Republic of Rwanda
Ministry of Education

RTB | RWANDA TVET BOARD

NON -BITUMINOUS PAVEMENTS MAINTENANCE

PWOPM401

Perform non-bituminous pavements maintenance

Competence

RQF Level: 4

Learning Hours 40

Credits: 4

Sector: Construction and Building Services

Trade: Public Works

Module Type: Specific

Curriculum: CBSPWO4001-TVET Certificate IV in Public Works

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<table>
<tr><td>Purpose statement</td><td colspan="6">This module describes knowledge, skills, and attitudes required to perform non-bituminous carriageway, shoulder and walkway maintenance. It is intended for learners who are pursuing RQF Level IV in Public Works. At the end of this module, the learners will be able to perform site investigation, perform demolition works and perform defects repair.</td></tr>
<tr><td>Learning assumed to be in place</td><td colspan="6">Cement concrete works , Non-bituminous pavement construction.</td></tr>
<tr><td rowspan="6">Delivery modality</td><td colspan="2">Training delivery</td><td>100%</td><td colspan="2">Assessment</td><td>Total 100%</td></tr>
<tr><td colspan="2">Theoretical content</td><td>30%</td><td rowspan="4">Formative assessment</td><td>30%</td><td rowspan="4">50%</td></tr>
<tr><td colspan="2">Practical work:</td><td rowspan="3">70%</td><td rowspan="3">70%</td></tr>
<tr><td>• Group work and presentation</td><td>30%</td></tr>
<tr><td>• Individual work</td><td>40%</td></tr>
<tr><td colspan="3"></td><td colspan="2">Summative Assessment</td><td>50%</td></tr>
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Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Perform site investigation	1.1. PPEs are properly used according to the work to be done
	1.2. Tools and equipment are appropriately selected in accordance with the work to be done for site investigation
	1.3. Road defects are correctly identified according to their types and sizes
	1.4. Solutions are correctly proposed according to the nature of defects
	1.5. Report is correctly produced according to the work done
2. Perform Demolition works	2.1 Tools and equipment for demolition works are appropriately selected in accordance with the nature of defects to be repaired
	2.2 Damaged areas are marked according to the investigation report
	2.3 Damaged parts are properly removed in accordance with the nature of defects to be repaired

	2.4 Demolition wastes are properly disposed according to environment requirements
3. Perform defects repair	3.1 Tools, equipment and materials are appropriately selected in accordance with the nature of defects to be repaired
	3.2 Defects are correctly repaired in accordance with the specifications
	3.3 Cleaning works are properly done as per requirements

Intended Knowledge, Skills, and Attitude

Knowledge	Skills	Attitude
✓ Identify road construction materials ✓ Identify drainage defects ✓ Differentiate pavement construction tools and equipment ✓ Identify Maintenance technics ✓ Describe Construction materials ✓ Explain basic knowledge of surveying technics ✓ Determine the quantities of materials required ✓ Recognize technical standards ✓ Maintain Health and Safety	✓ Interpret technical drawing ✓ Investigate the site ✓ Mark the affected area ✓ Use surveying instruments ✓ Repair damaged part ✓ Perform demolition works ✓ Report the done	✓ Use creativity and innovation throughout the design works ✓ Pay attention in identifying drainage defects ✓ Pay attention to use surveying instruments ✓ Communicate actively at workplace ✓ Be dynamic in performing concrete work ✓ Demonstrate good leadership in managing the site ✓ Respect time in reporting

Course content

Learning outcomes	At the end of the module the learner will be able to: 1. Perform site investigation

	2. Perform Demolition works 3. Perform defects repair
Learning outcome 1: Perform site investigation	**Learning hours: 10**

Indicative content

- **Use of PPE**
  - ✓ Types of PPE
  - ✓ Maintenance of PPE
- **Selection of tools and equipment**
  - ✓ Selection of tools
  - ✓ Selection of equipment
- **Identification of defects**
  - ✓ Types of defects
  - ✓ Causes of defects
  - ✓ Analysis of extent and severity of defects
- **Proposal of Solutions to repair defects**
  - ✓ Treatment of Oil Spots, Grass, Mud.
  - ✓ Cracking treatment
  - ✓ Potholes treatment
  - ✓ Depressions (bird baths) treatment
  - ✓ Rutting treatment
  - ✓ Shoving treatment
  - ✓ Upheaval treatment
  - ✓ Ravelling (very porous asphalt) treatment
- **Elaboration of investigation report**
  - ✓ Purpose of investigation report
  - ✓ Key elements of investigation report
  - ✓ Reporting

Resources required for the learning outcome

Equipment	PPE, Camera, Printer, Computer
Materials	Pens, Notebooks, Papers
Tools	Tape measure, Pickaxes, Hammer, Shovels/ Spades
Facilitation techniques	Brainstorming, Group discussion, Practical exercises, Demonstration, Simulation
Formative assessment	Oral assessment, Written assessment, Performance assessment, Product

methods /(CAT)	based assessment

Learning outcome 2: Perform Demolition works	**Learning hours: 15**
Indicative content	
• **Selection of tools and equipment for demolition works** ✓ Selection of tools ✓ Selection of equipment • **Marking of damaged areas** ✓ Marking out the area to be repaired ✓ Measuring the area to be demolished • **Removal of damaged parts** ✓ Opening up the damaged sections ✓ Piling the debris from demolition • **Disposal of demolition wastes** ✓ Loading demolition debris ✓ Transporting demolition debris ✓ Dumping demolition debris	
Resources required for the learning outcome	
Equipment	PPE, Safety signs, Concrete cutting machine, Wheel barrow, Broom/ mechanical sweeper, Watering can, Excavator, Sprayer
Materials	Marking chalks, Paint, Pegs
Tools	Wheelbarrow, trowels, Shovels, brush, Cones, Tape measure, Pick axe, Hammer, Chisels
Facilitation techniques	Brainstorming, Group discussion, Practical exercise, Demonstration, Simulation
Formative assessment methods /(CAT)	Oral assessment, Written assessment, Performance assessment, Product based assessment

Learning outcome 3: Perform defects repair	**Learning hours: 15**
Indicative content	

- **Selection of tools, equipment and materials to repair defects**
  - ✓ Selection of tools
  - ✓ Selection of equipment
  - ✓ Selection of materials
- **Repair of defects**
  - ✓ Treatment of Oil Spots, Grass, Mud.
  - ✓ Cracking treatment
  - ✓ Pot Holes treatment
  - ✓ Depressions (bird baths) treatment
  - ✓ Rutting treatment
  - ✓ Shoving treatment
  - ✓ Upheaval treatment
  - ✓ Ravelling (very porous asphalt) treatment
- **Cleaning works after the defects repair**
  - ✓ Types of cleaning
  - ✓ Cleaning of tools and equipment
  - ✓ Cleaning of the work place

Resources required for the learning outcome

Equipment	Tamping rammer, Vibrators, Compactors
Materials	Sand, Cement, Aggregates, Water, Marking chalk or spray, Hardcore
Tools	Wheelbarrow, trowels, Shovels, brush, Cones, Tape measure, Pick axe, Hammer, Chisels
Facilitation techniques	Brainstorming, Group discussion, Practical exercise, Demonstration, Simulation
Formative assessment methods /(CAT)	Oral assessment, Written assessment, Performance assessment, Product based assessment

Integrated/Summative assessment

Integrated situation

The 3km rigid road located in Muhima Sector, Nyarugenge District was damaged and this affected its level of service. NPPE Ltd has entered into a contract with KIGALI City to undertake the maintenance of the aforementioned road by repairing the defects present on its carriageway, shoulders, and walkways.

As a technician employed by NPPE Ltd, your responsibility is to repair the identified defects on a 20m long portion of the road within 7 hours.

Instructions:

- The boundaries of the section requiring repair will be indicated on-site.
- Upon your request, materials, tools, and equipment will be provided as they are available in the storage.

During the assessment, you will be expected to:

- Demonstrate how you conducted a site investigation to identify the defects.
- Demonstrate how you performed the necessary demolitions of the damaged areas

Resources

Tools	Shovels, Tamping rammer, Hammer, Chisels, pickaxe, Hack saw, saw, Strings, Machette, Tape measure, Warning tape
Equipment	Mechanical broom, Concrete Mixer, Compactor, Vibrator
Materials/ Consumables	Sand, Cement, Aggregates, Water, Marking chalk or spray, Hardcore, Timber, nails, Soil

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
1. Site investigation report **20 %**	Defects are correctly identified according to their types and sizes	Types of defects(potholes) are indicated			5
		Causes of defects are identified			5
		Extent and severity of defects are indicated			5
	Solutions are correctly proposed according to the nature of defects	Solutions are proposed			5
	Report is correctly produced according to the	Repot format is produced			5

	work done	Key elements of investigation report are covered			5
2. Demolition of damaged parts **30%**	Damaged areas are marked according to the investigation report	Affected area are marked in rectangular shapes			5
	Damaged parts are properly removed in accordance with the nature of defects to be repaired	Damaged parts are removed and piled aside			5
	Demolition wastes are properly disposed according to environment requirements	Wastes are loaded			5
		Wastes are transported			5
		Wastes are deposited			5
		Recycled materials are kept			5
3. Defects repair **50%**	Tools and equipment are appropriately selected in accordance with the nature of defects to be repaired	Tools are selected			5
		Equipment is selected			5
	Materials are appropriately selected in accordance with the nature of defects to be repaired	Consumable materials are selected			5
		Reusable materials are selected			4
	Defects are correctly repaired in accordance with the specifications	Area to be repaired is prepared			5
		Materials to be used are prepared			5
		Defects are repaired			5
	Cleaning works are properly done as per requirements	The workplace is cleaned			2
		Tools and equipment are cleaned			2
		Tools and equipment are stored			2
Total marks					/100
Percentage Weightage					100%
Minimum Passing line % (Aggregate):					70%

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