higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

# MARKING GUIDELINE

## NATIONAL CERTIFICATE

## BUILDING AND CIVIL TECHNOLOGY N3

## 14 April 2020

**This marking guideline consists of 8 pages.**

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## QUESTION 1

1.1
1.1.1 False
1.1.2 False
1.1.3 False
1.1.4 False
1.1.5 True
1.1.6 False
1.1.7 True
1.1.8 False
1.1.9 True
1.1.10 True
1.1.11 False
1.1.12 True

(12 × 1) (12)

1.2 1.2.1

- The engineer must work closely with the architect.
- The engineer must consult with the local authority as it assesses the stability of the projects.
- Assist the architect in his/her design and advise him/her where requires
- Produce calculations and relevant data to assist the quantity surveyor in cost control.
- Help to redesign or modify any work when required or as this becomes necessary
- Appoint a site represented(resident engineer) who will report back to him/her on all matters which affect the design

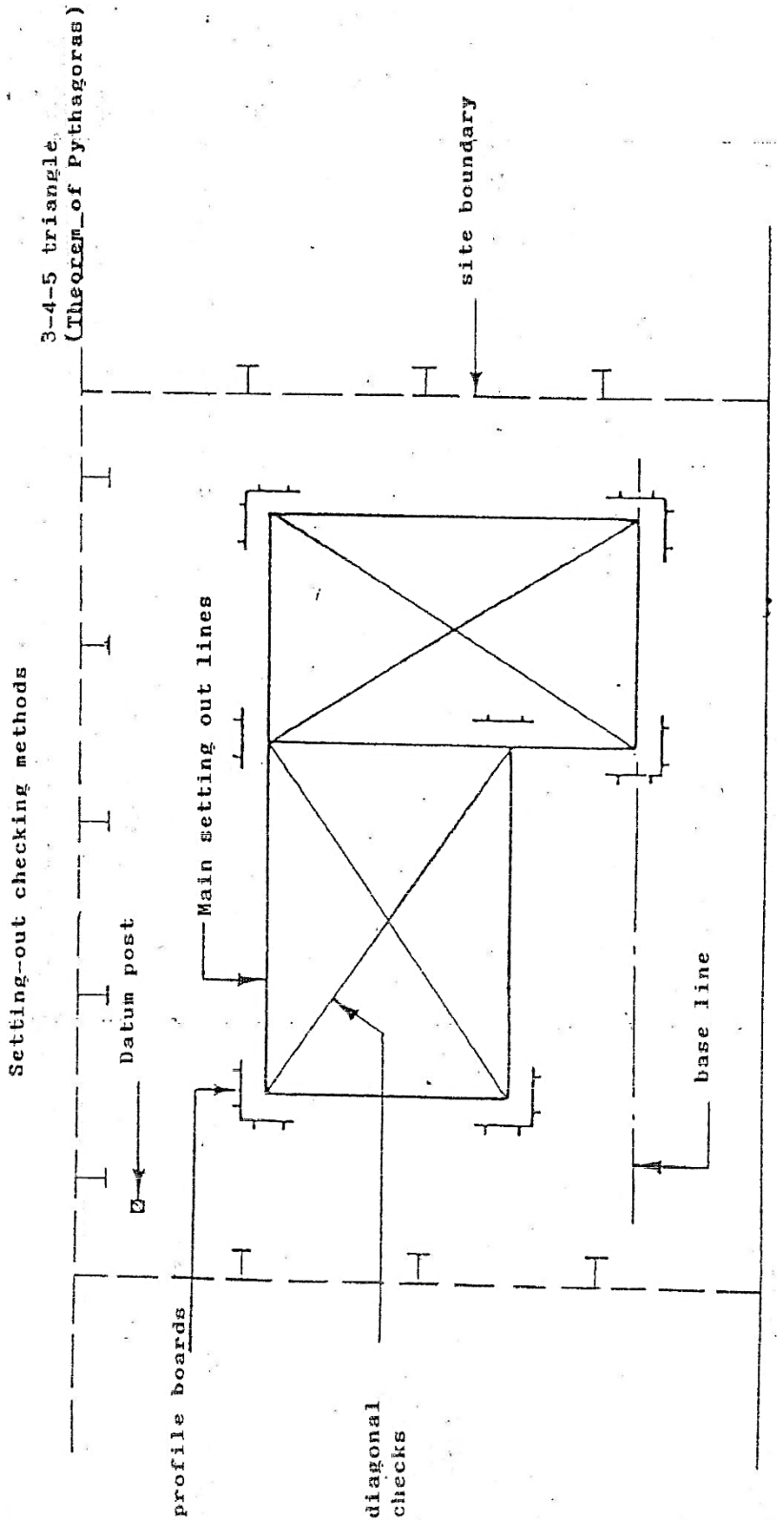
1.2.2

- The local authority must ensure that inspectors check that local by-laws are adhered to at specific stages during construction.
- The local authority must legislate the specific regulations and by-laws that apply to the area.
- Appoint their representative ( building inspectors) to inspect buildings and investigate any building irregularities that may have been found on building projects
- Compile and keep records of all reports which are submitted. Bylaws may differ from area to area and it is important for builders to familiarise themselves with these by-laws so that they do not infringe them and so find themselves involved in prosecution, litigation, or unnecessary and costly work stoppages

(2 × 2) (4)
**[16]**

## QUESTION 2

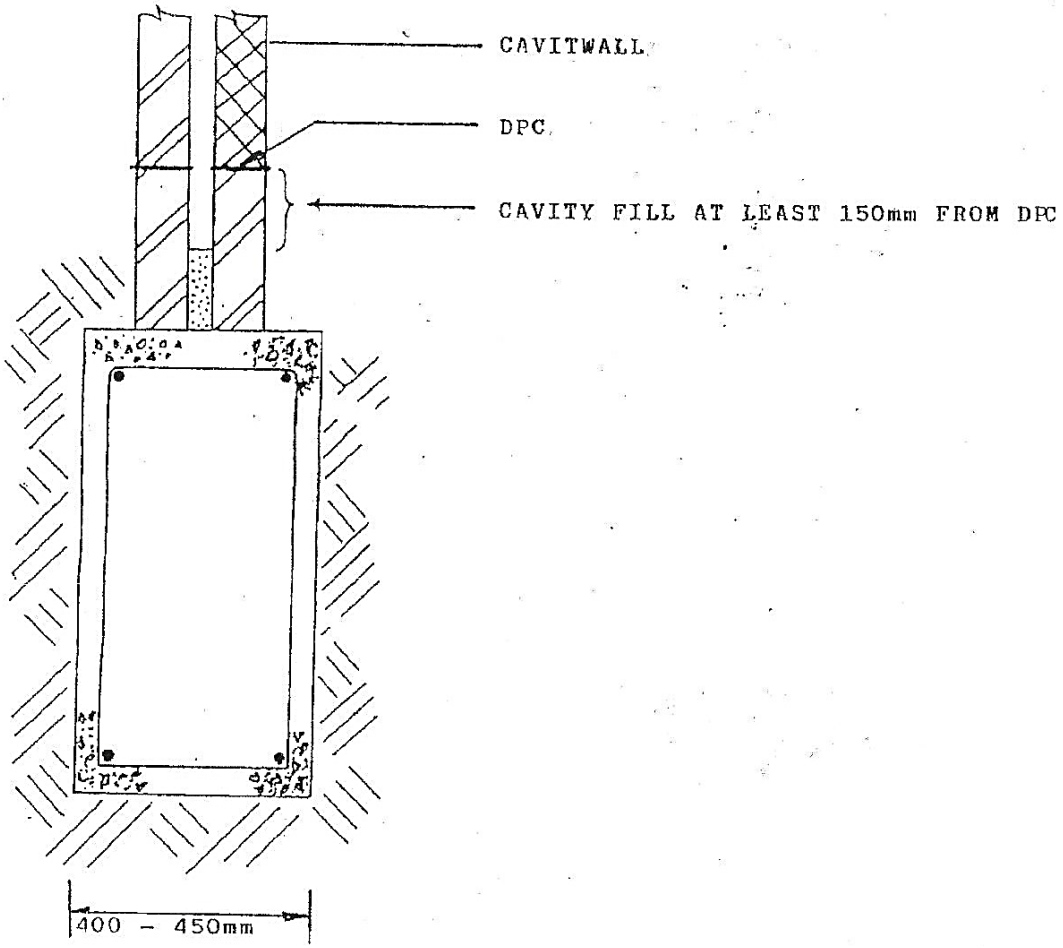
2.1




| MARK ALLOCATION | |
|---|---|
| Labels | 6 |
| Correctness | 2 |

(8)

2.2




| MARK ALLOCATION | |
|---|---|
| Labels | 6 |
| Correctness | 2 |

(8)
**[16]**

**QUESTION 3**

3.1
- Quantity of water used
- Grading of aggregates
- Ratio of the aggregate
- Duration of the mixing process
- Compaction (agitating) of the mixture
- Weather conditions during curing
- Method of placing
- Age of cement
- Curing
- Types of concrete mix
- Cement: water ratio
- Quantities and mixture ratio (Any 5 ×1) (5)

3.2 3.2.1 Coarse aggregate is that part of an aggregate of which at least 90% by mass is retained on a sieve having 5 mm mesh openings.✓ The maximum size of the aggregate varies.✓ Thus, for reinforced concrete work, the size of the aggregates is usually 19 mm and, for mass concrete (e.g. foundations), they are generally 38 mm to 64 mm wide. The aggregate must be clean so as to ensure that it adheres to the cement.✓

3.2.2 Fine aggregate is that part of an aggregate which (mostly) passes through a sieve having 5 mm openings.✓ River sand is the most commonly used fine aggregate today.✓ Cleanliness and grading are also important factors in this type of sand.✓

(2 × 3) (6)

3.3
- A cone is placed horizontally hold down by placing your feet on the foot pieces, on a clean non-absorbent surface and filled with freshly mixed concrete.
- The cone is filled in four layers. Each layer is rammed down 25 times with a 16 mm diameter steel ballpoint rod with a length of 600 mm.
- As soon as the container is full, the top is levelled by removing any surplus concrete.
- The cone is then lifted vertically in one even swoop from the contents and turned over next to the mixture. (4)

3.4 Mortar is a dagha that is a mixture of sand and cement or a building material of lime and cement combined. (1)

**[16]**

**QUESTION 4**

4.1
- It requires no expansion pipes.
- It is compact because it requires very little space and can be installed in a confined space.
- It is cheaper because it requires less labour and fewer materials for installation and functioning.
- It does not rely on a supply tank for its feed. (4)

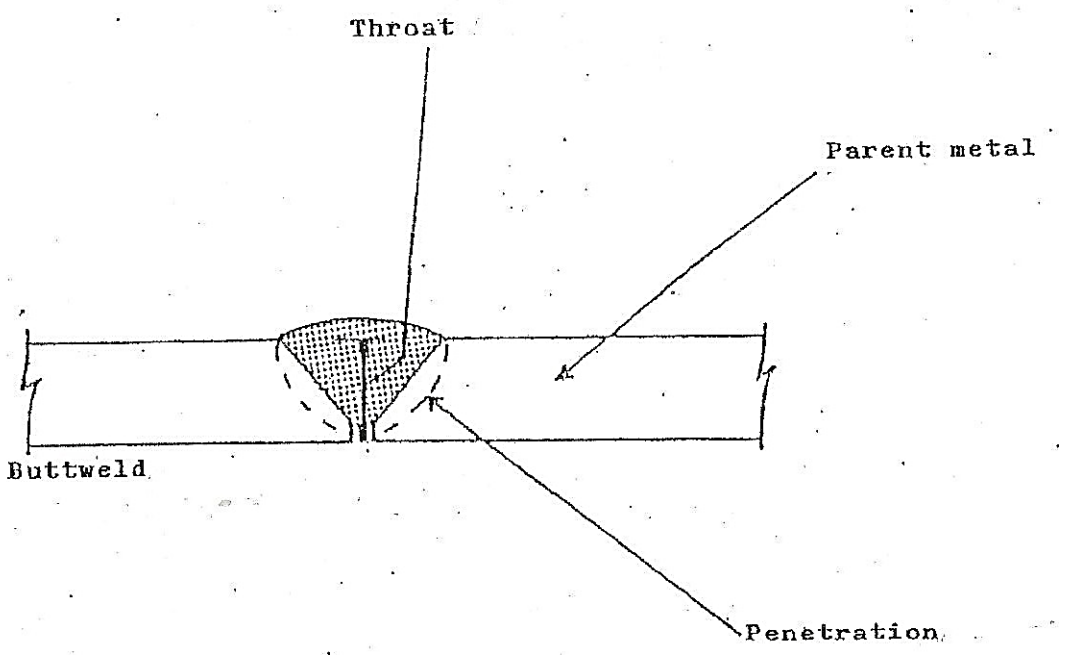
4.2 4.2.1 Refrigerator
4.2.2 Bidet
4.2.3 Washbasin
4.2.4 Gas water heater
4.2.5 Draining tap
4.2.6 Water storage

(6 × 1) (6)

4.3 4.3.1 Strength grade mechanical
4.3.2 Strength grade visual

(2 × 1) (2)

4.4




| MARK ALLOCATION | |
|---|---|
| Labels | 3 |
| Correctness | 1 |

(4)
**[16]**

**QUESTION 5**

5.1 5.1.1 Sandblasting is a commonly used and very effective method of cleaning iron and steel work.

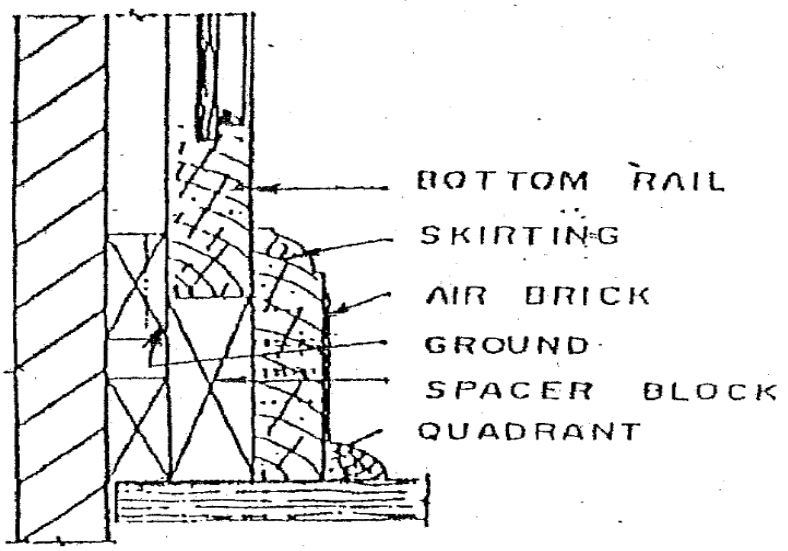
5.1.2 Acid pickling is treatment in the form of a solution of phosphate applied in a coating layer to steel.

5.1.3 Flame cleaning is very effective when removing the scale and rust spots from metal.

(3 × 2) (6)

5.2
- Oil paint
- Emulsion paint
- Synthetic paint
- Cellulose paint
- Water paint
- Different primers and underlays
- Hard Gloss paint
- Enamel paints
- Stains used on wood ,etc
- Whitewash and distempers
- Varnishes
- Emulsion PA paints

(Any 2 × 1) (2)




SECTION OF TYPICAL TIMBER WALL PANELLING (8)
**[16]**

**QUESTION 6**

6.1 6.1.1 Highest point in the cross section of a cambered road

6.1.2 Outermost part of the width of the carriageway

6.1.3 Fine crushed aggregate coated with bitumen laid at a thickness of 25 mm

6.1.4 Layer of material on which traffic is carried

(4 × 1) (4)

6.2 Granolithic flooring is used mainly in situations where easy maintenance✓ and durability are paramount, such as in a common entrance hall to a block of flats.✓ (2)

6.3 Clay tiles is normally used in household✓ floor applications✓ (2)

6.4 6.4.1 Length of wall = 16 m
Height of wall = 3 m
Door opening = 2 m × 1,8 m
Window opening = 1,5 m × 1,5 m

Area of wall = 16 × 3
= 48 $m^2$✓

Door opening = 2 × 1,8
= 3,6 $m^2$✓

Window opening = 1,5 × 1,5
= 2,25 $m^2$✓

Total area = 48 – (3,6 + 2,25)✓
= 48 – 5,85✓
= 42,15 $m^2$✓ (6)

6.4.2 Amount of bricks required = 42,15 × 100✓
= 4 215✓ (2)

6.4.3 Amount of sand required = 4 215 × 1 000✓
= 4,215 tons✓ (2)

6.4.4 Labour cost = 42,15 × 200✓
= R8 430✓ (2)
**[20]**

**TOTAL: 100**

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