

**SKILLS FRAMEWORK FOR PUBLIC TRANSPORT  
TECHNICAL SKILLS & COMPETENCIES (TSC) REFERENCE DOCUMENT**

<b>TSC Category</b>	Rail Systems Maintenance					
<b>TSC</b>	Drainage, Plumbing and Sanitary Systems Maintenance					
<b>TSC Description</b>	Implement preventive and corrective maintenance of drainage, plumbing and sanitary systems					
<b>TSC Proficiency Description</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Level 5</b>	<b>Level 6</b>
	<b>PTP-RSM-1008-1.1</b>	<b>PTP-RSM-2008-1.1</b>	<b>PTP-RSM-3008-1.1</b>	<b>PTP-RSM-4008-1.1</b>		
	Carry out scheduled maintenance work on drainage, plumbing and sanitary systems	Conduct corrective maintenance on drainage, plumbing and sanitary systems	Troubleshoot and locate faults on drainage, plumbing and sanitary systems and recommend rectification methods	Diagnose root causes of drainage, plumbing and sanitary systems failure and review maintenance plans to prevent fault recurrence		
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>Types, functions, configurations and operating principles of drainage, plumbing and sanitary systems</li> <li>Schematic diagrams of drainage, plumbing and sanitary systems</li> <li>Types and specification of drainage, plumbing and sanitary components that includes:                             <ul style="list-style-type: none"> <li>Pump control panel</li> <li>Sump pump motor</li> <li>Sump pump supervisory system monitoring</li> <li>Sump pit</li> <li>Level sensors and/or switches</li> <li>Ejector pump system</li> <li>Domestic water pump</li> </ul> </li> <li>Procedures for servicing drainage, plumbing and sanitary systems in accordance to organisational procedures, Work Instructions (WI) and/or Original Equipment Manufacturer (OEM) technical manuals</li> </ul>	<ul style="list-style-type: none"> <li>Types, functions, configurations and operating principles of drainage, plumbing and sanitary systems</li> <li>Schematic diagrams of drainage, plumbing and sanitary systems</li> <li>Types and specification of drainage, plumbing and sanitary components that includes:                             <ul style="list-style-type: none"> <li>Pump control panel</li> <li>Sump pump motor</li> <li>Sump pump supervisory system monitoring</li> <li>Sump pit</li> <li>Level sensors and/or switches</li> <li>Ejector pump system</li> <li>Domestic water pump</li> </ul> </li> <li>Risk assessment procedures</li> <li>Types of drainage, plumbing and sanitary systems fault indicators and response procedures</li> <li>Procedures to dismantle, repair, replace, and re-assemble drainage, plumbing and sanitary components</li> </ul>	<ul style="list-style-type: none"> <li>Common fault symptoms in drainage, plumbing and sanitary systems</li> <li>Methods of locating and rectifying faults</li> <li>Types of troubleshooting techniques, equipment and tools</li> <li>Safety guidelines for usage of tools and equipment to execute troubleshooting on drainage, plumbing and sanitary systems</li> <li>Cause and effect diagrams</li> <li>Schematic and control diagrams of drainage, plumbing and sanitary systems</li> <li>Functional relationships between drainage, plumbing and sanitary systems and the overall rail systems</li> </ul>	<ul style="list-style-type: none"> <li>Factors affecting equipment and system performance</li> <li>Failure investigation and prevention methods</li> <li>Methods and tools for diagnostic analysis</li> <li>Procedures for defect diagnosis and root cause analysis</li> <li>Types and methods of functional and integrated testing</li> <li>Organisational maintenance procedures, Work Instruction (WI) and Original Equipment Manufacturer (OEM) technical recommendations</li> <li>Functional relationships between drainage, plumbing and sanitary systems and the overall rail systems</li> <li>Public Utilities Board (PUB) discharge of trade effluent requirements</li> </ul>		

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	<ul style="list-style-type: none"> <li>• Safety guidelines on use of tools and equipment for preventive maintenance on drainage, plumbing and sanitary systems</li> <li>• Types and usage of Personal Protective Equipment (PPE) for drainage, plumbing and sanitary systems maintenance</li> <li>• Organisational maintenance documentation and fault reporting procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Procedures for conducting system performance checks and identifying faults on drainage, plumbing and sanitary systems</li> <li>• Safety guidelines on use of tools and equipment for corrective maintenance on drainage, plumbing and sanitary systems</li> <li>• Types and usage of Personal Protective Equipment (PPE) for drainage, plumbing and sanitary systems maintenance</li> <li>• Organisational maintenance documentation and fault reporting procedures</li> </ul>				
<b>Abilities</b>	<ul style="list-style-type: none"> <li>• Perform preparation work to conduct preventive maintenance on drainage, plumbing and sanitary systems</li> <li>• Follow organisational procedures WI and/or OEM technical manuals to carry out preventive maintenance on drainage, plumbing and sanitary systems</li> <li>• Perform serviceability checks on drainage, plumbing and sanitary systems</li> <li>• Adhere to safety guidelines and operating instructions for tools and equipment during maintenance work</li> <li>• Record drainage, plumbing and sanitary systems maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• Interpret work orders and prepare for corrective maintenance</li> <li>• Carry out first line recovery in response to drainage, plumbing and sanitary systems faults and alarms</li> <li>• Apply fault identification procedures to determine causes of drainage, plumbing and sanitary systems faults</li> <li>• Dismantle faulty drainage, plumbing and sanitary systems for corrective maintenance</li> <li>• Repair and/or replace faulty components</li> <li>• Reassemble and reinstate drainage, plumbing and sanitary systems</li> </ul>	<ul style="list-style-type: none"> <li>• Use troubleshooting tools, equipment and methods to locate and analyse causes of faults in drainage, plumbing and sanitary systems</li> <li>• Recommend corrective actions for identified faults on drainage, plumbing and sanitary systems</li> <li>• Implement procedures on safe usage of tools and equipment during maintenance work</li> <li>• Analyse maintenance work documented for drainage, plumbing and sanitary systems to identify possible workflow improvements so as to prevent fault recurrence</li> </ul>	<ul style="list-style-type: none"> <li>• Guide Establish structured failure investigation and specify functional testing requirements</li> <li>• Perform fault tree analyses to diagnose root cause failure of drainage, plumbing and sanitary systems</li> <li>• Review organisational drainage, plumbing and sanitary systems maintenance procedures</li> <li>• Propose new and/or enhanced maintenance procedures and/or WI in reference to OEM technical recommendations</li> <li>• Monitor overall maintenance progress of drainage, plumbing and sanitary systems to</li> </ul>		

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	activities and report occurrences of potential faults identified	<ul style="list-style-type: none"> <li>• Perform functional and tripping tests on drainage, plumbing and sanitary systems</li> <li>• Apply operating and safety measures in operating tools and equipment during maintenance work</li> <li>• Record and collate documentation of drainage, plumbing and sanitary systems maintenance work</li> </ul>		<p>ascertain effectiveness of maintenance procedures</p> <ul style="list-style-type: none"> <li>• Develop long-term solutions by analysing diagnostic data to prevent faults and failures recurrence</li> <li>• Develop troubleshooting, rectification and fault analysis methods</li> <li>• Develop test procedures for system performance checks</li> <li>• Coordinate drainage, plumbing and sanitary systems maintenance with other rail systems maintenance needs</li> </ul>		
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