Finishing Construction Work Level II

Learning Guide-11

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

Module Title: Using Maps, Plans, Drawings And Specifications

LG Code: EIS FCW2 M04 LO2-LG-11

TTLM Code: EIS FCW2 M04 TTLM 0919v1

LO 2: Read and interpret engineering drawings and specifications.

Instruction Sheet	Learning Guide 11

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

- Identifying drawings, notes and descriptions.
- Identifying project specifications.
- Identifying Specifications related to particular mapping and planning.
- Identifying Product/system/component/item represented by the drawing.

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 drawings, notes and descriptions from Symbols, codes, legends and diagrammatic representations in the drawing are identified correctly with relevant personnel Job specifications.
- Identify Standards of work, finishes and tolerances from the project specifications.
- Identify Specifications related to particular maps, plans and quality standards.
- identify Product/system/component/item represented by the drawing correctly with relevant personnel.

Learning Instructions:

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

Information Sheet-1	Identifying drawings, notes and descriptions

2.1. Identifying drawings, notes and descriptions.

2.1.1. Drawings

Drawing is a language that can be learned and used like any other. There is course, drawing as related to art, where creative expression evolves a form unique to the particular artist. The results can be great inspiration and pleasure to those who view the finished artwork.

Before starting, manufacturing or construction work, product to be developed or plan of housing society firstly drawn on paper. The purpose of these drawings is to define actual shape and size of a particular object by means of lines and other useful information about the object.

Technical drawing - is the communication between the designer and the manufactures to bring ideas into reality by means of drafting

Definition should include technical drawing as the graphic representation of an object or a concept, using a universal language consisting of graphic symbols.

Technical drawing - is the communication between the designer and the manufactures to bring ideas into reality by means of drafting.

Every construction drawing or plan will follow a set of conventions. Conventions are the rules or standards that apply to ensure that drawings are readable and accurate.

Common conventions may include:

- Use of dimensions and elevations.
- Use of lines or sections and projections.
- Use of orientation.
- The scale applicable.
- Specific lettering and numbering.
- How materials and objects will be represent graphically.
- Relative size and shape, landscape features

- Use of symbols

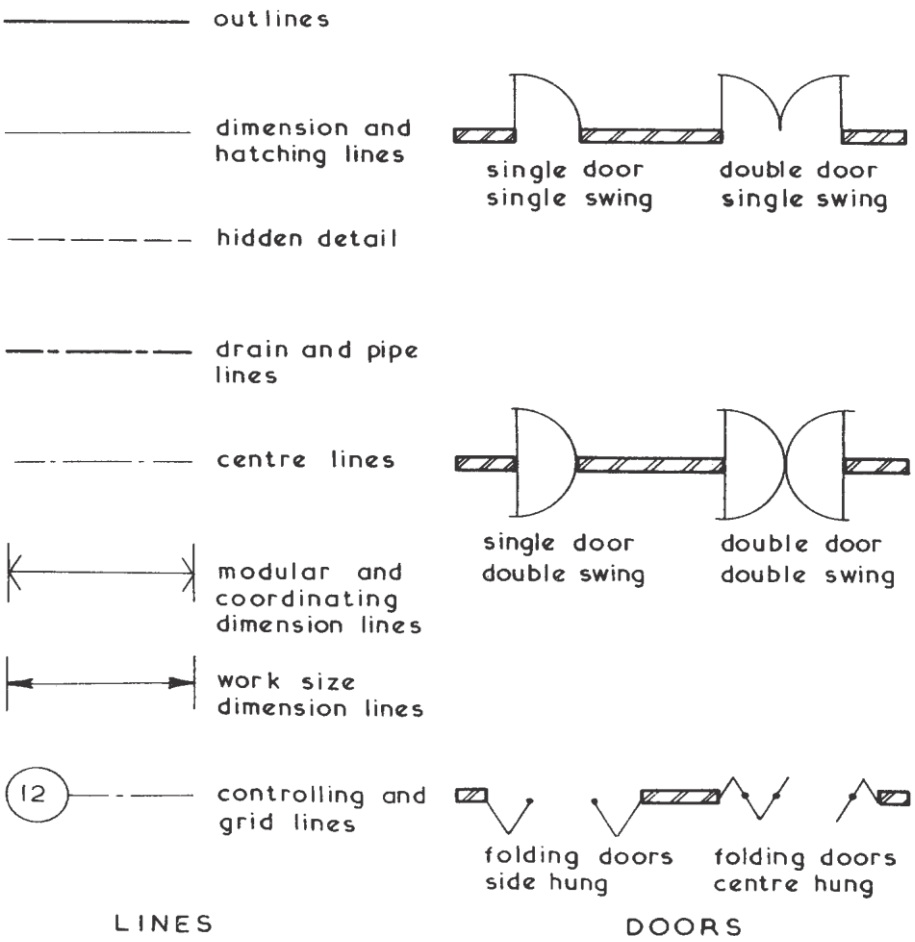
The conventions used are usually similar across civil projects with only minor differences in organisational style and terminology. Always check with a supervisor you are uncertain.

These are the principal means of communication between the designer, the builder and other parties to a contract.

Drawings should therefore be clear, accurate, contain all the necessary information and be capable of being easily read.

Design practices have their own established symbols and notations for graphical communication. Some of which are shown on this and the next pages Other guidance can be found

Typical Examples~



2.1.2. Notes

Notes are commonly found on plans and specifications to explain or details specific elements on the drawing. Notes may include instructions on materials, instructions for interpreting the plan or guidelines that will help you to complete the job.

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

Notes are generally placed a minimum of 3 inches below the Revision block on the right-hand side of the first sheet. The purpose of these notes is to give additional information that clarifies a detail or explains how a certain phase of construction is to be performed. You should read all notes, along with the specifications, while you are planning a project.

Notes should always be lettered horizontally in capital letters and begin above the leader line and may end below also. Further, notes should be brief and clear and the wording should be standard in form as shown in Fig. 3.42. The meaning of the notes in each case is given below:

S.No.	Note	Meaning/Instruction
1.	Φ 25 DEEP 40	Drill a hole of diameter 25 mm, to a depth of 40 mm.
2.	Φ 10 CSK Φ 15	Drill a through hole of diameter 10 mm and countersink to get 15 mm on top.
3.	4 holes, Φ 12 CBORE Φ 15 DEEP 8	Drill through hole of Φ 12 mm, counterbore to a depth of 8 mm, with a Φ 15 mm, the number of such holes being four.
4.	6 holes, EQUI-SP Φ 17 CBORE FOR M 16 SOCKET HD CAP SCR.	Drill a through hole of Φ 17 and counterbore to insert a socket headed cap screw of M 16. Six holes are to be made equi-spaced on the circle.
5.	KEY WAY, WIDE 6 DEEP 3	Cut a key way of 6 mm wide and 3 mm depth.

6.	KEY SEAT, WIDE 10 DEEP 10	Cut a key seat of 10 mm wide and 10mm deep to the length shown.
7.	U/C, WIDE 6 DEEP 3	Machine an undercut of width 6 mm and depth 3 mm.
8.	(a) DIAMOND KNURL 1 RAISED 30^{o}	Make a diamond knurl with 1 mm pitch and end chamfer of 30^{o}
	(b) M 18 X 1	Cut a metric thread of nominal diameter 18 mm and pitch 1 mm.
9.	(a) THD RELIEF, Φ 20.8 WIDE 3.5	Cut a relief for thread with a diameter of 20.8 mm and width 3.5 mm.
	(b) NECK, WIDE 3 DEEP 1.5	Turn an undercut of 3 mm width and 1.5 mm depth.
	(c) CARB AND HDN	Carburise and harden

2.1.3. Descriptions

Because many aspects of construction cannot be shown graphically, even the best prepared construction drawings often inadequately show some portions of a project. For example, how can anyone show on a drawing the quality of workmanship required for the installation of doors and windows? Or, who is responsible for supplying the materials? These are things that can be conveyed only by hand lettered notes. The standard procedure is to supplement construction drawings with detailed written instructions. These written instructions, called specifications, or more commonly specs, define and limit materials and fabrication to the intent of the engineer or designer.

The design engineer usually has the responsibility of preparing project specifications.

As a Builder, you will be required to read, interpret, and use these in your work as a crew leader or supervisor. You must be familiar with the various types of federal, military, and nongovernmental reference specifications used in preparing project specs.

When assisting the engineer in preparing or using specifications, you also need to be familiar with the general format and terminology they use

Self-Check -1	Written Test

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

1. Write the deference between drawings, notes and descriptions. (5 points)
2. list and sketch at least three types of typical example of drawing.(6points)

Note: **Satisfactory rating - 6 out of 11 points Unsatisfactory - below 6 out of 11points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____

_____

_____

Information Sheet-2	Identifying project specifications

2.2. Identifying project specifications

2.2.1. Project Specifications

Construction drawings are supplemented by written project specifications. Project specifications give detailed information regarding materials and methods of work for a particular construction project. They cover various factors relating to the project, such as general conditions, scope of work, quality of materials, standards of workmanship, and protection of finished work.

The drawings, together with the project specifications, define the project in detail and show exactly how to construct it. Usually, drawings for an important project are accompanied by a set of project specifications. The drawings and project specifications are inseparable. Drawings indicate what the project specifications do not cover. Project specifications indicate what the drawings do not portray, or they further clarify details that are not covered amply by the drawings and notes on the drawings. When you are preparing project specifications, it is important that you closely coordinate the specifications and drawings in order to minimize discrepancies and ambiguities.

Whenever there is conflicting information between the drawings and project specs, the specifications take precedence over the drawings.

2.2.2 Specifications 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.

2.2.3 Job Description and Job Specification

Job Analysis is a primary tool to collect job-related data. The process results in collecting and recording two data sets including job description and job specification. Any job vacancy cannot be filled until and unless HR manager has these two sets of data. It is necessary to define them accurately in order to fit the right person at the right place and at the right time. This helps both employer and employee understand what exactly needs to be delivered and how.

Both job description and job specification are essential parts of job analysis information. Writing them clearly and accurately helps organization and workers cope with many challenges while onboard.

Though preparing job description and job specification are not legal requirements yet play a vital role in getting the desired outcome. These data sets help in determining the necessity, worth and scope of a specific job.

2.2.3.1 Job Description

Job description includes basic job-related data that is useful to advertise a specific job and attract a pool of talent. It includes information such as job title, job location, reporting to and of employees, job summary, nature and objectives of a job, tasks and duties to be performed, working conditions, machines, tools and equipment to be used by a prospective worker and hazards involved in it

2.2.3.2 Purpose of Job Description

The main purpose of job description is to collect job-related data in order to advertise for a particular job. It helps in attracting, targeting, recruiting and selecting the right candidate for the right job.

It is done to determine what needs to be delivered in a particular job. It clarifies what employees are supposed to do if selected for that particular job opening.

It gives recruiting staff a clear view what kind of candidate is required by a particular department or division to perform a specific task or job.

It also clarifies who will report to whom.

2.2.3.3 Job Specification

Also known as employee specifications, a job specification is a written statement of educational qualifications, specific qualities, level of experience, physical, emotional, technical and communication skills required to perform a job, responsibilities involved in a job and other unusual sensory demands. It also includes general health, mental health, intelligence, aptitude, memory, judgment, leadership skills, emotional ability, adaptability, flexibility, values and ethics, manners and creativity, etc.

2.2.3.4 Purpose of Job Specification

Described on the basis of job description, job specification helps candidates analyze whether are eligible to apply for a particular job vacancy or not.

It helps recruiting team of an organization understand what level of qualifications, qualities and set of characteristics should be present in a candidate to make him or her eligible for the job opening.

Job Specification gives detailed information about any job including job responsibilities, desired technical and physical skills, conversational ability and much more.

It helps in selecting the most appropriate candidate for a particular job.

Job description and job specification are two integral parts of job analysis. They define a job fully and guide both employer and employee on how to go about the whole process of recruitment and selection. Both data sets are extremely relevant for creating a right fit between job and talent, evaluate performance and analyze training needs and measuring the worth of a particular job.

Self-Check -2	Written Test

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

1. Write the difference b/n job Descriptions and job specification (**3 points)**
2. What is Project specification? (**2 points**)

Note: **Satisfactory rating –3 out of 5 points Unsatisfactory - below -3 out of 5 points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
   _____
   _____

2._____
_____
_____

Information Sheet-3	Identifying Specifications related to particular mapping and planning.

2.4. Identifying Specifications related to particular mapping and planning

A specification is a detailed description of the goods and/or services required and forms part of an invitation to supply or invitation for expressions of interest document.

The cost of a unit quantity of work is governed by its specification.

A work is carried out according to its specification and the contractor is paid for the same. Any change in specification changes the tendered rate.

The necessity of specification is to verify and check the strength of materials for a work involved in a project.

Specification is an essential contract document and is required for Arbitration or court cases.

Specification is necessary to specify the equipment, tools and plants to be engaged for a work and thus enables to procure them beforehand.

- A professional specification should include:
  - •clear, concise requirements
  - • functional and performance terms only, unless specific technical requirements are needed
  - • enough information for vendors to be able to appropriately determine and cost the goods or services that they will offer, and to what level of quality.

2.4.1. Principles of specifications:

Description of materials: The quality and size of materials required to do an item of work shall be fully described for checking up at site according to the bindings provided in the specification.

Workmanship: Complete description of workmanship, the method of mixing to the proportion, the method of laying, preparation of base or surface, compaction, finishing and curing etc. specifically applicable to the item of work shall be clearly stated in different clauses.

Tools and plants: The tools and plants to be engaged to carry out a work shall be described. The method of operation and by whom to be supplied shall be stated.

Protection of new work: The method of protection of new works against damage or the method of curing if required, the test of completed work if necessary shall be described in separate clauses

Expression: While writing a specification endeavor shall be made to express the requirements of the specification clearly and in concise form avoiding repetition and unusual words. The style of tense shall remain same throughout.

Clauses of specifications: As far as possible, the clauses shall be arranged in the order in which work shall be carried out. This does not mean to follow the works according to the order of arrangements but it facilitates reference. While framing clauses for quality of materials, workmanship, tools and plants etc. practical possibilities shall be realized

2.4.2drawings&specifications

the sole function of working drawings is to convey the intention of the designer, so far as drawings are capable of doing this. They must be accurate and legible before everything else. They are part of the contract documents of the building contract and should always be prepared with the realization that they are legal documents.

2.4.3 Two types of drawings are used.

1. Design or sketch drawings that set down ideas on room relationships, room sizes, the orientation of the house, the stylistic treatment of the house, color schemes, possible furniture layout and landscaping ideas.
2. Working drawings or construction drawings that show the finalized design. They indicate the exact arrangement of spaces, their sizes, the materials of construction and specific details so as to enable the building of the house. The drawings must be clear and perfectly legible to everyone who needs to work from them. To ensure this, the terms, abbreviations, symbols and other conventions used must be commonly understood.

Self-Check -3	Written Test

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

1. What is the purpose of specification (**4 points)**
2. Explain two types of drawings. . (**3 points**)
3. List Principles of specifications(**3 points**)

Note: **Satisfactory rating –5 out of 10 points Unsatisfactory - below -5 out of 10points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____

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2. _____

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3. _____

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_____

Information Sheet-4	Identifying Product/system/component/item represented by the drawing

What is drawing?

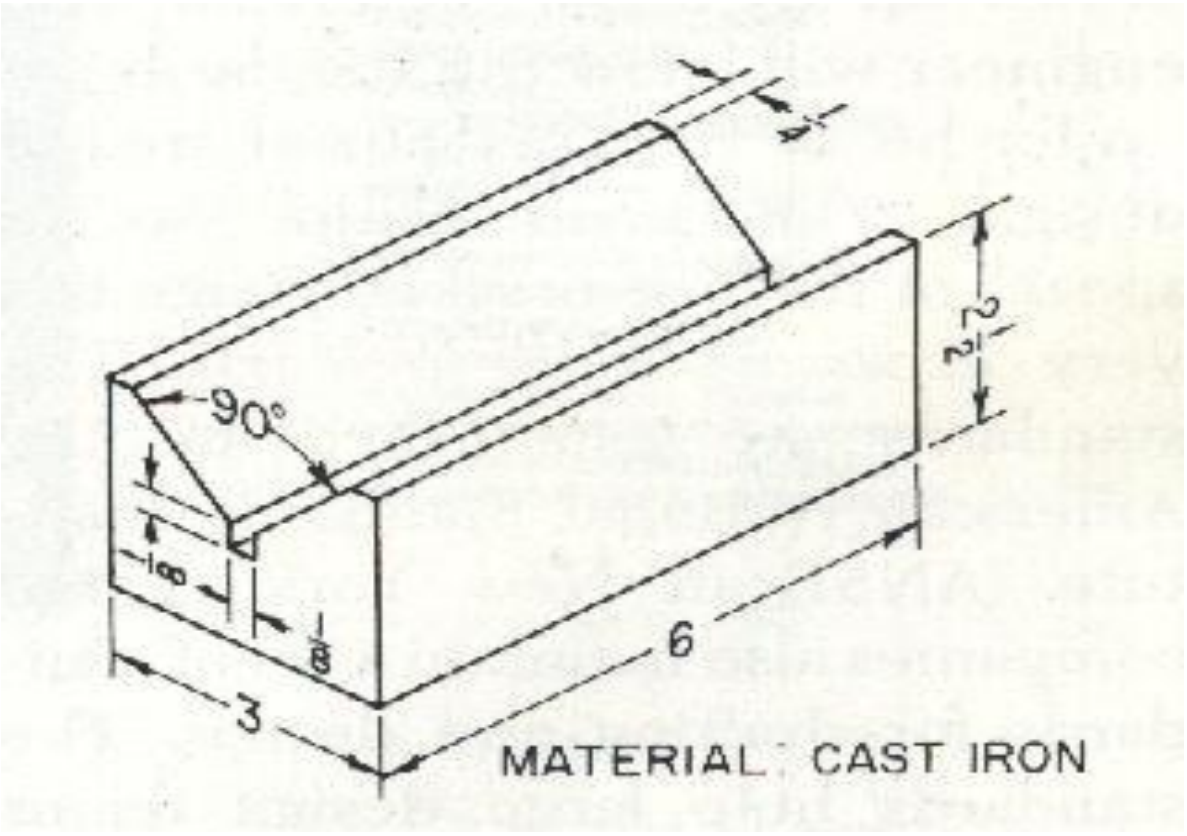
Drawing is a graphic language used to express ideas. In other words it is one means of communication.

- It is used for:
  - Research and Development
  - Design
  - Production
  - Construction
  - Operation
  - Maintenance
  - Installation
  - etc

Drawing as a Means of Communications

Exchange of ideas needs means of communication. As the idea becomes technical the usual means of communication (speak or listen, read or write) will be less exact. For this reason visual language is developed to be technical and accurate means communication. This visual language in broad term is called graphic language. We call it universal language of industry when it is used for production purpose.

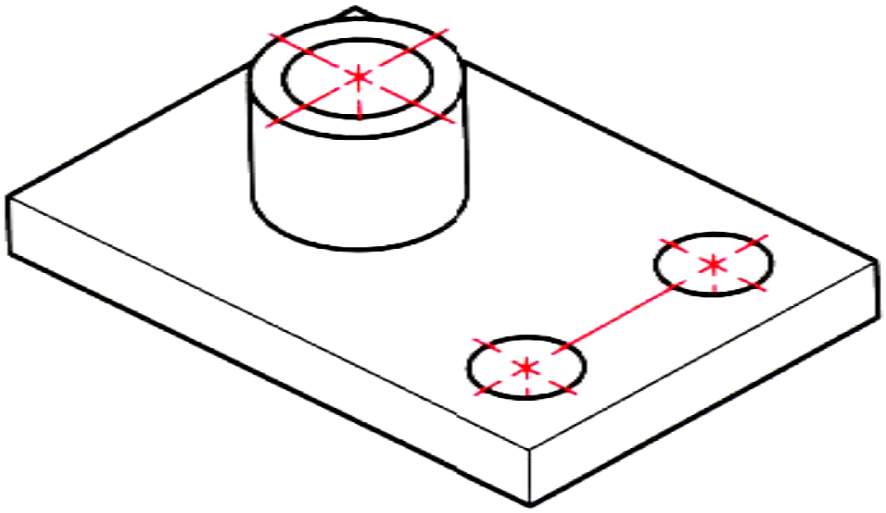
The v-block is to be made of cast iron and machined on all surfaces. The overall sizes are two and one-half inches high, three inches wide, and six inches long. A v-shaped cut having an included angle of 90° is to be made through the entire length of the block. The cut is to be made with the block resting on the three inch by six inch surface. The v-cut is to begin one-quarter inch from the outside edges. At the bottom of the v-cut there is to be a relief slot one-eighth inch wide by one-eighth inch deep.



How would you describe this object?

In teams of two, describe using only words.

How effective is this approach?



- It is a form of communication that is technical and very exact.
- It is visual language
- Utilize line, curves and symbols agreed all over the world.
- It is economical and unforgettable than any other languages.
- The most common names associated with the graphic languages are:

  Drafting: represent all graphic languages.

  Technical Drawing: Any drawing which expresses technical ideas, including sketches, instrument drawings, charts, and illustrations.

- **Technical Sketching:** A technical drawing used to proportion shape of ideas so that other can understand the shape of things.
- **Mechanical Drawing:** A technical drawing made with drafting instruments.
- **Engineering Drawing:** Drawing used by engineers and other member of the design-engineering team to describe the production of parts, shape, size and material.
- **Descriptive Geometry:** The grammar of graphic language, the basic principle set up to use geometric descriptions for solving two and three dimensional problems.
- **Computer Graphics:** Use of computer as drafting instrument with printer or plotter.

Three Basic Types of Technical Drawings

- Freehand sketches
- Instrument drawings
- Computer drawings and models

There are two principles in drawing

- Visualization
  - The ability to see what an object looks like in the mind of eye.
- Implementation
  - Drawing of an object that has been visualized.

Self-Check -5	Written Test

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

1. What is the Three Basic Types of Technical Drawings?(3points)
2. What are the two principles in drawing?(2points)

Note: **Satisfactory rating –3 out of 5 points Unsatisfactory - below -3 out of 5points**

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____

_____

_____

2. _____

_____

_____

Answer keys for learning guide -100

Self check 1

1. Drawing is a language that can be learned and used like any other.

2. Notes: - may include instructions on materials, instructions for interpreting the plan or guidelines that will help you to complete the job.

Self check 2

1.

- ✓ Job description includes basic job-related data that is useful to advertise a specific job and attract a pool of talent.
- ✓ Also known as employee specifications, a job specification is a written statement of educational qualifications, specific qualities, level of experience, physical, emotional, technical and communication skills required to perform a job, responsibilities involved in a job and other unusual sensory demands.

2. **Project specifications**: - give detailed information regarding materials and methods of work for a particular construction project.

Self check 4

1. **Design or sketch drawings**: - that set down ideas on room relationships, room sizes, the orientation of the house, and the stylistic treatment of the house, color schemes, possible furniture layout and landscaping ideas.

Working drawings or construction drawings: - that show the finalized design.

2.

- ✓ Description of materials
- ✓ Workmanship
- ✓ Tools and plants
- ✓ Protection of new work

- ✓ Expression:
- ✓ Clauses of specifications

Self check 5

1.

- ✓ Freehand sketches
- ✓ Instrument drawings
- ✓ Computer drawings and models

2.

- Visualization
  - The ability to see what an object looks like in the mind of eye.
- Implementation
  - Drawing of an object that has been visualized