

## PLUMBER (Sewage network maintainer and repairer)

(name of the programme)

Eil. No.	Parameters	Notes
1.	<b>Title of learning programme</b>	Plumber (Sewage network maintainer and repairer)
2.	<b>General information</b>	
2.1.	<b>Relevance of the learning programme</b>	<p>Studying a plumbing programme is relevant because it will enable you to:</p> <ul style="list-style-type: none"> <li>- explain the principles of wastewater collection and disposal;</li> <li>- explain the principles of wastewater networks and installations;</li> <li>- explain the technological process of continuous wastewater collection;</li> <li>- maintenance of wastewater networks;</li> <li>- preparing a schedule of planned maintenance works on wastewater networks;</li> <li>- carrying out preventive cleaning of sewage networks according to a set schedule;</li> <li>- record any faults identified and carry out work on the wastewater network;</li> <li>- acceptance of newly built networks;</li> <li>- explain the basic principles of operation of wastewater networks and equipment in networks;</li> <li>- prepare tools and materials for work on wastewater networks;</li> <li>- carrying out repairs to wastewater networks according to set schedules;</li> <li>- to explain in detail the safety of workers when carrying out work on sites, the requirements for working with equipment and materials, the requirements for working in manholes and chambers, and for carrying out work in the street.</li> </ul>
2.2.	<b>Aim and objectives</b>	<p>The aim of the programme is to learn how to work in the maintenance of water and wastewater treatment plants.</p> <p>Objectives:</p> <ul style="list-style-type: none"> <li>- Maintain sewage networks;</li> <li>- Carry out repairs to sewage networks.</li> </ul>
2.3.	Duration of the learning programme:	90
2.3.1.	Duration of practical contact work Academic hours	63
2.3.2.	Duration of theoretical contact work Academic hours	27
2.3.3.	Duration of self-study Academic hours	Not applicable
2.4.	Minimum requirements for participation (if applicable):	Secondary education.

2.5.	Method(s) of teaching the learning programme:				
2.5.1.	Curriculum blended learning		-		
2.5.2.	Learning programme Teaching method Distance learning synchronous		-		
2.5.3.	Learning programme teaching method contact		Contact (auditory)		
2.6.	System/scale for assessing acquired competences		Credited / Not credited		
2.7.	<b>Learning Programme Annotation</b>		This training programme is designed for those wishing to acquire the theoretical knowledge and practical skills to work in the maintenance of water and wastewater treatment plants.		
<b>3.</b>	<b>Competences acquired or developed in a learning programme:</b>				
	<b>Competence(s)</b>	<b>Means of assessing the competence(ies) developed and/or acquired in the programme</b>			
3.1.	General competences				
	Communicate using professional terms.	Not evaluated			
	Collect, process and store the information you need for your work.	Not evaluated			
	Organise your learning.	Not evaluated			
3.2.	Professional competences				
	Maintain wastewater networks	Credited / not credited			
	Carry out repairs to wastewater networks	Credited / not credited			
<b>4.</b>	<b>Learning programme content and methods</b>				
	<b>Eil. No.</b>	<b>Title of topic</b>	<b>Brief description of the topic</b>	<b>Methods of teaching (training)</b>	<b>Competences to be acquired/improved</b>
	1.	<b>Principles of wastewater collection and disposal</b>	<p><b>Topic. General knowledge of wastewater and its properties</b></p> <ul style="list-style-type: none"> <li>• Generation and pollution of wastewater</li> <li>• Requirements for use of wastewater networks</li> <li>• Composition of the discharged effluent</li> <li>• Wastewater collection schemes.</li> </ul> <p><b>Topic. Wastewater collection systems</b></p> <ul style="list-style-type: none"> <li>• General system</li> </ul>	Informative (imparting, consolidating and testing knowledge), Practical Operational (building knowledge and skills), Creative (developing a reflective and creative personality) Oral: explanation and lecture; Practical: demonstration and observation and exercises; Visual: practical work.	Knowledge of the principles of wastewater collection and disposal.

		<ul style="list-style-type: none"> <li>• Mixed system</li> <li>• Group system</li> <li>• Individual with sewage treatment</li> <li>• Individual with wastewater discharge to a storage tank.</li> </ul> <p><b>Topic. Wastewater treatment requirements</b></p> <ul style="list-style-type: none"> <li>• Regulation of wastewater management</li> <li>Subscriber contracts and responsibilities.</li> </ul>		
2.	<b>Principles for the installation of wastewater networks and facilities</b>	<p><b>Topic. Installation of wastewater networks</b></p> <ul style="list-style-type: none"> <li>• Self-flowing wastewater networks</li> <li>• Pressurised wastewater networks</li> <li>• Vacuum wastewater collection system.</li> </ul> <p><b>Topic. Manholes and pumping stations for wastewater networks</b></p> <ul style="list-style-type: none"> <li>• Wastewater network manholes and their installation</li> <li>• Sewage pumping stations, their functions.</li> </ul>	Informative (imparting, consolidating and testing knowledge), Practical Operational (building knowledge and skills), Creative (developing a reflective and creative personality) Oral: explanation and lecture; Practical: demonstration and observation and exercises; Visual: practical work.	Knowledge of the principles of installation of wastewater networks and facilities.
3.	<b>Technological process for continuous wastewater collection networks</b>	<p><b>Topic. Operational challenges for wastewater networks and pumping stations</b></p> <ul style="list-style-type: none"> <li>• Continuous wastewater management</li> <li>• Efficiency of the wastewater collection system</li> <li>• Accident recovery</li> <li>• Survey work</li> </ul> <p>Repair and reconstruction work.</p>	Informative (imparting, consolidating and testing knowledge), Practical Operational (building knowledge and skills), Creative (developing a reflective and creative personality) Oral: explanation and lecture; Practical: demonstration and observation and	Explain the technological process of continuous wastewater collection networks.

4.	<b>Carrying out maintenance of wastewater networks</b>	<p><b>Topic. Operation of wastewater networks</b></p> <ul style="list-style-type: none"> <li>• Periodic maintenance of wastewater networks</li> <li>• External inspection of wastewater networks</li> <li>• Internal inspection of wastewater networks</li> <li>• Unscheduled inspection of wastewater networks</li> </ul> <p><b>Topic. Acceptance of constructed wastewater networks</b></p> <ul style="list-style-type: none"> <li>• Wastewater network documentation</li> <li>• Acts of execution for wastewater network works</li> <li>• Television diagnostics of wastewater networks</li> </ul>	exercises; Visual: practical work.	Maintenance of wastewater networks.
5.	<b>Preparation of a schedule of planned maintenance works on wastewater networks</b>	<p><b>Topic. Organising the operation of wastewater networks</b></p> <ul style="list-style-type: none"> <li>• Wastewater network inspection reports</li> <li>• Data on interruptions in wastewater management</li> <li>• Televised diagnostic material for wastewater networks</li> <li>• Data on emergency sections of wastewater networks</li> <li>• Scheduling planned maintenance work on wastewater networks</li> <li>• Determination of the need for funds for planned repairs</li> </ul>	Informative (imparting, consolidating and testing knowledge), Practical Operational (building knowledge and skills), Creative (developing a reflective and creative personality) Oral: explanation and lecture; Practical: demonstration and observation and exercises; Visual: practical work.	Establish a schedule of planned repairs to wastewater networks.

6.	<b>Carrying out preventive cleaning of sewage networks according to a set schedule.</b>	<p><b>Topic. Sewage network cleaning works</b></p> <ul style="list-style-type: none"> <li>• Flushing of sewage networks with special equipment</li> <li>• Repair of manholes and manhole covers in wastewater networks</li> <li>• Mechanical cleaning of sewage networks</li> </ul> <p><b>Topic. Worker safety in on-site work</b></p> <ul style="list-style-type: none"> <li>• Requirements for working with equipment and materials</li> <li>• Requirements for work in inspection wells and chambers</li> <li>• Work in the street</li> <li>• Earthworks</li> </ul>		To carry out preventive cleaning of wastewater networks according to a set schedule.
7.	<b>Recording in a logbook all faults identified and work carried out on the wastewater network.</b>	<p><b>Topic. Technical documentation</b></p> <ul style="list-style-type: none"> <li>• External and internal inspection records</li> <li>• Urgent Repair Lists</li> <li>• Wastewater network flushing register</li> <li>• Register of mechanical treatment works for wastewater networks</li> </ul>	Informative (imparting, consolidating and testing knowledge), Practical Operational (building knowledge and skills), Creative (developing a reflective and creative personality) Oral: explanation and lecture; Practical: demonstration and observation and exercises; Visual: practical work.	Keep a log of all faults found and work carried out on the wastewater network.
8.	<b>Acceptance of new wastewater networks.</b>	<p><b>Topic. Acceptance of constructed wastewater networks</b></p> <ul style="list-style-type: none"> <li>• Wastewater network documentation</li> <li>• Acts of execution for wastewater network works</li> <li>• Television diagnostics of wastewater networks</li> </ul>		Carrying out the acceptance of new wastewater networks.

9.	<b>The basic principles of operation of wastewater networks and equipment in networks.</b>	<p><b>Topic. Sewage networks, their functions and purpose</b></p> <ul style="list-style-type: none"> <li>• Purpose of wastewater networks</li> <li>• Functions of wastewater networks</li> <li>• Principles of wastewater network operation</li> </ul> <p><b>Topic. Purpose and function of wastewater manholes and other devices in networks</b></p> <ul style="list-style-type: none"> <li>• Wastewater network manholes</li> <li>• Wastewater network cameras</li> <li>• Sewage pumping stations</li> </ul>	<p>Informative (imparting, consolidating and testing knowledge), Practical Operational (building knowledge and skills), Creative (developing a reflective and creative personality) Oral: explanation and lecture; Practical: demonstration and observation and exercises; Visual: practical work.</p>	<p>Explain the basic principles of operation of wastewater networks and equipment in networks.</p>
10.	<b>Principles for the installation of wastewater networks and equipment in networks</b>	<p><b>Topic. Installation of wastewater networks and facilities</b></p> <ul style="list-style-type: none"> <li>• Commissioning of wastewater networks</li> <li>• Commissioning of sewage pumping stations</li> </ul>		<p>Knowledge of the principles of installation of wastewater networks and equipment in networks.</p>
11.	<b>Preparation of tools and equipment needed for wastewater network repair work.</b>	<p><b>Topic. Sewage network repair works</b></p> <ul style="list-style-type: none"> <li>• Cleaning individual sections of wastewater networks</li> <li>• Possible ways of rehabilitating wastewater networks</li> <li>• Mechanical cleaning of wastewater networks</li> </ul> <p><b>Topic. Work equipment and tools</b></p> <ul style="list-style-type: none"> <li>• Hydrodynamic machine</li> <li>• Mechanical cleaning unit</li> <li>• TV diagnostic equipment for wastewater networks</li> </ul>		<p>Prepare the tools and equipment needed for the repair of wastewater networks.</p>

	12.	<b>Carrying out repairs to sewage networks according to pre-arranged schedules</b>	<p><b>Topic. Organisation of sewage network repair works</b></p> <ul style="list-style-type: none"> <li>• Dangerous jobs in wastewater management</li> <li>• Account-Release</li> <li>• Carriageway works</li> <li>• Work in wells and chambers, collectors</li> </ul> <p><b>Topic. Safe performance of repairs to wastewater networks</b></p> <ul style="list-style-type: none"> <li>• Occupational health and safety requirements</li> <li>• Assessing the potential risks of wastewater network repair works</li> <li>• Recognising the health and safety hazards for workers when carrying out repairs to wastewater networks</li> </ul>		Carry out repairs to wastewater networks according to pre-arranged work schedules.
<b>5.</b>	<b>Learning programme plan</b>				
	<b>Eil. No.</b>	<b>Title of topic</b>	<b>Hours to be allocated</b>		
			<b>Total</b>	<b>For theoretical teaching</b>	<b>For practical training</b>
	1.	Principles of wastewater collection and disposal	10	5	5
	2.	Principles for the installation of wastewater networks and facilities	7	2	5
	3.	Technological process for continuous wastewater collection networks	5	2	3
	4.	Carrying out maintenance of wastewater networks	7	1	6
	5.	Preparation of a schedule of planned maintenance works	6	2	4

		on wastewater networks			
	6.	Carrying out preventive cleaning of sewage networks according to a set schedule.	14	2	12
	7.	Recording in a logbook all faults identified and work carried out on the wastewater network.	4	1	3
	8.	Acceptance of new wastewater networks.	4	1	3
	9.	The basic principles of operation of wastewater networks and equipment in networks.	6	3	3
	10.	Principles for the installation of wastewater networks and equipment in networks	4	2	2
	11.	Preparation of tools and equipment needed for wastewater network repair work.	10	2	8
	12.	Carrying out repairs to sewage networks according to pre-arranged schedules	13	4	9
	<b>Total</b>		90	27	63
<b>6.</b>	<b>Relevance of the acquired/improved competence to the competence(ies) for the relevant qualification(s) set out in the relevant occupational standard (if the relevant occupational standard is adopted)</b>		Not applicable		
<b>7.</b>	<b>Preparing for non-formal adult education and training</b>				
<b>7.1.</b>	<b>Requirements for those delivering the Learning Programme:</b>				
	1.	Have a qualification as a water and wastewater plant maintenance worker or equivalent, or a degree in environmental engineering or equivalent, or at least 3 years' experience in water and wastewater plant maintenance.			
<b>7.2.</b>	<b>A detailed description of the material and methodological resources required for the training, corresponding to the number of participants to be trained and to the aims and objectives of the programme.</b>				



Eil. No.	The resources used in the teaching process:	
1.	Training facilities	A classroom or other room equipped with technical facilities (computer and internet access, multimedia projector) for the presentation of teaching/learning material.
2.	Equipment	Practical training classroom (room) equipped with samples of pipes, catalogues of sample wastewater wells, well installation diagrams, catalogues of sewage pumps, sewage network installation project, a sample topo photo of the network, map of the city's sewage network, safety signs for street work, safety equipment for working in wells, personal protective equipment, work clothes.
3.	Sources of training	<ul style="list-style-type: none"> <li>• Textbooks and other educational material</li> <li>• Legislation on drinking water supply and wastewater collection</li> <li>• Building technical regulations</li> <li>• Wastewater management regulation</li> <li>• Surface water management regulation</li> <li>• Recommendations for the operation of municipal water supply installations</li> <li>• Methodological guidance for works in water management companies</li> <li>• Occupational health and safety requirements</li> <li>• Technological descriptions of installations</li> </ul>
4.	Other measures	<ul style="list-style-type: none"> <li>• Visual aids</li> <li>• Examples of wastewater network design</li> <li>• Drawings for the installation of sewage pumping stations</li> <li>• Catalogues of sewage pumps</li> <li>• Example of a photo of a topo with sewage networks</li> <li>• Catalogues of wastewater wells</li> <li>• Online view of a sewage pumping station in principle (Wilo, KSB, ABS)</li> <li>• Execution photos of urban wastewater networks</li> <li>• Visuals on cleaning sewage networks with a hydrodynamic machine</li> <li>• Visuals on how to rebuild wastewater networks</li> </ul>

Disclaimer: The European Commission's support for this document does not imply endorsement or approval of its contents. The contents of this document reflect the views only of the authors, and the Commission cannot be held responsible for the reliability of the information contained therein.