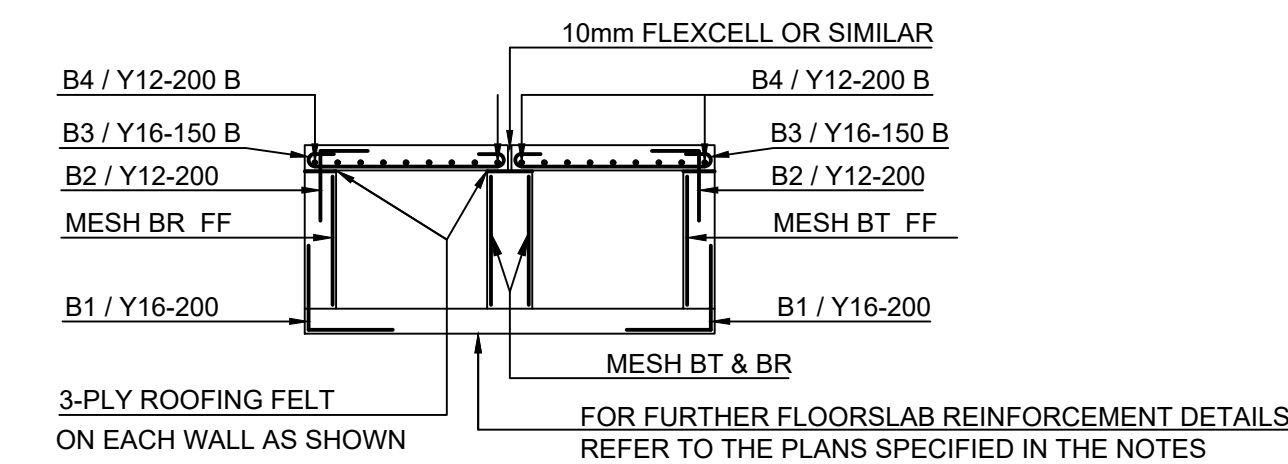
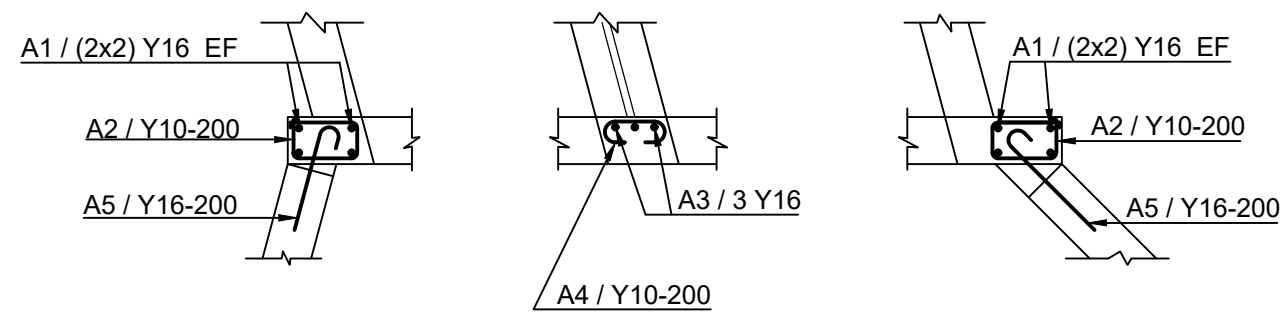


$L = HC \times S \text{ (min.1500mm)}$        $S = \text{BATTER SLOPE}$   
 $QA = L \times \tan(\Theta/30)$        $\Theta = \text{CULVERT SKEW ANGLE}$   
 $PA = L \times \tan(\Theta/30)$        $t = \text{PRECAST WALL THICKNESS}$   
 $NA = L \times \sec(\Theta/30) - KA \times \tan(\Theta/30)$   
 $MA = L \times \sec(\Theta/30) - KA \times \tan(\Theta/30)$   
 $T = t \times 2 + 80$   
 $QB = (KA + 200) \times \sec(\Theta/30)$   
 $PB = (KA + 200) \times \sec(\Theta/30)$   
 $KB = (KA + 200) \times \sin(\Theta/30)$   
 $PC = (KA + 200) \times \cos(\Theta/30)$   
 $GA = W/2 + KA \times \sec(\Theta/30)$   
 $GB = \{ [200 + COSEC(\Theta/30)] - KA \} \times \tan(\Theta/30)$   
 $FA = W/2 + KA \times \sec(\Theta/30)$   
 $FB = \{ [200 + COSEC(\Theta/30)] - KA \} \times \tan(\Theta/30)$   
 $R = t + 100 \text{ (INSET BARRREL SLAB THICKNESS)}$



TYPICAL REINFORCEMENT PLAN OF  
INLET / OUTLET WING WALLS - MAX  $\emptyset = 30^\circ$

SECTION S5-S5 - INLET / OUTLET WING WALLS  
INSITU BARREL (BOX CULVERTS ONLY) - REINFORCEMENT



SECTION S6-S6 - INLET/OUTLET WING WALLS  
HEADWALL COLUMNS - REINFORCEMENT



REFER TO SANRAL  
CULVERT DETAILS:  
TD-D-WW-1001  
TD-D-WW-1002

**FOR TENDER**

DESIGN CRITERIA

- 1.1 THE WING WALLS ARE DESIGNED AS CANTILEVERS FIXED TO THE BASE AND SUPPORTED BY THE HEADWALL.
- 1.2 THE WING WALLS ARE DESIGNED FOR A SURCHARGE OF 750mm AND A MAXIMUM SLOPE OF 1:1.5 FOR ANY FILL HEIGHT.
- 1.3 THE DENSITY OF SOIL = 20 kN/m<sup>3</sup>.
- 1.4 SOIL PRESSURES DETERMINED USING RANKINE'S THEORY.
- 1.5 CONCRETE:

CHARACTERISTIC STRENGTH (MPa)	WING WALL	INSITU BARREL
CLASS CONCRETE	30 / 19	30 / 19
- 1.6 REINFORCEMENT ACCORDING TO SABS 902 - LATEST REVISION.  
CHARACTERISTIC STRENGTH OF HIGH TENSILE STEEL = 450 MPa  
CHARACTERISTIC STRENGTH OF HIGH TENSILE STEEL MESH = 450 MPa.
- 1.7 A LINEAR SOIL PRESSURE DISTRIBUTION IS ASSUMED.
- 1.8 THE INSITU BARREL IS DESIGNED FOR SNABC TRAFFIC LOADING IN ACCORDANCE WITH TMH 7 PARTS 1, 2&3 (AS AMENDED 1980) 'CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA'.
- 1.9 GENERAL
- 2.1 THE REQUIRED CLASS OF SURFACE FINISH IS F2 FOR ALL VISIBLE SURFACES.
- 2.2 ALL VISIBLE CORNERS MUST HAVE A 25 x 25 mm CHAMFER.
- 2.3 TWO 150 mm LAYERS OF APPROVED MATERIAL, COMPACTED TO 93% MODIFIED AAS H.T.O. DENSITY, ARE REQUIRED UNDER THE INLETS AND OUTLETS.
- 2.4 MINIMUM CONCRETE COVER TO REINFORCEMENT IS 40mm.
- 2.5 FURTHER INFORMATION REGARDING SPECIFIC CULVERTS APPEAR ON THE DRAINAGE SCHEDULES. OF THE ROAD.
- 2.6 THE INLET AND OUTLET UNITS ARE DESIGNED TO ACT AS INDEPENDENT UNITS WHEN USED TOGETHER WITH PIPES, PRECAST BARRELS, AS WELL AS INSITU BARREL UNITS.
- 2.7 REINFORCEMENT DETAILS OF THE FLOOR SLAB SUPPORTING THE CULVERT BARRELS APPEAR ON THE TYPICAL PLAN FOR PRECAST PORTAL CULVERTS BASE SLABS.
- 2.8 THE HEADWALLS MUST BE ALIGNED PARALLEL TO THE ROAD SHOULDER.