



Republic of Rwanda  
Ministry of Education



RTB | RWANDA  
TVET BOARD

**PLTSA301**

## SANITARY APPLIANCES INSTALLATION

INSTALL SANITARY APPLIANCES

### Competence

RQF Level: 3

Learning Hours



100

Credits: 10

Sector: Construction and Building Services

Trade: Plumbing Technology

Module Type: Specific

Curriculum: CBSPLT302- TVET Certificate 3 in Plumbing Technology

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Issue Date: May 2022

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<b>Purpose statement</b>	This module describes the skills, knowledge and attitude to be acquired by a trainee to install sanitary appliances for plumbing works at the construction site in respective to the standards.					
<b>Leaning assumed to be in place</b>	Safety, Health and environment at workplace; Plumbing Works Planning; Pipes Joining; Installation of House Drainage; Install Domestic water supply.					
<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
<b>1. Prepare the workplace</b>	1.1 Site is properly inspected according to the appliances to be installed
	1.2 Unwanted materials are clearly removed at workplace
	1.3 Measurements are correctly taken according to the drawing
<b>2 Interpret sanitary appliance user manual</b>	2.1 Appliances specification are properly checked.
	2.2 Manuals are properly related to the appliances
	2.3 Installation steps are properly analysed according to the appliances.
<b>3 Select materials, tools and equipment</b>	3.1 Tools are properly selected according to the work
	3.2 Materials are properly selected according to the work
	3.3 Equipment are properly selected according to the work
<b>4 Perform drilling for sanitary appliances.</b>	4.1 Appliances spacing is accurately measured according to the work
	4.2 Spaces are precisely marked according to the types of appliances
	4.3 Holes are properly drilled according to the marked spaces

<b>5 Perform fixing and mounting of sanitary appliances and accessories</b>	5.1 Plugs and Screws are appropriately fixed according to the task
	5.2 Sealant is properly applied
	5.3 Appliances are appropriately fixed and mounted
	5.4 Inlet and outlet are appropriately connected
<b>6 Test performance of sanitary appliances</b>	6.1 Water is appropriately flushed to the sanitary appliances system
	6.2 Leakages are appropriately tested according to the installed appliances
	6.3 Pressure is appropriately tested according to the installed appliances
<b>7 Perform Cleaning of the workplace and report the work.</b>	7.1 Tools & equipment are properly cleaned according to the work done
	7.2 Tools, equipment & materials are properly stored
	7.3 Working area is properly cleaned according to the work done
	7.4 Reports are properly prepared according to the work done

### 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. <b>Prepare the workplace</b></li> <li>2. <b>Interpret sanitary appliance user manuals</b></li> <li>3. <b>Select materials, tools and equipment</b></li> <li>4. <b>Perform drilling for sanitary appliances.</b></li> <li>5. <b>Perform fixing and mounting of sanitary appliances and accessories</b></li> <li>6. <b>Test performance of sanitary appliances.</b></li> <li>7. <b>Perform Cleaning of the workplace and report the work.</b></li> </ol>
Learning outcome 1: Prepare the workplace	<b>Learning hours: 10</b>
<b>Indicative content</b>	
<ul style="list-style-type: none"> <li>• <b>Site inspections for sanitary appliance installation</b></li> </ul> <ul style="list-style-type: none"> <li>✓ Inspect site locations</li> <li>✓ Identify existing features and access</li> <li>✓ Identify available local labor and materials</li> </ul>	

- **Removing unwanted materials at workplace: (Refer to: RS 367,RS ISO 14001,Rwanda building code page 575, ISO14015)**

- ✓ Remove remained construction materials from the workplace

- + Bricks
- + Concretes
- + metals chip
- + soils
- + surplus mortar

- ✓ Method of cleaning

- + Mechanical method

- ❖ Air pressure

- + Manual method

- ❖ Water

- ❖ Brush

- ❖ Spades & wheelbarrow

- **Collection of measurements according to the drawing (Refer to: I SO 7078,ISO 80000-1)**

- ✓ **Measures the space:**

- + Height
- + Length
- + Width
- + Deep

### Resources required for the learning outcome

Equipment	Power hand drill, PPE, Drilling machine,
Materials	Pens ,Flexible pipe, Pipes, thread tap ,Fittings , Soil solvent ,screws ,appliances
Tools	Screw drivers ,Hack saw ,Pliers, Hammer ,calibrated Tape measure, pipe cutter, Rulers- Vernier caliper, Spanners ,Pipe wrench, drill bit
Facilitation techniques	Lecture, Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided, Group discussion
Formative assessment methods	Written assessment, Oral presentation, Performance assessment, Product based assessment Project based assessment

**Learning outcome 2: Interpret sanitary appliance user manual**

**Learning hours: 5**

**Indicative content**

- **Checking Appliances specifications**
  - Fabrication materials of sanitary appliances (**Refer to** : RS 273, RS EAS 1017-1,Rwanda Building code :SANITARY FACILITIES CLAUSE 5.12.3.1 TO 5.12.3.3.1 )
    - ✚ Ceramics
    - ✚ Glazed clay
    - ✚ Stainless steel
    - ✚ Plastics
    - ✚ Cast iron
    - ✚ Fibers
  - **Relating Manuals to the Appliances (Refer to: ISO 7078, ISO 80000-1)**
    - ✓ Metric unit conversion
    - ✓ Sanitary appliances symbols
  - **Analyze Installation steps from user manual**
    - ✓ Analyze guidelines for the installation of sanitary appliances
      - ✚ Use of manuals.
      - ✚ Link manuals with drawings

**Resources required for the indicative content**

Equipment	PPE, Computers, phones, tablets, white/black board, projector,
Materials	Pens, papers, manuals
Tools	Screw drivers, Hack saw, Pliers, Hammer, Calibrated Tape measure, pipe cutter, book , internet
Facilitation techniques	Lectures, Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided , Group discussion
Formative assessment methods	Written assessment , Oral presentation ,Performance assessment , Product based assessment , Project based assessment

**Indicative content**

- **Selection of materials**
- **Types of materials used (Refer to :RS ISO 15874-3, RS ISO 15874-2, RS ISO 7005-1, RS ISO 6594, RS ISO 2531)**
  - ✓ Flexible pipe
  - ✓ Pipes
  - ✓ Sealant materials
  - ✓ Fittings
  - ✓ Soil solvent
  - ✓ Screws
  - ✓ Plugs
  - ✓ Appliances
  - ✓ Valves
- **Selection of tools (Refer to: ISO 2380-2)**
  - ✓ Criteria for selecting tools
  - ✓ types of tools
- **Selection of equipment**
  - ✓ Criteria of selecting equipment
  - ✓ Types of equipment

**Resources required for the indicative content**

Equipment	PPE, Computers, phones, tablets, white/black board, , Power hand drill, projector
Materials	Pens, Flexible pipe, Pipes, Teflon, Fittings, Soil solvent, screws, appliances
Tools	Screw drivers, Hack saw, Pliers, Hammer, calibrated Tape measure, pipe cutter, Spanners, pipe wrench, drill bit, books, internet.
Facilitation techniques	Lectures, Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided , Group discussion
Formative assessment methods	Written assessment, Oral presentation, Performance assessment, Product based assessment, Project based assessment

**Indicative content**

• **Measuring spaces for sanitary appliance (Refer to: ISO 7078, ISO 80000-1)**

✓ Standard unit used in plumbing:

✚ Metric system unit

✚ Imperial system unit

✓ **Measures the space:**

✚ Height

✚ Length

✚ Width

✚ Deep

• **Marking spaces for sanitary appliances:**

✓ Marking tools and equipment

✓ Mark the center and boundaries of space

• **Drilling holes according to the marked spaces**

✓ Different types of drill bit

✓ Types of drilling machine

✓ Drill holes

**Resources required for the indicative content**

Equipment	Drilling machines, PPE, extension cable, Computers, phones, tablets, white/black board, , Power hand drill, projector.
Materials	Pens ,papers, drill bit, pegs
Tools	Screw drivers, Hack saw, Pliers, calibrated (Tape measure, Try Squares, Foot steel tape, Vernier caliper), hammer, Rulers, books, internet.
Facilitation techniques	Lectures, Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided, Group discussion
Formative assessment methods	Written assessment , Oral presentation , Performance assessment , Product based assessment , Project based assessment

**Learning outcome 5: Perform fixing and mounting of sanitary appliances and accessories.**

**Learning hours: 45**

**Indicative content**

- **Fixing plugs and screws according to the task**
  - ✓ Different types of plugs
  - ✓ Different types of screws
  
- **Sealing of sanitary appliances**
  - ✓ Sealants materials
  - ✓ Application of Sealant materials
  
- **Fixation and Mounting of appliances (Refer to: ISO 2380-2, Rwanda building code Section 3:SANITARY FACILITIES CLAUSE 5.12.3.1 TO 5.12.3.3.1, RS 273)**
  - ✓ Materials and tools for sanitary Mounting
  - ✓ types of wall plug
  - ✓ Types of nuts
  - ✓ types of fasteners
  - ✓ Fix and Mount soil/wastewater sanitary appliances.
  - ✓ Connection of inlet and outlet.

**Resources required for the indicative content**

Equipment	Drilling machine, PPE, Computers, phones, tablets, white/black board, , Power hand drill, projector
Materials	Sealant materials, Fittings, screws, appliances, flushing cistern, wall plugs, fasteners, appliances.
Tools	Hack saw, Pliers, Hammer, Tape measure, pipe cutter, Split level, Plumber bob, screwdriver.
Facilitation techniques	Lectures, Demonstration and simulation, Individual and group work, Practical exercise , Individualized , Trainer guided ,Group discussion
Formative assessment methods	Written assessment , Oral presentation , Performance assessment , Product based assessment , Project based assessment

<b>Learning outcome 6: Test performance of sanitary appliances.</b>		<b>Learning hours: 5</b>
<b>Indicative content</b>		
<ul style="list-style-type: none"> <li>• <b>Flushing Water to the sanitary appliances system</b> Passing water through the system</li>   <li>• <b>Leak Test</b> <ul style="list-style-type: none"> <li>✓ Water pressure</li> <li>✓ Air compressor</li> <li>✓ Smoke test</li> </ul> </li>   <li>• <b>Pressure Test</b></li> </ul>		
<b>Resources required for the indicative content</b>		
Equipment	Manometer, PPE, air compressor, pressure gauge	
Materials	Water, air	
Tools	Spanners,	
Facilitation techniques	Lectures, Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided, Group discussion	
Formative assessment methods	Written assessment, Oral presentation, Performance assessment, Product based assessment, Project based assessment	

<b>Learning outcome 7: Perform Cleaning of the workplace and report the work</b>		<b>Learning hours: 5</b>
<b>Indicative content</b>		
<ul style="list-style-type: none"> <li>• <b>Clean tools &amp; equipment</b> <ul style="list-style-type: none"> <li>✓ Purposes of cleaning tools and equipment</li> <li>✓ Method of cleaning tools and equipment</li> <li>✚ Water</li> <li>✚ Rugs</li> <li>✚ Oil</li> <li>✚ Brushes</li> <li>✚ Cotton waste</li> </ul> </li>   <li>• <b>Storing Tools, equipment &amp; materials</b> <ul style="list-style-type: none"> <li>✓ Points to follow in storing tools and equipment</li> </ul> </li> </ul>		

- ✓ Process of storing tools and equipment
- **Clean Working area: (Refer to: RS ISO 14001, Rwanda building code page 575, ISO14015)**
  - ✓ The importance of a clean workplace
  - ✓ Method of cleaning:
  - ✓ Remove Hazardous Materials
- **Preparation of reports according to the work done**
  - + Writing the Relevant report on:
  - + Used materials
  - + Remained materials
  - + Condition of tools and equipment
  - + Status of accomplished tasks

### Resources required for the indicative content

Equipment	Air compressor, PPE, wheelbarrow, , phones, tablets, Computers, phones, tablets, white/black board,, projector
Materials	Soap, water, oil, Papers, notebooks, water.
Tools	cloth rugs, Brushes, spade, Mops, books, internet
Facilitation techniques	Lectures, Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided, Group discussion
Formative assessment methods	Written assessment, Oral presentation, Performance assessment , Product based assessment , Project based assessment

### Integrated/Summative assessment :8 Hours

#### Integrated situation

Mr. John the brother in law of James decided to install Sanitary appliances in his residential house located at CONGO NIL near RUTSIRO DISTRICT HEAD QUARTER, so as plumber you are requested to carry out this job of installing WC, Two wash basins, one shower within 8 Hours. Remember that the distance from soak is 10m and 7m from Septic.

Resources	
Tools	Screw drivers, Hack saw , Pliers, Hammer, Tape measure, cutter, Spanners, Pipe wrench,
Equipment	Drilling machine, PPE,
Materials/ Consumables	Pens, Flexible pipe, Pipes, Teflon, Fittings, Soil solvent, screws, sanitary appliances, tangit glue , hemp , drill bit, valves, sealant materials, wall plugs

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
<b>Learning outcome 1:</b> Prepare the workplace  (10%)	1.1. Site is properly inspected according to the appliances to be installed	Site is visited			2
		Necessary data are gathered			1
		Gathered data are reported			1
	1.2. Unwanted materials are clearly removed at workplace	Safety precaution are assured			1
		materials to be removed are identified			1
		unwanted materials are removed			1
	1.3. Measurements are correctly taken according to the drawing	Measuring tools are well selected			1
		Measurement are well taken			1
		Measurements are recorded			1
<b>Learning outcome 2:</b> Interpret sanitary appliance user manual (10%)	2.1. Appliances specifications are properly checked	Appliances specifications are well selected			1
		Quality standard checking is well conducted			1
		Observations are well reported			1
	2.2. Manuals are properly related to the appliances	Drawing and manuals are collected			1
		Manuals and drawing are well related			1
		Observations are well recorded			1
	2.3. Installation steps are	The task to be done is			2

	properly analyzed according to the appliances	well analyzed			
		Steps to be uses are well analyzed			1
		Steps and task are well analyzed			1
<b>Learning outcome 3:</b> Select materials, tools and equipment  <b>(10%)</b>	3.1. Tools are properly selected	Task to be done is well understood			1
		Tools to be used are well selected			1
		All tools required are collected			1
	3.2. Materials are properly selected	Task to be done is well analyzed			1
		Materials to be used are well selected			2
		All materials to be used are collected			1
	3.3. equipment are properly selected	Task to be done is well analyzed			1
		equipment to be used are well identified			1
		All equipment to be used are collected			1
	<b>Learning outcome 4:</b> Perform drilling for sanitary appliances. <b>(10%)</b>	4.1. appliance Spaces are accurately measured	Measuring tools are well selected		
Measuring of spaces is well done					1
Measurements are well recorded					1
4.2. Spaces are precisely marked according to the types of appliances		Marking tools are well selected			1
		Spaces are well marked			1
		Marked spaces are well secured			1
4.3. Holes are properly drilled according to the marked spaces		Holes to be drilled are well prepared			1
		Holes are well drilled with appropriate drill bit			1
		Drilled holes are well cleaned			1

<b>Learning outcome 5:</b> Perform fixing and mounting of sanitary appliances and accessories <b>35%)</b>	5.1 Plugs and screws are fixed appropriately according to the task	Plugs are well selected			1
		plugs are well cleaned			2
		Plugs are well fixed			2
		Holes to be screwed are well drilled with appropriate drill bit			2
		Screws are well selected			2
		Screws are well selected			2
	5.2.Sealants are properly applied	Sealant materials to be used is well selected			2
		Preparation of space to apply sealant is well prepared			2
		Sealant materials is well sealed			3
	5.3.Appliances are appropriately fixed and mounted	Appliances to be mounted are well selected			2
		Appliances are well cleaned			2
		Appliances are well mounted			2
		Appliances to be fixed are well selected			2
Appliances are well cleaned				2	
Appliances are well fixed				2	
Inlet and outlet are appropriately connected				3	
<b>Learning outcome 6:</b> Test proper performance of sanitary appliances <b>(10%)</b>	6.1. Water is appropriately flushed to the sanitary appliances system	Water is getting well in appliances through inlet.			1
		Water is well flushed			3
	6.2. Leakages are appropriately	Leakages are well repaired			1

	tested according to the installed appliances	Leakages are well tested			1	
		Reporting of leakage test is well done			1	
	6.3. Pressure is appropriately tested according to the installed appliances	Water is fully filled			1	
		Pressure test is well conducted			2	
<b>Learning outcome 7:</b> Perform Cleaning of the workplace and report the work. (15%)	7.1. Tools & equipment are properly cleaned	Tools and equipment are well collected			1	
		Cleaning tools are well selected			1	
		Tools and equipment are well cleaned			1	
	7.2. Tools, equipment & materials are properly stored	Storing place is well identified			1	
		Tools, equipment and materials are well stored			1	
		Storing place is well secured			1	
	7.3. Working area is properly cleaned	Materials to be used are well selected			1	
		Working area is well cleaned			1	
		Cleaned area is well watered			1	
	7.4. Reports are properly prepared according to the work done	Data are well collected			1	
		Data collected are well analyzed			2	
		Reports is well done			3	
	<b>Total marks</b>					<b>100</b>
	<b>Percentage Weightage</b>					<b>100%</b>
	<b>Minimum Passing line % (Aggregate): 70%</b>					



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6. [www.nationalbimlibrary.com/en/sanitary-appliance-systems](http://www.nationalbimlibrary.com/en/sanitary-appliance-systems)
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8. [www.designingbuildings.co.uk/wiki/Types\\_of\\_sanitary\\_appliances](http://www.designingbuildings.co.uk/wiki/Types_of_sanitary_appliances)
9. C.J. Smith and B. Curry, Practical Plumbing, Macmillan Publishers Ltd, 1998
10. RS 273: Sanitary appliances — Selection, installation and maintenance — Code of practice
11. RS EAS 1017-1: Sanitary appliances (vitreous china) — Part 1: General requirements
12. RS EAS 1017-2: Sanitary appliances (vitreous china) — Specification — Part 2: Wash down water closet pan
13. RS EAS 1017-3: Sanitary appliances (vitreous china) — Specification — Part 3: Wash basin
14. RS EAS 1017-4: Sanitary appliances (vitreous china) — Specification — Part 4: Squatting pans
15. RS EAS 1017-5: Sanitary appliances (vitreous china) — Specification — Part 5: Urinal
16. RS EAS 1017-6: Sanitary appliances (vitreous china) — Specifications — Part 6: Flushing cistern
17. Rwanda building code Section 3: SANITARY FACILITIES CLAUSE 5.12.3.1 TO 5.12.3.3.1