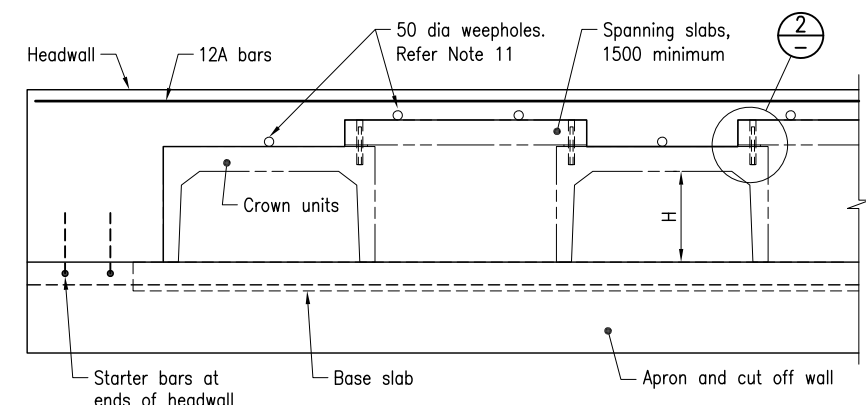
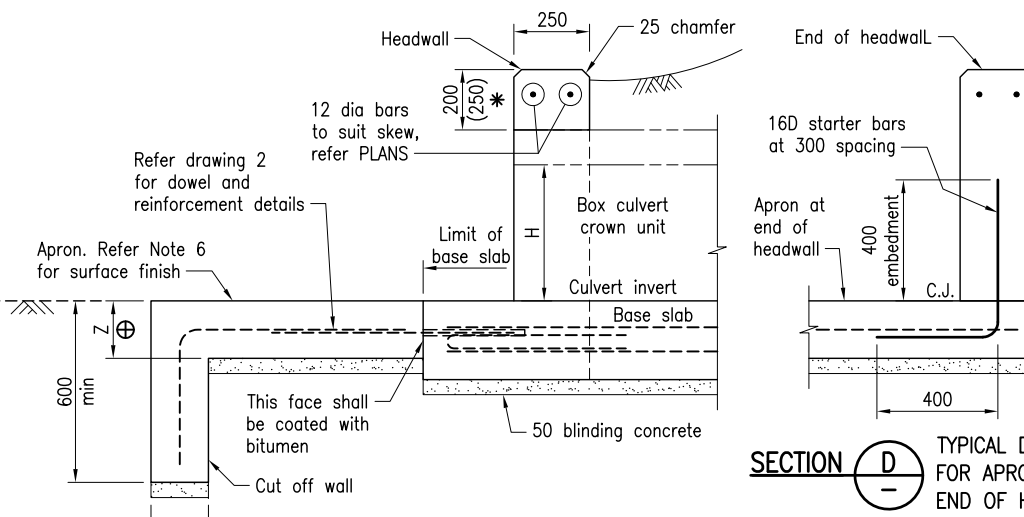


TYPICAL PLAN
SQUARE SLAB LINK CULVERT SHOWN
SQUARE SINGLE AND MULTICELL BOX CULVERTS SIMILAR



TYPICAL ELEVATION - SPANNING SLAB DETAILS

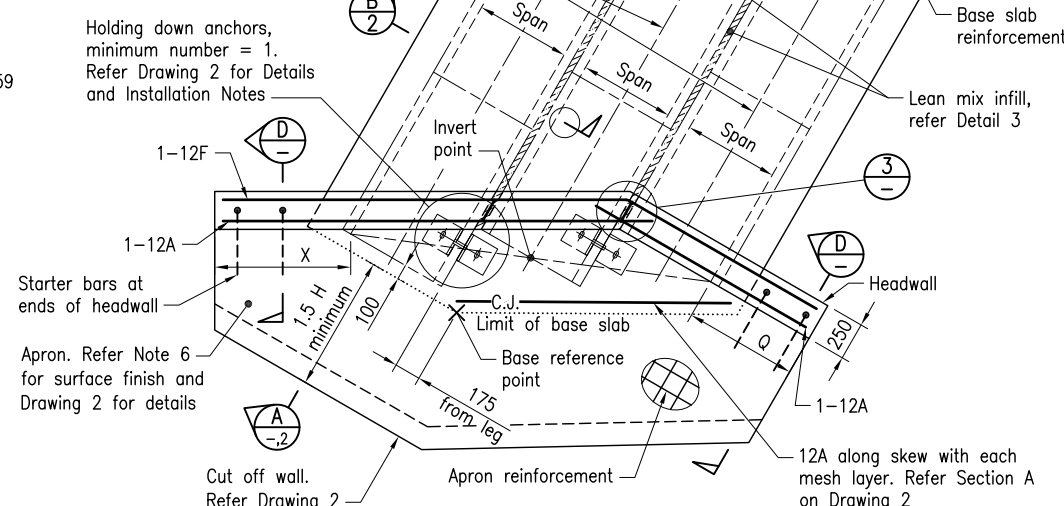
GENERAL ARRANGEMENT - SLAB LINK BOX CULVERT



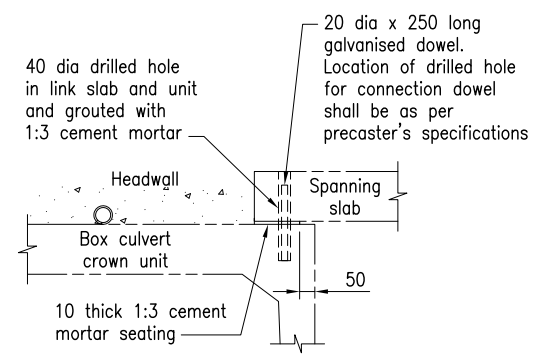
SECTION A TYPICAL DETAILS FOR APRON AND BASE SLAB

TABLE OF DIMENSIONS

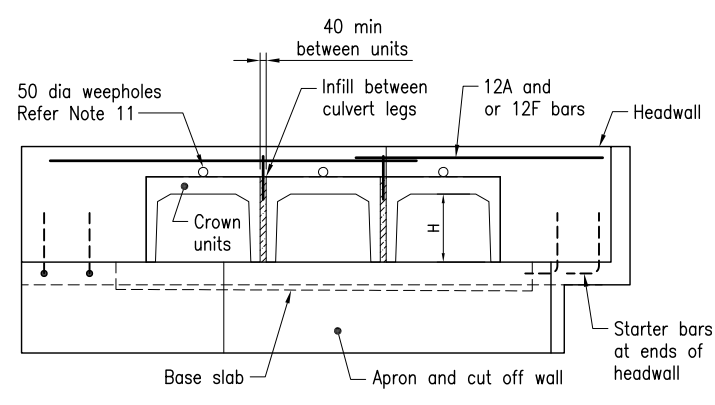
Skew angle θ	Dim for Q and X for height of opening H			
	H	375	450	600
0-10	Q	600	750	900
11-20	Q	600	750	900
	X	650	800	1000
21-30	Q	600	750	900
	X	700	900	1100
31-45	Q	600	750	900
	X	800	1000	1200



TYPICAL PLAN - HIGH SKEW DRAWN
MULTICELL BOX CULVERT SHOWN
SKEWED SINGLE AND SLAB LINK BOX CULVERTS SIMILAR

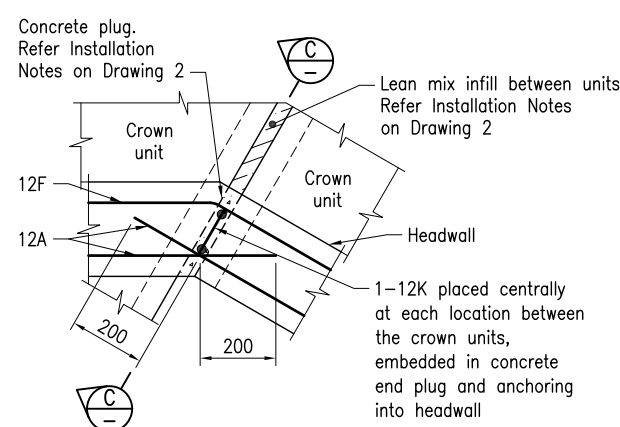


DETAIL 2 SPANNING SLAB SUPPORT

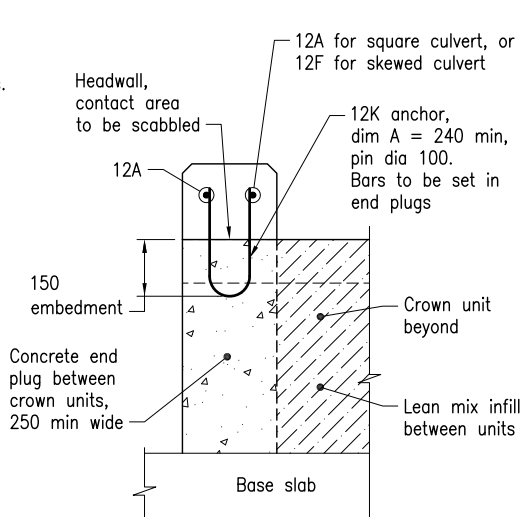


TYPICAL ELEVATION - MULTICELL DETAILS

GENERAL ARRANGEMENT - MULTIPLE CELL RC BOX CULVERT



DETAIL 3



SECTION C CONNECTION DETAILS

The purpose of this Standard Drawing is to provide typical standard details that shall be used within the limitations specified in the drawing and in accordance with the following:

1. The adaptability of the standard details shall be assessed by the project designer in respect of specific project geometric, appropriate foundation and scour conditions.
2. In reactive soils: this standard drawing is only applicable for reactive soils with linear shrinkage up to 8%. Specialist geotechnical design advice shall be sought otherwise.
3. If the insitu bearing capacity is inadequate, the following options may be explored subject to review and acceptance by E&T Structures and Geotechnical sections:
 - a. Insitu ground improvement, and/or
 - b. Redesign of the base slab.
 Any redesign works shall be RPEQ certified by appropriate engineering disciplines for compliance.
4. When there is uncertainty regarding the application of the standard details on this drawing for a specific project, advice shall be sought from E&T Structures.

GENERAL NOTES:

1. SCOPE: This drawing is to detail cast insitu base slab, aprons and headwalls for precast R C Box Culverts and Slab Link Box Culverts where H (height of opening) = 375 to 600. This drawing supersedes Standard Drawings 1174 and 1317. This drawing does not provide details of fish passage requirements. Where project specific environmental assessment determines that waterway barrier works are required, additional details shall be developed and included in the project drawings.
2. BOX CULVERTS shall be constructed in accordance with MRTS03.
3. DESIGN TRAFFIC LOADING: HLP400, M1600, A160 and W80 are in accordance with AS 5100.2. Maximum height of fill over the culvert shall be 2000. Maximum design pressure (E_d) under the culvert slab bases are provided in the Base Slab Details and Dimensions table on drawing 2.
4. DOWELLED CONTRACTION JOINTS shall be provided where (a) the length and/or (b) the width of the base slab exceed 20m. When contraction joints are required across the width, they shall be located at 1/4 span points of crown units and are to be continued across the aprons. 24 hours minimum shall be allowed between pours.
5. APRON AND BASE SLAB MINIMUM REINFORCEMENT for shrinkage and temperature effects are designed considering the full restraint condition to AS 5100. For the slab on ground condition, only the top half of the slab thickness is considered for calculation of this reinforcement.
6. CONCRETE shall be in accordance with MRTS70. Design life 100 years. Exposure classification and cover to reinforcement shall be in accordance with AS 5100. Minimum concrete strength and cover to reinforcement shall be as shown in table below.

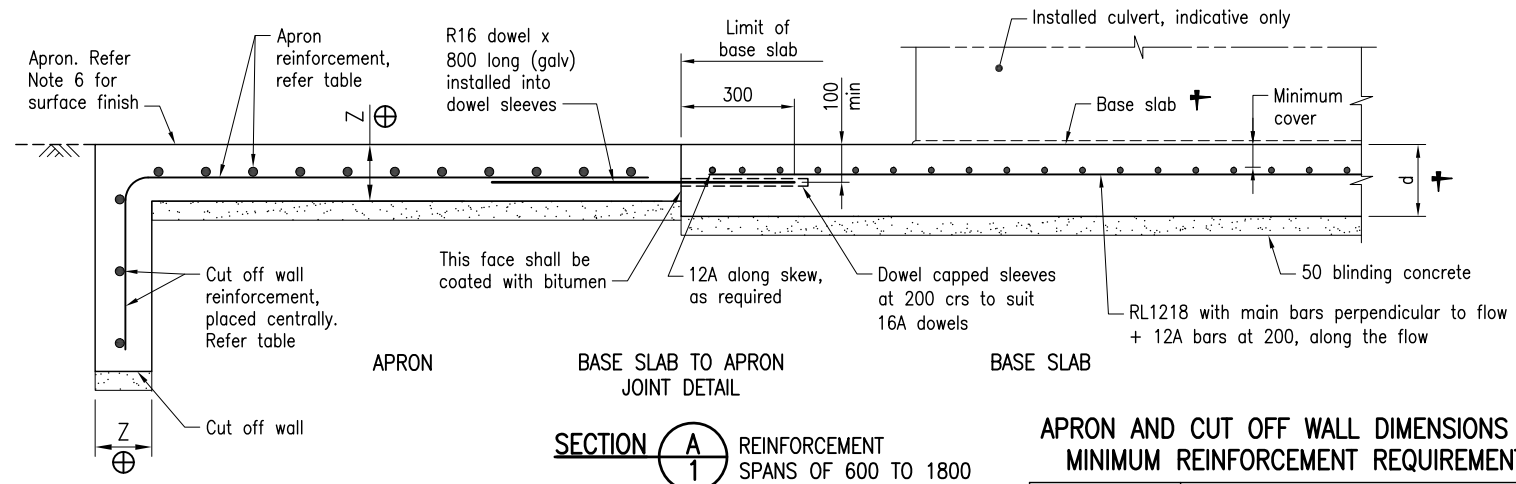
Exposure classification	minimum B2	C1 *	C2 *
Minimum concrete strength	S40/20	S50/20	S55/20
Minimum Cover UNO	60	70	80

* Dimensions within brackets () are for classification C1 and C2.

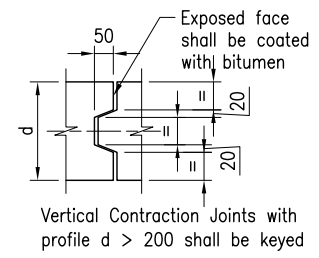
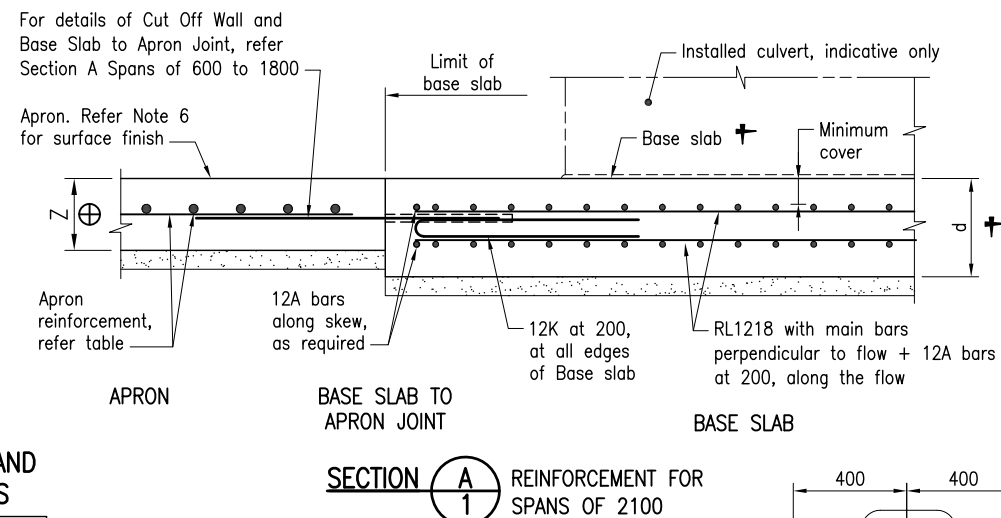
- Triple-blend concrete in accordance with MRTS70 is required for Exposure classifications C1 and C2.
Blinding concrete N20/20.
Surface roughening of the aprons shall be broom finish using a broom not less than 400 wide to achieve an average texture depth of 0.8. The direction of brushing shall be perpendicular to the direction of flow.
All exposed edges shall have 19 x 19 chamfers, unless nominated otherwise.
7. PRECAST CONCRETE CULVERTS shall be designed and manufactured in accordance with MRTS24.
 8. STEELWORK shall be fabricated to the requirements of MRTS78. Angle Grade 300 to AS/NZS 3679.1. Bolts and screws Class 4.6 to AS 1111.1. Nuts Class 5 to AS 1112.1. Washers Class 5 to AS 1237.1. After fabrication all bolts and nuts shall be hot dip galvanised to AS 1214, and all other steelwork to AS/NZS 4680.

General Notes are continued on Drawing 2.

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R C BOX CULVERTS AND SLAB LINK BOX CULVERTS		
CULVERTS HEIGHT = 375 TO 600		Standard Drawing No
DRAWING 1 OF 2		1260
GENERAL ARRANGEMENT AND NOTES		Date 3/2021
A3	Not to Scale	
A	B	C



CUT OFF WALL TYPICAL FOR ALL SPANS



Vertical Contraction Joints with profile d > 200 shall be keyed

APRON AND CUT OFF WALL DIMENSIONS AND MINIMUM REINFORCEMENT REQUIREMENTS

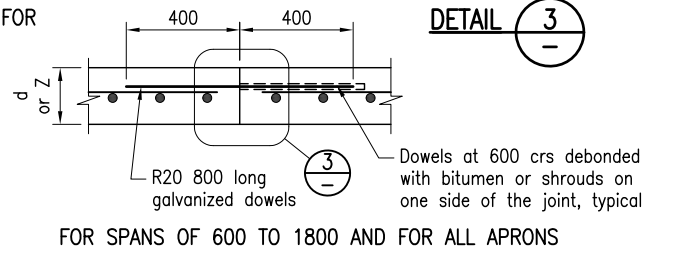
Exposure classification	Apron and Cut off wall #	
	Thickness Z ⊕	Reinforcement
B2	150	N12 at 150 both ways
C1	175	N12 at 150 both ways
C2	190	N12 at 125 both ways

⊕ where Z is a constant thickness for aprons and cut off walls.
Refer Note 5 of Drawing 1

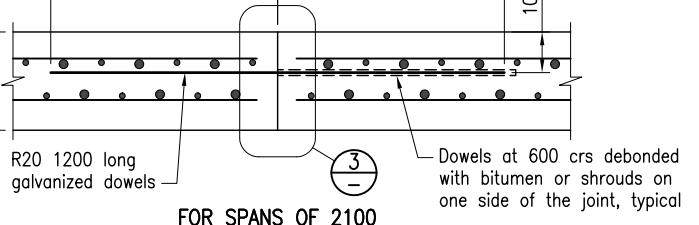
BASE SLAB DETAILS

Up to Span	Maximum design pressure (E _d) kPa	Base slab thickness d for Exposure classification		
		B2	C1	C2
600	190	180	190	200
750		180	190	200
900		180	190	200
1200		190	200	210
1500		190	200	210
1800		210	220	230
2100				

† where d is a constant thickness for base slab

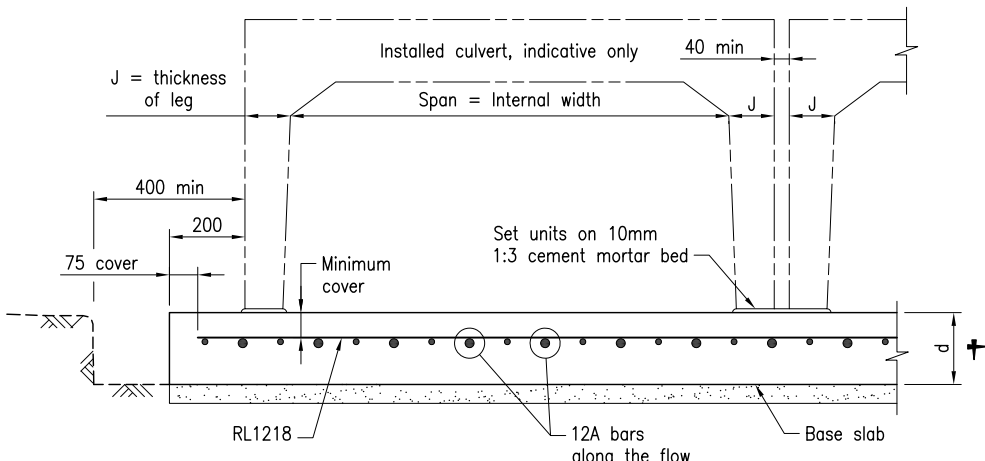


FOR SPANS OF 600 TO 1800 AND FOR ALL APRONS

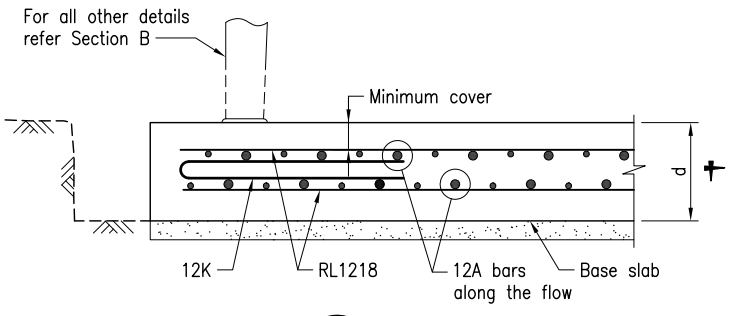


FOR SPANS OF 2100

Installed with direction of flow. Refer Note 4 on Drawing 1

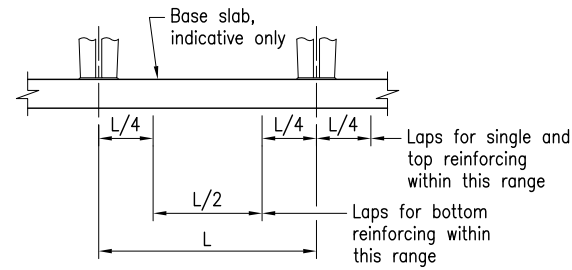


SECTION B1 SPANS OF 600 TO 1800



SECTION B1 SPANS OF 2100

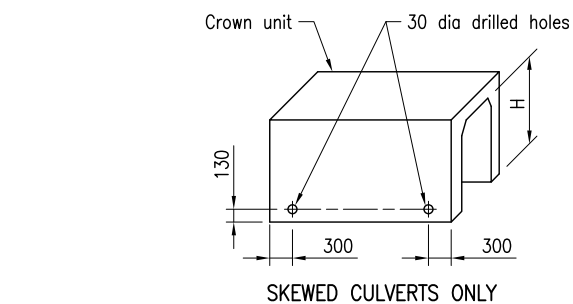
TYPICAL BASE SLAB FOR SMALL BOX CULVERTS



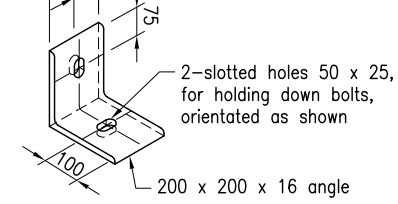
REINFORCING BAR LAP LOCATIONS - ALL BASE SLABS

GENERAL NOTES, continued from Drawing 1:

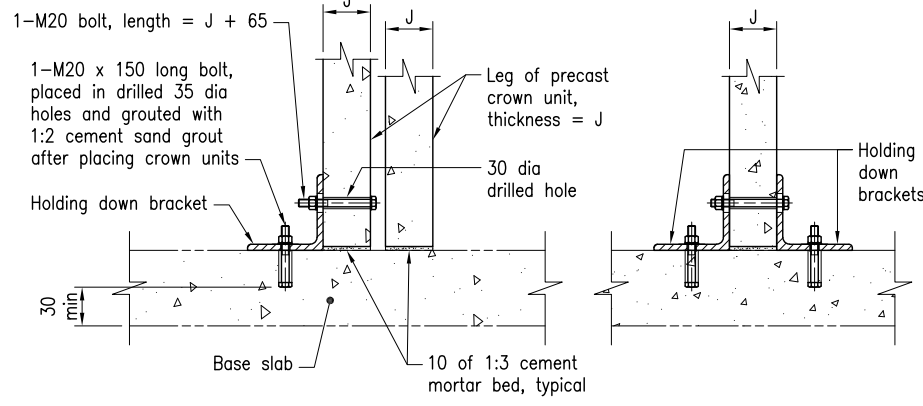
- INFILL between legs of multiple cell culverts shall be achieved by placing concrete plugs of 250 minimum length at both ends of the culvert, using same grade of concrete as headwall, and infill the remaining gap with 1:10 lean mix having maximum aggregate size of 10mm packed dry. Do not use fluid grout as hydrostatic head will damage culvert legs.
- REINFORCING STEEL shall be read in conjunction with Standard Drawings 1043 and 1044, shall be in accordance with MRTS71 and AS/NZS 4671, and ACRS certified. Deformed bars Grade D500N. Round bars Grade R250N. Mesh Grade D500L. Reinforcement shall be hot dip galvanised to AS/NZS 4680 where shown. Reinforcing Steel welding shall be in accordance with Standard Drawing 1044.
- WEEPHOLES shall be provided in the headwalls horizontally as follows: Minimum of 1 weep hole for each culvert crown unit, placed centrally where spans ≥ 1200; location of weep holes shall be determined such that reinforcement cover requirements are met; and, approved drainage filter shall be provided at each weep hole.
- Refer Standard Drawing 1359 for details of earthworks to culverts.
- PROJECT-SPECIFIC INFORMATION to be shown on the drawings: Exposure classification; Culvert chainage; Skew angle; Base and apron setout, extents and details; Skew spanning slab details (if required); Headwall extents and details; Requirements for fish passage.
- DIMENSIONS are in millimetres. ASSOCIATED and REFERENCED DEPARTMENTAL DOCUMENTS: Design Criteria for Bridges and Other Structures; Road Drainage Manual (RDM) Standard Drawing 1359 Culverts - Installation, Bedding and Filling/Backfilling MRTS03 Drainage, Retaining Structures and Protective Treatments MRTS24 Manufacture of Precast Concrete Culverts MRTS70 Concrete; MRTS71 Reinforcing Steel; MRTS78 Structural Steelwork



DRILLED HOLES IN CROWN UNITS FOR HOLDING DOWN ANCHORS



HOLDING DOWN BRACKET Isometric view



TYPICAL ASSEMBLY DETAILS HOLDING DOWN ANCHORS

TYPICAL INSTALLATION OF PRECAST UNITS

NOTES FOR INSTALLATION OF PRECAST UNITS:

- PRECAST CONCRETE CULVERTS shall be supplied and installed in accordance with MRTS03 and MRTS24. Doweled connections shall be in accordance with this drawing.
- INFILL between legs of multiple cell culverts shall be achieved by placing concrete plugs of 250 minimum length at both ends of the structure and infill the remaining gap with 1:10 lean mix having maximum aggregate size of 10mm packed dry.
- Do not use fluid grout as hydrostatic head will damage culvert legs.
- HOLDING DOWN ANCHORS shall be installed where the leg(s) of the crown unit extend more than 300 beyond the outside face of the headwall. Refer details on this drawing for holding down anchor placement and installation.
- LEAN MIX CONCRETE shall be placed between spanning slabs on crown unit cells. Lean mix concrete infill is not required on the outermost crown units.

Department of Transport and Main Roads			
R C BOX CULVERTS AND SLAB LINK BOX CULVERTS			
CULVERTS HEIGHT = 375 TO 600			
DRAWING 2 OF 2			
BASE SLAB AND APRON DETAILS AND INSTALLATION OF PRECAST UNITS			