

073106T4QSV

QUANTITY SURVEY LEVEL 6

ENG/OS/QS/CR/03/6

Produce Civil Engineering Drawings

March/April 2026



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL
(TVET CDACC)**

WRITTEN ASSESSMENT

TIME: 3 HOURS

INSTRUCTIONS TO CANDIDATE

1. This paper consists of **TWO** sections: **A** and **B**.
2. Answer **ALL** questions in section A.
3. Answer question **FIFTEEN** (15) and any other **TWO** (2) questions in section B.
4. Marks for each question are indicated in the brackets.
5. Candidates are provided with a separate answer booklet
6. Do not write on the question paper.

This paper consists of FIVE (5) printed pages

Candidate should check the question paper to ascertain that all pages are printed as indicated and that no questions are missing.

SECTION A: (40 MARKS)

Answer ALL questions in this section

1. Invert levels are normally indicated on drainage drawings using standard symbols and notations. State THREE consequences of incorrect or missing invert levels on drawings.
(3 Marks)
2. Elevated water tanks are shown on civil engineering drawings with distinct features. State TWO advantages of using elevated water tanks in water supply systems. (2 Marks)
3. Exploded pavement drawings are used to clearly communicate pavement structure. State TWO reasons why exploded pavement views are important in pavement drawings.
(2 Marks)
4. Landscaping specifications complement drawings to ensure correct implementation site. State THREE reasons why specifications are necessary in landscaping drawings.
(3 Marks)
5. Bridge drawings and layouts are influenced by prevailing site conditions. State TWO site factors that should be considered when selecting a suitable bridge type. (2 Marks)
6. Waterfront structures serve specific functions in harbour and marine engineering works. State TWO functions of waterfront structures used in harbour design. (2 Marks)
7. Clear and accurate railway track layout drawings are essential in railway projects. State TWO standard features that are normally indicated on a railway track layout drawing.
(2 Marks)
8. Drainage details are always shown on retaining wall drawings. State TWO consequences of failing to provide adequate drainage behind a retaining wall. (2 Marks)
9. Ground conditions have a direct influence on the design and construction of tunnels. State TWO ground condition factors that should be considered during tunnel design.
(2 Marks)
10. Pavement cross-sections complement plan views in road construction drawings. State THREE problems that may occur if pavement cross-sections are not properly prepared or interpreted. (3 Marks)
11. External works drawings are essential documents during site development and construction. State FOUR items or details that should be clearly shown on external works drawings.
(4 Marks)

12. Safety-related pipe details are incorporated in water tank drawings to ensure reliable and hazard-free operation. List THREE risks that may occur if safety pipe provisions are omitted or incorrectly shown on water tank pipe layout drawings. (3 Marks)
13. Retaining wall drawings must clearly communicate structural form and stability features to guide construction. Using a neat labeled sketch, draw a simple cantilever retaining wall and indicate its key structural components. (6 Marks)
14. Pavements are designed to perform specific functional requirements in road construction. State FOUR functional requirements of a road pavement. (4 Marks)

SECTION B (60 MARKS)

Answer question FIFTEEN (15) and any other TWO (2) questions

15. Railway track construction drawings present both written and graphical information required for execution of the works.
 - a. List FOUR types of information normally included in the notes/specification block of a railway track drawing. (4 Marks)
 - b. With the aid of a neat, well-proportioned drawing, draw a typical railway cross-section to a scale of 1:25, clearly showing any main components. (10 Marks)
 - c. Explain THREE reasons why track drainage safety layouts shown in railway construction drawings. (6 Marks)
16. Road construction drawings are prepared to present essential information required for planning, execution, and control of pavement works.
 - a. State FOUR reasons why pavement drawings are important during road construction projects. (4 Marks)
 - b. With the aid of a neat, well-proportioned sketch drawn to a scale of 1:25, draw a typical flexible pavement cross-section and label its main layers. (10 Marks)
 - c. Explain THREE reasons why pavement profiles are necessary in road design and construction. (6 Marks)
17. Drainage construction drawings are prepared to convey layout information, structural details, and level data required for effective installation and operation of the system.
 - a. List FIVE items normally shown on a drainage layout drawing. (5 Marks)
 - b. Using a well labelled drawing in the scale of 1:25 illustrates the typical features a manhole as represented on drawings. (9 Marks)
 - c. Explain THREE reasons why invert levels should be included in drainage drawings. (6 Marks)
18. Bridge design and construction require careful consideration of drawings, structural form, and site conditions to ensure satisfactory performance.
 - a. State THREE construction problems that may arise if bridge unclear or incomplete. (3 Marks)

- b. Explain THREE reasons why engineers may select different bridge types for specific site conditions. (9 Marks)
- c. Explain FOUR consequences of inadequate bridge design or inappropriate bridge selection. (8 Marks)