

PRODUCE CIVIL ENGINEERING DRAWINGS

UNIT CODE: ENG/OS/QS/CR/03/6/A

UNIT DESCRIPTION

This unit describes the competence in producing civil engineering drawings. It involves preparing drainage drawings, preparing water tank drawings, preparing pavement drawings, preparing external works drawings, preparing bridge drawings, preparing waterfront structure drawings, preparing railway track drawings and preparing tunnel drawings

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA <i>(Bold and italicized terms are elaborated in the Range)</i>
1 Prepare drainage drawings	1.1 Drainage survey is conducted as per SOPs 1.2 Drainage line is located based on the drainage survey 1.3 Invert levels for drains and manholes are located based on the drainage line 1.4 Manhole dimensions are determined based on the invert levels 1.5 Drainage layout sketch is prepared as per SOPs 1.6 Detailed drainage drawings are produced to scale as per layout plan 1.7 <i>Exploded views</i> are prepared based on the drainage system
2 Prepare water tank drawings	2.1 Consumption details are determined based on site facilities and client requirements 2.2 <i>Type of water tank</i> is determined based on client requirements 2.3 Soil analysis is carried out based on the ground conditions 2.4 Water pipe layout is established based on-site facilities 2.5 Detailed water tank design is carried out as per SOPs 2.6 Water tank drawings are prepared based on design details
3 Prepare pavement drawings	3.1 Function of pavement is determined based on <i>road use</i> 3.2 <i>Type of pavement</i> is determined based on the pavement function 3.3 Pavement layout sketches are prepared as per SOPs 3.4 Detailed pavement drawings are produced to scale as per SOPs 3.5 <i>Exploded views</i> are prepared based on type of pavement
4 Prepare external works drawings	4.1 Draft <i>external works</i> layout is prepared based on the layout plan 4.2 <i>Item specifications</i> are prepared based on the layout plan and the client requirements 4.3 Detailed external works drawings are prepared based on the layout
5 Prepare bridge drawings	5.1 Function of bridge is determined based on <i>use</i> 5.2 <i>Type of bridge</i> is determined based on the bridge function and site conditions 5.3 Layout sketch is prepared as per SOPs 5.4 Bridge drawings are prepared to scale as per SOPs

ELEMENT	PERFORMANCE CRITERIA <i>(Bold and italicized terms are elaborated in the Range)</i>
	5.5 Exploded views are prepared based on type of bridge
6 Prepare waterfront structure drawings	6.1 Waterfront structure function is determined based on use 6.2 <i>Type of waterfront structure</i> is determined based on the function and site conditions 6.3 Layout sketch is prepared as per SOPs 6.4 Waterfront structure drawings are prepared to scale as per SOPs 6.5 Exploded views are prepared based on type of waterfront structure
7 Prepare railway track drawings	7.1 <i>Type of railway track</i> is determined based on the function 7.2 Layout sketch is prepared as per SOPs 7.3 Railway track drawings are prepared to scale as per SOPs 7.4 <i>Exploded views</i> are prepared based on type of railway
8 Prepare tunnel drawings	8.1 Tunnel function is determined based on the use 8.2 <i>Type of tunnel</i> is determined based on the function and site conditions 8.3 Tunnel drawings are prepared to scale as per SOPs 8.4 <i>Exploded views</i> are prepared based on the type and use of tunnel

RANGE

Variable	Range <i>May include but is not limited to:</i>
1. Exploded views	<ul style="list-style-type: none"> • Manholes • Drains • Septic tanks • Cesspools • Soak pits • Bio digester
2. Type of water tank	<ul style="list-style-type: none"> • Concrete • Steel • Plastic • Underground • Elevated
3. Road use	<ul style="list-style-type: none"> • Public • Private
4. Type of pavement	<ul style="list-style-type: none"> • Flexible • Rigid
5. Exploded views	<ul style="list-style-type: none"> • drains • carriageway • shoulders • embankments

	<ul style="list-style-type: none"> • cross sections • longitudinal profiles • cuts and slopes
6. External works	<ul style="list-style-type: none"> • Landscaping <ul style="list-style-type: none"> • Fencing • Gates • Site clearance • Demolition • Excavations <ul style="list-style-type: none"> • Hedges • Walkways • Parking
7. Item specifications	<ul style="list-style-type: none"> • Landscaping <ul style="list-style-type: none"> • Fencing • Gates • Site clearance • Demolition • Excavations <ul style="list-style-type: none"> • Hedges
7 Use	<ul style="list-style-type: none"> • Public • Private
8 Type of bridge	<ul style="list-style-type: none"> • Arch • Suspended • Cable stayed
9 Type of waterfront structure	<ul style="list-style-type: none"> • Jetties • Quays • Sea walls • Dolphins
10 Type of railway	<ul style="list-style-type: none"> • Normal • High speed • Subway rail track
11 Exploded views	<ul style="list-style-type: none"> • Base details • Railway track exploded views
12 Type of tunnel	<ul style="list-style-type: none"> • Double deck tunnels • Multipurpose tunnels • Covered passageways
13 Exploded views	<ul style="list-style-type: none"> • Invert • Crown

REQUIRED KNOWLEDGE

- Surveying
- Measurements
- Building code regulations

- Technical drawing
- Tabulation of data
- Soil analysis
- Plumbing
- Design
- Material technology
- Civil engineering works
- Computer literacy
- Material technology
- Landscaping
- Plan interpretation
- Scaling

SKILLS

- Technical drawing
- Scaling
- Landscaping
- Computer Aided Design
- Analytical
- Soil analysis
- Design
- Pipe laying
- Surveying

EVIDENCE GUIDE

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

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> • Conducted drainage survey • Determined invert levels • Detailed drainage drawings • Determined type of water tank • Produced detailed water tank drawings • Determined pavement function • Determined types of pavements • Produced detailed pavement drawings • Prepared external works drawings • Prepared bridge drawings • Determined type of waterfront structure • Prepared waterfront structure layout sketch • Prepared waterfront structure drawings • Prepared railway track drawings
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2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> • Drawing instruments and equipment • Computers • Stationery • Studio • CAD software • Printers • Scientific calculators
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Written text</p> <p>3.2 Interview</p> <p>3.3 Observation</p>
4. Context of Assessment	<p>Competency may be assessed on the job, off the job or a combination of these. Off the job assessment must be undertaken in a closely simulated workplace environment.</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>