



Republic of Rwanda  
Ministry of Education



**RTB** | RWANDA  
TVET BOARD

## WOODWORKING MACHINES INSTALLATION PLAN

**WOTMI301**

**PLAN FOR WOODWORKING MACHINES INSTALLATION**

### Competence

RQF Level: 3

Learning Hours



Credits: 3

Sector: Agriculture and Food Processing

Trade: Wood Technology

Module Type: Specific

Curriculum: AFPWOT3002- TVET Certificate 3 in Wood Technology

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Issue Date: June 2022

1200

<b>Purpose statement</b>	This module describes employable and practicable skills, knowledge and right attitudes required by the student to prepare for planning for machine installation layout, referring to catalogue, manual or prepared assembly sketch, Prepare for the installation work including safety measures, Determine harmony/routing with the rest of the production line and Schedule test run and follow up monitoring . It is designed for students pursuing TVET certificate III in wood technology. Graduates at this level will have knowledge and skills for initial work, community involvement and/or further learning.					
<b>Delivery modality</b>	<b>Training delivery</b>		<b>100%</b>	<b>Assessment</b>		<b>Total 100%</b>
	Theoretical content		30%	Formative assessment	30%	50%
	Practical work:		70%		70%	
	• Group project and presentation	20%				
	• Individual project /Work	50%	Summative Assessment		50%	

## Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Plan for machine layout installation	1.1. Specific legal practices and procedures are strictly observed and all necessary documentation needed to install a machine as per the local laws are done.
	1.2. Drawings, standards, quality control procedures and specifications used for the installation are correctly interpreted according to BS and ISO schematics, symbols and terminology
	1.3. Site for positioning of the equipment is correctly marked out as per the installation manual guidelines
	1.4. Wall and floor are firmly reinforced and the machine position ground well prepared as per the guideline in machine manuals
	1.5. Necessary additional reinforcement materials are properly fixed to the space as designed
2. Prepare for the installation work	2.1. Hazards associated with installing mechanical equipment are sufficiently analyzed and their mitigation measures determined as per the impact assessment reports.
	2.2. Personal protective equipment (PPE) needed for the installation activities are timely obtained and availed in readiness for the installation day
	2.3. Machine utility requirement is correctly determined and utility supply timely planned
3. Determine harmony/routing	3.1. Operations steps for the other machines are correctly identified as per the production standard operating procedures

with the rest of the production line	3.2. New machines are appropriately set to be in operational harmony with other machines and the flow of work is well defined and continuous as guided in standard operating procedures
4. Schedule test run and follow up	3.3. Machine is properly installed facing the feedstock receiving end and the feed out relays to the operation station
	4.1. Machine operation is properly tested as per the installation specification
	4.2. Visual checks for completeness and freedom from damage is thoroughly done and loose nut perfectly tensioned
	4.3. Relevant records/paperwork are clearly documented and filed with the organization for future use in repair or maintenance

## Course content

<b>Learning outcomes</b>	<b>At the end of the module the learner will be able to:</b> <ol style="list-style-type: none"> <li>1. Plan for machine layout installation</li> <li>2. Prepare for the installation work</li> <li>3. Determine harmony/routing with the rest of the production line</li> <li>4. Schedule test run and follow up</li> </ol>
<b>Learning outcome 1: Plan for machine layout installation</b>	<b>Learning hours: 10</b>
<b>Indicative content</b>	
<ul style="list-style-type: none"> <li>• <b>Specific legal practices and procedures</b> <ul style="list-style-type: none"> <li>✓ Review of guidelines by Rwanda Utilities Regulatory Agency ( RURA) requirement for electrical installation i.e. Rwanda Grid Code</li> <li>✓ Description of procedures for obtaining licensing from government authorities i.e. Business permits</li> <li>✓ Explanation of Occupational Health and safety (OSHA) accreditation process</li> </ul> </li> <li>• <b>Interpretation process of drawings, standards, quality control procedures and specifications used for machine installation</b> <ul style="list-style-type: none"> <li>✓ Identification of machine standard symbols</li> <li>✓ Interpretation of process flow charts and diagrams</li> <li>✓ Interpretation of machine specifications parameters</li> <li>✓ Safety zoning for machine operations</li> </ul> </li> <li>• <b>Marking out of the site for equipment positioning</b> <ul style="list-style-type: none"> <li>✓ Description of types of measurement and marking instruments</li> <li>✓ Use of measurement and marking instruments during ground marking out</li> <li>✓ Application of chalk lines and use of stakes</li> </ul> </li> <li>• <b>Wall and floor reinforcement and preparation of machine position ground</b> <ul style="list-style-type: none"> <li>✓ Identification of reinforcement needs for various machines based on their specifications</li> <li>✓ Types of machine motion behaviour for reinforcement</li> <li>✓ Identification of workshop ventilation requirement for various machines</li> </ul> </li> </ul>	
<b>Resources required for the learning outcome</b>	
Equipment	<ul style="list-style-type: none"> <li>• Personal protective equipment,</li> </ul>

	<ul style="list-style-type: none"> <li>• Computer,</li> <li>• Internet,</li> <li>• Projector</li> </ul>
Materials	<ul style="list-style-type: none"> <li>• Marking chalk,- Powder chalk for marking lines on ground</li> <li>• Machine manuals</li> <li>• Rwanda Grid Code</li> <li>• Charts and diagrams</li> <li>• Flipchart</li> <li>• Markers</li> </ul>
Tools	<ul style="list-style-type: none"> <li>• Measuring tape,</li> <li>• Mason square,</li> <li>• T-square</li> </ul>
Facilitation techniques	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Demonstration and simulation</li> <li>• Individual and group work</li> <li>• Practical exercise</li> <li>• Individualized</li> <li>• Trainer guided</li> <li>• Group discussion</li> </ul>
Formative assessment methods	<ul style="list-style-type: none"> <li>• Written assessment</li> <li>• Performance assessment</li> </ul>

<b>Learning outcome 2: Prepare for the installation work</b>	<b>Learning hours: 5</b>
<b>Indicative content</b>	
<ul style="list-style-type: none"> <li>• <b>Analysis of hazards associated with installing mechanical equipment and mitigation measures</b> <ul style="list-style-type: none"> <li>✓ Determination and description of examples of hazards associated with wood working machines</li> <li>✓ Classification of hazards</li> <li>✓ Hazard management procedure</li> </ul> </li> <li>• <b>Personal protective equipment (PPE) needed for the installation activities</b> <ul style="list-style-type: none"> <li>✓ Description of safety measures while working with wood working machines</li> <li>✓ Identification of sources of risks in machine installation</li> <li>✓ Identification of PPE used during machine installation</li> <li>✓ Description of appropriate use of PPE used during machine installation</li> </ul> </li> <li>• <b>Machine utility requirement</b> <ul style="list-style-type: none"> <li>✓ Identification machine power rating</li> <li>✓ Description of single and 3-phase power supply</li> <li>✓ Description of machine power consumption</li> </ul> </li> </ul>	

## Resources required for the indicative content

Equipment	<ul style="list-style-type: none"> <li>• Vibrator,</li> <li>• PPEs,</li> <li>• Machines to install,</li> <li>• Computer,</li> <li>• Internet,</li> <li>• Projector</li> </ul>
Materials	<ul style="list-style-type: none"> <li>• Machine manuals</li> <li>• Rwanda Grid Code</li> <li>• Charts and diagrams</li> <li>• Flipchart</li> </ul>
Tools	<ul style="list-style-type: none"> <li>• Screw drivers,</li> <li>• power testers,</li> <li>• voltmeters</li> </ul>
Facilitation techniques	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Demonstration and simulation</li> <li>• Individual and group work</li> <li>• Practical exercise</li> <li>• Individualized</li> <li>• Trainer guided</li> <li>• Group discussion</li> </ul>
Formative assessment methods	<ul style="list-style-type: none"> <li>• Written assessment</li> <li>• Performance assessment</li> <li>• Product based assessment</li> </ul>

**Learning outcome 3: Determine harmony/routing with the rest of the production line**

**Learning hours: 5**

### Indicative content

- **Operations steps for the other machines**
  - ✓ Identification of key machine operations
  - ✓ Interpretation of process flow charts
  - ✓ Drawing of process flow diagrams
- **Setting new machines to be in operational harmony with other machines and defining the flow of work**
  - ✓ Description of importance of machine harmony
  - ✓ Description of workflow from process flow diagrams
  - ✓ Identification of machines stations/role of station numbering in wood workshop
- **Proper machine installation**
  - ✓ Determination of machine rotation direction

- ✓ Description of proper fastening of machine frames
- ✓ Identification of machine alignment requirement
- ✓ Description of machine switches and functions, ON and OFF switches and Emergency switches

### Resources required for the indicative content

Equipment	<ul style="list-style-type: none"> <li>• Digital laser levelling machine,</li> <li>• PPEs,</li> <li>• Machines to install,</li> <li>• Computer,</li> <li>• Internet,</li> <li>• Projector</li> </ul>
Materials	<ul style="list-style-type: none"> <li>• Wire cables, threading tapes, silicone, insulation tape wire connectors , screws, nuts, bolts</li> </ul>
Tools	<ul style="list-style-type: none"> <li>• Spirit level hose pipe, plumb lines, impact drills, spanner sets, pliers, wire strippers, silicon gun,</li> </ul>
Facilitation techniques	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Demonstration and simulation</li> <li>• Individual and group work</li> <li>• Practical exercise</li> <li>• Individualized</li> <li>• Trainer guided</li> <li>• Group discussion</li> </ul>
Formative assessment methods	<ul style="list-style-type: none"> <li>• Written assessment</li> <li>• Oral presentation</li> <li>• Performance assessment</li> </ul>

**Learning outcome 4: Schedule test run and follow up**

**Learning hours: 10**

#### Indicative content

- **Testing machine operation**
  - ✓ Description of machine feed rate
  - ✓ Description of machine running cycles
  - ✓ Description of machine production rate
  - ✓ Explanation of how to safely start and run various wood working machines
- **Visual checks for completeness and tensioning loose nut**
  - ✓ Determination of studs and nuts firmness
  - ✓ Description of belts/ chain tensioning requirement
  - ✓ Identification of labelling requirement of machine parts control

- **Documenting relevant records/paperwork**

- ✓ Description types of machine data for documentation
- ✓ Preparation of machine maintenance schedules
- ✓ Description of the importance of documentation with respect to machine installation

**Resources required for the indicative content**

Equipment	<ul style="list-style-type: none"> <li>• Installed wood working machine,</li> <li>• PPEs,</li> <li>• Computer,</li> <li>• Internet,</li> <li>• Projector</li> </ul>
Materials	<ul style="list-style-type: none"> <li>• Machine manuals</li> <li>• Rwanda Grid Code</li> <li>• Charts and diagrams</li> <li>• Flipchart</li> </ul>
Tools	<ul style="list-style-type: none"> <li>• Spanner,</li> <li>• screw driver and</li> <li>• power tester</li> </ul>
Facilitation techniques	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Demonstration and simulation</li> <li>• Individual and group work</li> <li>• Practical exercise</li> <li>• Individualized</li> <li>• Trainer guided</li> <li>• Group discussion</li> </ul>
Formative assessment methods	<ul style="list-style-type: none"> <li>• Written assessment</li> <li>• Oral presentation</li> <li>• Performance assessment</li> </ul>

**Integrated/Summative assessment**

**Integrated situation**

GETISM enterprise LTD a company based in Kenya and deals in General Timber Smiths is starting up a wood workshop in Rwanda, Nyamagabe District. GETISM has procured the following wood working equipment for their new wood workshop:

- Table jointer
- Table circular saw
- Thickness planer and
- Vertical band saw

However GETISM do not have any correspondent millwright in Rwanda to perform machine installation related duties and tasks. As qualified personnel in wood working machines installation and use with TVET Certificate III from Kibeho TVET School, they have hired you to perform the following duties by installing one of those machines:

- ✓ Plan for machines layout in their new built workshop
- ✓ Prepare for machines installation
- ✓ Determine process flow and design process flow diagrams
- ✓ Schedule test run and plan follow up maintenance

GETISM has also avail for you an office, writing materials, tools and equipment.

You have 8 hours maximum.

### Resources

Tools	<ul style="list-style-type: none"> <li>• Spirit level</li> <li>• Hose pipe,</li> <li>• Plumb lines,</li> <li>• Impact drills,</li> <li>• Spanner sets,</li> <li>• Pliers,</li> <li>• Wire stripers,</li> <li>• Silicon gun</li> </ul>
Equipment	<ul style="list-style-type: none"> <li>• Digital laser levelling machines</li> </ul>
Materials/ Consumables	<ul style="list-style-type: none"> <li>• Marking chalk,</li> <li>• Powder chalk for marking lines on ground</li> <li>• Machine manuals</li> <li>• Rwanda Grid Code</li> <li>• Charts and diagrams</li> <li>• Flipchart</li> <li>• Markers</li> </ul>

Assessable	Assessment criteria (Based	Indicator	Observation	Marks
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outcomes	on performance criteria)		Yes	No	allocation
<b>Learning outcome 1:</b>  <b>Plan for machine layout installation</b>  (30%)	1.1. Specific legal practices and procedures are strictly observed and all necessary documentation needed to install a machine as per the local laws are done	Specific legal practices and procedures are identified and strictly observed			7
	1.2. Drawings, standards, quality control procedures and specifications used for the installation are correctly interpreted according to BS and ISO schematics, symbols and terminology	Drawings, standards, quality control procedures and specifications used for the installation are correctly interpreted			8
	1.3. Site for positioning of the equipment is correctly marked out as per the installation manual guidelines	Site for positioning of the equipment is correctly marked out			8
	1.4. Wall and floor are firmly reinforced and the machine position ground well prepared as per the guideline in machine manuals	Wall and floor are firmly reinforced and the machine position ground well prepared			7
<b>Learning outcome 2:</b>  <b>Prepare for the installation work</b>  (20%)	2.1. 2.1 Hazards associated with installing mechanical equipment are sufficiently analyzed and their mitigation measures determined as per the impact assessment reports.	Hazards associated with installing mechanical equipment are sufficiently analyzed and their mitigation measures determined			7
	2.2. Personal protective equipment (PPE) needed for the installation activities are timely obtained and availed in readiness for the installation day	PPEs needed for the installation activities are timely obtained and availed			6
	2.3. Machine utility requirement is correctly determined and utility supply timely planned	Machine utility requirement is correctly determined and utility supply timely planned			7

<b>Learning outcome 3:</b>  <b>Determine harmony/rotating with the rest of the production line</b>  <b>(30%)</b>	3.1. Operations steps for the other machines are correctly identified as per the production standard operating procedures	Operations steps for the other machines are correctly identified			10
	3.2. The new machines are appropriately set to be in operational harmony with other machines and the flow of work is well defined and continuous as guided in standard operating procedures.	The new machines are appropriately set to be in operational harmony with other machines and the flow of work is well defined and continuous			10
	3.3. Machine is properly installed facing the feedstock receiving end and the feed out relays to the operation station	Machine is properly installed facing the feedstock receiving end and the feed out relays to the operation station			10
<b>Learning outcome 4:</b>  <b>Schedule test run and follow up</b>  <b>(20%)</b>	4.1. Machine operation is properly working as per the installation specification	Machine operation is properly working			7
	4.2. Visual checks for completeness and freedom from damage is thoroughly done and loose nut perfectly tensioned	Visual checks for completeness and freedom from damage is thoroughly done and loose nut perfectly tensioned No obvious hazards left unattended to			6
	4.3. Relevant records/paperwork are clearly documented and filed with the organization for future use in repair or maintenance.	Relevant records/paperwork are clearly documented and filed			7
<b>Total marks</b>					<b>100</b>
<b>Percentage Weightage</b>					<b>100%</b>
<b>Minimum Passing line % (Aggregate): 70%</b>					