

- GENERAL:**
- THESE GENERAL NOTES HAVE BEEN MADE SPECIFIC TO THE DESIGN, CONSTRUCTION, PRODUCTION AND INSTALLATION OF THE WINGWALL & GRATES SPECIFIED IN THIS SET. THE FOLLOWING LIMITATIONS FOR ADOPTION OF A WINGWALL GRATE IS BELOW:
 - WINGWALL ANGLES ARE SET AT MAXIMUM OF 15°
 - MAXIMUM SPAN OF 4m
 - MAXIMUM CULVERT SKEW OF 20°
 - WHERE CULVERT REQUIREMENTS / WINGWALLS EXCEED THESE LIMITATIONS, THE WINGWALL GRATE SHALL NOT BE INSTALLED AND CONSIDERATION GIVEN TO ALTERNATIVE SAFETY CONTROLS SUCH AS SAFETY BARRIER.
 - IN ACCORDANCE WITH AUSTRALIA STANDARD AS5100.5-2017, THE MINIMUM REQUIRED CONCRETE COVER UNDER DIFFERENT EXPOSURE CLASSIFICATIONS ARE AS PROVIDED IN CS3100 - NOTE 1
 - ALL DIMENSIONS WITHIN THIS STANDARD DRAWING SET ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

- STEELWORK:**
- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS4100 AND AS 1554.1-2014.
 - ALL WELDS SHALL BE PERFORMED BY QUALIFIED WELDER IN ACCORDANCE WITH AS 1554.1-2014 AND WITH E41XX ELECTRODES
 - ALL WELDS TO BE 8mm CONTINUOUS "SP" FILLET WELD UNLESS NOTED OTHERWISE.
 - ALL STEELWORK TO BE HOT DIPPED GALVANISED, EXCLUDING REINFORCEMENT.
 - ALL ANCHORS, NUTS AND WASHERS ARE TO BE HOT DIPPED GALVANISED
 - PLAIN ROUND BARS SHALL BE GRADE 250 IN ACCORDANCE WITH AS 4671-2019
 - ALL STEELWORK SHALL HAVE STEEL GRADE AND IN ACCORDANCE WITH REQUIRED STANDARDS
 - HOT ROLLED PLATES - GRADE 250 - AS3678-2016
 - HOT ROLLED STEEL ANGLE SECTIONS - GRADE 3300 - AS3679.1-2016

- REINFORCEMENT:**
- ALL REINFORCING STEEL SHALL BE IN ACCORDANCE WITH AS 4671-2019. REFER CS3100 - NOTE 8 TO NOTE 17

- OVERLAY & FILL & BACKFILL:**
- WINGWALL FILL/BACKFILL MATERIAL SHALL BE PLACED 300mm THICK BEHIND WINGWALLS FOR THE LENGTH AND HEIGHT OF THE WINGWALLS.
 - ALL BACKFILL AND BEDDING MATERIALS SHALL CONFORM TO THE CURRENT STANDARD SPECIFICATION FOR ROADWORKS. FOR FURTHER INFORMATION, REFER TO CS3101

- REINFORCED CONCRETE PIPES & REINFORCED CONCRETE BOX CULVERTS:**
- FOR NOMINATED PIPE CLASS, REFER PROJECT DRAWINGS AND MANUFACTURERS SPECIFICATION. MANUFACTURER TO PROVIDE CERTIFICATION OF PIPE CLASS OF PIPES DELIVERED TO SITE
 - ALL EXPOSED EDGES TO BE PROVIDED WITH 20mm CHAMFERS
 - FOR FURTHER CULVERT SPECIFIC NOTES, REFER TO CS3100

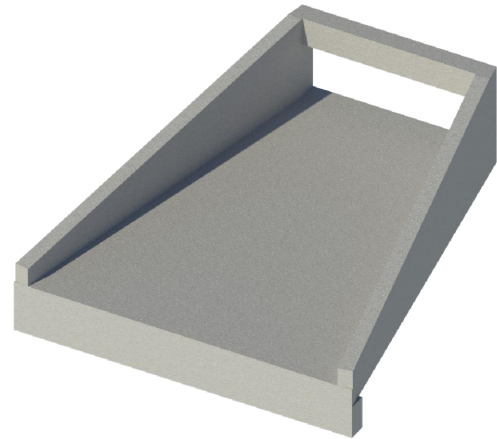
- WINGWALL & HEADWALL SETOUT:**
- SPECIFIED REFERENCE POINT REFERS TO CENTRE OF CULVERT CELLS OR CULVERT GROUPS FOR INLET & OUTLET CONDITIONS
 - THE MINIMUM HEADWALL HEIGHT SHALL BE 200mm. THIS MAY BE INCREASED LOCALLY TO SUIT SITE CONDITIONS & TO MEET FLUSH WITH THE BATTER HINGE.
 - WEEPHOLES SHALL BE PROVIDED HORIZONTALLY AS FOLLOWS:
 - MINIMUM 450mm OFFSET FROM HEADWALL
 - WINGWALLS & ABUTMENT WALLS @ 1200 CRS
 - A MINIMUM OF 2 WEEPHOLES SHALL BE INSTALLED IN THE HEADWALL FOR EACH CULVERT CELL. THESE SHALL BE LOCATED AT THE START & END OF EACH CELL AT THE HEADWALL (MEETING MINIMUM COVER REQUIREMENTS)
 - PROVIDE 300 x 300 x 150 DRAINAGE FILTER MATERIAL (10-20mm AGGREGATE) WRAPPED IN STRENGTH CLASS 'B' GEOTEXTILE BEHIND EACH WEEPHOLE.

- PROTECTION:**
- WHERE SPECIFIED, DOWNSTREAM END TO BE PROTECTED BY RENO MATTRESS. REFER TO CS3100 FOR BOLT CONNECTION DETAILS OF RENO MATTRESS AND CONCRETE

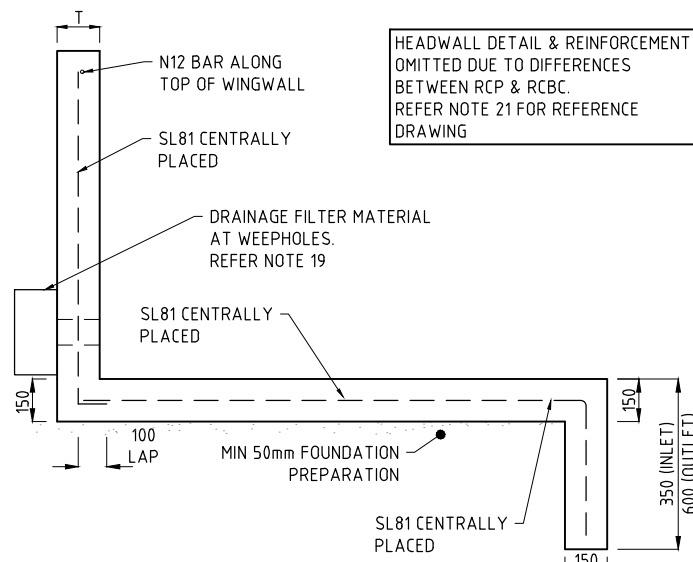
- STANDARD DRAWING REFERENCES:**
- THE BELOW STANDARD DRAWINGS ARE REFERENCED WITHIN THIS DRAWING SET:
 - CS3100 - CULVERT GENERAL NOTES & PROTECTION DETAIL
 - CS3101 - INSTALLATION, BEDDING AND BACKFILLING OVER CULVERTS
 - CS3103 - CS3106 - RCP CULVERT HEADWALL DETAILS & REINFORCEMENT
 - CS3108 - CS3110 - RCBC CULVERT HEADWALL DETAILS & REINFORCEMENT
 - CS3111 & CS3112 - BASE SLAB DETAILS FOR RCBC CULVERTS
 - CS3134 - TRAFFICABLE GRATE MAX 2m SPAN & 1V:4H BATTER
 - CS3135 - TRAFFICABLE GRATE MAX 2m SPAN & 1V:6H BATTER
 - CS3136 - TRAFFICABLE GRATE MAX 4m SPAN & 1V:4H BATTER
 - CS3137 - TRAFFICABLE GRATE MAX 4m SPAN & 1V:6H BATTER
 - CS3138 - TRAFFICABLE GRATE SETOUT REFERENCES
 - CS3139 - SETOUT DIMENSIONS FOR WINGWALLS & GRATE FOR MAX SPAN 2m
 - CS3140 - SETOUT DIMENSIONS FOR WINGWALLS & GRATE FOR MAX SPAN 4m

ABBREVIATIONS & VALUES:

DESCRIPTION	SYMBOL / REFERENCE
REINFORCED CONCRETE PIPE	RCP
REINFORCED CONCRETE BOX CULVERT	RCBC
CULVERT WIDTH	W
INTERNAL DIAMETER / INTERNAL HEIGHT OF CULVERT	D
HEADWALL HEIGHT (MEASURED FROM TOP OF APRON TO TOP OF HEADWALL)	H
WINGWALL THICKNESS	D ≤ 900, T = 150mm D > 900, T = 250mm
HEADWALL THICKNESS	250mm
HEADWALL HEIGHT (TOP OF CULVERT CELL TO TOP OF HEADWALL)	MIN 200mm
ROAD BATTER SLOPE	1V:XH 1 VERTICAL UNIT FOR EVERY (X) HORIZONTAL UNITS
APRON LENGTH (MEASURED FROM BACK OF HEADWALL)	A
INTERNAL ANGLE OF WINGWALL	α
WIDTH OF WINGWALL DUE TO ANGLE	B
APRON END WIDTH/GRATE MAX SPAN	C

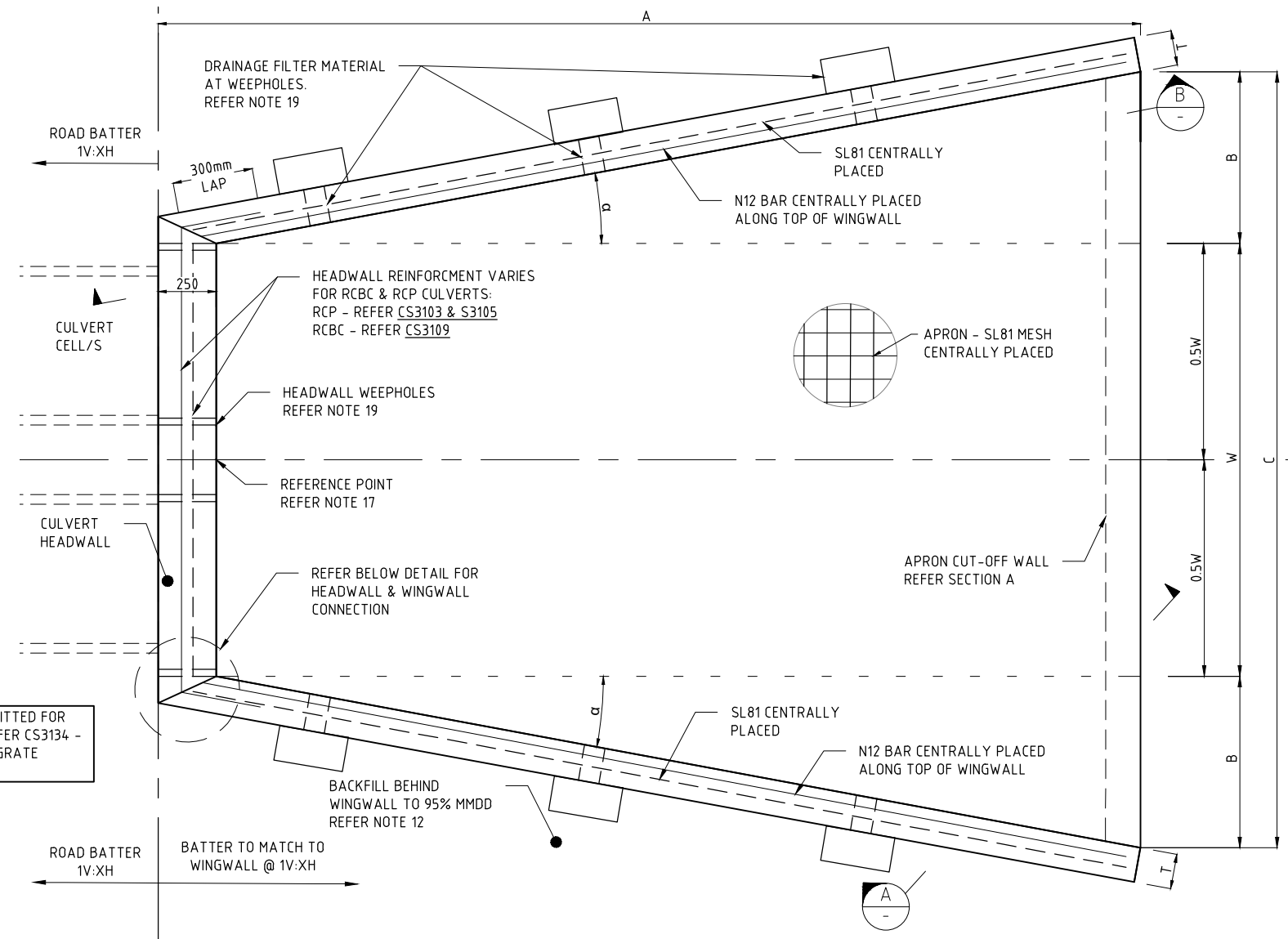


TYPICAL MODIFIED CULVERT WINGWALLS
NOT TO SCALE

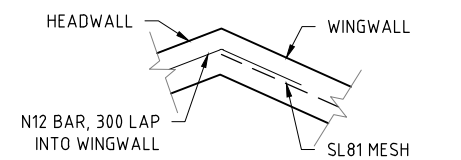


APRON & WINGWALL REINFORCEMENT - SECTION A
NOT TO SCALE

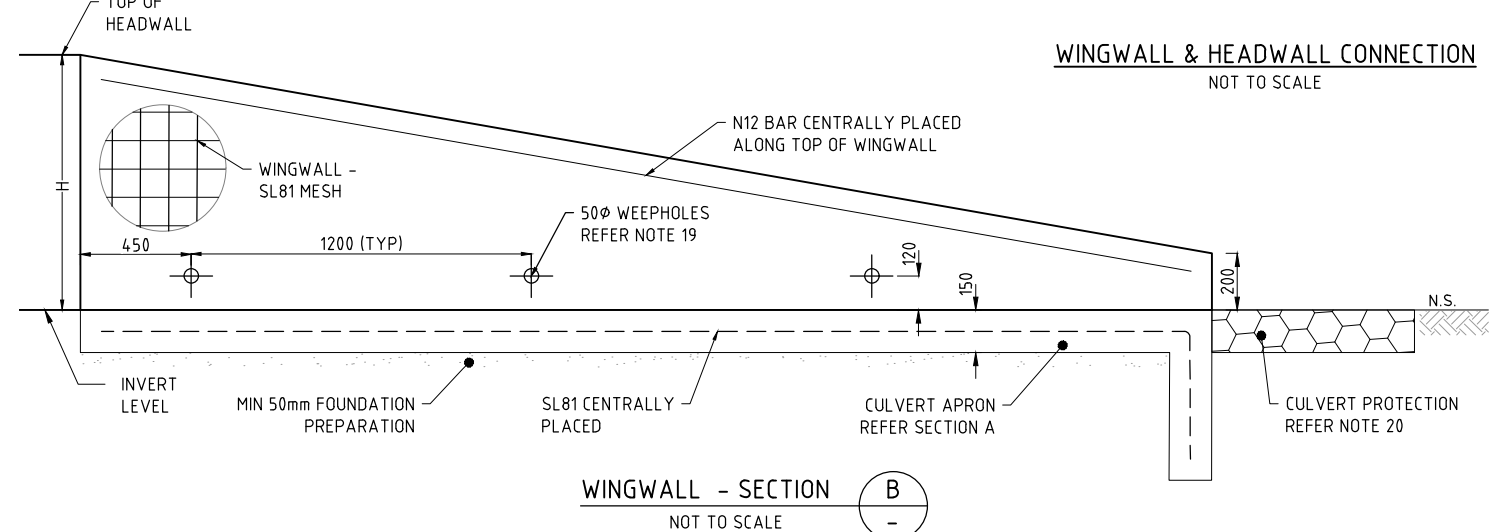
GRATE IS OMITTED FOR CLARITY. REFER CS3134 - CD3137 FOR GRATE DETAILS.



RCP & RCBC CULVERT - MODIFIED WINGWALL ANGLE - SETOUT PLAN
NOT TO SCALE



WINGWALL & HEADWALL CONNECTION
NOT TO SCALE



WINGWALL - SECTION B
NOT TO SCALE

No.	AMENDMENT DESCRIPTION	DATE	INIT.	DEPT/COMPANY
0	ISSUED AS A STANDARD DRAWING	JUN 2023	J. COOK	TCS / DIPL

Drawn J. COOK Date: MAY 2023	Checked S. HATZI Date: MAY 2023
Designed J. COOK Date: MAY 2023	Checked S. HATZI Date: MAY 2023
Design Project Leader DIPL Date: MAY 2023	NTG Project Manager DIPL Date: MAY 2023



STANDARD DRAWINGS
DRAINAGE

TRAVERSABLE CULVERT WINGWALL & GRATE
GENERAL NOTES & MODIFIED WINGWALL SETOUT

NTG Project No.	NTG Asset No.	Sheet Reference	NTG Drawing No.	Amendment
-	-	01 OF 08	CS3133	0 A1