higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE (VOCATIONAL)

CARPENTRY AND ROOF WORK
NQF LEVEL 3

10 March 2020

This marking guideline consists of 5 pages.

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QUESTION 1: HIPPED ROOFS

1.1 1.1.1 both rationally designed and deemed-to-satisfy roofs
1.1.2 materials used
1.1.3 manufacture and erection of roof trusses
1.1.4 45°
1.1.5 bracing details

(5 × 1) (5)

1.2 1.2.1
- A tilting batten is a thicker batten✓ placed at the lowest point of the roof to compensate for the tile thickness.✓
- A ridge batten is the last batten✓ fixed at the highest point of the roof.✓

1.2.2
- Battens measure 38 mm × 38 mm✓ and are used to support roofing tiles.✓
- Purlins measure 76 mm × 50 mm ✓ and are used to support roofing sheets.✓

1.2.3
- A fascia board is fitted to the ends of the rafters✓ and supports the gutters.✓
- Barge boards are fitted to the ends of battens/purlins✓ at the gable ends of the roof.✓

1.2.4
- The eaves are the horizontal distance✓ from the wall to the end of the roof.✓
- The overhang is the distance the top chord of the truss✓ extending past the top of the wall.✓

1.2.5
- The apex is where two top chords meet✓ and is the highest point on the roof.✓
- The rise is the distance from the bottom of the tie beam✓ to the top of the king post.✓

(5 × 4) (20)

1.3
- Girder truss
- Half truss
- Hip girder
- Jack truss
- Common truss

(5)
[30]

QUESTION 2: ERECTING AN L-SHAPED ROOF

2.1
- An L-shaped monopitch roof is erected with trusses sloping inwards forming a valley intersection without a hip.✓ The roof slopes to one side only✓
- An L-shaped duel-pitched roof means the pitch runs up on one side and down on the other side✓ thereby forming a valley and a hip.✓ (4)

2.2 An L-shaped roof must be designed using structural✓ and scientific calculations✓ which can only be done by a civil and structural engineer.✓ (3)

2.3
- Open valley
- Closed valley
- Bastard valley (3)

2.4
- Prepare the four-ply girder by nailing and bolting it on the ground.
- Raise the girder.
- Move it in its final position.
- Tack and straighten the girder.
- Fit the 45° hangers for the jack rafters. (5)

2.5
$\therefore 7{,}5^2 + 7{,}5^2 = C\ C^2$
$\therefore 56.25 + 56{,}25 = C\ C^2$
$\therefore 112{,}5 = C\ C^2$
$\therefore \sqrt{112{,}5} = C\ C$
$\therefore C\ C = 10{,}6$ meters (3)

2.6
- Ensure that the lining is nailed to the valley batten.
- Do not have too big an overlap.
- Apply some mastic to the valley planks to hold the lining down.
- Make sure that the lining projects past the valley planks and into the gutter by at least 50 mm. (4)

2.7 2.7.1 Standard position or level from which measurements are taken

2.7.2 Driving nail in only half-way so that it can be easily removed

2.7.3 Made beforehand in some other place

2.7.4 Gaps between trusses on outer walls that are filled with bricks and mortar

(4 × 1) (4)

2.8 It should be able to support the weight of the average person (1)

2.9
- Cut pockets into the brickwork
- Use truss hangers
- Arrange with bricklayer to build void formers (hollow wood boxes) into the masonry as they progress (3)

[30]

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QUESTION 3: INSPECTION OF ROOF TRUSSES

3.1 3.1.1 A person who is registered as a professional in a relevant category

3.1.2 A person who is qualified by virtue of his training and experience

3.1.3 A person who takes responsibility for a specific task

3.1.4 A person who has been specifically trained by a recognised authority

(4 × 1) (4)

3.2
- It must be structurally sound
- It is easier to inspect when you are free to move around
- If the structure is faulty it would be a waste of time and money to remove the roof covering
- If the roof is found to be faulty, it could be unsafe to load the roof
- Visibility is improved at the time of the inspection
- Faults and errors can be speedily corrected (Any 4 × 1) (4)

3.3
- Extra costs to repair faults
- Delays in occupancy
- Unable to live in house while repairs are being done
- Refusal of payment if bond has been obtained from a bank (4)

3.4
- Cutting of tiles minimised
- Regular and true horizontal lines of tile courses
- Perpendicular lines of tile edges to truss alignment
- Overall appearance of roof enhanced (no sagging)
- Ridge perfectly straight (Any 3 × 1) (3)

[15]

QUESTION 4: CLADDING A TIMBER ROOF STRUCTURE

4.1

ADVANTAGES	DISADVANTAGES
Less chance of denting a sheet	Easily rusts at fixing point
Does not stress a plastic sheet	Debris collection
Shorter type of fastener	Water could run into hole

(6)

4.2
- Grade of timber used
- Batten spacing
- Purlin spacing
- Rafter spacing
- Roof slope
- Number of bolts and connectors used (Any 4 × 1) (4)

4.3
- Have to be built into the masonry
- Must correspond with truss positions
- Must correspond with the correct truss spacing (3)

4.4
- Long life span
- Fire-resistant
- Low maintenance
- Wide range of colours (Any 3 × 1) (3)

4.5
- Tiled roofs with a pitch between 17,5° and 26°
- Tiled roofs with a pitch more than 45°
- All tiled roofs within 30 km of the sea (3)

4.6
4.6.1 40 mm clout nails
4.6.2 40 mm ring-shank nails
4.6.3 75 mm nails
(3 × 1) (3)

4.7
- Eaves
- Verges
- Ridge
- Downward slopes/planes (Any 3 × 1) (3)

[25]

TOTAL: 100

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