

# CONSTRUCT WASTEWATER INFRASTRUCTURE

**UNIT CODE:** CON/OS/CET/CR/10/6/A

## UNIT DESCRIPTION

This unit covers the competencies required to construct wastewater infrastructure. It involves analysis of soil properties, construction of the wastewater infrastructure units, organization of the construction site, and preparation of construction schedule

## ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b> These describe the <b>key outcomes</b> which make up <b>workplace function</b>	<b>PERFORMANCE CRITERIA</b> These are <b>assessable</b> statements which specify the required level of performance for each of the elements. <i><b>Bold and italicized terms are elaborated in the Range</b></i>
1. Analyse soil properties	1.1 <i><b>Soil analysis tools, supplies and materials</b></i> are identified and gathered based on available resources and the tests to be conducted 1.2 Engineering properties of soils are identified based on the soil classification 1.3 Properties of soils are analysed based on the standard procedures 1.4 Soil analysis report is prepared based on the results.
2. Prepare construction schedule	2.1 Engineering drawings are Interpreted based on the engineering codes 2.2 <i><b>Construction activities</b></i> are identified based on scope of work 2.3 Project management timelines are prepared based on project specifications
3. Organize construction Site	3.1 Site is cleared and secured based on the contract document. 3.2 Human resources construction plant and equipment are identified and mobilized based on the contract document 3.3 <i><b>Site infrastructures</b></i> are put in place based on contract document and legal requirements.
4. Construct wastewater infrastructure units	4.1 <i><b>Construction materials and tools</b></i> are sourced and mobilized based on the bill of quantities 4.2 Infrastructure is set out based on the engineering drawings. 4.3 <i><b>Wastewater infrastructure units</b></i> are constructed based on the design drawings 4.4 Labour payments are done based on the progress report and attendance. 4.5 As built drawings are prepared and submitted based on the actual construction 4.6 Payment certificate is prepared based on progress report.

	<p>4.7 Completion certificate is prepared based on the legal requirements</p> <p>4.8 Site personal health and safety is observed as per the OSH Act and site regulations</p>
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## RANGE

This section provides work environments and conditions to which the performance criteria apply. It allows for different work environments and situations that will affect performance.

Variables	Range
Construction activities may include but not limited to:	<ul style="list-style-type: none"> <li>• Concrete works</li> <li>• Steel works</li> <li>• Earth work</li> <li>• Form works</li> <li>• site clearance</li> <li>• Trenching and excavation</li> <li>• Backfilling</li> </ul>
Soil analysis tools, supplies and materials	<ul style="list-style-type: none"> <li>• Sieve analysis e.g.</li> <li>• PI index</li> <li>• Moisture content</li> <li>• CBR</li> <li>• Proctor</li> <li>• Triaxial test</li> <li>• Oedometer tests</li> <li>• Cassagrande</li> <li>• Cone penetrometer</li> <li>• Sand Replacement</li> <li>• California Bearing Ratio</li> </ul>
Site infrastructures may include but not limited to:	<ul style="list-style-type: none"> <li>• Site office</li> <li>• Site store</li> <li>• Ablution block</li> <li>• Fence</li> <li>• Signage/safety signs</li> <li>• Hoarding</li> </ul>

<p>construction materials and tools may include but not limited to:</p>	<ul style="list-style-type: none"> <li>• Cement</li> <li>• Aggregates (course and fine)</li> <li>• Steel</li> <li>• Stones /blocks</li> <li>• Timber</li> <li>• Tape measure</li> <li>• Hack saws</li> <li>• Pipe wrenches</li> <li>• Leveling tools e.g. Hammer</li> <li>• Set of protective gear</li> </ul>
<p>Wastewater infrastructure units may include but not limited to:</p>	<ul style="list-style-type: none"> <li>• Screen</li> <li>• Grit chamber-horizontal, aerated/spiral</li> <li>• Sedimentation tanks</li> <li>• Activated sludge chamber</li> <li>• Trickling filters</li> <li>• Ponds</li> <li>• Oxidation ditch</li> <li>• Aerated lagoons</li> <li>• Storm water drains</li> <li>• Equalization tank</li> <li>• Sequential Batch Reactor</li> <li>• Rotating biological contactors</li> <li>• Oil and grease trap</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required Skills

The individual needs to demonstrate the following skills:

#### Generic skills:

- Communication
- Analytical
- Organizing
- Decision making
- Planning
- Record keeping
- Problem solving
- First aid
- Supervising

- Organizing
- Time management

### **Technical skills:**

- Analysis
- Reporting
- Performance appraising
- Trouble shooting
- Data logging
- Technical specifications
- Safety measures
- Statutory regulations
- Occupation Safety and Health
- Construction
- Hydraulics
- Surveying
- Computer Aided Design

### **Required Knowledge**

The individual needs to demonstrate knowledge of:

- Technical specifications
- Statutory regulations
- Construction management
- Occupational health, safety
- Quality Assurance
- Wastewater treatment technologies
- Statistics
- Wastewater treatment processes
- Soil analysis methods
- Hydraulics
- Statutory regulations and legislation in water
- Sewer construction
- Measurement and costing
- Construction documents
- Contract document development

### **EVIDENCE GUIDE**

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Analysed soil properties</li> <li>1.2 Prepared construction schedule</li> <li>1.3 Organised construction site</li> <li>1.4 Constructed wastewater infrastructure units</li> </ul>
2. Resource Implications	<p>The following resources <b>must</b> be provided:</p> <ul style="list-style-type: none"> <li>2.1 Adequately equipped concrete lab</li> <li>2.2 Adequately equipped soils laboratory</li> <li>2.3 Surveying equipment store</li> <li>2.4 Construction tools and equipment</li> <li>2.5 Adequately equipped timber workshop</li> <li>2.6 Plumbing and pipe workshop</li> <li>2.7 Electro mechanical workshop</li> <li>2.8 Software</li> <li>2.9 Computers</li> </ul>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Practical</li> <li>3.2 Verbal assessment</li> <li>3.3 Written assessment</li> <li>3.4 Construction reports</li> <li>3.5 Industrial attachment</li> <li>3.6 Project</li> <li>3.7 Presentations</li> </ul>
4. Context of Assessment	<p>Assessment may be done:</p> <ul style="list-style-type: none"> <li>4.1 On job training</li> <li>4.2 Off the job</li> <li>4.3 Coursework</li> <li>4.4 Industrial assessment</li> </ul>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the building sector workplace and job role is recommended.</p>