Carpentry

Level-II

Learning Guide-21

Unit of Competence: Read and Interprets plans and specifications

Module Title: Reading and Interpreting plans and specifications

LG Code: EIS CRP2 M05 LO6-LG-21

TTLM Code: EIS CRP2 M05 TTLM 0919v1

LO 6: Read and interpret job specifications.

Instruction Sheet	Learning Guide 18

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

- Identifying Job specifications from drawings, notes and descriptions.
- Identifying Standards of work, finishes and tolerances from the project specifications.
- Identifying Material attributes from 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**:

6.1. Job specifications are identified from drawings, notes and descriptions.
6.2. Standards of work, finishes and tolerances are identified from the project specifications.
6.3. Material attributes are identified from specifications

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, up to Sheet 3.
4. Accomplish the Self-checks respectively.
5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheets**.**
6. Do the “LAP test” (if you are ready).

Information Sheet-1	Identifying Job specifications from drawings, notes and descriptions

6.1. Identifying Job specifications from drawings, notes and descriptions

6.1.1 Introduction to Job specifications

Job (Technical) specifications are prepared to provide consistency and to instruct construction contractors on how the works are to be carried out, the quality of the workmanship and methods of quality assurance for the construction. Technical specifications describe the project design and construction practices, technical standards, specifications and principles to be followed during construction. Technical specifications may specify a performance goal (a performance specification) or procedures used to meet the performance goal (design specification). A performance specification permits flexibility and change. For example, a performance specification for a feed processing system may specify that the capacity be nominated tones per hour at a particular standard of quality. In general, the scope and detail of technical specifications will depend on the nature and complexity of the project. Technical specifications should form part of all construction projects. The level of adherence to the design drawings and technical specifications ultimately determines the quality of the project and influences the performance of the constructed works.

- **Objectives**

The objectives of the design drawings and technical specifications are to

- ✓ provide a detailed record of the design of the project
- ✓ set standards for the technical aspects required in the construction
- ✓ set standards for the execution of the construction
- ✓ set standards for documenting the design, tendering and construction process.

The design drawings and job / technical specifications should include

- ✓ **Design drawings** : these set out design information and procedures which are required to be used on the works.
- ✓ **Bill of Quantities** : this itemizes the quantity of materials to enable a renderer to accurately cost the work for which they are bidding.
- ✓ **Material specifications** : such as diameter, type and grade of material for pipes (e.g. polyethylene pipes or UPVC), joining methods (e.g. electro-fused or compression fittings etc), or 28day compressive strength of concrete.

- ✓ **Requirements for Material** Testing e.g. testing required for earthworks (i.e. minimum required compaction and moisture range to be achieved), frequency of testing (e.g. one soil density test per 1,000 m3 of bulk earthworks) or the number of tests per 1,000 m2 of area for hydraulic conductivity tests in sedimentation ponds.
- ✓ **Construction and installation methods**.
- ✓ **Development approval conditions** that have to be complied with throughout the construction.

6.1.2 Design documents

Design documents relate to the design, construction and commissioning of the project works. Typically, the documents should include

- Design drawings
- Construction specifications

- **Design drawings**

Design drawings for construction contain all the information necessary for the construction contractor to bid on and build a particular project. Typically, the preparation of design drawings provides a detailed record of the design and structural requirements of the works. A contract or tender document often references design drawings. Design drawings should show details on layout, measurements, plan, cross-sectional and vertical profiles. This information is prepared as scale drawings of the works to be constructed. Design drawings should be presented in such a way that

- ✓ The project can easily be understood
- ✓ They visually communicate the concept to the lot feeder and the construction contractor
- ✓ They are legible
- ✓ They include all information from previous revisions and updates. The design drawings should include the following aspects
- ✓ Site layout and the location of the works to be constructed
- ✓ Plan views
- ✓ Detailed designs and cross-sectional profiles of the works
- ✓ Dimensions and units gradients
- ✓ Titles and scales that meet the required standards and units
- ✓ Adequate labeling
- ✓ Elevations that are referenced to meters Australian Height Datum (m AHD)
- ✓ Be dated and signed by the designer

The lot feeder should ensure that all parties responsible for the creation, processing or supply of drawings and diagrams standardize the layout and content of these drawings. This will preclude the need to incorporate specific instructions on the engineering content of drawings and diagrams in project documentation and other specifications.

To define the content of design drawings and standardize the approach and terminology used, drawing specifications may be followed. Various standards and codes of practice have

been prepared to guide engineers and drafters on technical drawings and these are detailed in Table 1. The adoption of a drawing standard into a design shall be accompanied by a statement of compliance for that standard, confirming that the drawings are fit for purpose and meet all current legislative and Australian Standards requirements. This shall be accompanied by all design calculations as required to confirm compliance. Computational devices and computer aided drafting and design (CADD) packages have made the creation of project design information in digital form commonplace.

Table 1. Relevant Australian and International Standards and Codes of Practice

Document No.	Document title
AS1100	Technical drawing
	1100.101 Part 101: General principles
	1100.201-1992 Technical drawing - Mechanical engineering drawing
	1100.301 Part 301: Architectural drawing
	1100.401 Part 401: Engineering survey and engineering survey design drawing
	1100.501 Part 501: Structural engineering drawing
AS1101	Graphical symbols for general engineering
	1101.1 Part 1: Hydraulic and pneumatic systems
	1101.3 Part 3: Welding and non-destructive examination
AS1102	Graphical symbols for electrotechnical documentation
	1102.101: General information and general index
	1102.102: Symbol elements, qualifying symbols and other symbols having general application
	1102.103: Conductors and connecting devices
	1102.104: Basic passive components
	1102.105: Semiconductors and electron tubes
	1102.106: Production and conversion of electrical energy
	1102.107: Switchgear, control gear and protective devices
	1102.108: Measuring instruments, lamps and signalling devices
	1102.109: Telecommunications – Switching and peripheral equipment
	1102.110: Telecommunications – Transmission
	1102.111: Architectural and topographical installation plans and diagrams
AS2536	Surface texture
AS ISO 128.1-2005	Technical drawings - General principles of presentation – Introduction and index
AS ISO 128.20-2005	Technical drawings – General principles of presentation – Basic conventions for lines
AS ISO 128.21-2005	Technical drawings - General principles of presentation - Preparation of lines by CAD systems
AS ISO 128.22-2005	Technical drawings – General principles of presentation –Basic conventions and applications for leader lines and reference lines
AS ISO 128.23	Technical drawings – General principles of presentation – Lines on construction drawings
AS ISO 128.24	Technical drawings - General principles of presentation – Lines on mechanical engineering drawings
BS 1553 Parts 1-3	Specification for Graphical Symbols for General Engineering
HB 3-1996	Electrical and electronic drawing practice for students
HB 20-1996	Graphical symbols for fire protection drawings
HB 24-1992	Symbols and abbreviations for building and construction
ISO 14617 Parts 1-11	Graphical symbols for diagrams

"About Construction specification we will discuss on information sheet 3"

Self-Check -1	Written Test

Directions: Say true or false for the questions listed below. Use the Answer sheet provided in the next page:

1. Job (Technical) specifications are prepared to provide consistency and to instruct construction contractors on how the works are to be carried out, the quality of the workmanship and methods of quality assurance for the construction.
2. A contract or tender document may not refer design drawings.
3. The design drawings and job / technical specifications should include Construction and installation methods.

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

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

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

True or False Question

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

Information Sheet- 2	Identifying Standards of work, finishes and tolerances from the project specifications.

6.2. Identifying Standards of work, finishes and tolerances from the project specifications.

6.2.1 Identified works from Site plan information

By Using the site plan can obtain the information listed below

1. The street address of the project
2. The client
3. The width of the block at the front boundary
4. The depth of the block
5. The floor level (FL or FFL) of the house
6. The front setback (distance from front boundary to nearest part of the house)
7. The width of the driveway
8. The driveway to be paved with
9. The clothes hoist to be situated
10. The driveway crossover part of the contract
11. Distance of the left-hand (or right-hand) boundary of the house
12. Direction does the front of the house face
13. Wide of the garden path
14. The existing boundary fences made of
15. The RL of the datum point (or TBM

6.2.2 Identified works from floor plan information

By Using the floor plan can obtain the information listed below

1. The width of the main bedroom (Bed 1)

2. The amount of Downpipes (DPs or RWPs) are there

3. The Size (width × depth) of the WIR in the main bedroom

4. The width of the kitchen window

5. The width of the WC door

6. The depth of the shelves in the built-in robes

7. The width of the garage door

8. The amount of bedrooms are there

10. The length of the bath

11. The overall width of the house

12. The length of the outside wall nearest the front boundary

13. The location of electric meter box

14. The location of water heater

15. The size (width × length) 0f the external brick piers

16. The location of manhole into the roof space

17. The thickness of the internal walls

18. The slope (pitch) of the roof

19. The internal dimensions (width × length) of the garage

20. The amount of external doors (doors leading outside)

6.2.3 Identified works from elevation plan information

By Using the elevation plan can obtain the information listed below

1. The materials that external walls made from (eg brick, boards, corrugated iron)
2. The height of the floor-to-ceiling
3. The slope (pitch) of the roof
4. The height of the toilet window
5. The width of the Bed 2 window
6. The height of the Bed 2 window
7. The height above floor level of the meter box
8. The finish applied to the gable part of the roof (if there is one)
9. The roof covering?
10. The type(s) of windows included in the house (how do they open)

6.2.4 Identified works from electrical plan information

By Using the electrical plan can obtain the information listed below

1. The type of light fitting(s) the kitchen has
2. The amount of external lights
3. The amount of GPOs in the main bedroom
4. The height of the GPOs in the laundry
5. The amount of fluorescent lights in the house
6. The location of TV point(s)
7. The amount of exhaust fans in the house
8. The location of switch for the rear outside light
9. The height above the floor of the GPOs in Bed 2
10. The amount of smoke detectors

Self-Check -2	Written Test

Directions: Choose column A with column B for the questions listed below. Use the Answer sheet provided in the next page:

Column A

1. The street address of the project
2. The width of the main bedroom (Bed 1)
3. The type of light fitting(s) the kitchen has
4. The materials that external walls made from (eg brick, boards, corrugated iron)

Column B

A. Information obtain the elevation plan
B. Information obtain the floor plan
C. Information obtain the site plan
D. Information obtain the section plan
E. Information obtain the electrical plan

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

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

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

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

Information Sheet-3	Identifying Material attributes from specifications.

6.3. Identifying Material attributes from specifications.

6.3.1 Construction specifications

A contract or tender document often references technical specifications about the specific requirements and construction standards for various elements of a project. This includes how the work will be done, the quality of workmanship and methods of testing. Typically, construction projects require construction of various elements and use of various materials. More than one technical specification may be required for the whole project. For example, a construction project may require individual technical specifications for

- Earth works
- Erosion and sediment controls
- Concrete works
- Fencing
- Building works
- Roads
- Electrical systems
- Water reticulation systems.

For small projects, the material and construction specifications may be documented in the form of notes on the design drawings. For larger projects, a separate specification document is more practical. Designers will usually have suitable standard technical specification documents. However, as a guide a specification might include

- Descriptive title, number, identifier etc. of the specification
- Date of last effective revision and revision designation
- A logo or trademark to indicate the document copyright, ownership and origin
- Table of Contents (TOC) if the document is long
- Person or office responsible for questions on the specification, updates and deviations
- The significance, scope or importance of the specification and its intended use
- Terminology, definitions and abbreviations to clarify the meanings of the specification
- References and Standards used or to be complied with
- Test methods for measuring all specified characteristics
- Material requirements: physical, mechanical, electrical, chemical
- Targets and tolerances
- Acceptance testing, including performance testing requirements and tolerances
- Workmanship
- Certifications required
- Safety considerations and requirements
- Environmental considerations and requirements
- Approval authority considerations and requirements
- Quality control requirements, acceptance sampling, inspections, acceptance criteria
- Person or office responsible for enforcement of the specification
- Completion and delivery
- for rejection, re inspection, rehearing, corrective measures

Self-Check -3	Written Test

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

1. More than one technical specification may be required for the whole project.
2. For small projects, the material and construction specifications may not be documented in the form of notes on the design drawings
3. Targets and tolerances are not the part of specification

Note: **Satisfactory rating – 3 and 4 points** **Unsatisfactory - below 3 and 4 points**
You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____ Date: _____

True or False Question

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

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

UNIT OF COMPETENCY: Read And Interpret Plan And Specification							
LO: 6 LG: 21 Read and interpret job specifications							
Self check: 1		Self check:2		Self check:3		Self check:4	
True or False		Matching		True or False			
1	True	1	C	1	True	1	
2	False	2	B	2	False	2	
3	True	3	E	3	False	3	
4		4	A	4		4	
5		5		5		5	

List of Reference Materials

References hand and power tools

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

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