higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PLUMBING THEORY N2

9 April 2020

This marking guideline consists of 9 pages.

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QUESTION 1: COLD-WATER SUPPLY

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

(10 × 1) (10)

1.2 Caused by bicarbonates✓ of calcium and/or magnesium✓ held in solution by carbon dioxide✓ (3)

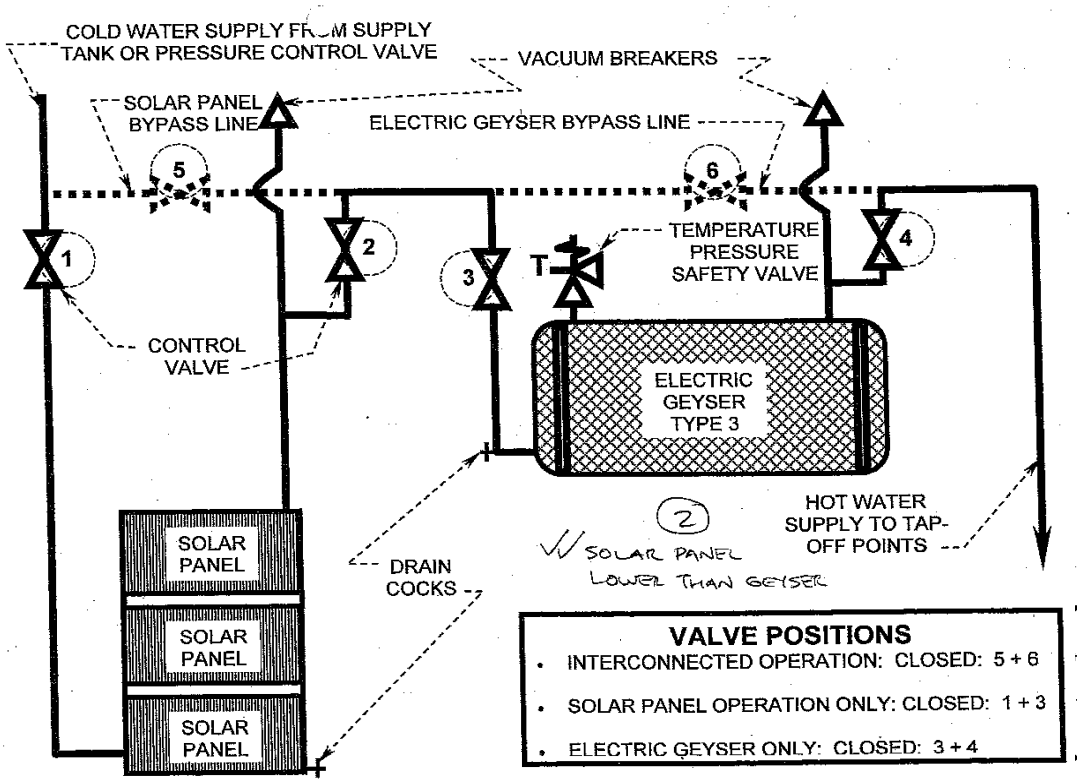
1.3
- Provides water to emergency services to rinse or wash streets after accidents
- Provides access to municipal workers to use water off a metered standpipe
- Used as temporary connection with approval by city engineers
- Used to fill municipal tankers (Any 3 × 1) (3)

1.4
- More economical with regard to installation costs
- Operating costs and maintenance costs are kept to a minimal
- Reliable and ensures much more constant supply
- Constant pressure ensured (Any 2 × 2) (4)

[20]

QUESTION 2: HOT-WATER SUPPLY

2.1



(9)

2.2
- Pressure-reducing valve takes up very little space
- Reduces labour and material costs
- Valve easily accessible for repairs (3)

2.3
- Poor temperature at mixer taps and shower outlet
- High pressure on cold-water system increases chance of water hammer and pipe vibration
- Increased noise level caused by cisterns and water tanks filling up through ball valve
- Increased splashing at water outlet especially in high-pressure areas (4)

2.4 Advantages
- Solar energy used to heat water
- Decrease in electricity consumption (Any ONE)

Disadvantages
- Costly installation
- Added weight to the structure (Any ONE)

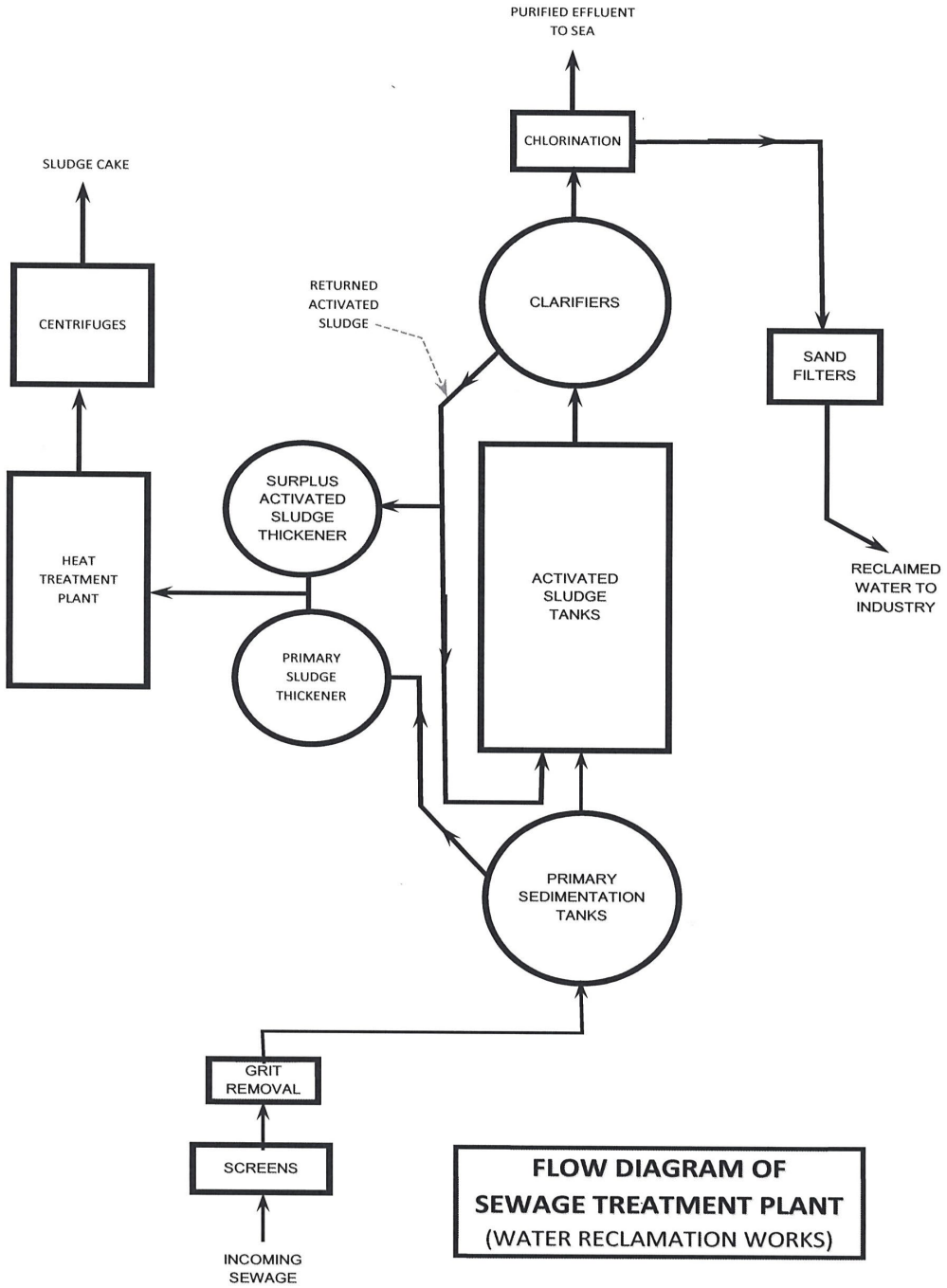
(2 × 1) (2)

2.5
- Outlet of any WC trap discharging to stack more than 1,5 m above invert of bend at base of stack
- outlet of any sanitary fixture (other than a WC trap) discharging into stack more than 2 m above invert of bend at base of stack
- Stack serving more than one group of sanitary fixtures
- Stack serving any common branch discharge pipe connected to range or ranges of sanitary fixtures
- Outlet of any sanitary fixture (Any 2 × 1) (2)

[20]

QUESTION3: DRAINAGE

3.1



(Any 10 × 1) (10)

3.2 An inspection eye is an access opening✓ for inspecting and testing the interior of any pipe or pipe fitting in a drainage installation.✓ (2)

3.3 3.3.1 Earthenware
3.3.2 Wash Trough
3.3.3 Water Meter (3 × 1) (3)

3.4 *Fall over* 11 *m*

$= 8 \times \frac{1}{35}$ ✓

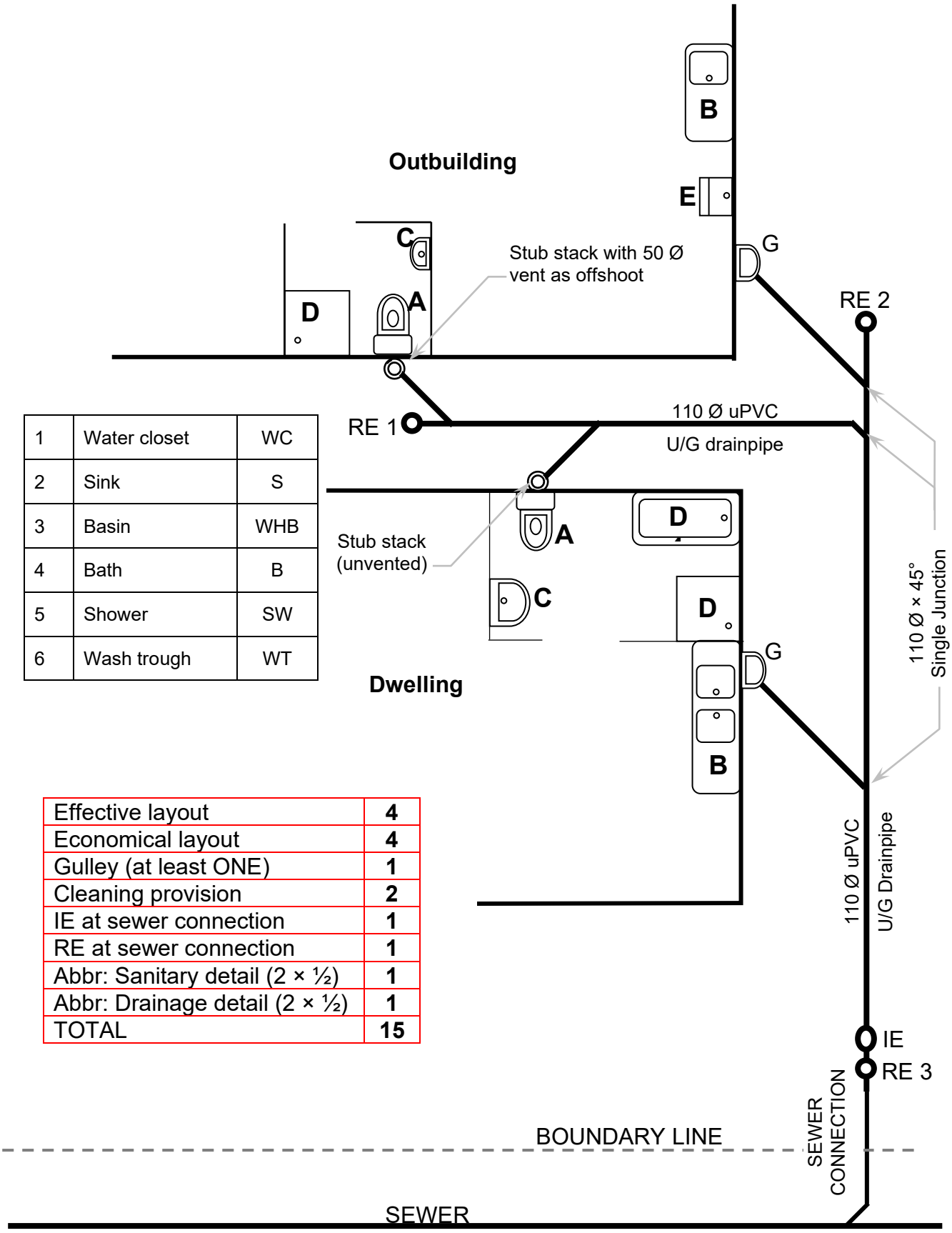
$= 0{,}229\ m$ ✓

Invert Depth at next change ✓

$= 0{,}625 + 0{,}229$ ✓

$= 0{,}854\ m$ ✓ (5)

3.5

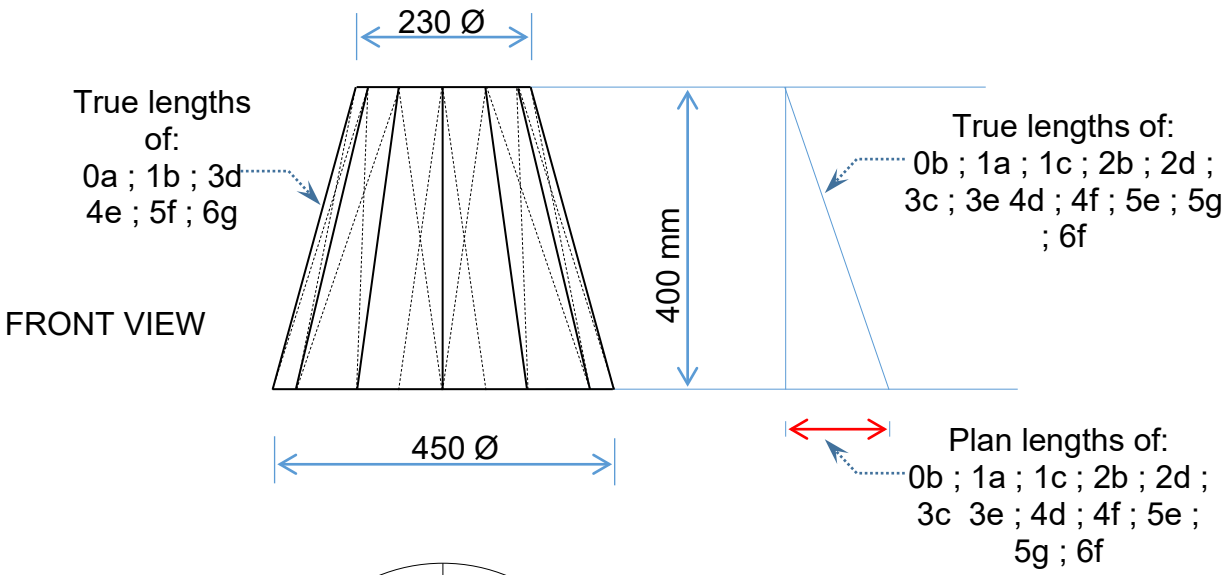


1	Water closet	WC
2	Sink	S
3	Basin	WHB
4	Bath	B
5	Shower	SW
6	Wash trough	WT

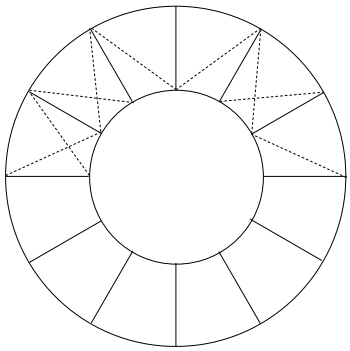
Effective layout	**4**
Economical layout	**4**
Gulley (at least ONE)	**1**
Cleaning provision	**2**
IE at sewer connection	**1**
RE at sewer connection	**1**
Abbr: Sanitary detail (2 × ½)	**1**
Abbr: Drainage detail (2 × ½)	**1**
TOTAL	**15**

(15)
[35]

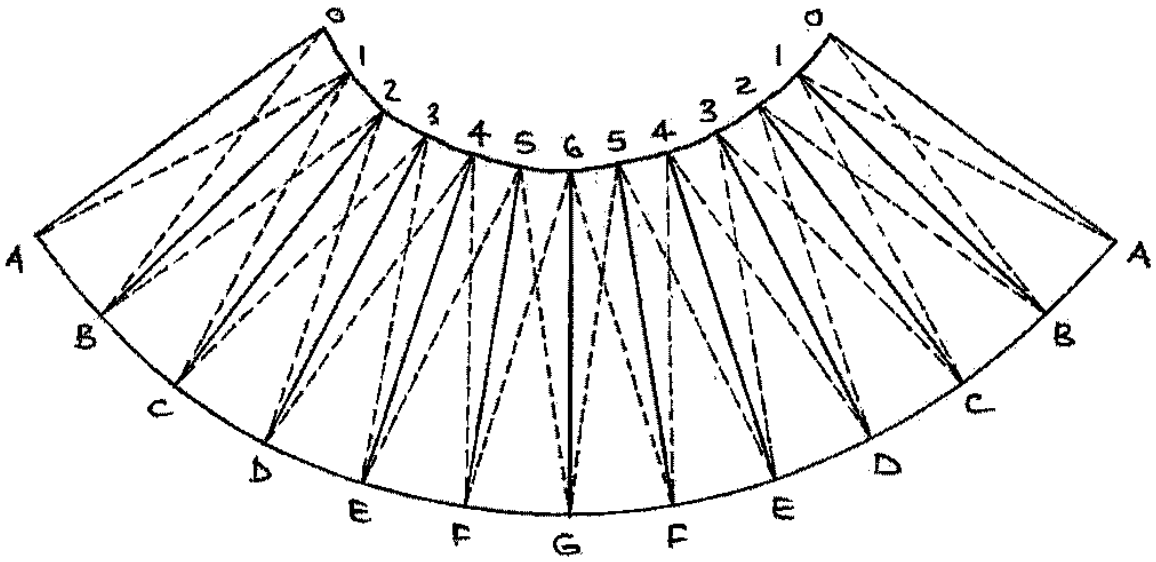
QUESTION 4: SHEET METAL WORK AND FLASHINGS



TOP VIEW



True length	2
Top view	2
Front view	2
Pattern	9



PATTERN DEVELOPMENT

[15]

QUESTION 5: CALCULATIONS

	DESCRIPTION	QUANTITY	NO TOTALS
1	150 litre × 400 kPa horizontal geyser	1	
2	400 kPa temperature and pressure safety valve	1	
3	Vacuum breaker	2	
4	15 mm stopcock	2	
5	22 mm stopcock	1	
6	400 kPa combination pressure control and relief valve	1	
7	22 mm equal tee	6	
8	22 × 22 × 15 tee	6	
9	22 × 15 × 22 tee	2	
10	15 mm × ½ Female Tee/Swivel Tee	2	
11	Basin tap set	2	
12	Bath tap set	2	
13	Sink mixer taps	1	
14	22 mm holder bats/pipe clips	20	

[10]

TOTAL: 100

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