

GENERAL

- G1. THE CONTRACTOR SHALL OBTAIN APPROVALS FROM THE APPROPRIATE AUTHORITIES FOR THE INSTALLATION AND CONNECTION OF ALL SERVICES ASSOCIATED WITH THE BUILDING.
- G2. ALL WORK BY EACH TRADE SHALL BE CARRIED OUT BY TRADESMEN COMPETENT AND SKILLED IN THAT TRADE AND TO A HIGH STANDARD. WHERE REQUIRED BY THE REGULATORY AUTHORITY, WORK SHALL BE CARRIED OUT BY OR UNDER THE DIRECT SUPERVISION OF SUITABLY LICENSED PERSONNEL.
- G3. ALL WORK SHALL BE SET OUT TO PROVIDE THE BEST APPEARANCE AND BEST SERVICE POSSIBLE. ALL FINISHES SHALL BE NEAT AND REGULAR IN APPEARANCE AND SHALL BE WITHIN THE TOLERANCES SPECIFIED.
- G4. STANDARDS:
- ALL MATERIALS, INSTALLATION THEREOF AND WORKMANSHIP SHALL COMPLY WITH, BUT NOT NECESSARILY BE LIMITED TO, THE FOLLOWING RELEVANT AUSTRALIAN STANDARDS:

- BUILDING CODE OF AUSTRALIA
 - ATSPEC BUILDING SPECIFICATIONS
 - NSW RURAL FIRE SERVICE "BUILDING CONSTRUCTION AND DESIGN"
 - AS1397 – STEEL SHEET AND STRIP – HOT DIPPED ZINC COATED OR ALUMINIUM/ZINC COATED
 - AS1562 – DESIGN AND INSTALLATION OF SHEET ROOF AND WALL CLADDING – METAL
 - AS1680 – INTERIOR AND WORKPLACE LIGHTING
 - AS2700 – COLOUR STANDARDS FOR GENERAL PURPOSES
 - AS2904 – DAMP-PROOF COURSES AND FLASHINGS
 - AS3500 – NATIONAL PLUMBING AND DRAINAGE
 - AS3700 – MASONRY STRUCTURES
 - AS3999 – THERMAL INSULATION OF DWELLINGS, BULK INSULATION – INSTALLATION REQUIREMENTS
 - AS4200.1 – PLIABLE BUILDING MEMBRANES AND UNDERLAYS – MATERIALS
 - SYDNEY WATER'S TECHNICAL SPECIFICATION PART 1 – CIVIL WORKS
 - SYDNEY WATER'S TECHNICAL SPECIFICATION PART 2 – MECHANICAL WORKS
 - SYDNEY WATER'S TECHNICAL SPECIFICATION PART 3 – ELECTRICAL WORKS
 - SYDNEY WATER'S HSS INSTRUMENTATION & CONTROL STANDARDS TOG_TS01
 - SYDNEY WATER'S SHELL ELECTRICAL DESIGNS
 - SYDNEY WATER'S SHELL DESIGN DRAWINGS FOR A CONTROL ROOM

SUBSTRUCTURE

- S1. THE MINIMUM REQUIRED ALLOWABLE BEARING PRESSURES ARE:
UNDER SLAB – 100 kPa
UNDER BEAMS – 150 kPa
- S2. THE SITE CLASSIFICATION TO AS2870 SHALL BE ESTABLISHED BY AN APPROPRIATELY QUALIFIED & PRACTICING GEOTECHNICAL ENGINEER.
- S3. FOR SITE CLASSIFICATION DETERMINED AS H2,E & P TO AS2870, THE STRUCTURAL DESIGN OF THE SUBSTRUCTURE SHALL BE CARRIED OUT BY AN APPROPRIATELY QUALIFIED & PRACTICING STRUCTURAL ENGINEER.
- S4. THE EXCAVATED FOUNDING STRATA SHALL BE INSPECTED BY A GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION AND PLACING OF BLINDING CONCRETE.
- S5. AS SOON AS PRACTICABLE, THE EXPOSED FOUNDING LEVEL OF THE PREPARED FOUNDATION SHALL BE SEALED WITH A 50mm THICK LAYER OF BLINDING CONCRETE.
- S6. A POLYURETHANE WATERPROOF MEMBRANE (MINIMUM 0.2mm THICK) SHALL BE PLACED AGAINST ALL CONCRETE SURFACES IN CONTACT WITH BACKFILL/GROUND AND OVER BLINDING CONCRETE LAYERS, PRIOR TO POURING CONCRETE. JOINTS SHALL BE LAPPED 200mm & SEALED WITH TAPE.
- S7. TERMITE TREATMENT SHALL BE CARRIED OUT IN ACCORDANCE WITH AS3660 PART 1.

CONCRETE

- C1. WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600, AS3735 & SYDNEY WATER'S TECHNICAL SPECIFICATION – PART 1 – CIVIL WORKS.
- C2. STRUCTURAL CONCRETE SHALL BE GRADE N32 & BLINDING CONCRETE SHALL BE GRADE N15 IN ACCORDANCE WITH SYDNEY WATER'S TECHNICAL SPECIFICATION PART 1 – CIVIL WORKS..
- C3. SIZES OF CONCRETE MEMBERS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
- C4. A 40mm CHAMFER FOR ALL EXPOSED CONCRETE EDGES AND 20mm FILLET FOR ALL RE-ENTRANT CORNERS SHALL BE PROVIDED U.N.O.
- C5. NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR APPROVAL OF THE PRINCIPAL.
- C6. SURFACE FINISHES SHALL BE IN ACCORDANCE WITH AS3610 AS FOLLOWS:
FORMED – CLASS 3. UNFORMED – CLASS 4 (EXCEPT FOR FOOTPATHS, WHICH SHALL BE A BROOM FINISH).
- C7. CONSTRUCTION JOINTS, WHERE APPROVED BY THE PRINCIPAL, SHALL COMPLY WITH THE FOLLOWING:
- a) ALL REINFORCEMENT SHALL BE CONTINUOUS ACROSS CONSTRUCTION JOINTS.

b) EXISTING SURFACE TO BE PREPARED BY SCABBLING OF THE HARDENED CONCRETE TO EXPOSE AGGREGATE TO A MINIMUM DEPTH OF 3mm.

c) IMMEDIATELY PRIOR TO PLACEMENT OF ADJOINING CONCRETE, THE SURFACE OF THE CONSTRUCTION JOINT & THE PROJECTING REINFORCEMENT SHALL BE WASHED AND THE CONCRETE SURFACE SHALL BE SATURATED WITH WATER. FOLLOWING THAT, ALL EXCESS WATER & LOOSE MATERIAL SHALL BE REMOVED.
- C8. CONDUIT PENETRATIONS THROUGH THE SUBSTRUCTURE SHALL BE MADE WATERTIGHT BY WRAPPING THE CONDUITS WITH "PARCHEM" PIPE PENETRATIONS HYDROTITE DSS0220-AD (2 x20).
- C9. FOR DETAILS OF CONDUITS REFER TO ELECTRICAL DRAWINGS.

CONCRETE (CONT)

- C10. THE DESIGN, CONSTRUCTION AND PERFORMANCE OF FORMWORK AND FALSEWORK SHALL BE CERTIFIED BY A QUALIFIED STRUCTURAL ENGINEER.
- C11. THE FINISHED CONCRETE SHALL BE FULLY MECHANICALLY VIBRATED TO ACHIEVE FULL COMPACTION, COMPLETELY FILLING FORMWORK, THOROUGHLY EMBEDDING REINFORCEMENT AND FREE OF STONE POCKETS. ALL CONCRETE, INCLUDING SLABS ON GROUND AND FOOTINGS, SHALL BE FULLY VIBRATED USING A HIGH FREQUENCY MECHANICAL VIBRATOR. FINAL SURFACE COMPACTION SHALL BE ACHIEVED USING A POWER TROWEL.
- C12. THE FINISHED CONCRETE SHALL BE CURED FOR A MINIMUM OF SEVEN DAYS USING AT LEAST ONE OF THE FOLLOWING METHODS:
- a) PONDING OR CONTINUOUS SPRINKLING WITH WATER.

b) THE USE OF AN ABSORBENT COVER KEPT CONSTANTLY WET. (WHEN THE AMBIENT TEMPERATURE EXCEEDS 32°C, CURING MAY ONLY BE ACHIEVED USING METHODS a & b).

c) THE USE OF AN IMPERMEABLE SHEET MEMBRANE OVER A MOISTENED SURFACE (THE MEMBRANE SHALL BE FIXED AND LAPPED SO THAT NO AIR CIRCULATION CAN OCCUR AT THE CONCRETE SURFACE).

d) THE USE OF A CURING COMPOUND COMPLYING WITH AS3799, APPLIED UNIFORMLY & IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND WHEN DRY, THE COAT SHOULD BE CONTINUOUS, FLEXIBLE & WITHOUT VISIBLE BREAKS OR PIN HOLES FOR SEVEN DAYS.

REINFORCEMENT

- R1. ALL REINFORCEMENT BARS AND FABRIC TO AS/NZS 4671.
- REINFORCEMENT SYMBOLS:

N – DENOTES GRADE 500N DEFORMED BARS

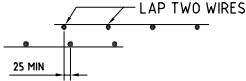
R – DENOTES GRADE 250N ROUND BARS

SL – DENOTES GRADE 500L DEFORMED SQUARE FABRIC

RL – DENOTES GRADE 500L DEFORMED RECTANGULAR FABRIC
- R2. CLEAR CONCRETE COVER TO REINFORCEMENT FOR EXPOSURE CLASIFICATION UP TO B1 SHALL BE AS FOLLOWS UNLESS OTHERWISE SHOWN:-
FORMED SURFACES – 40 mm
CAST AGAINST GROUND – 50 mm WITH WATERPROOF MEMBRANE
FOR EXPOSURE CLASSIFICATION GREATER THAN B1 TOAS3600, THE DESIGNER SHALL NOMINATE THE COVER TO REINFORCEMENT.
- R3. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS SHOWN ON THE DRAWINGS.
- R4. PIPES OR CONDUITS SHALL NOT BE PLACED WITHIN THE CONCRETE COVER TO REINFORCEMENT WITHOUT THE APPROVAL OF THE PROJECT MANAGER.
- R5. REINFORCEMENT SHALL NOT BE BENT OR HEATED ON SITE WITHOUT THE PRIOR APPROVAL OF THE STRUCTURAL DESIGNER.
- R6. WHERE APPROVED BY THE STRUCTURAL DESIGNER, WELDING OF REINFORCEMENT MUST BE DONE IN ACCORDANCE WITH AS 1554.3.
- R7. REINFORCEMENT IS SHOWN DIAGRAMMATICALLY ON THE DRAWINGS & THEREFORE DOES NOT DEPICT THE EXACT POSITION OF THE BARS.
- R8. REINFORCEMENT ANCHORAGE, COGS & LAP LENGTHS SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE.

BAR SIZE (GRADE 500N)	N12	N16	N20
ANCHORAGE & LAP LENGTH	400	600	800
COG LENGTH	200	250	300

- R9. FABRIC LAP DETAIL :



- R10. WHERE REINFORCEMENT IS LAPPED, THE LAPS MUST BE STAGGERED & 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.
- R11. REINFORCEMENT TO BE SUPPORTED ON PLASTIC CHAIRS BOTH WAYS AT NOT GREATER THAN 800mm FOR BARS & 500mm FOR FABRIC.

INSULATION

- IN1. CLOSED CELL, FLAME RETARDANT POLYSTYRENE SMTG GRADE STYROFOAM BOARDS SHALL BE INSTALLED IN THE WALL CAVITIY, FASTENED TO THE INTERNAL BRICK WALL. THE STYROFOAM BOARDS SHALL BE PURPOSE DESIGNED TO BE USED AS THERMAL INSULATION IN BRICK WALLS. THE STYROFOAM BOARDS SHALL BE DESIGNED WITH A TONGUE AND GROOVE EDGE TO ENSURE THE BOARDS LOCK TOGETHER, WITH SARKING (WITH A 50mm FLAP AT THE BOTTOM) BONDED TO THE OUTER FACE, TO PREVENT MOISTURE PASSING THROUGH BOARD OR THE JOINTS. THE BOARDS SHALL BE 600mm WIDE TO FIT BETWEEN THE BRICK TIES WHICH HOLD THEM IN PLACE.
- IN2. PROVIDE INSULATION AGAINST BOTH THE ROOF CLADDING AND ON THE CEILING SUCH THAT EACH SHALL HAVE A THERMAL PERFORMANCE OF R4 AND AN STC RATING OF 50. THE INSULATION SHALL BE NON – FLAMMABLE, EQUIVALENT TO ROCKWOOL FIBRETEX.

BRICKWORK

- B1. WORKMANSHIP & MATERIALS SHALL BE IN ACCORDANCE WITH AS3700 & SYDNEY WATER'S TECHNICAL SPECIFICATION PART 1 – CIVIL WORKS.
- B2. MORTAR :
- SAND FOR FACE WORK SHALL BE SELECTED FOR COLOUR AND GRADING.

• MORTAR IN FACE WORK SHALL BE WHITE UNLESS ADVISED OTHERWISE BY SYDNEY WATER. IF A DIFFERENT COLOUR IS REQUIRED, COLOURING PIGMENTS SHALL BE METALLIC OXIDES INSOLUBLE IN WATER, MIXED WITH CEMENT AND SAND COMPATIBLE WITH THE REQUIRED COLOUR.

• MORTAR SHALL BE PORTLAND CEMENT, HYDRATED LIME & SAND IN THE RATION 1:1:4
- B3. BRICKS:
- BRICKS SHALL BE SOLID DRY PRESSED FACE BRICKS THE FOLLOWING DIMENSIONS 230mm x 110mm x 76mm.

• BRICK COLOUR SHALL BE NAMOI VALLEY "NORTH WEST HOMESTEAD" UNLESS DIRECTED OTHERWISE BY SYDNEY WATER.

• TOLERANCES SHALL BE AS SPECIFIED IN RELEVANT STANDARD.

• BRICKS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 20 MPa.
- B4. BRICK BOND SHALL BE STRETCHER BOND OR SHALL MATCH ANY EXISTING BUILDINGS.
- B5. HEADERS IN FACE WORK SHALL BE AVOIDED BY TYING WALLS AT T-INTERSECTIONS WITH 3.15mm DIAMETER RECTANGULAR GALVANISED STEEL WIRE TIES AT EVERY FOURTH COURSE. ALL OTHER BRICK WALL INTERSECTIONS SHALL BE CONTINUOUSLY BONDED.
- B6. LAY BRICKS ON A FULL BED OF MORTAR WITH FROGS (IF ANY) UP AND FILL PERPENDS SOLIDLY WITH MORTAR. MORTAR STRENGTH AND CLASS SHALL BE TO AS3700. MORTAR JOINTS SHALL BE FLUSH.
- B7. SET OUT BRICKWORK TO MINIMISE CUTTING OF BRICKS. PROPRIETARY SILL BRICKS SHALL BE USED IN PREFERENCE TO MITRE CUT BRICKS. IN FACE WORK, CUT THE BRICKS WITH A MASONRY SAW TO MAINTAIN BOND & MITRE CUT THE SILL BRICKS WITH A MASONRY SAW TO FORM CLEAN AND TRUE RIGHT ANGLE CORNERS.
- B8. COMMENCE FACE WORK FROM FINISHED SLAB LEVEL. SET OUT FACE WORK TO SUIT BOND, KEEPING PERPENDS IN ALTERNATE COURSES IN VERTICAL ALIGNMENT. DISTRIBUTE FACE BRICKS EMBODYING THE APPROVED COLOUR RANGE EVENLY THROUGHOUT THE WORK. AVOID 'BANDING' AND COLOUR CONCENTRATIONS.
- B9. MAKE PROVISION AS THE WORK PROCEEDS FOR BUILDING IN, TO THEIR CORRECT POSITIONS AND ALIGNMENT. STRAPS, COLUMNS, PLATES, BOLTS, ANCHORS, FIXINGS, FLASHINGS, DOOR JAMBS AND THE LIKE. FILL VOIDS AT BACK OF JAMBS AND HEADS OF STEEL DOOR FRAMES WITH MORTAR AS THE WORK PROCEEDS. FERROUS METALS BUILT IN OR IN CONTACT WITH BRICKWORK SHALL BE HOT DIPPED GALVANISED UNLESS OTHERWISE SPECIFIED.
- B10. DO NOT CHASE STRUCTURAL OR FACE BRICKWORK WITHOUT PRIOR APPROVAL. SUCH CHASES SHALL BE VERTICAL WHERE PRACTICABLE, NOT EXCEEDING 20mm DEEP, MADE USING A MASONRY SAW. WHEREVER PRACTICABLE PROVIDE HOLES, SLEEVES AND CHASES FOR SERVICES DURING ERECTION OF BRICKWORK TO AVOID CUTTING AWAY AND MAKING GOOD. PROVIDE CORED BRICKS TO RECEIVE VERTICAL CONDUITS IN DOUBLE FACED SINGLE LEAF WALLS OR CUT 15mm DEEP U OR V SHAPE IN ENDS OF BRICKS WITH MASONRY SAW. SLEEVES FOR SERVICES BRIDGING CAVITIES SHALL FALL TOWARDS THE OUTER LEAF.
- B11. BUILD IN STAINLESS STEEL HEAVY DUTY CAVITY TIES EQUIVALENT TO ABEY CODE 0596, 15mm x 245 LONG AT A MAXIMUM 600mm CENTRES HORIZONTALLY AND 600mm VERTICALLY. EACH TIE SHALL HAVE A MINIMUM 50mm BEARING ON EACH LEAF. STAGGER TIES IN ALTERNATE ROWS AND FALL (IF ANY) TOWARDS THE EXTERNAL LEAF. ADJACENT TO OPENINGS, THE SPACING OF TIES SHALL BE AT A MAXIMUM OF 300mm HORIZONTALLY & VERTICALLY.
- B12. KEEP CAVITIES CLEAR OF MORTAR DROPPINGS AS THE WORK PROCEEDS. IF NECESSARY USE WOOD SLIPS, LAID ON EACH LEVEL OF TIES, LIFTED AND CLEANED EVERY THIRD COURSE. LEAVE EVERY FOURTH BRICK LOOSE AT THE BOTTOM OF THE CAVITY IN THE OUTER LEAF SO THAT THE CAVITY CAN BE CLEANED. BUILD IN THESE BRICKS IN MATCHING MORTAR AFTER INSPECTION AND APPROVAL. PROVIDE CAVITY FLASHINGS IN THE FOLLOWING LOCATIONS:
– FULL WIDTH OF OUTER LEAF IMMEDIATELY ABOVE CONCRETE UP STANDS
– UNDER SILLS
– OVER LINTELS TO OPENINGS
– AT ABUTMENTS WITH STRUCTURAL FRAMES OR SUPPORTS
- B13. FORM WEEP HOLES BY LEAVING OPENINGS EVERY FOURTH PERPEND IN COURSE ABOVE FLASHINGS AND CAVITY FILL. WEEP HOLES & DAMP PROOF COURSES ARE TO BE PROVIDED OVER DOORS.
- B14. PROVIDE BITUMEN COATED 0.45mm/0.55mm THICK ALUMINIUM DAMP-PROOF COURSE IN WALL ADJOINING INFILL FLOOR SLABS ON MEMBRANES AND CAVITY WALLS BUILT OFF SLABS ON GROUND
- B15. WORKMANSHIP GENERALLY:
- BUILD BRICKWORK PLUMB, LEVEL AND PROPERLY BONDED. ALLOW NO PART TO RISE MORE THAN 1000mm ABOVE ADJACENT UNFINISHED WORK. CARRY UP CORNERS TO A HEIGHT SUFFICIENT ONLY TO ALLOW COMPLETION OF INTERMEDIATE WORK BY THE END OF THE DAY'S WORK. TEMPORARILY BRACE NEW BRICKWORK TO WITHSTAND LATERAL LOADS. BEFORE MORTAR SETS HARD REMOVE EXCESS MORTAR WITH A SMOOTH BRUSH AIDED BY A WOOD BLOCK FOR LARGE LUMPS. SCRUB BRICKWORK WITHIN 24 HOURS OF LAYING USING A FIBRE BRISTLE BRUSH AND DETERGENT IF NECESSARY.
- B16. EXTENT OF BRICKWORK CLEANING:
- REMOVE MORTAR DROPPINGS FROM BRICKWORK AND CLEAN DOWN FACE BRICKWORK GENERALLY TO REMOVE DISCOLOURATION, MORTAR SPLASHES AND STAINS. CLEAN BRICKWORK PROGRESSIVELY AS WALLS ARE COMPLETED, AND ON BRICKWORK CLEAN BEFORE WORK IS COMMENCED BY OTHER TRADES.
- B17. ALL BRICKWORK SHALL BE HORIZONTALLY REINFORCED WITH "BRICKTOR" OR APPROVED EQUIVALENT EVERY 4th COURSE AND ALSO ABOVE AND BELOW OPENINGS.

THIS DRAWING TO BE READ IN CONJUNCTION WITH DRG. No. DTC-3006

<div>Sydney</div> <div>WATER</div>	APPROVED					DEEMED TO COMPLY DRAWINGS		DTC	
	<div>K. WIGGINS</div> <div>MANAGER - E & ES</div>					LOW VOLTAGE ELECTRICAL SWITCHROOM FOR PUMPING STATIONS WITH 2 PUMPS VSD STARTERS ≤ 125 kW EACH		3005	
	ENGINEERING & ENVIRONMENTAL SERVICES	A	ORIGINAL ISSUE	K.W.	19.08.15	ARRANGEMENT & DETAILS - SHEET 6 OF 7		ISSUE	DATE
LETTER		DETAILS OF ISSUE / AMENDMENT	APP'D	DATE	A			19.08.15	
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