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

20 November 2024

This marking guideline consists of 6 pages.

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QUESTION 1

1.1
- Sketch drawings✓ – Freehand drawings that give a general indication of what the structure will look like.✓
- Design drawings✓ – Detailed freehand drawings that can be used to prepare the contract documents and the working documents.✓
- Working drawings✓ – Complete set of drawings. These are provided to the different contractors to assist in completing the project.✓ (3 × 2) (6)

1.2
- Advertisements for bids
- Instructions to the bidder
- Plans
- Special conditions of construction
- Specifications
- Budget
- List of construction drawings
- Drawings prepared by the professional team (Any 5 × 1) (5)

1.3 Specifications also determine when payment to contractors is made.✓ If specifications are not adhered to,✓ payment may be withheld✓ as the contract specifically states what needs to be done.✓ (4)

[15]

QUESTION 2

2.1 In property law, servitude refers to the right of which property owned by one person can be used by another.✓ This means that the holder (municipality) has the right to do something with that specific part of the other person's property.✓ Examples of this are where a servitude on a plot of land allows the neighbour right of way to reach their own property.✓ Municipalities have the rights to drainage, sewers, water supply, electricity supply, etc.✓ A servitude can exist to maintain the character of a residential neighbourhood because of a specific commercial development or historic property.✓ (5)

2.2
- Drawing that includes the work that must be done
- Specifications describing the materials and workmanship to be used
- Priced bills of quantities
- Schedule of model preliminaries
- Agreement and schedule of conditions of contract
- Tender form
- Explanatory letters
- Tender qualifications (5)

[10]

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QUESTION 3

3.1
- Rulers and measuring tapes
- Vernier callipers and micrometres for precision measuring
- Setting-out instruments
- Levelling instruments to determine relative heights from earth surface
- Theodolite to measure horizontal and vertical angles for precision (5)

3.2
- Measurements of physical quantities such as length and mass are usually taken.
- Measurements are expressed in standard units.
- Most measurements involve a certain amount of error that needs to be considered. (3)

3.3
- They are affected by moisture and can shrink.
- Their length can change when stretched.
- They are more likely to twist and do not remain straight in windy conditions. (3)

3.4 When measuring intervals from one peg to another, always measure from the same side of the peg.✓ Since the tape hooks on the first peg, one must measure the first distance to the side of the peg nearest the first peg.✓ Keep the tape in line with the measurement and ensure that it does not sag.✓ When using a retractable tape to measure short distances, use a nail as an anchor for the zero mark.✓ If the nail is driven into the peg, ensure that the peg is grounded properly to prevent it from falling over when the tape is stretched.✓ Two people should do measurements as errors are greatly reduced and greater accuracy is achieved.✓ Lining by eye with the aid of ranging poles will be needed in the field for long distances.✓ (7)

3.5 The 3-4-5 setting out method is limited to 90-degree angles✓ with level and flat surfaces.✓ (2)

[20]

QUESTION 4

4.1 The main function of a foundation is to provide support to the structure by transferring the structural loads directly to the underlying ground or rock strata.✓ These structural loads from the structure must be safely transmitted into the ground without causing the ground to subside or allowing excessive settlement of the structure.✓ These structural loads follow a general load path from the roof to the beams✓ to the columns down✓ to the foundations and are spread out on the ground.✓ (5)

4.2 In pad foundations the concrete pads are shaped to the exact size required by the column to support it.✓ The foundation is designed to support isolated elements of the structure such as columns or pillars✓ when spaced more than a meter apart.✓ (3)

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4.3 Step 1: Locate the borders of the building
Step 2: Erect small profile boards (batter boards) over the pegs
Step 3: Measure and mark the length of the building
Step 4: Check that the corners are square
Step 5: Erect profiles for each corner and the external walls
Step 6: Erect profiles for the internal walls (6 × 1) (6)

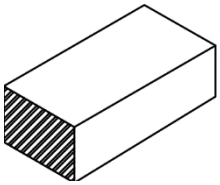
4.4 a) Screed
b) Concrete surface bed
c) Hardcore filling
d) Brick footings
e) NGL (Natural ground level)
f) DPC (Damp proof course) (6 × 1) (6)
[20]

QUESTION 5

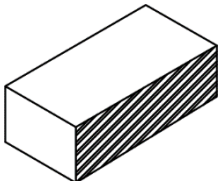
5.1 Wall ties are metal rods used to join and reinforce parts of a structure.✓ The metal is rigid, corrosion resistant and fitted into a bed joint.✓ Wall ties are used to connect multiple wythes of different materials.✓ Wall ties can be used for load bearing masonry, cavity walls and brick veneer construction.✓ It is not a bed-joint reinforcement but joins two adjacent walls and does not strengthen the mortar bond.✓ (5)

5.2
- Stretcher – is an orientation in which the brick is laid on its bed surface with the longest side exposed and mortar placed on the bed and head surfaces.
- Header – a brick is placed with the smallest end of the brick horizontally aligned with the surface of the wall and is exposed to the weather.
- Shiner – a brick laid with the surface bed exposed and mortar placed on the face and head. (Basically laying down on its face surface.) (3)

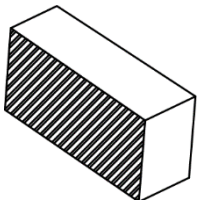
5.3



Header course



Stretcher course



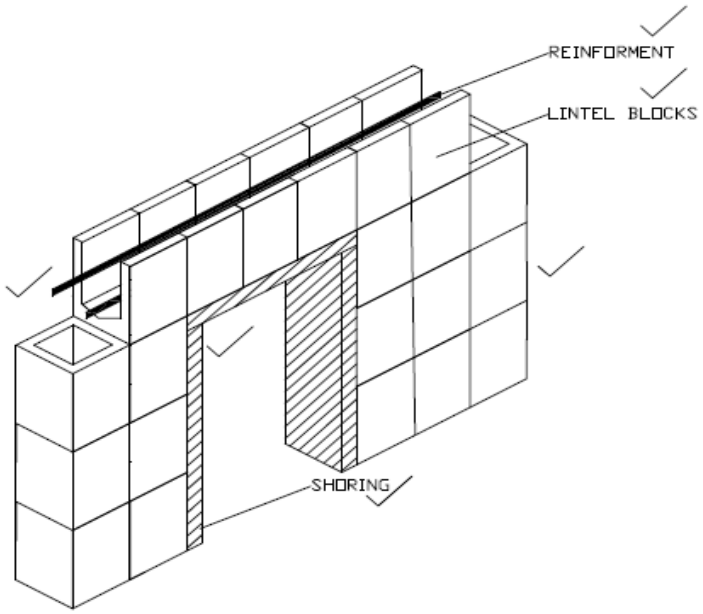
Shiner course (3)

5.4
5.4.1 True
5.4.2 True
5.4.3 False
5.4.4 False
5.4.5 True
5.4.6 True
5.4.7 True
5.4.8 False
5.4.9 True
5.4.10 True

(10 × 1) (10)

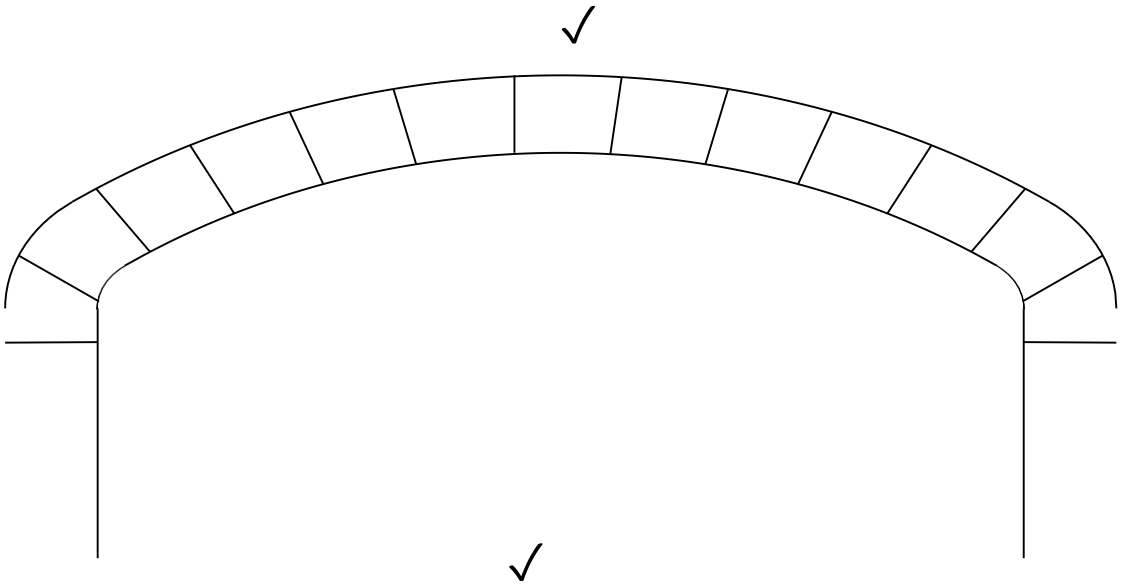
5.5 Cavity walls consist of two leaves of walls separated by a hollow space.✓ They can be used instead of building thicker walls.✓ They used to prevent moisture penetration through the wall and therefore are used commonly in coastal regions.✓ The cavity is sometimes filled with insulation like Polypearl beads or polyester. This can be done for noise reduction, for example to soundproof a room as in music studio.✓ (4)

5.6



CONCRETE MASONRY LINTEL CONSTRUCTION (6)

5.7

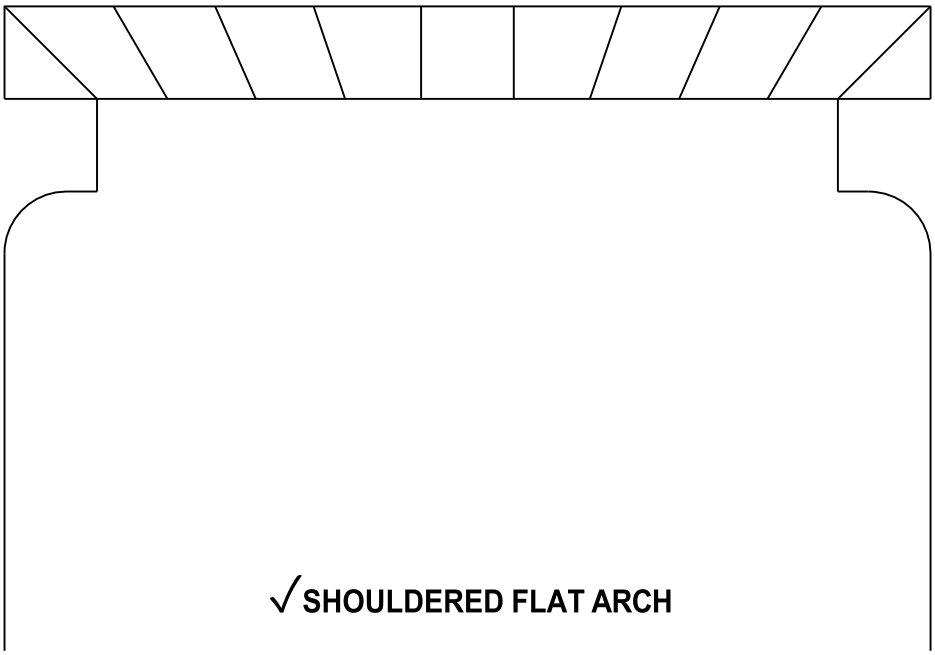


✓

✓

THREE-CENTERED ARCH

✓



✓**SHOULDERED FLAT ARCH**

(2 × 2) (4)
[35]

TOTAL: 100

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