higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

ARCHITECTURAL GRAPHICS AND TECHNOLOGY
(Second paper)
NQF LEVEL 2

24 November 2023

This marking guideline consists of 6 pages.

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QUESTION 1

1.1
- Sketch drawings
- Design drawings
- Working drawings (3)

1.2
- View of the drawing
- Scale
- Symbols and abbreviations
- Dimensions (4)

1.3
- Room dimensions, including all wall thicknesses and overall dimensions
- Doors, windows and openings
- Intended use of the rooms and spaces
- Sanitary fixtures
- Ground elevations (heights) (5)

1.4 A site plan is a drawing that shows the size✓ and features of a site✓ and locates the position of the buildings currently on the site as well as the proposed building.✓ It also contains other information required by the local authority, such as building lines and dimensions.✓ (4)

[16]

QUESTION 2

2.1
- Recyclable
- Natural and plentiful
- Manufactured through resource-efficiency processes
- Locally available
- Reusable
- Durable (6)

2.2
- Choose construction materials and interior finishes that do not give off vapours.
- Provide adequate ventilation.
- Select materials that are resistant to microbial growth.
- Choose appliances that control heat and humidity.
- Make use of natural lighting. (5)

[11]

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QUESTION 3

3.1
- Spirit level
- Plumb bob
- Straight edge
- Builder's square
- Steel square
- Ranging rods
- Optical square (7)

3.2
- Horizontal distances
- Vertical distances
- Length of slopes (3)

3.3
- Each length that is cut is the same as the reference length
- Time saving
- Very little possibility of error due to the reference length that was cut first
- Less wastage of material
- Workers' efficiency is increased (5)

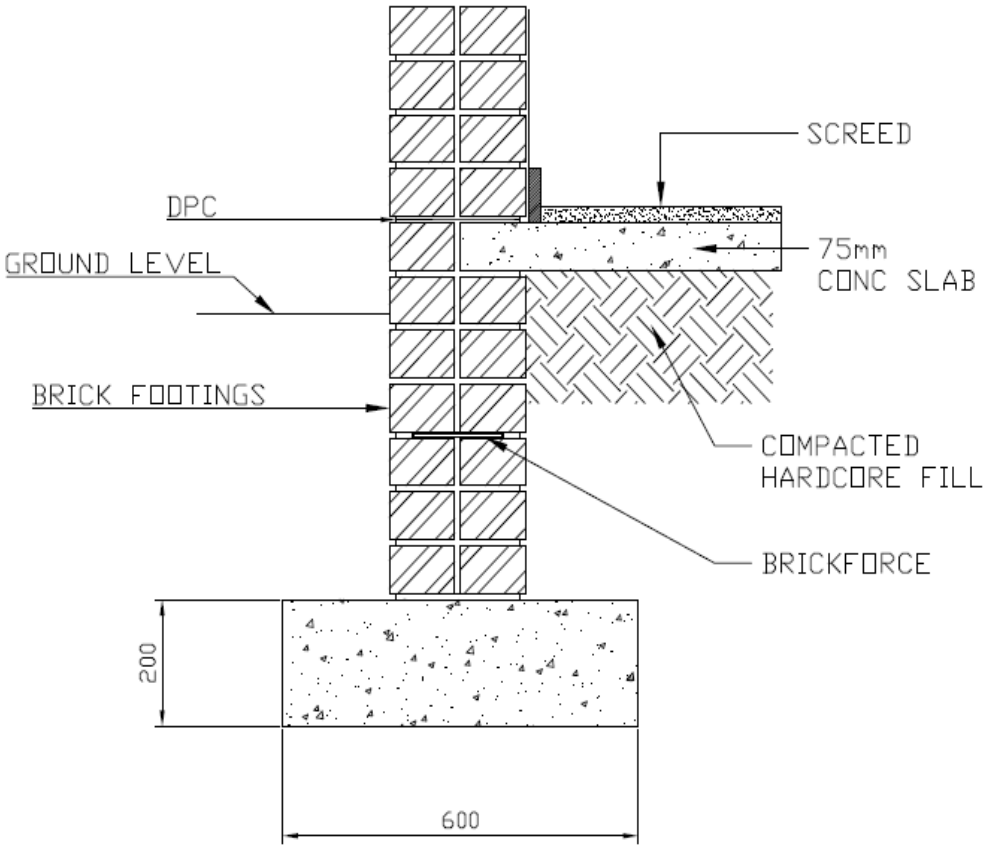
3.4 A spirit level is an instrument designed to indicate whether a surface is level or plumb.✓ It is used in horizontal and vertical levels.✓ The body of a spirit level has one or more vials used to check that the surface is level.✓ Different types of spirit levels are used by different types of workers, but the working principle is the same.✓ (4)

[19]

QUESTION 4

4.1 Piled foundations are use where shallow foundations are unsuitable✓ and will not give enough support to the building.✓ They apply loads from the building✓ to more solid parts of the ground many metres below.✓ Long piles are placed under the top slab✓ to keep it from sinking into the grounds at the weak points of the slab.✓ They are suitable for structures built on soft soils or sand, such as bridge piers.✓ (7)

4.2



STRIP FOUNDATION

ITEM	MARK
Labels	6 × 0,5 = 3
Correctness	5
Dimensions	1
Title	1
TOTAL	10

(10)

4.3
- Weight of the building
- Bearing capacity of the soil
- Minimum width stipulated by building code (3)

[20]

QUESTION 5

5.1 Bricks were imported from Holland,✓ but were soon replaced by English colonies in North America with bricks made in Virginia in 1612. The first kiln was erected in 1629.✓

During the building boom of the 19th century,✓ locally made bricks were often used in the eastern seaboard cities of Boston and New York City.✓ However, the trend of building upwards soon showed the limitations of this method of building✓ and was replaced in later years with steel and concrete.✓ The Monadnock Building in Chicago was built from bricks and is 17 stories high with ground walls 1,8 m thick.✓

In 1950, the use of bricks for high structures was revived following work by the Swiss Federal Institute of Technology and the Building Research Establishment in the United Kingdom.✓ This did not amount to much, as only in the 20th century did bricks come back into play with low- and medium-rise buildings✓ or as a thin decorative cladding over steel and concrete buildings and as internal non-loadbearing walls.✓ (10)

5.2 A bed joint is a horizontal layer of mortar on which the masonry units are placed.✓ The layer forms the bond between the two brick layers.✓ This joint relies heavily on the bond between the mortar and the bricks.✓ This means that reinforcement is needed.✓ The reinforcement gives the wall some additional resistance to lateral load, for example wind,✓ and prevents cracks due to movement.✓ (6)

5.3 A half-brick wall is a wall equal to the thickness of a brick laid as a stretcher, built into internal walls in single leaf.✓ The width of the wall is determined by the imperial brick size width,✓ which is half the size of the length of the brick.✓ With South African bricks, this is not the case,✓ and because we use South African size bricks in building nowadays, the term ‘half-brick wall’ has been replaced with the term ‘single-leaf wall’.✓ (5)

5.4 A cavity walls consist of two leaves of walls separated by a hollow space.✓ They can sometimes be used instead of building a thicker wall.✓ Cavity walls are used to prevent moisture penetrating through the walls✓ and are therefore commonly used in coastal areas.✓ To increase wall strength, corrosion-resistant metal ties linking the two walls together are embedded in the mortar during construction.✓ (5)

5.5 5.5.1 The width of the opening;✓ the clear horizontal space in-between the two walls supporting the arch structure✓

5.5.2 Wedge-shaped elements, made of bricks, clay or concrete;✓ keystones and springers are also voussoirs✓

5.5.3 The inner boundaries✓ of the voussoir✓

5.5.4 The outer boundaries✓ of the voussoir✓

(4 × 2) (8)
[34]

TOTAL: 100

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