Building Electrical installation

Level II

Learning Guide-14

- **Unit of Competence:** Read and Interpret Plans and Specifications
- **Module Title:** Reading and Interpreting Plans and Specifications

LG Code: EIS BEI2 M05 LO1- LG-14

TTLM Code: EIS BEI2 TTLM 0919V1

LO1: Identify types of drawings and Their function

Instruction Sheet	Learning Guide #14

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

- identifying types of *plans* and drawings in the construction sector
- identifying *Key* features and functions of each drawing
- recognizing and adhering Quality requirements
- Environmental requirements and controls from job plans, specifications and environmental plan

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

- identify types of plans and drawings in the construction sector
- identify Key features and functions of each drawing
- recognize and adhering *Quality requirements*
- Environmental requirements and controls 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, Sheet 2, Sheet 3 and Sheet 4”.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -8, 13, 15 and 18** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1 **in page -19.**
6. Do the “LAP test” **in page – 20** (if you are ready).

Information Sheet-1	identifying types of *plans and drawings* in the construction sector

1.1 types of *plans* in the construction sector

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.

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.

- **types of *plans***

1. Plot Plan (site plan), 2**.** Elevations, **3.** Foundation Plan, **4.** Floor Framing Plans, 5. Floor Plans **6.** Ceiling Framing Plans, **7.** Roof Framing Plans

1.2 Types of Drawings Used In Building Construction:

Drawings are the most important things we need to start any construction project. There are different types of drawings for different purposes. In this article, we will discuss different types of construction drawings (also known as working drawing).

Construction drawings provide detail measurements and clear section of every building parts. After reviewing, the drawings are justified and modified and finally approved for construction. The different types of construction drawings are listed below.

- **Architectural Drawing:**

This type of drawing provides complete view of a building. It demonstrates the location of building and all building parts where they will be placed. There are different types of architectural drawings with different names such, architectural drawings, structural drawings, civil drawings, mechanical drawings, electrical drawings, and so on. Traditionally, working drawings consist of two-dimensional orthogonal projections of the building or component they are describing, such as plans, sections and elevations

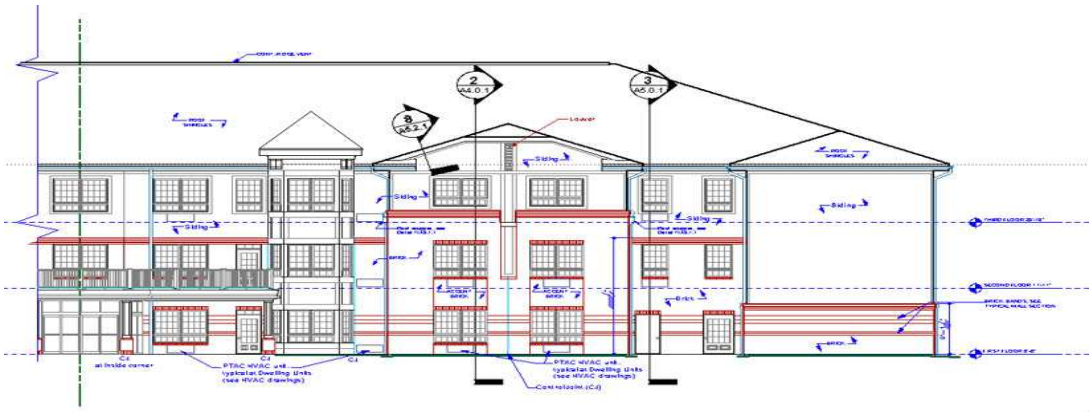


Fig 1.1 architectural drawing

- **Structural Drawing:**

As the name suggests, this type of drawing provides information about structure, like strength of different structural elements, structural materials, grade, size and placement of reinforcement etc A structural drawing, a type of Engineering drawing, is a plan or set of plans for how a building or other structure will be built. ... They are primarily concerned with the load-carrying members of a structure. They outline the size and types of materials to be used, as well as the general demands for connections.

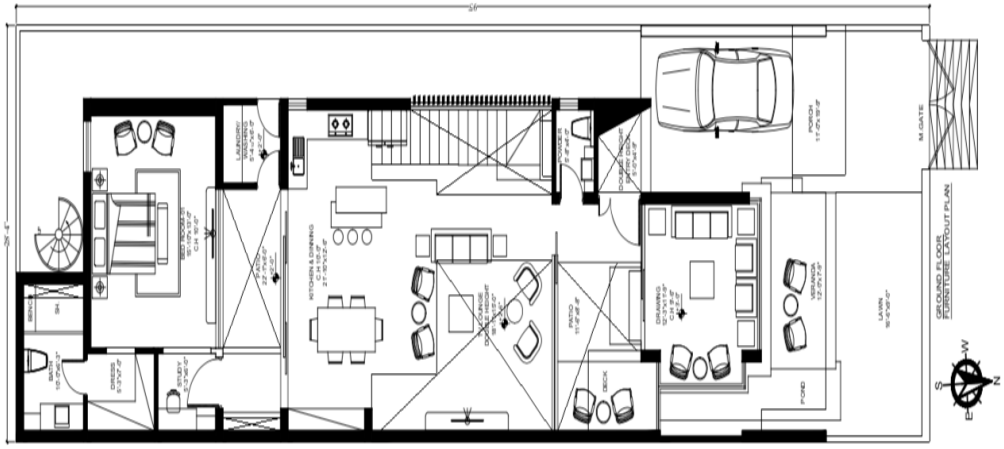


FIG 1.2 Structural Drawing

- **Electrical Drawing:**

This type of drawings provide the details and location of electrical wiring, fixtures, sub-station etc. The electrical load calculation is also given in the drawing.

Electrical drawings, sometimes referred to as wiring diagrams, are a type of technical drawing that provide visual representation describing electrical systems or circuits. They are used to explain the design to electricians or other workers who will use them to help install or repair electrical systems.

A set of electrical drawings on a project might include:

- A site plan which shows the location of the building and any external wiring.
- Floor plans which show the positions of electrical systems on each floor.
- Wiring diagrams which show the physical connections and layout of electrical circuits.
- Schedules and other information.

Electrical drawings for buildings tend to include the following details:

- How the electrical wires and other parts of the system are interconnected and switched.
- Where fixtures and other components connect to the system.
- Incoming power lines and their voltage, size, capacity and rating.
- Power transformers and their winding connection and means of grounding.
- The main switches, fused switches and tie breakers.
- Equipment such as batteries, air conditioning, solar panels, generators, and so on,includingtheir voltage and size.

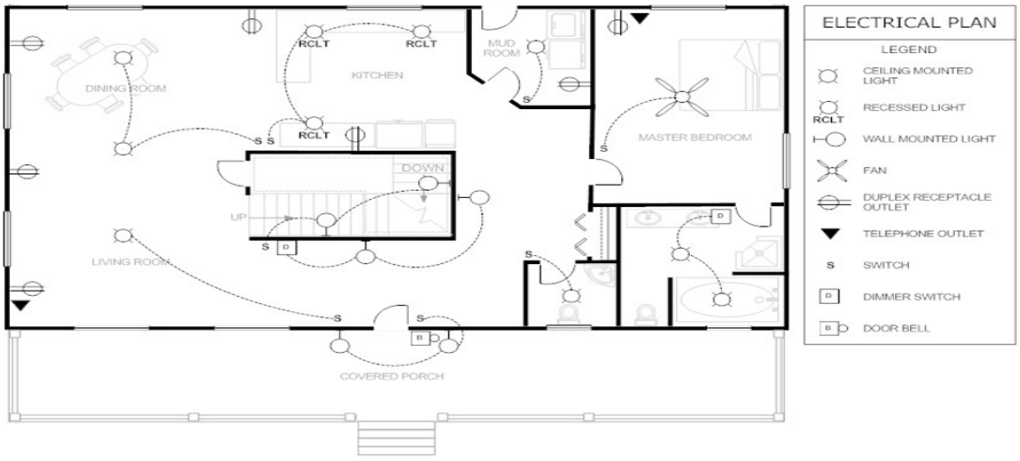


Fig 1.3 Electrical Drawing

- **Plumbing and Sanitary Drawings:**

A plumbing drawing, a type of technical drawing, shows the system of piping for fresh water going into the building and waste going out, both solid and liquid. It also includes fuel gas drawings. Mainly plumbing drawing consist of water supply system drawings, drainage system drawings, irrigation system drawings, storm water system drawings. In water supply system drawing there will be hot water piping and cold water piping and hot water return piping also. In drainage system drawings there will be waste piping , Soil piping and vent piping. The set of drawing of each system like water supply , drainage etc is consist of Plans, Riser diagram, Installation details, Legends, Notes. Every pipes should me marked with pipe sizes.

If the drawing is detailed , fixture units also should be marked along with the pipe. If it is shop drawing, sections also should be shown where there pipes are crossing. In shop drawings pipe sizes should be marked with the text and size should be shown with double line. Each pipes with different purposes will be displayed with different colors for ease of understanding. Drainage pipes should be shown with slope. For water supply , pump capacity and number of pumps will be attached as drawing file. For drainage, manhole schedule which consist of each manhole name, Invert level, Cover level ,Depth are attached as drawing file.

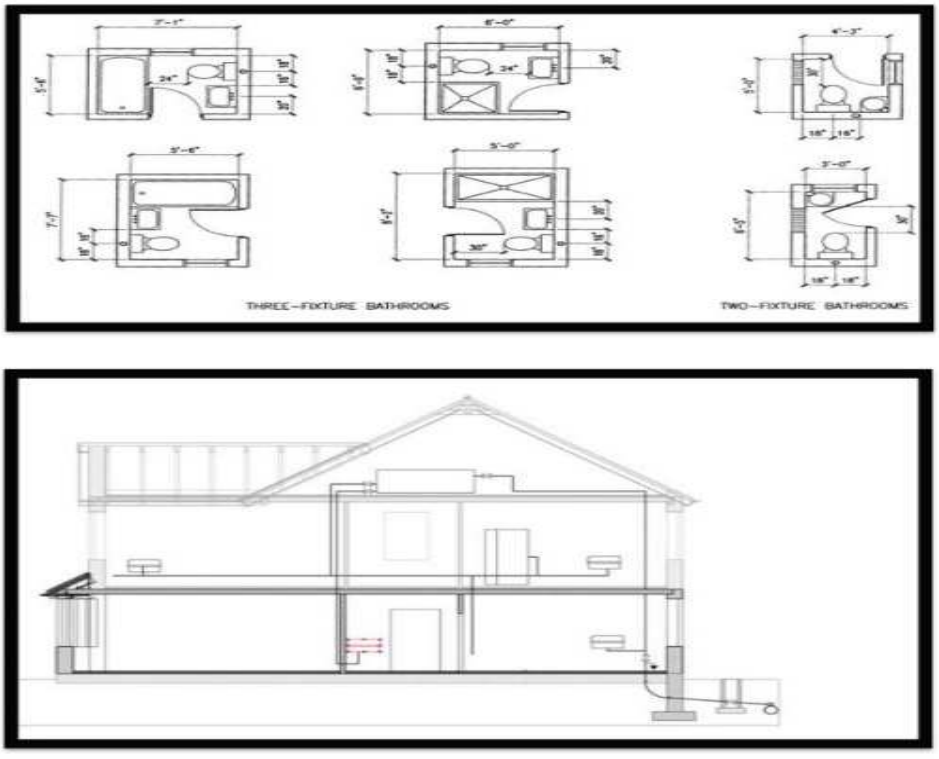


Fig1.4 Plumbing And Sanitary Drawings

- **Finishing Drawing:**

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.

These types of drawings contain the details of finishing and appearance of the building such as marbles, tiles, etc.

Fig1.5 Finishing Drawing

Self-Check -1	Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: choose the correct Answer all the questions listed below.

1. --------IS Shows the contours, boundaries, roads, utilities, trees, structures, and any other significant physical features on or near the construction site? (1 pt.)

   A. Site Plan B. Artistic drawing C**.** Floor plans D**.** Technical drawing

2. ----------is contains more information than all the other working drawings

A. Artistic drawing B. Technical drawing C**.** Floor plans D**.** Technical drawing

3. ----------is a universal language which is important to world tread

. A. Site Plan B. drawing C. Floor plans D. Artistic drawing

Note: **Satisfactory rating – 4.5 and 9 points** **Unsatisfactory - below 4.5 and 9 points**

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

Information Sheet-2	identifying *Key features* and functions of each drawing

2.1. Key features of drawings

Drawing sheets and layout features are standardized. It is essential that certain basic information be shown on every drawing. While some features may vary slightly, most drawings should have the following:-

Throughout this chapter there are many references to diagrams/drawings and these may be categorized as follows:

Block diagrams:

These show, using squares, rectangles etc., the sequence of a system without too much technical detail e.g. Figures 1

Layout diagrams:

These are very similar to block diagrams, but they indicate more technical detail and Tend to show items in their correct geographical location. (e.g. Figures 2 and 3).

Circuit/schematic Diagrams:

These show how a circuit functions and takes no account of exact locations of terminals or equipment (e.g. Figures 1).

Wiring diagram:

These indicate how a circuit or system is physically wired (e.g. Figures 2).

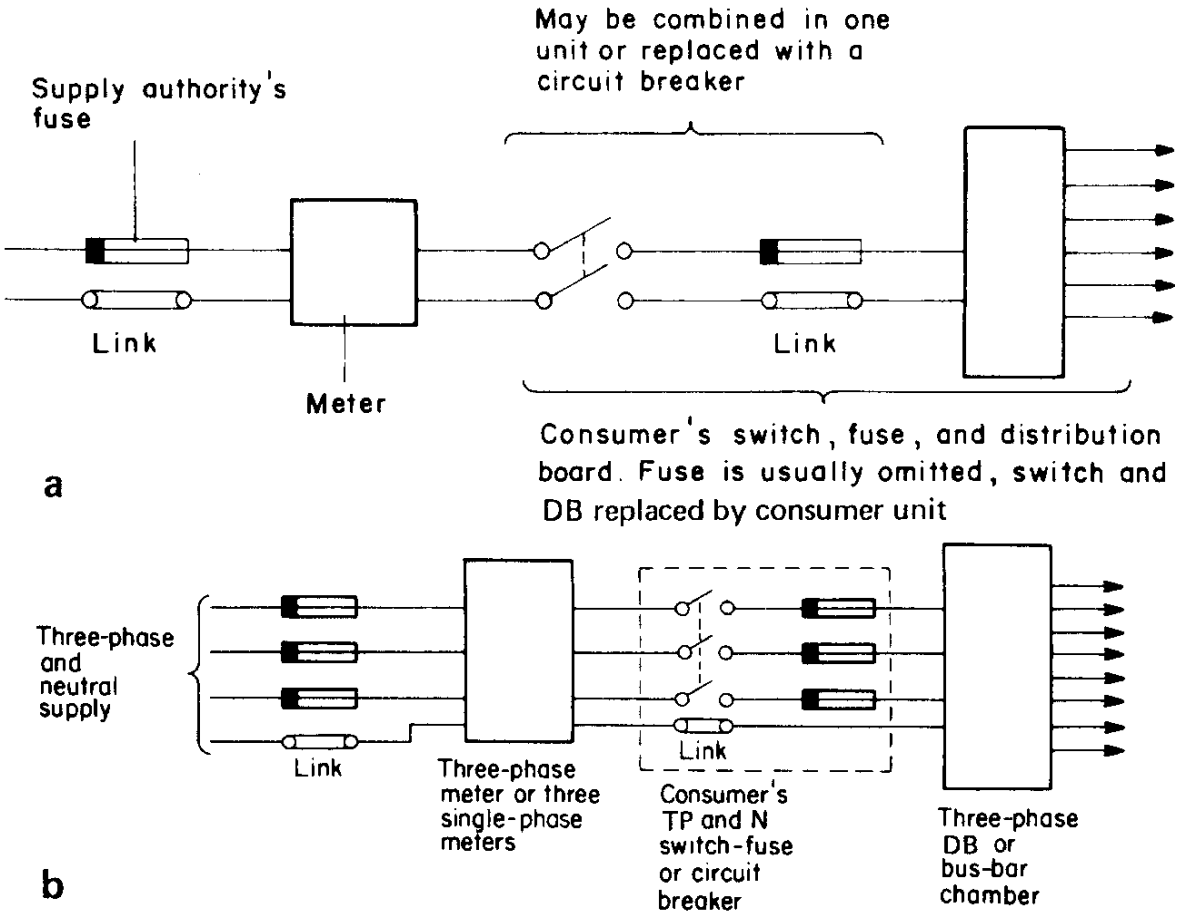


Fig. 2.1.A, B Block Diagram

(a) Single-phase control:

(b) three-phase control. TP and N = triple pole and neutral

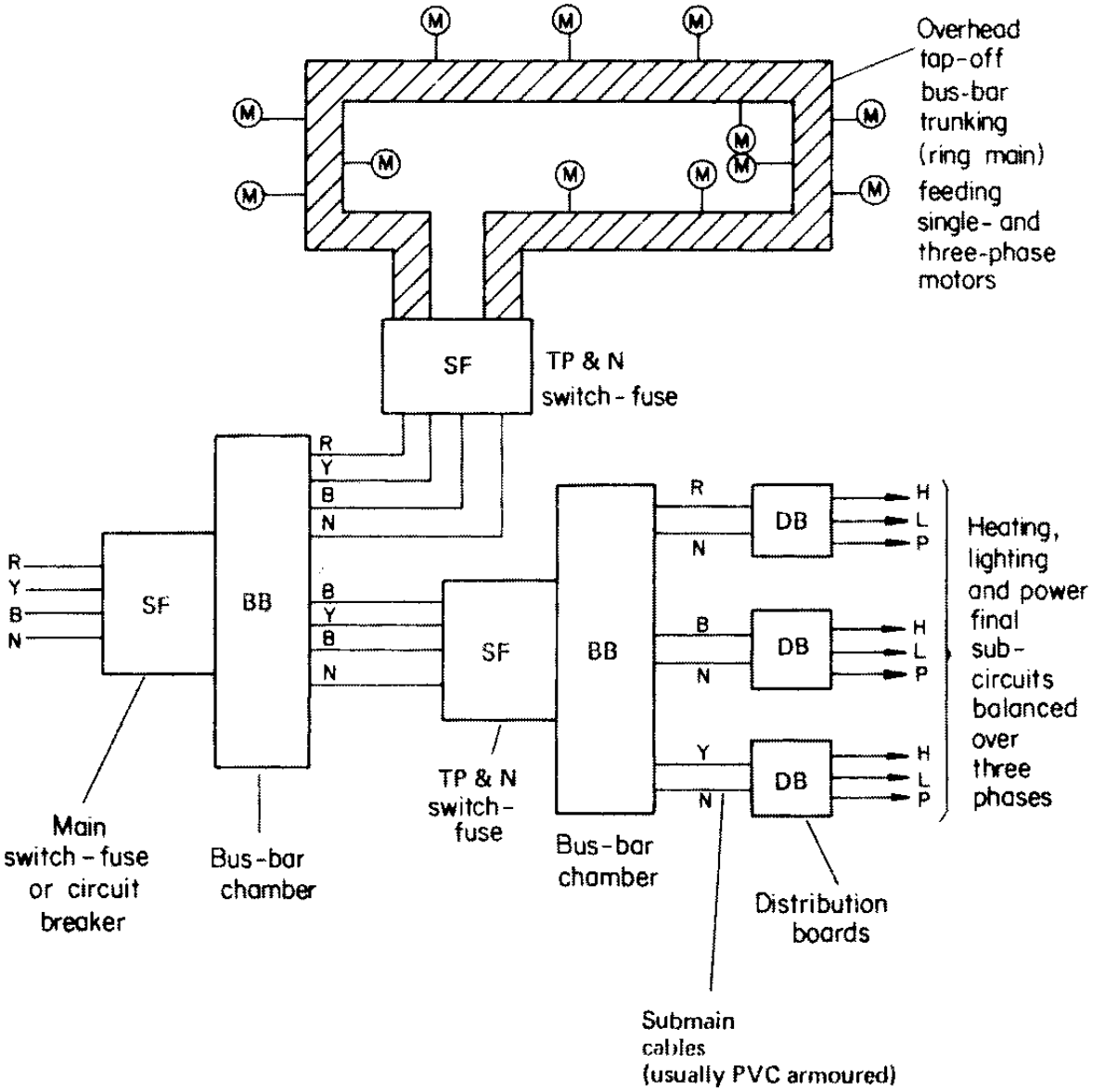


Fig. 2.2 A Layout Diagram

Layout of industrial

Installation

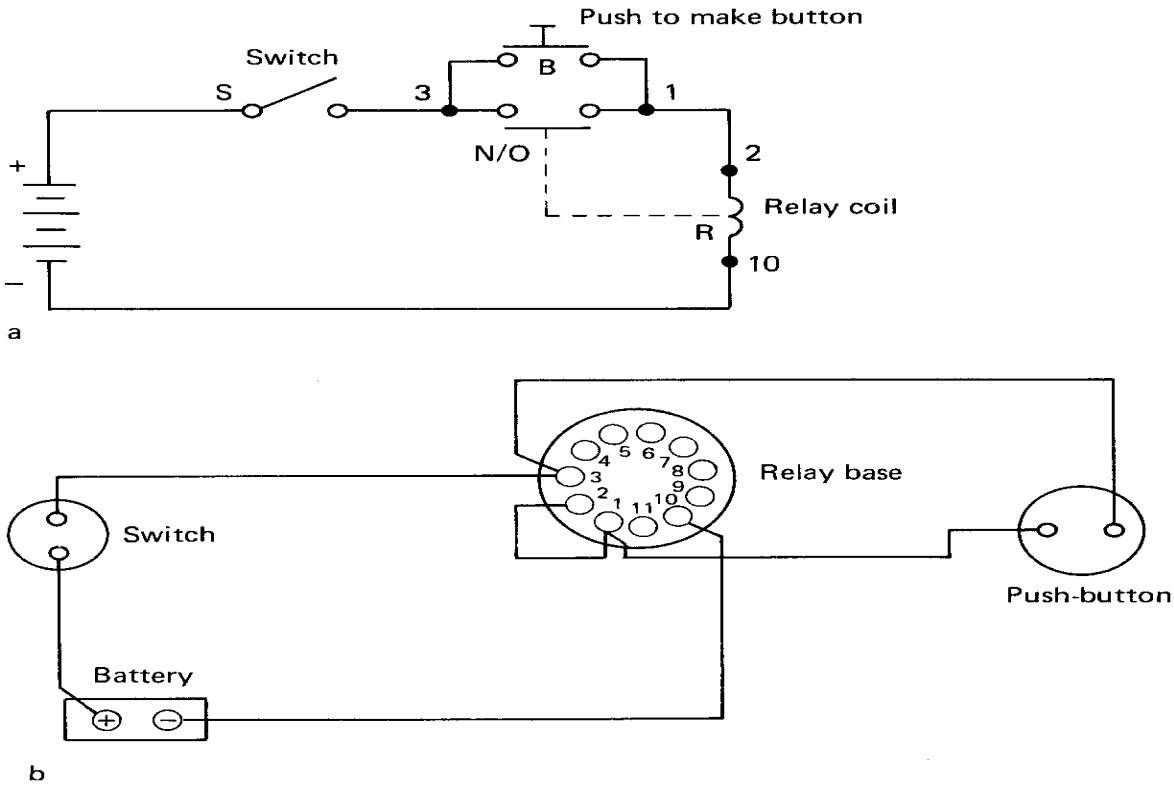


Fig. 2.3. *(a)* **A circuit Diagram**

*(b)***Wiring Diagram**

2.2. Functions of each drawing.

Drawing is the act and discipline of composing drawings that visually communicate how something functions or is constructed.

Technical drawing is essential for communicating ideas in industry and engineering. To make the drawings easier to understand, people use familiar symbols, perspectives, units of measurement, notation systems, visual styles, and page layout. Together, such conventions constitute a visual language and help to ensure that the drawing is unambiguous and relatively easy to understand. Many of the symbols and principles of technical drawing are codified in an international standard called ISO

The need for precise communication in the preparation of a functional document distinguishes technical drawing from the expressive drawing of the visual arts. Artistic drawings are subjectively interpreted; their meanings are multiply determined. Technical drawings are understood to have one intended meaning

Self-Check -2	Written Test

Directions: choose the correct Answer all the questions listed below.

1. ----------is indicate how a circuit or system is physically wired (2pt)
   A. Block diagrams B. Layout diagrams C. schematic Diagrams D. Wiring diagram
2. ----------is show, using squares, rectangles etc., the sequence of a system without too much technical detail? (2pt)
   A. Block diagrams B. schematic Diagrams C. Wiring diagram D. Layout diagrams
3. ------are very similar to block diagrams, but they indicate more technical detail and Tend to show items in their correct geographical location (2pt)
   A. Wiring diagram B. Layout diagrams C. Block diagrams D. schematic Diagrams

Note: **Satisfactory rating - 3 and 6 points** **Unsatisfactory - below 3 and 6 points**

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

Information Sheet-3	recognizing and adhering *Quality requirements*

3.1 Adherence to Quality *requirements*.

In all matters related to the Company's use of the Solazyme Trademarks, the Company shall maintain and adhere to standards of quality and specifications that conform to or exceed the highest of

- such quality standards and technical and operational specifications as may be adopted and authorized by Solazyme with respect to Solazyme's Trademarks ("Quality Standards") and
- such quality standards and technical and operational specifications as may be imposed by Applicable Law.

3.1.2 Quality requirement

Quality requirement Is a common term in project management 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.

Quality is an important factor when it comes to any product or service. With the high market competition, quality has become the market differentiator for almost all products and services. Therefore, all manufacturers and service providers out there constantly look for enhancing their product or the service quality. In order to maintain or enhance the quality of the offerings, manufacturers use two techniques, quality control and quality assurance. These two practices make sure that the end product or the service meets the quality requirements and standards defined for the product or the service.

Self-Check -3	Written Test

Directions: Give short Answer all the questions listed below.

1. What is important quality requirement?(3 point)
2. What are the two maintain or enhance the quality of the offerings, manufacturers use techniques?(3 point)

Note: **Satisfactory rating - 3 and 6 points Unsatisfactory - below 3 and 6 points**

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

Information Sheet-4	**Environmental requirements and controls from job plans, specifications and environmental plan**

4.1. Environmental requirements

4.1.1. Environmental Requirements for Design and Construction

All construction projects shall be conducted using established specifications. Environmental Compliance and Pollution Prevention must be incorporated for all projects. These environmental compliance and pollution prevention and sustainability actions must be required of every project to which they apply All facilities shall be designed and constructed in accordance with the criteria and standards set forth in the authorities cited above. All facilities shall comply with local, state, and Federal regulations and codes applicable to the collection, transmission, and disposal of waterborne wastes contributing to the sanitary, storm, and industrial waste systems; to the abatement of airborne emissions; and to the handling of hazardous materials and wastes. When the possibility of an accidental release of contaminated material or waste exists, adequate safeguards shall be included in such designs. Due consideration shall be given to applicable discharge limits.

Control or treatment facilities may be required in order to prevent such accidental or normal releases. Secondary containment is required for hazardous material storage and hazardous waste accumulation areas.

The environmental impact and assessment of design, construction, and modification activities shall be evaluated in the initial planning stages. Requirements governing the preparation and review of assessments of the environmental impact of Ames activities are contained.

All construction projects shall be conducted using established specifications. Environmental Compliance Pollution Prevention must be incorporated for all projects handling hazardous materials and hazardous wastes or creating emissions into the air or water, or onto the land. These environmental compliance and pollution prevention actions must be required of every project to which they apply. Construction projects with the potential to impact protected wildlife species, wetlands, the coastal zone,

4.2 Specification for construction

Specifications describe the materials and workmanship required for a development. They do not include cost, quantity or drawn information, and so need to be read alongside other information such as quantities, schedules and drawings.

Specifications vary considerably depending on the stage to which the design has been developed, ranging from performance specifications (open specifications) that require further design work to be carried out, to prescriptive specifications (closed specifications) where the design is already complete.

4.2.1. **Manufacturer's Specifications**

Manufacturer's specifications contain the precise description for the manner and process for making, constructing, compounding, and using any items the manufacturer produces. They should not be referenced or copied verbatim in project specifications but may be used to aid in preparing project specifications.

4.3. **environmental plan**

.environmental planning is the process of facilitating decision making to carry out land development with the consideration given to the natural environment, social, political, economic and governance factors and provides a holistic framework to achieve sustainable outcomes.

Effective environmental planning requires the effective interaction and overlay between three components - hardware, software and heart ware. Hardware consists of the physical fabric of a city - infrastructure, buildings, railway, roads, ports etc.

Self-Check -4	Written Test

Directions: Give short Answer all the questions listed below.

1. Which factors are affect environmental planning ?(3 point)

   A. Social B. political C. economic D. governance E. all

2. Specifications describe the materials and workmanship required for a development. They do not include?(3 point)

   A. cost B. quantities C. schedules D. drawings

3. Specifications describe the materials and workmanship required for a development. They do include?(3 point)

   A. cost B. Quantity C. drawn information D. schedules

Note: **Satisfactory rating – 4.5 and 9 points Unsatisfactory - below 4.5 and 9 points**

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

Operation Sheet 1	identifying types of *plans and drawings* in the construction sector

T***opic:*** *Draw Electrical plan b*y fire hand

Procedure:-

Step1 Prepare yourself for the work

Step2 Prepare all materials, equipments and tools which are needed for the work.

Step3 design the building plan

Step4 locate all site plan Symbols in the site plan paper in proper position

Step5 connect the electrical symbols

Step6 Check your drawing

Step7 Submit you're drawing to the supervisor

Not the house area is 8cmx10cm =180cm^2

LAP Test 1	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks with in **3** hour

Task1. *Draw Electrical plan by* fire hand

Referees

https://theconstructor.org › building › drawing-types-constr...

https://drahmedelyamany.weebly.com › uploads › site-layo...

https://www.linkedin.com › learning › construction-management-plann..

https://www.ukessays.com › dissertation › examples › construction ›

Building Electrical installation

Level II

Learning Guide-15

- **Unit of Competence:** Read and Interpret Plans and Specifications
- **Module Title:** Reading and Interpreting Plans and Specifications

LG Code: EIS BEI2 M05 LO2 –LG -15

TTLM Code: EIS BEI2 TTLM 0919**V1**

LO 2: Recognizes Amendment

Instruction Sheet	Learning Guide #15

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

- Checking Title panel of project documentation
- checking Amendments to specifications to ensure currency information and conveying to others

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:

- Check Title panel of project documentation
- Check Amendments to *specifications* to ensure currency information and conveying to others

Learning Instructions:

7. Read the specific objectives of this Learning Guide.
8. Follow the instructions described below 3 to 6.
9. Read the information written in the information “Sheet 1, Sheet 2.
10. Accomplish the “Self-check 1, Self-check t 2, **in page -27and 29** respectively.
11. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, **in page -30.**
12. Do the “LAP test” **in page – 31** (if you are ready).

Information Sheet-1	Checking Title panel of *project documentation*

1.1. Title panel.

A title panel (sometimes called a title block) is found on all drawings. It identifies also gives some specific information about that particular drawing sheet. The title panel can be found at the bottom or the side (usually the right and side) of the drawing sheet. Title panel at the bottom of the sheet. Title panel at the right-hand side of the sheet. Where the title panel is located and what it looks like are decided by the drafting or architectural company. They will usually incorporate company styles, colors and logo. Employees creating drawings will be required to follow company procedures by inserting and completing the title block correctly

1.1.1 Drawing border and title block

- **Border Line** is a line drawn around the inside edge of the paper. Usually this is 10mm(20mm) from the edge of the paper (left side of the paper) and (from bottom, top and right side of the paper) 5mm. It is basically a rectangle drawn precisely and inside this rectangle is the design area.
- **A title block** is normally drawn at the bottom of the paper. Inside the title block is printed important information such as Name, Title, drawing No, scale and Date. The measurements for the title block can be seen below (these can vary depending on the type of title block being used). All the lines are dark with the exception of the guidelines between which the printing is positioned.

The border line and title block ensures that the design sheet looks more professional and includes vital information

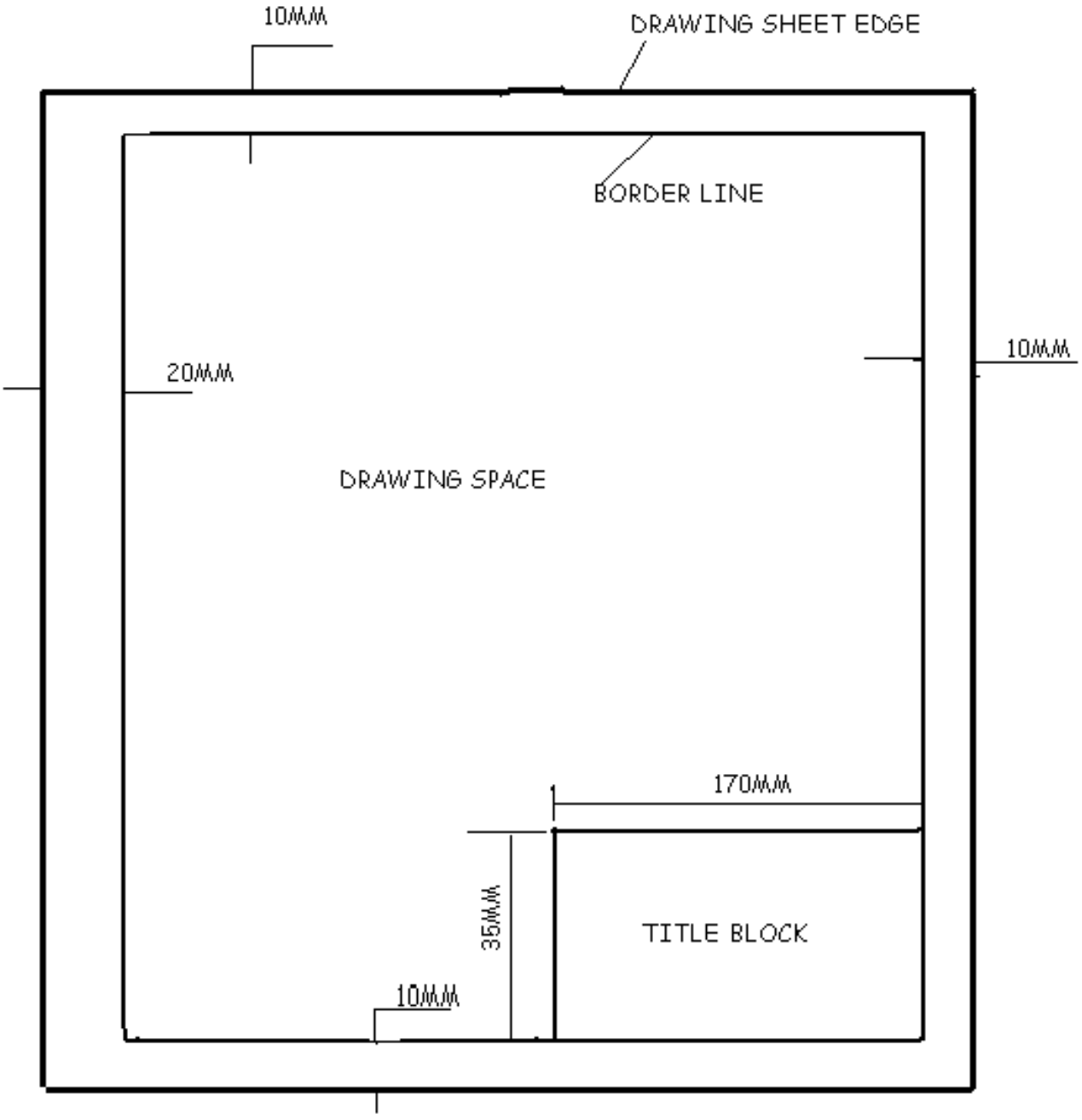


Figure 5.1laying drawing paper (sheet)

- **Making a Title Block**

Now that we have our page setup prepared, we can make a title block with a ruler and other geometries in the layout view. You can also import a title block from any drawing if you have it previously prepared. For the current example, I will import a simple A3 title block from a drawing.

- **Lay out with title block.**

You can also make a title block from scratch using simple draw and modify commands. As an example, make a rectangle with a length of 420 mm and a width of 297 mm along the edges of the layout (the dimensions mentioned here are of an ISO A3 paper). Offset this rectangle in an inward direction to a distance of 10 mm, and erase the original rectangle.

- **Adding Fields to Tile Block**

The current title block has only geometries and no fields for showing information related to the sheet set. To make this title block useful, we will add fields that can fetch information automatically from the sheet set.

1.2. ***project documentation***

Covers documents created during and for the project itself. Examples include the overall project vision, the project plans, the schedule, and the risk analysis. The documentation process has a deeper purpose than merely creating piles of paper.

- **Documentation stimulates and structures critical thinking**

in planning the project's goals, risks, and constraints. The document is the evidence and chronicle of this critical thinking.

- **It provides memory containers** for managing a level of detail that cannot be kept in people's heads. This includes the small details easily overlooked during day-to-day project work, as well as the larger things easily remembered today, but potentially lost or forgotten due to the passage of time or critical personnel changes.
- **It keeps the team and other stakeholders synced up and informed** about project changes, issues, and progress. In many projects, the documentation is often done late, done poorly, or not done at all usually because the documentation is perceived as having little or no value. And, in fact, this is true if the documents are created as an afterthought or a necessary evil.

Even documents with adequate content will lose value if they are created at the wrong time during the project, or aren't used in the project management process. Here are some **examples**:

- **Timing:** If the project documentation is created at the wrong project stage, it may have little or no value, even if its content is quite good. Examples: a vision document created late in the project; a detailed schedule created before the stakeholders have agreed on an overall project vision.
- **Use:** If the plan, vision, or risk analysis documents are created and then rarely or never referenced, they will likely have little or no value except for generating some initial critical thinking during their creation. Examples: a risk analysis that isn't referenced to measure progress on mitigations, or updated with newly discovered risks as they occur; a requirements document that isn't referenced later as a design completeness checklist.
- **Content:** Inadequate or incomplete content decreases a document's value, even if it is created on time and used correctly. Examples: a status report for product development that doesn't track the product costs; a risk analysis that doesn't include risk mitigations.

A key reason for documenting is to reduce the risks in the project. The level of detail in even the simplest project is simply too great for the human brain to capture, remember, and manage. Properly done, project documentation is a dynamic, animated extension of the brains of the stakeholders. It allows us to focus our limited mental processing and decision making on different areas of the project at different times, without having to keep the entire detailed state of the project in our heads.

1.2.1. SCHEDULES

A schedule is a group of general notes, usually grouped in a tabular form, according to Materials of construction “General notes” refer to all notes on the drawing not accompanied by a leader and an arrowhead. Item schedules for doors, rooms, footings, and so on.

Self-Check -1	Written Test

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

1. ____is a line drawn around the inside edge of the paper? (2 points)

   A. board line C**.** drawing board

   B. Title blocks D. All

   2._____is normally drawn at the bottom of the paper?(2 points)

   A. a title blocks C. Timing

   B. drawing space D. board line

   3.----------is the project documentation is created at the wrong project stage?(2 points)

   A. title blocks C. drawing sheet

   B. drawing space D. board line

Note: **Satisfactory rating - 3 and 6 points** **Unsatisfactory - below 3 and 6 points**

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

Information Sheet-2	**checking Amendments to *specifications* to ensure currency *information and conveying to others***

1.1 checking Amendments to *specifications* to ensure currency *information and conveying to others*

Amendments After a Standard has been published, new information may be presented to the committee or errors found in the published document. When this occurs it is usual to issue an amendment to the Standard. Normally, amendments should not alter more than 10% of the original document and should not have more than two amendments issued for the one edition of document. If this is exceeded, a full revision of the document is recommended and a new edition is typically developed. Amendments are usually only issued in the first two years after the Standard's publication; any changes after this should be incorporated into a new edition

Self-Check -2	Written Test

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

1. What Amendments in ensure currency information?(8 point)

Note: **Satisfactory rating 4- and 8 points** **Unsatisfactory -below 4 and 8 points**

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

Operation Sheet 1	Checking Title panel of *project documentation*

Techniques for Free hand sketch electrical plan

Procedure:-

Step1: Prepare drawing instruments and materials

Step 2: Clean the drawing table surface.

Step 3: Properly attach drawing paper on the drawing board

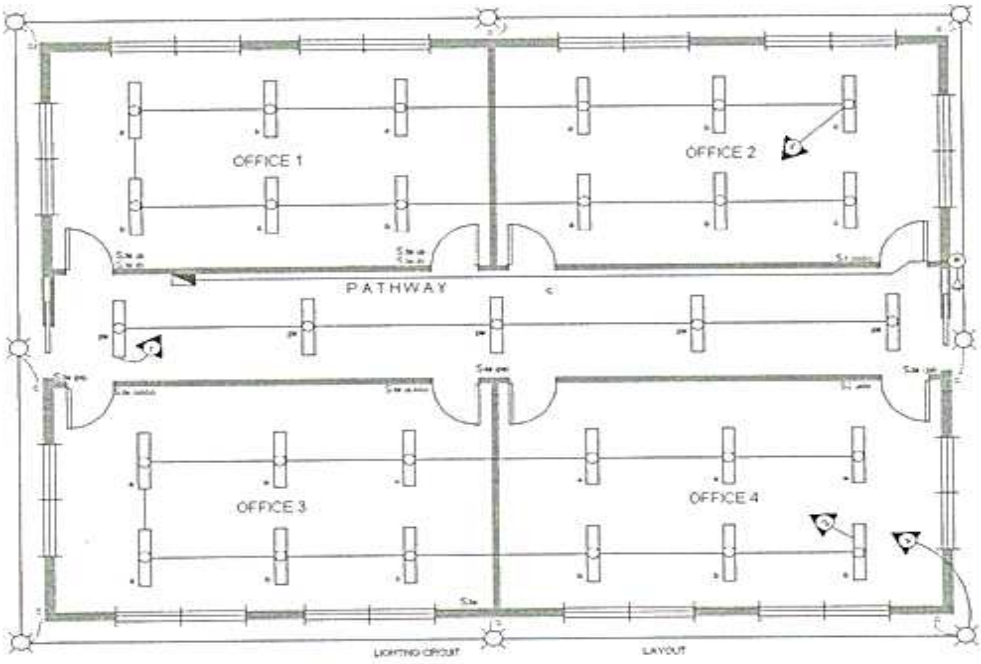
Step 4: Prepare drawing boarder line and title block

Step 5: Draw the given drawing without instrument by free hand sketch based on First problem

Step 6: Draw the given drawing with proper instrument based on second problem

Step 7: clean the drawing workshop room

- Pr**oblem 1:**based on above steps sketch under the given questions and drawing with visual estimate
- Problem- 2 based on above steps draws the following electrical plan



LAP Test 1	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks with in **4** hour.

Task 1. For Free hand sketch electrical plan

Referees

https://www.overleaf.com › learn › LaTeX_video_tutorial_for_beginn

https://edition.cnn.com/election/2018/results/alabama/ballot-measures/2

Building Electrical installation

Level II

Learning Guide-16

- **Unit of Competence:** Read and Interpret Plans and Specifications
- **Module Title:** Reading and Interpreting Plans and Specifications

LG Code: EIS BEI2 M05 LO3-LG-16

TTLM Code: EIS BEI2 TTLM 0919V1

LO3: Recognizes commonly used symbols and abbreviations

Instruction Sheet	Learning Guide #16

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

- Recognizing Construction symbols and abbreviations
- Legend is locating on project drawings, and symbols and abbreviations are correctly interpreted

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:

- Construction symbols and abbreviations are recognized.
- Legend is located on project drawings, and symbols and abbreviations are correctly interpreted.

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, Sheet 2.
4. Accomplish the “Self-check 1, Self-check t 2 **in page - 38 and 52** respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 **in page -53.**
6. Do the “LAP test” **in page – 55** (if you are ready).

Information Sheet-1	Recognizing Construction symbols and abbreviations

1.1. Recognizing Construction symbols and abbreviations

Construction blueprints, also called construction plans or drawings, are full of abbreviations and acronyms to save space and neaten the overall appearance of the presentation. Remembering all of this shorthand can be tricky, especially when this is added to the challenge of reading all the symbols and deciphering the conventions that might be used by a particular draftsperson or designer.

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

1.1.1. Electrical Graphic Symbols

Electrical engineers and designers generally follow accepted standards for the basic electrical and electronic symbols. These electrical symbols can be classified as those used on *connection and interconnection diagrams* and those used on *elementary or schematic diagrams.*

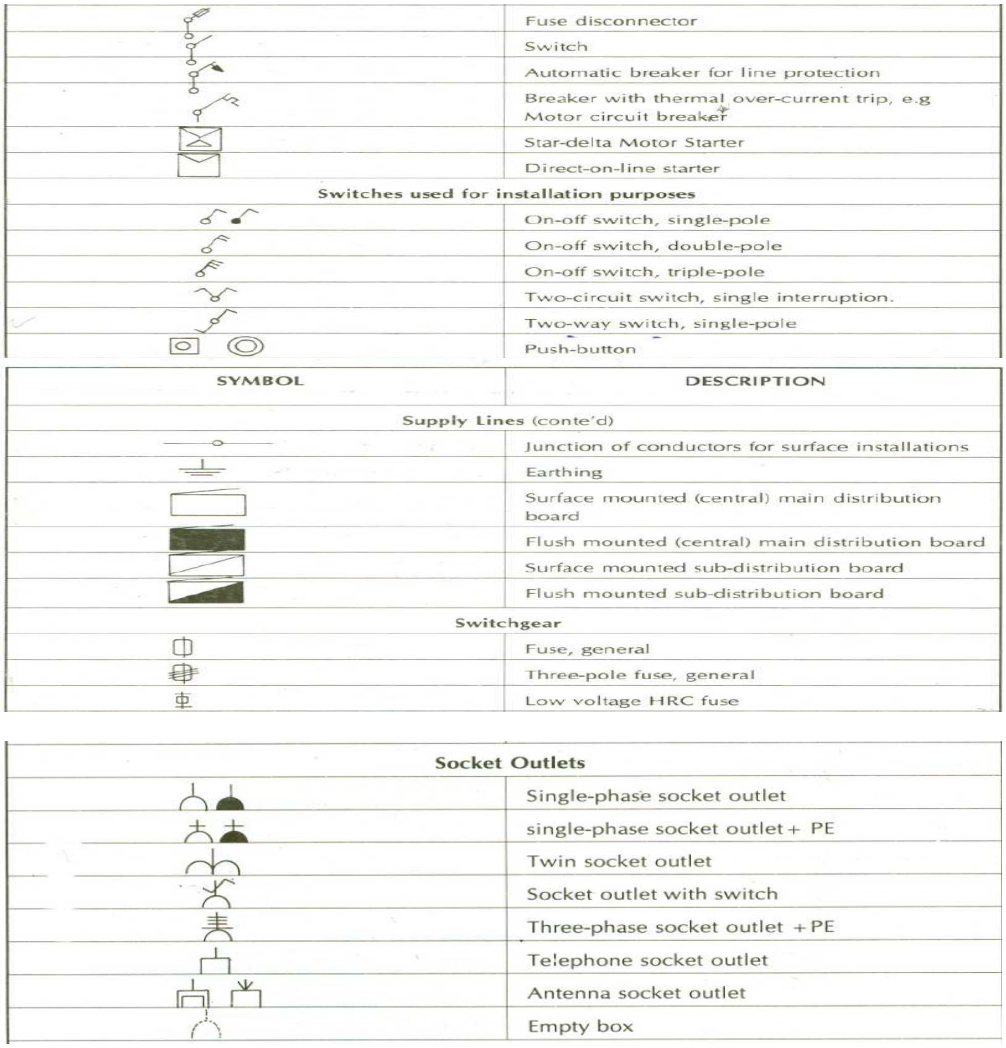
Connection and interconnection symbols represent complete electrical devices such as switch outlets, receptacle outlets, lighting fixtures or luminaries, and auxiliary systems. These symbols take the form of relatively simple geometric shapes modified with lines and letters inside or outside of them. The intent was to create a kind of technical shorthand that could be easily learned. They were kept simple to reduce the time and expense of preparing drawings, particularly those used in the field for installation of common off-the-shelf electrical components.

The American National Standards Institute (ANSI) recommended symbols for use on architectural drawing in its selection and interconnection. These symbols, or modified versions of them, are widely used on electrical drawings in North America.

CAD electrical drafting software has eliminated the chore of reproducing these symbols. The software contains a library of symbols that can be accessed from a menu, downloaded, and dragged into position on the face of the screen as needed. The basic symbols can be modified to fulfill special requirements or identify devices not listed in the standard symbol list. In the past, symbols were usually drawn by the draftsperson tracing around the inside of geometric cutouts in templates made of sheet plastic.

As with line conventions, the motivation for using standardized symbols is to eliminate the time involved in trying to interpret drawings that include unfamiliar proprietary symbols. It is important that the symbols be easily recognized by all parties involved in an electrical project, from the designer to the electricians doing the work. As a result, the chances of making costly mistakes in interpretation are lessened.

Moreover, large architectural and consulting engineering firms with national and international clients approve of symbol standardization because of the many people of different backgrounds, languages, and cultures that could be using the drawings. This is especially true of large-scale new construction projects such as hospitals, power stations, and industrial plants involving many different contractors.

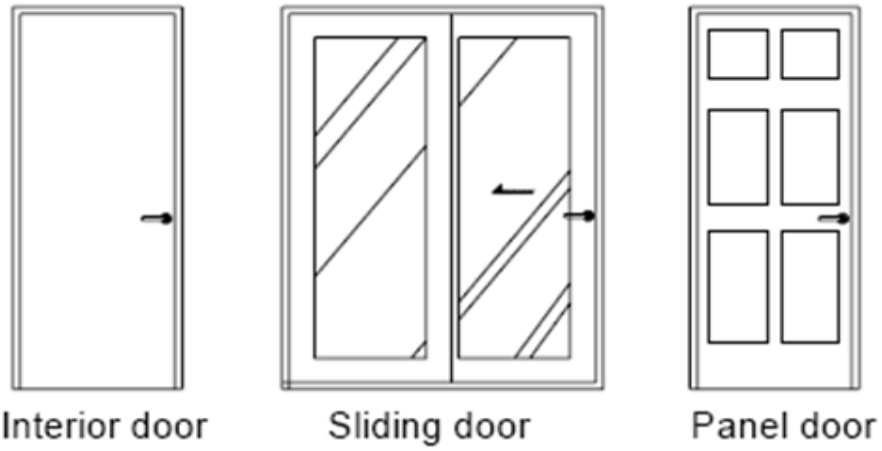


	Fuse disconnector
	Switch
	Automatic breaker for line protection
	Breaker with thermal over-current trip, e.g Motor circuit breaker
	Star-delta Motor Starter
	Direct-on-line starter
Switches used for installation purposes	
	On-off switch, single-pole
	On-off switch, double-pole
	On-off switch, triple-pole
	Two-circuit switch, single interruption.
	Two-way switch, single-pole
	Push-button

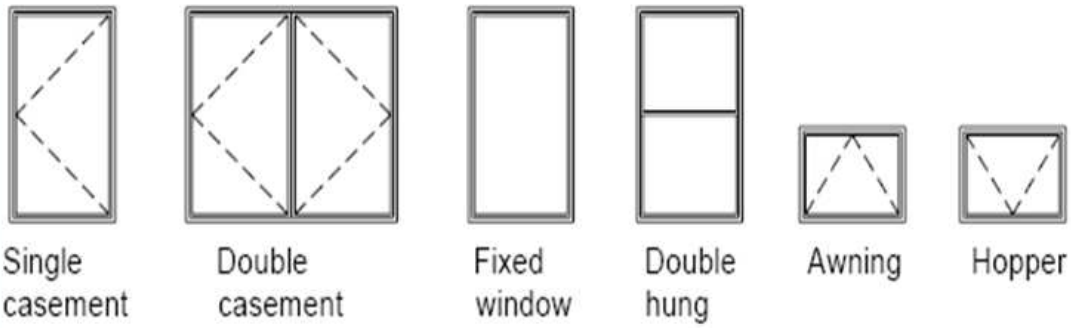
SYMBOL	DESCRIPTION
Supply Lines (conte'd)	
	Junction of conductors for surface installations
	Earthing
	Surface mounted (central) main distribution board
	Flush mounted (central) main distribution board
	Surface mounted sub-distribution board
	Flush mounted sub-distribution board
Switchgear	
	Fuse, general
	Three-pole fuse, general
	Low voltage HRC fuse

Socket Outlets	
	Single-phase socket outlet
	single-phase socket outlet + PE
	Twin socket outlet
	Socket outlet with switch
	Three-phase socket outlet + PE
	Telephone socket outlet
	Antenna socket outlet
	Empty box

1.1.1. Table 1,1 Electrical Graphic Symbols



Examples of door symbols in plan view



Examples of window symbols in elevation view

Fig 1.1 Construction door and widow symbols

- **Electrical abbreviation**

Electrical abbreviations are used throughout several industries. These include everything from automotive and construction to electricity wiring, electronic device repair, electronic device manufacturing, and telephony. Since it doesn't make sense to write out the full terms every time, especially under the tight space constraints of many devices and panels, the much shorter abbreviations are used for various circuits, conduits, sizes, standardized tools, and more. Because electrical work involves significant cost and/or safety risks, understanding these abbreviations and acronyms is important for everyone involved.

- **Switch Outlets**

- S Single pole switch
- S2 Double pole switch
- S3 Three way switch
- S4 Four way switch
- SD Automatic door switch
- SE Electrolier switch
- SK Key operated switch
- SP Switch and pilot lamp
- SCB Circuit breaker switch
- SWCB Weather proof circuit breaker
- SMC Momentary contact switch
- SRC Remote control switch
- SWP Weatherproof switch
- SF Fused switch
- SWF Weatherproof fused switch

- **Architectural Abbreviation**

HCB – Hollow concert block
GIS – Galvanized iron sheet

T—Double shutter
S—Single shutter
W—Window
D—Door
CB—Concert Block
FF—Floor Finishing
CIS-- Corrugated iron sheet
Ar= architectural

- **Sanitarily abbreviation**

Sn=sanitary
PVC—Poly Vinyl Chloride
V—ventilation
WC- Water Close
BT - Bath Tub
D- Dryer
BD- Bidet
AV- Air Vent
UR - Urinal
S- Sink
KS- Kitchen Sink
SH- Shower
RCP- Reinforced Concert Pipe
FD- Floor Drain
B- Boi
HWB- Hand Wash Basin
CW- Cold Water
HW- Hot Water
WH- Water Heater
MH- Man Hole
ST - Septic Tank
W – Washer

Self-Check -1	Written Test

Directions: **Choose the best answer.(2 point each)**

__**1.**Which one of the following is the abbreviation of galvanized iron sheet? (2 point)

A. GIS B. W C. CIS D. CB

__**2.** Which one of the following is the abbreviation of weather proof circuit breaker**?** (2 point)

A. SWCB B. SMC C. SRC D. SPCB

___**3.** One of the following is the abbreviation of momentary contact switch**?** (2 point)

A. SWCB B. SMC C. SRC D. SPCB

Note: **Satisfactory rating3 and 6points** **Unsatisfactory 3 and 6 below points**

You can ask you teacher for the copy of the correct answer

Information Sheet-2	**Legend is locating on project drawings, and symbols and abbreviations are correctly interpreted**

2.1. Introduction

The drawings will comprise plan view and sections, and the thickness of lines will depend on the information hierarchy. Outlines and different components drawn with thicker lines alert the user to key information as the eye scans the entire drawing. The placing of the section on the drawing sheet should be carefully laid out to minimise search time for the end user.

Identification of materials using standard conventions will complement the annotation and convey the extent of the materials used in the assembly detail.

The amount of text and dimensions included on the sheet should be just enough to achieve the purpose of the drawing. For example, a drawing of a substructure detail should not include text or specification relating to the roof. When placing text and dimensions onto the sheet, it is best to assist the end user by leaving the drawing area uncluttered. The focal point is the drawn detail. Once the diagram has been assimilated, further information is sought, with the eye radiating out form the focus diagram. The diagram should therefore be encircled with dimensions and text, and the text should be legible, concise and accurate

2.2. Drawings.

Drawing or drafting is known to be one of the basic languages of technology, namely ***math***, ***science*** and ***drawing*****.** Through this application a technology task can be performed correctly. Examples of it is the schematic diagram of a circuit for electronics technician & electrician, detailed plan of an object for carpenters and machinist, technical and floor plans for carpenters and construction workers.

Although drafting is sometimes accomplished by a project engineer, architect - or even by shop personnel such as a machinist - skilled drafters (and/or designers) usually accomplish the task and are always in demand to some level. But basically it must be a common competency for all technical workers in order to interpret the task to be performed and could prepare one to describe other details of the task to be performed to other co-workers.

2.1. Electrical Symbols

Electrical engineers and designers generally follow accepted standards for the basic electrical and electronic symbols. These electrical symbols can be classified as those used on *connection and interconnection diagrams* and those used on *elementary or schematic diagrams.*

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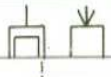
	Single-phase socket outlet
	single-phase socket outlet + PE
	Twin socket outlet
	Socket outlet with switch
	Three-phase socket outlet +PE
	Telephone socket outlet
	Antenna socket outlet
	Empty box

Luminaires	
	Luminaire general symbol
	Wall mounted luminaire
	Luminaire with switch
	Emergency luminaire
	Flood light (Projector)
	Florescent luminaire single lamp

Table 2.1 electrical symbol

2.2 Abbreviations

Abbreviations can be created in different ways. In some cases the word is shortened. Examples include ‘ENS’ for ensuite and ‘CPBD’ for cupboard. In other cases initials are used. Examples include ‘WIR’ for walk-in robe and ‘WC’ for water closet (toilet). There might be several recognised abbreviations for the same thing. For example, you may see ‘brickwork’ shortened to BRK, BWK or just BK. If you come across a new abbreviation in a drawing and you aren’t sure what it means, have a look at where it is in the drawing as that will often give you a clu

Commonly used sanitary abbreviations

WC- Water Close
BT - Bath Tub
BD- Bidet
UR - Urinal
S- Sink
KS- Kitchen Sink
SH- Shower
FD- Floor Drain
HB- Hose Bib
HWB- Hand Wash Basin
CW- Cold Water
HW- Hot Water
HWC_ Hot Water Cylinder
MH- Man Hole
ST - Septic Tank
B- Boiler
D- Dryer
AV- Air Vent
CO- Clean Out
DF - Drinking Fountain
FL- Flow line
RCP- Reinforced Concert Pipe
RD- Roof Drain
SOV- Shut off Valve
V- Vent
VS- Vent Stack
VTR- Vent through Roof
WH- Water Heater
WS- Waste Stack
W - Washer
YD- Yard Drain

- **Interpreting Electrical Plan**

1. This is the floor plan layout, it show the location of the furniture, equipment and other electrical appliances. This plan is used by electrical designers as basis for the location of the convenience outlet, switch outlets, lighting outlets and other special purpose outlet.

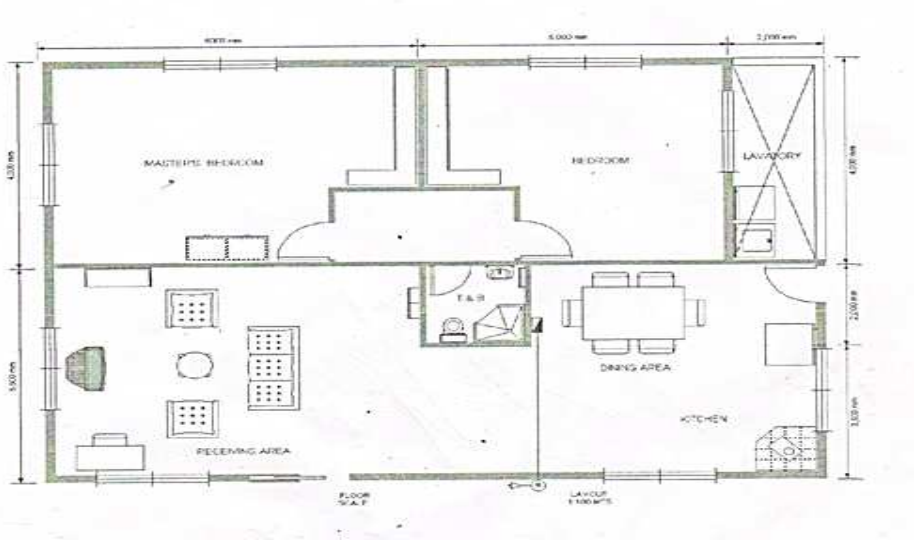


Fig 2.1 Electrical Plan

2. This is a lighting circuit layout. The lighting circuit in this plan divided into two circuit, circuit 1 and circuit 2 as represented by the symbol circuit home run.

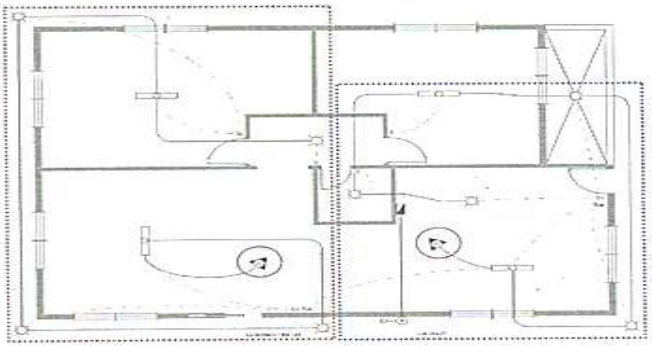


Fig 2.2 Electrical Plan

3. You will notice that the circuit home run symbol is pointing towards the power panel, to represent that these circuits are connected to this power panel and each circuit is individually protected by a circuit protection device.
4. Circuit 1 is composed of two fluorescent lamps and four incandescent lamps. This means that circuit 1 interconnects these lamps up to the power panel board

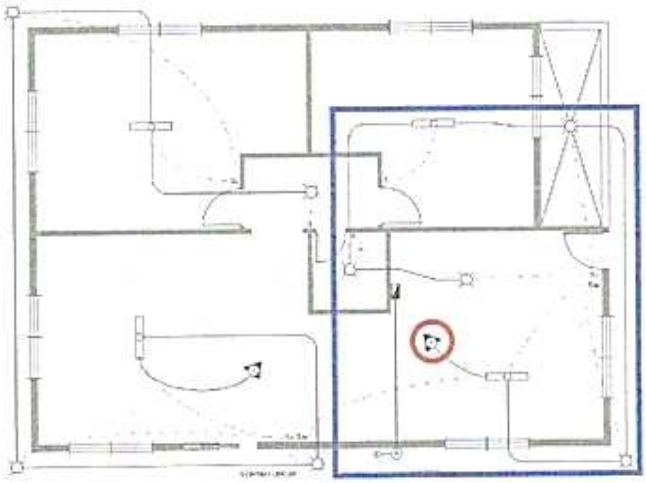


Fig 2.3 Electrical Plan

5. Circuit 2 is also composed of two fluorescent lamps and four incandescent lamps. This means that circuit 2 interconnects these lamps to the power panel board

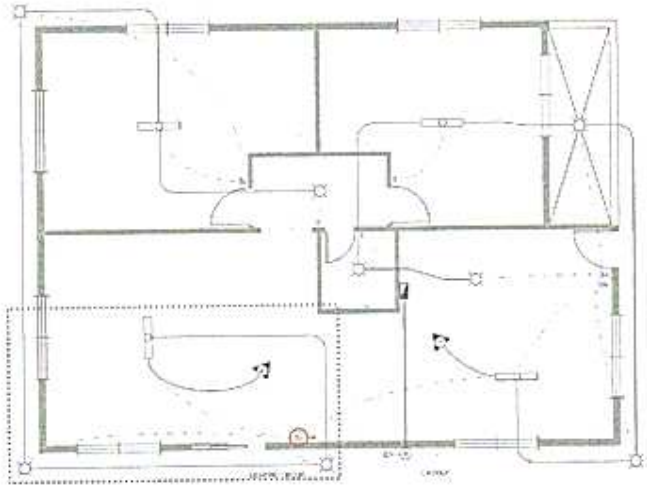


Fig 2.4 Electrical Plan

6. These two incandescent lamps and 1 fluorescent lamp are controlled by 3-ganged switch. This means each lamp is controlled by a single pole switches in one switch plate

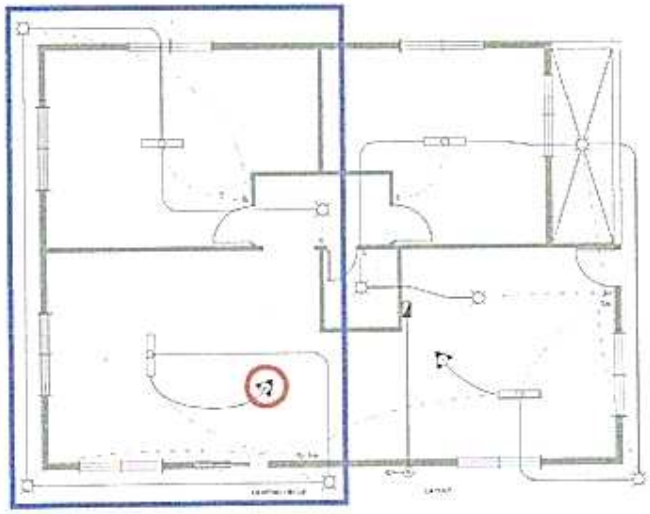


Fig 2.5 Electrical Plan

7. The fluorescent lamp in the kitchen is controlled by two three-way switches in two different locations

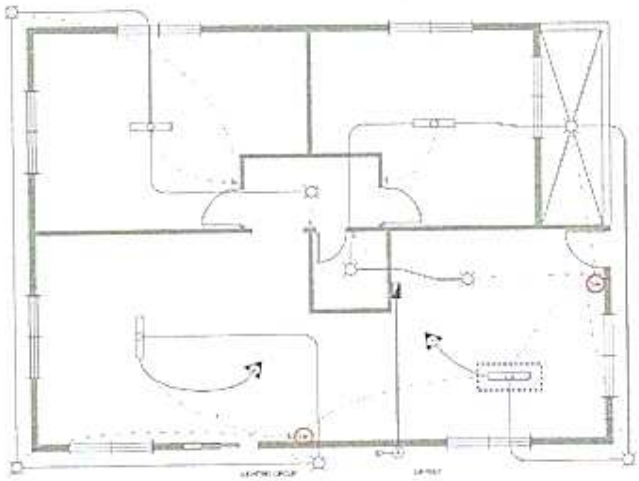


Fig 2.6 Electrical Plan

8. These two lamps are controlled by two-ganged switch. This means that each lamp is controlled individually by a single pole switches in one switch plate.

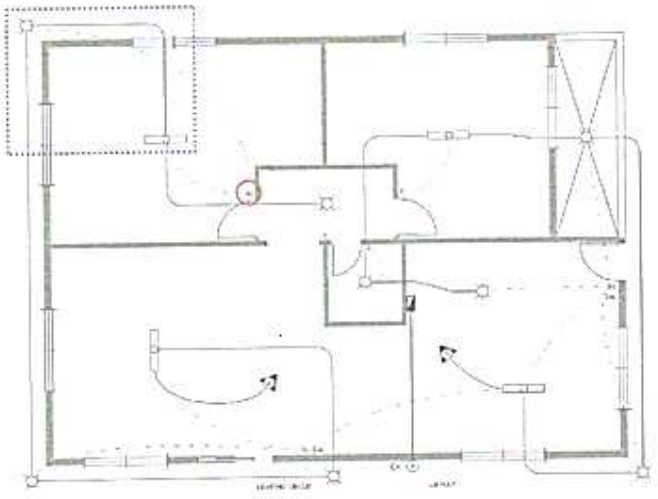


Fig 2.7 Electrical Plan

9. These lighting outlets are individually controlled by one-ganged switch. You will notice that the switches are located near the door for convenient access.

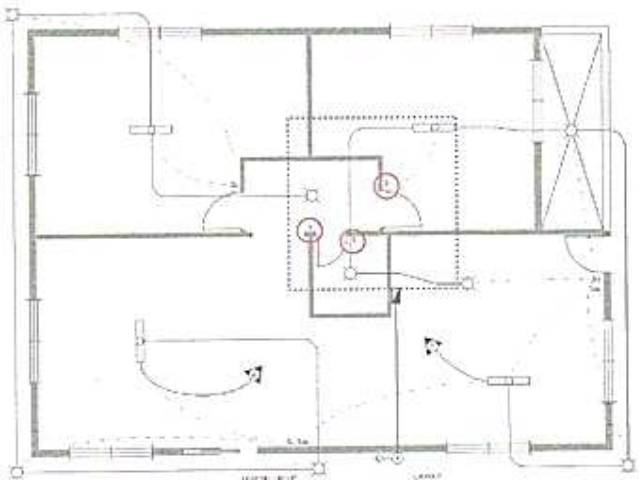


Fig 2.8 Electrical Plan

10. This is the power layout of the same electrical plan. There are six circuits in this power layout. Three circuits for small appliance load or sometimes called convenience outlets and four special purpose outlet

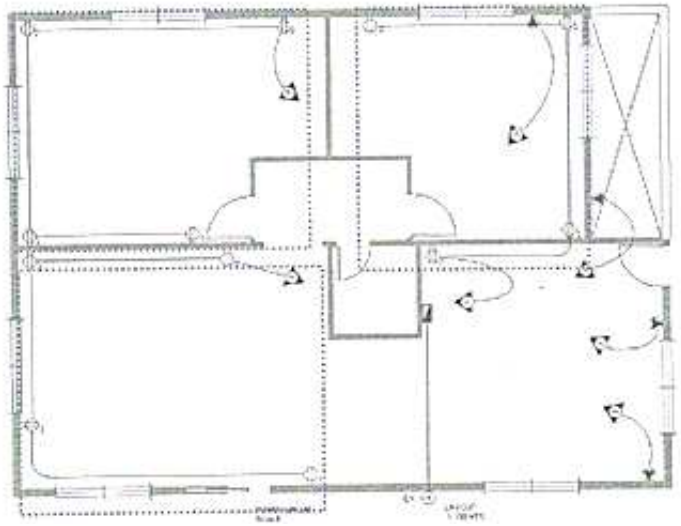


Fig 2.9 Electrical Plan

11. Every small appliance load circuit in this plan is composed of four duplex convenience outlets interconnected with each other and guarded by a pair of circuit protection.
12. Special purpose outlet is an outlet that is specially designed to supply special equipment/appliance like air-conditioning unit (ACU) in the master's bedroom (circuit no. 7), washing machine/drier in the lavatory (circuit no. 9), refrigerator and electric range in the kitchen circuit no. 8 and 10 respectively

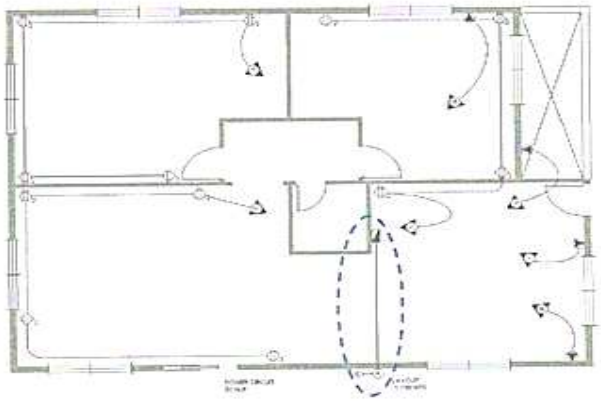


Fig 2.10 Electrical Plan

13. The power panel, KWHr meter service entrance are also included in the electrical plan to show their actual locations.
14. This is one-line diagram of this plan. It indicates single line diagram of lighting and receptacles panel boards showing mains and branch circuit rating; size of conductors for feeders, rated voltage and current of each circuit.

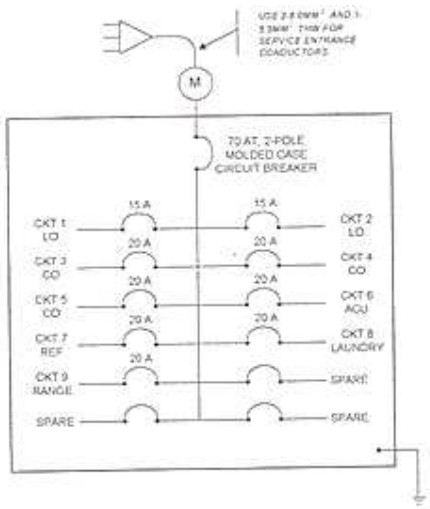


Fig 2.11 Electrical panel boards

15. This is the schedule of load of this plan. It shows the description of each circuit, current, voltage, size and type of wire, circuit breaker and conduit

SCHEDULE OF LOAD

CKT NO.	DESCRIPTION	NO OF OUTLETS	A	V	VA	CB RATING	SIZE OF WIRE	SIZE OF CONDUIT
1	LIGHTING OUTLET	6	2.61	230	600	15 AT 2P	2-2.0mm^2 THHN	20 mm uPVC
2	LIGHTING OUTLET	6	2.61	230	600	15AT 2P	2-2.0mm^2 THHN	20 mm uPVC
3	CONVENIENCE OUTLET	4	6.52	230	1,500	20 AT 2P	2-3.5mm^2 THHN	20 mm uPVC
4	CONVENIENCE OUTLET	4	6.52	230	1,500	20 AT 2P	2-3.5mm^2 THHN	20 mm uPVC
5	CONVENIENCE OUTLET	4	6.52	230	1,500	20 AT 2P	2-3.5mm^2 THHN	20 mm uPVC
6	AIR CONDITIONING UNIT	1	10.00	230	2,300	20 AT 2P	2-3.5mm^2 THHN	20 mm uPVC
7	REFRIGERATOR	1	4.35	230	1,000	20 AT 2P	2-3.5mm^2 THHN	20 mm uPVC
8	LAUNDRY CIRCUIT	1	6.52	230	1,500	20 AT 2P	2-3.5mm^2 THHN	20 mm uPVC
9	ELECTRIC RANGE	1	8.70	230	2,000	20 AT 2P	2-3.5mm^2 THHN	20 mm uPVC
10	SPARE							
11	SPARE							
12	SPARE							
	TOTAL		54.35		12,500			

COMPUTATION:

LIGHTING RECEPTACLE
12 LO @100VA EACH — 1,200 VA

SMALL APPLIANCE LOAD
3 CO CIRCUITS @1500VA EACH — 3,000 VA

LAUNDRY CIRCUIT
1 CIRCUIT @1500VA EACH — 1,500 VA

TOTAL — **5,700 VA**

APPLICATION OF DEMAND FACTOR
FIRST 3,000 VA @ 100% DEMAND FACTOR — 3,000 VA
REMAINDER @ 35% DF (2,700 VA X 35%) — 945 VA

3,945 VA

OTHER LOAD
1000 VA REF @ 100% DF — 1,000 VA
1.5 HP ACU @ 100% DF (10 A X 230 V) — 2,300 VA
RANGE @ 2,000 VA @ 100% DF — 2,000 VA

TOTAL NET COMPUTED LOAD — **9,245 VA**

SERVICE ENTRANCE CONDUCTOR
TOTAL FULL LOAD CURRENT
[9,245 VA + 25% (2300)] ÷ 230 V] = **42.7 A**
USE 2-8.0MM^2 AND 1-5.5MM^2 THW FOR SERVICE ENTRANCE CONDUCTORS

SERVICE EQUIPMENT
[9,245 VA + 250% (2300)] ÷ 230 V] = **65.2 A**
USE 70 AT, 2-POLE, MOLDED CASE CIRCUIT BREAKER

Table 2.2 schedule of load

This is the general notes and specification of this plan. These indicate nature of electrical service, voltage, type of wiring to be used, mounting height of receptacle and KWHr. Meters, etc. this will guide the electrician on the specification of electrical installation.

NOTES AND SPECIFICATION

1. All works herein shall be done in accordance with the latest provision of the Philippine Electrical Code and Local Building Code.
2. The nature of electrical service shall be 1Φ-3-wire, 240V, 60 Hz alternating current.
3. The service entrance conductor shall be stranded building wire 8.0 mm^2, THW; and 5.5mm^2 as grounding conductor.
4. The mounting height of electric service kWhr meter shall be 1.700 mm above finished floor level.
5. The conductors to be installed shall be stranded building wire, THHN made by Phelps Dodge and the sizes are as follows;

   - Lighting circuit.....2.0 mm^2
   - Convenience receptacle circuit.....3.5 mm^2
   - Air conditioning unit.....3.5 mm^2

6. Grounding conductor shall be provided in ACU, convenience receptacles and laundry circuit.
7. The mounting height of receptacles and panel board above finished floor shall be;

   - Panel board.....1,600 mm
   - Switch outlets.....1,400 mm
   - Convenience receptacle.....300 mm
   - Convenience receptacle-counter top.....1,000 mm

8. The conduit to be used shall be uPVC, Neltex or its equivalent, thick wall, 20 mm diameter, in some circumstances where uPVC is impractical to install, flexible non-metallic conduit of approved type may be used.
9. All wiring installation shall be installed with approved type connectors and fitting in accordance with the existing electrical code standards.
10. All works herein shall be done under direct supervision of duly licensed electrical engineer or registered master electrician.

Table 2.2 note and specification

16. This is the location and site plan; it is included in the plan to show the location of site of the proposed project. It shows public or well-known streets, landmarks or structures

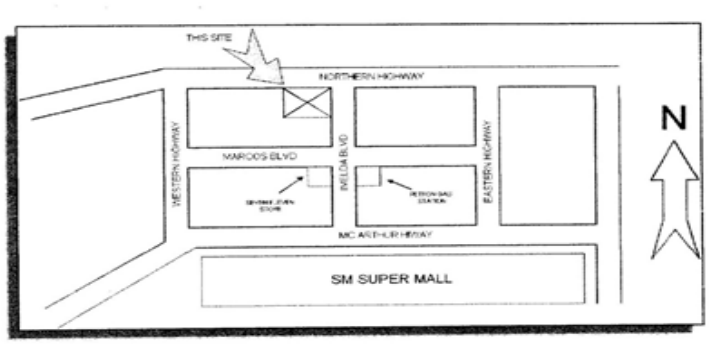


Fig 2.12 location and site plan

17. The parts described can be found in a single sheet of standard size electrical plan, but sometimes these can be drawn in several sheets due to the size and scale used.
18. Mostly, electrical plans particularly the lighting and power layout are drawn in scale of 1:100 meters. This means that 1 unit of measures in the plan equals 100 units in the actual situation. Example: if a convenience outlet in the plan is measured 1 mm away from the wall; it is measured 100 mm away from the wall in actual situation.

Self-Check -2	Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: *mach* the *correct Answer from the following questions column "A"* to *column "B".* (2pts each)

1. WC	A. man hole
2. S	B. hand wash basin
3. KS	C. sink
4. MH	D. ki*tchen sink*
5. HWB	E. wa*ter close*
	F. water ha*ter*

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

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

Operation Sheet 2	**Legend is locating on project drawings, and symbols and abbreviations are correctly interpreted**

Constructing electrical symbol using Auto CAD

Procedure:-

Step1. Prepare yourself for the work

Step2 Prepare all materials, equipments and tools which are needed for the work

Step3 Take the readings from Electrical Symbols

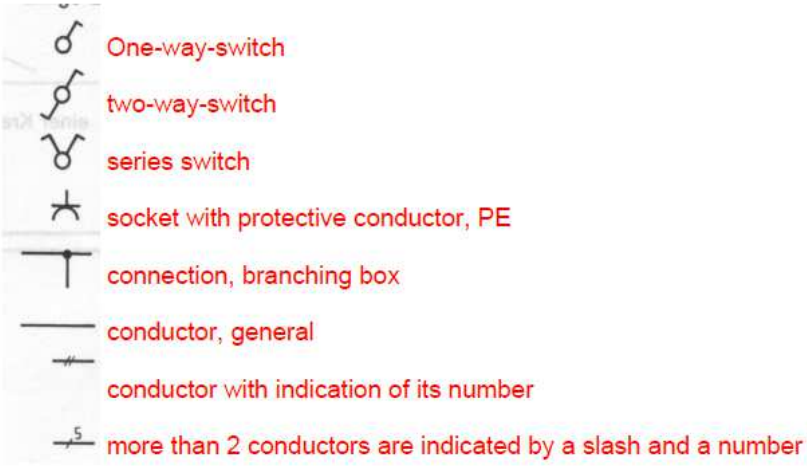
Step4 Set the computer and Auto CAD into operation

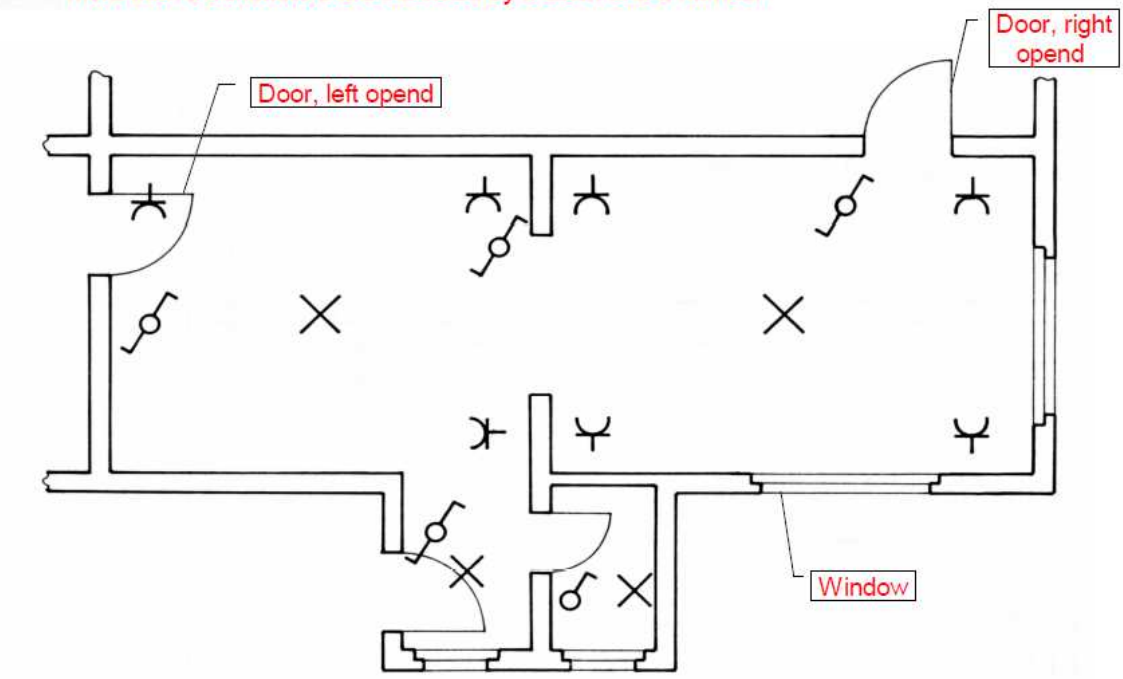
Step5 Construct electrical symbols in its proper location

Step6 Check your output and print for submission

Step7 Submit your output for checking

- Pr**oblem 1:**based on above steps sketch under the given questions and drawing with visual estimate


One-way-switch
two-way-switch
series switch
socket with protective conductor, PE
connection, branching box
conductor, general
conductor with indication of its number
5
more than 2 conductors are indicated by a slash and a number


Door, right opend
Door, left opend
Window

LAP Test 2	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks with in **3** hour

Task 1 Constructing electrical symbol using Auto CAD

Referees

https://www.youtube.com/watch?v=n4UiPAUDfaY

Building Electrical Installation

Level II

Learning Guide-17

- **Unit of Competence:** Read and Interpret Plans and Specifications
- **Module Title:** Reading and Interpreting Plans and Specifications

LG Code: EIS BEI2 M05 LO 4 –LG-17

TTLM Code: EIS BEI2 TTLM 0919V1

LO: 4 Locate and identify key features on a site plan

Instruction Sheet	Learning Guide #17

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

- achieving Orientation of site plan
- Identifying and locating Key features of the site
- identifying access to site, main features, contours and datum

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**:

- achieve Orientation of site plan
- Identify and locating Key features of the site
- Identify access to site, main features, contours and datum

Learning Instructions:

13. Read the specific objectives of this Learning Guide.
14. Follow the instructions described below 3 to 6.
15. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3.
16. Accomplish the “Self-check 1, Self-check 2, Self-check 3 **in page -61, 64 and 67** respectively.
17. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 3 ” **in page -68.**
18. Do the “LAP test” **in page – 69** (if you are ready).

Information Sheet-1	achieving Orientation of the Site plan

1.1. Introduction of Site plan.

A construction site plan, also known as a “construction blueprint” or just “blueprint” is a 2-D drawing (or a set of 2-D drawings) that illustrate all of the details of a construction project. A comprehensive construction site plan should include the following:

- Dimensions of the construction site, the building that will be constructed and rooms inside the building.
- Parts that will be used in the construction process, often represented by special symbols in the legend.
- The location of the construction site, the layout of the building, how rooms will be oriented, and where parts and materials will be used on the construction site.
- Notes indicating what materials will be used for various applications on the job site.
- Topographical information about the construction site, identifying any hills, slopes or valleys that could impact construction
- A demolition plan, which describes what structures or features on the construction site must be demolished before the site can be graded for construction.
- A site utility plan that illustrates the location of existing utility services to the construction site describes how they will be protected during construction and establishes how the new building will connect to existing utilities infrastructure.
- An indication of where the foundation for the building will be dug and poured.

Contractors often require more information about a construction site than an architect or designer could reasonably fit into a single drawing. For this reason, the project design team typically produces a set of construction site plans and architectural drawings pertaining to a specific project and indexes them so that they can be easily referenced by the contractor, project manager, and other stakeholders

A site plan is a large scale drawing that shows the full extent of the site for an existing or proposed development. Site plans, along with location plans, may be necessary for planning applications. In most cases, site plans will be drawn up following a series of desk studies and site investigations.

Typically, depending on the size of the project, site plans are likely to be at a scale of 1: 500 or 1: 200. However, for very small projects, larger scales may be used, and for large projects smaller scales, or even several drawings, perhaps pulled together on one very small scale plan

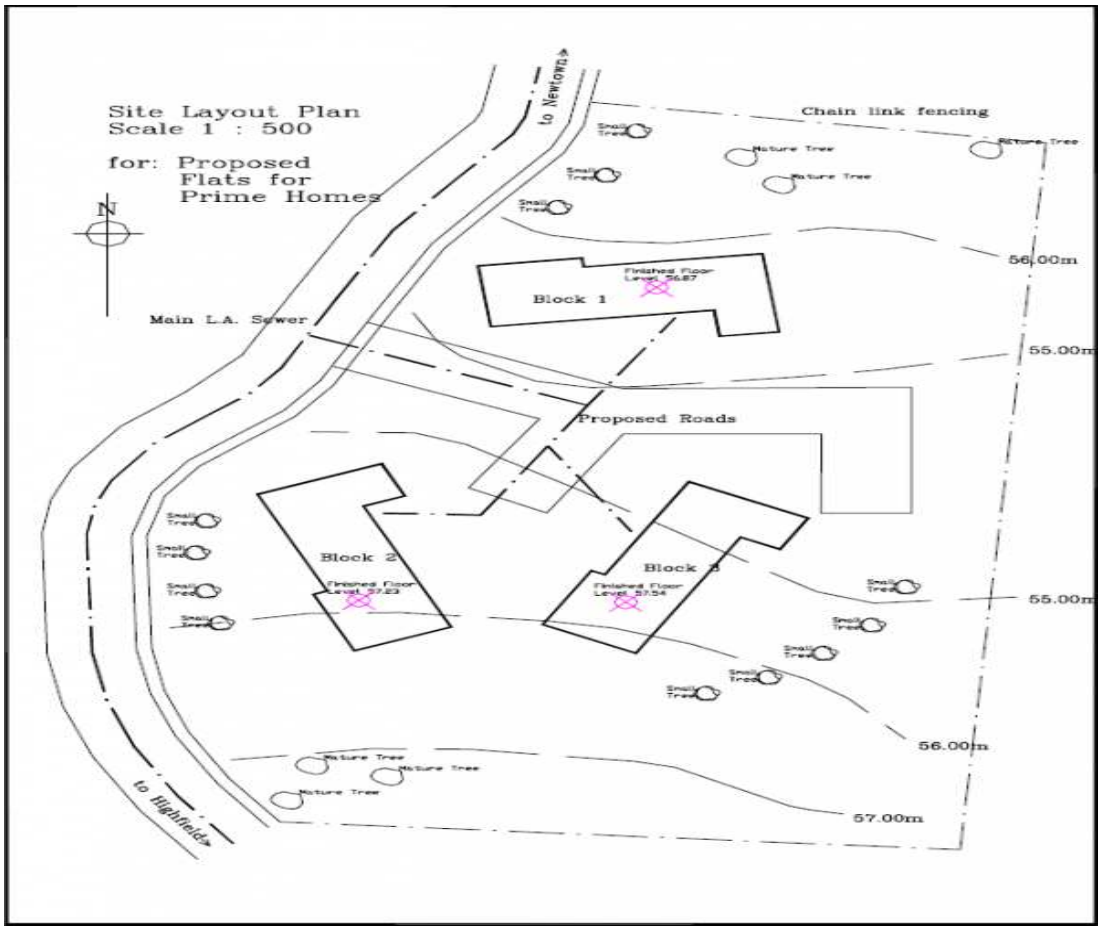
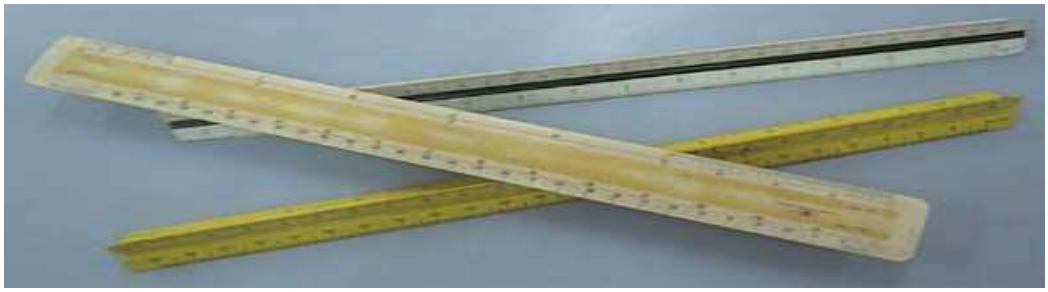


Fig1. 1 sit plan

Scale

Scale is depicted as a ratio. An example is 1:10, which is spoken as ‘one to 10’ or ‘one in 10’. This means that at that scale, each millimeter on the drawing represents the 10 millimeters on the building. The scale of a drawing is chosen so that it can show the builder sufficient detail for the building to be constructed the way the architect or designer wants.

Interpreting scaled drawings you should always use the written dimensions when getting sizes from drawings, unless there's a very good reason not to. On a well-drawn set of drawings, all the sizes the builder needs will be written somewhere on the drawings. Occasionally, however, if a required dimension is not written, the tradesperson will need to 'scale' from the drawing. This means that a scale rule is used to measure directly from the drawings.



Fg 1.2. Scale

Using a scale rule

Scale rules are usually white and made of plastic. They have a different scale printed along each edge. Some have a single scale per edge, and others have two scales combined on one edge. Different brands may vary in the way the scales are grouped. A scale rule can be triangular shaped or flat, like a standard ruler. On the top edge of the rule below, the scales are 1:1 and 1:100, so the dimensions they show differ by a factor of 100

Self-Check -1	Written Test

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

1. what is site plan ?(2 point)
2. What is 1:150 in drawing and building relation? (3 point)

Note: **Satisfactory rating – 2.5 and 5 point Unsatisfactory - below 2.5 and 5 points**

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

Information Sheet-2	. Identifying and locating ,Key features of the site

2.1. Definition of Identifying and locating ,Key features of the site

Being able to locate the key elements on a plan is critical for the success of your building construction. The plan will indicate all the critical information required. These elements may be pictorial, or shown via notes or abbreviations. You will need to pay attention to all of these elements to be able to properly read and interpret plans. This topic will help you develop the skills and knowledge to enable you to:

- ✓ identify a building site from location drawings
- ✓ identify true north and building orientation from details provided on the site plan
- ✓ identify and locate key features on a site plan

2.2. Locations of the site

A site location plan should contain: A 1:1250 or 1:2500 scale. A red line marked up to show where planning is sought, or with a blue line to show any other property owned on the plan. A larger area of land than a 'block plan' (sometimes called a 'site plan'). The general locality of a site requiring planning consent.

Generally, a site plan should show:

- All existing and proposed structures on the allotment
- Easements, rights of way, driveways, vehicle access points, location of any watercourse on the property, any adjacent roads and streets
- Allotment boundaries (including dimensions in meters)
- Approximate north point and scale

Site plans are usually drawn at a scale of not less than 1:200.

2.3. SitePlan

A site plan allows us to:

- Calculate the area and site coverage of the proposed development.
- Calculate the distance from the boundaries to the development.
- View the contours that may be imposed on the land in question.
- View the driveway, storm water drainage, paths, easements and right of carriage
- Identify features that must be preserved e.g. trees, rocks, existing structures

2.3 Key features of the site

- A site plan is a scaled drawing which shows the uses and structures proposed for a parcel of land. It also includes information concerning the landscape features of a given parcel.
- Site plans are intended to show how the intended land use relates to the features of a parcel and its surrounding area.
- site is (obsolete) sorrow, grief or site can be the place where anything is fixed; situation; local position; as, the site of a city or of a house while location is a particular point or place in physical space

Self-Check -2	Written Test

Directions: chose the following question for the given alternator Answer all the questions listed below.

1. Which one is true sitatment about a Site Plan?(3point)
   A. A site plans us to calculate the area and site coverage of the proposed development.
   B. A site plans us to Calculate the distance from the boundaries to the development.
   C. A site plans us to View the contours that may be imposed on the land in question.
   D. all
2. Which one is true sitatment about features of the site?(3point

A. A site plan is a scaled drawing which shows the uses and structures proposed for a parcel of land

B. A site plan is **not** includes information concerning the landscape features of a given parcel.

C. A site plan is **not** a scaled drawing which shows the uses and structures proposed for a parcel of land

D. all sitatment are true

Note: **Satisfactory rating - 3 and 6 points** **Unsatisfactory - below 3 and 6 points**

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

Information Sheet-3	identifying main features of gained and services

3.1. identifying main features of gained and services

3.1.1. Plumbing lines (sewerage and supply& electrical and telephone lines) Services

Before starting work, the OSHA (occupational health safety authority) standard requires you to do the following:

- Determine the approximate location of utility installations sewer, telephone, fuel, electric, and water lines; or any other underground installations;
- Contact the utility companies or owners involved to inform them of the proposed work within established or customary local response times
- Ask the utility companies or owners to find the exact location of underground installations. If they cannot respond within 24 hours (unless the period required by
- If your excavation work exposes underground installations, requires you to protect, properly support, or remove them.
- Excavating without checking for underground services is extremely unsafe. Legislation exists to provide a level of safety for the individual and the assets.
- Before beginning any excavation work, reference shall be made to the details or plans of the utility or private services in the proposed excavation area.
- The location of underground services provided by a service or utility provider may not be accurate for many reasons.

3.1.2. Building Services.

Water supply, drainage, sanitation, electric supply lifts, external works, construction of cupboard, etc. are considered as items outside of civil works and are called building services. Water supply, drainage, and sanitation (building service). These works are considered separate from civil works and are also estimated separately. Design and details of these will be studied in public health engineering under building services. However, an elementary treatment of the subject is always included in basic building construction.

3.1.3. Electrical works (building service).

Lighting and supply of electricity for various pieces of equipment used in buildings also come under building services. The supply and distribution of electricity in a building is a specialized work to be carried out by an electrical engineer. However, the basics of these works are also usually dealt with in

Self-Check -3	Written Test

Directions: chose the following question for the given alternator Answer all the questions listed below.

1. Which one is the following used to sanitation building service Fischer ?(2pon**t**)
   A. water close B. sink C. man hole D. all
2. Which one is the following used to electrical building service equipment?(2pon**t**)
   A. water close B. sink C. Three way switch D. all

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

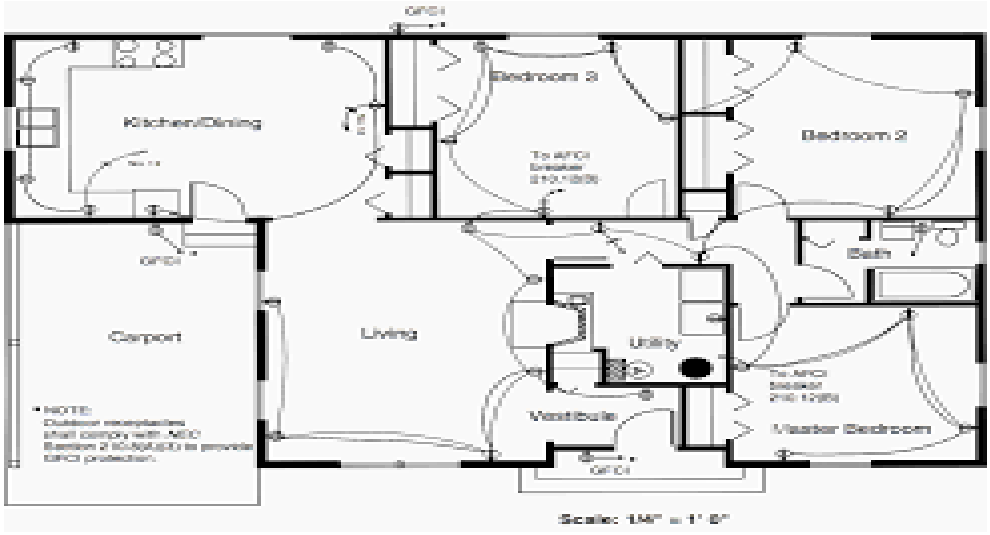
You can ask you teacher for the copy of the correct answers.

Operation Sheet 3	identifying main features of gained and services

Topic Read the plan and gives the services to the building electrical installation

Procedure:-

Step1 Prepare all materials, equipments and tools which are needed for services.
Step2 Prepare yourself for the work
Step3 read the electrical plan of the building
Step4 notify the electrical installation of the building
Step5 test the connection of the electrical installation
Step6 dismantle the erred electrical installation
Step7 Check the circuit out put
Step8 reconnect the circuit with the reference of the site plan
Step9 Check your output



LAP Test 3	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary constriction plan you are required to perform the following tasks with in **3** hour

Task 1 Reading the plan and give the services to the building electrical installation

Building Electrical installation
Level II

Learning Guide-18

- **Unit of Competence:** Read and Interpret Plans and Specifications
- **Module Title:** Reading and Interpreting Plans and Specifications

LG Code: EIS BEI2 M05 LO 5-LG-18

TTLM Code: EIS BEI2 TTLM 0919V1

LO 5: Identify project requirements

Instruction Sheet	Learning Guide #18

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

- Identifying Dimensions for project and nominated locations
- Identifying types Construction and dimensions for nominated locations
- Identifying Environmental controls and locations.
- Identifying Location, dimensions and tolerances for ancillary works

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

- Identify Dimensions for project and nominated locations
- Identify types Construction and dimensions for nominated locations
- Identify Environmental controls and locations.
- Identify Location, dimensions and tolerances for ancillary works

Learning Instructions:

19. Read the specific objectives of this Learning Guide.
20. Follow the instructions described below 3 to 6.
21. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
22. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” **in page -74, 79, 82 and 84** respectively.
23. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 3” **in page -85.**
24. Do the “LAP test” **in page – 87** (if you are ready).

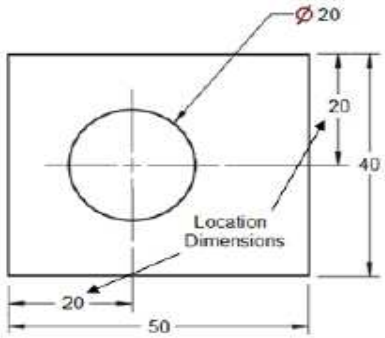
Information Sheet-1	identifying Dimensions for project and nominated locations

1.1. Dimension for project

Dimensioning is the process of defining the size, form and location of geometric features and components on an engineering drawing.

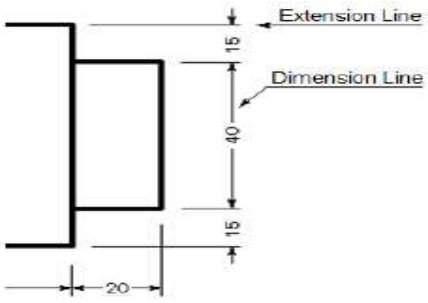
Before an object can be built, complete information about both the size and shape of the object must be available. The exact shape of the part or assembly is shown by the different views in the drawing sheet. Dimensions are added to the two-dimensional views (*not to the 3D view*) in the drawing sheet such that it will show all the size and location details of the part.

- In metric drawings, generally, dimensions are in millimeters. To avoid having to specify '**mm**' after every dimension, a label such as **'all dimensions in mm**' or '**unless otherwise stated all dimensions are in mm**' is usually contained in the title block.
- If the dimension is_less than one a leading zero should be used before the decimal point (e.g., **0.5**).
- Dimensions used in drawings can be categorized as:
- ***Size dimensions*** - define size of features (*radius, diameter, length, width, thickness, etc*).
  - ***Location dimensions*** - define location of part features (*such as holes*



Dimension Lines and Extension Lines

Extension (or Projection) lines are used to indicate the extremities of a dimension. They are generally drawn up to 1 mm from the outline of the object.



Dimension lines are used to label a particular dimension. They have one or more arrowheads

- Dimensions are usually placed between extension lines. But when there is no enough room to accommodate the dimension, either the dimension value or the dimension lines can be located the outside extension lines as illustrated

Types of Dimensions

Dimensions may be divided into three different types; Linear dimensions, Angular dimensions, and Leader dimensions.

- ***Linear Dimensions*** - they are either horizontal or vertical to the dimensioning plane.
- ***Angular Dimensions*** - they are usually specified in decimal degrees (e.g., **27.5°**). Also they can be specified using degrees and minutes or degrees minutes and seconds (e.g., **27°30'** or **0°15'40"**).
- ***Leader Dimensions*** - they are usually used to specify a diameter or a radius where a leader line is used to point towards the feature being dimensioned.

1.2. nominated locations for project

It shows the relationship of the property to adjoining properties. It establishes discrepancies between actual occupation or use and the description of record. It indicates the location of physical improvements in relation to the property lines.

A location is the place where a particular point or object exists. A place's is its exact place on Earth, often given in terms of latitude and longitude absolute location. For example, the Empire State Building is located at 40.7 degrees north (latitude), 74 degrees west (longitude).

Location is the position of an place, relative or global. An area is a region or part of a town, world, etc. surrounding a place or an event. A site is a place on which you build a building, a small town, etc or some event might be taking place

Site selection indicates the practice of new facility location, both for business and government. Site selection involves measuring the needs of a new project against the merits of potential locations

Self-Check -1	Written Test

Directions: mach the following question from column A to column B (2point each)

1. Leader Dimensions	A. horizontal or vertical
2. Angular Dimensions	B. degreesminutes
3. Linear Dimensions	C. latitude
	D. point

Note: **Satisfactory rating – 3 and 6 points** **Unsatisfactory - below 3 and 6 points**

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

Information Sheet-2	**identifying types Construction and dimensions for nominated locations**

1.1. What is Construction?

Construction comes from the word 'construct,' which means 'to build.' Building a sand castle, a fort out of pillows, or a house of cards are all examples of constructing something. In engineering terms, construction is usually associated with large structures like houses, railways, and power plants.

In terms of engineering, construction is the activity of putting together different elements, using a detailed design and plan, to create a structure for a certain location. When you construct large structures, you need to have a clear plan of how you are going to do that. You also need to know the specific location. Architects and engineers design and build the structure with that location in mind.

1.1.1 Types of Construction

Almost all construction projects can be broadly categorized into one of three types of projects:

- buildings and houses
- public works
- industrial-type structures

Within each of these types of construction, there are lots of sub-categories. For instance, buildings include both residential homes and commercial skyscrapers. Building projects may involve renovations on existing buildings or building from scratch. Public works involve roads, railways, water and waste water distribution and purification systems, damns, and bridges. Finally, industrial projects include refineries, pipelines, power utilities, manufacturing plants, and telecommunication infrastructure.

1.1.2 Types of Construction Specifications

Owners, architects, and designers must be specific about the work needed on a project. If you communicate what needs to be done poorly, it can result in huge delays, change orders, and rising costs. The construction industry created a process to ensure that construction specifications communicate project needs efficiently. This process consists of 3 types of construction specifications that help detail the workflow.

2. What are Construction Specifications?

Construction specifications, also called specs, are the details for the work that needs to be completed in a construction project. These details include information such as materials, the scope of work, installation process, and quality of work. Subcontractors and teams use these specs as a guide to choose the right materials for the specific project. The specs discussed between the project owner and the contractor become a part of the legal documents for the project.

Architects or designers create construction specifications before work actually starts. But many involve project engineers for technical help. In every construction project, there are three types of construction specifications. The three types of construction specifications are prescriptive, performance, and proprietary.

1. Prescriptive Specifications

the three types of construction specifications, prescriptive specs focus on the details for the types of materials used and the installation of said materials. Architects or engineers tend to take over the job of project design in prescriptive specs. Prescriptive specs give a better image of what the final product will look like compared to other specs.

Prescriptive specs can be broken up into three separate parts: general, products, and execution. General consists of information such as national quality standards, product handling, design requirements, and keeping quality control. The products phase will go over the different products necessary for each task as well as the individual performance levels of each product. The execution phase will go over how to prepare materials and go through with installing them. This process also involves testing the quality of the materials and checking if they were installed correctly.

2. Performance Specifications

After prescriptive specs come performance specs. Performance specs discuss the operational requirements of a project. It details what the final installed product has to be capable of doing. In this phase, the owner or general contractor doesn't give a subcontractor specs detailing how to finish the job. Instead, designers and architects give contractors details on how the final product has to work in this phase. For example, a contract asks the team to make a pump that pumps 300 gallons per minute. There are no directions on how to make the pumping system go that fast, so it is up to the contractor to figure it out.

Of the three types of construction specifications, this phase involves most of the testing to make sure a project meets all of its operational requirements. The architect or engineer describes the project outcome, and trusts the trade contractor's experience to get there. Since the contractor has to figure out what to do, decisions about materials and strategy move away from the architect and engineers and shift towards the contractor.

3. Proprietary Specifications

Proprietary specs are used when you need to use a single type of product for any kind of installation. These are the least common of the three types of construction specifications, but they are for jobs involving existing equipment and already completed installations. When the owner or client wants to be consistent with their materials or just prefers a specific type of material, use proprietary specs. Contractors use proprietary specs when their section of the project is dependent upon the performance of a specific product.

Architects and engineers tend to try and avoid proprietary specs because it can lead to promoting a specific manufacturer. Favoring a manufacturer can discourage competition during the bid phase of the project, which may increase the total cost of the project. Architects and engineers will give the contractor a list of reliable suppliers to choose from to stop.

1.2 Dimensions and nominated locations.

Dimensions are a very important part of construction drawings. Without them, no-one would know what size anything should be. In this section, we'll look at some of the different types of dimensions and how they are shown in drawings.

A good designer or draftsperson will make sure that a drawing has all the information needed about the length, width and height of everything that is to be built. Length and width are usually indicated with rows of 'dimension lines' that align with the various features of the drawing. Alternatively, there might be a note near the feature – for example, '830 wide × full height opening'

Door & Window Schedule		
Dimensions stated as Nominal only. Glazing Design Wind Speed: 41m/s All doors treated with weather seals all round		
Item	***Glass***	***Specification***
W1	S	1000 x 1600 Timber Awning
W2	S	1000 x 600 Timber fixed vented & obscure (Toilet Window)
W3	S	1000 x 2400 Timber double hung
W4	S	1500 x 1000 Timber Double Hung (Repositioned Existing Window)
W5, 6 & 11	S	1500 x 1000 Timber double hung
W7	DG	2100 x 900 Timber Awning
W8	S	2400 x 500 Timber Hopper
W9	GB	2100 x 700 Glass Block
W10	GB	1500 x 2000 Glass Block
W12	TDG	1800 x 3100 Timber Gable Hopper
D1 & 2	S	2040 x 820 Glazed Timber External
D3	NA	2040 x 820 Flush Panel Cavity Slider
D4 - D9	NA	2040 x 820 Colonial Timber Internal
GD1	S	2150 x 2000 Glazed Timber External
GD2	DG	2150 x 3100 Glazed Timber Bifold External
GD3	DG	2040 x 1800 Glazed Timber External Door & Awning Window
GD4	DG	2040 x 1800 Glazed Timber External
GD5	S	2040 x 2400 Glazed Timber French Doors with Awning Sidelights
GD6	S	2150 x 2500 Glazed Timber French Doors with Awning Sidelights
GD7	S	2040 x 2400 Solid Timber Entrance Door with Awning Sidelights
Glass Codes	S DG TDG	Single 5mm Double Glazed min 3-6-3 Toughened Double Glazed

Table 2.1 **Dimensions and nominated locations**

Self-Check -2	Written Test

.**Directions:** chose the following question for the given alternator Answer all the questions listed below.

1. -------are used when you need to use a single type of product for any kind of installation.

   A. Prescriptive Specifications C. Construction Specifications

   B. Performance Specifications D. Proprietary Specifications

2. Which one is **not** include types of construction specifications

   A. Prescriptive Specifications C. Performance Specifications

   B. Construction Specifications D. Proprietary Specifications

Note: **Satisfactory rating - 3 and 5 points** **Unsatisfactory - below 3 and 5 points**

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

Information Sheet-3	Identifying Environmental controls and locations

3.1. Environmental controls

On large sites, it is normal to divide the areainto segments. Afor each segment. Segment bound ariesare selected on the basis o f natural features, the placement of sub-catchments, or association with different contractors.

A number of elements of the plan will be thesame for each segment, such as hours of operation and controls on noise and emissionsfrom vehicles. However, each segment mayrequir e area-specific controls.

The controls are taken from the action planarising out of the ris management process

The main components of a segment environmental control plan are as follows

- ***Work scheduling***

Actions taken to reduce or avoid environmentalimpact by rescheduling works, or prohibiting or limiting certain activities from times of the year when unfavourable climatic conditions exist, should be stated.

- ***Land disturbance***

Map the existing topography and changes to the landform of each segment, as construction progresses. The map should identify critical areas fo protection which may be easily erodible, such as highly erodible soils, steep slopes, haul roads, or bare areas

*Soil stockpiles and batters*The plan should address how stockpi les and batters are to be managed.

3.1.1 Waste management

Waste materials that may be generated during demolition and construction include concrete, steel, aluminium, plasterboard, bricks and tiles, plastic andglass.

Effective construction planning can minimise the production of waste, and appropriate storage of wastes – particularly suitable source separation of waste materials – can greatly improve recycling rates and potentially lower disposal fees.

The waste management hierarchy[9] provides a framework to maximise the useful life of materials when waste cannot be avoided. Waste from construction and building sites should be managed in accordance with the waste management hierarchy.

3.2. locations

Location is the position of an place, relative or global. An area is a region or part of a town, world, etc. surrounding a place or an event. A site is a place on which you build a building, a small town, etc or some event might be taking place

Site selection indicates the practice of new facility location, both for business and government. Site selection involves measuring the needs of a new project against the merits of potential locations

Self-Check -3	Written Test

Directions: Give short Answer all the questions listed below.

4. What is environmental controls?(3 point)
5. What is waste management? (2 point)

Note: **Satisfactory rating – 2.5 and 5 points** **Unsatisfactory - below 2.5 and 5 points**

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

Information Sheet-4	identifying Location, dimensions and tolerances for ancillary works

4.1. Locations

It shows the relationship of the property to adjoining properties. It establishes discrepancies between actual occupation or use and the description of record. It indicates the location of physical improvements in relation to the property lines.

A location is the place where a particular point or object exists. A place's is its exact place on Earth, often given in terms of latitude and longitude absolute location. For example, the Empire State Building is located at 40.7 degrees north (latitude), 74 degrees west (longitude).Location is the position of an place, relative or global. An area is a region or part of a town, world, etc. surrounding a place or an event. A site is a place on which you build a building, a small town, etc or some event might be taking place

Site selection indicates the practice of new facility location, both for business and government. Site selection involves measuring the needs of a new project against the merits of potential locations

4.2. **Dimensions**.

Dimensions are a very important part of construction drawings. Without them, no-one would know what size anything should be. In this section, we'll look at some of the different types of dimensions and how they are shown in drawings.

A good designer or draftsperson will make sure that a drawing has all the information needed about the length, width and height of everything that is to be built. Length and width are usually indicated with rows of 'dimension lines' that align with the various features of the drawing. Alternatively, there might be a note near the feature – for example, '830 wide × full height opening'.

4.3. Tolerances

The general tolerances entered in the supplementary portion of the Title block shall control all dimensions applied to the drawing, except those specifically labeled "Max," "Min," "Ref," "Datum," or "Basic," or dimensions having tolerances applied directly thereto, or dimensions controlled by notes or documents invoked on the drawing. General tolerances may be changed to the prevalent tolerances that are required by the drawing type. This is done by striking through the tolerance and inserting the new tolerance beneath the old. In the case where metric tolerance is required,

Self-Check -4	Written Test

Directions: I. chose the following question for the given alternator Answer all the questions listed below.

1. -------is a very important part of construction drawings? (3 point)

A. Dimensions B. Tolerances C. Locations D. environmental

II. Give short Answer all the questions listed below

2. What is a tolerance? (3 point)

Note: **Satisfactory rating - 3 and 6 points** **Unsatisfactory - below 3 and 6 points**

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

Operation Sheet 1	identifying Dimensions for project and nominated locations

Techniques for Free hand sketch and orthographic projection drawing:

Procedure:-

Step1: Prepare drawing instruments and materials

Step 2: Clean the drawing table surface.

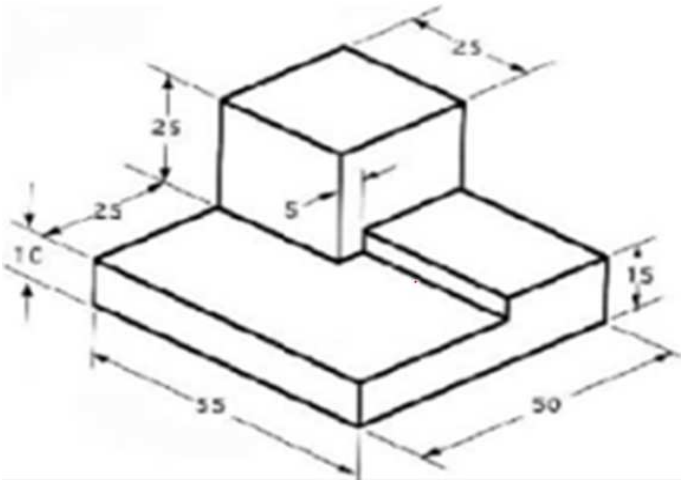
Step 3: Properly attach drawing paper on the drawing board

Step 4: Prepare drawing boarder line and title block

Step 5: Draw the given drawing without instrument by free hand sketch based on First problem

Step 6: Draw the given drawing with proper instrument based on second problem

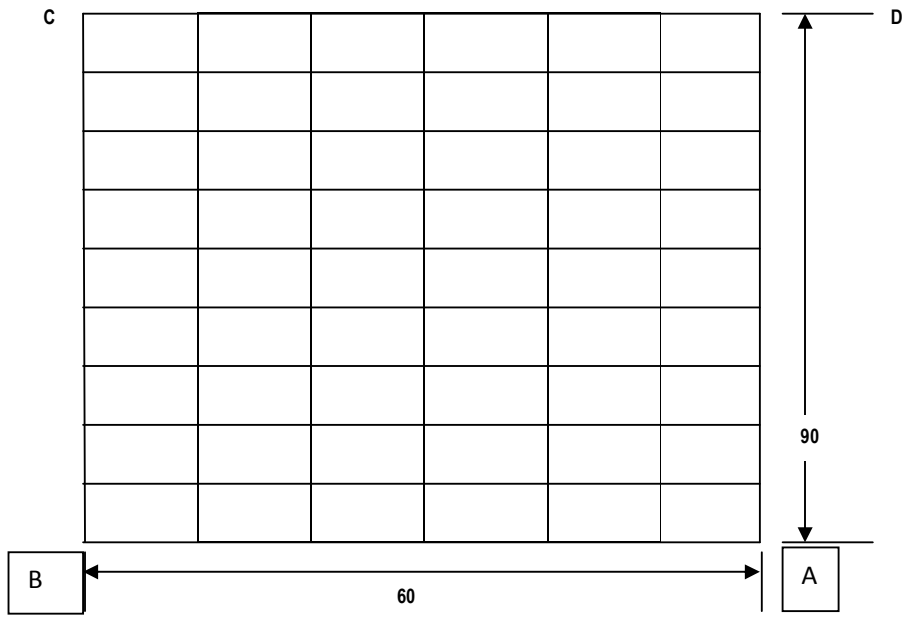
Step 7: clean the drawing workshop room



❖ Pr**oblem 1:** based on above steps sketch under the given questions and drawing with visual estimate.

Problem- 2 based on above steps **draws** the following three-dimensional drawing changes to orthographic Projection drawing by first angle projection

- Line A-B is divided into 6 equal parts.
- Line A-D is divided into 9 equal parts.



NOTE: - All measurements are in “mm”

LAP Test 1	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks with in **7** hour.

Task 1 Free hand sketch and orthographic projection drawing

Building Electrical installation

Level II

Learning Guide-19

- **Unit of Competence:** Read and Interpret Plans and Specifications
- **Module Title:** Reading and Interpreting Plans and Specifications

LG Code: EIS BEI2 M05 LO6-LG-19

TTLM Code: EIS BEI2 TTLM 0919V1

LO6: Read and interpret job specifications

Instruction Sheet	Learning Guide #19

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

- Identifying specifications, drawings, notes and descriptions.
- identifying Standards, finishes and tolerances of project specifications
- identifying Material attributes specifications

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

- Identify specifications, drawings, notes and descriptions.
- identify Standards, finishes and tolerances of project specifications
- Identify Material attributes specifications

Learning Instructions:

25. Read the specific objectives of this Learning Guide.
26. Follow the instructions described below 3 to 6.
27. Read the information written in the information “Sheet 1, Sheet 2 and Sheet 3.
28. Accomplish the “Self-check 1, Self-check t 2 and Self-check 3 **page -93, 97 and 99** respectively.
29. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, **in page -100.**
30. Do the “LAP test” **in page – 101** (if you are ready).

Information Sheet-1	identifying specifications, drawings, notes and descriptions

1.1 specifications

Drawings are the best way to convey most of the information required for a building project, but a specification is needed to explain anything that cannot be included clearly in the drawings. Specifications are commonly used to communicate the following.

- Fixture and fittings to be used, where things like dimensions, color or model number are important – for example 'Acme 'De Luxe claw foot bath, 1675mm, white'.
- To provide instructions to the builder or trades people for how something is to be done. For example, drawings might show that internal walls are to have a plaster finish, but it is the specification that tells the plasterer how – 'bring walls to a reasonable flat surface by the application of a cement render float coat while the plaster is setting'.
- To provide instructions to the builder about things that may not be part of the finished building but that nevertheless need to happen during the project – for example, safety barriers, disposal of rubbish or protection or adjoining properties. Specifications usually include a clause about making good any damage to footpaths, fences and any other amenities in the vicinity of the project. There will also be a clause that deals with the general quality of the materials and workmanship to be used. This usually reads something like: All materials are to be new and of best quality and all work is to be carried out to best practice and to the relevant Australian Standard where one applies

Specifications used to draw the building drawing

The specifications of the building components which are commonly followed in small residential and office building construction are given below:

Minimum Sizes

No Description Minimum Sizes

1. Drawing room or living room 16m2
2. Bed rooms 12m2
3. Kitchen 8m2
4. Bath room 2.6m2
5. W.C 2m2
6. Bath and W.C. 5.50m2
7. Lobby, passage etc 1.00m wide
8. Window are 1/10th, floor area excluding doors
9. W.C., bath rooms and 10% of floor area.

1.2. Drawing.

The building of any structure is described by a set of related drawings that give the Builder a complete, sequential, graphic description of each phase of the construction process. In most cases, a set of drawings begins by showing the location, boundaries, contours, and outstanding physical features of the construction site and its adjoining areas. Succeeding drawings give instructions for the excavation and disposition of existing ground; construction of foundations and superstructure; installation of utilities, such as plumbing, heating, lighting, air conditioning, interior and exterior finishes; and what ever else is required to complete the structure.
The engineer works with the architect to decide what materials to use in the structure and the construction methods to follow. The engineer determines the loads that supporting members will carry and the strength qualities the members must have to bear the loads. The engineer also designs the mechanical systems of the structure, such as the lighting, heating, and plumbing systems. The end result is the architectural and engineering design sketches.

- **Types of drawings**

There are many types of construction drawings. These drawings are all necessary for a building to be built correctly.

The main types of drawings are

- architectural,
- engineering,
- electrical,
- hydraulic and mechanical

Fg 1.1 electrical drawing

1.2.1 Drawings specifications

All drawings require annotation describing the elements or identifying the components. As these descriptive notes and words must be clearly understood, it is essential to aim for legibility if they are hand written, which means taking time to:

- Form and shape each individual letter.
- Space letters and words correctly.
- Arrange the text to help the end user.
- Arrange the text in hierarchical context.

To help achieve clarity of specification, stencils and dry letter transfers are available. When using CAD, take the time to select a clear and suitable font. Fonts like Comic Sans should never be used on any formal documents, signage, publications or drawings.

1.2.2. Bill of quantities

The bill of quantities which is, first, a vital tender document, then a contract document – should be an accurate description and quantification of the project. There should therefore be a cross-reference to the tender drawing and architect's notes or specifications

1.3. Notes and descriptions

Information other than pictorial views and dimensions necessary for completing a drawing is classified as “notes.” The two types of note forms are General Notes and Local Character Notes. Notes on a drawing take precedence over specification requirements; hence, notes conflicting with referenced specifications shall not be placed on a drawing unless they are necessary for deviations from certain provisions of the specification.

Self-Check -1	Written Test

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

1. Which of the following is, first, a vital tender document, then a contract document?(1 point)

A. Notes B. descriptions C. Vertical members D. Diagonal members

2. Which one of the following **not** includes construction drawings? (1 point)

A. architectural B. Outside-wall

C. engineering D. electrical

3. Which one is **not** correct to mach *description minimum sizes* building construction (1 point)

A. Bed rooms 12m2 C. Bath room 2.6m2

B. Kitchen 8m2 D. Bath room 2.9m2

Note: **Satisfactory rating – 2.5 and 5 points Unsatisfactory - below 2.5 and 5 points**

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

Information Sheet-2	identifying Standards, finishes and tolerances of project specifications

2.1. Introduction

A specification is a written description of the building to be constructed. It supplements the information on the drawings and, like the drawings, it is a legal part of the contract between the client and the builder. A specification might only be a few pages long for a small project such as an addition to a house, or it might be a multi-volume set of bound books for a big project such as a shopping mall or high-rise building. For a large commercial or industrial project there may be a specification for the architectural features, and additional specifications for the plumbing, electrical and mechanical requirements of the job. For house construction, one specification booklet is usually sufficient.

2.2. Standards of project specifications

Drawings are the best way to convey most of the information required for a building project, but a specification is needed to explain anything that cannot be included clearly in the drawings. Specifications are commonly used to communicate the following.

- Fixture and fittings to be used, where things like dimensions, colour or model number are important – for example ‘Acme ‘De Luxe clawfoot bath, 1675mm, white’.
- To provide instructions to the builder or trades people for how something is to be done. For example, drawings might show that internal walls are to have a plaster finish, but it is the specification that tells the plasterer how – ‘bring walls to a reasonable flat surface by the application of a cement render flaot coat while the plaster is setting’. Instructions can also relate to regulations – ‘all lintels shall be galvanised treated, in accordance with BCA Clause 3.3.3.4’.
- To provide instructions to the builder about things that may not be part of the finished building but that nevertheless need to happen during the project – for example, safety barriers, disposal of rubbish or protection or adjoining properties. Specifications usually include a clause about making good any damage to footpaths, fences and any other amenities in the vicinity of the project. There will also be a clause that deals with the general quality of the materials and workmanship to be used. This usually reads something like: All materials are to be new and of best quality and all work is to be carried out to best practice and to the relevant Australian Standard where one applies.

Specifications include:

- Detail relating to materials and quality of work, quality assurance, nominated subcontractors, and provision of site access/facilities
- details relating to performance, including:
  - characteristics
  - material types
  - standards of work
  - tolerances
  - treatments and finishes

2.2.1. Finishes

Finishes are used in the final part of the construction or manufacturing process, forming the final surface of an element. They can protect the element they finish from impact, water, frost, corrosion, abrasion, and so on, and/or they can be decorative Decorative papers / fabrics. Edge fixed carpeting.

2.2.2. project specifications

specification when two or more classes, grades, materials, services, styles, or types of goods or services have a requirement, the covering specification is considered to be general.

Types of specification

These details include information such as materials, the scope of work, installation process, and quality of work. Subcontractors and teams use these specs as a guide to choose the right materials for the specific project. The three types of construction specifications are prescriptive, performance, and proprietary

2.2.3. tolerances of project specifications

Tolerances in construction are generally a variation in a dimension, construction limit, or physical char- act eristic of a material. They are a practical variation related to the function of the material or finished work and commonly accepted standards of the construction industry.

construction tolerances may be defined as the allowable deviation from specified or designed values. They primarily serve as a protection for both the "buyer" (building owner in construction) as well as the "seller" (the contractor in construction) of the product or service.

Tolerance is a range of how far a true measurement can range from what is intended. Physical tolerances specify the deviation from a specific dimension. Any dimension between

any two points can have a tolerance. Limits are a type of tolerance that specifies a different lower and upper deviation

- **Tolerance** is the total amount a dimension may vary and is the difference between the maximum and minimum limits.

Self-Check -2	Written Test

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

1. ------are used in the final part of the construction or manufacturing process, forming the final surface of an element(2point)

   A. Finishes B. specifications C. Tolerances D. project

2. ------- Is a written description of the building to be constructed.(2point)

   A. Tolerances B. specifications C. project D. Finishes

3. Which one is the following construction specifications include? (2point)

   A. performance B. project C. Tolerances D, Finishes

Note: **Satisfactory rating - 3 and 6 points** **Unsatisfactory - below 3 and 6 points**

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

Information Sheet-3	identifying *Material attributes* specifications

1.1 *Material attributes* specifications

Use the material attribute to describe the main fabric or material that your product is made of. For example, a high-heeled pump might be made out of leather, denim, or suede. This information helps create accurate filters, which users can use to narrow search results. If your product has variants that vary by material, then provide that information through this attribute.

How to use

Required for all products that vary by material

Optional for any products where material is an important, distinguishing feature

If the material is an important feature of your product, then submit this attribute. We especially recommend that you submit the `material` attribute if users might search for your product by material or if users might decide to buy your product based on the material.

Self-Check -3	Written Test

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

1. how to specify material in building electrical installation?(5pont)

Note: **Satisfactory rating – 2.5 and 5 points** **Unsatisfactory - below 2.5 and 5 points**

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

Operation Sheet 1	identifying specifications, drawings, notes and descriptions

Topic used to Specifications draw building drawing

Procedure:-

Step1: Prepare drawing instruments and materials

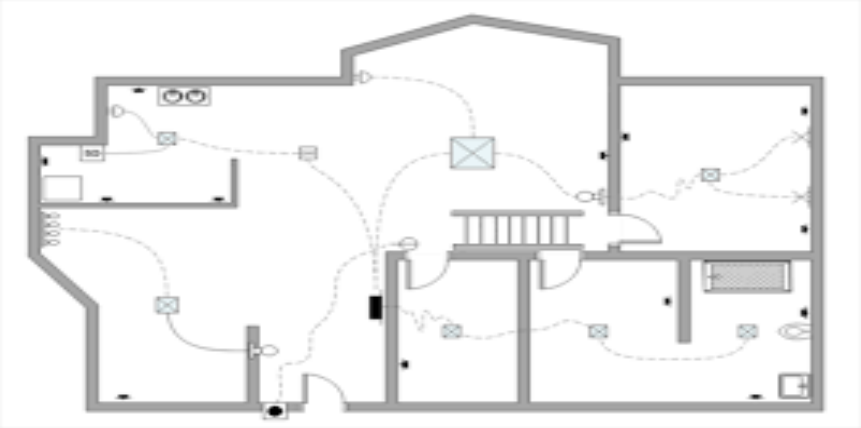
Step 2: Clean the drawing table surface.

Step 3: Properly attach drawing paper on the drawing board

Step 4: Prepare drawing boarder line and title block

Step 5: Draw the given drawing without instrument by free hand sketch

Step 6: to sue Specifications draw building drawing symbol



LAP Test 1	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks with in **2** hour.

Task 1. Used to Specifications draw building drawing

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