

# ROAD CONSTRUCTION AND MAINTENANCE LEVEL – I



## CURRICULUM

**Based on March, 2022 (V- I) Occupational standard  
(OS)**

March, 2022  
Addis Ababa, Ethiopia

## Preface

The reformed TVET-System is an outcome-based system. It utilizes the needs of the labor market and occupational requirements from the world of work as the benchmark and standard for TVET delivery. The requirements from the world of work are analyzed and documented – taking into account international benchmarking – as occupational standards (OS).

In the reformed TVET-System, curricula and curriculum development play an important role with regard to quality driven comparable TVET-Delivery. The Curricula help to facilitate the training process in a way, that trainees acquire the set of occupational competences (skills, knowledge and attitude) required at the working place and defined in the occupational standards (OS).

This curriculum has been developed by a group of professional experts from different Regional TVET Bureaus, colleges, Industries, Institutes and universities based on the occupational standard for Road Construction and Maintenance Level I.

The curriculum development process has been actively supported and facilitated by **Ministry of Labor and Skills**.

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## TVET-Program Design

### 1.1. TVET-Program Title: Road Construction and Maintenance Level I

### 1.2. TVET-Program Description

The Program is designed to develop the necessary knowledge, skills and attitude of the trainees to the standard required by the occupation. The contents of this program are in line with the occupational standard. The Trainees who successfully completed the Program will be qualified to work as **Assistance Road worker I** with competencies elaborated in the respective OS. Graduates of the program will have the required qualification to work in the **Economic Infrastructure** sector in the field of **Road Construction and Maintenance**

The prime objective of this training program is to equip the Trainees with the identified competences specified in the OS. Graduates are therefore expected to Read and Interpret Plans, Drawings and Specifications, Operate Small Plants and Equipment, Conduct Simple Sampling and Testing ,Carry-out Basic Leveling ,Implement Traffic Management Plan with Stop-Slow Bat, Drain and De-Water Construction Site, Conduct Labor based Earthwork, Conduct Labor Based Gravel Pavement Work, Carry out Chiseling, Lay Cobblestone & Block Pavement Work, Conduct Basic Scaffolding Operations/ Formworks/False works, Apply Basic Concreting Works, Apply Basic Masonry Works, Conduct Road Marking and Maintenance Operation, Apply 5s Procedures in accordance with the performance criteria and evidence guide described in the OS.

### 1.3. TVET-Program Training Outcomes

The expected outputs of this program are the acquisition and implementation of the following units of competences:

EIS RCM1 01 0322 Read and Interpret Plans, Drawings and Specifications

EIS RCM1 02 0322 Operate Small Plants and Equipment

EIS RCM1 03 0322 Conduct Simple Sampling and Testing

EIS RCM1 04 0322 Carry-out Basic Leveling

EIS RCM1 05 0322 Implement Traffic Management Plan with Stop-Slow Bat

EIS RCM1 06 0322 Drain and De-Water Construction Site

EIS RCM1 07 0322 Conduct Labor based Earthwork

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EIS RCM1 08 0322 Conduct Labor Based Gravel Pavement Work

EIS RCM1 09 0322 Carry out Chiseling, Lay Cobblestone & Block Pavement Work

EIS RCM1 10 0322 Conduct Basic Scaffolding Operations/ Formworks/False works

EIS RCM1 11 0322 Apply Basic Concreting Works

EIS RCM1 12 0322 Apply Basic Masonry Works

EIS RCM1 13 0322 Conduct Road Marking and Maintenance Operation

EIS RCM1 14 0322Apply 5s Procedures

#### 1.4. Duration of the TVET-Program

The Program will have duration of **1010 hours** including the on school/ Institution training and on-the-job practice or cooperative training time. Such cooperative training based on realities of the industry, nature of the occupation, location of the TVET institution, and other factors will be considered in the training delivery to ensure that trainees acquire practical and workplace experience.

s.no	Unit competency	TVET Institution training		Cooperative training	Total hours	Remarks
		Theory	Practical			
1.	Read and Interpret Plans, Drawings and Specifications	21	28	21	70	
2.	Operate Small Plants and Equipment	18	24	18	60	
3.	Conduct Simple Sampling and Testing	30	40	30	100	
4.	Carry-out Basic Leveling	27	36	27	90	
5.	Implement Traffic Management Plan with Stop-Slow Bat	18	24	18	60	
6.	Drain and De-Water Construction Site	27	36	27	90	

7.	Conduct Labor based Earthwork	27	36	27	90	
8.	Conduct Labor Based Gravel Pavement Work	24	32	24	80	
9.	Carry out Chiseling, Lay Cobblestone & Block Pavement Work	21	28	21	70	
10.	Conduct Basic Scaffolding Operations/ Formworks/False works	18	24	18	60	
11.	Apply Basic Concreting Works	21	28	21	70	
12.	Apply Basic Masonry Works	21	28	21	70	
13.	Conduct Road Marking and Maintenance Operation	21	28	21	70	
14.	Apply 5s Procedures	9	12	9	30	

### 1.5. Qualification Level and Certification

Based on the descriptors elaborated on the Ethiopian National TVET Qualification Framework (NTQF) the qualification of this specific TVET Program is Level I.

The trainee can exit after successfully completing the modules in one level and will be awarded the equivalent institutional certificate on the level completed. However, only institutional certificate of training accomplishment will be awarded.

### 1.6. Target Groups

Any citizen **with or without disability** who meets the entry requirements under items 1.7 and capable of participating in the training activities is entitled to take part in the Program.

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### 1.7 Entry Requirements

The prospective participants of this program are required to possess the requirements or directive of the **Ministry of Labor and Skills**.

### 1.8 Mode of Delivery

This TVET-Program is characterized as a formal Program on Assistance Road worker I. The mode of delivery is co-operative training. The time spent by the trainees in the real work place/ industry will give them enough exposure to the actual world of work and enable them to get hands-on experience.

The co-operative approach will be supported with school-based lecture-discussion, simulation and actual practice. These modalities will be utilized before the trainees are exposed to the industry environment.

Hence based on the nature of the occupation, location of the TVET institutions, and interest of the industry alternative mode of cooperative training such as apprenticeships, internship and traineeship will be employed. In addition, in the areas where industry is not sufficiently available the established production and service centers/learning factories in TVET institutions will be used as cooperative training places. The Training-Institution and identified companies have forged an agreement to co-operate with regard to the implementation of this program.

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### 1.9. TVET-Program Structure

Unit of Competence		Module Code & Title		Training Outcomes	Duration (In Hours)
EIS RCM1 010322	Read and Interpret Plans, Drawings and Specifications	EIS RCM1 M01 0322	Reading and Interpreting Plans, Drawings and Specifications	<ul style="list-style-type: none"> <li>Identify types of drawings</li> <li>Check changes to drawing</li> <li>Locate and identify key features on a site plan</li> <li>Read and interpret job specifications</li> </ul>	70
EIS RCM1 02 0322	Operate Small Plants and Equipment	EIS RCM1 M02 0322	Operating Small Plants and Equipment	<ul style="list-style-type: none"> <li>Plan and prepare</li> <li>Conduct pre-operational checks</li> <li>Use small plant and equipment</li> <li>Carry out operator maintenance</li> <li>. Clean up</li> </ul>	<b>60</b>
EIS RCM1 03 0322	Conduct Simple Sampling and Testing	EIS RCM1 M03 0322	Conducting Simple Sampling and Testing	<ul style="list-style-type: none"> <li>Prepare for sampling</li> <li>Take sample</li> <li>Conduct material testing</li> <li>Conduct preparation of stabilized construction materials</li> <li>Identify hazards and risks</li> <li>Control hazards and risks</li> </ul>	100

EIS RCM1 04 0322	Carry-out Basic Leveling	EIS RCM1 M04 0322	Carrying-out Basic Leveling	<ul style="list-style-type: none"> <li>• Plan and prepare work</li> <li>• Establish offsets for civil works</li> <li>• Set up and use leveling device</li> <li>• Clean up</li> </ul>	90
EIS RCM1 05 0322	Implement Traffic Management Plan with a Stop-Slow Bat	EIS RCM1 M05 0322	Implementing Traffic Management Plan with a Stop-Slow Bat EIS RCM1 05 0322	<ul style="list-style-type: none"> <li>• Plan and prepare</li> <li>• Coordinate traffic</li> <li>• Set out the traffic guidance scheme</li> <li>• Monitor traffic guidance scheme</li> <li>• Operate radio</li> <li>• Close down traffic guidance scheme</li> <li>• Clean up</li> </ul>	60
EIS RCM1 06 0322	Drain and De-water Civil Construction Site	EIS RCM1 M06 0322	Draining and De- watering Civil Construction Site EIS RCM1 06 0322	<ul style="list-style-type: none"> <li>• Plan and prepare</li> <li>• Position sedimentation control</li> <li>• Remove surface water</li> <li>• Construct sump/wells</li> <li>• Remove water from sumps/wells, trenches and pits</li> <li>• Clean up</li> </ul>	90
EIS RCM1 07 0322	Conduct Labor based Earthwork	EIS RCM1 M07 0322	Conducting Labor based Earthwork	<ul style="list-style-type: none"> <li>• Conduct Labor based Earthwork</li> <li>• EIS RCM1 07 0322</li> </ul>	90



				<ul style="list-style-type: none"> <li>• Plan and prepare work</li> <li>• Carry out clearing and grubbing operation</li> <li>• Perform excavation and fill operation</li> <li>• Conduct ditches and road formation operation</li> <li>• Clean up</li> </ul>	
EIS RCM1 08 0322	Conduct Labor Based Gravel Pavement Works	EIS RCM1 M08 0322	Conducting Labor Based Gravel Pavement Works	<ul style="list-style-type: none"> <li>• Prepare and perform pre-condition activities</li> <li>• Conduct selects material production</li> <li>• Conduct, surfacing /paving work/</li> </ul>	80
EIS RCM1 09 0322	Carry out Chiseling, Lay Cobblestone & Block Pavement Work	EIS RCM1 M09 0322	Carrying out Chiseling, Lay Cobblestone & Block Pavement Work	<ul style="list-style-type: none"> <li>• Plan and prepare for work</li> <li>• Identify the raw material</li> <li>• Prepare chiseling tools and materials</li> <li>• Select proper place for chiseling</li> <li>• Carry-out chisel works</li> <li>• Complete work process</li> <li>• Prepare to lay paving materials</li> <li>• Lay pavers</li> </ul>	70

				<ul style="list-style-type: none"> <li>• Clean up</li> </ul>	
EIS RCM1 10 0322	Conduct Basic Scaffolding Operations/Formworks/ Falseworks	EIS RCM1 M10 0322	Conducting Basic Scaffolding Operations/Formworks/ Falseworks	<ul style="list-style-type: none"> <li>• Plan and prepare for scaffolding operations</li> <li>• Erect and maintain scaffolding</li> <li>• Dismantle scaffolding</li> <li>• Prepare for formwork erection</li> <li>• Erect formwork</li> <li>• Inspect formwork</li> <li>• Strip formwork</li> <li>• Clean up</li> </ul>	60
EIS RCM1 11 0322	Apply Basic Concreting Works	EIS RCM1 M11 0322	Apply Basic Concreting Works	<ul style="list-style-type: none"> <li>• Plan and prepare work</li> <li>• Select materials for concrete</li> <li>• Set-out for concrete work</li> <li>• Construct and fit reinforcement</li> <li>• Erect formworks</li> <li>• Carry out concrete work</li> <li>• Strip formwork</li> <li>• Clean up</li> </ul>	70

EIS RCM1 12 0322	Apply Basic Masonry Works	EIS RCM1 M12 0322	Applying Basic Masonry Works	<ul style="list-style-type: none"> <li>• Plan and prepare work</li> <li>• Prepare materials for mortar</li> <li>• Lay bricks/ blocks and masonry stones</li> <li>• Finish joints</li> <li>• Erect formworks</li> <li>• Strip formwork</li> <li>• Clean up</li> </ul>	70
EIS RCM1 13 0322	Conduct Road Marking and Maintenance Operation	EIS RCM1 M13 0322	Conducting Road Marking and Maintenance Operation	<ul style="list-style-type: none"> <li>• Plan and prepare</li> <li>• Prepare surface, set out and conducting road marking or setting out and conducting speed breaker and maintenance operation</li> <li>• Clean up</li> </ul>	70
EIS RCM1 14 0322	Apply 5S Procedures	EIS RCM1 M14 0322	Applying 5S Procedures	<ul style="list-style-type: none"> <li>• Prepare for work.</li> <li>• Sort items.</li> <li>• Set all items in order.</li> <li>• Perform shine activities.</li> <li>• Standardize 5S.</li> <li>• Sustain 5S.</li> </ul>	30

\*The time duration (Hours) indicated for the module should include all activities in and out of the TVET

### 1.10 Institutional Assessment

Two types of evaluation will be used in determining the extent to which training outcomes are achieved. The specific training outcomes are stated in the modules. In assessing them, verifiable and observable indicators and standards shall be used.

The formative assessment is incorporated in the training modules and form part of the training process. Formative evaluation provides the trainee with feedback regarding success or failure in attaining training outcomes. It identifies the specific training errors that need to be corrected, and provides reinforcement for successful performance as well. For the teacher, formative evaluation provides information for making instruction and remedial work more effective.

Summative Evaluation the other form of evaluation is given when all the modules in the program have been accomplished. It determines the extent to which competence have been achieved. And, the result of this assessment decision shall be expressed in the term of institutional Assessment implementation guidelines..

Techniques or tools for obtaining information about trainees' achievement include oral or written test, demonstration and on-site observation.

### 1.11 TVET Teachers Profile

The teachers conducting this particular TVET Program are **B Level** and above who have satisfactory practical experiences or equivalent qualifications

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## LEARNING MODULE 01

TVET-PROGRAMME TITLE: **Road construction and maintenance Level L1**

MODULE TITLE: **Reading and Interpreting Plans, Drawings and Specifications**

MODULE CODE: [EIS RCM1 M01 0322](#)

NOMINAL DURATION: .70 Hours

**MODULE DESCRIPTION:** This module covers the knowledge, attitudes and skills required in reading and interpreting of plans, drawings and specifications in the road construction industry. It includes: identifying types of drawings and their functions; recognizing amendments and commonly used symbols and abbreviations; locating and identifying key features on a site plan; and reading and interpreting job specifications.

### LEARNING OUTCOMES

At the end of the module the trainee will be able to:

**LO1.** Identify types of drawings

**LO2.** Check changes to drawing

**LO3.** Locate and identify key features on a site plan

**LO4.** Read and interpret job specifications

MODULE CONTENTS:

#### **LO1. Identify types of drawings**

- 1.1 Identifying types drawings and plan.
- 1.2 Identification of drawing convenient.
- 1.3 Recognizing of quality requirement.
- 1.4 Identify environmental controls specifications

#### **LO2. Check changes to drawing**

- 2.1 Checking amendments to drawing
- 2.2 Checking amendments of specifications

#### **LO3. Locate and identify key features on a site plan**

- 3.1 Civil construction symbol and abbreviation.

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3.2 Interpreting legend project and drawing abbreviation, symbol.

3.3 Achieving orientation of the plan.

3.4 Identifying key features of the site.

3.5 Identifying services, features, contours and datum

**LO4. Read and interpret job specifications**

4.1 identifying drawings descriptions and specification

4.2 identifying project specifications

4.3 Identifying specifications Material attributes.

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>



<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

**ASSESSMENT CRITERIA:**

**LO.1 Identify types of drawings**

- Identify the main types of plans and drawings used in the industry and their functions
- Identify the key functions of each type of drawing
- Recognize and adhere to quality requirements of Company operations
- Identify environmental controls from the job plans, specifications and environmental plan

**LO.2 Check changes to drawing**

- Check title panel to verify latest amendments to drawing
- Check amendments to specifications to ensure Currency of information

**LO.3 Locate and identify key features on a site plan**

- Locate and correctly interpret legend on project and drawings, abbreviations symbol
- Gain access to site and identify services, features, contours and datum
- Identify and locate key features of the site
- Achieve orientation of the plan with the site

**LO.4. Read and interpret job specifications**

- Job specifications are identified from drawings, notes and descriptions
- Material attributes are identified from specifications
- Standards of work, finishes and tolerances are identified from the project specifications

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### Annex: Resource Requirements

Reading and Interpreting Plans, Drawings and Specifications <u>EIS RCM1 M01 0322</u>				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A.</b>	<b>Learning Materials</b>			
1.	TTLM	TTLTM prepared by the trainer	5	1:1
2.	Reference Books			
2.1	Technical drawing book		5	1:5
2.11	Understanding Construction Drawing	Mark W. Huth 5th Edition	5	1:5
2.12	Working drawing and specification	Vol.I	5	1:5
2.13	Journals/Publication/Magazines			
2.14	Engineering Drawing.	Second Edition. K. Venkata	5	1:5
<b>B.</b>	<b>Learning Facilities &amp; Infrastructure</b>			
1.	Lecturing room	8m*6m	1	1:25
2.	White board	Nonmagnetic 1.8m*1.2m	1	1:25
3.	Arm chair	“PU molded foam” 595W x 580D x 830H (mm)	25	1:1
<b>C.</b>	<b>Consumable Materials</b>			
1.	pencil	2HB, HB	25	1:1
2	eraser	APSARA white	25	1:1
5	Different size paper	A0,A1,A2,A3,A4	25	1:1
6	Fixer	0.5-0.7	25	1:1
8	Scotch tape	Olympia	25	1:1
9	Drawing board	Adjustable	25	1:1
<b>D.</b>	<b>Tools and Equipments</b>			
1.	Drawing table	dimensions 100 cm x 150 cm	25	1:1

		And Adjustable inclination from 0° to 30°.		
2	T-square	60cm Aluminum		
3	ruler	Plastic Ruler 50cm	25	1:1
4	Set- square	30,45,60		
6	Printer	Maximum Paper Input Capacity 900 sheets Dimensions (W x D x H) 438 x 373 x 312mm	1	For trainer

<b>LEARNING MODULE 02</b>	
<b>TVET-PROGRAMME TITLE: Road Construction and Maintenance Level I</b>	
<b>MODULE TITLE: Operating Small Plants and Equipment</b>	
<b>MODULE CODE: <a href="#">EIS RCM1 M02 0322</a></b>	
<b>NOMINAL DURATION: 60hr Hours</b>	
<p><b>MODULE DESCRIPTION:</b> This module covers the knowledge, attitudes and skills required in operating of a range of small plant and equipment in resources and infrastructure industries. It includes the planning and preparation for work, the conducting of pre-operational checks, the use of plant and/or equipment, and carrying out operator maintenance and cleaning up.</p>	
<p><b>LEARNING OUTCOMES</b></p> <p>At the end of the module the trainee will be able to:</p> <ul style="list-style-type: none"> <li><b>LO1.</b> Plan and prepare</li> <li><b>LO2.</b> Conduct pre-operational checks</li> <li><b>LO3.</b> Use small plant and equipment</li> <li><b>LO4.</b> Carry out operator maintenance</li> <li><b>LO5.</b> Clean up</li> </ul>	

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## **MODULE CONTENTS:**

### **LO1. Plan and prepare**

- 1.1. Accessing, interpreting and applying compliance documentation
- 1.2. Applying of work instructions
- 1.3. Confirming and apply safety requirements
- 1.4. Selecting tools and equipment
- 1.5. Consistent job requirements
- 1.6. Identifying and confirming environmental protection requirements

### **LO2. Conduct pre-operational checks**

- 2.1 Selecting fuel and lubricants
- 2.2 Checking and adjusting fuel, oil and water levels
- 2.3 Coupling and maintain bolts, nuts
- 2.4 Checking and adjusting function of controls and gauges
- 2.5 Conducting and operating start-up and shutdown procedures

### **LO3. Use small plant and equipment**

- 3.1. Identifying small plant and equipment hazards
- 3.2. Operating techniques for small plant and equipment
- 3.3. Operating machine produce

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3.4. Locating plant and equipment

**LO4. Carry out operator maintenance**

- 4.1 preparing and operator maintenance
- 4.2 Conduct and inspect organizational requirements
- 4.3 Remove and replace defective parts safely
- 4.4 programming and maintenance organizational requirements

**LO5. Clean up**

- 5.1 Clearing work area
- 5.2 Clean, check, maintain and store plant, equipment and tools

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>



## ASSESSMENT CRITERIA:

### LO.1 Plan and prepare

- Access, interpret and apply compliance documentation relevant to operate small plant and equipment
- Obtain, confirm and apply *work instructions* for the allotted task
- Obtain, confirm and apply to the allotted task *safety requirements* from the site safety plan and organizational policies and procedures Select plant, tools and equipment to carry out tasks are consistent with the requirements of the job
- Identify, confirm and apply to the allotted task *environmental protection requirements* from the *project* environmental management plan

### LO.2 Conduct pre-operational checks

- Select fuel and lubricants according to manufacturer's specifications
- Check and adjust fuel, oil, hydraulic fluid and water levels according to manufacturer's manual Secure/tighten and maintain bolts, nuts, guards and attachment couplings in accordance with manufacturer's instructions
- Check and adjust function of controls and gauges where necessary to comply with manufacturer's manual
- Conduct standard start-up and shutdown procedures according to requirements of operator's manual

### LO.3 Use small plant and equipment

- Identify site hazards associated with *small plant and equipment* operations and establish appropriate controls in accordance with the requirements of the site safety plan
- Identify and apply operating techniques for small plant and equipment to achieve optimum output in accordance with manufacture's design specifications while maintaining specified tolerances

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- Operate machine to produce results within design specifications to meet specified tolerances
- Safely locate plant and equipment when not in immediate use

#### **LO.4 Carry out operator maintenance**

- Shutdown plant/equipment and prepare it for *operator maintenance* as per manufacturer's manual and organizational requirements
- Conduct inspection and fault finding in accordance with the manufacture's specifications and/or organizational requirements
- Remove and replace defective parts safely and effectively according to manufacturer's manual and organizational requirements
- Carry out regular programmed maintenance tasks in accordance with the manufacturer's and/or organizational requirements

#### **LO.5 Clean up**

- Clear work area and dispose of or recycle *materials* in accordance with project environmental management plan
- Clean, check, maintain and store plant, equipment and tools in accordance with manufacturer's recommendations and standard work practices

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### Annex: Resource Requirements

Operating Small Plants and Equipment <a href="#">EIS RCM1 M02 0322</a>				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A.</b>	<b><i>Learning Materials</i></b>			
1.	TTLM	TTLM prepared by the trainer	25	1:5
2.	Reference Books			
2.1	Process Plant Equipment: Operation, Control, and Reliability 1st Edition, Kindle Edition	Book		
2.2	Plant Engineer's Reference Book 2nd Edition Editor: DENNIS A SNOW			
4.	Journals/Publication/Magazines			
<b>B.</b>	<b><i>Learning Facilities &amp; Infrastructure</i></b>			
1.	Lecture Room	10 X 10m	1	1:25
2.	Library	15 X 15m	1	1:25
3.	Workshop or work place	10 X 10m	1	1:25

4	Internet Room	5 X 5m	1	1:25
<b>C. Consumable Materials</b>				
1	Timber	Australia 30x2.5x400	30 pcs	1:1
2	Benzene	Standard	10Lit.	1:3
3	Sand	Pure sand	30m <sup>3</sup>	1:1
4	Bitumen	Penetration 20/30	10Lit.	1:3
5	Fine Aggregate	0.000 size		
6	Course Aggregate	o.2 size		
<b>D. Tools and Equipment's</b>				
1.	concrete mixers,	capacity 200 liter	1pcs	1:30
2	Mini roller	Diesel-engine operated, 2- drums roller, total weight 600 Kg.	1pcs	1:30
3	Jig saw frame with blade	Jig saw frame with blade	6pic	1:5
4	Circular cutter	24 tooth carbide blade CB724AB	6pic	1:5
5	Water pump	1 HP	1pcs Each	1:30

<b>LEARNING MODULE 3</b>
<b>TVET-PROGRAMME TITLE: Road Construction &amp; Maintenance Level I</b>
<b>MODULE TITLE: Conducting Simple Sampling And Testing</b>
<b>MODULE CODE: EISRCM1 M030322</b>
<b>NOMINAL DURATION: 100 Hours</b>
<b>MODULE DESCRIPTION:</b> This modules covers the knowledge, attitudes and skills required to conduct simple construction material sampling & testing operations. It includes the planning and preparation for work, taking samples, conduct material testing, conduct preparation of stabilized construction materials, identifying hazards and risks and controlling hazards and risks.
<p><b>LEARNING OUTCOMES</b></p> <p>At the end of the module the trainee will be able to:</p> <p><b>LO1.</b> Prepare for sampling</p> <p><b>LO2.</b> Take sample</p> <p><b>LO3.</b> Conduct material testing</p> <p><b>LO4.</b> Conduct preparation of stabilized construction materials</p> <p><b>LO5.</b> Identify hazards and risks</p> <p><b>LO6.</b> Control hazards and risks</p>
<p><b>MODULE CONTENTS:</b></p> <p><b>LO1. Prepare for sampling</b></p> <p>1.1.Obtaining confirming and applying work instruction</p> <p>1.2.Organizing OHS and site safety</p> <p>1.3.Using construction materials</p> <p>1.4.Selecting tools ,materials and equipment</p> <p>1.5.Environmental protection requirement</p>

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## **LO2. Take sample**

- 2.1 . Obtaining sampling tools.
- 2.2 . Sampling methods and procedure
- 2.3 . Handling Sample with procedure
- 2.4 . Using OHS to handle hazards and risks
- 2.5 . Reporting and documenting

## **LO3. Conduct material testing**

- 3.1 Identifying hazard during test and operation
- 3.2 Identifying test and operation techniques
- 3.3 Operating field and laboratory tests

## **LO4. Conduct preparation of stabilized construction materials**

- 4.1 . Using additional (stabilizer) construction materials.
- 4.2 . Identifying hazard in stabilizer preparation
- 4.3 . Preparation techniques of stabilizer and applying.

## **LO5. Identify hazards and risks**

- 5.1 . Clarifying type of safety and hazard.
- 5.2 Identifying minimizing of hazard.
- 5.3 . Recognizing Contingency measures during workplace accidents.

## **LO6. Control hazards and risks**

- 6.1 . Using OHS procedure.
- 6.2 Organizing OHS policies with procedure.
- 6.3 .Using personal protective equipment (PPE) with OHS
- 6.4 Providing appropriate assistance workplace emergency.

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>



		(if necessary)		
<b>Group discussion</b>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>

<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> <li>❖ Introduce new and relevant vocabularies</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>
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**ASSESSMENT CRITERIA:**

**LO.1.** Prepare for sampling

- Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and applied to the allotted task
- Safety requirements are obtained from the working place safety plan and organizational policies and procedures, confirmed and applied to the allotted task
- Construction materials to be used and handling procedures to be employed are determined according to specifications
- Environmental protection requirements are identified from the organization environmental management plan, confirmed and applied to the allotted task
- Plant, tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified reported

**LO.2.** Take sample

- Suitable clean containers and sampling tools are obtained
- Sample is taken in accordance with approved procedure/job instructions/standards/sampling methods
- Sample is handled, labeled and stored in accordance with approved procedure/job instructions/standards/ sampling methods
- OHS procedures for obtaining and handling samples are adhered to throughout the process including handling hazards and risks
- Necessary reports and documentation are accomplished in accordance with organization standards and format.

**LO.3** Conduct material testing

- Hazards associated with testing operations are identified and safe operating techniques are used to minimize risk
- Operations of field and laboratory tests are carried out in accordance with the work specific requirements.

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- Operating techniques in the use of testing equipment are identified and applied to achieve optimum output in accordance with manufacturers' design specifications while achieving specified tolerances

#### **LO.4. Conduct preparation of stabilized construction materials**

- Proper handling of construction materials and additives (stabilizers) used for the preparation of the mix.
- Preparation techniques for stabilized construction materials are identified and applied to achieve optimum output in accordance with technical specification.
- Site hazards associated with the preparation of stabilized construction materials are identified and safe operational techniques are used to minimize risk.
- Job specifications are identified from drawings, notes and descriptions
- Material attributes are identified from specifications
- Standards of work, finishes and tolerances are identified from the project specifications

#### **LO5. Identify hazards and risks**

- Safety regulations and workplace safety and hazard control practices and procedures are clarified based on organization procedures
- Contingency measures during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures
- Hazards/risks in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures

#### **LO6. Control hazards and risks**

- Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed
- Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies

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- Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol
- Personal protective equipment (PPE) is correctly used in accordance with organization OHS procedures and practices

#### **Annex: Resource Requirements**

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Conducting Simple Sampling And Testing EISRCM1 M030322				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A.	<b>Learning Materials</b>			
1.	TTLM	TTTLM prepared by the trainer		
2.	Reference Books			
2.1	Road Construction Materials	J. Kisunge January 2012	5	1:5
2.2	The nature and properties of soils, 12th edition,	Nyle C. Brady, EEE, Prentice-Hall, 2002.	5	1:5
2.3	ASTM, . American Society for Testing and Materials (ASTM). West Conshohocken, Pa, USA.	2004	5	1:5
2.4	ERA manual	2013 edition	10	1:3
B.	<b>Learning Facilities &amp; Infrastructure</b>			
2.	Arm Chair	Wood with metal		
3.	Printer	Lesser jet	1	1:25
4	Printer	Maximum Paper Input Dimensions (W x D x H) 438 x 373 x 312mm	1	For trainer
5	Laptop	Hp	1	For trainer
6	LCD projector		1	For trainer
C.	<b>Consumable Materials</b>			
1.	paper	A4		
2	pen	I-pen		
5	gravel	>10cm		
6	soil	Clay,silt,cotton		
8	sand	River sand		
9				
10				

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D.	<b>Tools and Equipment</b>			
1.	Chair		25	1:1
2	Laptop	Hp	1	For trainer
3	LCD projector		1	For trainer
4	White screen			

<b>LEARNING MODULE 04</b>	
<b>TVET-PROGRAMME TITLE: Road construction and maintenance Level I</b>	
<b>MODULE TITLE: Carrying -out Basic Leveling</b>	
<b>MODULE CODE: <a href="#">EIS RCM1 M04 0322</a></b>	
<b>NOMINAL DURATION: 90 Hours</b>	
<b>MODULE DESCRIPTION:</b> This unit module the knowledge, attitudes and skills required in carrying out of basic leveling in the civil construction industry. It includes planning and preparing, establishing offsets for civil works, setting up and using leveling device, and cleaning up.	
<b>LEARNING OUTCOMES</b> At the end of the module the trainee will be able to: <b>LO1.</b> Plan and prepare work <b>LO2.</b> Establish offsets for civil works <b>LO3.</b> Set up and use leveling device <b>LO4.</b> Clean up	
<b>MODULE CONTENTS:</b> <b>LO1. Plan and prepare work.</b> 1.1 Appling compliance documentation 1.2 Basic concept of leveling terminology 1.3 Safety requirement 1.4 Implementing signage requirement 1.5 Selecting tool ,plant and equipment 1.6 Identifying environmental protection <b>LO2. Establish offsets for civil works</b> <b>2.1</b> Establishing recovery and offset pegs <b>2.2</b> Re-establishing earth work and offset pegs <b>2.3</b> Establishing drainage offset	

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**LO3. Set up and use leveling device**

- 3.1 Basic concept of leveling task and calculation
- 3.2 Leveling instrument set up
- 3.3 Identifying heights from project plan
- 3.4 Leveling procedures

**LO4. Clean up**

- 4.1. Clean work area
- 4.2. Cleaning, checking, maintaining and storing tools and equipment

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

**ASSESSMENT CRITERIA:**

**LO.1 Plan and prepare**

- Access, interpret and apply compliance documentation relevant to the work activity
- Obtain and confirm safety requirements from the site safety plan and organizational policies and procedures, and apply to the allotted task
- Identify, obtain and implement signage requirements From the project traffic management plan,
- Select plant, tools and equipment to carry out leveling tasks consistent with the requirements of the job, check for serviceability and rectify or report any faults
- Check leveling equipment for serviceability within specified tolerances, and report any faults
- Identify environmental protection requirements from the project environmental management plan, and confirm and apply to the allotted task

**LO.2 Establish offsets for civil works**

- Establish offset and recovery pegs from survey controls to specified plans and drawings to meet project requirements
- Re-establish earthwork and pavement control lines from offsets and/or recovery pegs in accordance with plans, drawings and specifications
- Establish drainage offsets from survey

**LO.3 Set up and use leveling device**

- Identify heights to be transferred/established from project plans or instructions
- Set up and use leveling instruments correctly in accordance with standard operating procedures and manufacturer's guidelines
- Transfer heights from the known to the required
- Document results of leveling procedure and close them

**LO.4. Clean up**

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- Clear work area and dispose of or recycle materials in accordance with project environmental management plan
- Clean, check, maintain and store tools and equipment

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**Annex: Resource Requirements**

<b>(EIS RCM1 04 0322) Carrying-out Basic Leveling</b>				
<b>Item No.</b>	<b>Category/Item</b>	<b>Description/ Specifications</b>	<b>Quantity</b>	<b>Recommended Ratio (Item: Trainee)</b>
<b>A. Learning Materials</b>				
1.	TTLM	TTLM prepared by the trainer	5	1:
2.	Reference Books			
2.1	Surveying and leveling	2 <sup>nd</sup> edition john Clancy	5	10:25
2.2	Basic principles in surveying 1	Version 1 December 2008	5	10:25
3.	Journals/Publication/Magazines	Electronic ( open access journal)	5	1:5
<b>B. Learning Facilities &amp; Infrastructure</b>				
1.	Lecture Room	8 X 10m	1	1:25
2.	Library	15 X 15m	1	1:25
3.	Workshop or work place	10 X 10m	1	1:23
4	Internet Room	6 X 5m	1	1:30
<b>C. Consumable Materials</b>				
1.	Drawing Paper	A4	6 Pack	1:5
2	Pencil	HB	25	1:1
3	Eraser	r@tring B20,TB20,B30	25	1:1
4	chalk line	180*67*65 mm Line length: 15 m	25	1:1
<b>D. Tools and Equipments</b>				

1.	Automatic levels	Magnification + 32 , Image- erect , objective aperture: 36mm, field of view : 1 degree 20 <sup>0</sup> , accuracy:- +-0.3 , net wet – 1.8kg with accessories	5 pcs Each	1:5
2	Plumb bob	VRS 250 grams	15 pics	1:2
3	survey pegs	50cm height and made from steel/wood	5	1:5
4	string lines	2mm thick, yellow	5 roll	1:5
5	Range pole	2 meter long /wooden/	30pcs	10:1
5	Tape measures	5meter pocket metric scale on both sides and 50meter, plastic type	5pcs Each	1:5
6	Line level	80x120mm length 4-6cm	15 pics	1:2
7	Spirit levels	Steel with 80m	5	1:5
8	Hammers	Steel with handle wood 5kg	5	1:5

<b>LEARNING MODULE 05</b>
<b>TVET-PROGRAMME TITLE: Road Construction and Maintenance Level I</b>
<b>MODULE TITLE: Implementing Traffic Management Plan with Stop-Slow Bat</b>
<b>MODULE CODE: <a href="#">EIS RCM1 M05 0322</a></b>
<b>NOMINAL DURATION: 60 Hours</b>
<p><b>MODULE DESCRIPTION:</b> This module covers the competency required to implement a traffic management plans in the public road construction sites. It includes: planning and preparing; set out the traffic guidance scheme, monitoring and closing down the traffic guidance scheme; and cleaning up.</p> <p>And also, it covers the knowledge, attitudes and skills required to control traffic on public road construction sites for the protection of site workers and the general public. This unit includes operating a radio and using a stop-slow bat.</p>
<p><b>LEARNING OUTCOMES</b></p> <p>At the end of the module the trainee will be able to:</p> <ul style="list-style-type: none"> <li><b>LO1.</b> Plan and prepare</li> <li><b>LO2.</b> Coordinate traffic</li> <li><b>LO3.</b> Set out the traffic guidance scheme</li> <li><b>LO4.</b> Read and interpret job specifications</li> <li><b>LO5.</b> Operate radio</li> <li><b>LO6 .</b>Close down traffic guidance scheme</li> <li><b>LO7 .</b>Clean up</li> </ul>

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**MODULE CONTENTS:**

**LO1. Plan and prepare work**

- 1.1 Accessing Compliance documentation
- 1.2 Applying conforming and obtaining Work instructions
- 1.3 Safety requirements.
- 1.4 Identifying Signage *and* devices requirements
- 1.5 Tools and equipment.
- 1.6 Identifying, Environmental protection requirements
- 1.7 Advising Traffic controlling requirements

**LO2. Coordinate traffic**

- 2.1 Confirming temporary traffic signs
- 2.2 Confirming traffic site plan
- 2.3 Controlling Vehicles and pedestrian traffic
- 2.4 Monitoring and adjustments traffic flow
- 2.5 Using Hand held stop/slow bats
- 2.6 Using Hand signals
- 2.7 Reporting traffic offenders

**LO3 Set out the traffic guidance scheme**

- 3.1 Selecting traffic guidance scheme
- 3.2 Determining site communications
- 3.3 Ensuring signs and devices
- 3.4 Ensuring and displaying signs and devices
- 3.5 Ensuring , positioning signs and devices
- 3.6 Controlled and ensured traffic work area

**LO4. Monitor traffic guidance scheme**

- 4.1 Monitoring Traffic flow
- 4.2 Monitoring work activities
- 4.3 Applying traffic dealing process

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4.4 Applying offending motorists procedures

**LO5. Operate radio**

5.1 Adjusting Radio controls reception/ transmission results

5.2 Transmitting messages concisely

5.3 Maintained Radio power supply

5.4 Checked Radio contact

**LO6. Close down traffic guidance scheme**

6.1 Controlling traffic devices

6.2 Ensuring traffic control devices

**LO7. Clean up**

7.1 Removing signs and devices

7.2 Clearing work area

7.3 Cleaning tools and equipment

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>



<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

## ASSESSMENT CRITERIA:

### LO.1 Plan and prepare

- **Compliance documentation** are accessed, interpreted and applied relevant to implement a traffic management plans
- **Work instructions**, including plans, working drawings, quality requirements and operational details relevant to the tasks are obtained, confirmed and applied to the allotted task
- **Safety requirements** are obtained from the site safety plan and organizational policies and procedures, confirmed and applied to the allotted task
- **Signage and devices** requirements are identified and obtained from the project traffic management plan and implemented
- **Tools and equipment** selected to carry out tasks that are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported
- **Environmental protection requirements** are identified from the project environmental management plan confirmed and applied to the allotted task.
- **Traffic controllers** are advised of the traffic flow requirements for the site

### LO.2 Coordinate traffic

- Temporary traffic signs and barriers are positioned or confirmed in accordance with Regional or Federal regulations
- Traffic is directed in accordance with site traffic plan and away from services or areas of potential damage or danger
- Vehicles and pedestrian traffic within the work site are controlled to ensure safety of workers through Traffic
- Traffic is monitored, adjustments made for changing conditions, and waiting vehicles positioned to allow for smooth traffic flow
- Hand held stop/slow bats are used in accordance with Regional State or Federal regulatory authority approved procedures

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- Hand signals are used in accordance with Regional State or Federal regulatory authority approved procedures
- Traffic offenders are reported in accordance with regulatory authority approved procedures

### **LO.3 Set out the traffic guidance scheme**

- Traffic guidance scheme is selected to suit site conditions, traffic volumes and work activities
- Adherence to work schedule, maximum traffic delays, signals and site **communications** are
- Signs and devices are ensured that they correctly positioned on the approaches to the work area in accordance with the traffic management plan
- Signs and devices are ensured that they positioned and displayed on each approach according to Road Authority
- Signs and devices are ensured that they positioned laterally and displayed in accordance with Road Traffic is controlled effectively and ensured to protect the work crew placing traffic control devices around the work area

### **LO.4 Monitor traffic guidance scheme**

- Traffic flow is monitored and effectiveness of guidance scheme determined and ensured
- Work activities are monitored and guidance is provided to adjust scheme
- Process for dealing with traffic controllers when they fail to adhere to the approved procedures are applied
- Procedures to deal with offending motorists are applied

### **LO.5 Operate radio**

- Radio controls are adjusted for optimum reception/ transmission results
- Messages are transmitted concisely and in accordance with operating procedures or best practice

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- Radio power supply is maintained in accordance with manufacturers recommendation
- Radio contact is checked after nominated period of non-contact and in accordance with operating procedures

**LO.6 Close down traffic guidance scheme**

- Traffic is ensured controlled to protect work crew removing traffic control devices from the work area
- Signs are ensured removed in sequence to provide maximum warning during removal of traffic control devices
- Guidance scheme details are ensured recorded to organizational and or Road Authority requirements
- Incidents are ensured reported as required by the organization and/or Road Authority

**LO.7 Clean up**

- Signs and devices are removed or covered sequentially to provide warning to motorists during Shutdown Work area is ensured cleared in accordance with the project environmental management
- Tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers' recommendations and standard work practices

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## Annex: Resource Requirements

Implementing Traffic Management Plan with Stop-Slow Bat				
EIS RCM1 M05 0322				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Learner)
<b>A.</b>	<b>Learning Materials</b>	Prepared by the trainers Module 01		
1.	TTLM	Prepared by Trainers	5	1:5
2.	Reference Books	1, Traffic Flow Theory by D R Drew 2, Traffic Signal Information First published: 27 May 2016	5	1:5
3.	Journals/Publication/Magazines	Journal of Traffic management plan	5	1:5
<b>B.</b>	<b>Learning Facilities &amp; Infrastructure</b>		1	1:25
1.	Lecture Room	8 X 6m	1	1:25
2.	Library	10 X 10m	1	
3.	work place	standard		
4.	Internet Room		1	1:25
5.	White board	1.22×2.44m	1	1:25
<b>C.</b>	<b>Consumable Materials</b>			
<b>D.</b>	<b>Tools and Equipments</b>			
1.	Radio	Wireless Resolution No. 91/4	10pcs	2:5
2.	Stop-slow bat	G102303 Australian Aluminum	5pcs	1:5
4.	Traffic cones	High Density Polyethylene 2kg	30pcs	6:5
5.	Warning lights and beacons	High visibility	10pcs	2:5

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6.	Arrow boards	TC12 LED	10pcs	2:5
4.	LCD projector	EPSON HD	1	1:25
5.	Printer	LaserJet speed upto 43ppm standard device	1	1:25
6.	Copy machine	BWA3 multi functional copy,print,and scan	1	1:25
7.	Screen	Poly-silicon bright link480i*260 pixels 64”	1	1:25
<b>C.</b>	<b>Consumable Materials</b>			
2	Pencil	HB, 2HB, 4H	25 pcs	1:1
5	pen & ink	Red, blue and black	25 pcs	1:1
6	Eraser	Synthetic rubber, 40 x 20 x 10 mm	25pcs	1:1

## LEARNING MODULE 06

**TVET-PROGRAMME TITLE: Road construction and maintenance Level L1**

**MODULE TITLE: Draining and De-watering Civil Construction Site**

**MODULE CODE: [EIS RCM1 M06 0322](#)**

**NOMINAL DURATION: 90... Hours**

**MODULE DESCRIPTION:** This module covers draining and/or dewatering of civil construction project sites. It includes: planning and preparing; positioning sedimentation control; remove surface water; constructing sump and wells; removing water from sumps or wells, trenches and pits; and cleaning up.

### LEARNING OUTCOMES

At the end of the module the trainee will be able to:

- LO1.** Plan and prepare
- LO2.** Position sedimentation control
- LO3.** Remove surface water
- LO4.** Construct sump/wells
- LO5.** Remove water from sumps/wells, trenches and pits
- LO6.** Clean up

### MODULE CONTENTS:

#### LO1. Plan and prepare

- 1.1 Accessing Compliance documentation related to draining and/or dewatering project
  - 1.1.1. Ethiopian standards for draining and dewatering
  - 1.1.2. code of practice for draining and dewatering
- 1.2 Obtaining, confirming, and applying work instructions to the task
- 1.3 Safety requirements
- 1.4 Implementing Signage requirements for project
- 1.5 Plant, tools and equipment
- 1.6 Environmental protection requirements

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**LO2. Position sedimentation control**

- 2.1 Positioning sedimentation control
- 2.2 Constructing sedimentation control barriers.
- 2.3 Positioning geo-fabrics and/or woven wire

**LO3. Remove surface water**

- 3.1 Establishing Temporary drainage systems
- 3.2 Draining or diverting surface and sub-surface water
- 3.3 Removing Slab and site surface water
- 3.4 Filling surface holes and depressions
- 3.5 Draining Surface water to drainage system

**LO.4 Constructed sump/wells**

- 4.1 located Sump and/or well to maximize pump efficiency
- 4.2 Constructing Sump and/or well

**LO. 5 Remove water from sumps/wells, trenches and pits**

- 5.1 Installing surface or submersible pumps
- 5.2 Locating Surface pump
- 5.3 pumping Water to temporary drainage system
- 5.4 Dispersing discharged water

**LO. 6 Clean up**

- 6.1 Clearing work area
- 6.2 Maintain and store tools and equipment.

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>



	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

## ASSESSMENT CRITERIA

### LO1. Plan and prepare

- Compliance documentation relevant to draining and/or dewatering project sites are accessed, interpreted and applied.
- Relevant Work instructions are obtained, confirmed and applied to the tasks to the allotted task.
- Safety requirements from the site safety plan and organizational policies and procedures are obtained, confirmed and applied to the allotted task.
- Signage requirements from the project traffic management plan are identified, obtained and implemented.
- Plant, tools and equipment to carry out tasks that are consistent with the requirements of the job are selected, checked them for serviceability and rectified or any faults are reported.
- Environmental protection requirements from the project environmental management plan are identified, confirmed and applied to the allotted task

### LO2. Position sedimentation control

- Sedimentation controls are positioned according to project environmental management plan.
- Sedimentation control barriers are constructed in accordance with the environmental management plan.
- Geo-fabrics and/or woven wire is positioned according to specification and to the environmental management plan

### LO3. Remove surface water

- Temporary drainage systems are established to drain or divert surface and sub-surface water to the storm water drainage system.

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- Slab and site surface water is removed and/or directed to the temporary drainage system.
- Surface holes and depressions are filled
- Surface water is drained to drainage system using adequate fall

**LO4. Construct sump/wells**

- Sump and/or well is located at the lowest point to be drained to maximize pump efficiency.
- Sumps and/or wells are constructed to work instructions

**LO5. Remove water from sumps/wells, trenches and pits**

- Surface or submersible pumps are installed.
- Surface pump is located as close as practicable to the sump or well.
- Water is pumped to temporary drainage system according to the project environmental management plan.
- Discharged water is dispersed using approved procedures

**LO6. Clean up**

- Work area is cleared and materials are disposed of or recycled in accordance with project environmental management plan.
- Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturer's recommendations and standard work practices

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### Annex: Resource Requirements

Draining and De-watering Civil Construction Site EIS RCM1 M06 0322				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A. Learning Materials</b>				
1.	TTLM	Prepared by the trainers Module 01	5pcs	1:5
2.	Textbooks			
3.	Reference Books			
4.	Journals/Publication/Magazines			
<b>B. Learning Facilities &amp; Infrastructure</b>				
1.	Lecture Room	10 X 10m	1	1:25
2.	Library	15 X 15m	1	1:25
3.	Workshop or work place	10 X 10m	1	1:25
<b>C. Consumable Materials</b>				
1.	pipe	50dia,110dia,3”	5	1:5
2.	cement	PPC,OPC	5	1:5
3.	aggregate	00,01,02	5M3	1:5
4.	sand	M <sup>3</sup>	5M3	1:5
5.	timber	M <sup>2</sup> (4MX0.2M)	5	1:5
<b>D. Tools and Equipment's</b>				
1	Hoses	25-100ft Expandable Flexible Watering Sprayer	6pcs	1:5
2	Shovels	Material: Metal Foldable Size: (L)X(W)24.5X15cm	6pcs	1:5

## LEARNING MODULE 07

**TVET-PROGRAMME TITLE: Road Construction And Maintenance Level I**

**MODULE TITLE: Conducting Labor based Earthwork**

**MODULE CODE: [EIS RCM1 M07 0322](#)**

**NOMINAL DURATION: 90 Hours**

### LEARNING OUTCOMES

At the end of the module the trainee will be able to:

- LO1.** Plan and prepare work
- LO2.** Carry out clearing and grubbing operation
- LO3.** Perform excavation and fill operation
- LO4.** Conduct ditches and road formation operation
- LO5.** Clean up

### MODULE CONTENTS:

#### **LO1. Plan and prepare work**

- 1.1 Earth work
  - 1.1.1 Introduction to earth work
  - 1.1.2 Types of earth work
- 1.2 Occupational Health and Safety requirements
- 1.3 traffic signage requirement
- 1.4 Selecting Plant, tools and equipment
- 1.5 Identifying compaction Standard and testing
- 1.6 Environmental protection requirements

#### **LO2. Carry out clearing and grubbing operation**

- 2.1 Site selecting and preparation
- 2.2 Informing job requirements
- 2.3 Clearing, grubbing & disposing operations

#### **LO3. Perform excavation and fill operation**

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- 3.1 Setting out Cross section, vertical and horizontal alignment
- 3.2 Cutting & filling level to level operation
- 3.3 Method & Types of compaction
- 3.4 Carrying out quantity estimation
- 3.5 Moisture Content Determination
- 3.6 disposing waste materials

**LO4. Conduct ditches and road formation operation**

- 4.1 Setting out ditch location ,shape and shoulder
- 4.2 Informing Labor forces
- 4.3 Setting out road formation operation Ditch
- 4.4 assessing and controlling earthworks operation process
- 4.5 disposing waste materials

**LO5. Clean up**

- 5.1 Clearing work area
- 5.2** Disposing or recycling materials
- 5.3 Cleaning, Checking, Maintaining and Storing

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>





		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

**ASSESSMENT CRITERIA:**

**LO.1 Plan and prepare work**

- Types and sources of Information are obtained, confirmed and applied to form the earthwork of the labor-based road project task
- Occupational Health and Safety requirements are obtained from the site safety plan and organizational policies and procedures, confirmed and applied to the allotted task
- Signage requirements are identified and obtained from the project traffic management plan and implemented
- Plant, tools and equipment which are selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported
- Compaction standards and testing requirements are correctly identified for job from specification / briefs
- Environmental protection requirements are identified from the project environmental management plan, confirmed and applied to the allotted task

**LO.2 Carry out clearing and grubbing operation**

- Clearing road width and length is set out as per the work order
- Labor forces are informed of job requirements
- Bush clearing, stamp, top soil and boulders are removed as per the work order using labor based road construction technologies
- Cleared and removed materials are disposed in accordance to the work order

**LO.3 Perform excavation and fill operation**

- Cross sections, vertical and horizontal alignments are set out as per the work order using labor base technologies.
- Labor forces are informed of job requirements.
- Given earth work quantities and team days are accomplished and known with suitable working space.

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- Level to level cut /fill are done in accordance to the working drawing or the work order using labor based road construction method.
- Moisture content, sequence and layer compaction are done according to the work order
- Cleared and waste materials are disposed of as per the work order

#### **LO.4 Conduct ditches and road formation operation**

- The given ditch location, shape and shoulder control points are set out and checked using labor base technologies
- Labor forces are informed of job requirements.
- Ditches, road formation, camber, super elevation and side slope formation are set out and performed according to the working drawing.
- The earthworks operation process is assessed and controlled to ensure that the specified height and the overall dimensions are achieved.
- Cleared and waste materials are disposed in the given space

#### **LO.5 Clean up**

- Clear work area and dispose of or recycle materials in accordance with project environmental management plan
- Clean, check, maintain and store plant, tools and equipment

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### Annex: Resource Requirements

EIS RCM1 07 0322 Conducting Labor based Earthwork				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A.</b>	<b>Learning Materials</b>			
1.	TTLM	TTTLM prepared by the trainer	5	1:5
2	Reference Books			
2.1.	1.contractor's hand book labor-based road works	Republic of Zambia Ministry of Works and Supply Roads Department, Roads Training School	5	1:5
2.2	Labour Based Road Construction and Maintenance	ERA Ginchi-Chancho Training Center	5	1:5
<b>B.</b>	<b>Learning Facilities &amp; Infrastructure</b>			
1.	Class room	8mx6m	1pcs	1:25
2.	Whit-board/Blackboard	240 x 120 cm	1pcs	1:25
3.	Arm Chair		25	1:1
4.	Workshop	10mx10m	1	1:25
5.	LCD	espos	1pcs	1:25
6.	Laptop or Computer	32-bit OS; 4 GB RAM; Intel core i5 (Processor) For trainer	1pcs	1:25
7.	Library	Per section 105 – 180 m2	180 m2	
10.	Internet room	5mx5m	1	1:25
<b>C.</b>	<b>Consumable Materials</b>			
1.	peg	Eucalypts tree Ø 6cm	250pcs	10:1
2.	water		150	6:1

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3	String	3-5mm nylon rope construction string	25	1:1
<b>D.</b>	<b>Tools and Equipments</b>			
1.	Tape Measures	Stainless steel measuring tape size 5mx19mm	25	1:1
2	Tape Measures	Fiber water proof measuring tape 50 m	25	1:1
3	Pick Axes	mild steel1.8kg MS India	5	1:5
4	Tractor With Trailer	MS mini tractor trailer capacity 1500 kg	1	1:25
5	Towed Water Tanker	5-7 ton 4 wheel tanker towed	1	1:5
6	Sprit Level	1m-1.5m aluminum frame and digital sprit level	13	1:2
7	Ranging Rods	ranging rod 2m length	75	5:1
8	Straight Edge	straight edge 3m length	9	1:3
10	Shovel	Wooden handle shovel (Belcha) MS mouth	13	1:2
11	Wheel barrows	60L 120kg load capacity heavy duty wheel barrow for construction	5	1:5
12	Profile Board	China aluminum profile board 2m length	13	1:2



<b>LEARNING MODULE 08</b>
<b>TVET-PROGRAMME TITLE: Road Construction and Maintenance Level I</b>
<b>MODULE TITLE: Conducting Labor Based Gravel Pavement Works</b>
<b>MODULE CODE: <u>EIS RCM1 M08 0322</u></b>
<b>NOMINAL DURATION: .80... Hours</b>
<b>MODULE DESCRIPTION:</b> This module covers the knowledge, attitudes and skills required to conduct the construction of a gravel pavement using labor-based road construction technology. It includes the minimum criteria for competence assessment. The competence includes the set-out, the direction for the placement and spreading, trimming of granular pavement, material compaction and cleanup of waste materials.
<p><b>LEARNING OUTCOMES</b></p> <p>At the end of the module the trainee will be able to:</p> <p><b>LO1.</b> Prepare and perform pre-condition activities</p> <p><b>LO2.</b> Conduct selects material production</p> <p><b>LO3.</b> Conduct, surfacing /paving work/</p>
<p><b>MODULE CONTENTS:</b></p> <p><b>LO1. Prepare and perform pre-condition activities</b></p> <p>1.1.Appling and confirm types of information</p> <p>1.2.Organizing policies and procedures OH&amp;S</p> <p>1.3.Identifying and implemented signage requirements</p>

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- 1.4.Plant, tools and equipment
- 1.5. Identifying and appropriate handle material
- 1.6.Responsibility and obligations employment conditions
- 1.7. Identifying Environmental protection requirements

**LO2. Conduct selects material production**

- 2.1 Selecting quarry site and quality of material
- 2.2 Producing Selected material
- 2.3 Labor base material production techniques

**LO3. Conduct, surfacing /paving work/**

- 3.1 Setting and lying out Road width, thickness and damping space
- 3.2 transporting Surfacing material
- 3.3 Compacting and spreading Surfacing material

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>



## ASSESSMENT CRITERIA:

### LO.1 Prepare and perform pre-condition activities

- Types & Sources of Information are obtained, confirmed and applied to the allotted task.
- Occupational Health & Safety requirements are obtained and implemented as per organizational policies and procedures.
- Identified signage requirements are obtained and implemented.
- Selected Plant, tools and equipment to carry out tasks are checked for serviceability and any faults are rectified or reported.
- Material appropriate to the work application are identified, safely handled and located ready for use.
- Civil construction employment conditions, responsibilities and obligations are communicated.
- Environmental protection requirements are identified from the project environmental management plan or appropriate regulatory specifications

### LO.2 Conduct selects material production

- Quarry site is selected; *quality of material* is insured according to the *work order*.
- Selected material is produced using the practice and procedure of labor-based road construction material production techniques by using *tools and equipment*.

### LO.3 Conduct, surfacing /paving work/

- Road width, thickness and damping space are set and lied out according to the work order.
- Surfacing material is transported using the appropriate *hauling means*.
- Surfacing material is spread and compacted according to the work order /using labor-based surfacing techniques by using *tools and equipment*.

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### Annex: Resource Requirements

Conducting Labor Based Gravel Pavement Works <a href="#">EIS RCM1 M08 0322</a>				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A.</b>	<b><i>Learning Materials</i></b>			
1.	TTLM	TTLM prepared by the trainer		
2	Road Plans	Cross-sectional, profile & plain view	1	1 : 25
3	working drawings and specification	Cross-sectional, profile & plain view	1	1 : 25
4	Road drawings	Presentation	1	1 : 25
<b>2.</b>	<b>Reference Books</b>			
2.1	technical Manual for Labour Based Road Rehabilitation Works, RTS incollaboration with Norconsult A.S.Kenya, Lusaka, March 2000			
4.	Journals/Publication/Magazines			
	<a href="https://www.ilo.org/wcmsp5/group/public/---asia/---ro-">https://www.ilo.org/wcmsp5/group/public/---asia/---ro-</a>			

	bangkok/documents/genericdocument/wcms_101009.pdf			
<b>B.</b>	<b><i>Learning Facilities &amp; Infrastructure</i></b>			
1.	Lecture room	8 x 10m	1	1:25
2.	Lap top	Core i 5/ 7, CPU@ 2.80Gz, RAM 8GB,	1	1:25
3	LCD projector	HD	1	1:25
4	Printer	Heavy duty	1	1:25
5	Copy machine	Heavy duty	1	1:25
6	Screen	64"	1	1:25
	Work area	100mx100m	1	1:25
<b>C.</b>	<b><i>Consumable Materials</i></b>			
1.	scotch tape	A4 Size	25 pcs	1:1
2	Pencil	HB	25 pcs	1:1
3	pen & ink	Blue, red, black	25 pcs	1:1
4	Calculator	Scientific	25 pcs	1:1
5	Paper	A4 Size	2 Rim	1:13

6	fixer with lead	0.5, 0.7	25 pcs	1:1
7	Duster	For White & black board	1	1 : 25
8	White Board Marker	2mx1m	1pcs	1:25
9	Crashed aggregate	By size(00, 01, 02, 03mm )	15meter cubic	1:15
<b>D. Tools and Equipments</b>				
1.	wheel barrow	25kg capacity	5 pcs	1:5
2	Sledge Hammer	By kg (3, 5,10kg)	5 pcs	1:5
3	Roller	Small plant	1 pc	1:25
4	Rakes or Spreaders	Made of metal and wooden	1 pc	1:25
5	Camber Board + Spirit Level	Made of metal and wooden	5 pcs	1:5
6	Pig	Made of metal	5 pcs	1:5
7	Hoes	Made of plastic	5 pcs	1:5
8	Shovels	Made of Metal and wooden	5 pcs	1:5
9	Strings	Rolled	5 roll	1:5
10	ranging rods	Made of Metal and wooden	50 pcs	2:1

<b>LEARNING MODULE 9</b>	
TVET-PROGRAMME TITLE: <b>Road Construction &amp; Maintenance Level I</b>	
MODULE TITLE: <b>Carrying out Chiseling, Laying Cobblestone &amp; Block Pavement Works</b>	
MODULE CODE: <b>EIS RCM1 M09 0322</b>	
NOMINAL DURATION: 70Hours	
<p><b>MODULE DESCRIPTION:</b> This module covers the knowledge, attitudes and skills required in the selection of raw materials, preparing chiseling tools, selecting chiseling place and observing safety precaution and it covers the laying of pavers in the civil construction industry. It includes planning and preparing for work, preparing to lay paving, laying pavers, and cleaning up.</p>	
<p><b>LEARNING OUTCOMES</b></p> <p>At the end of the module the trainee will be able to:</p> <p><b>LO1.</b> Plan and prepare for work</p> <p><b>LO2.</b> Identify the raw material</p> <p><b>LO3.</b> Prepare chiseling tools and materials</p> <p><b>LO4.</b> Select proper place for chiseling</p> <p><b>LO5.</b> Carry-out chisel works</p> <p><b>LO6.</b> Complete work process</p> <p><b>LO7.</b> Prepare to lay paving materials</p> <p><b>LO8.</b> Lay pavers</p> <p><b>LO9.</b> Clean up</p>	
<p><b>MODULE CONTENTS:</b></p> <p><b>LO1. Plan and prepare for work</b></p> <p>1.1 Accessing, applying and Interpreting Compliance documentation</p> <p>1.2 Obtaining safety requirements</p> <p>1.3 Carrying out tools and equipment</p> <p>1.4 Environmental protection requirements</p>	

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1.5 Identifying Area and location of paving

1.6 Selecting required paving material

**LO2. Identify the raw materials**

2.1 . Identify types of raw material

2.2 . Identifying raw material and producing the size of the cobble stone

**LO3.Prepare chiseling tools and materials**

3.1 . Selecting and preparing Tools

3.2 . Selecting Chiseling materials

3.3 Checking functioning of Chiseling material

**LO4. Select proper place for chiseling**

4.1 . Sheltering work place

4.2 . Selecting Flat and well-ventilated work place

**LO5. Carry-out chisel works**

5.1 . Using appropriate tools with their chiseling capacity.

5.2 . Measuring out raw material

5.3 . Using personal protective equipment wore procedure.

5.4 . Identifying Safety cloths

5.5 . Wearing Safety cloths

**LO6. Complete work process**

6.1 .Cleaning Work area

6.2 . Cleaning tools and materials

6.3 . Observing OHS throughout the work process

**LO7. Prepare to lay paving materials**

7.1 . Setting out paving area.

7.2 . Excavating to specific depth and thickness

7.3 . positioning drainage pipes

7.4 . preparing sub-soil and footing

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7.5 .selecting base materials

7.6 . Cleaning surface free of loose materials.

**LO8. Lay pavers**

8.1 . positioning edge boards

8.2 . Spreading and compacting. sand and aggregate

8.3 .Paving and grading surface to run off water.

8.4 . Mixing mortar for masonry pavement.

8.5 . Cutting paving material

8.6 . Laying paving units.

8.7 . Completing edges.

8.8 . Completing Compacting, mortaring and sweeping

8.9 . Maintaining across junctions with different level.

**LO9. Clean up**

9.1.Cleaning tools and materials.

9.2.Observing OHS during work process.

9.3.Clearing and disposing or recycle material.

9.4.Cleaning checking, maintaining and storing tools and equipment.

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>



	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

		(if necessary)		
<b>Group discussion</b>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>

<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> <li>❖ Introduce new and relevant vocabularies</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>
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**ASSESSMENT CRITERIA:**

**LO.1. Plan and prepare for work**

- Compliance documentation relevant to the work activity are accessed, interpreted and applied
- Safety requirements are obtained and confirmed from the site safety plan and organizational policies and procedures, and applied to the allotted task.
- Paving requirements and selected material are calculated to meet required finish of surface and pattern
- Environmental protection requirements are identified from the project environmental management plan, and confirmed and applied to the allotted task
- Area and location of paving are identified from job drawings
- Tools and equipment to carry out tasks are selected consistent with the requirements of the job, checked for serviceability and rectified or reported any faults

**LO.2. Identify the raw material**

- Types of raw material are identify based on the desired need of client
- Identified raw material is made ready for the work according to the size of the cobble stone to be produced

**LO.3. Prepare chiseling tools and materials**

- Tools are selected and prepared in accordance with the job specifications
- Chiseling materials are selected based on the type of stone to be chiseled
- Chiseling material are checked for their proper functioning

**LO.4 .Select proper place for chiseling**

- Flat and well-ventilated chiseling place is selected based on safe work place procedures
- Sheltered place form the sun and rain is selected based on safe work place procedures
- Standards of work, finishes and tolerances are identified from the project specifications

**LO5. Carry-out chisel works**

- Primary and secondary chiseling tools are used appropriate to their chiseling capacity.

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- Appropriate personal protective equipment is worn following safe work procedures
- Safety cloths are identified based on the proposed work procedure
- Raw material is measured out and chiseled according to job requirement and specifications
- Safety cloths are worn based on the requirement of the work

#### **LO6. Complete work process**

- Work area is cleaned after chiseling works
- OHS is observed throughout the work process
- Tools and materials are cleaned and kept/stored in accordance with standard procedures

#### **LO7. Prepare to lay paving materials**

- Location and shape of paving area are set out to dimensions from job drawings
- Excavation to specified depth, allowing for base and thickness of unit are carried out
- Drainage pipes are positioned in sub-soil to local regulations
- Sub-soil and footing are prepared in accordance with specifications
- Surface is cleaned free of loose material and dust where paving is to be bonded to substrate
- Base material is selected in accordance with manufacturer's specifications for identified substrate

#### **LO8. Lay pavers**

- Edge boards are positioned to set out and specifications
- Paving surface is graded, where drainage is necessary, to fall evenly without ponding to outlets or surface run off system provided
- Finish level is maintained across junctions between different levels
- Mortar is mixed for masonry paving to specifications
- Pavers are cut to form edges ensuring fit and minimum wastage of material
- Paving units are laid to designed pattern

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- Edges are completed to specification
- Compaction, mortaring and sweeping work are completed to specifications.
- Sand and aggregate are spread and compacted to specifications

#### **LO9. Clean up**

- Tools and equipment are cleaned, checked, maintained and stored
- OHS is observed throughout the work process
- Work area materials are cleaned, cleared and disposed of or recycled in accordance with project environmental management plan
- Tools and materials are cleaned and kept/stored in accordance with standard procedures

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## Annex: Resource Requirements

Carrying out Chiseling, Laying Cobblestone & Block Pavement Works EIS RCM1 M09 0322				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A. Learning Materials</b>				
1.	TTLM	TTLM prepared by the trainer	5	1:5
2.	Reference Books			
2.1	Road Construction Materials	J. Kisunge 2 <sup>nd</sup> edition	5	1:5
2.2	Masonry wall	VOL.2	5	1:5
2.3	Materials (ASTM). West Conshohocken, Pa, USA.	2004	5	1:5
2.4	ERA manual	2013 edition	10	1:3
2.5				
<b>B. Learning Facilities &amp; Infrastructure</b>				
1.	Lecturing room	8m*6m	1	1:25
2.	Chair	Wood with metal	25	1:1
7	White board			
<b>C. Consumable Materials</b>				
1.	paper	A4		
2	pen	Bick or lexis	25	1:1

5	Stone	basalt	10M <sup>3</sup>	1:2
6	sand	River sand	10M <sup>3</sup>	1:2
8	Dressed coble	10cm*10cm	200pcs	10:1
9	fuel	Diesel oil	12 litter	1:2
10	Filer aggregate	0.00m	5M <sup>3</sup>	1:2
11	string	Ø 3mm /100m	12	1:2
<b>D.</b>	<b><i>Tools and Equipments</i></b>	<b><i>jos</i></b>		
1.	Square	Stainless Steel 6 inch 150mm	25	1:1
2	Sprite level	LENGTH 45cm 3 bubbles	25	1:1
3	Chisel	Model Number AS-060” round punch “	25	1:1
4	Stone hammer	Alloyed steel 2kg	25	1:1
5	Sledge hammer	Alloyed steel 5 kg	25	1:1
6	Meter	5m	25	1:1
7	Wire or hair brush	Length: 40 cm. Width: 5,5 cm. <u>handle holder</u> Ø 24 mm. Metal screws.	5	1:5



9	First aid kit	Contain, Alcohol, bandage etc	1	1:25
10	trowels	Alloy Steel pointed	25	1:1
11	Shovel	dimensions L x W x H 82 x 15 x 8.5 cm Weight 1.1kgs Round Point	25	1:1
12	compactor	High Performance Gasoline (HZR- 80) Plate Compactor	1	1:25
13	Wheelbarrow	Load Capacity 250kg	5	1:5
14	rubber mallets	Weight 1.2kg, Rubber Head Head Size (in.) 5.1 x 3.3 x 3.3	25	1:1

<b>LEARNING MODULE 10</b>	
<b>TVET-PROGRAMME TITLE: Road construction and maintenance Level I</b>	
<b>MODULE TITLE: Conducting Basic Scaffolding Operations/Formworks/False works</b>	
<b>MODULE CODE: <a href="#">EIS RCM1 10 0322</a></b>	
<b>NOMINAL DURATION: 60 Hours</b>	
<p><b>MODULE DESCRIPTION:</b> This module covers the knowledge, attitudes and skills required in the conduct of basic scaffolding operations and construction of formwork and falsework in the civil construction industry. It includes planning and preparing for scaffolding operations, erecting maintaining scaffolding and dismantling scaffolding, and erecting, inspecting and stripping formwork.</p>	
<p><b>LEARNING OUTCOMES</b></p> <p>At the end of the module the trainee will be able to:</p> <p><b>LO1.</b> Plan and prepare for scaffolding operations</p> <p><b>LO2.</b> Erect and maintain scaffolding</p> <p><b>LO3.</b> Dismantle scaffolding</p> <p><b>LO4.</b> Prepare for formwork erection</p> <p><b>LO5.</b> Erect formwork</p> <p><b>LO6.</b> Inspect formwork</p> <p><b>LO7.</b> Strip formwork</p> <p><b>LO8.</b> Clean up</p>	
<p><b>MODULE CONTENTS:</b></p> <p><b>LO1. Plan and prepare for scaffolding operations.</b></p> <p>1.1 . Accessing, Interpreting &amp; Applying of compliance documentation</p> <p>1.2 . Access and interpret work requirements</p> <p>1.3 . Preparing of scaffolding plan</p> <p>1.4 . Site preparation</p> <p>1.5 . Selecting &amp; Using of equipment</p>	

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- 1.6 . label and repair equipment
- 1.7 . Scaffolding Work Plan and Environmental requirements

### **LO2. Erect and maintain scaffolding**

- 2.1 . Erecting of scaffolding with safe work practice
- 2.2 . Applying of Safety requirements
- 2.3 . Installation of static lines
- 2.4 . Assembling & erecting of lifting device
- 2.5 . Inspection of critical areas
- 2.6 . Performing alteration to critical structural

### **LO3. Dismantle scaffolding**

- 3.1 . Isolating of scaffolding parts using the reverse procedure for erection
- 3.2 Inspect, classify, label and dismantle scaffolding
- 3.3. Clearing of work area
- 3.4 . Cleaning and checking equipment

### **LO4. Prepare for formwork erection**

- 4.1 . Identifying of location and design of formwork/false work
- 4.2 . Setting out locations
- 4.3 . Preparing work area and materials
- 4.4 . Assembling formwork shutters
- 4.5 . Erection formwork support system (false work)
- 4.6 . Placing scaffolding, hand railing & formwork support bracings
- 4.7 . Setting support system

### **LO5. Erect formwork**

- 5.1 . Fabricating, positioning and fixing of formwork
  - 5.1.1 beams, drop panels and cantilevers
    - 5.1.1. for walls
    - 5.1.3. soffit
- 5.2 . Fix edge boxing

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5.3 Place formwork Brace

5.4 . Install cast-ins, inserts and penetration blocks

**LO6. Inspect formwork**

6.1 .Inspecting of formwork and its support system

6.2 .Removing of waste material

6.3 .Appling release agent

6.4 .Monitoring formwork and support system during concrete pour

**LO7. Strip formwork**

7.1 Approval to removing formwork support

7.2 Removing edge boxing and braces

7.3 Backing off support system

7.4 Removal of formwork

7.5 Selecting and installing back propping system

**LO8. Clean up**

8.1 Cleaning of work area and recycle materials

8.2 Cleaning, checking, maintaining and storing plant, tools and equipment

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	



<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

## Assessment Criteria

### LO1. Planning and preparing for scaffolding operations

- Access, interpret and apply compliance documentation relevant to the work activity
- Access and interpret work requirements
- Develop the preliminary scaffolding plan in accordance with safety requirements
- Confirm site preparation with other appropriate personnel and implement hazard control measures if necessary
- Identify and select equipment consistent with work requirements
- Check equipment is ready for use and report, label and repair any defects
- Confirm scaffolding plan in accordance with regulatory authorities and environmental requirements

### LO2. Erecting and maintaining scaffolding

- Erect scaffolding in accordance with safe work practices
- Adhere to safety requirements at heights, on incomplete Structures and in confined spaces
- Install static lines when specified
- Assemble and erect lifting device where specified
- Inspect critical structural and safety areas and equipment
- periodically while in use to identify any variation from the plan and record inspection in inspection log
- Perform alteration or repair to critical structural and safety areas and equipment

### LO3. Dismantling of scaffolding

- Isolate scaffolding and appropriately sign and barricade to enable safe dismantling

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- Inspect, classify, label and dismantle scaffolding safely using the reverse procedure for erection
- Clear work area and dispose of used and recycled materials in accordance with job specification, relevant regulatory authorities and environmental requirements
- Clean and check equipment and store in accordance with manufacturer's recommendations and standard work practices

#### **LO4. Preparing for formwork erection**

- Identify location and design of formwork/false work from site drawings, engineers' design and specifications
- Accurately place key set out locations to requirements of job drawings
- Prepare work area and materials for the erection of formwork/ false work
- Assemble formwork shutters to design form requirements and specified dimensions
- Sequentially erect formwork support system (falsework) according to initial set out and standards
- Check scaffolding and/or hand railing where required in accordance with job specification and standards
- Place bracing of formwork support to job requirements and design specifications to maintain rigidity and stability
- Set support system to correct height level, line and tolerance

#### **LO5. Erecting formwork**

- Fabricate, position and fix formwork for beams, drop panels and cantilevers into place
- Assemble, erect and fix formwork for walls into place, plumb and to specified tolerance
- Fabricate, position and fix soffit formwork into place

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- Fix edge boxing to formwork in correct position and plumb to alignment.
- Brace formwork
- Install cast-ins, inserts and penetration blocks to locations

#### **LO6. Inspecting formwork**

- Inspect erected formwork and formwork support system for safety and quality of work in accordance with standards
- Remove loose dirt, sawdust and other waste material with due care to welfare of site personnel and public
- Apply release agent to formwork in accordance with specifications
- Monitor formwork and support system during concrete pour

#### **LO7. Striping formwork**

- Obtain approval to remove formwork support from appropriate site authority
- Carefully remove edge boxing and braces, denial, clean and store/stack
- Back off support system to appropriate height to loosen soffit decking
- Safely and sequentially remove formwork, denial and relocate or store
- Select and install appropriate back propping system, where applicable, according to standards and engineers' requirements

#### **LO8. Cleaning up**

- Clear work area and dispose of or recycle materials in accordance with project environmental management plan
- Clean, check, maintain and store plant, tools and equipment

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## Annex: Resource Requirements

Conducting Basic Scaffolding Operations/ Formworks/Falseworks ( <a href="#">EIS RCM1 M10 0322</a> )				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Learner)
<b>A. Learning Materials</b>				
1.	TTLM	Prepared by the trainers Module 01	25pcs	1:1
2.	Textbooks			
2.1	Building construction	3 <sup>rd</sup> Edition	5	1:5
3.	Reference Books			
3.1	Formwork and scaffolding	2 <sup>nd</sup> edition Unit 16	5	1:5
4.	Journals/Publication/Magazines	Electronic ( open access journal)	5	1:5
<b>B. Learning Facilities &amp; Infrastructure</b>				
1.	Lecture Room	10 X 10m	1	1:30
2.	Library	15 X 15m	1	1:30
3.	Workshop or work place	10 X 10m	1	1:30
4.	Internet Room	5 X 5m	1	1:30
<b>C. Consumable Materials</b>				
1.	Timber	30x2.5x400	30pcs	3:5
2.	Timber	25x2.5x400	30pcs	3:5
3.	Timber	20x2.5x400	30pcs	3:5
3.	Equplatus wood	Dia10/local area /	30pcs	3:5
4.	Nail	No5	kg	1:5
5.	Nail	No7,8,9,10	kg	1:5
9	Nets	Dia10	kg	1:5
<b>D. Tools and Equipment</b>				
1.	Tape measures	5m	6 pcs	1:5
2.	Claw hammers	1kg	6 pcs	1:5
3.	String lines	Thin	6 Rolls	1:5
4.	Spirit levels	50cm	5 pcs	1:5

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<b>LEARNING MODULE 11</b>	
<b>TVET-PROGRAMME TITLE: Road Construction and Maintenance Level I</b>	
<b>MODULE TITLE: Apply Basic Concreting Works</b>	
<b>MODULE CODE: <a href="#">EIS RCM1 M11 322</a></b>	
<b>NOMINAL DURATION: .70 Hours</b>	
<b>MODULE DESCRIPTION:</b> This Module covers the knowledge, attitudes and skills required to prepare and right mix concrete. It includes selection of different materials for the preparation of the concrete	
<p><b>LEARNING OUTCOMES</b></p> <p>At the end of the module the trainee will be able to:</p> <p><b>LO1.</b> Plan and prepare work  <b>LO2.</b> Select materials for concrete  <b>LO3.</b> Set-out for concrete work  <b>LO4.</b> Construct and fit reinforcement  <b>LO5.</b> Erect formworks  <b>LO6.</b> Carry out concrete work  <b>LO7.</b> Strip formwork  <b>LO8.</b> Clean up</p>	
<p><b>MODULE CONTENTS:</b></p> <p><b>LO1. Plan and prepare work</b></p> <p>1.1 Obtaining, confirming and applying work instructions  1.2 Identifying design and Location of concrete.  1.3 OHS requirements.  1.4 Tools and equipment's  1.5 Applying basic calculation.  1.6 Identifying, obtaining, and preparing Materials.  1.7 Identifying Environmental protection requirements.</p> <p><b>LO2. Select materials for concrete</b></p>	

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2.1 Determining Location of steel reinforcement and formwork

2.2 Checking reinforcement

2.3 Selecting Formwork material

2.4 Selecting Fixing/fasteners

### **LO3 Set-out for concrete work**

3.1 Setting String lines

3.2 Checking grades

3.3 Identifying and protecting Services

### **LO4. Construct and fit reinforcement**

4.1 Cut and bent reinforcement bar

4.2 Tying/fixing bars

4.3 Attaching Stiffening rods

4.4 Determining and placing Reinforcement material

4.5 Locating and securing Cast-ins

### **LO5. Erect formworks**

5.1 Preparing safe Working area

5.2 Setting out Formwork

5.3 Assembling/erecting of Formwork

5.4 Positioning Expansion joints

5.5 Positioning Dowel joints

5.6 Removing waste material

### **LO6. Carry out concrete work**

6.1 Placing Concrete

6.2 Compacting Concrete

6.3 Applying Concrete curing process

6.4 Protecting and covering Concrete surface

### **LO7. Strip formwork**

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- 7.1 Removing Edge boxing and braces
- 7.2 Cleaning Timber components
- 7.3 Cleaning Steel components
- 7.4 Discarding Damaged formwork
- 7.5 Cleaning safely before apply

**LO8. Clean up**

- 8.1 Clearing Work area
- 8.2 Checking tools and equipment

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

## ASSESSMENT CRITERIA:

### LO.1 Plan and prepare work

- Work instructions, including plans, specifications, quality requirements and operational details are obtained, confirmed and applied.
- Location and design of concrete works from site are identified
- Work site is cleared of debris and other waste and **OHS requirements** followed in accordance with safety plans and policies.
- **Tools and equipment** selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement.
- **Material quantity requirements** are calculated in accordance with plans and/or specifications.
- **Materials appropriate** to the work application are identified, obtained, prepared, safely handled and located ready for use.
- Environmental protection requirements are identified for the project in accordance

### LO.2 Select materials for concrete

- Location of steel reinforcement and formwork is determined from drawings and reinforcement bars schedule
- Reinforcement is checked against reinforcement drawings and specifications
- Formwork components/materials are selected consistent with job Fixing/fasteners are selected and used consistent with requirements of the job.

### LO.3 Set-out for concrete work

- String lines are set accurately from existing pegs
- Grades are checked to ensure correct fall

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- Services are identified and protected to prevent damage

#### **LO.4 Construct and fit reinforcement**

- Reinforcing fabric and bars are cut and bent as required to project drawings and specifications
- Fabric and bars are tied/fixed to configuration from project drawings and specifications
- Stiffening rods are attached to panels as required to facilitate handling
- Reinforcement material is located in formwork and placed on bar chairs/spacers as determined from drawings, noting clearance from formwork
- Cast-ins are located and secured

#### **LO.5 Erect formworks**

- Work area is cleared and surface prepared for safe erection of formwork
- Formwork is set out to requirements of drawings and specifications
- Formwork is assembled/erected and braced to specifications
- Expansion joints are positioned to specification
- Dowel joints are positioned to specification
- Debris, sawdust and other waste material are removed from formwork

#### **LO.6 Carry out concrete work**

- Concrete is placed correctly to specified levels and grades
- Concrete is compacted to specification using immersion vibrator or other specified method

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- Concrete is screened, finished and curing process applied to specifications
- Concrete surface is adequately covered and protected

**LO.7 Carry out concrete work**

- Edge boxing and braces are removed sequentially
- Timber components are derailed, cleaned and stored or stacked
- Steel components are cleaned, oiled and stored or stacked
- Damaged formwork components are discarded after stripping
- Screens are safely cleaned before movement where applicable

**LO.8 Carry out concrete work**

- Work area is cleared and materials disposed of, reused or recycled in accordance with legislation/regulations/codes of practice and job specification
- Plant, tools and equipment are cleaned, checked, maintained and stored in with manufacturers' recommendations and standard work practices

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## Annex: Resource Requirements

<u>EIS RCM1 M11 322</u> <b>Applying Basic Concreting Works</b>				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Learner)
<b>A. Learning Materials</b>				
1.	TTLM	Prepared by trainers	5	1:5
2	Reference Books	1,Concret Technology by R.S 2,Properties of Concrete by A.M	5	1:5
3	Journals/Publication/Magazines	Journal of Building Engineering(JOBE)		
<b>B. Learning Facilities &amp; Infrastructure</b>				
1.	Lecture Room		8m*6 m	1:25
2.	Library			
3.	Workshop or work place			
4.	Internet Room		1	1:25
<b>C. Consumable Materials</b>				
1.	Brick	25*12*6cm	750pcs	30:1
2.	Block	40*20*15cm class A	375pcs	15:1
3.	Stone		25m <sup>3</sup>	1:1
4.	Reinforcing bar	Grade 40 dia 6,8,10,12	6m	1:25
5.	Sand	M <sup>3</sup>	5m <sup>3</sup>	1:5
6.	Aggregate	00,1,2cm Grain size M <sup>3</sup>	5m <sup>3</sup>	1:5
7.	Cement	OPC or PPC	5qu.	1:5
8	Formwork	Australia timber	5pcs	1:5
9	Water	Clean and free from chemicals		
10	Additives if required	Additive chemicals 5L		
<b>D. Tools and Equipments</b>				
1.	Scaffolding	Material Aluminum Weight 13kg dimension L*W*H 120*40*66cm	5pcs	1:5
2.	Material hoist	Hydraulic lifting 150 kg	1pcs	1:25
3.	Forklifts	Capacity of 1000-2000kg	1pcs	1:25

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4.	Small mixer	260ml portable cement mixer electric motor 1h.p	1pcs	1:25
5	Vibrator	Frequencies of 2800-15000rpm	1pcs	1:25
7.	Shovels	Squire wood handle Material steel shovel size 21*17cm	15pcs	3:5
8.	Hammers	wood handle 5kg rectangular steel	10pcs	2:5
10.	Buckets	20 Liter capacity plastic Bucket	5pcs	1:5
11	Sprit level	60cmSensitivity: 0.02mm/m	25pcs	1:1
12	Trowel	Flat rectangular steel blade with wood handle	25pcs	1:1
13	Plumb bob	500g weight	5pcs	1:5
16	String line	0.13 cm <i>diameter</i> nylon <i>string</i>	5pcs	1:5
17	Trowel	plastering square type, with wood handle	5pcs	1:5

## LEARNING MODULE 12

**TVET-PROGRAMME TITLE: Road construction and maintenance Level L1**

**MODULE TITLE: Apply Basic Masonry Works**

**MODULE CODE: [EIS RCM1 M12 0322](#)**

**NOMINAL DURATION: .70 Hours**

**MODULE DESCRIPTION:** This module covers the knowledge, attitudes and skills required to prepare and different mortars (also in regard of their usage). It includes selection of different materials for the preparation of the mortar.

### LEARNING OUTCOMES

At the end of the module the trainee will be able to:

- LO1.** Plan and prepare work
- LO2.** Prepare materials for mortar
- LO3.** Lay bricks/ blocks and masonry stones
- LO4.** Finish joints
- LO5.** Erect formworks
- LO6.** Strip formwork
- LO7.** Clean up

### MODULE CONTENTS:

#### **LO1. Plan and prepare work**

- 1.2 Obtaining, confirming, and applying work instructions
- 1.3 Determining the location and style of masonry works
- 1.4 OHS requirements
- 1.5 Tools and equipment
- 1.6 Calculating the material quantity
- 1.7 Identifying, obtaining, preparing, safely handling, and locating materials.

#### **LO2. Prepare materials for mortar**

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- 2.1 Constructing a work platform
- 2.2** Selecting construction materials.
- 2.3 Selecting materials for mortar
- 2.4 Setting out masonry stone/ block work/brickwork
- 2.5 Mixing **mortar**
- 2.6 Determining the measurement of a masonry stone, brickwork, or block work

### **LO3. Lay bricks/ blocks and masonry stones**

- 3.1 Masonry characteristics and properties
- 3.2 Structural technology
- 3.3 Preparing and verifying the mortar mix
- 3.4 Locate bricks, blocks, or masonry stone.
- 3.5 Checking Bricks/blocks walls or masonry stone
- 3.6 Laing Bricks/blocks walls or masonry stone
- 3.7 Cutting Brick
- 3.8 Establishing a Corners bond

### **LO.4 Finish joints**

- 4.1 Removing Excess mortar
- 4.2 Laing Joints
- 4.3 Brushing bricks, blocks, or walls, as well as masonry stone

### **LO. 5 Erect formworks**

- 5.1 Preparing the surface for the safe erection of formwork.
- 5.2 Setting Out Formwork
- 5.3 Assembling, erecting, and bracing Formwork
- 5.4 Positioning Expansion joints
- 5.5 Removing waste material

### **LO. 6 Strip formwork**

- 6.1 Taking off edge boxing and braces

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6.2 Derailing, cleaning, and storing timber components.

6.3 Cleaning, oiling and storing Steel components

6.4 Discarding Damaged formwork components

6.5 Cleaning safely

**LO7.Clean up**

7.1 Clearing Work area

7.2 Cleaning, checking, maintaining and storing Plant, tools and equipment

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>



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<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
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<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

## ASSESSMENT CRITERIA

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- Location and design of masonry works from site are identified
- Work site is cleared of debris and other waste and OHS requirements followed in accordance with safety plans and policies.
- Tools and equipment selected to carry out tasks are consistent with the requirements of the job, checked for serviceability and any faults are rectified or reported prior to commencement.
- Material quantity requirements are calculated in accordance with plans and/or specifications.
- Materials appropriate to the work application are identified, obtained, prepared, safely handled and located ready for use.
- Environmental protection requirements are identified for the project in accordance with environmental plans and regulatory obligations and applied.

### LO2. Prepare materials for mortar

- Work platform is erected in accordance with regulatory and workplace requirements
- Construction materials are selected according to quality requirements and specifications
- Materials for mortar are selected to requirements of specification.
- Location of masonry stone/ block work/brickwork is set out on reinforced concrete footing slab in accordance with dimensions and details from job drawings
- Mortar is mixed in accordance with the job specifications.
- Masonry stone/ Brickwork/block work gauge is determined and set out rod /bar is prepared

### LO3. Lay bricks/ blocks and masonry stones

- Mortar mix is prepared and checked for conformity and applied evenly to job and set out location

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- Bricks/blocks or masonry stones are located to job set out to specifications, standards and codes.
- Bricks/blocks walls or masonry stone are to be straight and true in plumb, line and level within standard tolerances and codes
- Bricks/blocks or masonry stone are laid maintaining stretcher bond throughout construction to specifications, standards and codes
- Bricks are cut
- Corners are formed maintaining bond and perpendicular intersection of both surfaces
- Reinforcement is placed and laid to bed joints to specifications, where applicable
- Brickwork/block or masonry stone work is laid and completed to job drawings, specifications, standards and codes

#### **LO4. Finish joints**

- Excess mortar is removed from brick/block or masonry stone work surfaces and cavities are cleaned free of mortar and debris in accordance with manufacturers' recommendations, job specifications, standards and codes
- Joints of laid brickwork/block or masonry stone work are raked, struck or ruled to correct profile and depth to job specifications
- Brickwork/block or masonry stone work is brushed down prior to drying to remove unwanted mortar

#### **LO5. Erect formworks**

- Work area is cleared and surface prepared for safe erection of formwork
- Formwork is set out to requirements of drawings and specifications
- Formwork is assembled/erected and braced to specifications
- Expansion joints are positioned to specification
- Debris, sawdust and other waste material are removed from formwork

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### **LO6. Strip formwork**

- Edge boxing and braces are removed sequentially
- Timber components are derailed, cleaned and stored or stacked
- Steel components are cleaned, oiled and stored or stacked
- Damaged formwork components are discarded after stripping
- Screens are safely cleaned before movement where applicable

### **LO7.Clean up**

- Work area is cleared and materials disposed of, reused or recycled in accordance with legislation/regulations/codes of practice and job specification
- Plant, tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers' recommendations and standard work practices.

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### Annex: Resource Requirements

EIS RCM1 07 0322 Conducting Labor based Earthwork				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
<b>A. Learning Materials</b>				
1.	TTLM	Prepared by the trainers Module 01	5pcs	1:5
2.	Textbooks			
3.	Reference Books			
4.	Journals/Publication/Magazines			
<b>B. Learning Facilities &amp; Infrastructure</b>				
1.	Lecture Room	10 X 10m	1	1:25
2.	Library	15 X 15m	1	1:25
3.	Workshop or work place	10 X 10m	1	1:25
<b>C. Consumable Materials</b>				
1.	clay bricks,	250x112.5x60mm	250 pcs	1:5
2.	masonry blocks,	400x200x200mm	30 pcs	1:1
3.	masonry stone	M <sup>3</sup>	5M <sup>3</sup>	1:5
4.	sand	M <sup>3</sup>	5M <sup>3</sup>	1:5
5.	cement or lime	PPC,OPC(Kg)	5	1:5
6.	formwork components	4mx0.2m	5	1:5
7.	curing agents	Adhesive chemical 5L	1	1:
<b>D. Tools and Equipment's</b>				
1	scaffolds	Material Aluminum Weight 13 Kilograms Item dimensions L x W x H 120 x 40 x 166 centimeters	1	1:25
2	forklifts,	500-1500 kg capacity	1	1:25
3	small mixers	Portable Concrete Mixer Machine, Small ... Power electric motor: 2 H.P. 1 or 3 Phase	1	1:25

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		Capacity 500 L		
4	handle shovels	21x17 cm steel with wooden handling		
5	hammers	5kg rectangular		
6	buckets	20 liter capacity	5	125

<b>LEARNING MODULE 13</b>	
TVET-PROGRAMME TITLE: <b>Road Construction And Maintenance Level I</b>	
MODULE TITLE: <b>Conducting Road Marking and Maintenance Operation</b>	
MODULE CODE: <a href="#">EIS RCM1 M13 0322</a>	
NOMINAL DURATION: 70 Hours	
<b>MODULE DESCRIPTION:</b> This module covers the conduct of road marking and maintenance operation in the civil construction industry. It includes planning; preparing surface, set out and conducting road marking or setting out and conducting speed breaker and maintenance operation, and cleaning up.	
<b>LEARNING OUTCOMES</b>	
At the end of the module the trainee will be able to:	
<b>LO1.</b> Plan and prepare	
<b>LO2.</b> Prepare surface, set out and conducting road marking or setting out and conducting speed breaker and maintenance operation	
<b>LO3.</b> Clean up	
<b>MODULE CONTENTS:</b>	
<b>LO1. Plan and prepare</b>	
1.1 accessing, interpreting and applying Compliance documentation	
1.2 Safety requirements	
1.3 Signage requirements	
1.4 Tools and equipment	
1.5 Environmental protection requirements	
<b>LO2. Prepare surface, set out and conducting road marking or setting out and conducting speed breaker and maintenance operation</b>	
2.1 Selecting and preparing equipment and/or product removing markings	
2.2 Identifying location for line marking	
2.3 Identifying location for speed breaker marking	

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- 2.4 removing pre-existing visible marks/lines
- 2.5 installing Speed breaker
- 2.6 Conducting road marking or maintenance operation

**LO3. Clean up**

- 3.1 Clearing work area
- 3.2 Maintain store, tools and equipment's

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	



<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

**ASSESSMENT CRITERIA:**

**LO.1 Plan and prepare**

- Compliance documentation relevant to the work activity is accessed, interpreted and applied
- Safety requirements are obtained and confirmed from the site safety plan and organisational policies and procedures, and applied to the allotted task,
- Signage requirements are identified, obtained and implemented from the project traffic management plan
- Tools and equipment are selected to carry out tasks consistent with the requirements of the job, checked for serviceability and rectified or reported any faults
- Material quantity requirements are calculated in accordance with plans and/or specifications
- Environmental protection requirements are identified, confirmed and applied from the project environmental management plan

**LO.2 Prepare surface, set out and conducting road marking or setting out and conducting speed breaker and maintenance operation**

- Hazards and fixtures are removed from the area
- Equipment and/or product are selected and prepared for removing markings
- Location for line marking is identified.
- Location for speed breaker marking is identified.
- Area is cleared of dirt, debris and other contaminants.
- Location for line marking is identified and set out with control points to drawings, job requirements and/or specifications.
- Straight lines and curves are spotted in preparation for marking.
- Pre-existing visible marks/lines are removed to specification.
- Road marking or maintenance operation is conducted as per the drawing and design specifications

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- Speed breaker is installed at appropriate locations as per the drawing and design specifications

### **LO.3 Clean up**

- Work area is cleared and materials are disposed of or recycle in accordance with project environmental management plan.
- Unused materials are stored in accordance with job requirements.
- Plant, tools and equipment are cleaned, checked, maintained and stored
- Moisture content, sequence and layer compaction are done according to the work order

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**Annex: Resource Requirements**

<b>EIS RCM1 13 0322 Conducting Road Marking and Maintenance Operation</b>				
<b>Item No.</b>	<b>Category/Item</b>	<b>Description/ Specifications</b>	<b>Quantity</b>	<b>Recommended Ratio (Item: Trainee)</b>
<b>A.</b>	<b><i>Learning Materials</i></b>			
1.	TTLM	TTLM prepared by the trainer	5	1:5
2.	Reference Books			
2.1	contractor's hand book labor-based road works	Republic of Zambia Ministry of Works and Supply Roads Department, Roads Training School	5	1:5
2.2	Labour Based Road Construction and Maintenance	ERA Ginchi-Chancho Training Center		
<b>B.</b>	<b><i>Learning Facilities &amp; Infrastructure</i></b>			
1.	Class room	8mx6m	1pcs	1:25
2.	Workshop	10mx10	1	1:25

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3.	LCD	Used to display	1pcs	1:25
4.	Laptop or Computer	32-bit OS; 3 GB RAM; Intel core i5 (Processor)	1pcs	1:25
5.	Library	Per section 105 – 180 m2	180 m2	1:5
8.	Printer	Laser type	1pcs	1:25
9.	Photocopier	Non-colored	1 pcs	1:25
10.	Internet room	5mx5m	1	1:25
<b>C. Consumable Materials</b>				
1.	Drawing Paper	A 4	5Pack	1:5
2.	Pencil	HB 0.5/0.7 black	25 pcs	1:1
3.	Eraser	Soft rubber for pencil	25 pcs	1:1
4.	Sand paper	China grit p60-2000	1 role	1:25
5.	Emulsions	CSS-1h asphalt emulsion	50Lit.	2:1
<b>D. Tools and Equipment's</b>				
1.	Shot blasters	YG-270	2pcs	1:12
2	Brooms	Wooden handle plastic broom	5pcs	1:5
3	Shovels	Wooden handle shovel (Belcha) MS mouth	5pcs	1:5

5	Line grinders	Handok airless Hle 707 high quality	2pcs	1:12
6	Sand blasters	Nieko 3006	2pcs	1:12
7	Water blasters	Xshot mini for road onstruction	2pcs	1:12
8	Emulsion sprayers		5pcs	1:5
9	Water trucks		1pcs	1:25

<b>LEARNING MODULE 14</b>	
TVET-PROGRAMME TITLE: <b>Road Construction And Maintenance Level I</b>	
MODULE TITLE: <b>Apply 5S Procedures</b>	
MODULE CODE: <a href="#">EIS RCM1 M14 0322</a>	
NOMINAL DURATION: 45 Hours	
<b>MODULE DESCRIPTION:</b> This module covers the knowledge, skills and attitude required to apply 5S techniques to his/her workplace. It covers responsibility for the day-to-day operations of the workplace and ensuring that continuous improvements of Kaizen elements are initiated and institutionalized.	
<b>LEARNING OUTCOMES</b>	
At the end of the module the trainee will be able to:	
<b>LO1.</b> Prepare for work.	
<b>LO2.</b> Sort items	
<b>LO3.</b> Set all items in order	
<b>LO4.</b> Perform shine activities	
<b>LO5.</b> Standardize 5S	
<b>LO6.</b> Sustain 5S	
<b>MODULE CONTENTS:</b>	
<b>LO1. Prepare for work</b>	
1.1 Job requirements.	
1.1.1 work instructions	
1.1.2 Job specifications	
1.1.3 Working manual.	
1.2 OHS requirements	
1.2.1 Safety policies /Legislation/ regulations/codes of practice	
1.2.2 Safe operating procedures	
1.2.3 Emergency procedures	

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1.2.4 Personal protective equipment

1.3 Prepare tools and equipment

1.3.1 sorting activity

1.3.2 set in order activity

1.3.3 shining activity

## **LO2. Sort items.**

2.1 Definition of the first pillar of 5S

2.2 Benefits of sort activity

2.3 Sort activity

2.3.1 Plan and procedures for sort activity

2.3.2 Record and quantify all items in the work area

2.3.3 Red tag strategy for unnecessary items

2.3.3.1 Overview of red tagging

2.3.3.2 Red-tag Holding areas

2.3.3.3 Steps/procedures in Red tagging

2.4 Types of unnecessary items

2.5 Places where unnecessary items accumulate

2.6 Reporting methods and formats for sort results

## **LO3. Set all items in order**

3.1 Definition of the second pillar of 5S

3.2 Benefits of set in order

3.3 Set in order

3.3.1 Plan and procedures for set in order

3.3.2 Set in order strategies

3.3.2.2 Visual control Strategy

3.3.2.2.1 Signboard strategy

3.3.2.2.2 Painting strategy

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3.3.2.2.3 Color-code strategy

3.3.2.2.4 Outlining strategy

3.3.2.2.5 Visual Management Board (Kaizen board) Strategy

3.3.3 Reporting methods and formats for set in order results

#### **LO4. Perform shine activities**

4.1 Definition of the third pillar of 5S

4.2 Benefits of shine

4.3 Shine activity

4.3.1 Plan and procedures for shine activities

4.4 Inspection

4.4.1 The relationship of shine and inspection

4.4.2 The need for inspection

4.4.3 Inspection steps

4.4.4 Inspection methods

4.5 Reporting methods and formats for shine results

#### **LO5. Standardize 5S**

5.1 Prepare plan for implementation.

5.2 Tools and techniques to standardize 5s.

5.2.1 Prepare tools and techniques

5.2.1.1 5S Job Cycle Charts

5.2.1.2 Standardization level checklist

5.2.1.3 5S checklist

5.2.2 Implement tools and techniques

5.1 Reporting system.

5.2 Review standardization

#### **LO6. Sustain 5S**

6.1 Prepare plan for implementation

6.2 Tools and techniques to sustain 3S

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6.2.1 Prepare tools and techniques

6.2.2 Implement tools and techniques based on procedures for sustain.

6.3 Reporting system.

6.4 Review sustains activity

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<b>Learning Methods:</b>				
<b>For none impaired trainees</b>	<b>Reasonable Adjustment for Trainees with Disability (TWD)</b>			
	<b>Low Vision</b>	<b>Deaf</b>	<b>Hard of hearing</b>	<b>Physical impairment</b>
<b>Lecture-discussion</b>	<ul style="list-style-type: none"> <li>❖ Provide large print text</li> <li>❖ Prepare the lecture in <b>Audio/video</b></li> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Write short notes on the black/white board using large text</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Use normal tone of voice</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign sign language interpreter</li> <li>❖ Arrange the class room seating to be conducive for eye to eye contact</li> <li>❖ Make sure the luminosity of the light of class room is kept</li> <li>❖ Introduce new and relevant vocabularies</li> <li>❖ Use short and clear sentences</li> <li>❖ Give emphasis on visual lecture and ensure the attention of the trainees</li> <li>❖ Avoid movement during lecture time</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible to trainees</li> <li>❖ Speak loudly</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Present the lecture in video format</li> <li>❖ Ensure the attention of the trainees</li> </ul>	<ul style="list-style-type: none"> <li>❖ Organize the class room seating arrangement to be accessible for wheelchairs users.</li> <li>❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Encourage trainees to record the lecture in audio format</li> <li>❖ Provide Orientation on the physical feature of the work shop</li> <li>❖ Summarize main points</li> </ul>	<ul style="list-style-type: none"> <li>❖ Present the lecture in video format</li> <li>❖ Summarize main points</li> </ul>		
<b>Demonstration</b>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up</li> <li>❖ Use verbal description</li> <li>❖ Provide special attention in the process of guidance</li> <li>❖ facilitate the support of peer trainees</li> <li>❖ Prepare &amp; use simulation</li> </ul>	<ul style="list-style-type: none"> <li>❖ use Sign language interpreter</li> <li>❖ Use video recorded material</li> <li>❖ Ensure attention of the trainees</li> <li>❖ Provide structured training</li> <li>❖ Show clear and short method</li> <li>❖ Use gesture</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Illustrate in clear &amp; short method</li> <li>❖ Use Video recorded material</li> <li>❖ Ensure the attention of the trainees</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines</li> <li>❖ Assign peer trainees to assist</li> <li>❖ Conduct close follow up</li> <li>❖ Provide tutorial support (if necessary)</li> </ul>

<p><b>Group discussion</b></p>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Brief the thematic issues of the work</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreters</li> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> </ul>	<ul style="list-style-type: none"> <li>❖ Facilitate the integration of trainees with group members</li> <li>❖ Conduct close follow up</li> <li>❖ Introduce the trainees with other group member</li> <li>❖ Inform the group members to speak loudly</li> </ul>	<ul style="list-style-type: none"> <li>❖ Introduce the trainees with their peers</li> </ul>
<p><b>Exercise</b></p>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Conduct close follow up and guidance</li> <li>❖ Provide tutorial support if necessary</li> <li>❖ provide special attention in the process/ practical training</li> </ul>	<ul style="list-style-type: none"> <li>❖ Assign peer trainees</li> <li>❖ Use additional nominal hours if necessary</li> </ul>

		❖ Introduce new and relevant vocabularies		
<b>Individual assignment</b>	<ul style="list-style-type: none"> <li>❖ prepare the assignment questions in large text</li> <li>❖ Encourage the trainees to prepare and submit the assignment in large texts</li> <li>❖ Make available recorded assignment questions</li> <li>❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide briefing /orientation on the assignment</li> <li>❖ Provide visual recorded material</li> </ul>	

<b>ASSESSMENT METHODS:</b>				
<b>Interview</b>		<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter</li> <li>❖ Use short and clear questioning</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Speak loudly</li> <li>❖ Using sign language interpreter if necessary</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use written response as an option for the trainees having speech challenges</li> </ul>
<b>Written test</b>	<ul style="list-style-type: none"> <li>❖ Prepare the exam in large texts</li> <li>❖ Use interview as an option if necessary</li> <li>❖ Prepare the exam in audio format</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers</li> <li>❖ Avoid essay writing</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use oral response as an option to give answer for trainees having severe upper limb impairment</li> <li>❖ Time extension for trainees having</li> </ul>



	<ul style="list-style-type: none"> <li>❖ Assign human reader</li> <li>❖ (if necessary)</li> <li>❖ Time extension</li> </ul>			severe upper limb impairment
<b>Demonstration/Observation</b>	<ul style="list-style-type: none"> <li>❖ Brief the instruction or provide them in large text</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Use sign language interpreter</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Provide activity-based/practical assessment method</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Brief on the instruction of the exam</li> <li>❖ Use loud voice</li> <li>❖ Time extension</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provide activity based assessment</li> <li>❖ Conduct close follow up</li> <li>❖ Time extension</li> </ul>

## ASSESSMENT CRITERIA:

### LO.1 Prepare for work

- Work instructions are used to determine job requirements, including method, material and equipment
- Job specifications are read and interpreted following working manual
- Kaizen Board (Visual Management Board) is prepared and used in harmony with different workplace contexts
- **Tools and equipment** are prepared and used to implement 5S
- **Safety equipment and tools** are identified and checked for safe and effective operation
- **OHS requirements**, including dust and fume collection, breathing apparatus and eye and ear personal protection needs are observed throughout the work

### LO.2 Sort items

- Plan is prepared to implement sorting activities.
- Cleaning activities are performed
- All **items** in the workplace are identified following **the appropriate procedures**
- Necessary and **unnecessary items** are listed using the **appropriate format**
- **Red tag** strategy is used for unnecessary items
- Unnecessary items are evaluated and placed in an appropriate place other than the workplace
- **Necessary items** are recorded and quantified using appropriate format.
- Performance results are reported using appropriate formats
- Necessary items are regularly checked in the workplace

### LO.3 Set all items in order

- Plan is prepared to implement set in order activities
- General cleaning activities are performed

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- Location/Layout, storage and indication methods for items are decided
- Necessary tools and equipment are prepared and used for setting in order activities
- Items are placed in their assigned locations
- After use, the items are immediately returned to their assigned locations.
- Performance results are reported using appropriate formats
- Each item is regularly checked in its assigned location and order

#### **LO.4 Perform shine activities**

- Plan is prepared to implement shine activities
- Necessary tools and equipment are prepared and used for shinning activities.
- Shine activity is implemented using appropriate procedures
- Performance results are reported using appropriate formats
- Regular shining activities are conducted

#### **LO.5 Standardize 5S**

- Plan is prepared and used to standardize 5S activities.
- Tools and techniques to standardize 5S are prepared and implemented based on relevant procedures.
- Checklists are followed for standardize activities and reported to relevant personnel.
- The workplace is kept to the specified standard
- Problems are avoided by standardizing activities

#### **LO.5 Sustain 5S**

- Plan is prepared and followed to sustain 5S activities
- Tools and techniques to sustain 5S are discussed, prepared and implemented based on relevant procedures
- Workplace is inspected regularly for compliance to specified standard and sustainability of 5S techniques
- Workplace is cleaned up after completion of job and before commencing next job or end of shift

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- Situations are identified where compliance to standards is unlikely and actions specified in procedures are taken
- Improvements are recommended to lift the level of compliance in the workplace.
- Checklists are followed to sustain activities and report to relevant personnel.
- Problems are avoided by sustaining activities

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## Annex: Resource Requirements

Applying 5S Procedures <a href="#">EIS RCM1 14 0322</a>				
Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A.	<i>Learning Materials</i>			
1.	TTLM	TTTLM prepared by the ministry of Labor and skills	25pcs	1:1
B.	<i>Learning Facilities &amp; Infrastructure</i>			
1.	Class room	31.5 m <sup>2</sup>	1pcs	1:25
2.	Whit-board/Blackboard	240 x 120 cm	1pcs	1:25
3.	Arm Chair	55 X 100 x 70	25	1:1
4.	Workshop	100 m <sup>2</sup>	1	1:25
5.	LCD	Used to display	1pcs	1:25
6.	Laptop or Computer	32-bit OS; 3 GB RAM; Intel core i5 (Processor)	1pcs	1:25
7.	Library	Per section 105 – 180 m <sup>2</sup>	180 m <sup>2</sup>	1:5
8.	Printer	Laser type	1pcs	1:25
9.	Photocopier	Non-colored	1 pcs	1:25
C.	<i>Consumable Materials</i>			
1.	Printer toner/ink	Compatible with the existing printer	5 pcs	1:5
2.	Photocopier ink/toner	Compatible with the existing printer	1pcs	1:25
3.	CD/DVD	RW	5 pcs	1:5

4.	Paper	A4 80gms	5 reams	1:25
5.	Dose	Blue ,green, yellow and red	50 pcs	1:25
6.	Bond paper	A4 size; 20 gsm	5 reams	1:25
7.	Flip chart	Sinar line	5 pads	1:25
8.	Colored pens	Blue, red, green and black colors	5 sets	1:25
9.	Candies	Different color	5 pack	1:25

## Acknowledgement

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**The trainers who developed the curriculum**

<b>N o</b>	<b>Name</b>	<b>Qualificatio n</b>	<b>Educational background</b>	<b>Region</b>	<b>College</b>	<b>Mobile number</b>	<b>E-mail</b>
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**SECTOR: Economic Infrastructure**  
**SUB-SECTOR: Road Construction and Maintenance**

