



- NOTES:**
- GENERAL**
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH MAIN ROADS SPECIFICATION 404.
 - THE CSP CULVERT UNITS SHALL BE SUPPLIED IN ACCORDANCE WITH MAIN ROADS CULVERT SPECIFICATION 404.
 - CONCRETE**
 - APRON SLABS, WINGWALLS AND HEADWALLS SHALL BE CLASS N40 CONCRETE MINIMUM UNLESS NOTED OTHERWISE (U.N.O.) IN ACCORDANCE WITH MAIN ROADS SPECIFICATION 404 ANNEXURE 404C.06.
 - THE MINIMUM CLEAR COVER TO REINFORCEMENT SHALL BE:
 - ALL EXPOSED FACES 55
 - BURIED FACES - HEADWALLS & WINGWALLS 55
 - FACES IN CONTACT WITH GROUND - APRONS & SLAB 65
 IF MORE AGGRESSIVE SOIL CONDITIONS ARE PRESENT THEN SLABS AND WINGWALLS REQUIRE REDESIGNING AND SHALL BE SUBMITTED TO MAIN ROADS FOR REVIEW AND APPROVAL.
 - CONCRETE FINISHES SHALL CONFORM TO THE FOLLOWING:
 - INDICATES A FORMED CONCRETE SURFACE FINISH AND SHALL BE IN ACCORDANCE WITH AS 3610
 - INDICATES AN UNFORMED CONCRETE SURFACE (REFER TO SPECIFICATION 901)
 - ALL EXPOSED CONCRETE EDGES SHALL HAVE 20 mm x 20 mm CHAMFERS U.N.O.
 - REINFORCEMENT**
 - REINFORCEMENT SHALL BE IN ACCORDANCE WITH MAIN ROADS SPECIFICATION 404 CLAUSE 404.9.
 - THE REINFORCEMENT SYMBOLS AND DENOTATIONS ARE AS FOLLOWS:
 - N - HOT ROLLED DEFORMED GRADE D500N BAR OF 500 MPa YIELD STRENGTH
 - SL - GRADE D500L FABRIC OF 500 MPa YIELD STRENGTH
 - U.N.O. ALL BAR LAP LENGTHS SHALL BE A MINIMUM OF 45D AND A MAXIMUM OF 450+150 FOR REINFORCING BARS. STOCK LENGTHS AND STAGGERED LAPS SHALL BE PROVIDED. U.N.O. ALL FABRIC OVERLAPS SHALL BE A MINIMUM OF TWO CROSS WIRES ON BOTH SHEETS.
 - REINFORCEMENT SHALL NOT BE WELDED OR HEAT TREATED.
 - CUTTING AND BENDING OF REINFORCEMENT SHALL BE IN ACCORDANCE WITH AS 3600.
 - REINFORCEMENT PLACEMENT ABBREVIATIONS ARE:
 - FF - FAR FACE NF - NEAR FACE EF - EACH FACE
 - TS - TOP SECONDARY T - TOP
 - BS - BOTTOM SECONDARY B - BOTTOM
 - FABRIC MAIN REINFORCING WIRES SHALL BE AT RIGHT ANGLES TO FLOW DIRECTION.
 - GUARDRAILING**
 - GUARDRAILING IF REQUIRED SHALL BE SHOWN ON THE PROJECT SPECIFIC DRAWINGS.
 - STEELWORK**
 - AFTER FABRICATION, ALL STEELWORK SHALL BE HOT-DIP GALVANISED, AS FOLLOWS: PLATES, BOLTS, NUTS, WASHERS AND HOOK BOLTS IN ACCORDANCE WITH AS 1214.
 - ALL CUTTING & DRILLING OF C.S.P. SHALL BE TREATED WITH AN APPROVED COLD GALVANISING.
 - Ø16 HOOK BOLTS - GRADE 250 ROUND MERCHANT BAR TO AS/NZS 3679.1.
 - INSTALLATION**
 - THE SERVICEABILITY LIMIT STATE BEARING CAPACITY SHALL BE NOT LESS THAN 250 kPa. A GEOTECHNICAL ENGINEER SHALL CONFIRM THAT THE BEARING PRESSURE IS ADEQUATE.
 - THE INSTALLATION AND BACKFILLING OF CSP CULVERTS SHALL BE IN ACCORDANCE WITH MAIN ROADS SPECIFICATION 404.
 - BACKFILL MATERIAL IN ZONE OF SPECIAL COMPACTION AND CEMENT STABILISED BACKFILL SHALL COMPLY WITH MAIN ROADS SPECIFICATION 404.
 - THE NEED FOR SCOUR PROTECTION SHALL BE DETERMINED BY THE PROJECT ENGINEER. THE DEPTH OF APRON SLAB DOWNSTANDS MAY BE VARIED TO SUIT THE ROCK PROTECTION. ROCK PROTECTION SHALL COMPLY WITH MAIN ROADS SPECIFICATION 406.

2. DRAWING PRESENTATION STYLE AMENDED. MAXIMUM PIPE SIZE LIMITED TO 1500 DIA. PLAN, SECTION 'A' & 'B' AMENDED. WINGWALL ELEVATION AMENDED.				METADATA GROUND SURVEY STANDARD: DATE OF CAPTURE: MAPPING SURVEY STANDARD: DATE OF CAPTURE: MAIN ROADS PROJECT ZONE: HEIGHT DATUM:				THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRG. NO. 200131-064, 200131-066 Government of Western Australia MAIN ROADS Western Australia TECHNOLOGY AND ENVIRONMENT DIRECTORATE ROAD AND TRAFFIC ENGINEERING WATERLOO CRESCENT Telephone (08) 9323 4111				STANDARD DRAWING C.S.P. CULVERT DETAILS MAXIMUM PIPE DIAMETER 1500 CONSTRUCTION DETAILS FOR BASE SLABS, APRON SLABS WINGWALL, HEADWALL SHEET 2 OF 3				DESIGNED G. DE SILVA DRAWN J. COOK / K. KASIRI DRAWING TYPE FILE NUMBER 67-08-52 DRAWING NUMBER 200131-065-2				VERIFIED J. KARPINSKI 12.12.02 APPROVED R. GROVE 19.12.02 AMEND.				A 1			
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