higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

NATIONAL CERTIFICATE (VOCATIONAL)

CIVIL AND STRUCTURAL STEEL WORK DETAILING

NQF LEVEL 3

(Second paper)

(12050663)

13 November 2024 (Y-paper)
13:00–15:00

REQUIREMENTS: **Hot-rolled structural steel sections (BOE 8/2)**
A4 drawing sheet

Drawing instruments and calculators may be used.

This question paper consists of 4 pages and 4 diagram sheets.

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CIVIL AND STRUCTURAL STEEL WORK DETAILING
NQF LEVEL 3
(Second paper)
TIME: 2 HOURS
MARKS: 75

INSTRUCTIONS AND INFORMATION

1. Answer all the questions.
2. Read all the questions carefully.
3. Number the answers according to the numbering system used in this question paper.
4. Start each question on a new page.
5. Rule off across the page on completion of each question.
6. Drawings and sketches must be done neatly using drawing instruments.
7. Use only ONE side of the drawing sheet.
8. Use an A4 DRAWING SHEET.
9. A 15 mm border must be drawn on the drawing sheet.
10. Use your own discretion where applicable.
11. Unspecified radii must be R3.
12. A balanced layout is very important, and candidates will be penalised for poor planning.
13. Write neatly and legibly.

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QUESTION 1: REINFORCED CONCRETE DETAILING AND SPECIFICATIONS

1.1 A horizontal and vertical section of a rectangular concrete column is shown in the attached DIAGRAM SHEET 1, FIGURE 1.

A rectangular 500 mm × 350 mm column with SIX Y20 longitudinal bars and R6 helical binders at a centre of 250 mm must be constructed.

Draw, to scale 1:5, a vertical longitudinal section and a horizontal cross-section through the column to show the construction details.

Print the title and scale centred beneath the drawing. (20)

1.2 The attached DIAGRAM SHEET 2, FIGURE 2 shows the vertical section of the T-BEAM concrete.

Redraw the reinforced T-beam concrete shown in DIAGRAM SHEET 2, FIGURE 2.

Draw, to scale 1:5, a vertical longitudinal section through the T-beam to show the constructional details as shown.

Print the title and scale centred beneath the drawing. (15)
[35]

QUESTION 2: STRUCTURAL STEELWORK DETAILING AND SPECIFICATIONS

DIAGRAM SHEET 3 (attached) shows the beams to column cap connection. FIGURE 3 shows the main and the secondary beams mounted into a single column using end plates, four equal-angle steel cleats, and eight bolts and nuts.

Use a 1:5 scale and redraw the detailed beams to the column cap connection.

All bolt holes are drilled on the centre lines of the angles, and all bolts are M12.

Print the title and scale of the profile centred beneath the drawing. **[20]**

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QUESTION 3: STRUCTURAL STEELWORK DETAILINGS

FIGURE 4 on DIAGRAM SHEET 4 (attached) shows a line diagram of a typical WELDED latticed girder. Do not copy the drawing.

SPECIFICATIONS:

- Top and bottom booms: rolled steel angle profiles, 120 × 120 × 10
- All internal members: rolled steel angle profiles, 100 × 100 × 8
- Do not insert any dimensions

Gusset plate sizes, as well as information not given, are left to your own discretion.

Draw, to scale 1:5, typical details of each of the following:

3.1	Detail A	(6)
3.2	Detail B	(7)
3.3	Detail C	(7)
		[20]

TOTAL: 75

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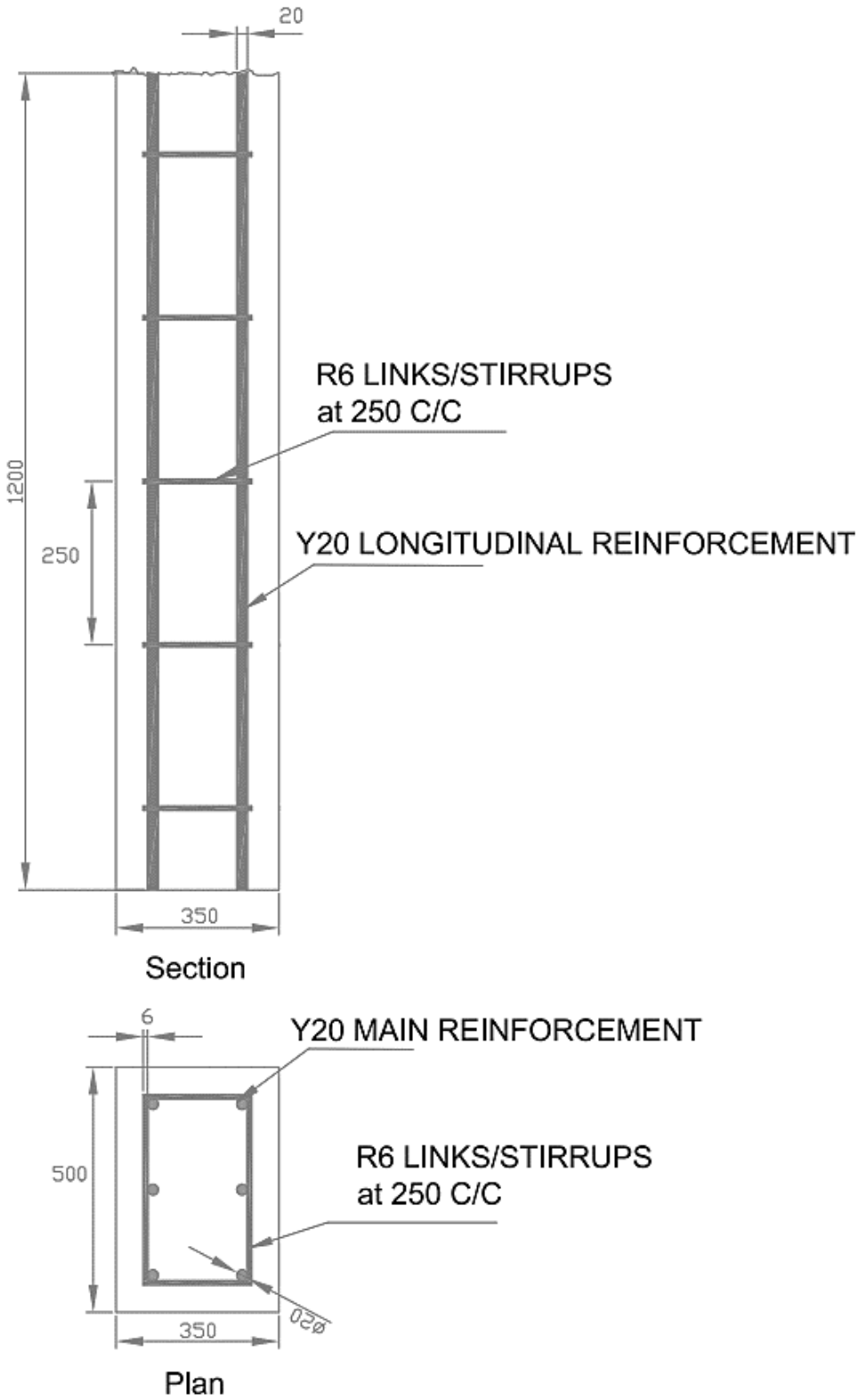
DIAGRAM SHEET 1



RECTANGULAR BEAM

Scale 1:5

FIGURE 1

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DIAGRAM SHEET 2

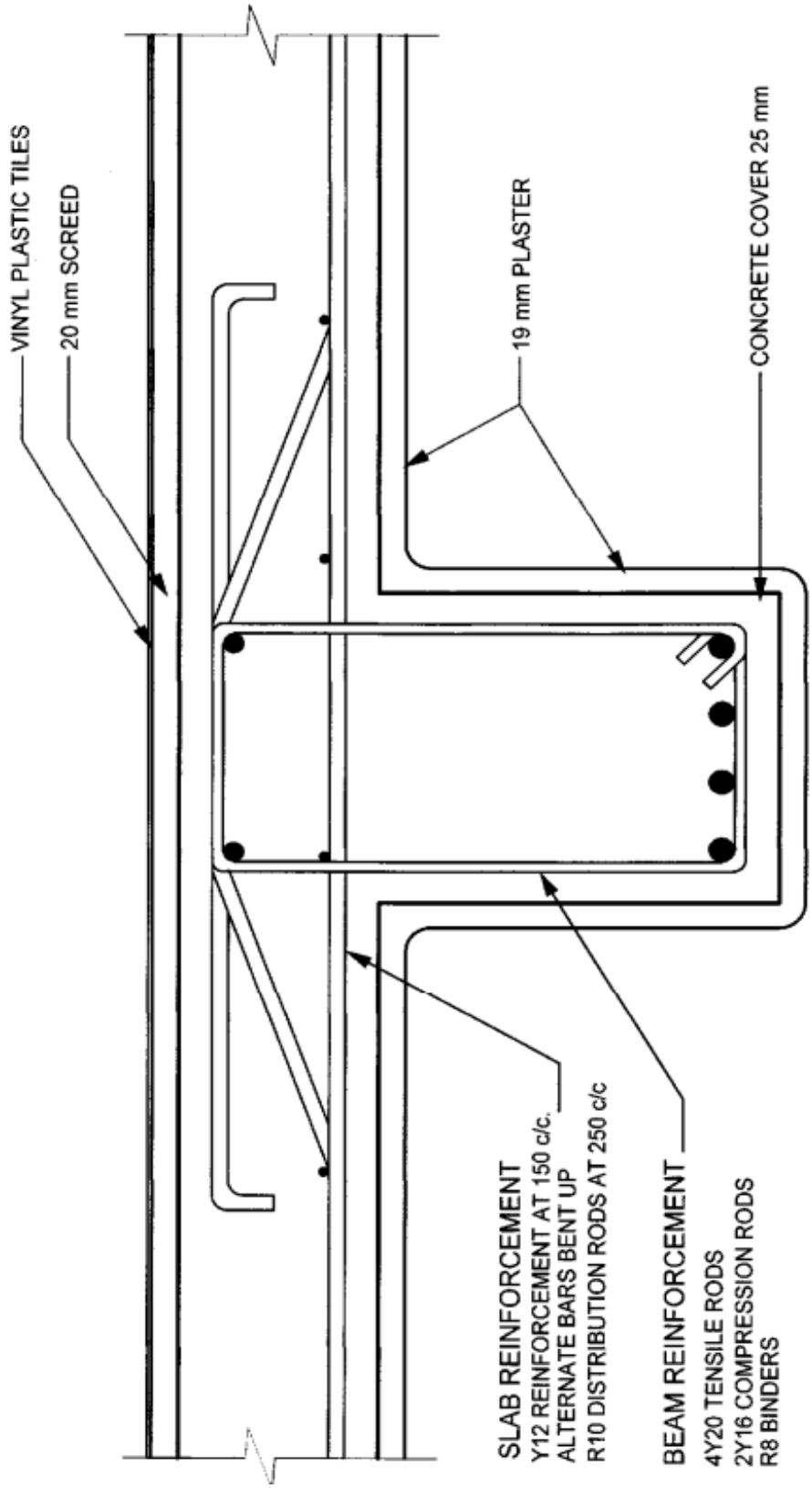

FIGURE 2

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DIAGRAM SHEET 3

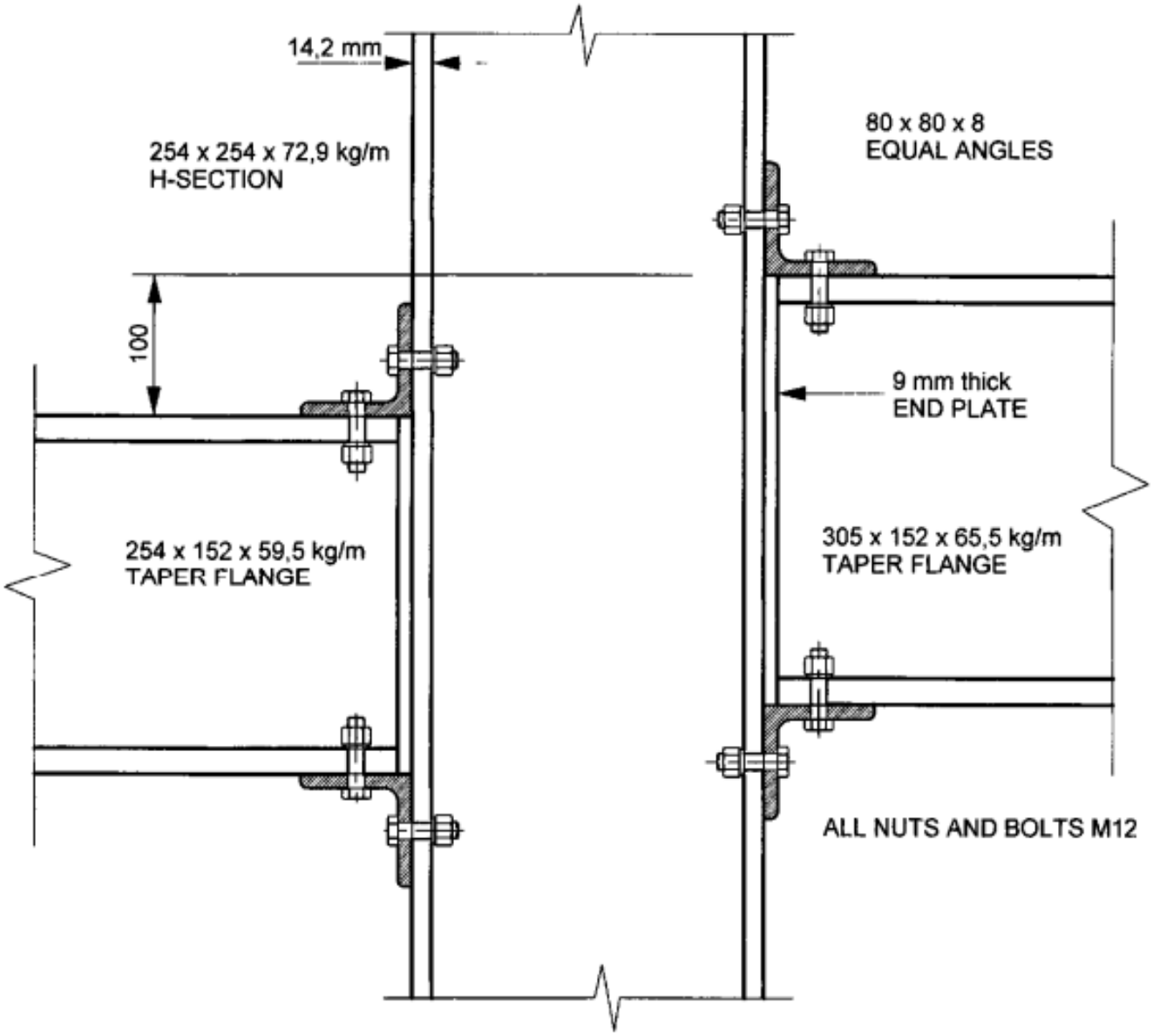

FIGURE 3

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DIAGRAM SHEET 4

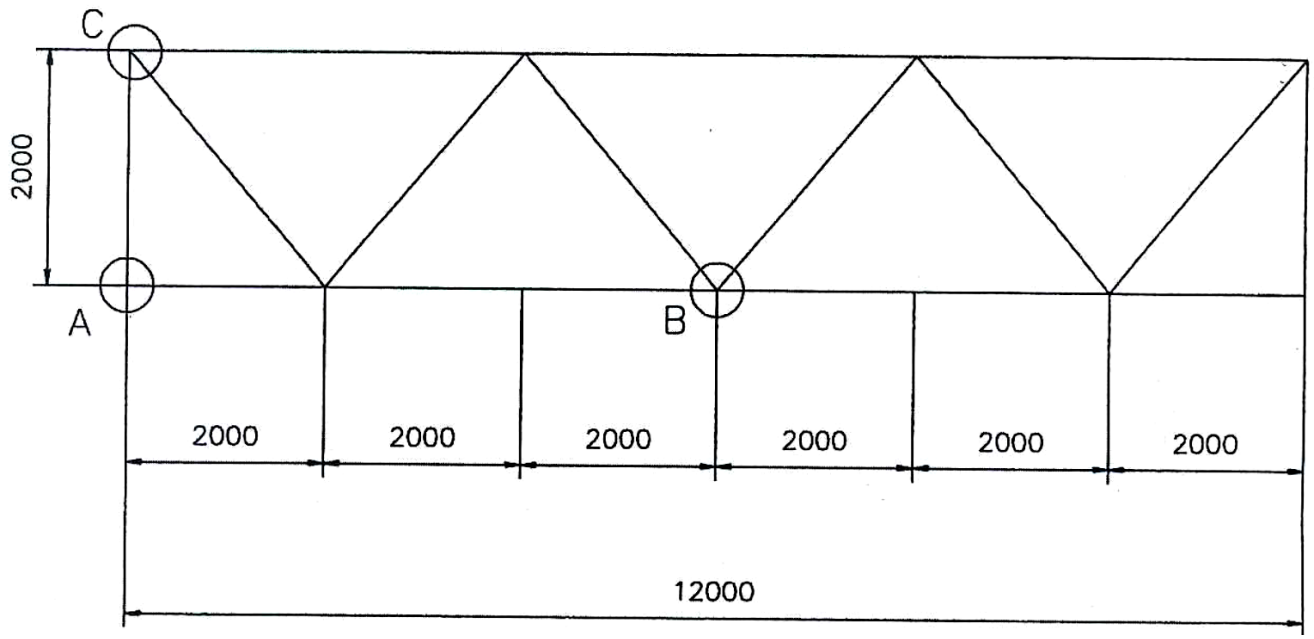

FIGURE 4

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