



higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

T1220(E)(N30)T
NOVEMBER EXAMINATION
NATIONAL CERTIFICATE
QUANTITY SURVEYING N6

(2050026)

30 November 2016 (X-Paper)
09:00–13:00

REQUIREMENTS: Dimension paper (BOE 8/12)
Abstract paper (BOE 8/10)
Billing paper (BOE 8/11)

Candidates need the Standard System of Measuring Building Work.

Calculators may be used.

This question paper consists of 4 pages and 5 addenda.

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DEPARTMENT OF HIGHER EDUCATION AND TRAINING
REPUBLIC OF SOUTH AFRICA
NATIONAL CERTIFICATE
QUANTITY SURVEYING N6
TIME: 4 HOURS
MARKS: 100

INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.
 2. Read ALL the questions carefully.
 3. Only QUESTION 1 must be done in the ANSWER BOOK. The remainder of the work MUST be done on the appropriate paper.
 4. Number the answers according to the numbering system used in this question paper.
 5. Work strictly according to the question numbers, for example QUESTION 2.1 and QUESTION 2.2 may NOT be combined.
 6. Loose sheets must be placed in the correct sequence in the back of the ANSWER BOOK. Do NOT use a stapler.
 7. Consult the STANDARD SYSTEM of MEASURING BUILDING WORK for description criteria.
 8. Do NOT use red or green ink.
 9. ALL the specification notes must be incorporated.
 10. In marking the answers, particular attention will be paid to systematic and orderly methods of taking-off and working-up techniques, well-referenced measurements with side casts, neatness, and clear description of work.
 11. Start each answer on a NEW page.
 12. Write neatly and legibly.
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QUESTION 1

- 1.1 Give any FIVE duties/functions of the quantity surveyor which are provided to the building owner. (5)
- 1.2 State FIVE uses of the bill of quantities. (5)
- 1.3 Fully explain ALL the steps and considerations of the quantity surveyor so that variation orders can be paid out. (10)
- 1.4 List all the important steps to be followed when the worker does squaring. (5)
- [25]**

QUESTION 2

On ADDENDUM A (attached), a view and a table of reinforced concrete piles with no under reaming bottom are shown.

Measure ALL the quantities for the piles. Use the following subheadings/descriptions:

- Plant to be set up at pile
- Aug. drill 405 Ø in stable ground in n.e. 10 m
- Do. exc. 10 m n.e. 15 m
- Do. exc. 15 m n.e. 20 m
- Do. exc. 20 m n.e. 25 m
- E.o. drilling for c.a.
- E.o. drilling in hard rock
- 30 MPa R.c. in 455 Ø pile
- Do. in 610 Ø do.
- Fmwk to round piles above G.L 300 mm hi.
- 12 Ø H.S reinf.
- 16 Ø do.

SPECIFICATIONS:

EARTHWORKS: Drilling is in stable ground
Allowing for 300 mm excav. in hard rock

CONCRETE: 30 MPa reinforced concrete
Shuttering to piles above ground level
Reinforcement as indicated in table

NOTE: Reinforcement for spiral has been measured elsewhere and should NOT be calculated.

HINTS:

- 2.1 Consult the trade 'piling' in the standard system. Pay special attention to clauses 3, 4, 6, 13 and 15.
- 2.3 The volume for a round pile = $\pi \times \frac{1}{4} \times d \times d \times h$
- 2.4 The circumference of a round pile = π

[25]**QUESTION 3**

On ADDENDUM B (attached) a plan and FOUR sectional details of a drainage system are shown. 1, 2 and 3 are rodding eyes and A, B, C and D are junctions. Next to the wall one gully is found, and next to it a 500 mm ventilation pipe with a relief valve on top is fixed vertically to the wall. Near junction D the pipe ends in a sewer. (The sewer is not part of this project.)

Measure the provisional drainage system item in the following order:

- 3.1 Pipe et cetera in ground (17)
- 3.2 Ventilation pipe et cetera, including the two plain bends (6)
- 3.3 Provisional sum (2)

SPECIFICATIONS:

- 100 mm \varnothing PVC pipes
- 100 mm \varnothing 'universal' gully head with 'universal' Q-trap
- The drain will be subjected to an air test as described in PP 26.1, (a) and (b) of SABS 0400-1987.

[25]**QUESTION 4**

ADDENDUM C (attached) shows the plan and sectional elevation of a basement. ADDENDA D and E (attached) are the measurements of this structure.

Remove ADDENDA D and E, insert your examination number on each sheet and do the following:

- 4.1 Square ALL measurements. (6)
- 4.2 Abstract the earthworks only. (12)
- 4.3 Bill the earthworks only. (7)

[25]**TOTAL: 100**

ADDENDUM A

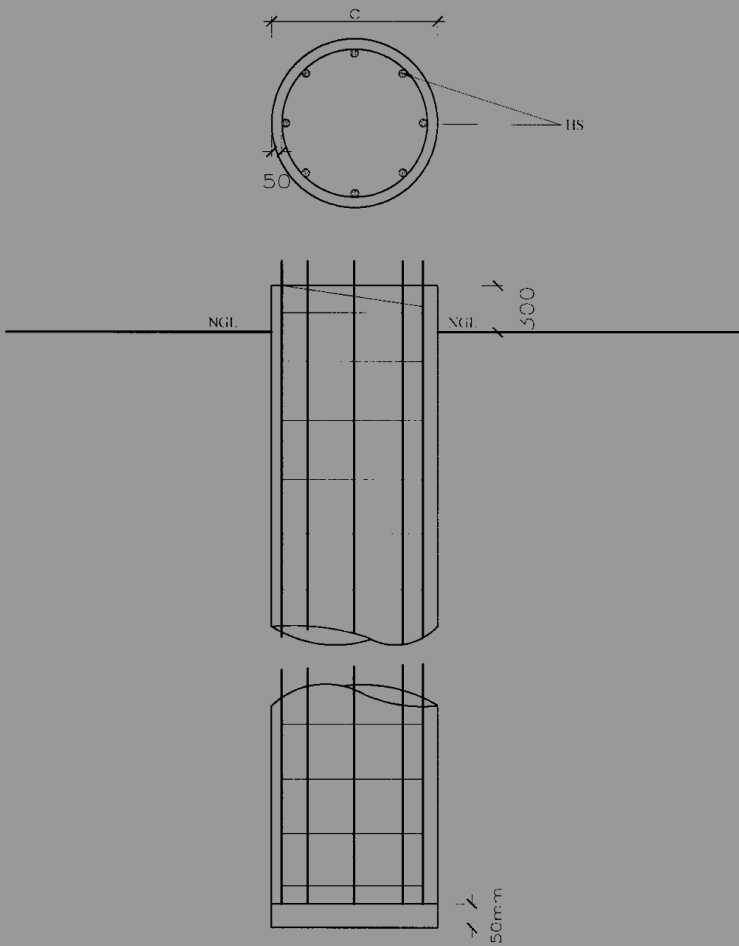
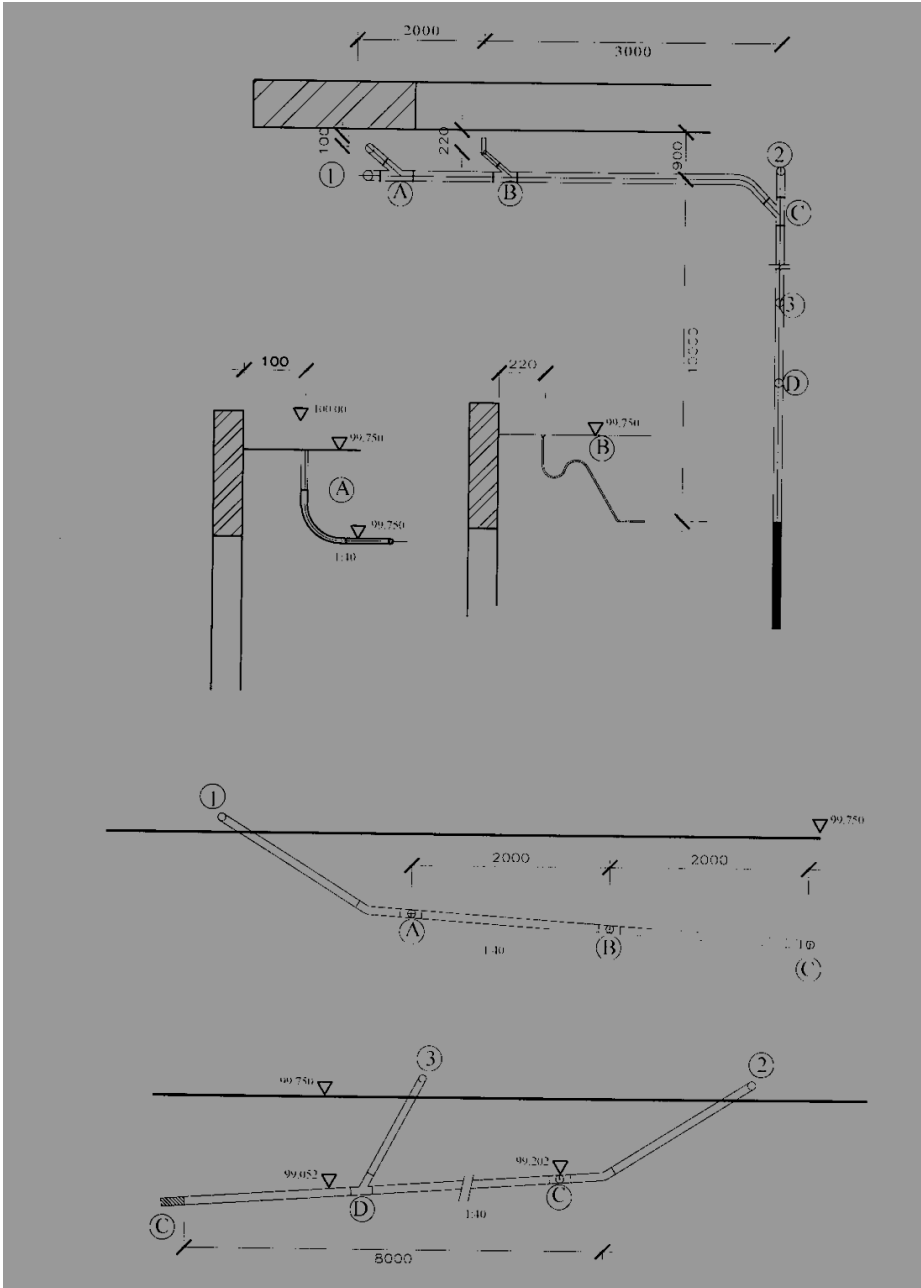


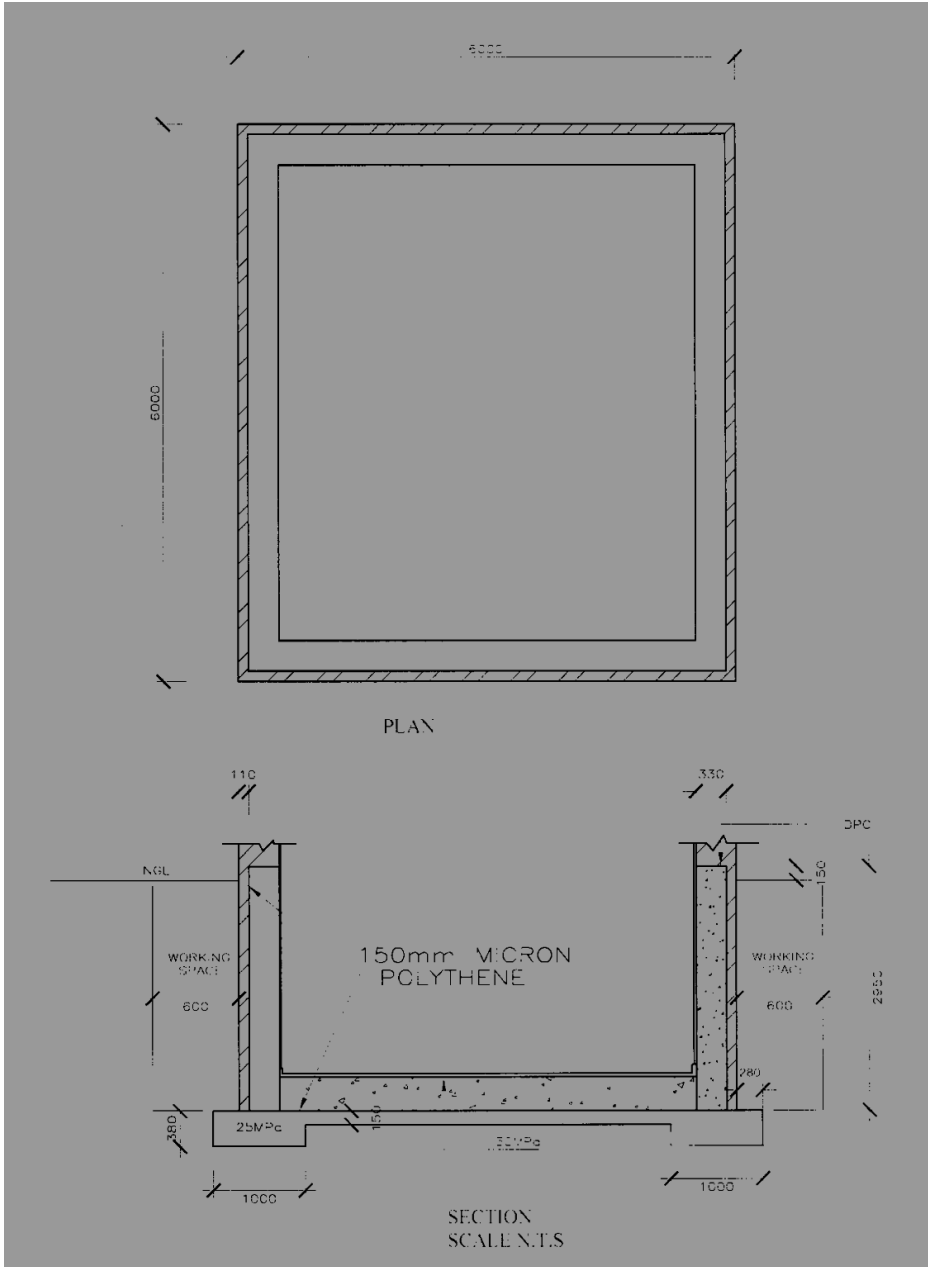
TABLE 1

REF	NUMBER	d	LENGTH	HSO	HS (L)
A1	2	455	20,50	12	21,00
A2	6	610	23,00	16	23,50

ADDENDUM B



ADDENDUM C



ADDENDUM D

EXAMINATION NUMBER:

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	BASEMENT					
	NOTE: up to & inclgd DPC					Excav in earth for basem. n.e. 2m dp
	<u>Collections</u>					x2,00 2800 150 2950 <u>-2000</u> 950
<u>Footg</u>	6000 2/280 <u>560</u> 2/6560 = 13120			7,96 <u>7,96</u>		and Ditto exc. 2.n.e. 4 m x 1,15 and E.o. excav. for c.a. surplus material x3,15
<u>ext girth</u>	6000 2/280 <u>560</u> 2/6560 = 13120 26240 -4/1000 <u>4000</u> 22240					Excav.s.t.n.e. 2m below basem.excav. 380 and <u>-150</u> 230 E.o.excav. for c.a.a.b and
<u>int girth</u>	2/6000 12000 2/6000 <u>12000</u> 24000			22,24 1,00 <u>0,23</u>		25 Mpa conc. thicken. to edges of basem. Blindng
<u>1/2BKWL</u>	24000 -8/440 <u>3520</u> 20480					
<u>150 Mic Polyth</u>	24000 -4/110 <u>440</u> 23560					
<u>330 Conc wl</u>	24000 -8/110 <u>880</u> 23120			13,12 <u>3,18</u>		R.O.C. to sides of basem.excav.exc. 1,5 m dp
<u>Backfill</u>	23120 -4/330 <u>1320</u> 21800					2800 <u>380</u> 3180
<u>DPC</u>	24000 4/280 <u>1120</u> 25120					
	330 110 -4/440 <u>1760</u> 22240					

ADDENDUM E

EXAMINATION NUMBER:

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26.24 <u>0.50</u>	Excav. for wkg space 320 mm away from basem. excav. incldg f.i.ξr.n.e. 500 mm dp 2800 600 -500 -280 2300 320 <u>1000</u> 1300	5.80 <u>5.80</u>	150 Mic. Polyth. Waterprfg on blindg Betw. Flrs 6000 -2/100 <u>200</u> 5800 and 30 MPA r.c.in. basem. flr X.25
26.24 <u>1.00</u>	Do exc. 500 mm n.e. 1,5 m dp	<u>23.12</u>	Turng up waterprfg incldg triangular grout fillet as nec.
26.24 <u>1.30</u>	Do exc. 1,5 m n.e. 3 m dp		
18.24 <u>0.23</u>	R.C.O. to basem. tr. n.e. 1,5 m dp below basem. excav. 22240 4/1000 <u>4000</u> 18240 Int only	21.80 0.33 <u>2.70</u>	30 MPA r.c. in basem. wls 2800 150 2950 -250 2700
<u>Item</u>	Risk of H ₂ O	23.12 <u>2.95</u> 20.48 <u>2.70</u>	Fmwk to sides of conc. wls. n.e. 3,5m hi
22.24 0.22 <u>2.80</u>	Back fill to sides of basem, incldg ramg in layers and <u>Ddt</u> E.o. excav. for c.a.a.b	23.12 <u>2.95</u> 22.24 <u>0.44</u>	150 Mic. Polyth. Waterprfg. Vertical betw. Conc. wl ξ bk skin DPC on wls
7.96 7.96 <u>0.15</u>	25 mpa. Conc. in blindg	23.56 <u>2.95</u>	1/2bk exc. Skin blt wi. local bks in 1:4 cm. against conc. wl (in confined spaces