



**DIMENSIONS OF PRECAST CONCRETE MANHOLE**

D	P	M	DC	MIN.	MAX.
200/250	300	75	1050	1500	6000
300/400	300	130	1200	2000	6000
450/500	300	130	1350	2100	6000
600/700	300	130	1500	2200	6000
800	300	150	1800	2400	6000
900/1000	300	150	1800	2600	6000

**DETAILS OF R.C. SLAB**

D	J	K	L	M	N	MAX.	MIN.
200 - 250	1350	900	205	75	2500	1500	
300 - 450	1350	1050	225	130	2500	1600	
500 - 700	1500	1275	300	130	2800	1800	
750 - 900	1800	1500	300	150	3000	2000	

D	D/4	E	F	G	H
200 - 250	75	150	225	300	450
300 - 450	115	150	300	450	600
500 - 600	150	150	350	600	850
650 - 750	180	150	400	700	1000
800 - 900	225	150	425	800	1150
950 - 1050	275	225	560	1000	1350
1100 - 1200	300	225	600	1120	1500
1300 - 1800	D/4	300	D/2	D-75	D-450

- NOTES ON SEWER LINES**
1. THE DIAMETER, TYPE AND CLASS OF PIPE ARE TO BE INDICATED ON THE LONGITUDINAL SECTIONS TOGETHER WITH THE TYPE SECTION TO BE USED.
  2. THE CLASS AND TYPE OF PIPE ARE TO BE STRUCTURALLY ADEQUATE FOR THE TYPE SECTION SHOWN AND THE TRENCH DEPTH, ETC. OTHERWISE STATED.
  3. BREAK JOINTS AS SHOWN ARE TO BE FORMED IN ALL TYPE 'C' AND 'D' SECTIONS WHERE FLEXIBLE JOINT PIPES ARE USED.
- NOTES ON MANHOLES**
1. BASES, BENCHING AND POINTING OF BRICK OR PRECAST CONCRETE MANHOLES AND THE WHOLE OF CAST-IN-SITU CONCRETE MANHOLES ARE TO BE CONSTRUCTED WITH ORDINARY PORTLAND CEMENT, UNLESS OTHERWISE STATED.
  2. BENCHINGS TO MANHOLES TO BE TROWELLED TO THE SOFFIT OF THE OUTGOING SEWER RISING BY 75mm TO THE MANHOLE WALLS. CURVED AND JUNCTION BENCHINGS TO BE FORMED TO A RADIUS ON THE CENTRE LINE OF CHANNEL OF NOT LESS THAN 400mm OR 150 WHOEVER IS GREATER. FOR LARGE DEGREE BENDS AND MULTIPLE JUNCTIONS MANHOLE, SPECIAL OR ENLARGED MANHOLES ARE REQUIRED.
  3. FOR SEWERS OVER 900mm DIAMETER AND MANHOLES MORE THAN 6m DEEP TO INVERT SEE SPECIAL MANHOLE DETAILS.
  4. FOR ALL SEWERS 700mm AND ABOVE IN DIAMETER, SAFETY ROPES ARE TO BE PROVIDED AT THE ENTRANCE OF THE DOWNSTREAM PIPE.
  5. MEDIUM DUTY MANHOLE FRAMES & COVERS ARE TO BE USED WHERE VEHICULAR TRAFFIC IS NOT EXPECTED.
  6. HEAVY DUTY MANHOLE FRAMES & COVERS ARE TO BE USED ON ALL ROADS SERVICE VERGE, CAR PARKS AND WHERE VEHICULAR TRAFFIC IS EXPECTED.
  7. MANHOLE COVER SHALL BE LAD FLUSH WITH PAVED, TILED AND ROAD SURFACES. ON TURFED GROUNDS, THE MANHOLE COVER SHALL BE LAD 50mm HIGHER THAN THE SOIL LEVEL.
  8. REINFORCEMENT SHALL BE DESIGNED BY THE PROFESSIONAL ENGINEER.
  9. ALL HDPE LININGS SHALL INCLUDE ALL NECESSARY SEALING BY ANGLE FILLETS, WELDINGS AND TESTING.
  10. ALL STRUCTURAL CONCRETE GRADE SHALL BE MINIMUM C28/35.
  11. ALL CONCRETE GRADE FOR HAUNCHING AND BENCHING SHALL BE C20/25.
  12. ALL CONCRETE COVER TO REINFORCEMENT SHALL BE MINIMUM 50mm DEPENDENT ON SOIL CONDITIONS.
  13. THE ENDS OF ALL PILES AT MANHOLE WALLS SHALL BE GROUND SMOOTH.
  14. ALL RC ROOF SLABS ARE TO BE CAST WITH MIN 2.5mm THICK HDPE PROTECTIVE LININGS TO THE UNDERSIDE OF SLAB INCLUDING ALL NECESSARY SEALING BY ANGLE FILLETS, WELDING AND TESTING.

- 1) CONCRETE GRADE 7 TO FOUNDATION TO ENGINEER'S DETAILS.
- 2) CAST IRON FRAME AND COVER TO MANHOLE FRAME AND COVER.
- 3) DETAILS OF MANHOLE FRAME AND COVER ON ROAD/PAVEMENT AND ON TURF UPATED.
- 4) HEIGHT OF BRICKWALL TO EXCLUDE MANHOLE FRAME THICKNESS.
- 5) TOP SLAB REINFORCEMENT DETAIL REMOVED AND TO BE DESIGNED BY PROFESSIONAL ENGINEER.
- 6) MIN 2.5mm THICK HDPE LINING ADDED TO MANHOLE WALLS WITH INTEGRAL ANCHOR STUDS ALL ROUND. 15mm THICK PVC REMOVED.
- 7) MAXIMUM ALLOWABLE PIPE DIAMETER ANGED AND VELOCITY ADDED FOR BACKDROP AND TUMBLING BAY DETAIL.
- 8) MANHOLE AND PIPE HAUNCHING DIMENSIONS FOR 200 and 250mm DIAMETER PIPE ADDED.
- 9) NOTES REVISED.
- 10) TYPE 'A' AND TYPE 'B' SECTION REVISED FOR PUMPING MAINS ONLY.
- 11) JUNCTION CONNECTION ADDED.
- 12) MIN 300mm SHORT PIPE FROM MANHOLE WALL ADDED.
- 13) CAST IN OR CHEMICALLY ANCHORED DOWEL BARS WRAP ROUND THE SHORT PIPE CONCRETE HAUNCHING ADDED.
- 14) SUITABLE PILES AT CENTRES & LENGTHS AT ALL MANHOLE SECTIONS ADDED.
- 15) CONCRETE SURROUND TO CONCRETE HAUNCHING.
- 16) WATERSTOP DETAIL ADDED.
- 17) BACKDROP MIN PIPE TO PIPE HEIGHT REVISED TO MAXIMUM 6000.
- 18) PILE FOUNDATION REVISED.
- 19) SELECTED COMPACTED BACKFILLING TO COMPACTED GRANULAR BACKFILLING.
- 20) TUMBLING BAY MAX PIPE TO PIPE HEIGHT REVISED TO MAXIMUM 6000.
- 21) SAND REPLACED TO LEAN CONCRETE FOR TYPE 'B', 'C' OR 'D' SECTION.
- 22) INTERNAL DIAMETER OF MANHOLE REVISED.

AMENDMENTS

**OPUB** SINGAPORE'S NATIONAL WATER AGENCY

WATER RECLAMATION (NETWORK) DEPARTMENT

DRG. NO. PUB/WRN/STD/001B

# STANDARD DETAILS OF SEWERS AND MANHOLES

ISSUED : APR 2005

REVIEWED : JAN 2019

**SCALES**  
1 : 20  
UNLESS OTHERWISE STATED

ORIGINAL BORDER SIZE 810mm X 565mm