **Customer Experience**: requirements that make a product or service more pleasing to customer. For example, the requirement that coffee smells good when you first open the can.
6. **Look & Feel**: the look and feel of products and services such as the aesthetics of mobile device.
7. **Environments**: the quality of environments such as the interior design of a hotel lobby
8. Customer services requirements such as the practice of greeting guests of a hotel by all staff in common areas such as hallways.
9. **Performance**: performance requirements such as responsiveness and speed of a user interface.
10. **Maintainability**: requirements that things be easy to maintain and fix. For example a mobile device with elements that can be swapped in a and out by user to upgrade or replace things.
11. **Materials and ingredients**: specification of materials and ingredients quality such as the requirement that coffee be organic coffee of a particular appellation.

1.3.2. Manufacturing and Manufacturers specifications

1.3.2.1. Manufacturing Specification

A manufacturing specification contains all the information that is needed to make the product. It describes the stages of manufacture and the materials needed, using flowcharts, diagrams, notes and samples. This means that if more than one product is made then each product should be the same. A manufacturing specification is done once the final product has been developed. It explains exactly what the product is and how it is made. It should provide enough information so that anyone could use the specification to make the product again and again. It ensures that a product is always made in the same way and each product is identical and made to a set standard.

A manufacturing specification should contain the following information:

- Fabric details including quality, quantity, colour, cost
- Component details, quality, quantity, color, cost.
- Tools and equipment to be used, in detail.
- Instructions for making in simple steps.
- Tolerances allowed in the making. Eg. a seam should be 1.5cm +/- 0.1cm.
- How long each process should take.
- Health and safety considerations.
- Pattern lay plan.
- Samples of fabrics and components

1.3.2.2. Manufacturer's specifications

means (a) the written specifications, instructions or recommendations provided by the manufacturer of equipment or supplies that describe how the equipment or supplies are to be constructed, erected, installed, assembled, examined, inspected, started, operated, used, handled, stored, stopped, calibrated, adjusted, maintained, repaired or dismantled, or (b) an instruction, maintenance or operating manual provided by the manufacturer of equipment or supplies; (directives du fabricant).
Specifications needed by the most manufacturers are mentioned as follows

- **Tolerance levels** There will be an ideal size set by a manufacturer for a product, but small deviations from that size can be allowed. For example, a cushion cover may have an ideal size of 45 x 45 cm, but in reality, the cushion cover sizes permitted of a batch of cushions may vary between 44.5 and 45.5cm. This means that the tolerance is +/-0.5cm. Tolerance levels may be given for the size of a product, the seam allowances, the placement of components and embellishments. A seam may be 1.5cm with a tolerance of +/-0.2cm, so it can vary between 1.3cm and 1.7cm.
- **Working drawings** A working drawing shows the exact details of the design, it contains information about fabric, components, sizes and construction techniques to be used. Swatches and samples of components are often put on too.
- **Prototypes** These can be made to test the manufacturing process and make sure that the manufacturing specification is accurate.

- **Just in time (JIT)** This is a way of having materials available just as they are needed. JIT is a computer based system that lets companies track the stock of components and materials to make sure that they arrive at the factory just as they are needed. However, if any mistakes are made then it does mean that there will be a delay in production. This shape shows the beginning and end of your production plan flow chart.
- **Production planning is** something used in manufacture to give clear instructions to all employees to makes sure that they can work together efficiently. It makes sure that
    - ❖ Resources are organised
    - ❖ Stages of making are detailed
    - ❖ The making order is sensible
    - ❖ Quality is monitored
    - ❖ Work schedules are met (things are done on time)
- **Flowcharts** These are used to show the production system in diagrammatic form. A Flowchart is a universal system used to plan work for the manufacture of a product, it lists and puts into order the operations to be carried out during the manufacture of a product.
- **Glossary Feedback loop** If you look at the flowchart for bags that is attached with this file, you will see that for each quality control check, there are arrows going back to the process that has been checked if it doesn't pass the check. These show that the process has to be done again if it is not up to standard, and this is called a FEEDBACK LOOP, if it passes the quality control test then it can proceed on to the next stage of production.
- **Tolerance** This is the small amount of leeway allowed on each process, so a seam may have to be 1.5cm, but the quality controller will allow plus or minus 0.1mm, or a skirt may be intended to be 24cm in length, but a plus or minus 5mm variance is allowed, so the skirt could be 24.5cm or 23.5cm and this would still be acceptable.

1.3.3. Workplace operations and procedures

Organizations are places where groups of people work together to achieve a common goal, or goals. Managers are often responsible for staff who have multiple tasks and who move between jobs and tasks. Content-free managers are common. That is, they have not necessarily been trained in, or worked directly in, the department or area they are managing. A manager is responsible for coordinating the work people do to achieve specific goals. Because most organizations aim to make profits and meet customer expectations, managers are also required to make sure the work is done:

Efficiently – that is, on time and within the given resource constraints
Effectively – that is, the service or product meets quality standards and the job is done well.

In large organizations, roles and responsibilities are more likely to be defined and separated, and managers will work in specific teams or units. In a smaller enterprise, staff may be required to work across a number of areas (for example, in sales and marketing and distribution).

All organizations have a culture or a mind-set or a particular way of operating. This is sometimes hard to define or even to find, but it will always be there. The culture of a business is often described as „the way we do things around here".
The culture could be:

- Supportive of staff
- Customer-oriented
- Friendly
- Comfortable
- Casual
- Total quality management in focus/nature
- Blaming
- Negative
- Stressful
- Or any combination of the above.

There are good reasons to monitor progress and adjust plans. The benefits are:

- Things are more likely to happen as planned
- Management and staff actually know what's going on in the business
- Problems are identified and corrected
- Service and product are consistent over time
- Work operations fit with work and organization goals
- Staff feel supported and involved
- Customer needs are met.

In workplace context, delegation has two meanings:

- It can mean the allocating of tasks to staff that are part of their normal duties
- It can also mean allocating some of your own duties to staff who are willing to take these on.

Times will arise when there is a need for you to assist staff members in the prioritization of their workload. Critical elements in providing this sort of help are the use of Feedback and Coaching

- **Feedback** :- Feedback may be seen as the on-going verbal and non-verbal support provided to staff

- **Coaching**. Coaching can be seen as a process of providing information, including feedback, to an employee. The purpose of coaching is to reinforce and extend knowledge and skills developed through other training.

Self-Check -3	Written Test

Directions: choose the correct answer for the questions listed below. Use the Answer sheet provided in the next page:

1. Which proclamations of Ethiopian building code and standards implies about basic designs.
   A. EBCS-1-1995
   B. EBCS-2-1995
   C. EBCS-3-1995
   D. EBCS-4-1995
2. Who is authorized to monitor and maintain the quality management system
   A. Labor
   B. Government
   C. Manager
   D. Consultant
3. ---------- is a clear statement aligns with organization purpose and strategic provides frame work for quality objectives
   A. Constitution
   B. Quality policy
   C. Building code
   D. All of the above
4. Which quality requirements are implies durable and consistent performance in real world condition
   A. Consistency
   B. Reliability
   C. Usability
   D. Environment
5. A manufacturers specification that can be made to test the manufacturing process
   A. Prototype
   B. Working drawing
   C. Tolerance
   D. Plans

Note: **Satisfactory rating – 3 and 4 points** **Unsatisfactory - below 3 and 4 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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

Information Sheet-4	Identifying environmental requirements and control

1.4. Identifying environmental requirements and control

1.4.1. Environmental management

An environmental management plan may be required for a project, depending on the type of project and where it is located. Environmental management includes the following controls:

- **Land disturbance** – for example management of storm water, dust control and erosion.
- **Noise and vibration** – for example working only during prescribed site operating hours and monitoring noise and vibration levels of vehicles and equipment.
- **Waste management** – for example minimizing waste, sorting waste into the appropriate bins and leaving the site clean and tidy at the end of each day.
- **Hazardous goods** – for example ensuring material safety data sheets (MSDS) are available and ensuring correct storage procedures are followed.

An environmental management plan can be either a separate written document, included in the specifications, or depicted as a plan similar to the project site plan. Everyone involved in a project needs to follow the environmental management plan

1.4.2. Clean up management

- **On-Site Duties**

Site clean-up includes coming in behind different subcontractors to clean up their messes and prepping the area for the next subcontractor. For example, once the flooring contractors complete their work, clean-up workers get the property ready for the painters, cabinetry workers or whichever subcontractor is coming in next. Cleaning up on site includes properly disposing of any debris and trash. Often, the clean-up worker will do a walk-through with the contractor to get an idea of exactly what the contractor expects and to receive any special clean-up instructions. The clean-up worker's supervisor, or the worker himself, if he is an independent contractor, often follows up with the contractor to confirm that the clean-up job met expectations.

- **Post-Construction Cleaning**

Part of site clean-up may include cleaning the actual home, office or structure the contractors built so that it is ready for the new occupants to move into. Clean-up workers wipe down ceiling fixtures, fans, lights, mechanical registers, walls, cabinets, windows, sills, mirrors, baseboards, counters, appliances and other fixtures. They also sweep and mop floors and outdoor sidewalks and patio spaces. The clean-up worker must take care to only use products suited for the type of material he is cleaning. For example, workers cannot use harsh chemicals or cleaners when dealing with delicate materials such as granite, marble or quartz.

1.4.3 Waste management

Responsible management of waste is an essential aspect of sustainable building. In this context, managing waste means eliminating waste where possible; minimizing waste where feasible; and reusing materials which might otherwise become waste. Solid waste management practices have identified the reduction, recycling, and reuse of wastes as essential for sustainable management of resources.

Many opportunities exist for the beneficial reduction and recovery of materials that would otherwise be destined for disposal as waste. Construction industry professionals and building owners can educate and be educated about issues such as beneficial reuse, effective strategies for identification and separation of wastes, and economically viable means of promoting environmentally and socially appropriate means of reducing total waste disposed. Organizations and governments can assume stewardship responsibilities for the orderly, reasonable, and effective disposal of building-related waste, promotion of public and industry awareness of disposal issues, and providing stable business-friendly environments for collecting, processing, and repurposing of wastes.

Management of building-related waste is expensive and often presents unintended consequences. However, common sense suggests that failure to reduce, reuse and recycle societal wastes is unsustainable. It stands to reason that efficient and effective elimination and minimization of waste and reuse of materials are essential aspects of design and construction activity

Self-Check -4	Written Test

Directions: say True or False for the following questions listed below. Use the Answer sheet provided in the next page:

1. Site cleanup job includes coming in behind different sub contractor to clean up their messes and preparing the areas for next sub contractor
2. Cleaning drawing rooms, site office are not the part of construction cleaning
3. Solid wastes management practices have identified the reduction, recycling, and reuses of wastes as essential for sustainable management of resources
4. All wastes of construction works can be reused

Note: **Satisfactory rating – 3 points** **Unsatisfactory - below 3 and 4 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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

Operation Sheet 1	Techniques of Identify main types of plans and drawings used in the construction

Techniques of Identify main types of plans and drawings used in the construction

Step 1- collecting all plans and drawings that are prepared.

Step 2- looking to notes on title panel of the plan

Step 3- looking to symbols and abbreviations on title panel of the plan

Step 4- screening the plan that you want based on their purpose

LAP Test	Techniques of reading and interpreting plans and specifications

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Read the plan carefully and perform the following tasks

Task 1: Check to notes on title panel of the plan

Task 2: Read to symbols and abbreviations on title panel of the plan

Task 3: Interpret the symbol from the plan

Task 4: Interpret all the information put in the drawing

List of Reference Materials

- Design drawings and technical specifications AUTHORS: Rod Davis and Ross Stafford
- Designing Buildings
- Architectural Working Drawings8Ch
- Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices
- Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring By Devices Henry V. Oppermann, Chief NIST Weights and Measures Division Gaithersburg, MD 20899-2600
- Ethiopian Building Cod Standards ministry of work and urban development
- **Engineering drawing abbreviations and symbols**
- From Wikipedia, the free encyclopedia
- READ AND INTERPRET PLANS AND SPECIFICATIONS CERTIFICATE II IN BUILDING AND CONSTRUCTION (PATHWAY – PARAPROFESSIONAL) CPCCCM2001A LEARNER'S GUIDE on BUILDING AND CONSTRUCTION

Table of Answer keys for the self checks provided on each information sheets

UNIT OF COMPETENCY: Read And Interpret Plan And Specification							
LO: 1 LG: 16 Identify types of drawings and their functions							
Self check: 1		Self check:2		Self check:3		Self check:4	
Multiple choice		True or False		Multiple choice		True or False	
1	B	1	True	1	A	1	True
2	A	2	True	2	C	2	False
3	D	3	False	3	C	3	True
4	C	4	True	4	A	4	False
5	A	5	False	5	A	5	

The trainers prepare TTLM

No	Name	Qualification level	Region	TVET College	Phone number	E-mail address
1	Zeyede Tekle	B	Dire dawa	DDPTC	0921153259	zedjesus22@gmail.com
2	Yibeltal Shitie	B	Amhara	MOTTA PTC	0912455288	yibecon2019@gmail.com
3	Mihiretu Hambisa	B	Oromia	NEKEMTIE PTC	0910195546	mihambi@gmail.com
4	Tariku W/Agegne	A	SNNP	DILLA PTC	0916512167	mamush572@gmail.com
5	Fikrie Shiferaw	A	Somale	JIJIGA PTC	0913294412	

Facilitator

No	Name	Region	TVET Bureau	Email	Phone no
1	Tilahun Tesfaye	Amhara	Amhara TVET Bureau	Tilahuntesfayeeewnetu@gmail.com	0940651823
2	Abere Dagnaw	Amhara	Amhara TVET Bureau	Aberedagnaw10@gmail.com	09 18 1 41 11
3	Abdulahi Muktare	Somale	Somalia TVET Bureau		0935635068