

GENERAL NOTES

- G1. THESE DRAWINGS MUST BE READ IN CONJUNCTION WITH THE FOLLOWING:
  - SEWERAGE CODE OF AUSTRALIA WSA 02-2002-2.2 SYDNEY WATER EDITION 1 –VERSION 3, PART 3
  - SYDNEY WATER TECHNICAL SPECIFICATIONS PART 1 CIVIL WORKS, PART 2 MECHANICAL WORKS AND PART 3 ELECTRICAL WORKS
  - EPS 500 ENGINEERING PRODUCT SPECIFICATION FOR STANDARD PIPES AND FITTINGS FOR NETWORKS
  - EPS 501 LIST OF APPROVED NON-STANDARD PRODUCTS FOR NETWORKS
- G2. DIMENSIONS ARE IN MILLIMETRES U.N.O. DIMENSIONS MUST NOT BE OBTAINED BY SCALING THE DRAWINGS.
- G3. STRUCTURAL CRITERIA
  - i) STRUCTURAL WORK SHOWN ON THESE DRAWINGS HAS BEEN DESIGNED FOR THE FOLLOWING LOADING CONDITIONS:--

STRUCTURE	LOADS
STORAGE TANK	ROOF SLAB CONCRETE ROOF - 5 kPa METAL ACCESS HATCHES - 2.5 kPa
	TANK SHAFT RINGS AND BASE INTERNAL HYDROSTATIC PRESSURE FLUID DENSITY (γ ) = 15 kN/m EXTERNAL EARTH PRESSURE SOIL - ϕ’ = 30 (LOWER BOUND FOR DESTABILISING ULTIMATE ACTIONS) DENSITY (γ ) = 20 kN/m³ (UPPER BOUND FOR DESTABILISING ULTIMATE ACTIONS) COEFFICIENT OF EARTH PRESSURE AT REST K <sub>o</sub> = 0.5 MAX. COEFFICIENT OF ACTIVE EARTH PRESSURE FOR STABILISING SERVICEABILITY ACTIONS K <sub>a</sub> = 0.2 EXTERNAL SURCHARGE LOAD 20 kPa GROUNDWATER TABLE AT SURFACE LEVEL

- G4. THE USER 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 THE MANUFACTURER’S INSTRUCTIONS.
- G6. THIS DESIGN IS NOT SUITABLE FOR UNSTABLE GROUND, CONTAMINATED GROUND OR MINE SUBSIDENCE AREAS
- G7. THIS DESIGN IS SUITABLE FOR AREAS WITHIN PRIVATE PROPERTIES, AND PUBLIC PLACES, PEDESTRIAN MALLS AND FOOTWAYS NOT SUBJECTED TO VEHICULAR LOADING AND PREVENTED FROM ACCIDENTAL VEHICLE LOADING BY MEANS OF PHYSICAL BARRIERS (e.g. BOLLARDS, TRAFFIC BARRIERS, OR KERBS HIGHER THAN 300mm).  
  
THIS IS DESIGN IS NOT SUITABLE IN AREAS WHERE THE GROUND SLOPE IS GREATER THAN 1V:8H OR AREAS WHERE UNBALANCED LOADS ARE EXPECTED.
- G8. THE PRECAST MAINTENANCE HOLE AND STORAGE TANKS MUST BE LOCATED OUTSIDE THE ZONE OF INFLUENCE OF OTHER STRUCTURES.

PIPEWORK

- P1. ALL PIPES/FITTINGS/VALVES/OTHER PRODUCTS TO BE IN ACCORDANCE WITH EPS 500 OR EPS 501.
- P2. PIPEWORK MUST BE AS FOLLOWING:
  - PRESSURE PVC-U SERIES 1 PN18.
  - DWV PVC-U SN8
- P3. FLANGE BOLTS MUST BE COMMERCIAL GRADE GRADE 4.6, BOLTING CATEGORY 4.6/S SNUG TIGHTENED. ALL FASTENERS MUST BE GALVANISED. PROVIDE 3mm EPDM GASKET TO WSA PS-109.

CONCRETE

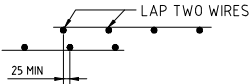
- C1. EXPOSURE CLASSIFICATION:
  - C - FOR FLOORS
  - D - FOR WALLS AND ROOF
- C2. THE DESIGN CERTIFICATION, CONSTRUCTION AND PERFORMANCE OF FORMWORK AND FALSE WORK IS THE RESPONSIBILITY OF THE USER. FORMWORK DESIGN MUST TAKE INTO CONSIDERATION INTENSE COMPACTION AND VIBRATION LOADS.
- C3. STRUCTURAL CONCRETE FOR STORAGE TANKS TO BE GRADE S50 FOR PRECAST AND IN-SITU CONCRETE ELEMENTS.
- C4. BLINDING CONCRETE TO BE GRADE N20.
- C5. DRY CAST MANUFACTURED PRECAST CONCRETE ELEMENTS MUST NOT BE USED.
- C6. STRUCTURAL CONCRETE FOR CONCRETE ELEMENTS OTHER THAN THE STORAGE TANKS MUST BE GRADE N32 U.N.O.
- C7. CONCRETE MUST ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 80% DESIGN STRENGTH PRIOR TO BACKFILLING. BACKFILL MUST BE PLACED AND COMPACTED EVENLY AROUND STRUCTURES IN LAYERS NOT EXCEEDING 300mm LOOSE THICKNESS. WHERE EXCAVATION SIZE DOES NOT FACILITATE COMPACTION, BACKFILL USING CEMENT STABILISED SAND.
- C8. SIZES OF CONCRETE MEMBERS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
- C9. CHAMFER 25mm FOR ALL EXPOSED CONCRETE EDGES AND 20mm FILLET FOR ALL RE-ENTRANT CORNERS MUST BE PROVIDED U.N.O.
- C10. CONCRETE CORING ON SITE MUST BE LIMITED TO 300mm DIAMETER.
- C11. A 250mm CLEARANCE IS TO BE MAINTAINED BETWEEN THE EDGE OF ANY CORED HOLE AND THE EDGE OF ANY JOINT.

REINFORCEMENT

- R1. REINFORCING 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. LOAD BEARING WELDED JOINTS FOR THE TRANSMISSION OF LOADS BETWEEN REINFORCEMENT IS NOT PERMITTED.  
NON LOAD BEARING WELDED JOINTS (TACK WELDS) TO KEEP REINFORCEMENT IN POSITION DURING FABRICATION, TRANSPORT & CONCRETING, IS PERMITTED WHERE WELDING WILL NOT IMPACT DUCTILITY OF REINFORCEMENT.  
GRADE 500L REINFORCEMENT MUST NOT BE FIELD WELDED.  
WELDING MUST BE IN ACCORDANCE WITH AS 1554.3.  
LAP LENGTHS MUST NOT BE REDUCED DUE TO WELDING.
- R3. PIPES OR CONDUITS MUST NOT BE PLACED WITHIN THE CONCRETE COVER TO REINFORCEMENT.
- R4. REINFORCEMENT IS SHOWN DIAGRAMMATICALLY ON THE DRAWINGS AND THEREFORE DOES NOT DEPICT THE EXACT POSITION OF THE BARS.
- R5. REINFORCEMENT ANCHORAGE COGS AND LAP LENGTHS MUST BE AS FOLLOWS U.N.O.

BAR SIZE		N12	N16	N20	N24	N28	N32	N36
DEVELOPMENT LENGTH	HORIZONTAL BARS WITH >300mm CONCRETE CAST BELOW THE BARS	550	750	950	1150	1400	1650	1950
	OTHER BARS	400	550	750	900	1100	1300	1500
LAP LENGTH	HORIZONTAL BARS WITH >300mm CONCRETE CAST BELOW THE BARS	700	950	1200	1500	1750	2100	2500
	OTHER BARS	500	700	950	1150	1400	1650	1900
COG LENGTH		200	250	300	350	400	450	450

- R6. MESH LAP DETAIL:



- R7. 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.
- R8. ALL HOOKS AND COGS MUST BE IN ACCORDANCE WITH AS5100
- R9. 

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
- R10. NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS MUST BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR APPROVAL OF SYDNEY WATER.

EARTHWORKS AND BACKFILLING

- EB1. ONLY EXCAVATED MATERIAL THAT MEETS THE DEFINITION OF SELECT FILL AS PER THE SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL MAY BE USED AS BACKFILL MATERIAL.
- EB2. COMPACTION MUST BE IN ACCORDANCE WITH SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.
- EB3. BACKFILLING AROUND STRUCTURES MUST BE CARRIED OUT SIMULTANEOUSLY ON ALL SIDES. AT NO STAGE MUST THE DIFFERENCE IN HEIGHT OF BACKFILL AGAINST THE WALLS BE MORE THAN 500mm.

FOUNDATIONS

- 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 TANK 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, C <sub>u</sub> , 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 CENTER OF THE MANHOLE 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 TANK 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.

METALWORK

- S1. STRUCTURAL STEELWORK MUST BE IN ACCORDANCE WITH SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.
- S2. ALL BOLTS MUST BE IN ACCORDANCE WITH SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL.
- S3. NON-STAINLESS STEEL WORK MUST BE GALVANIZED IN ACCORDANCE WITH WSA 201-2020 2.3 MANUAL FOR SELECTION AND APPLICATION OF PROTECTIVE COATINGS.
- S4. DAMAGE TO GALVANIZING AFTER FABRICATION TO BE MADE GOOD IN ACCORDANCE WITH MANUAL FOR SELECTION AND APPLICATION OF PROTECTIVE COATINGS WSA 201-2020 VERSION 2.3.

LIFTING & HANDLING OF PRECAST CONCRETE

- LH1. MINIMUM COMPRESSIVE STRENGTH FOR LIFTING AND HANDLING MUST BE 32MPa.
- LH2. DURING STORAGE, TRANSPORT AND HANDLING, SEGMENTS MUST BE KEPT IN AN UPRIGHT POSITION.
- LH3. SEGMENTS MUST ONLY BE LIFTED BY THE LIFTING ANCHORS PROVIDED. LOAD DISTRIBUTION IS ACHIEVED BY VIA SPREADER BEAMS AND THE LOAD IS EVENLY SHARED BETWEEN ALL LIFTING POINTS
- LH4. IT IS ASSUMED THE SURFACE OF THE MOULDS ARE OF OILED ROUGH STEEL OR VARNISHED TIMBER
- LH5. LIFTING ANCHORS MUST BE CAST IN ANCHORS WITH RUBBER RECESS FORMER TO COMPLY WITH AS3850.1:2015 (+A1 2019) - REID SWIFTLIFT FOOT ANCHORS OR APPROVED EQUIVALENT.
- LH6. ESTIMATED MASS OF EACH UNIT IS BASED ON A CONCRETE DENSITY OF 2400 kg/m³. THE ACTUAL MASS OF EACH UNIT MUST BE VERIFIED BY THE FABRICATOR.
- LH7. LIFTING ANGLE BETWEEN SLING AND HORIZONTAL LINE MUST NOT BE LESS THAN 60°
- LH8. DEFECTS ARISING FROM HANDLING, LIFTING AND TRANSPORTATION MUST BE RECTIFIED WITH AS/NZS 4058:2007.
- LH9. LIFTING MUST BE UNDERTAKEN AT NORMAL CRANE HOIST SPEEDS.

DRAWING INDEX:

DTC/6300	INSTRUCTIONS
DTC/6301	NOTES & DRAWING INDEX
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DTC/6303	COMPONENT DESCRIPTIONS - SHEET 2 OF 2
DTC/6304	STORAGE TANKS - STRUCTURAL - SHAFT RING ARRANGEMENT & DETAILS - SHEET 1 OF 2
DTC/6305	STORAGE TANKS - STRUCTURAL - SHAFT RING ARRANGEMENT & DETAILS - SHEET 2 OF 2
DTC/6306	STORAGE TANKS - STRUCTURAL - TANK BASE - DETAILS
DTC/6307	STORAGE TANKS - STRUCTURAL - PRECAST ROOF TYPE A - SHAFT RING
DTC/6308	STORAGE TANKS - STRUCTURAL - PRECAST ROOF TYPE B - SHAFT RING
DTC/6309	STORAGE TANKS - STRUCTURAL - PRECAST ROOF TYPE C - SHAFT RING
DTC/6310	ASSEMBLY DETAILS - SHEET 1 OF 3
DTC/6311	ASSEMBLY DETAILS - SHEET 2 OF 3
DTC/6312	ASSEMBLY DETAILS - SHEET 3 OF 3
DTC/6313	EXAMPLE ELECTRICAL DESIGN - SCHEMATIC DIAGRAM
DTC/6314	EXAMPLE DESIGN - SITE LAYOUT 1
DTC/6315	EXAMPLE DESIGN - SITE LAYOUT 2
DTC/6316	STORAGE TANKS - EXAMPLE DESIGN - GENERAL ARRANGEMENT
DTC/6317	STORAGE TANK SECTIONS - EXAMPLE DESIGN - GENERAL ARRANGEMENT - SHEET 1 OF 2
DTC/6318	STORAGE TANK SECTIONS - EXAMPLE DESIGN - GENERAL ARRANGEMENT - SHEET 2 OF 2

SUPPORT DRAWINGS:

DTC/3300	ACCESS HATCHES & SAFETY GRILLES ARRANGEMENT - SHEET 1 OF 4
DTC/3301	ACCESS HATCHES & SAFETY GRILLES ARRANGEMENT - SHEET 2 OF 4
DTC/3302	ACCESS HATCHES & SAFETY GRILLES ARRANGEMENT - SHEET 3 OF 4
DTC/3303	ACCESS HATCHES & SAFETY GRILLES ARRANGEMENT - SHEET 4 OF 4
DTC/5000	INTRUDER RESISTANT PERIMETER BARRIER TYPE 1 CHAINLINK FABRIC SECURITY FENCE & GATES - SHEET 1 OF 2
DTC/5001	INTRUDER RESISTANT PERIMETER BARRIER TYPE 1 CHAINLINK FABRIC SECURITY FENCE & GATES - SHEET 2 OF 2



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APPROVED

NORBERT SCHAEPER  
ENGINEERING MODERNISATION MANAGER

ENGINEERING & TECHNICAL SUPPORT

B	GENERAL UPDATE	NS	31/07/24
A	ORIGINAL ISSUE	KW	22/06/15
LETTER	DETAILS OF ISSUE / AMENDMENT		APP'D DATE

DEEMED TO COMPLY DRAWINGS

TEMPORARY SEWAGE PUMP-OUT INSTALLATIONS  
NOTES & DRAWING INDEX

DTC

6301

ISSUE	DATE
B	31/07/24