

INSTRUCTIONS NOTES FOR USE OF DEEMED TO COMPLY DRAWINGS FOR PRE-CAST MAINTENANCE HOLES:

- 1)

THE DESIGN IS BASED ON USE OF MODULAR PRECAST CONCRETE COMPONENTS ALLOWING ASSEMBLY TO SUIT A VARIETY OF APPLICATIONS.THE DRAWINGS PROVIDE DEEMED TO COMPLY (DTC) SOLUTIONS FOR VARIOUS COMPONENTS, AND ASSEMBLY DETAILS FOR THE COMPONENTS REQUIRED TO CONSTRUCT A DN1200 PRECAST MAINTENANCE HOLE.

COMPONENTS MAY BE CONSTRUCTED IN ACCORDANCE WITH THE SYDNEY WATER REFERENCE DESIGN, OR AN APPROVED EQUIVALENT 'OFF THE SHELF' PRODUCT. SUPPLIERS OF PRECAST COMPONENTS ARE ENCOURAGED TO SUBMIT DETAILS OF THEIR PRODUCT FOR ASSESSMENT AND LISTING IN THE DRAWINGS, WHERE ACCEPTED.
- 2)

THE USER MUST NOTE THAT USE OF STANDARD DESIGN COMPONENTS MAY INTRODUCE UNINTENDED SAFETY RISKS FOR SPECIFIC APPLICATION. THE USER MUST ADDRESS SAFETY RISKS THROUGH SITE SPECIFIC ASSESSMENT.
- 3)

LIMITATIONS ON THE NUMBER AND SIZES OF SEWERS AND MAINTENANCE HOLE DEPTH ARE GIVEN IN THE TABLE BELOW.

| NOMINAL INTERNAL DIA (mm) | DRG. NO. | MIN. DEPTH (m) | MAX. DEPTH (m) | OUTLET SEWER MAIN SIZE (DN) | MAX NUMBER INLETS |
|---------------------------|----------|----------------|----------------|-----------------------------|-------------------|
| 1200 | DTC/2253 | 0.85 | 6.00 | 150-225 | 3 |
| 1200 | DTC/2254 | 2.05 | 6.00 | 300-450 | 2 |
- 4)

EACH PRECAST MAINTENANCE HOLE ASSEMBLY IS MADE UP OF FIVE BASIC COMPONENTS AS FOLLOWS:

i)

A BASE UNIT

ii)

SHAFT RINGS (HEIGHT AND NUMBER SELECTED TO FORM THE REQUIRED MAINTENANCE HOLE HEIGHT)

iii)

ROOF CONVERTER SLAB (DN1200 MH)

iv)

A MAXIMUM OF ONE SPACER RING

v)

A DN600 ACCESS COVER WITH CONCRETE SURROUND

5)

MAINTENANCE HOLES MUST BE FORMED WITH THE MINIMUM NUMBER OF COMPONENTS TO MINIMISE THE NUMBER OF JOINTS.

6)

FOR THE SYDNEY WATER REFERENCE DESIGN, BASE UNIT PENETRATIONS MUST BE LOCATED TO SUIT SITE SPECIFIC GEOMETRY AS DETERMINED BY THE USER IN ACCORDANCE WITH THE FOLLOWING:

i)

DN150 SEWERS MUST BE CONNECTED THROUGH ø200 HOLE CORED THROUGH THE PRECAST BASE UNIT WALL

ii)

DN225 SEWERS MUST BE CONNECTED THROUGH ø300 HOLE CORED THROUGH THE PRECAST BASE UNIT WALL

iii)

DN300 TO DN450 SEWERS MUST BE CONNECTED THROUGH A ø650-700 TAPERED BLOCKOUT PROVIDED FOR DURING FABRICATION OF THE BASE UNIT.

7)

THE DESIGN INCLUDES A MINIMUM 50 DROP ACROSS THE BASE UNITS. GREATER DROPS AS REQUIRED BY WSA 02-2002-2.2 MUST BE ACHIEVED BY RAISING THE INLET INVERT POSITION OF UPSTREAM AND DOWNSTREAM PIPES WITHIN IN THE CORE OR BLOCKOUT.

8)

HIGH LEVEL CONNECTIONS TO MAINTENANCE HOLES (e.g. VENT LINE, EXTERNAL DROP)

i)

MAXIMUM SIZE FOR VENT LINE MUST BE DN300 VIA DN225 PENETRATION DETAIL IN A DN300 CORED HOLE WITH A DN225/DN300 TAPER.

ii)

MAXIMUM SIZE FOR EXTERNAL DROP MUST BE DN225.

iii)

LOCATED IN SHAFT RINGS WITH HEIGHTS OF 900 OR GREATER.

9)

FLOTATION OF STRUCTURES BELOW GROUND

i)

MAINTENANCE HOLES HAVE BEEN DESIGNED TO RESIST BUOYANCY FORCES DUE TO EXTERNAL GROUNDWATER BY ENGAGING THE SURROUNDING SOIL THROUGH THE OVERSIZED BASE SLAB. APPLICATION OF THIS METHOD ASSUMES ANY SHORING OR SHEET PILING IS REMOVED AS PART OF CONSTRUCTION.

NOTES

GENERAL:

G1.

ALL WORKS TO BE IN ACCORDANCE WITH SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL, AND SYDNEY WATER TECHNICAL SPECIFICATION - MECHANICAL UNO.

G2.

ALL PIPES/FITTINGS/VALVES/OTHER PRODUCTS MUST BE TO EPS 500 OR EPS 501 UNO.

G3.

THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH THE FOLLOWING:

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SEWERAGE CODE OF AUSTRALIA WSA 02-2002-2.2 SYDNEY WATER EDITION 1 - VERSION 4

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SEWAGE PUMPING CODE OF AUSTRALIA WSA 04-2005-2.1 SYDNEY WATER EDITION 2012

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WSAA MANUAL FOR SELECTION AND APPLICATION OF PROTECTIVE COATINGS WSA 201-2020 2.3 AND SYDNEY WATER SUPPLEMENT

G4.

THE CONTRACTOR MUST BE RESPONSIBLE FOR THE DESIGN OF ANY TEMPORARY WORKS.

G5.

WHERE PROPRIETARY ITEMS HAVE BEEN SPECIFIED, A SUITABLE EQUIVALENT MAY BE USED IF APPROVED BY SYDNEY WATER. PROPRIETARY ITEMS MUST BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

G6.

COMPLIANCE TESTING AND COMMISSIONING MUST BE UNDERTAKEN AS PER THE SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL, SYDNEY WATER TECHNICAL SPECIFICATION - COMMISSIONING, AND APPROVED SITE SPECIFIC COMMISSIONING PLAN PREPARED TO SYDNEY WATER STANDARD.

G7.

THIS DESIGN IS NOT SUITABLE FOR UNSTABLE GROUND, CONTAMINATED GROUND OR MINE SUBSIDENCE AREAS.

G8.

DIMENSIONS ARE IN MILLIMETRES U.N.O.. DIMENSIONS MUST NOT BE OBTAINED BY SCALING THE DRAWINGS.

CONCRETE

C1.

STRUCTURAL CONCRETE MUST BE SPECIAL CLASS S50 FOR PRECAST AND INSITU CONCRETE ELEMENTS TO SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.

C2.

DRY CAST MANUFACTURE OF PRECAST CONCRETE ELEMENTS MUST NOT BE USED.

C3.

CURING OF ALL CONCRETE MUST BE AS PER SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.

C4.

CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 32 MPa PRIOR TO BACKFILLING OR TESTING.

C5.

SIZES OF CONCRETE MEMBERS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.

C6.

25 CHAMFER FOR ALL EXPOSED CONCRETE EDGES AND 20 FILLET FOR ALL RE-ENTRANT CORNERS MUST BE PROVIDED U.N.O.

C7.

SURFACE FINISHES MUST BE IN ACCORDANCE WITH SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.

FOUNDATION:

F1.

GROUND CONDITIONS MUST BE VERIFIED BY A COMPETENT GEOTECHNICAL ENGINEER.

F2.

FOUNDATION PREPARATION MUST BE IN ACCORDANCE WITH THE SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.

F3.

THE BEARING STRATUM MUST BE NATURAL GROUND OR COMPACTED FILL. BEARING CAPACITY REQUIREMENTS WILL BE SATISFIED PROVIDED THE REQUIREMENTS OF TABLE F3 ARE MET.

TABLE F3: MINIMUM FOUNDATION CONDITIONS FOR MAINTENANCE HOLE SHAFT BASES

| MATERIAL | MINIMUM STRENGTH/ DENSITY INDEX/ COMPACTION | MINIMUM EQUIVALENT DCP TESTING (NOTE i) | REQUIRED TEST DEPTH BELOW FOUNDATION LEVEL |
|-------------------------|--|---|--|
| STIFF CLAY | UNDRAINED SHEAR STRENGTH, Su, NOT LESS THAN 75 kPa | DCP NOT LESS THAN 12 BLOWS/300mm | 1.5m OR PRIOR REFUSAL |
| MEDIUM DENSE SAND | DENSITY INDEX NOT LESS THAN 60% | DCP NOT LESS THAN 8 BLOWS/300mm DCP NOT LESS THAN 12 BLOWS/300mm | 0.0 TO 0.6m 0.6m TO 1.5m OR PRIOR REFUSAL |
| COMPACTED EXISTING FILL | - | DCP NOT LESS THAN 12 BLOWS/300mm | 0.0 TO 1.5m |

i.

DCP - DYNAMIC CONE PENETRATION TEST PER AS1289

TESTS MUST BE CARRIED OUT WITHIN 0.5m OF THE CENTRE OF THE MAINTENANCE HOLE BASE

ii.

COMPACT NEW FILL AS PER SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL

F4.

ALL SOFT OR LOOSE MATERIAL NOT MEETING THE ABOVE REQUIREMENTS MUST BE EXCAVATED AND REPLACED WITH SELECT FILL, COMPACTED AS PER THE SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.

F5.

ANY OVER-EXCAVATED ROCK OR CAVITIES MUST BE BACKFILLED WITH GRADE N20 MASS CONCRETE TO SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.

F6.

FOR SHALLOW, VERTICALLY LOADED MAINTENANCE HOLE SHAFT FOOTINGS WITH MINIMUM EMBEDMENT 1m BELOW FINAL GRADE, THE ULTIMATE BEARING CAPACITY OF THE GROUND AT FOUNDATION LEVEL IS ASSUMED TO BE 500kPa. A GEOTECHNICAL STRENGTH REDUCTION FACTOR OF 0.4 MUST BE ADOPTED TO CALCULATE DESIGN GEOTECHNICAL STRENGTH.

EARTHWORKS AND BACKFILLING:

B1.

BACKFILL MUST BE PLACED AND COMPACTED EVENLY AROUND EACH MAINTENANCE HOLE IN LAYERS NOT EXCEEDING 300 LOOSE THICKNESSES.

i)

WHERE EXTERNAL CLEARANCE AT THE TIME OF BACKFILL IS <500, BACKFILL STRUCTURE WITH 20:1 SAND TO GP CEMENT STABILISED SAND.

ii)

WHERE EXTERNAL CLEARANCE AT THE TIME OF BACKFILL IS >500, BACKFILL MUST BE SELECT FILL MATERIALS AS PER THE SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.

B2.

AT NO STAGE IS THERE TO BE A DIFFERENCE IN THE HEIGHT OF BACKFILL ACROSS A MAINTENANCE HOLE OF MORE THAN 500.

B3.

BACKFILLING AROUND EACH MAINTENANCE HOLE MUST BE STAGED IF THE DEPTH OF THE MAINTENANCE HOLE IS GREATER THAN 2.5m. AT NO STAGE MUST THE HEIGHT OF THE TOP OF A PARTIALLY COMPLETED MAINTENANCE HOLE BE MORE THAN 2.5m ABOVE THE LEVEL OF COMPACTED BACKFILL AROUND THE MAINTENANCE HOLE.

B4.

COMPACTION MUST BE IN ACCORDANCE WITH SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.

REINFORCEMENT

R1.

REINFORCEMENT BARS AND MESH MUST COMPLY WITH SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL. REINFORCEMENT SYMBOLS:
N - DENOTES GRADE 500N DEFORMED BARS
R - DENOTES GRADE 250N ROUND BARS
SL - DENOTES GRADE 500L DEFORMED SQUARE FABRIC
RL - DENOTES GRADE 500L DEFORMED RECTANGULAR FABRIC

R2.

CLEAR CONCRETE COVER TO REINFORCEMENT MUST BE AS FOLLOWS UNLESS OTHERWISE SHOWN

PRECAST CONCRETE ELEMENTS - RIGID FORMWORK / INTENSE COMPACTION
55 ALL SURFACES

CLEAR IN-SITU CONCRETE ELEMENTS - STANDARD FORMWORK/COMPACTION
70 LIQUID RETAINING SURFACES
70 SURFACES IN CONTACT WITH GROUND
70 SURFACES IN CONTACT WITH GROUND PROTECTED BY BLINDING CONCRETE
70 SURFACES ABOVE GROUND

R3.

REINFORCEMENT IN STRUCTURES MUST NOT BE WELDED UNLESS THEY ARE OF A WELDABLE GRADE. WELDING PROCEDURE MUST CONFORM TO THE MANUFACTURER'S RECOMMENDATIONS FOR CONTROL OF HEAT INPUT. WHERE GRADE 500L IS WELDED, IT MUST BE DEMONSTRATED TO SYDNEY WATER WHO WILL NEED TO BE PROVIDED WITH DOCUMENTARY EVIDENCE THAT THE WELDING PROCEDURE DOES NOT RESULT IN THE LOSS OF DUCTILITY. GRADE 500L REINFORCEMENT MUST NOT BE FIELD WELDED.

R4.

PIPES OR CONDUITS MUST NOT BE PLACED WITHIN THE CONCRETE COVER TO REINFORCEMENT.

R5.

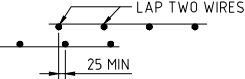
REINFORCEMENT IS SHOWN DIAGRAMMATICALLY ON THE DRAWINGS AND THEREFORE DOES NOT DEPICT THE EXACT POSITION OF THE BARS.

R6.

REINFORCEMENT ANCHORAGE, COGS AND LAP LENGTHS MUST BE AS FOLLOWS UNLESS NOTED OTHERWISE.

| BAR SIZE (GRADE 500N) | N12 | N16 |
|--------------------------|-----|-----|
| ANCHORAGE AND LAP LENGTH | 400 | 600 |
| COG LENGTH | 200 | 250 |

R7.

MESH LAP DETAIL :

R8.

WHERE REINFORCEMENT IS LAPPED, THE LAPS MUST BE STAGGERED AND NO MORE THAN 50% OF THE REINFORCEMENT MUST BE LAPPED AT ANY ONE SECTION UNLESS OTHERWISE SPECIFIED. SPLICE LENGTHS GIVEN ABOVE MUST BE INCREASED BY 33% AT LOCATIONS OF MAXIMUM STRESS OR WHERE MORE THAN ONE HALF OF THE BARS ARE SPLICED AT ANY ONE LOCATION.

R9.

ALL HOOKS AND COGS MUST BE IN ACCORDANCE WITH AS 5100.

R10.

TT - DENOTES TOP LAYER LAID SECOND.
T - DENOTES TOP LAYER LAID FIRST.
BB - DENOTES BOTTOM LAYER LAID FIRST.
B - DENOTES BOTTOM LAYER LAID SECOND.
EF - DENOTES EACH FACE.

R11.

NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS ARE TO BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR APPROVAL OF THE STRUCTURAL DESIGNER.

STRUCTURAL DESIGN BASIS

SD1.

THE STRUCTURES WITHIN THIS DTC SET HAVE BEEN DESIGNED FOR THE FOLLOWING SOIL PROPERTIES. DESIGNER IS TO UNDERTAKE SPECIFIC DESIGN IF SOIL PROPERTIES DO NOT COMPLY WITH THESE ASSUMPTIONS.

SOIL PROPERTIES
ø'= 30° (LOWER BOUND FOR DESTABILISING ULTIMATE ACTIONS)
DENSITY (γ) = 20kN/m³(UPPER BOUND FOR DESTABILISING ULTIMATE ACTIONS)
COEFFICIENT OF EARTH PRESSURE AT REST Ko = 0.5
COEFFICIENT OF ACTIVE EARTH PRESSURE FOR STABILISING SERVICEABILITY ACTIONS Ka = 0.2

SD2.

THE STRUCTURES WITHIN THIS DTC SET HAVE BEEN DESIGNED FOR THE FOLLOWING LOADS. DESIGNER IS TO UNDERTAKE SPECIFIC DESIGN IF LOADS DO NOT COMPLY WITH THESE ASSUMPTIONS.

EXTERNAL SURCHARGE LOAD: 20kPa
LIVE LOAD:
SUBJECT TO VEHICULAR TRAFFIC - SM1600 TO AS5100.2 AND CLASS D TO AS3996
NOT SUBJECT TO VEHICULAR TRAFFIC - CLASS B TO AS3996
GROUND WATER TABLE AT SURFACE LEVEL.

SD3.

THE STRUCTURES WITHIN THIS DTC SET HAVE BEEN DESIGNED FOR THE FOLLOWING CONCRETE EXPOSURE CLASSIFICATION. DESIGNER IS TO UNDERTAKE SPECIFIC DESIGN IF CONCRETE EXPOSURE CLASSIFICATION DOES NOT COMPLY WITH THIS ASSUMPTION.

CONCRETE EXPOSURE CLASSIFICATION - D (AS3735)

SD4.

THE STRUCTURES WITHIN THIS DTC SET HAVE BEEN DESIGNED FOR THE FOLLOWING SEISMIC LOAD. DESIGNER IS TO UNDERTAKE SPECIFIC DESIGN IF SEISMIC LOADS DO NOT COMPLY WITH THESE ASSUMPTIONS.

SEISMIC LOAD:
ANNUAL PROBABILITY OF EXCEEDANCE 1/2500
SITE SUB-SOIL CLASS Ce - SHALLOW SOIL SITE

REFERENCE DRAWINGS:

| | |
|----------|--|
| DTC/2253 | DN1200 MAINTENANCE HOLES - PRECAST - FOR DN150 - DN225 SEWERS, <6m DEEP - GENERAL ARRANGEMENT |
| DTC/2254 | DN1200 MAINTENANCE HOLES - PRECAST - FOR DN300 - DN450 SEWERS, <6m DEEP - GENERAL ARRANGEMENT |
| DTC/2256 | MAINTENANCE HOLES - PRECAST - DN1200 SHAFT RING - DETAILS |
| DTC/2257 | DN1200 MAINTENANCE HOLES - PRECAST - BASE SLAB FOR DN150 - DN225 SEWERS - GENERAL PLAN AND REINFORCEMENT |
| DTC/2258 | DN1200 MAINTENANCE HOLES - PRECAST - BASE SLAB FOR DN300 - DN450 SEWERS - GENERAL PLAN AND REINFORCEMENT |
| DTC/2259 | MAINTENANCE HOLES - PRECAST - PIPEWORK PENETRATION - DETAILS |
| DTC/2260 | MAINTENANCE HOLES - PRECAST - PRECAST COMPONENTS - MISCELLANEOUS DETAILS |
| DTC/2261 | MAINTENANCE HOLES - PRECAST - EXTERNAL DROP FOR DN150 - DN225 - DETAILS |
| DTC/2262 | MAINTENANCE HOLES - PRECAST - DN1200 - SHAFT RING - SCHEDULE |

SUPPORT DRAWINGS:

| | |
|----------|--|
| DTC/2220 | MAINTENANCE HOLES - DETAILS - SHEET 1 |
| DTC/2222 | MAINTENANCE HOLES - DETAILS - SHEET 3 |
| DTC/2223 | DN1200 MAINTENANCE HOLES - ROOF SLAB DETAILS |
| DTC/2224 | MAINTENANCE HOLE DETAILS, COVER AND SPACER DETAILS |

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|---|----------|---|----------------|--|-------|---------------------------|---|-------------|----------|--|--|--|--|
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| | | ENGINEERING & TECHNICAL SUPPORT | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | B | | GENERAL UPDATE | | NS | 31/07/24 | MAINTENANCE HOLES - PRECAST DN1200 NOTES, INSTRUCTIONS & DRAWING LIST | | | | | | |
| | A | | ORIGINAL ISSUE | | KW | 22/06/15 | | | | | | | |
| LETTER | | DETAILS OF ISSUE / AMENDMENT | | | APP'D | DATE | | | | | | | |
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