

- LEGEND**
- PFSL PROPOSED FINISHED SURFACE LEVEL
 - MH MANHOLE
 - SS STAINLESS STEEL
 - SLS SERVICEABILITY LIMIT STATE
 - ULS ULTIMATE LIMIT STATE
 - WAC WORK AS CONSTRUCTED

- NOTES:**
1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE CURRENT VERSIONS OF:
 - a. SYDNEY WATER DEEMED-TO-COMPLY DRAWINGS, TERMS AND CONDITIONS OF USE
 - b. SYDNEY WATER TECHNICAL SPECIFICATIONS - CIVIL, MECHANICAL
 - c. SYDNEY WATER ENGINEERING COMPETENCY STANDARDS
 - d. WSA 201 - MANUAL FOR SELECTION AND APPLICATION OF PROTECTIVE COATINGS AND SYDNEY WATER SUPPLEMENT TO WSA 201.
 - e. DEEMED TO COMPLY DRAWING DTC/2321.
 2. DTC VENTILATION SHAFTS ARE CLASSED AS 'MEDIUM STRUCTURES' WITHIN THE SYDNEY WATER ENGINEERING COMPETENCY STANDARDS FOR STRUCTURAL AND GEOTECHNICAL DISCIPLINES.
 3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 4. VENTILATION SHAFT DESIGN IS BASED ON AS/NZS 1170.2:2021 STRUCTURAL DESIGN ACTIONS PART 2: WIND ACTIONS. REFER TO TABLES 3 FOR APPLICABLE DESIGN WIND SPEED.
 5. ALL STAINLESS STEEL PLATES SHALL BE GRADE 316L TO ASTM A240/A240M: 2019. ALL STAINLESS STEEL PIPES SHALL BE TO ASTM A312/A312M, AND SHALL NOT BE COMPOSED OF LENGTHS OF PIPES WELDED TOGETHER.
 6. FLANGES SHALL BE FACTORY FILLET WELDED TO THE PIPES TO AS 1554.6.
 7. ALL WELDS ARE TO BE FACTORY WELDED WITH:
 - a. SUB-SURFACE (INTERNAL) QUALITY: CATEGORY 1
 - b. SURFACE (EXTERNAL) WELD QUALITY: CLASS A
 - c. SURFACE CONDITION: SURFACE CONDITION II-CLEANED AS PER AS/NZS 1554.6 - WELDING STAINLESS STEELS FOR STRUCTURAL PURPOSES. THE ATMOSPHERE WITHIN VENTILATION SHAFTS IS CONSIDERED TO BE CORROSIVE IN REGARD TO AS1554.6.
 8. E316XX ELECTRODES TO BE USED.
 9. NON-DESTRUCTIVE EXAMINATION OF WELDS SHALL BE TO AS1554.6 TABLE 7.4 FOR WELD CATEGORY 1A AND ALL FLANGE WELDS SHALL BE EXAMINED BY LIQUID PENETRANT OR RADIOGRAPHY/ULTRASONIC.
 10. ALL WELDS ARE TO BE FACTORY PICKLED AND PASSIVATED IN ACCORDANCE WITH ASTM A380.
 11. MINIMUM FOOTING DIMENSIONS IN TABLE 1, SHALL BE INVESTIGATED AND CONFIRMED BY A COMPETENT GEOTECHNICAL ENGINEER USING APPROPRIATE DESIGN CHECKS, TO SATISFY THE FOLLOWING CRITERIA, TO SUIT GROUND CONDITIONS ON SITE:
 - 11.1. ESTIMATED MAXIMUM DIFFERENTIAL SETTLEMENT ACROSS FOOTING WIDTH IS LESS THAN 8mm AT VARYING APPLIED PRESSURE OF MINIMUM 0 kPa TO MAXIMUM 100 kPa (APPLIED ACROSS THE WIDTH); UNDER SHORT AND LONG TERM CONDITIONS, OR;
 - 11.2. IF SETTLEMENT CRITERIA IN 11.1 IS NOT MET, SUITABLE GROUND IMPROVEMENT MEASURES SHALL BE DESIGNED BY A COMPETENT GEOTECHNICAL ENGINEER. GROUND IMPROVEMENT DESIGN SHALL BE SUBMITTED TO SYDNEY WATER FOR APPROVAL.
 12. DTC FOOTING DESIGN IS NOT SUITABLE FOR AGGRESSIVE SOIL CONDITIONS OR ADJACENT TO AN EMBANKMENT.
 13. ALL REINFORCEMENT SHALL BE TO AS/NZS 4671 SHAPE -D, STRENGTH GRADE - 500 MPa, DUCTILITY CLASS - N WITH 70 CLEAR COVER.
 14. ALL CONCRETE SHALL BE CLASS N32 TO SYDNEY WATER'S TECHNICAL SPECIFICATION-CIVIL. SLUMP SHALL BE IN THE RANGE OF 80-120. MAXIMUM NOMINAL AGGREGATE SIZE SHALL BE 20.
 15. VENTILATION SHAFT SHOULD NOT BE ERECTED UNTIL THE CONCRETE BASE BLOCK HAS REACHED 25 MPa STRENGTH.
 16. UNLESS DIRECTED OTHERWISE BY SYDNEY WATER, THE VENTILATION SHAFT SHALL NOT BE PAINTED. PAINTING SHALL BE IN ACCORDANCE WITH SYSTEM PUR-A. BEAD BLASTING IS NOT REQUIRED FOR VENTILATION SHAFTS TO BE PAINTED.
 17. EXTERNAL SURFACES FOR ALL STAINLESS STEEL ITEMS SHALL BE BEAD BLASTED TO ACHIEVE A NON-DIRECTIONAL LOW REFLECTIVE UNIFORM MATT FINISH WITH A SURFACE ROUGHNESS PROFILE OF RA 3.5 TO 4.5 MICRONS. BLAST MEDIA SHALL BE GLASS. THE BLASTING MEDIA SHALL BE FREE OF CONTAMINATION INCLUDING IRON AND STEEL.
 18. NO ADDITIONAL PICKLING OR PASSIVATION IS REQUIRED FOR BLASTED SURFACES.
 19. FLANGES ARE TO BE SEALED BY MEANS OF A CONTINUOUS NEUTRAL SILICON BEAD OF 6mm USING A CAULKING GUN TO THE INSIDE RING OF BOLTING PRIOR TO THE INSERTION OF THE UPPER SEGMENT WITH LOCK NUTS AND BOLTS TO ASTM A276. FLANGE BOLTS, INCLUDING HOLDING DOWN BOLTS, SHALL BE TIGHTENED IN ACCORDANCE WITH TIGHTENING TORQUES IN TABLES 6 AND 7 ON DTC/2321.
 20. STAINLESS STEEL HOLDING DOWN BOLTS TO BE LUBRICATED BY ANTI-GALLING PASTE TO STOP SEIZING.
 21. FINAL DIMENSIONS OF ALL VENTILATION ELEMENTS TO BE SHOWN ON WAC DRAWINGS.
 22. WHERE PROPRIETARY PRODUCTS ARE SPECIFIED, THE PRODUCT SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
 23. NO WELDED CONNECTION OTHER THAN THOSE SHOWN ON DRAWINGS ARE ALLOWED.
 24. VENT SHAFT SECTION WEIGHT LIMITED TO 250kg IN LINE WITH SWL OF SCAFFOLD WINCH ASSOCIATED WITH SECTION INSTALLATION.
 25. 'NYLOC' NUTS ARE NOT ACCEPTABLE TO REPLACE LOCK NUTS. LOCK NUTS MUST BE STAINLESS STEEL.

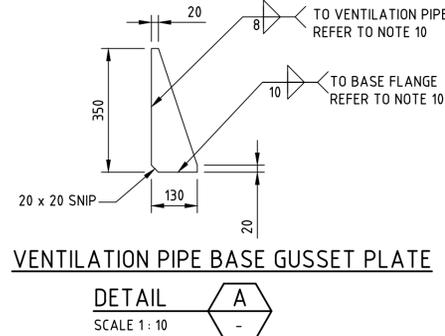


TABLE 1 - MINIMUM FOOTING DIMENSIONS (SEE NOTE 11)

NOMINAL DIAMETER	MIN 100 kPa (CORRESPONDING TO MAX 8mm SETTLEMENT) DEMAND ALLOWABLE BEARING CAPACITY (SEE NOTE 11)		
	W	D	P
DN150	1750	1300	φ450
DN250	2250	1500	φ550

TABLE 2 - ROCKER PIPE DIMENSIONS

NOMINAL DIAMETER	LENGTH	
	MIN	MAX
DN150	300	450
DN250	450	675

TABLE 3- VENTILATION PIPE DIMENSIONS FOR ULTIMATE DESIGN WIND SPEED ≤ 56 m/s

NOMINAL DIAMETER	MAX HEIGHT	PIPE SCHEDULE	DIMENSIONS	
			OD	WALL THICKNESS
DN150	12,000	S80	168.3	10.97
DN250	15,000	S40	273.1	9.27

TABLE 4- DESIGN PARAMETERS FOR WIND LOADING CALCULATION

VENTILATION SHAFT SERVICE LIFE	50 YEARS
IMPORTANCE LEVEL	2
ULS WIND RETURN PERIOD	500
SLS WIND RETURN PERIOD	25
REGION	A1
SLS LIMIT FOR LATERAL DEFLECTION OF VENTILATION SHAFT TIP	HEIGHT/30

TABLE 5- APPROXIMATE MASS PER 3m SPOOL SECTION (REFER NOTE 24)

NOMINAL DIAMETER	APPROX MASS (kg)
DN150	143
DN250	213