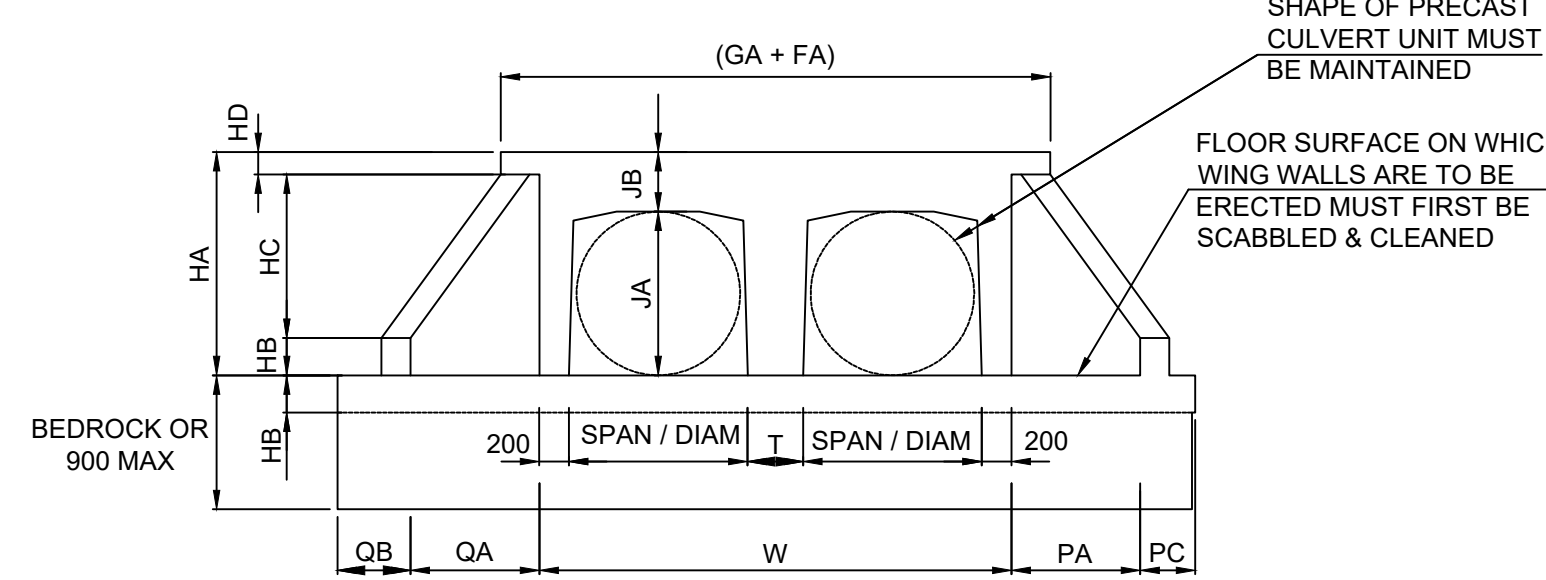
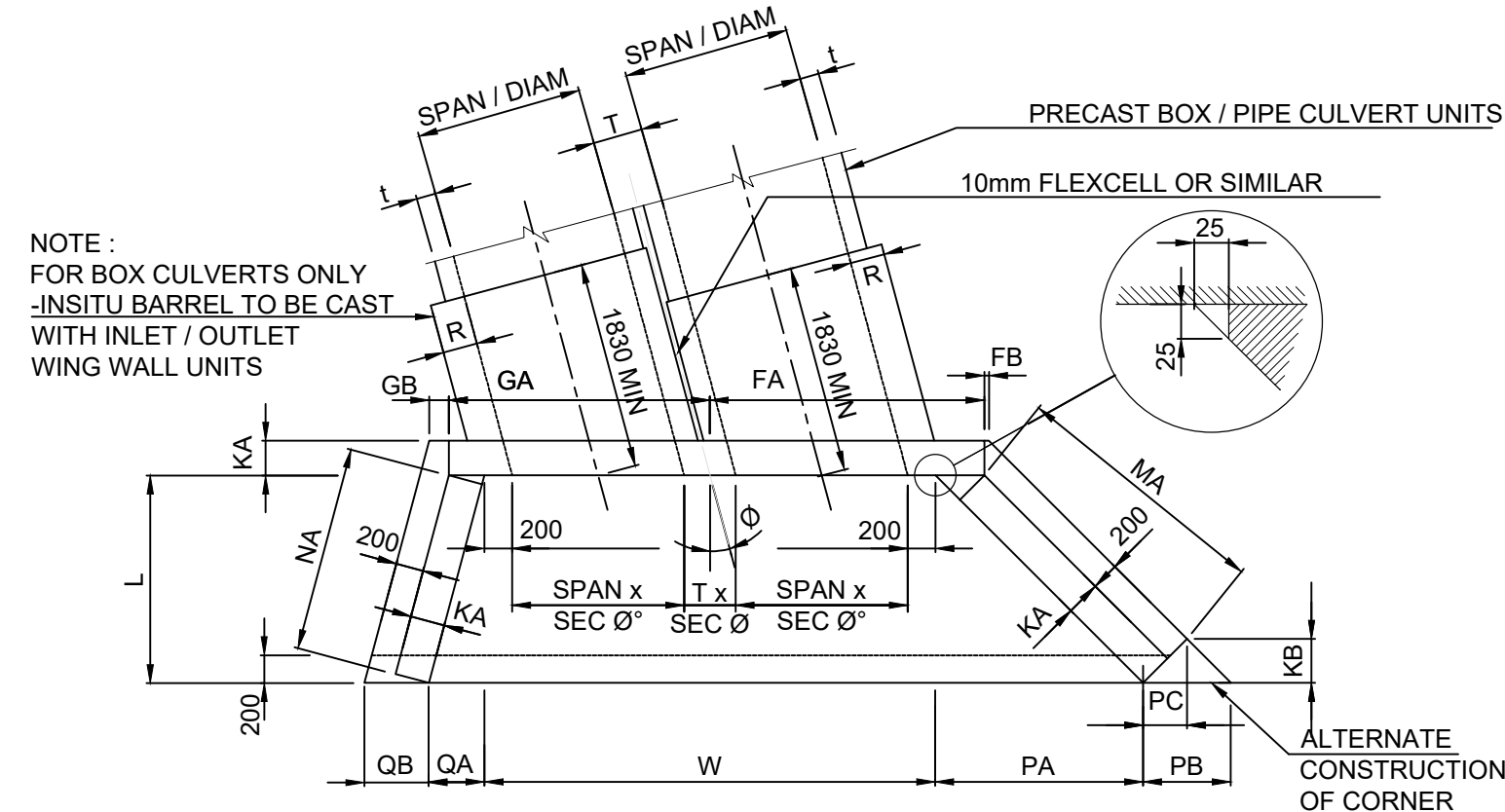


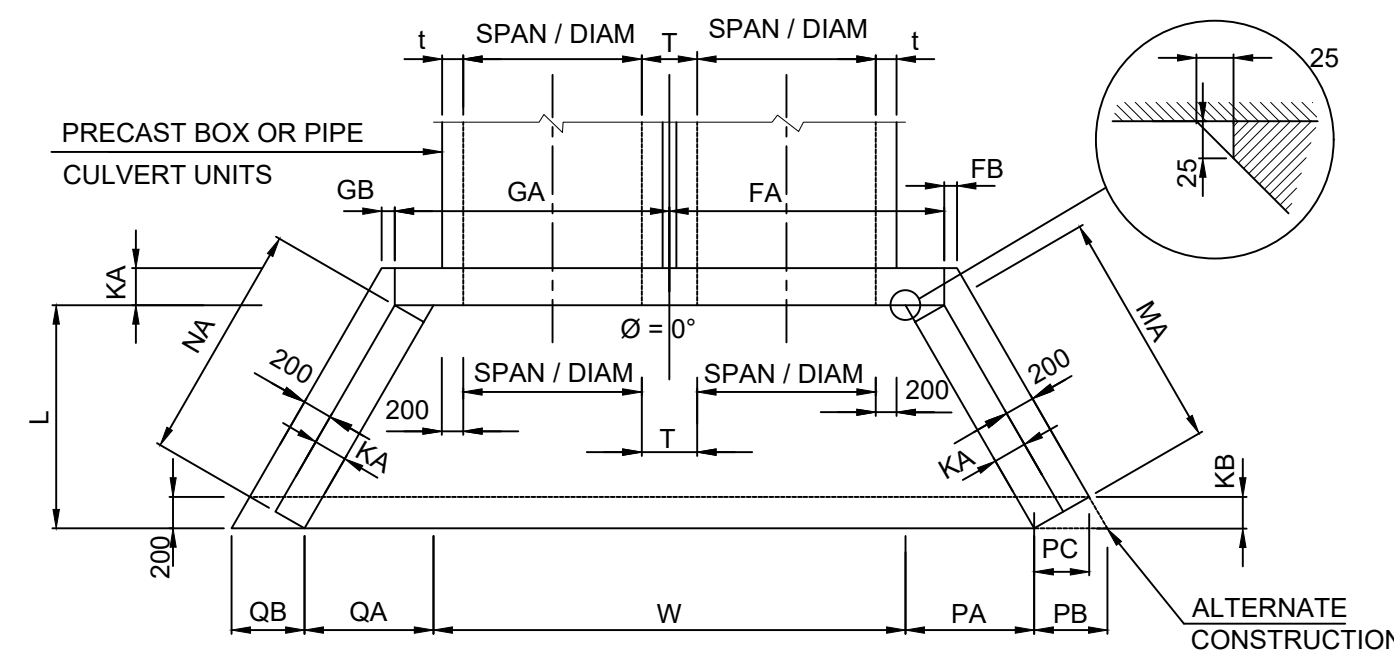
TYPICAL ELEVATION OF INLET / OUTLET WING WALLS - MAX Ø = 30°
N.T.S.



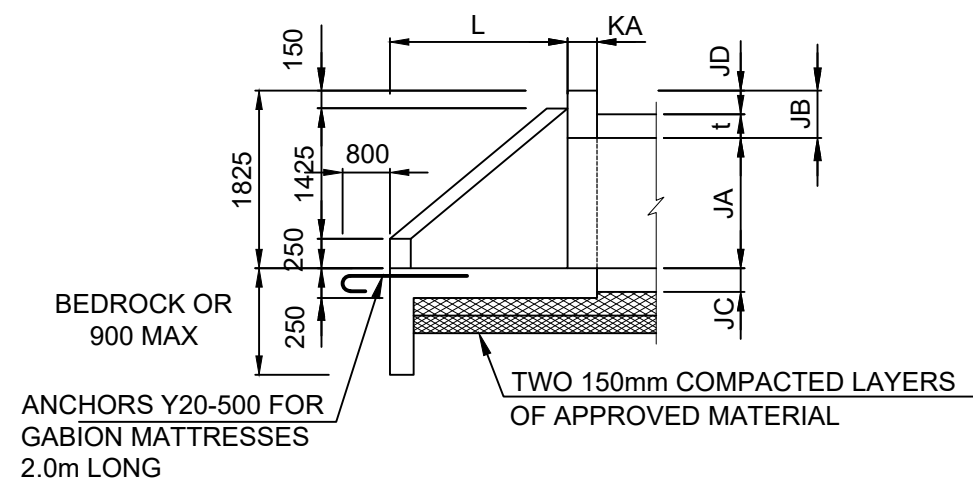
TYPICAL ELEVATION OF INLET / OUTLET WING WALLS - Ø = 0° (SQUARE)
N.T.S.



TYPICAL PLAN OF INLET / OUTLET WING WALLS - MAX Ø = 30°
N.T.S.

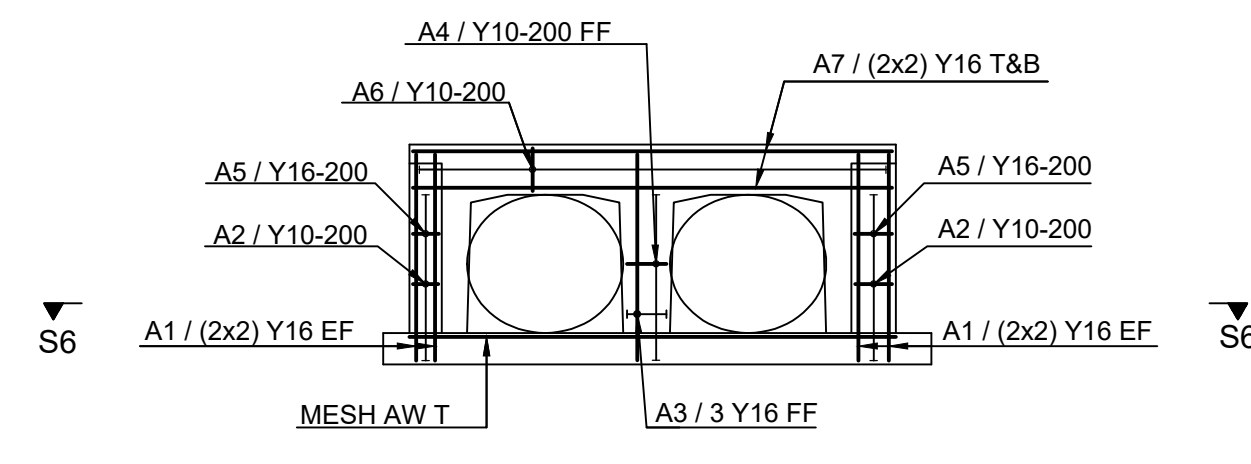


TYPICAL PLAN OF INLET / OUTLET WING WALLS - Ø = 0° (SQUARE)
N.T.S.

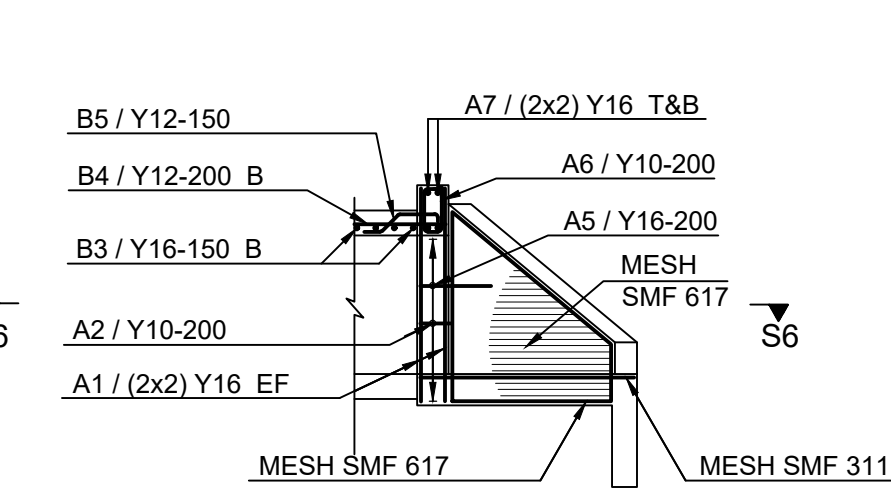


TYPICAL END-ELEVATION OF INLET / OUTLET WING WALLS - MAX Ø = 30°
N.T.S.

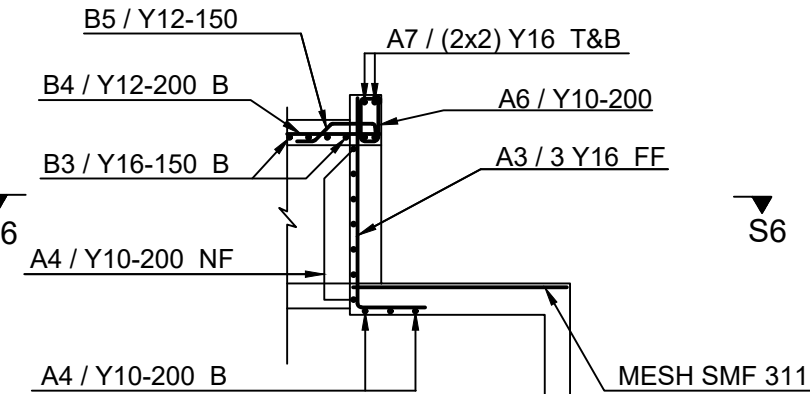
DATA SHEET AND FORMULAE				
VERTICAL HEIGHT OF CULVERT	HB	HD	KA	JB
JA < 900	150	150	225	300
JA > 900	250	150	250	400
INSITU FLOOR SLAB (JC) AND PRECAST UNIT DECK THICKNESS (I)				
	JC	t		
900mm SPAN	150mm	110mm		
1200mm SPAN	160mm	125mm		
1500mm SPAN	175mm	145mm		
1800mm SPAN	190mm	150mm		
2100mm SPAN	220mm	155mm		
2400mm SPAN	260mm	170mm		
All dimensions in mm				
FORMULAE				
L = HC x S (min.1500mm)		S = BATTER SLOPE		
QA = L x TAN(Ø-30)		Ø = CULVERT SKEW ANGLE		
PA = L x TAN(Ø+30)		t = PRECAST WALL THICKNESS		
NA = L x SEC(Ø-30) - KA x TAN(Ø-30)				
MA = L x SEC(Ø+30) - KA x TAN(Ø+30)				
T = t x 2 + 80				
QB = (KA + 200) x SEC(Ø - 30)				
PB = (KA + 200) x SEC(Ø + 30)				
KB = (KA + 200) x SIN(Ø + 30)				
PC = (KA + 200) x COS(Ø + 30)				
GA = W/2 + KA x SEC(Ø-30)				
GB = ((200 x COSEC(Ø - 30)) - KA) x TAN(Ø - 30)				
FA = W/2 + KA x SEC(Ø+30)				
FB = ((200 x COSEC(Ø + 30)) - KA) x TAN(Ø + 30)				
R = t + 100 (INSITU BARREL SLAB THICKNESS)				



SECTION S1-S1 - INLET / OUTLET WING WALLS HEADWALL & COLUMNS - REINFORCEMENT

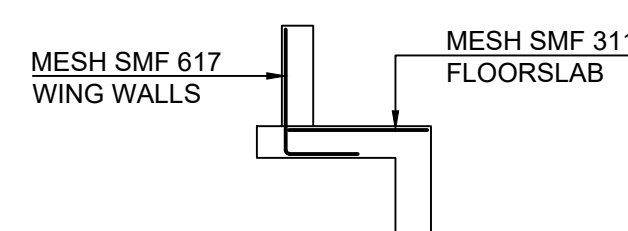


SECTION S2-S2 - INLET / OUTLET WING WALLS HEADWALL & WING WALLS - REINFORCEMENT

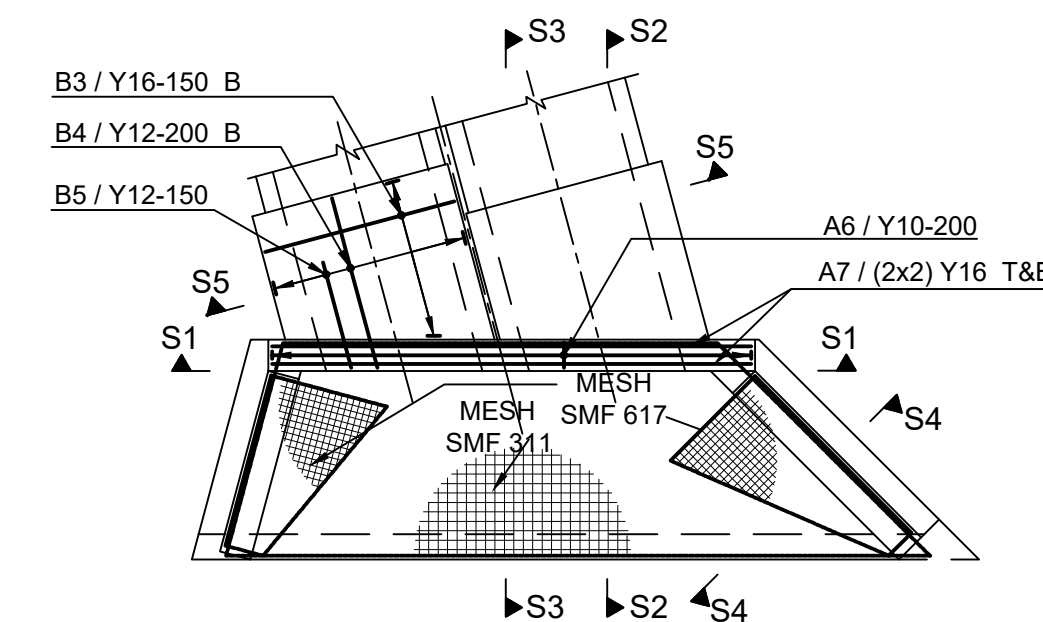


SECTION S3-S3 - INLET / OUTLET WING WALLS HEADWALL & COLUMNS - REINFORCEMENT

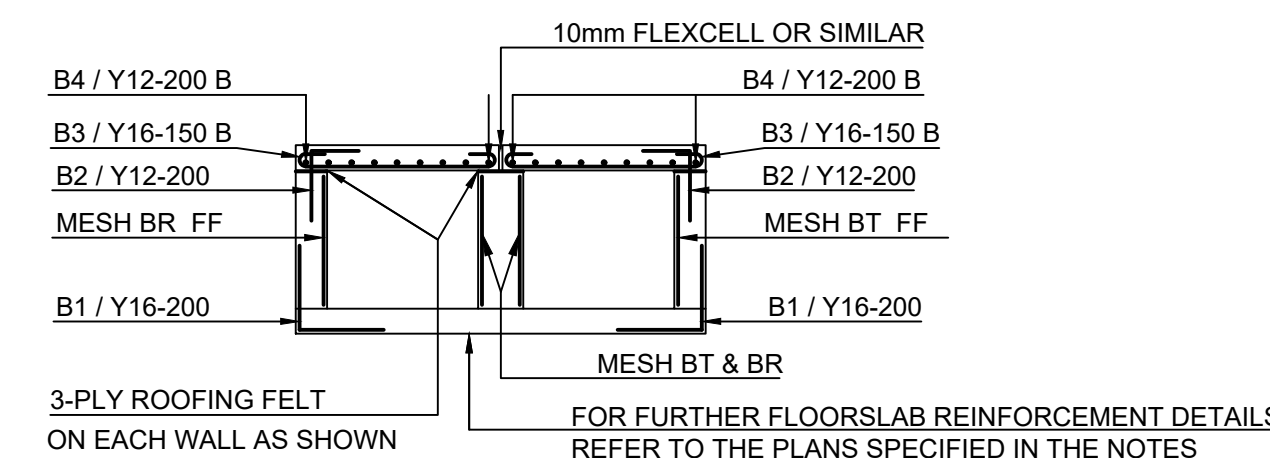
NOTE:
MESH REINFORCEMENT ONLY FOR CULVERTS WHERE VERTICAL OPENING, JA > 900



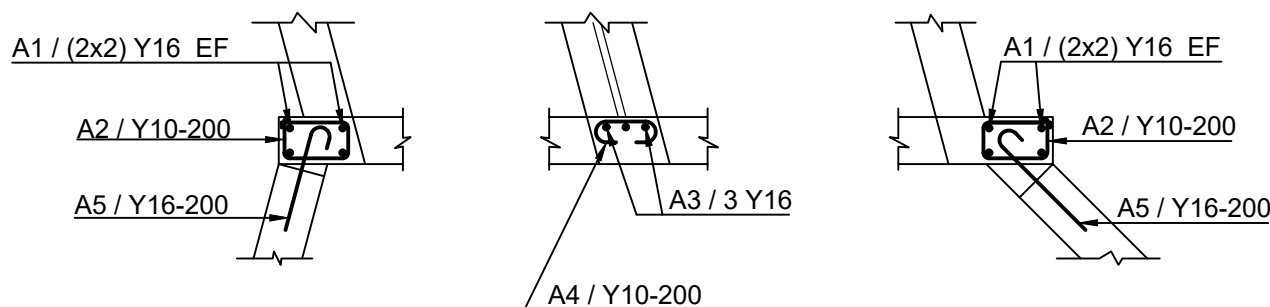
SECTION S4-S4 - INLET / OUTLET WING WALLS WING WALLS & FLOORSLAB - REINFORCEMENT



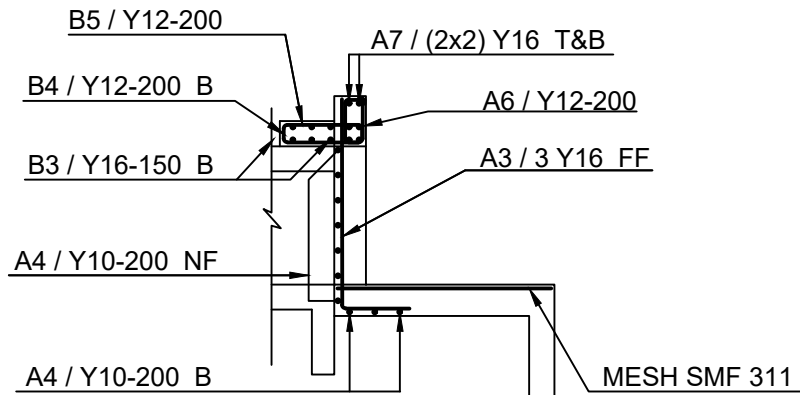
TYPICAL REINFORCEMENT PLAN OF INLET / OUTLET WING WALLS - MAX Ø = 30°



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



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



INLET/OUTLET WINGWALLS HEADWALL & COLUMNS REINFORCEMENT FOR PRECAST CULVERTS

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

FOR TENDER

NOTES FOR INLET / OUTLET WING WALLS:

- DESIGN CRITERIA
 - THE WING WALLS ARE DESIGNED AS CANTILEVERS FIXED TO THE BASE AND SUPPORTED BY THE HEADWALL.
 - THE WING WALLS ARE DESIGNED FOR A SURCHARGE OF 750mm AND A MAXIMUM SLOPE OF 1:1.5 FOR ANY FILL HEIGHT.
 - THE DENSITY OF SOIL = 20 kN/m.
 - SOIL PRESSURES DETERMINED USING RANKINE'S THEORY.
 - CONCRETE: WING WALL INSITU BARREL
CHARACTERISTIC STRENGTH (MPa) 30 30
CLASS CONCRETE 30 / 19 30 / 19
 - REINFORCEMENT ACCORDING TO SABS 800 - LATEST REVISION. CHARACTERISTIC STRENGTH OF HIGH TENSILE STEEL = 450 MPa. CHARACTERISTIC STRENGTH OF HIGH TENSILE STEEL MESH = 450 MPa.
 - A LINEAR SOIL PRESSURE DISTRIBUTION IS ASSUMED.
 - THE INSITU BARREL IS DESIGNED FOR SABC TRAFFIC LOADING IN ACCORDANCE WITH TMH 7 PARTS 1.2&3 (AS AMENDED 1988) 'CODE OF PRACTICE FOR THE DESIGN OF HIGHWAY BRIDGES AND CULVERTS IN SOUTH AFRICA'.
- GENERAL
 - THE REQUIRED CLASS OF SURFACE FINISH IS F2 FOR ALL VISIBLE SURFACES.
 - ALL VISIBLE CORNERS MUST HAVE A 25 x 25 mm CHAMFER.
 - TWO 150 mm LAYERS OF APPROVED MATERIAL, COMPACTED TO 93% MODIFIED A.A.S.H.T.O. DENSITY, ARE REQUIRED UNDER THE INLETS AND OUTLETS.
 - MINIMUM CONCRETE COVER TO REINFORCEMENT IS 40mm.
 - FURTHER INFORMATION REGARDING SPECIFIC CULVERTS APPEAR ON THE DRAINAGE SCHEDULES OF THE ROAD.
 - 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.
 - REINFORCEMENT DETAILS OF THE FLOOR SLAB SUPPORTING THE CULVERT BARRELS APPEAR ON THE TYPICAL PLAN FOR PRECAST PORTAL CULVERTS BASE SLABS.
 - THE HEADWALLS MUST BE ALIGNED PARALLEL TO THE ROAD SHOULDER.

CLIENT:



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TEL: (015) 491 9600
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PROJECT:

CONTRACT No. :

UPGRADING OF GRAVEL ROADS AND STORMWATER IN
MOORDKOPPIE CLUSTER MOLEKANE VILLAGE

DESIGN COORDINATOR APPROVAL:

SIGNATURE DATE

PROJECT MANAGER APPROVAL:

SIGNATURE DATE

CLIENT APPROVAL:

SIGNATURE DATE

A	JUL 2020	ISSUED FOR TENDER PURPOSE ONLY	SQ
REV	DATE	DESCRIPTION	DRAWN

REVISIONS

DRAWN: S. QUZA	CHECKED: S. SITHOLE	DESIGNED: P. SEOPA
SCALES:	AS SHOWN	DATE: SEPTEMBER 2020
DRAWING TITLE:	TYPICAL DETAIL OF CULVERT DETAIL SHEET 2	
SIZE:	A0	PROJECT No.
REV No.	A	DRAWING No. ROMH-042-07-10-14

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