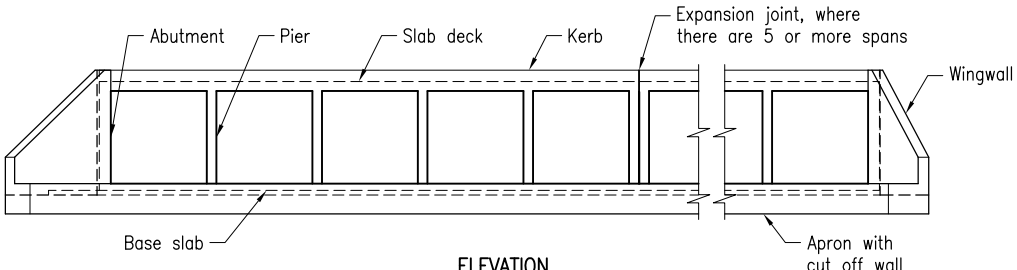
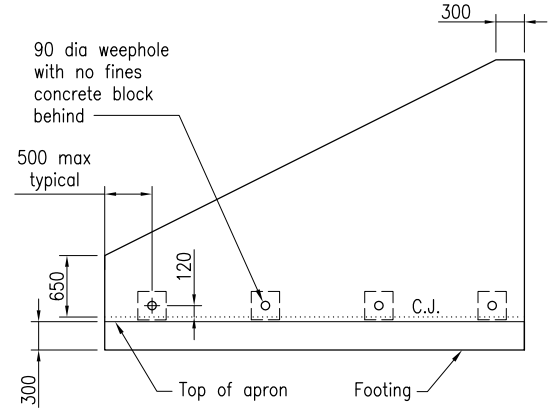
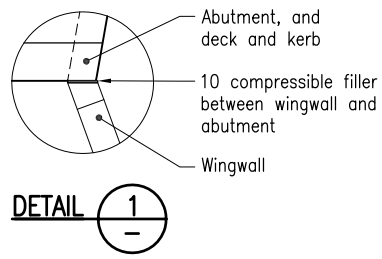


PLAN
TYPICAL FRAMING LAYOUT FOR BASE SLAB



ELEVATION
GENERAL ARRANGEMENT

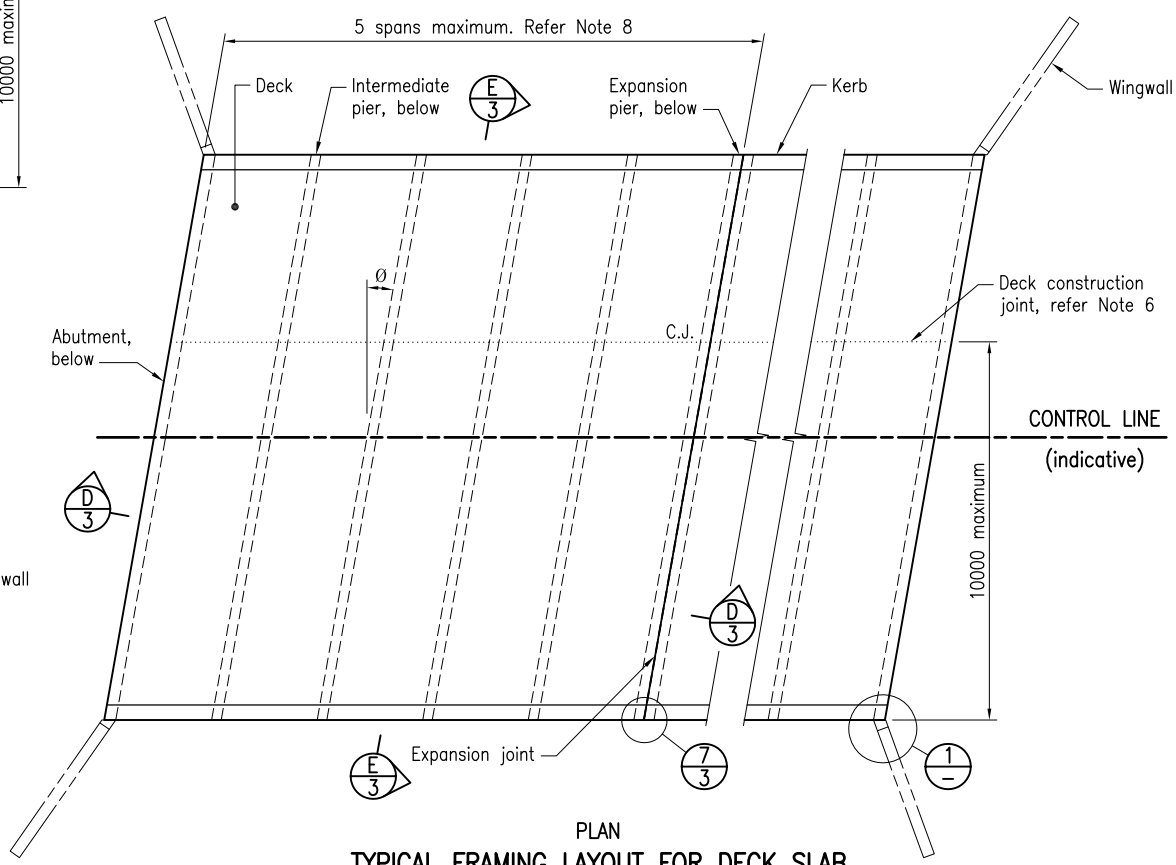


ELEVATION
WINGWALL

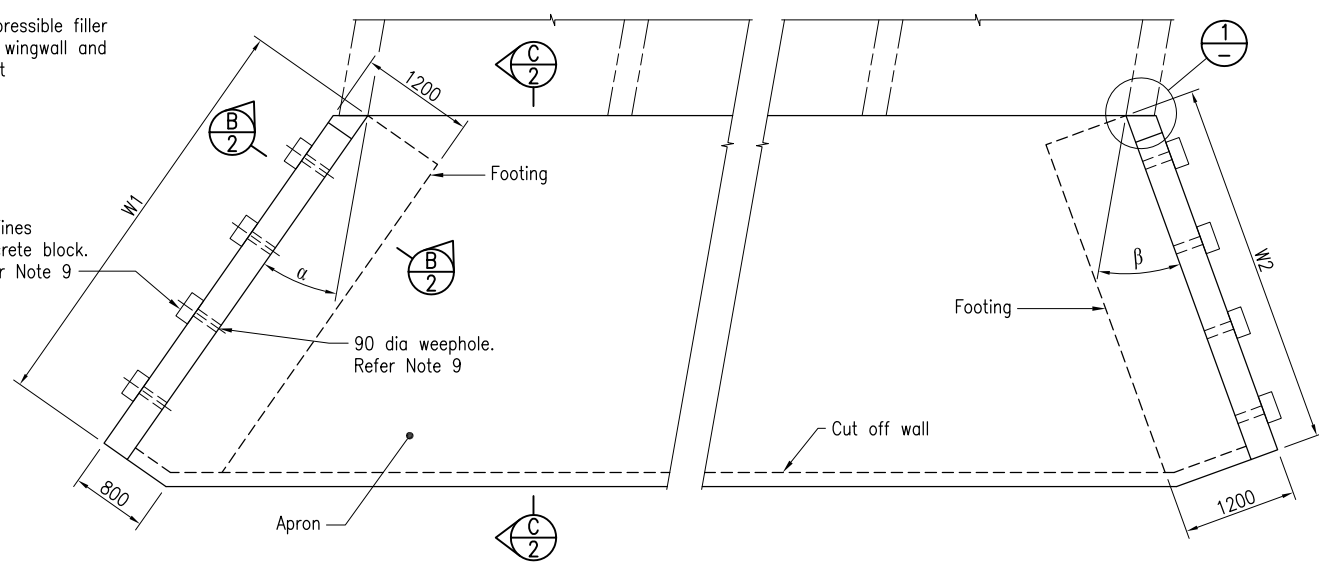
Apron and cut off wall omitted for clarity

TABLE OF WING ANGLES

Skew angle θ	Wing angle	
	α	β
0 - 10	30	30
11 - 20	25	30
21 - 30	20	30
31 - 45	15	30



PLAN
TYPICAL FRAMING LAYOUT FOR DECK SLAB

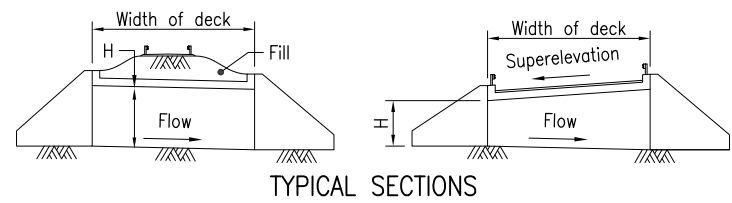


PLAN
APRON AND WINGWALLS

NOTE:
This design shall not be used in:
a. Highly reactive or expansive clay soils (linear shrinkage >8%).
b. Where large differential settlement is expected to occur.
Specialist design advice shall be obtained in these circumstances.

DESIGN FOUNDATION BEARING CAPACITY is 150 kPa.
Foundation bearing capacity shall be certified by an RPEQ Geotechnical engineer prior to casting of base slab

SLOPE OF DECK SLAB culverts with fill shall have the deck set on the same cross slope as the base so that H is constant over the length of the abutment. For culverts with no fill, the slope of deck and base may differ so that H is not constant



NOTES:

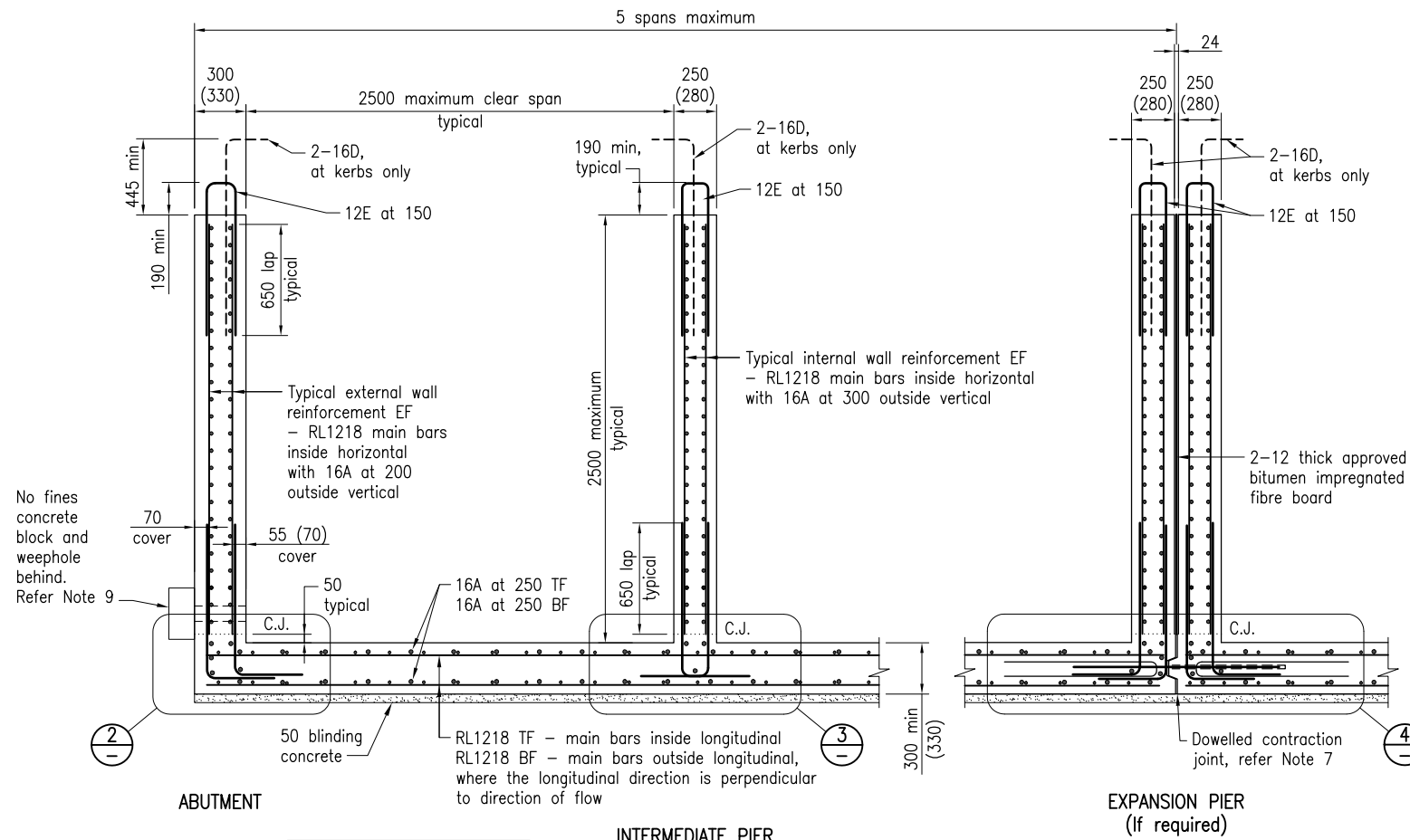
- RC SLAB DECK CULVERT shown in this Standard Drawing shall be constructed in accordance with MRTS03.
- DESIGN LOADS: Traffic loads and traffic load surcharge shall be in accordance with AS 5100. Heavy load platform is HLP400. Load factors and load combinations shall be in accordance with AS 5100.
- 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.
Blinding concrete N20/20.

Exposure classification	minimum B2	C *
Minimum concrete strength	S40/20	S50/20
Minimum Cover UNO	55	70

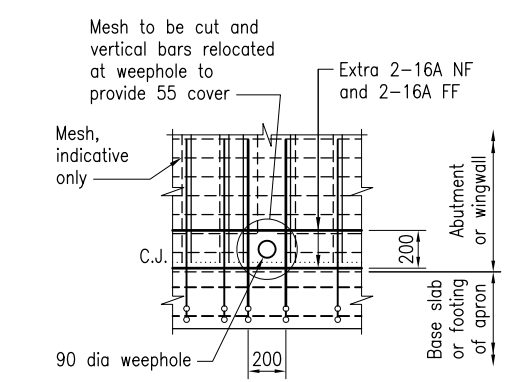
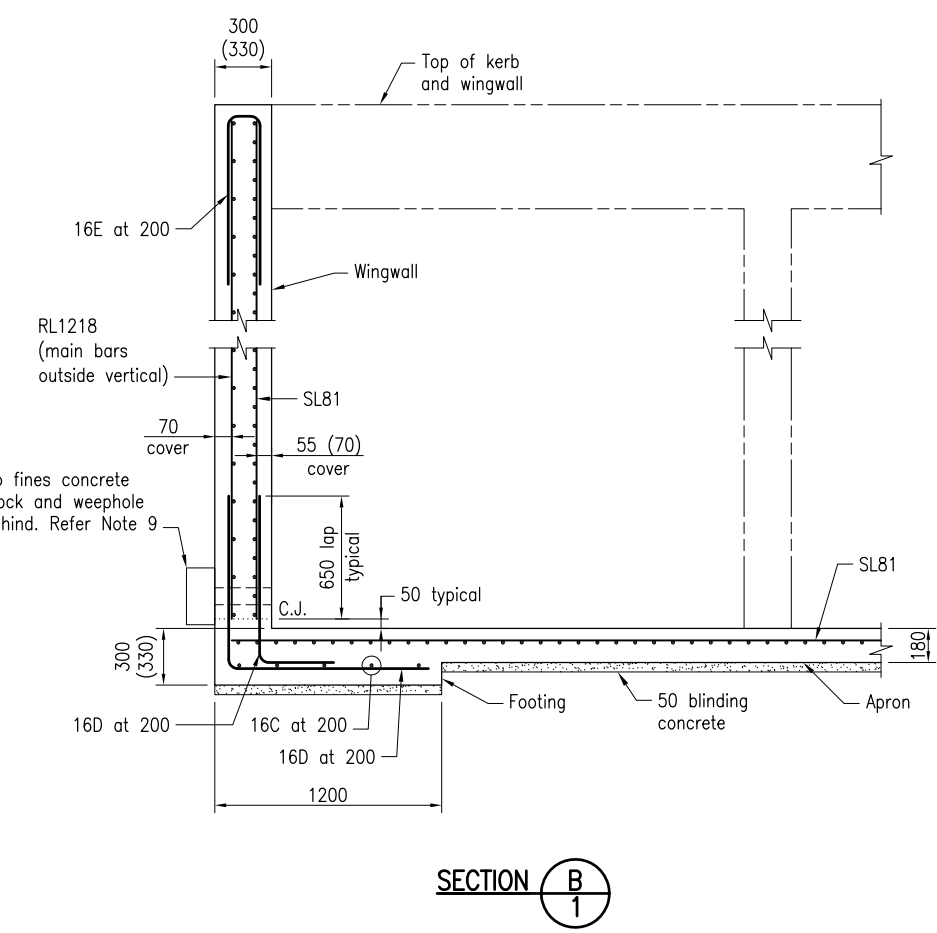
- * Dimensions within brackets () are for exposure classification C.
- REINFORCING STEEL to be read in conjunction with Standard Drawings 1043 and 1044. Reinforcing steel to be in accordance with MRTS71 and AS/NZS 4671. Deformed bars Grade D500N, Round bars Grade R250N and reinforcing mesh Grade D500L. Reinforcement to be hot dip galvanised to AS/NZS 4680 where shown.
 - TACK WELDING to reinforcement for location purposes to AS/NZS 1554.3. Welding consumables to be controlled hydrogen type: G49X to AS/NZS ISO 14341-B or T49X to AS/NZS ISO 17632-B unless shown otherwise.
 - CONSTRUCTION JOINTS (C.J.): A minimum of 24 hours shall be allowed prior to placement of adjacent concrete and the exposed face shall be treated as per MRTS70. The reinforcement shall be continued across the construction joint.
 - DOWELLED CONTRACTION JOINTS at the expansion pier in the base slab: A minimum of 24 hours shall be allowed prior to placement of adjacent concrete and the exposed face shall be coated with bitumen, and the joint shall be continued across the aprons.
 - EXPANSION PIERS shall be provided so that the maximum number of spans without an expansion pier is five and the minimum number of spans between abutment and expansion pier is three. No expansion pier is required up to 5 spans.
 - WEEPHOLES shall be provided as follows:
 - Wingwalls and abutment walls, horizontally at 1200 crs,
 - Kerbs where there is fill on the deck, a minimum of 2 weepholes for each span, provided horizontally, and where the deck is superelevated at the lower kerb only,
 - Location of weepholes shall be determined such that reinforcement cover requirements are met,
 - A 300 x 300 x 150 no fines concrete block or approved equivalent shall be provided at each weephole as a drainage filter.
 - SCUPPERS are applicable only when there is no fill on the deck and shall be provided at both kerbs of each span where
 - the length of culvert exceeds 10m measured along the Control Line and the grade is 0.25% or less
 - the length of culvert exceeds 20m measured along the Control Line and the grade is 0.35% or less
 Where the deck is superelevated, one scupper per span shall be provided at the lower kerb only. For culverts with fill, provide a 300 x 300 x 150 thick no-fines concrete block or approved equivalent on each scupper. Spacing of reinforcement in kerbs may be altered slightly near scuppers such that minimum cover is maintained.
 - HEIGHT OF FILL over deck shall be 2500 maximum.
 - Refer Standard Drawing 1359 for details of culvert installation and earthworks.
 - PROJECT-SPECIFIC INFORMATION TO BE SHOWN ON THE DRAWINGS: Skew angle; W1 and W2 dimensions; Safety barrier system setout; Steel schedule
 - DIMENSIONS are in millimetres unless shown otherwise.

- ASSOCIATED DEPARTMENTAL DOCUMENTS:
- Design Criteria for Bridges and Other Structures
 - NDRRA Guidelines
 - Road Planning and Design Manual
- REFERENCED DOCUMENTS:
- Departmental Standard Drawings:
- 1043 Reinforcing Steel - Standard Bar Shapes
 - 1044 Reinforcing Steel - Standard Hook, Lap and Bend Details and General Steel Reinforcement Information
 - 1359 Culverts - Installation, Bedding and Filling/Backfilling Against/Over Culverts
 - 1474 Steel Beam Guardrail - Installation and Setout
 - 1490 Steel Beam Guardrail - Installation and Setout Footing Details
- Departmental Specifications:
- MRTS03 Drainage, Retaining Structures and Protective Treatments
 - MRTS70 Concrete
 - MRTS71 Reinforcing Steel

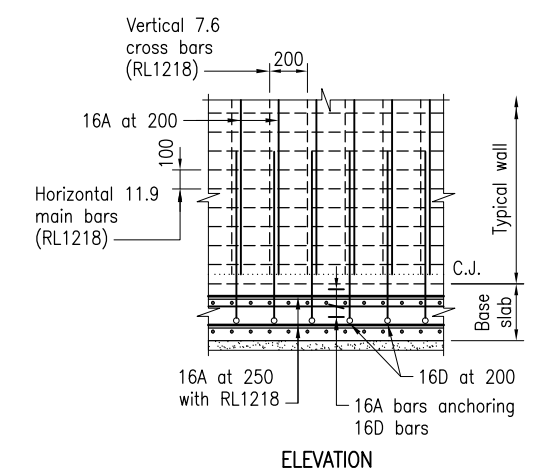
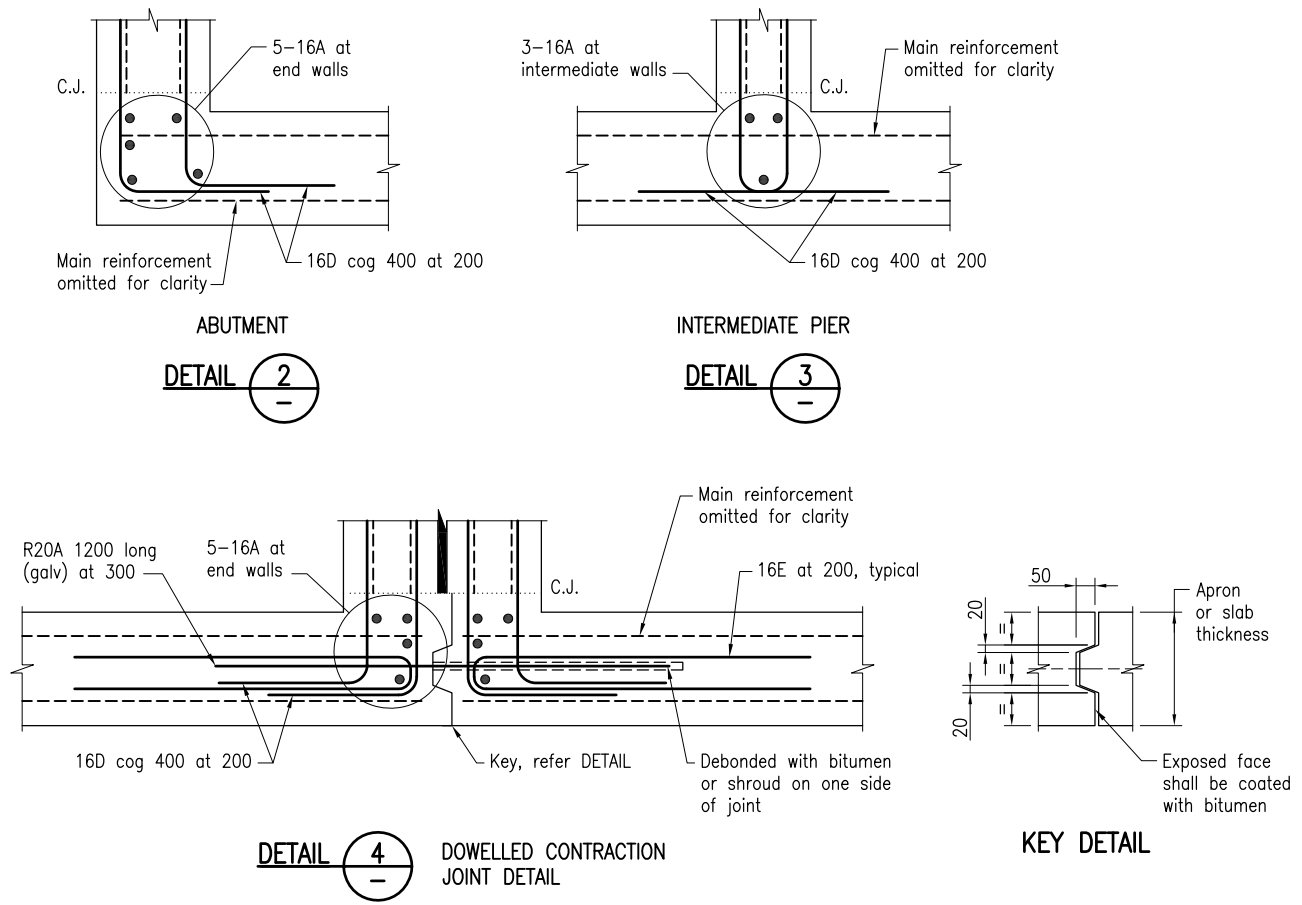
Department of Transport and Main Roads		<p>© The State of Queensland (Department of Transport and Main Roads) 2017 http://creativecommons.org/licenses/by/3.0/au</p>	
RC SLAB DECK CULVERT			
GENERAL ARRANGEMENT		A3	Standard Drawing No
DRAWING 1 OF 4		Not to Scale	1240
			Date 7/17



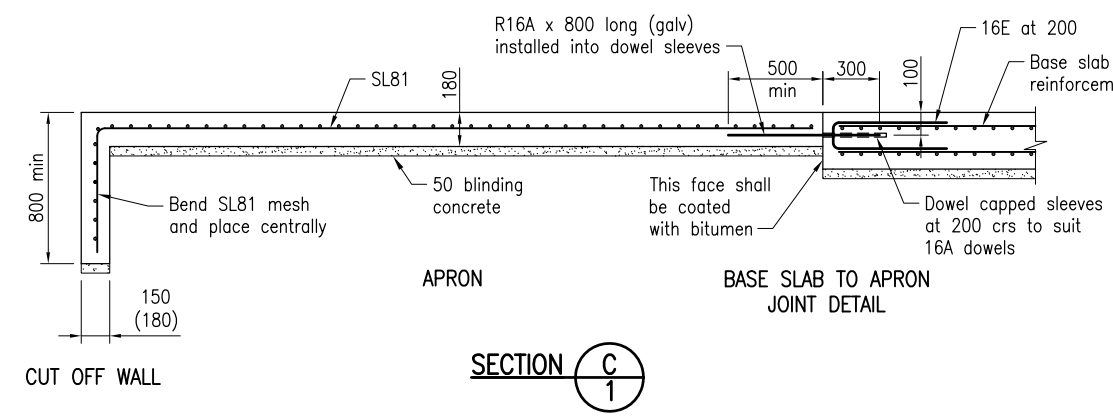
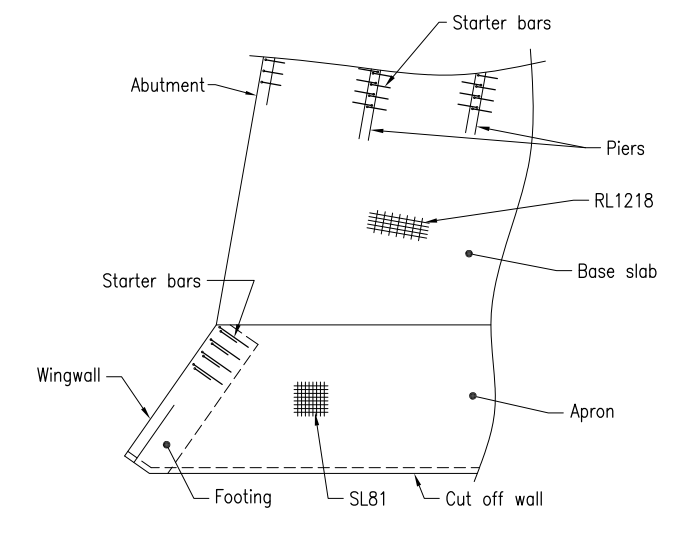
For dimensions shown in brackets, refer to Note 3



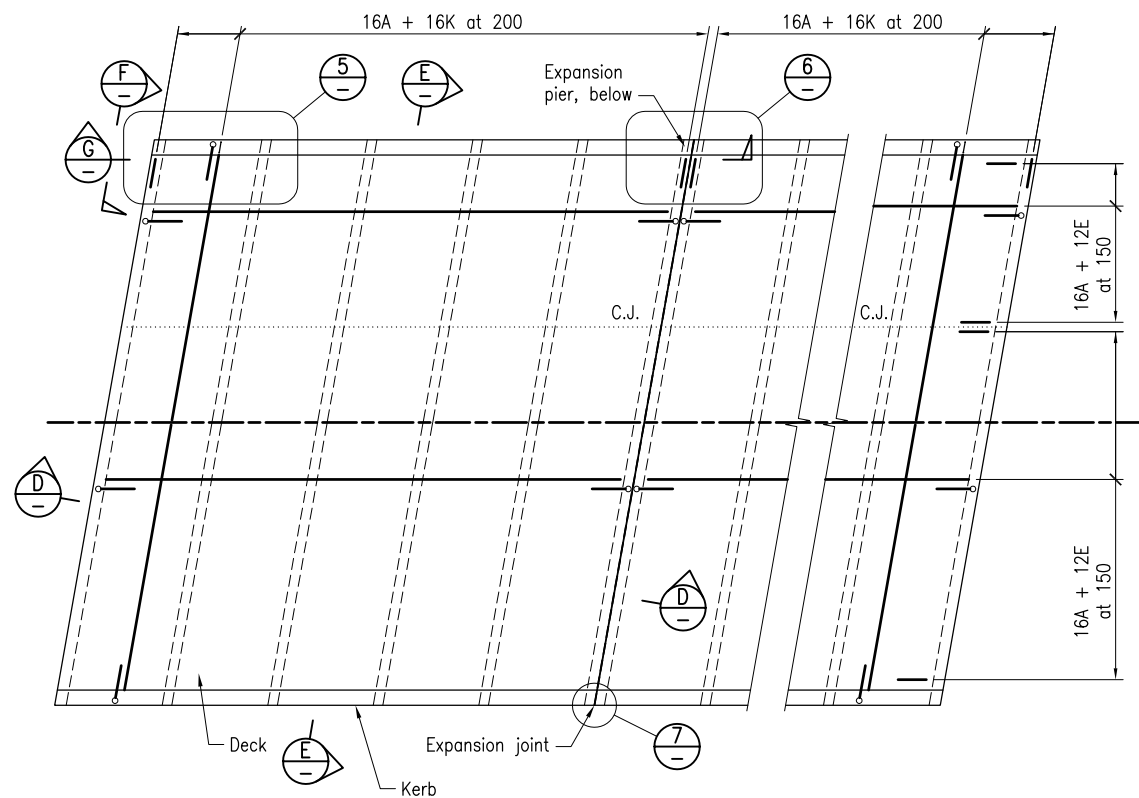
ELEVATION
TYPICAL REINFORCEMENT AT WEEPHOLE
For Abutment, Wingwall similar



ELEVATION
TYPICAL WALL REINFORCEMENT ARRANGEMENT

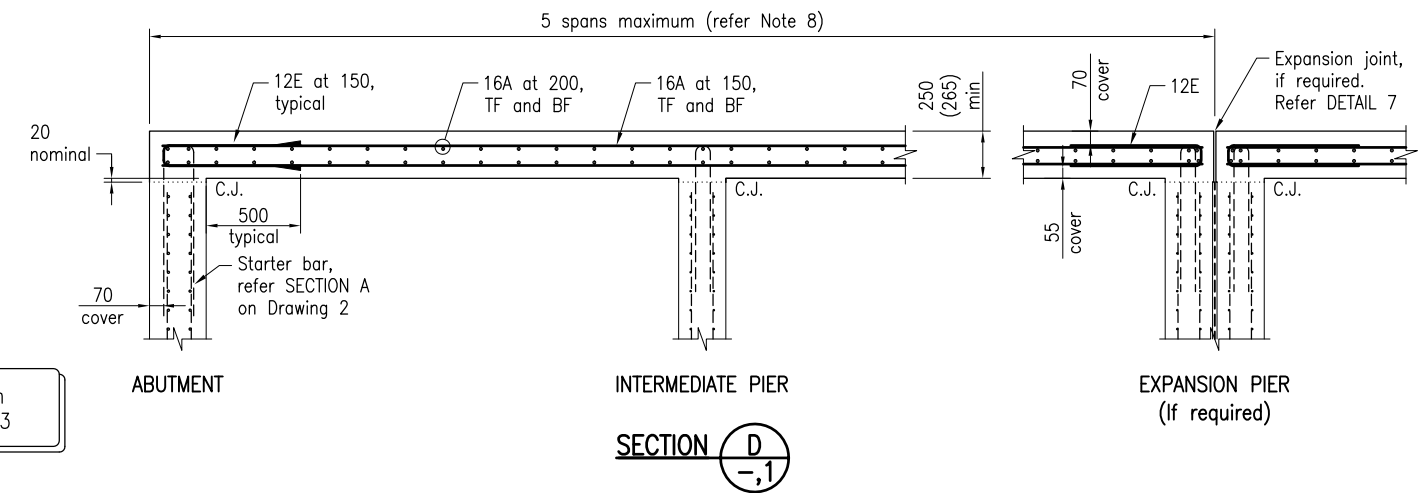


Department of Transport and Main Roads			
RC SLAB DECK CULVERT			
REINFORCEMENT DETAILS – BASE, APRONS, WALLS AND WINGS		A3	Standard Drawing No
DRAWING 2 OF 4		Not to Scale	1240
			Date 7/17



PLAN DECK REINFORCEMENT

For dimensions shown in brackets Refer to Note 3

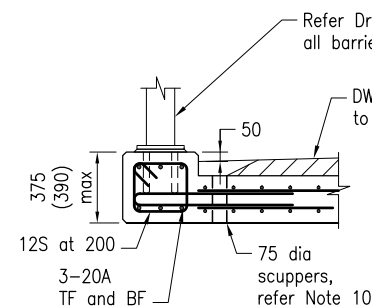


ABUTMENT

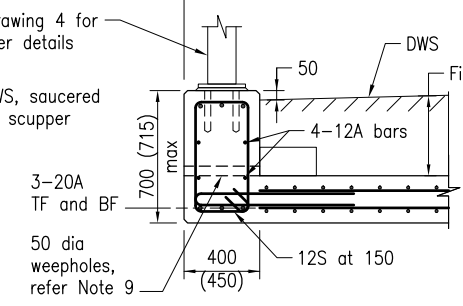
INTERMEDIATE PIER

EXPANSION PIER (if required)

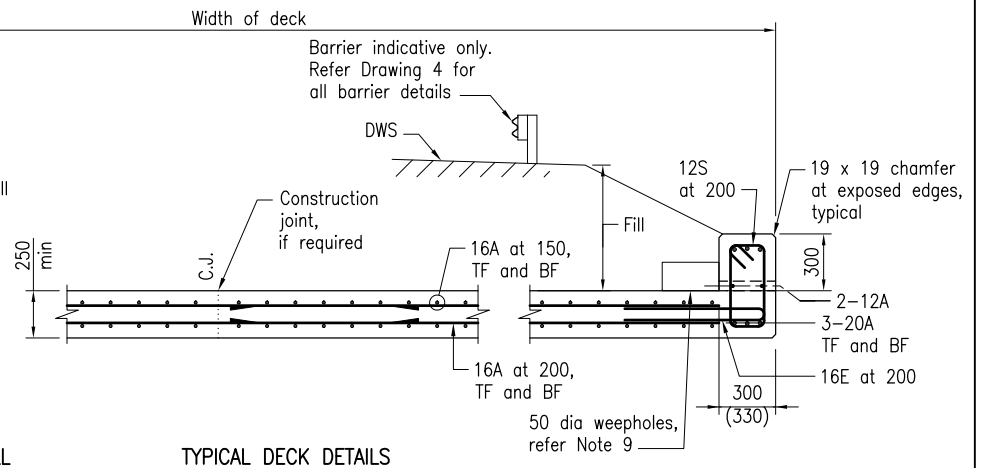
SECTION D-1



KERB DETAILS FOR NO FILL

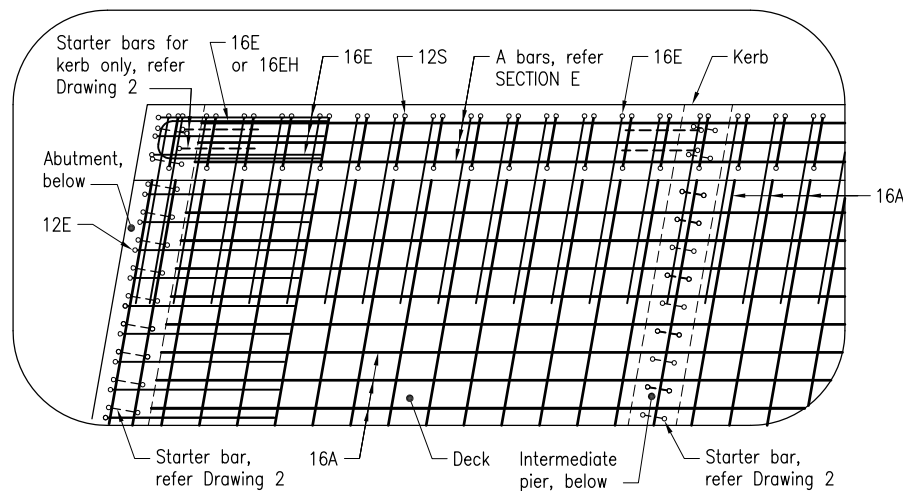


KERB DETAILS UP TO 400 DEEP FILL

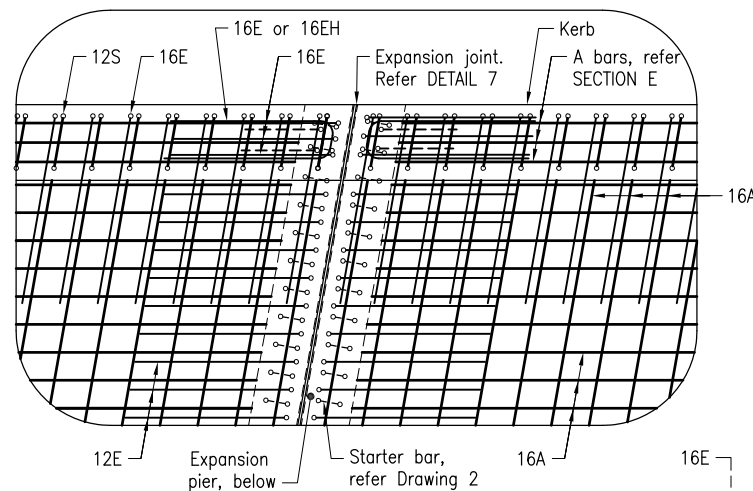


TYPICAL DECK DETAILS

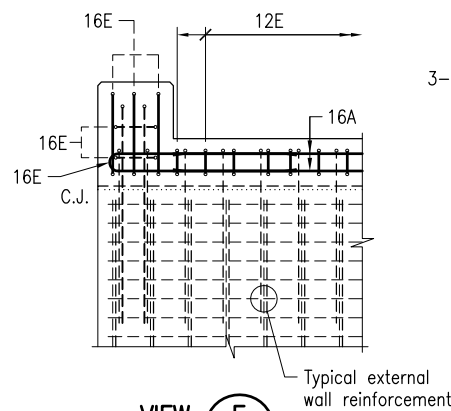
KERB DETAILS FOR GREATER THAN 400 DEEP FILL



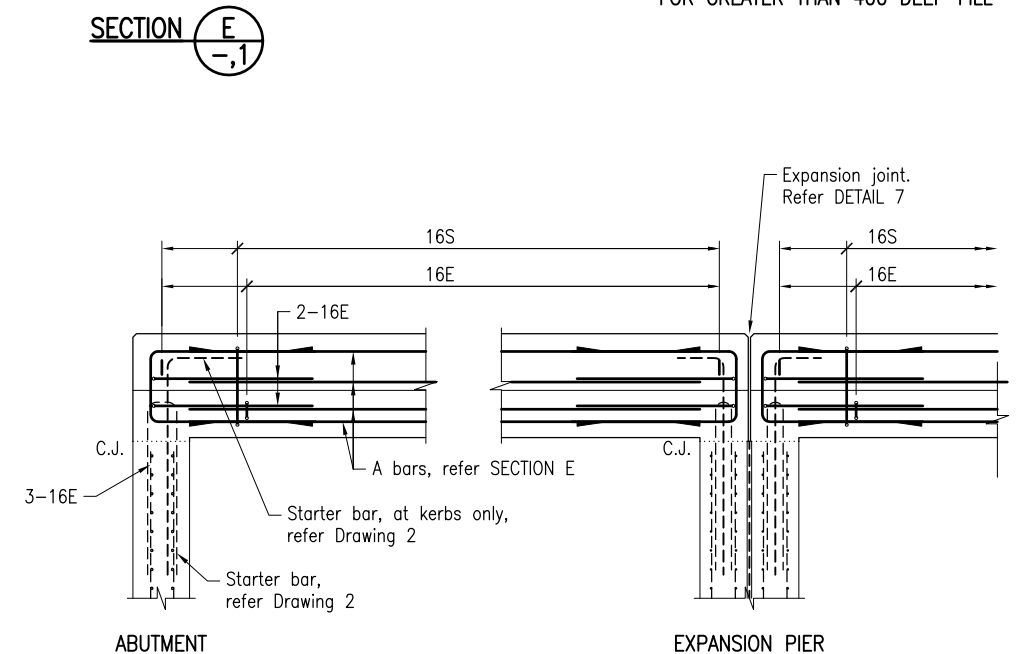
DETAIL 5



DETAIL 6

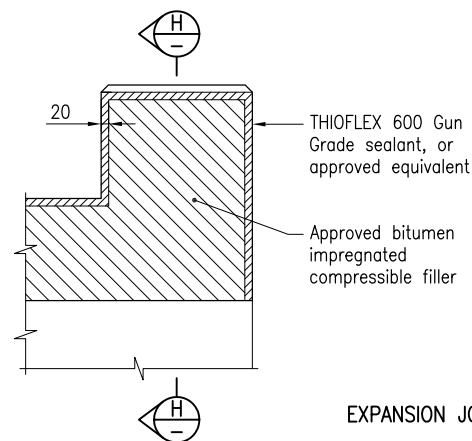


VIEW F



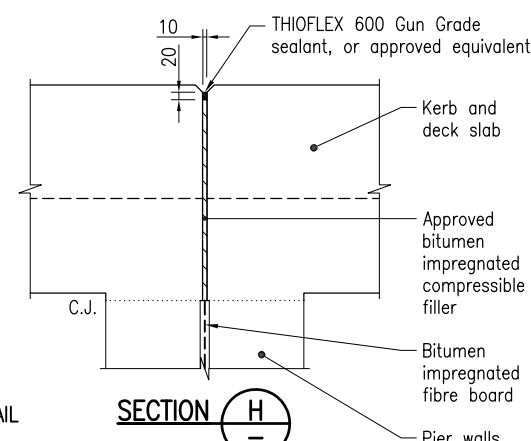
SECTION E-1

SECTION G



EXPANSION JOINT DETAIL

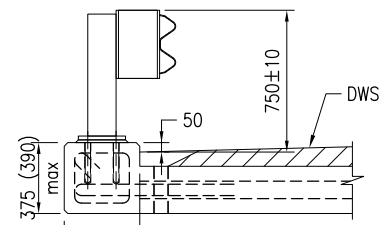
DETAIL 7



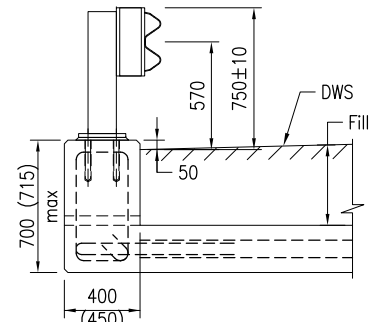
SECTION H

Department of Transport and Main Roads			
RC SLAB DECK CULVERT			
REINFORCEMENT DETAILS - SLAB DECK AND KERBS		A3	Standard Drawing No
DRAWING 3 OF 4		Not to Scale	1240
			Date 7/17

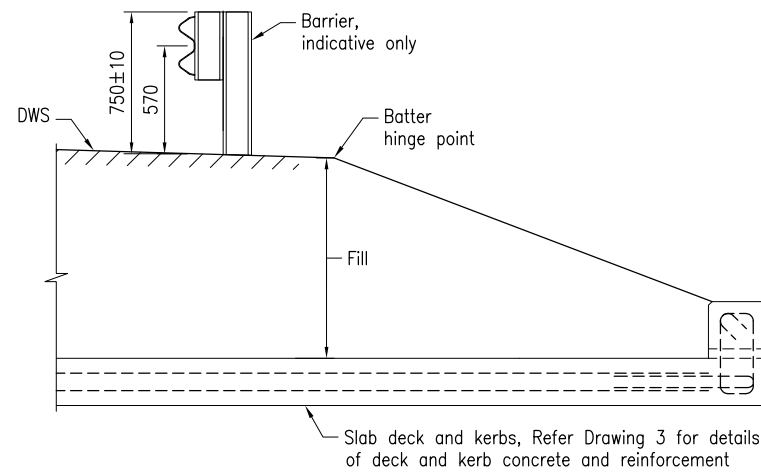
For dimensions shown in brackets refer to Note 3 on Drawing 1



PART SECTION - BARRIER DETAILS FOR NO FILL
Refer Note B of Barrier Selection Criteria



PART SECTION - BARRIER DETAILS UP TO 400 DEEP FILL
Refer Note B of Barrier Selection Criteria

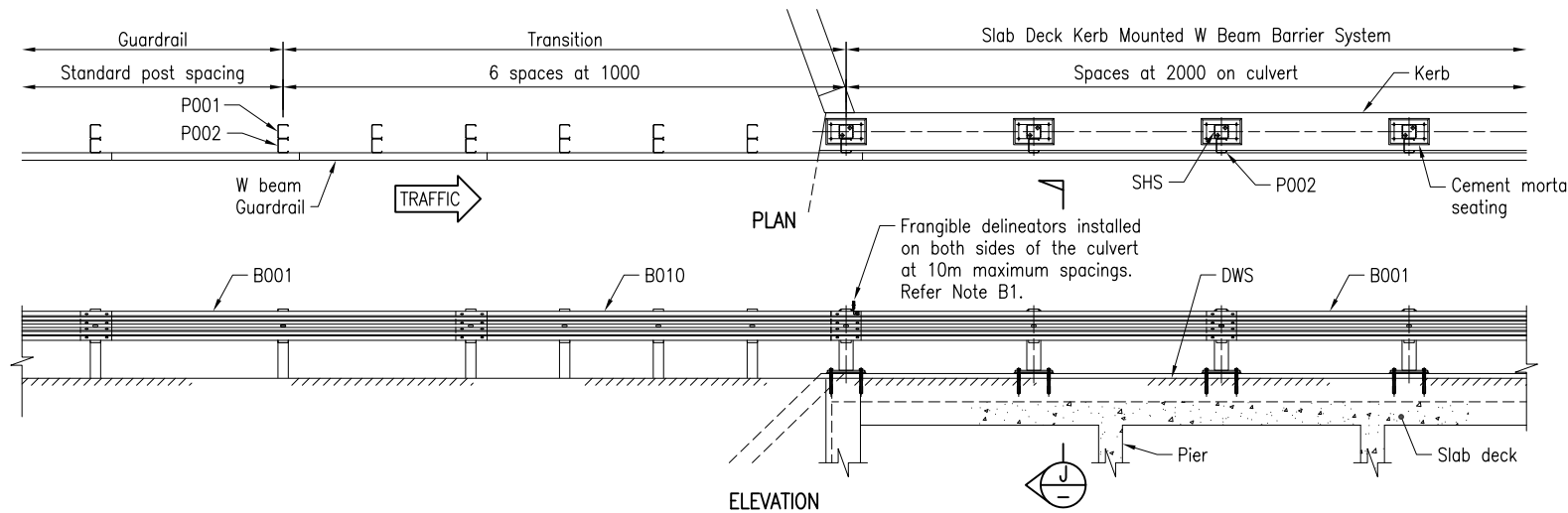


PART SECTION - KERB DETAILS FOR GREATER THAN 400 DEEP FILL
Refer Note A of Barrier Selection Criteria

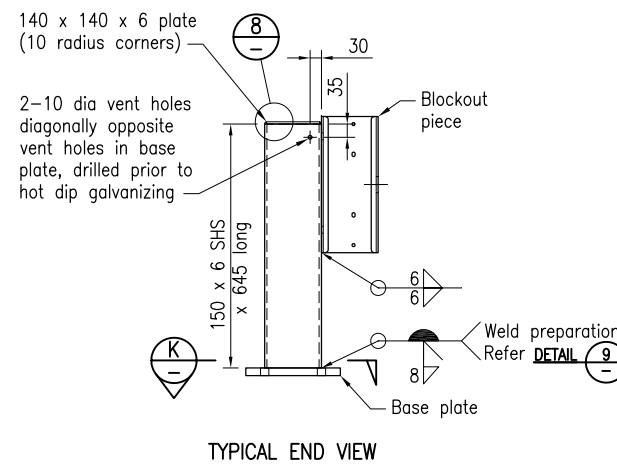
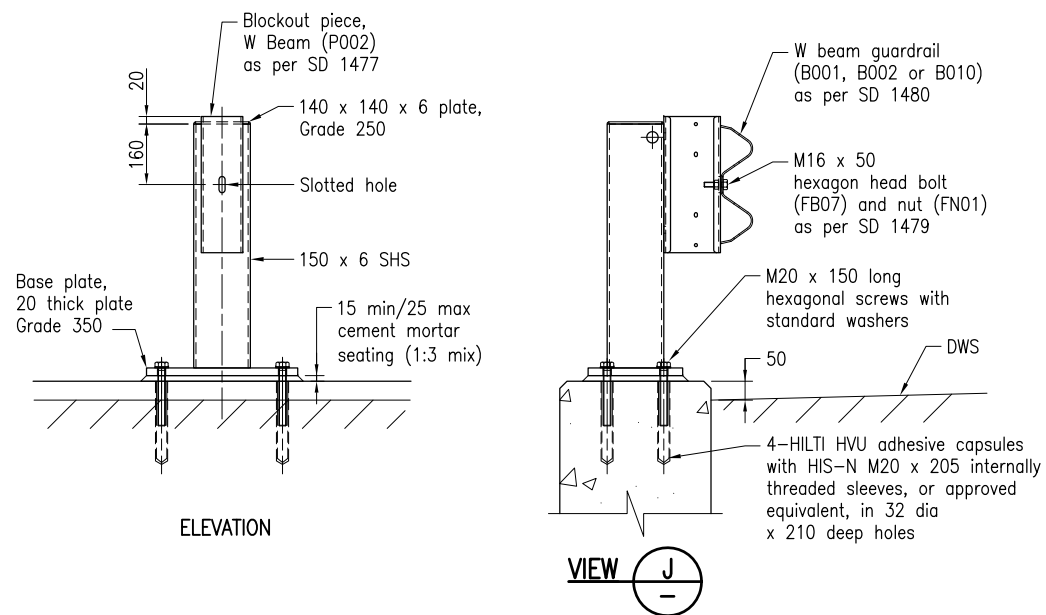
BARRIER SELECTION CRITERIA

- A. For W-beam rail barrier, a suitable road safety barrier design solution shall be adopted after all options from firstly SD1474 and secondly SD1490 Options 4 and 5 have been considered and assessed in accordance with the Road Planning and Design Manual. The design decisions leading to adoption of this solution shall be fully documented.
- B. Road safety barrier solution shown in this drawing shall only be adopted if all other options as per Note A above have been considered and assessed.

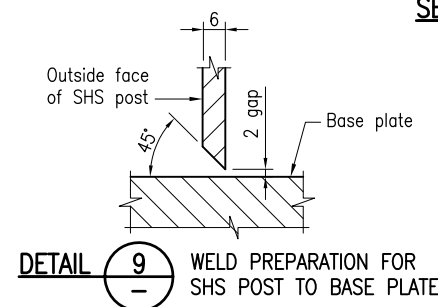
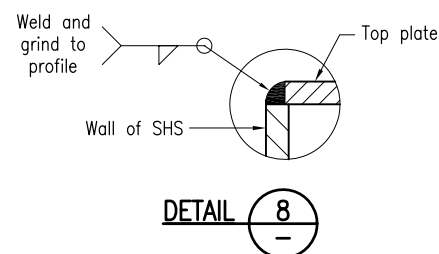
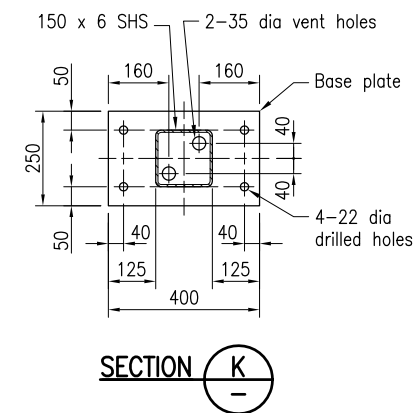
TYPICAL GENERAL ARRANGEMENT FOR BARRIER SYSTEMS ON SLAB DECK CULVERT



BARRIER TRANSITION DETAILS WHERE KERB MOUNTED SYSTEM IS USED
Approach Shown - Departure Opposite Hand



GUARDRAIL POST - FABRICATION DETAILS
No OFF = --



BARRIER NOTES:

- B1. THE BARRIER SYSTEM shown in this Standard Drawing shall be constructed in accordance with MRTS03 and MRTS14.
- B2. DELINEATION on the barrier system shall be installed in the location and to the spacing shown on the drawing. Delineators shall be consistent with the requirements specified in MRTS14.
- B3. STEELWORK shall be fabricated to the requirements of MRTS78. SHS shall be Grade C450L0 and manufactured to AS/NZS 1163. Steel plate shall be to AS/NZS 3678. Hexagon bolts and screws shall be to AS/NZS 1111, Class 4.6, nuts Class 5 to AS 1112.4. Black steel washers shall be to AS 1237. All nuts shall be snug tight in accordance with AS 4100. All threaded bolts, screws, washers and nuts shall be hot dip galvanized to AS 1214. All other steelwork to be hot dip galvanized to AS/NZS 4680. Prior to galvanizing all weld splatter and welding slag is to be removed.
- B4. WELDING symbols shall conform to AS 1101.3. All welding shall be to AS/NZS 1554.1. All welds except location tack welds to be SP category. Welding consumables shall be controlled hydrogen type: G493 to AS/NZS ISO 14341-B or T493 to AS/NZS ISO 17632-B.
- B5. DIMENSIONS are in millimetres unless shown otherwise.
- B6. Refer to Drawing 1 for all other notes.

REFERENCED DOCUMENTS:

- Departmental Standard Drawings
 - 1474 Steel Beam Guardrail - Installation and Setout
 - 1477 Steel Beam Guardrail - Posts and Blockouts, Soil and Bearing Plates, Slip Base Plate
 - 1479 Steel Beam Guardrail - Bolts, Nuts, Screws and Washers and Cable Assembly with Fasteners
 - 1480 Steel Beam Guardrail - Fabrication Details for W Beam Rails and Rail Components
 - 1490 Steel Beam Guardrail - Installation and Setout Footing Details

Departmental Specifications:

- MRTS03 Drainage, Retaining Structures and Protective Treatments
- MRTS14 Road Furniture
- MRTS14A Road Furniture (Steel Work)
- MRTS78 Fabrication of Structural Steelwork

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RC SLAB DECK CULVERT			A3	Standard Drawing No
BARRIER DETAILS		Not to Scale	1240	
DRAWING 4 OF 4		A	Date 7/17	