



**higher education  
& training**

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

# **MARKING GUIDELINE**

## **NATIONAL CERTIFICATE PLUMBING THEORY N2**

**9 April 2020**

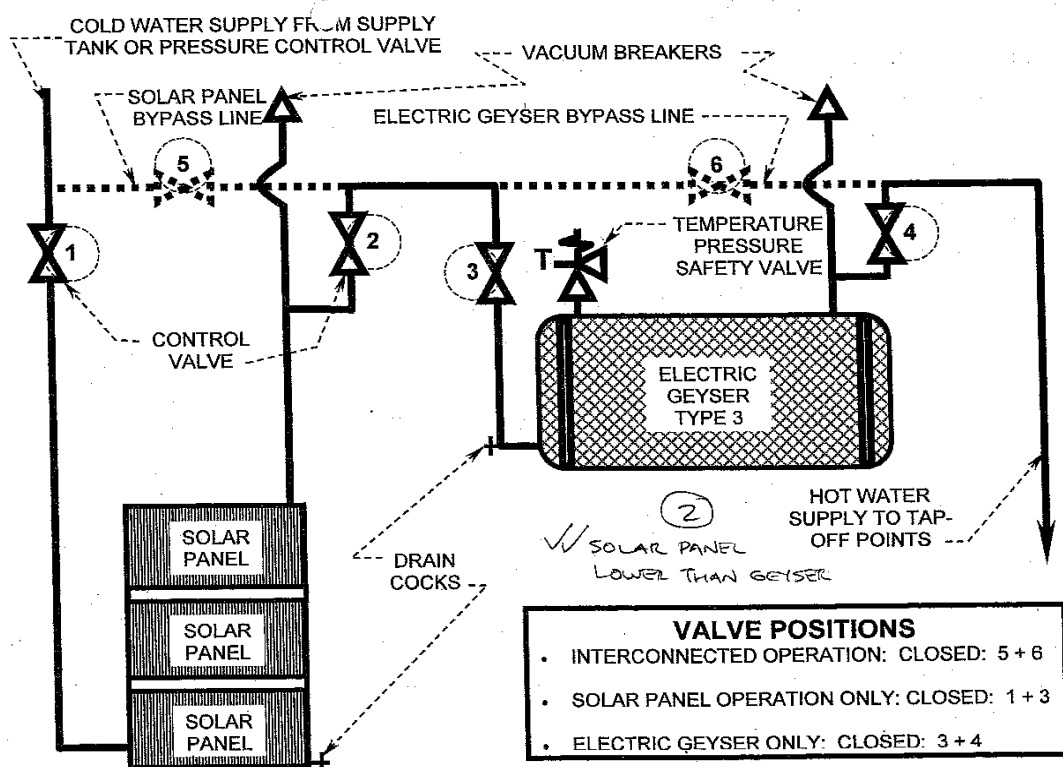
**This marking guideline consists of 9 pages.**

**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 | <ul style="list-style-type: none"><li>• Provides water to emergency services to rinse or wash streets after accidents</li><li>• Provides access to municipal workers to use water off a metered standpipe</li><li>• Used as temporary connection with approval by city engineers</li><li>• Used to fill municipal tankers</li></ul> |       |          | (Any 3 × 1) (3) |
| 1.4 | <ul style="list-style-type: none"><li>• More economical with regard to installation costs</li><li>• Operating costs and maintenance costs are kept to a minimal</li><li>• Reliable and ensures much more constant supply</li><li>• Constant pressure ensured</li></ul>  |       |          | (Any 2 × 2) (4) |
|     |   |       |          | <b>[20]</b>     |

**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)

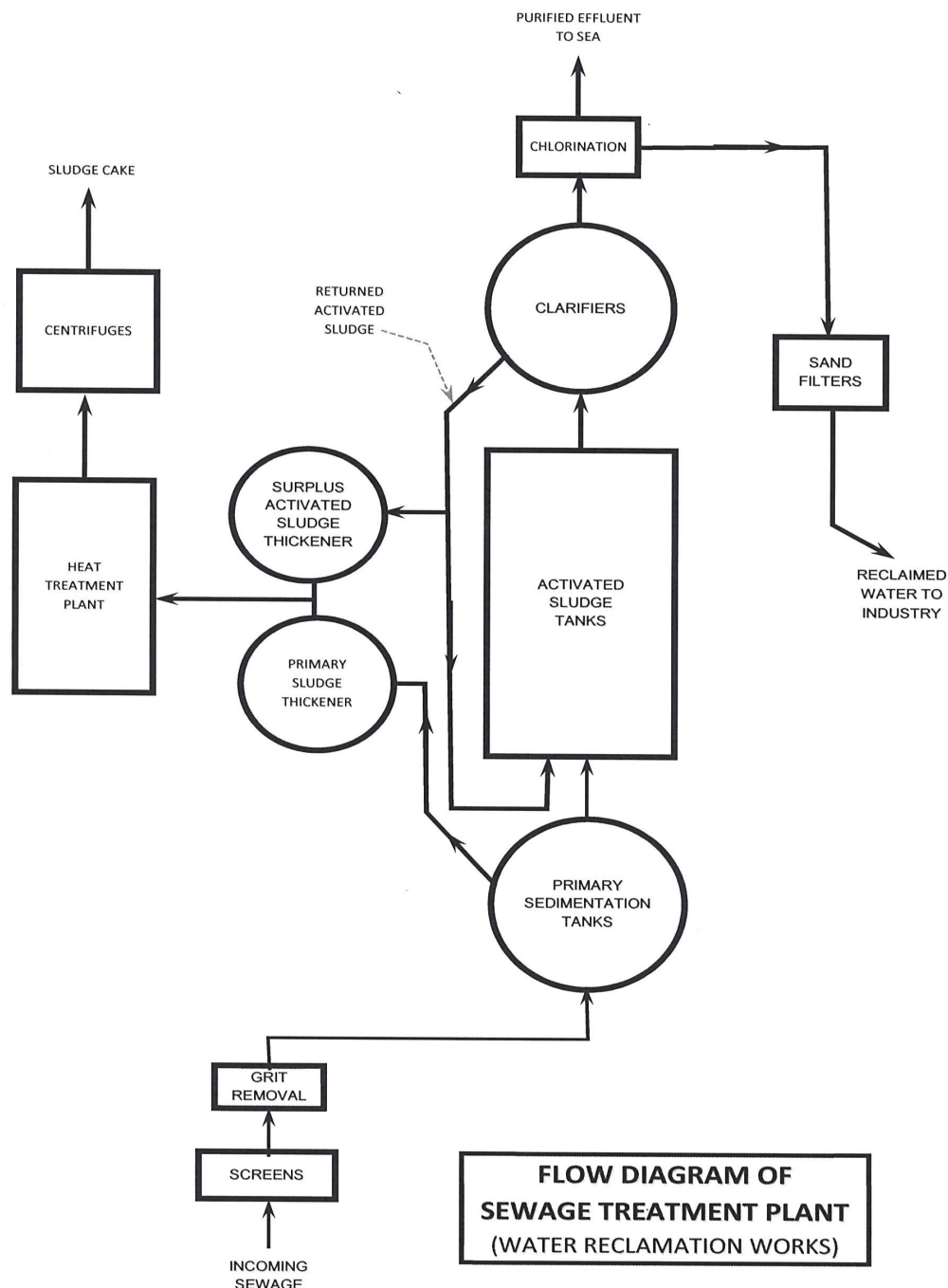
(2)

- 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

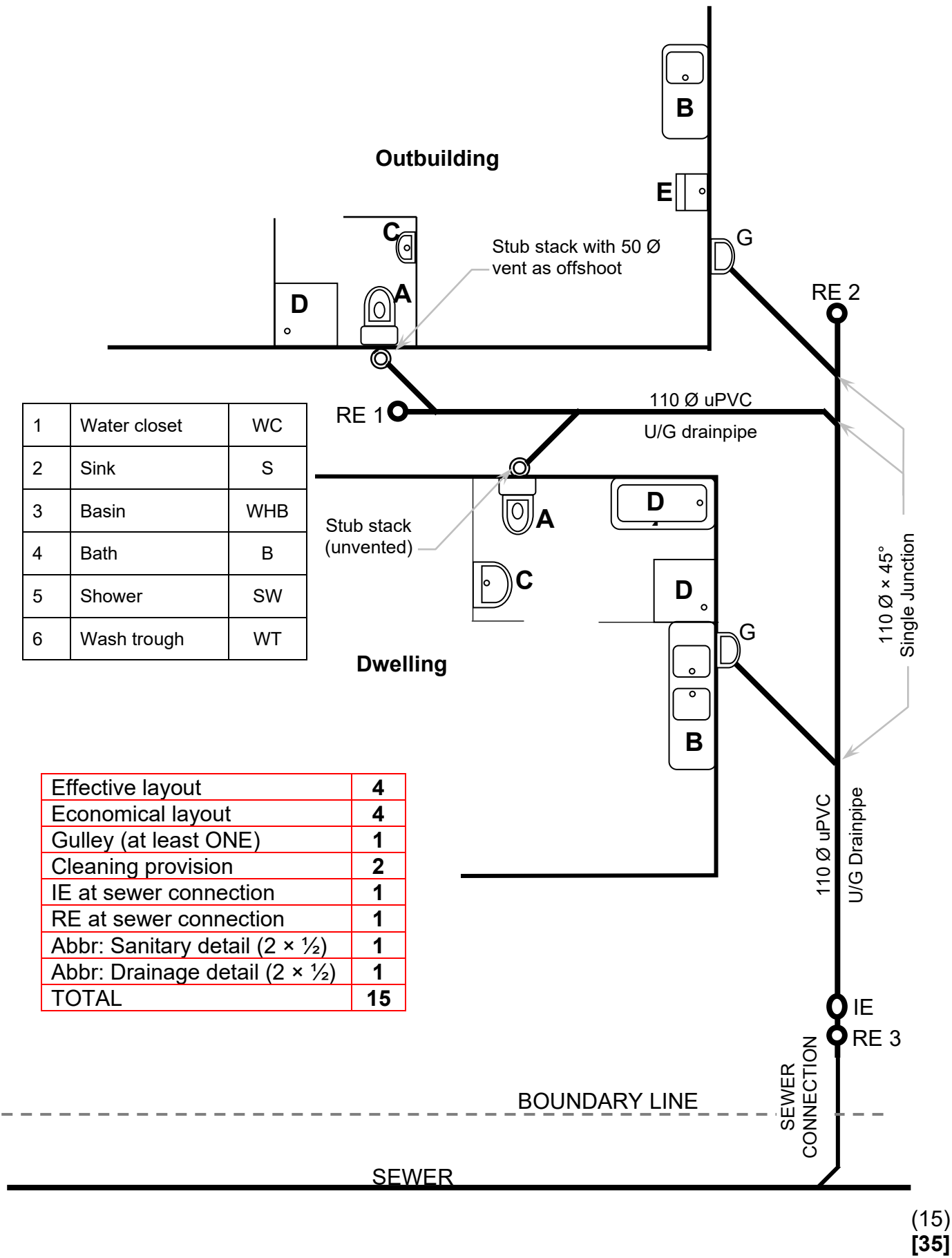


(Any 10 × 1)

(10)

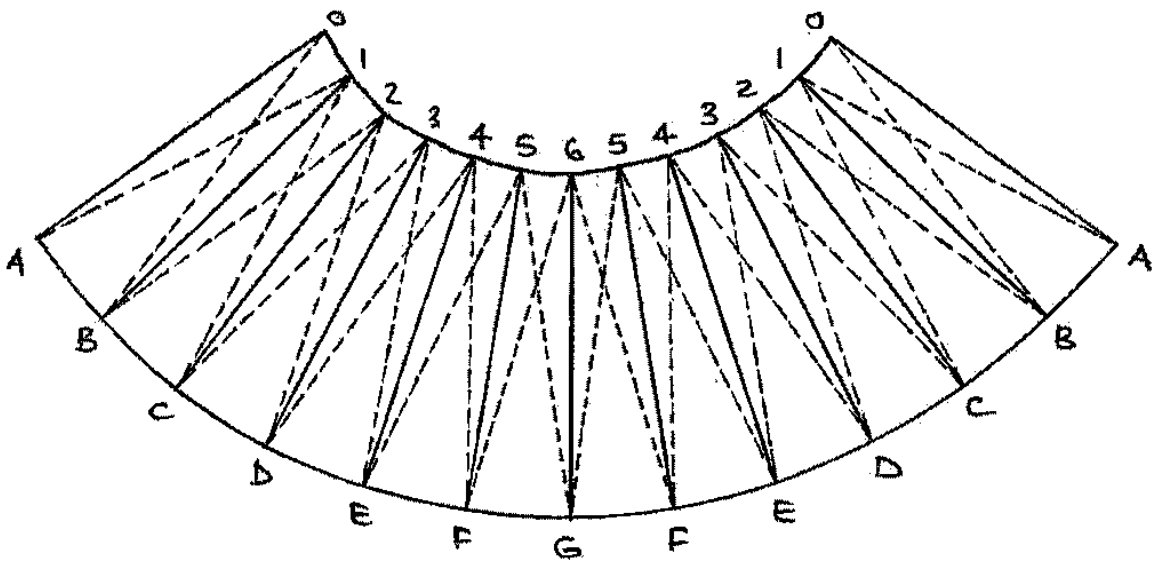
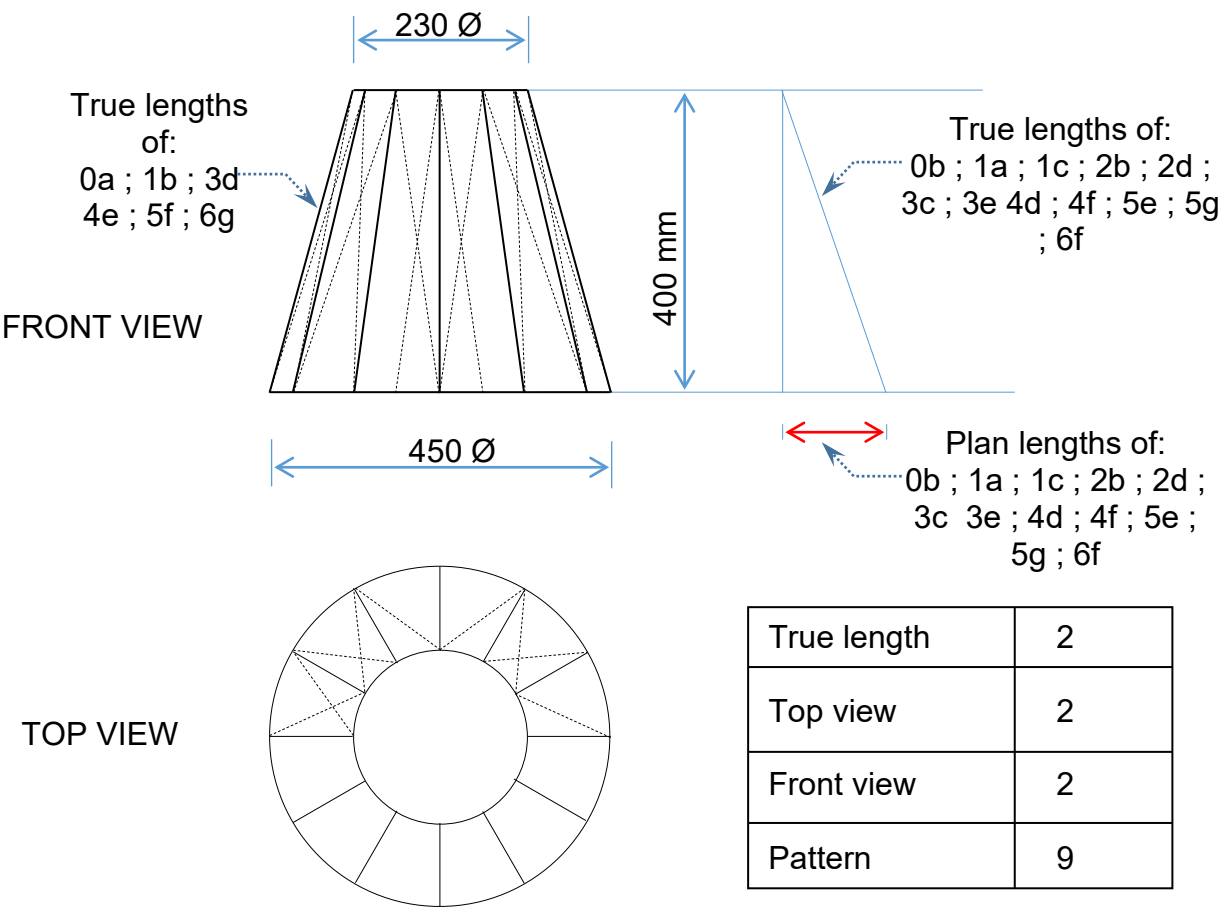
- 3.2 An inspection eye is an access opening✓ for inspecting and testing the interior of any pipe or pipe fitting in a drainage installation.✓ (2)
- 3.3 3.3.1 Earthenware  
3.3.2 Wash Trough  
3.3.3 Water Meter (3 × 1) (3)
- 3.4 *Fall over 11 m*  
 $= 8 \times \frac{1}{35}$  ✓  
 $= 0,229 \text{ m}$  ✓
- Invert Depth at next change* ✓  
 $= 0,625 + 0,229$  ✓  
 $= 0,854 \text{ m}$  ✓ (5)

3.5



(15)  
[35]

QUESTION 4: SHEET METAL WORK AND FLASHINGS



PATTERN DEVELOPMENT

[15]

**QUESTION 5: CALCULATIONS**

	<b>DESCRIPTION</b>	<b>QUANTITY</b>	<b>NO TOTALS</b>
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	
			<b>[10]</b>
			<b>TOTAL: 100</b>