

GENERAL

- G1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE LATEST EDITION OF THE FOLLOWING:
 - SEWAGE PUMPING STATIONS CODE OF AUSTRALIA WSA 04 SYDNEY WATER EDITION
 - SYDNEY WATER TECHNICAL SPECIFICATIONS CIVIL, MECHANICAL AND ELECTRICAL
 - WSAA MANUAL FOR SELECTION AND APPLICATION OF PROTECTIVE COATINGS WSA 201 AND SYDNEY WATER SUPPLEMENT TO WSA 201
 - SYDNEY WATER LIST OF ACCEPTABLE PRODUCT SPECIFICATIONS
 - WSA 114-2002 INDUSTRY STANDARD FOR CONCRETE SPECIAL CLASS
 - WSA 02 - GRAVITY SEWERAGE CODE OF AUSTRALIA
 - WSA 03 - WATER SUPPLY CODE OF AUSTRALIA
 - WSA 101 - INDUSTRY STANDARD FOR SUBMERSIBLE PUMPS FOR SEWAGE PUMPING STATIONS AND SYDNEY WATER SUPPLEMENT TO WSA 101.
 - SYDNEY WATER ENGINEERING COMPETENCY STANDARD
 - COMMISSIONING - TRANSITIONING ASSETS INTO OPERATION.
- G2. STRUCTURAL CRITERIA
 - i) STRUCTURAL WORK SHOWN ON THESE DRAWINGS HAS BEEN DESIGNED FOR THE FOLLOWING LOADING CONDITIONS:-

STRUCTURE	LOADS
	ROOF SLAB *
INLET MAINTENANCE HOLE (IMH)	CONCRETE ROOF - 5 kPa METAL ACCESS HATCHES - 2.5 kPa
WET WELL (Ww)	SHAFT RINGS AND BASE
VALVE CHAMBER (VC)	INTERNAL HYDROSTATIC PRESSURE FLUID DENSITY (γ) = 15kN/m ³
GAS CHECK MAINTENANCE HOLE (GAS CHECK MH)	EXTERNAL EARTH PRESSURE SOIL - ϕ ' = 30°, BULK DENSITY (γ) = 20kN/m ³ , K _o = 0.5
EMERGENCY STORAGE STRUCTURE (ESS)	EXTERNAL SURCHARGE LOAD 20 kPa GROUNDWATER TABLE AT PROPOSED FINISHED SURFACE LEVEL (P.F.S.L)

- * PLUS THE WEIGHT OF TWO PUMPING UNITS ON CONCRETE PORTION OF WET WELL ONLY
- ii) CONCRETE EXPOSURE CLASSIFICATION
IMH, Ww, GAS CHECK MH - C (AS3735)
VC - B2 (AS3600)

- G3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ANY TEMPORARY WORKS.
- G4. WHERE PROPRIETARY ITEMS HAVE BEEN SPECIFIED, A SUITABLE EQUIVALENT MAY BE USED IF APPROVED BY SYDNEY WATER. PROPRIETARY ITEMS SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- G5. COMPLIANCE TESTING AND COMMISSIONING SHALL BE UNDERTAKEN AS PER:
 - THE SEWAGE PUMPING STATION CODE OF AUSTRALIA WSA04- SYDNEY WATER EDITION.
 - SYDNEY WATER TECHNICAL SPECIFICATIONS
 - SYDNEY WATER DOCUMENT 'COMMISSIONING-TRANSITIONING ASSETS INTO OPERATIONS'
 - APPROVED SITE SPECIFIC COMMISSIONING PLAN PREPARED TO SYDNEY WATER STANDARD.
- G6. THIS DESIGN IS NOT SUITABLE FOR UNSTABLE GROUND, CONTAMINATED GROUND, SOFT SOILS OR MINE SUBSIDENCE AREAS.
- G7. DIMENSIONS ARE IN MILLIMETRES U.N.O. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.

PIPEWORK

- P1. DUCTILE IRON PIPES AND FITTINGS SHALL COMPLY WITH REQUIREMENTS OF AS/NZS 2280. SP AND SO DI PIPEWORK SHALL BE CLASS PN35. FLANGED DUCTILE IRON PIPEWORK SHALL BE FLANGE CLASS. BURIED DI PIPEWORK SHALL BE PROTECTED BY POLYTHYLENE SLEEVING IN ACCORDANCE WITH AS 3680. REFER TO PIPE SCHEDULE ON DTC/6029 FOR FURTHER REQUIREMENTS.
- P2. FLANGES SHALL BE IN ACCORDANCE WITH FIGURE B5 OF AS 4087 AND COMPLY WITH DTC/1145 AND DTC/1146.
- P3. PIPE WORK DESIGNED FOR THE FOLLOWING DESIGN PRESSURE
 - PRESSURE PIPE - 120 mH
 - GRAVITY PIPE - 10 mH
 - SCOUR PIPE - 1.25 * STATIC HEAD
- P4. ALL NON-RETURN VALVES TO BE SWING CHECK TYPE TO AS 4794.
- P5. NON-RETURN VALVES SHALL BE SUPPLIED WITH AN EXTENDED HINGE PIN ON ONE SIDE (FACING VALVE CHAMBER WALL) WITH SWING ARM AND COUNTERWEIGHT c/w GUARD. THE SWING ARM, COUNTERWEIGHT AND GUARD MAY BE REMOVED AT COMMISSIONING IF FOUND UNNECESSARY.
- P6. ALL GATE VALVES TO BE RESILIENT SEATED TO AS 2638.2
- P7. ALL FLANGE BOLTS, NUTS AND WASHERS SHALL BE S.S. GRADE 316. PROVIDE 3mm GASKETS TO WSA PS-109.
- P8. GATE VALVES SHALL CLOSE ANTI-CLOCKWISE AND SHALL HAVE NON-RISING SPINDLES. PROVIDE EXTENSION SPINDLES WITH SUPPORT BRACKETS AT 2000 CENTRES MAXIMUM 300 CLEAR OF SHAFT CONNECTION. EXTEND SPINDLES TO 50 BELOW UNDERSIDE OF COVERS OR SURFACE BOX. PROVIDE INDICATORS AT SURFACE LEVEL ADJACENT TO VALVE SPINDLE TO SHOW OPEN AND CLOSE DIRECTION.
- P9. ALL DI PUDDLE & THRUST FLANGES TO BE FACTORY FITTED AT A MACHINED GROVE TO AS/NZS 2280.

METALWORK

- S1. WELDS SHALL BE 6 CONTINUOUS FILLET WELD U.N.O.
- S2. BUTT WELDS SHALL BE COMPLETELY PENETRATED BUTT WELDS.
- S3. STRUCTURAL BOLTS TO BE HIGH STRENGTH STRUCTURAL BOLTS GRADE 8.8 TO AS/NZS 1252, BOLTING CATEGORY 8.8/S SNUG TIGHTENED OR PROPERTY CLASS A4-70 FOR SS 316 BOLTS.
- S4. BOLTS, NUTS AND WASHERS USED INSIDE WET WELL, INLET MAINTENANCE HOLE, EMERGENCY RELIEF SYSTEM AND EMERGENCY STORAGE STRUCTURE SHALL BE SS GRADE 316. ANTI-SEIZE LUBRICANT TO BE APPLIED ON ALL SS BOLTS.
- S5. NON - STAINLESS STEELWORK SHALL BE GALVANIZED IN ACCORDANCE WITH THE WSAA MANUAL FOR SELECTION & APPLICATION OF PROTECTIVE COATINGS WSA 201 AND SYDNEY WATER'S SUPPLEMENT TO WSA 201.
- S6. DAMAGE TO GALVANIZING AFTER FABRICATION TO BE MADE GOOD IN ACCORDANCE WITH NATIONAL STANDARD WSA 201 AND SYDNEY WATER'S SUPPLEMENT.
- S7. ALL UNPAINTED METAL WORK, WITH THE EXCEPTION OF ALUMINIUM AND STAINLESS STEEL, SHALL BE PAINTED "ENVIRONMENTAL GREEN G66" IN ACCORDANCE WITH AS2700. PAINTING TO WSA 201 AND SYDNEY WATER SUPPLEMENT, SYSTEM PUR-A.
- S8. ALL BOLTS TO BE TORQUED UP AS PER SYDNEY WATER DEEMED TO COMPLY DRAWINGS DTC-1145 AND DTC-1146 FOR VARYING BOLT SIZES.

CONCRETE

- C1. STRUCTURAL CONCRETE ASSOCIATED WITH ALL STRUCTURES INCLUDING THE IMH, WET WELL, VALVE CHAMBER, ESS AND GAS CHECK MH SHALL BE HAVE A MIX DESIGN IN ACCORDANCE WITH SYDNEY WATER TECHNICAL SPECIFICATION - CIVIL. GRADE S50 CONCRETE FOR PRECAST ELEMENTS. GRADE S40 CONCRETE FOR CAST IN SITU ELEMENTS UNO.
- C2. DRY CAST MANUFACTURE OF PRECAST CONCRETE ELEMENTS SHALL NOT BE USED.
- C3. SIZES OF CONCRETE MEMBERS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
- C4. 25 CHAMFER FOR ALL EXPOSED CONCRETE EDGES AND 20 FILLET FOR ALL RE-ENTRANT CORNERS SHALL BE PROVIDED UNO.
- C5. SURFACE FINISHES SHALL BE IN ACCORDANCE WITH AS3610
EXPOSED FORMED - CLASS 2. CONCEALED FORMED - CLASS 3, UNFORMED - CLASS 4. ACCESS ROAD WITH STEEP GRADE (>1:10) TO HAVE ANTI-SLIP SURFACE FINISH.
- C6. THE DESIGN, CONSTRUCTION AND PERFORMANCE OF ALL FORMWORK AND FALSEWORK SHALL BE CERTIFIED BY A COMPETENT STRUCTURAL ENGINEER.
- C7. PROTECTION OF CONCRETE SURFACES - REFER WSA201 AND SYDNEY WATER SUPPLEMENT TO WSA 201.

REINFORCEMENT

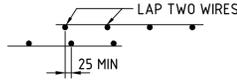
- R1. REINFORCEMENT BARS AND MESH SHALL COMPLY WITH AS/NZS 4671.
REINFORCEMENT SYMBOLS:
N - DENOTES GRADE 500N DEFORMED BARS
R - DENOTES GRADE 250N ROUND BARS
SL - DENOTES GRADE 500L DEFORMED SQUARE FABRIC
RL - DENOTES GRADE 500L DEFORMED RECTANGULAR FABRIC
- R2. CLEAR CONCRETE COVER TO REINFORCEMENT SHALL BE AS FOLLOWS UNLESS OTHERWISE SHOWN:-

PRECAST CONCRETE ELEMENTS - RIGID FORMWORK / INTENSE COMPACTION TO AS 3735 45 ALL SURFACES

CAST INSITU CONCRETE ELEMENTS - STANDARD FORMWORK/COMPACTION TO AS 3735 75 LIQUID RETAINING SURFACES
75 SURFACES IN CONTACT WITH GROUND
50 SURFACES IN CONTACT WITH GROUND PROTECTED BY BLINDING CONCRETE
50 SURFACES ABOVE GROUND
- R3. 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.
WELDING SHALL BE IN ACCORDANCE WITH AS 1554.3.
LAP LENGTHS SHALL NOT BE REDUCED DUE TO WELDING.
- R4. PIPES OR CONDUITS SHALL 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 SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE.

BAR SIZE (GRADE 500N)	N12	N16	N20	N24	N28	N32	N36
ANCHORAGE AND LAP LENGTH	400	600	800	1000	1200	1500	1800
COG LENGTH	200	250	300	350	400	450	450

REINFORCEMENT CONTINUED

- R7. MESH LAP DETAIL : 
- R8. WHERE REINFORCEMENT IS LAPPED, THE LAPS SHALL BE STAGGERED AND NO MORE THAN 50% OF THE REINFORCEMENT SHALL BE LAPPED AT ANY ONE SECTION UNLESS OTHERWISE SPECIFIED. SPLICE LENGTHS GIVEN ABOVE SHALL 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 SHALL 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. REINFORCEMENT SHALL BE SUPPORTED ON PLASTIC CHAIRS AT NOT GREATER THAN 1 METRE CENTRES BOTH WAYS.
- R12. NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR APPROVAL OF THE STRUCTURAL DESIGNER.

TESTING

- T1. ALL INSPECTION AND TESTING NOMINATED IN THE VARIOUS SPECIFICATIONS LISTED IN NOTE G1 SHALL BE UNDERTAKEN.

EARTHWORKS AND BACKFILLING

- EB1. BACKFILLING AROUND STRUCTURES SHALL BE CARRIED OUT SIMULTANEOUSLY ON ALL SIDES. AT NO STAGE THE DIFFERENCE IN THE HEIGHT OF BACKFILL AGAINST THE WALLS SHALL BE MORE THAN 500.
- EB2. CONCRETE SHALL ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 80% DESIGN STRENGTH PRIOR TO BACKFILLING AND TESTING OF STRUCTURES.
- EB3. INSTALLATION OF PRECAST SHAFT RING AND BACKFILLING SHALL BE UNDERTAKEN IN STAGES. THE EXCAVATION SHALL BE PROGRESSIVELY BACKFILLED SUCH THAT THE MAXIMUM HEIGHT FROM THE BASE SLAB, OR LEVEL OF COMPLETED BACKFILL, TO THE TOP STRUCTURE IS NO MORE THAN 3m.
- EB4. ANY EXCAVATION REQ. AFTER CONSTRUCTION COMPLETED IS TO BE SHORED AND NOT RELY ON THE WET WELL FOR STRUCTURAL STABILITY. THE WET WELL IS NOT TO BE PLACED UNDER DIFFERENTIAL EARTH PRESSURE DURING EXCAVATION.

FOUNDATIONS

- F1. GROUND CONDITIONS CONSIDERED IN DESIGN SHALL BE VERIFIED ON SITE DURING CONSTRUCTION IN ACCORDANCE WITH SWC TECHNICAL SPECIFICATION - CIVIL.
- F2. EXPECTED GROUND CONDITIONS AT EACH STRUCTURE SHALL MEET THE MINIMUM REQUIREMENTS SPECIFIED BELOW:

TABLE F1: EXPECTED GROUND CONDITIONS

STRUCTURE	SOIL/ROCK LAYER AND CONSISTENCY	MINIMUM STRENGTH	MINIMUM EQUIVALENT TESTING	REQUIRED TESTING DEPTH	MINIMUM ALLOWABLE BEARING CAPACITY AND STRENGTH REDUCTION FACTOR (ϕ) USED IN DESIGN
WET WELL	STIFF CLAY	UNDRAINED SHEAR STRENGTH, Su=75kPa	DCP = 6 BLOWS/100mm	MINIMUM 1m BELOW BASE SLAB	VERTICAL BEARING CAPACITY = 200kPa ϕ g = 0.5
VALVE CHAMBER	STIFF CLAY	UNDRAINED SHEAR STRENGTH, Su=50kPa	DCP = 3 BLOWS/100mm	MINIMUM 1m BELOW BASE SLAB	VERTICAL BEARING CAPACITY = 100kPa ϕ g = 0.5
INLET MH	STIFF CLAY	UNDRAINED SHEAR STRENGTH, Su=75kPa	DCP = 6 BLOWS/100mm	MINIMUM 1m BELOW BASE SLAB	VERTICAL BEARING CAPACITY = 200kPa ϕ g = 0.5
EMERGENCY RELIEF OUTLET STRUCTURE	STIFF CLAY	UNDRAINED SHEAR STRENGTH, Su=50kPa	DCP = 3 BLOWS/100mm	MINIMUM 1m BELOW BASE SLAB	VERTICAL BEARING CAPACITY = 100kPa ϕ g = 0.5
SIGN POST FOOTING	STIFF CLAY	UNDRAINED SHEAR STRENGTH, Su=50kPa	DCP = 3 BLOWS/100mm	MINIMUM 1m BELOW TOP OF FOOTING	LATERAL BEARING CAPACITY = 200kPa ϕ g = 0.5

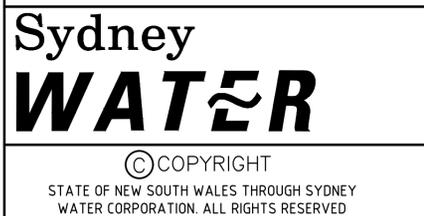
- F3. ALL WEAKER MATERIAL NOT MEETING THE ABOVE MINIMUM REQUIREMENTS SHALL BE EXCAVATED AND REPLACED WITH SELECT FILL MATERIAL COMPLYING WITH SWC TECHNICAL SPECIFICATION - CIVIL.
- F4. ANY OVER EXCAVATED ROCK OR CAVITIES SHALL BE BACKFILLED WITH GRADE N15 MASS CONCRETE.

FORMWORK

- F01. THE DESIGN CERTIFICATION, CONSTRUCTION AND PERFORMANCE OF FORMWORK AND FALSE WORK SHALL BE THE RESPONSIBILITY OF THE USER. DESIGN AND CONSTRUCTION OF FORMWORK SHALL BE IN ACCORDANCE WITH AS 3610. THE DESIGN SHALL ACHIEVE THE REQUIREMENTS OF AS3735 FOR RIGID FORMWORK AND INTENSE COMPACTION. FORMWORK DESIGN SHALL TAKE INTO CONSIDERATION INTENSE COMPACTION AND VIBRATIONS LOADS.

ELECTRICAL CONDUIT INSTALLATION

- E1. ALL ELECTRICAL CONDUITS SHALL BE SEALED USING 'DUCT SEAL PUTTY' SUPPLIED BY RAINBOW INDUSTRIES OR 'PETROLATUM MASTIC ST' SUPPLIED BY UNIVERSAL CORROSION COATINGS (UCC).
- E2. ALL CONDUITS ENTERING SYDNEY WATER STRUCTURES WHERE BENDING OF THE CABLES CAN OCCUR ARE TO BE FITTED WITH BELLMOUTHS.



STATE OF NEW SOUTH WALES THROUGH SYDNEY WATER CORPORATION. ALL RIGHTS RESERVED

APPROVED

NORBERT SCHAEPER
MANAGER - ENGINEERING

ENGINEERING & TECHNICAL SUPPORT

B	GENERAL UPDATE	N.S.	25/06/21
A	ORIGINAL ISSUE	KW	22/06/15
LETTER	DETAILS OF ISSUE / AMENDMENT	APP'D	DATE

DEEMED TO COMPLY DRAWINGS

SEWAGE PUMPING STATION

DTC
6002

GENERAL NOTES

ISSUE	DATE
B	25/06/21