

**NOTES:**

**GENERAL**

- ALL WORKMANSHIP AND MATERIALS SHALL BE UNDERTAKEN IN ACCORDANCE WITH AS 5100.5-2017 AND AS 1597.2-2013 EXCEPT AS VARIED BY THE DEPARTMENT OF STATE GROWTH SPECIFICATIONS: 210, 602, 610, 611, 614, 619, 620, AND 626. IN CASE OF DISCREPANCIES THE ORDER OF PRECEDENCE SHALL BE THE DEPARTMENT OF STATE GROWTH SPECIFICATIONS THEN WITH CURRENT EDITION OF AS5100 THEN WITH CURRENT EDITION AS1597.2 UNLESS SPECIFICALLY NOTED OTHERWISE.
- STRUCTURAL WORK HAS BEEN DESIGNED FOR FOLLOWING LOADS:
  - PERMANENT DEAD LOAD OF STRUCTURE: AS SHOWN ON DRAWINGS
  - DEPTH OF FILL OVER CULVERT BETWEEN FACE OF BARRIERS: FULL PAVEMENT DEPTH MIN. - 1500mm MAX.
  - VEHICLE LOADS: SM1600 AND HLP400 TO AS5100
  - ALL OTHER LOADS: TO AS1597
- TRAFFIC BARRIERS HAVE BEEN SPECIFIED TO UTILISE A SLIP-BASEPLATE (FRANGIBLE) ARRANGEMENT THEREFORE IT HAS BEEN ASSUMED THAT NEGLIGIBLE LOAD IS TRANSFERRED FROM THE BARRIER INTO THE SUPPORTING BOX CULVERT.
- PRIOR TO LAYING BEDDING SAND OR PLACING BLINDING, FOUNDATIONS SHALL BE INSPECTED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TO CONFIRM THEY ACHIEVE THE BEARING CAPACITIES AS SPECIFIED ON THE DRAWINGS.

**CONCRETE**

**CONCRETE MIX**

- WORKMANSHIP AND MATERIALS TO COMPLY WITH AS5100.5-2017 AND DEPARTMENT OF STATE GROWTH SPECIFICATION 610.
- QUALITY OF CONCRETE ELEMENTS TO BE AS FOLLOWS:

STRUCTURAL ELEMENT	BLINDING	PRECAST BOX CULVERTS	PRECAST KERBS	CAST IN-SITU CONCRETE
CONCRETE GRADE TO SPECIFICATION 610	N15	VR450/50*	VR450/50*	VR450/50*
SUPPLEMENTARY CEMENTITIOUS MATERIAL	-	8% SILICA FLUME	8% SILICA FLUME	8% SILICA FLUME
REQUIRED ADDITIVES	-	30L / m <sup>3</sup> OF CEMENTAID EVERDURE CALTITE OR APPROVED EQUIVALENT	-	-

\* INDICATES THAT THE STANDARD MIX HAS BEEN MODIFIED.

**REINFORCEMENT COVER**

- COVER IS CLEAR DISTANCE BETWEEN ANY REINFORCEMENT (INCLUDING LIGATURES, TIE WIRE etc) AND OUTSIDE SURFACE OF STRUCTURAL CONCRETE.
- COVER MUST NOT BE LESS THAN SPECIFIED. PROVIDE MINIMUM CLEAR COVER TO REINFORCEMENT AS SHOWN BELOW, EXCEPT WHERE SPECIFIED OTHERWISE. EXPOSURE CLASSIFICATIONS ARE IN ACCORDANCE WITH AS5100.5-2017 UNLESS NOTED OTHERWISE:

LOCATION	EXPOSURE CLASSIFICATION	COVER (mm)
PRECAST BOX CULVERTS - INSIDE FACES OF WALLS	C TO AS1597.2-2013	50
PRECAST BOX CULVERTS - OTHER FACES	BY SUPPLIER	BY SUPPLIER
PRECAST KERBS	B1	30
CAST IN-SITU BASE SLAB AND APRON SLAB - TOP	C1	70
CAST IN-SITU BASE SLAB AND APRON SLAB - BOTTOM AND SIDES	B1	40
PRECAST BASE SLAB - TOP	C1	65
PRECAST BASE SLAB - BOTTOM AND SIDES	B1	30

- PROVIDE 50mm BLINDING CONCRETE UNDER STRUCTURAL REINFORCED CONCRETE CAST ON GROUND UNO.
- CURING COMPOUNDS SHALL NOT BE USED ON ANY CONCRETE SURFACES WITHOUT WRITTEN APPROVAL OF THE DEPARTMENT OF STATE GROWTH.

**REINFORCEMENT**

- MATERIALS AND PLACEMENT OF REINFORCEMENT SHALL COMPLY WITH DEPARTMENT OF STATE GROWTH SPECIFICATION 611.
- SYMBOLS ON DRAWINGS FOR GRADE AND TYPE OF REINFORCEMENT ARE AS FOLLOWS:
  - R: STRUCTURAL GRADE 250 PLAIN ROUND BAR TO AS/NZS4671
  - N: HOT ROLLED GRADE 500 DEFORMED (RIBBED) BAR DUCTILITY CLASS N TO AS/NZS4671.
- DESIGNATION OF REINFORCEMENT BARS IS AS SHOWN:
  - eg. 17 N20 - 350 EF
  - 17: DENOTES No OF BARS AND TYPE IN GROUP
  - N: DENOTES BAR GRADE AND DUCTILITY CLASS
  - 20: DENOTES NOMINAL BAR DIAMETER IN mm
  - 350: DENOTES SPACING IN mm
  - EF: DENOTES LOCATION
- FOLLOWING ABBREVIATIONS APPLY TO LOCATION OF REINFORCEMENT:
  - EW: EACH WAY      FF: FAR FACE      BB: BOTTOM BOTTOM (LAID FIRST)
  - EF: EACH FACE      B: BOTTOM      TT: TOP TOP (LAID LAST)
  - NF: NEAR FACE      T: TOP      C OR CP: CENTRALLY PLACED
- LAPPED SPLICE LENGTHS FOR HORIZONTAL BARS TO COMPLY WITH THE FOLLOWING UNO:

LOCATION		N12	N16	N20	N24	N28	N32
LAPS STAGGERED	HORIZONTAL BARS WITH >300mm CONCRETE BELOW BARS	460	610	760	920	1160	1420
	HORIZONTAL BARS WITH ≤300mm CONCRETE BELOW BARS & VERTICAL BARS	350	470	580	710	900	1090
LAPS NOT STAGGERED	HORIZONTAL BARS WITH >300mm CONCRETE BELOW BARS	460	620	880	1150	1450	1770
	HORIZONTAL BARS WITH ≤300mm CONCRETE BELOW BARS & VERTICAL BARS	350	480	680	890	1120	1370

DO NOT INTERPOLATE INTERMEDIATE VALUES OF SPLICE LENGTHS, TABULATED VALUES WERE CALCULATED IN ACCORDANCE WITH AS5100.5-2017.

**PRECAST BOX CULVERTS**

- THE DESIGN AND SUPPLY OF BOX CULVERTS SHALL BE COMPLETED AND CERTIFIED BY A SPECIALIST CONTRACTOR IN ACCORDANCE WITH AS5100.5-2017, AS1597.2-2013 AND THE DEPARTMENT OF STATE GROWTH SPECIFICATIONS 620 AND 626.
- INSTALLATION OF BOX CULVERTS IS TO BE IN ACCORDANCE WITH THE DEPARTMENT OF STATE GROWTH SPECIFICATION 626.
- BOX CULVERTS ARE TO HAVE A 100 YEAR DESIGN LIFE.
- DESIGN LOADS FOR BOX CULVERTS:
  - THE RANGE OF FILL DEPTHS ON TOP OF THE CULVERTS AS NOTED ON THE DRAWINGS.
  - SM1600 (WHICH INCLUDES W80, A160, M1600, M1600 TRI-AXLE GROUP AND S1600 TRAFFIC DESIGN LOADS) AND HLP400 VEHICLE LOADS.
  - LOADS OF OTHER ANCILLARY ITEMS SHOWN ON THE DRAWINGS SUCH AS HEADWALLS, HANDRAILS ETC.
  - CONSTRUCTION LOADS TO THE DEPARTMENT OF STATE GROWTH SPECIFICATION 626.11.
- THE CONTRACTOR SHALL SUPPLY THE DEPARTMENT OF STATE GROWTH WITH DRAWINGS OF THE BOX CULVERTS. THE DRAWINGS SHALL INCLUDE THE FOLLOWING DETAILS AT A MINIMUM:
  - COMPLETE DIMENSIONS INCLUDING REINFORCEMENT DETAILS AND TOLERANCES.
  - CONCRETE EXPOSURE CLASSIFICATION AT RELEVANT LOCATIONS.
  - STANDARD AND GRADE OF MATERIALS USED IN THE MANUFACTURE OF THE UNITS.
  - TRAFFIC DESIGN LOADS INCLUDING DYNAMIC LOAD ALLOWANCE.
  - ASSUMED DEAD LOAD, LIVE LOAD AND SOIL FACTORS.
  - DESIGN FILL DEPTH OVER THE CULVERT UNITS.
  - PROVISIONS FOR LIFTING OF THE CULVERT UNITS.
  - CULVERT UNIT VOLUME AND MASS.
- THE CONTRACTOR SHALL PROVIDE THE DEPARTMENT OF STATE GROWTH WITH A RECORD SHOWING COMPLIANCE WITH THE SAMPLING AND TESTING REQUIREMENTS SPECIFIED IN SECTION 4 OF AS1597.2-2013.
- A COPY OF THE CALCULATIONS USED FOR THE DESIGN OF THE CULVERT UNITS SHALL BE MAINTAINED BY THE DESIGNER, IN ACCORDANCE WITH AS/NZS 9001, FOR A PERIOD OF NOT LESS THAN 7 YEARS, AND SHALL BE MADE AVAILABLE TO THE DEPARTMENT OF STATE GROWTH IF REQUESTED. DESIGN RECORDS SHALL INCLUDE CALCULATIONS PRODUCED DURING THE DESIGN AND VERIFICATION PROCESS.

DRAWING SD-55.000.dwg

	DRAWN: D.BOOKER (GHD) REVIEWED: D.GONANO (GHD) APPROVED: A.PERCY (STATE GROWTH) ASSET ENGINEER BRIDGES	 <b>Tasmanian Government</b>	<b>Department of State Growth</b> DEPARTMENT OF STATE GROWTH STANDARD DRAWING STANDARD STOCK UNDERPASS GENERAL NOTES	<b>DO NOT SCALE</b> Use of this drawing is governed by the conditions outlined on the State Growth website. It is the users responsibility to ensure it is the current revision. STANDARD DRAWING NUMBER <b>SD-55.000</b> REVISION NUMBER <b>00</b>
00 ISSUED FOR CONSTRUCTION No.      Amendment Description      Initials      Date A3 original      This sheet may be prepared using colour and may be incomplete if copied				

PROVIDE 10 ABLEFLEX OR APPROVED EQUIVALENT BETWEEN EARTH RETAINING WALL AND APRON SLAB TYPICAL

PROVIDE N12 'L' BARS WITH 800 LEGS (OR 800 LONG STRAIGHT BARS) TO ANY RE-ENTRANT CORNERS AS SHOWN, PROVIDE 1-N16 TO PERIMETER OF REINFORCEMENT AREA TYPICAL

MASS BLOCK OR APPROVED EQUIVALENT WINGWALL DESIGNED TO SUIT PROPOSED SITE BY OTHERS. WALL TO BE FOUNDED ON A SUITABLE BASE AS SPECIFIED BY THE WALL DESIGNER, ADEQUACY OF FOUNDATION TO BE CONFIRMED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER TYPICAL

TOP OF BATTER

PRECAST BOX CULVERT UNIT, TYPICAL

BASE SLAB TO BE EITHER CAST IN SITU OR PRECAST WITH IN SITU STITCHES, REFER SHEET SD-55.003 FOR DETAILS

CUT-OFF WALL, REFER SHEET SD-55.004 FOR DETAILS TYPICAL

PRECAST KERB, REFER SHEET SD-55.004 FOR DETAILS TYPICAL

APRON SLAB

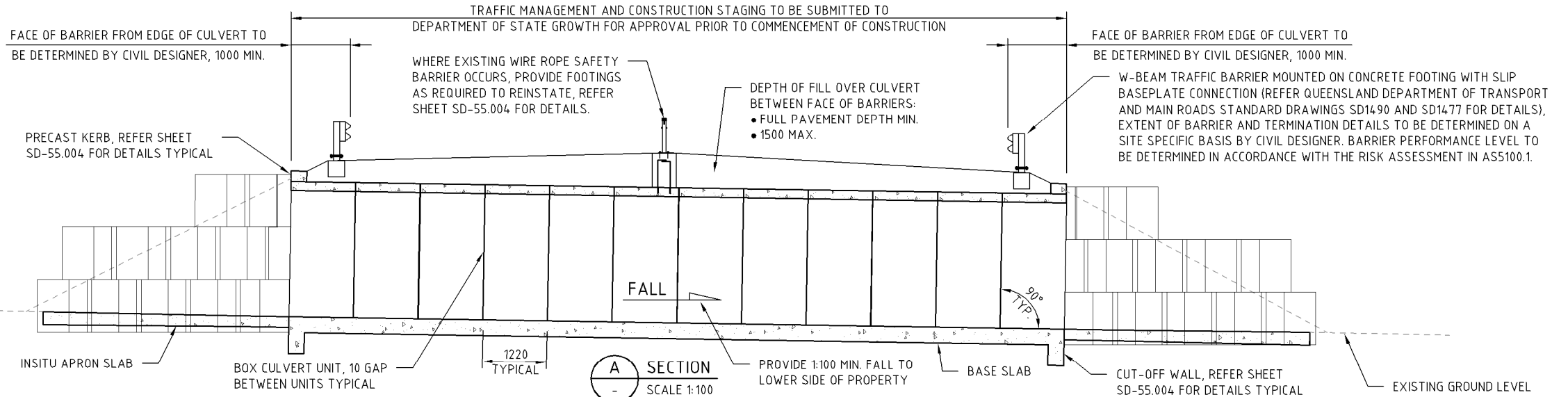
APRON SLAB

**PRECAST CULVERT LAYOUT - PLAN**

SCALE 1:100

**NOTE:**

PRECAST BOX CULVERT UNITS TO BE EITHER 2400, 3000, 3600 OR 4200 WIDE (CLEAR SPAN) AND 2400 OR 3000 HIGH (INTERNALLY), 3000 WIDE (CLEAR SPAN) SHOWN.



**A SECTION**  
SCALE 1:100

DRAWING SD-55.001.dwg

No.	Amendment Description	Initials	Date
02	UPDATED TO NEW SPECIFICATIONS	DI (GHD)	14.12.2017
01	UPDATED TO NEW SPECIFICATIONS	DI (GHD)	09.02.2016
00	ISSUED FOR CONSTRUCTION	DI (GHD)	30.04.2015

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REVIEWED:	D.GONANO (GHD)
APPROVED:	A.PERCY (STATE GROWTH) ASSET ENGINEER BRIDGES

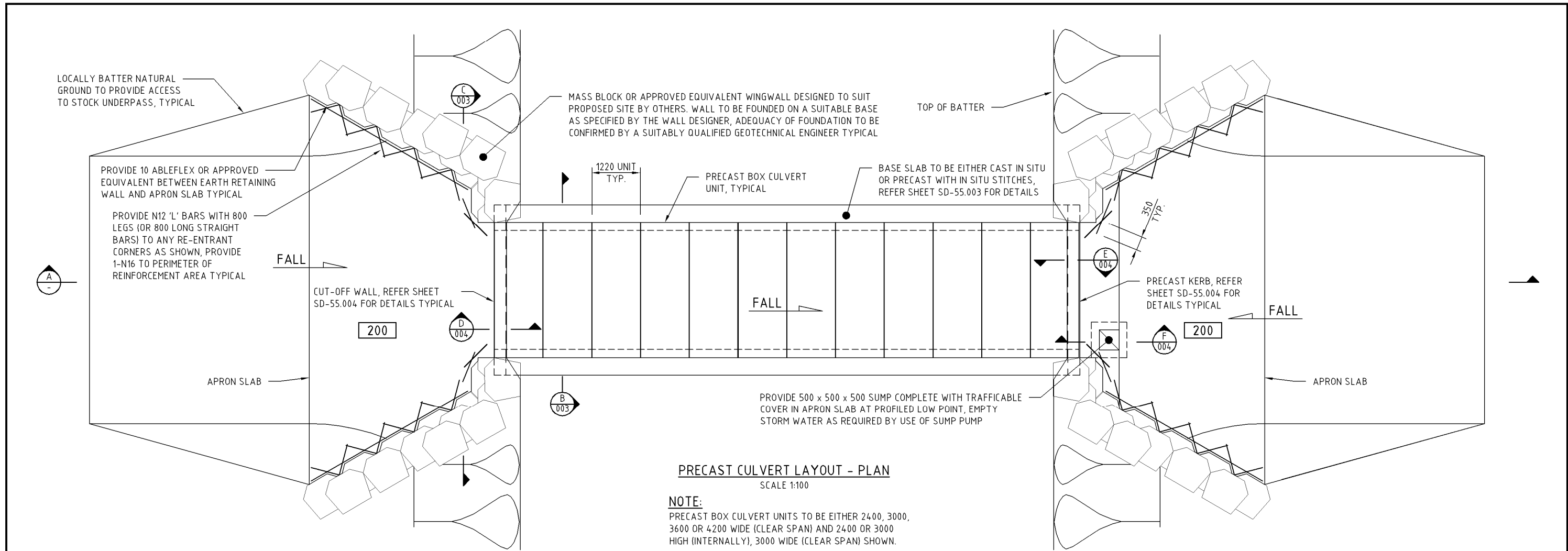


**Department of State Growth**

DEPARTMENT OF STATE GROWTH STANDARD DRAWING  
STANDARD STOCK UNDERPASS

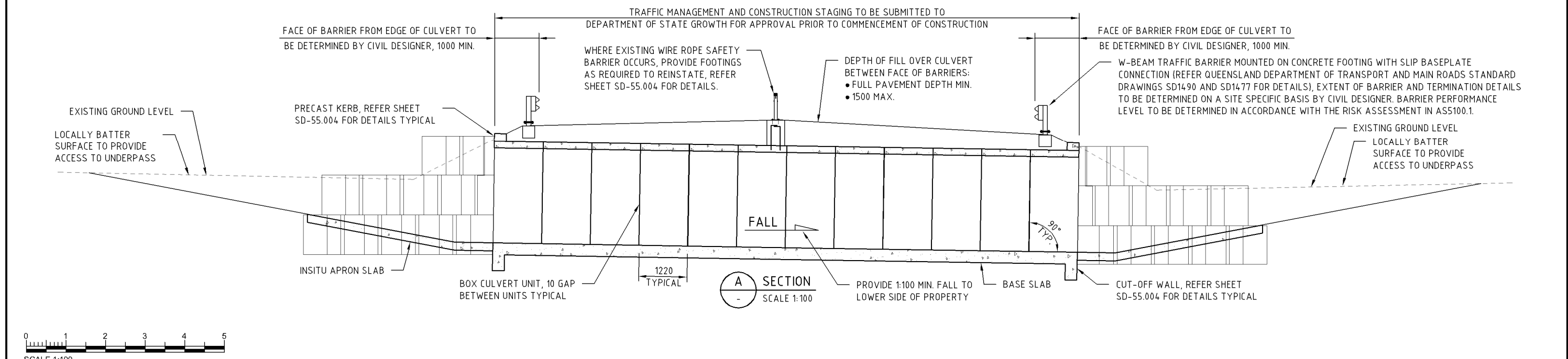
TYPICAL FOR BASE SLAB AT NATURAL SURFACE LEVEL  
REINFORCED CONCRETE BOX CULVERT GENERAL ARRANGEMENT - PLAN & SECTION

<b>DO NOT SCALE</b>	
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STANDARD DRAWING NUMBER <b>SD-55.001</b>	REVISION NUMBER <b>02</b>



**PRECAST CULVERT LAYOUT - PLAN**  
SCALE 1:100

**NOTE:**  
PRECAST BOX CULVERT UNITS TO BE EITHER 2400, 3000, 3600 OR 4200 WIDE (CLEAR SPAN) AND 2400 OR 3000 HIGH (INTERNALLY), 3000 WIDE (CLEAR SPAN) SHOWN.



**SECTION A**  
SCALE 1:100



DRAWING SD-55.002.dwg

No.	Amendment Description	Initials	Date
02	UPDATED TO NEW SPECIFICATIONS	DI (GHD)	14.12.2017
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**DRAWN:**  
D.BOOKER (GHD)

**REVIEWED:**  
D.GONANO (GHD)

**APPROVED:**  
A.PERCY (STATE GROWTH)  
ASSET ENGINEER BRIDGES



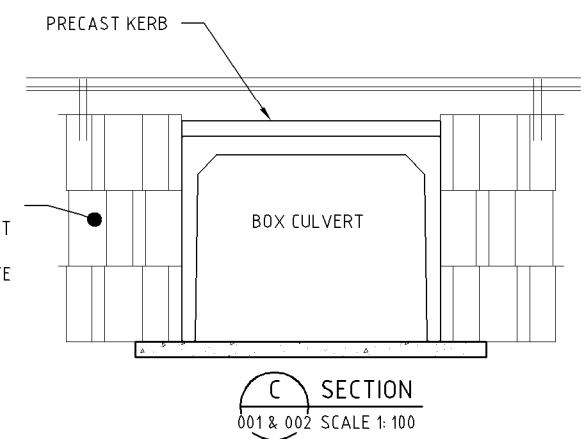
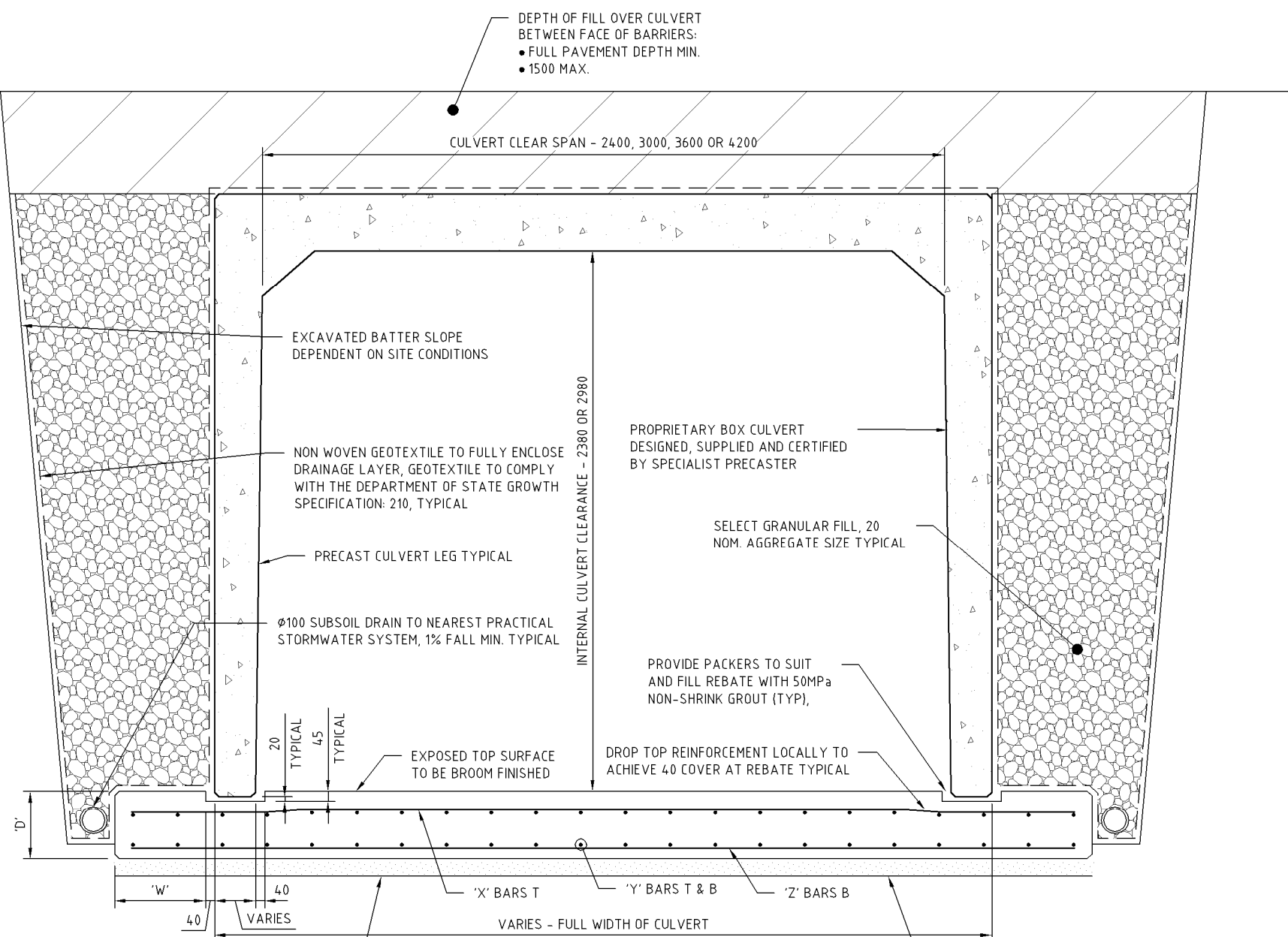
**Department of State Growth**

DEPARTMENT OF STATE GROWTH STANDARD DRAWING  
STANDARD STOCK UNDERPASS

TYPICAL FOR BASE SLAB BELOW NATURAL SURFACE LEVEL  
REINFORCED CONCRETE BOX CULVERT GENERAL ARRANGEMENT - PLAN & SECTION

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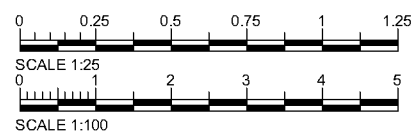
BASE SLAB SIZE & REINFORCEMENT SCHEDULE					
CULVERT CLEAR SPAN	'W'	'D'	'X' BARS	'Y' BARS	'Z' BARS
2400	400	300	N16-150	N12-200	N12-150
3000	400	300	N16-150	N12-200	N12-150
3600	500	350	N20-200	N12-150	N16-200
4200	600	350	N20-150	N12-150	N16-150



BASE SLAB, TO BE FOUNDED ON NATURAL UNDISTURBED MATERIAL WITH A MINIMUM ALLOWABLE BEARING CAPACITY 150 kPa TO BE CONFIRMED ON SITE BY SUITABLY QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACING SAND BEDDING OR BLINDING

**B SECTION**  
001 & 002 SCALE 1:25  
**TYPICAL BASE SLAB CROSS SECTION**  
(PRECAST OR CAST IN-SITU)

**NOTE:**  
PROVIDE 10 MAX. GAPS BETWEEN UNITS, COVER GAPS WITH 150 WIDE IMPREGNATED FABRIC AS PER THE DEPARTMENT OF STATE GROWTH SPECIFICATION 626.



- NOTES:**
- FULL PAVEMENT DEPTH (TO BE DESIGNED BY CIVIL ENGINEER) SHALL NOT BE LESS THAN:  
- 150 THICK BASE - CLASS 2  
(200 THICK BASE CLASS 1 FOR ROAD CATEGORY 1 & 2)  
- 150 THICK SUB BASE 1 - CLASS 3  
- 150 THICK SUB BASE 2 - CLASS 4.
  - ALL DIMENSIONS GIVEN ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
  - REFER STANDARD NOTES ON SHEET SD-55.000.

DRAWING SD-55.003.dwg

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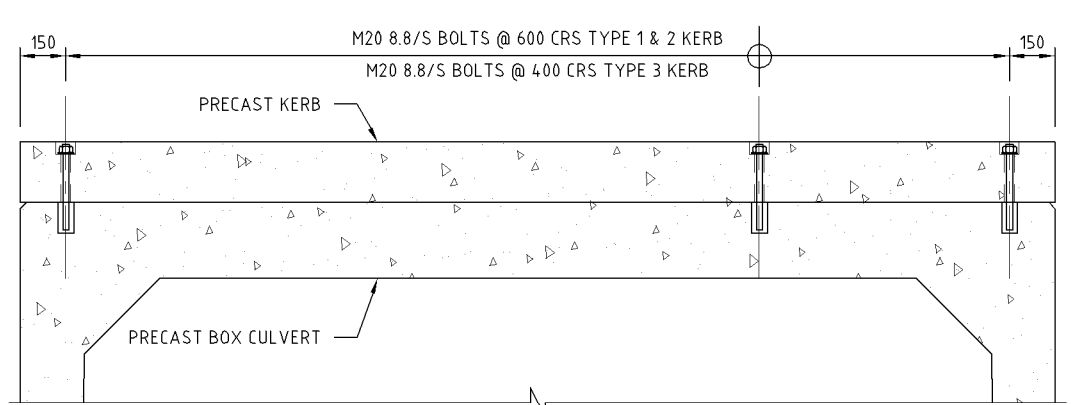
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REVIEWED: D.GONANO (GHD)  
APPROVED: A.PERCY (STATE GROWTH)  
ASSET ENGINEER BRIDGES



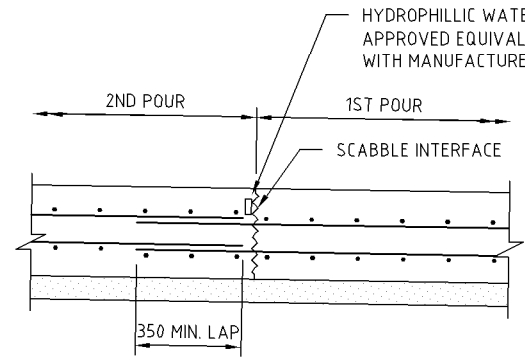
**Department of State Growth**  
DEPARTMENT OF STATE GROWTH STANDARD DRAWING  
STANDARD STOCK UNDERPASS  
**REINFORCED CONCRETE BOX CULVERT - TYPICAL SECTIONS**

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STANDARD DRAWING NUMBER	REVISION NUMBER
<b>SD-55.003</b>	<b>01</b>

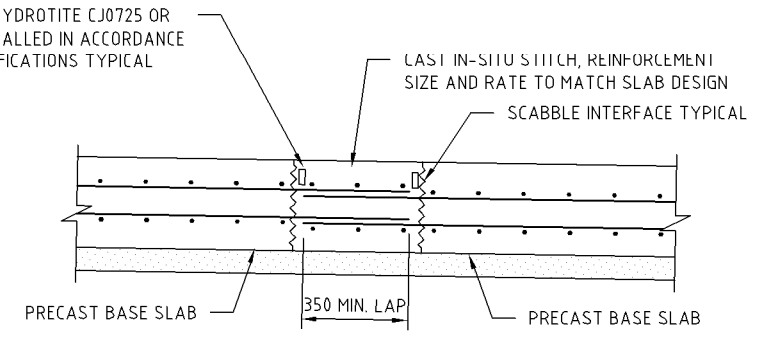




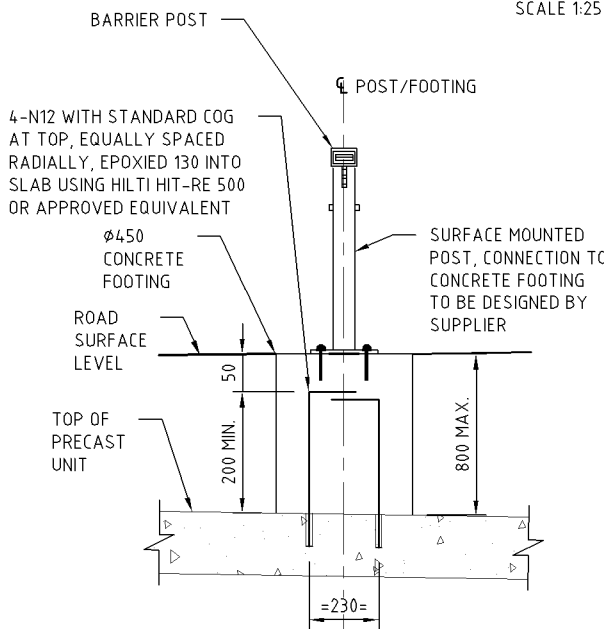
**KERB - TYPICAL ELEVATION**  
SCALE 1:25



**CAST IN-SITU BASE SLAB CONSTRUCTION JOINT**  
SCALE 1:25

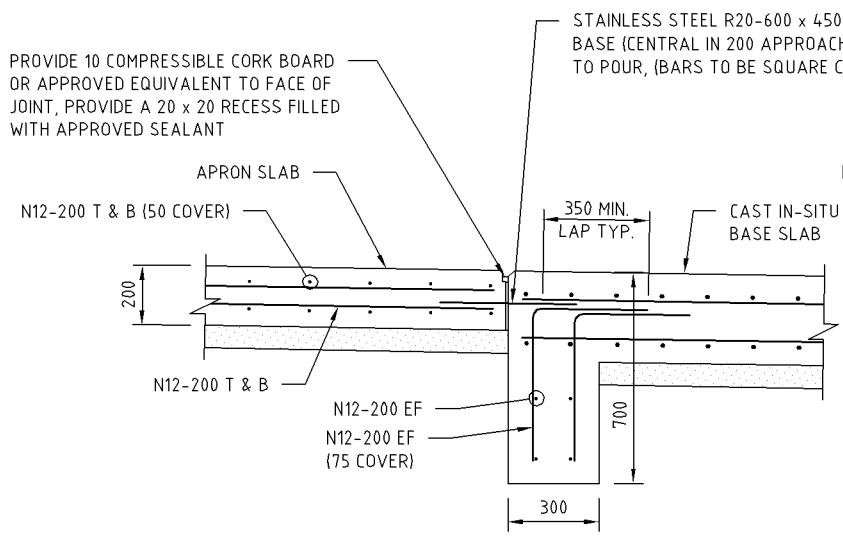


**PRECAST BASE SLAB CONSTRUCTION JOINT**  
SCALE 1:25

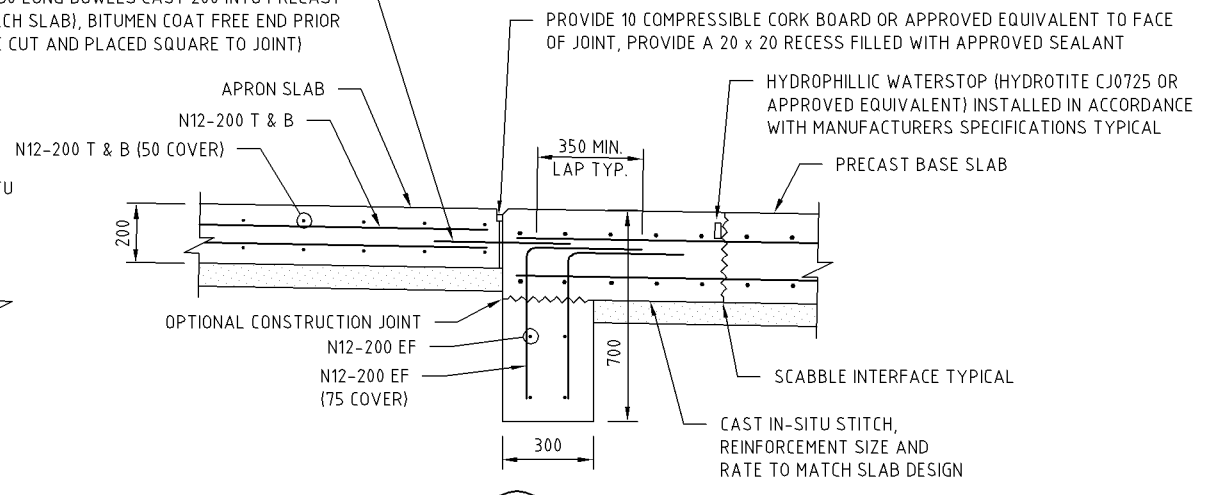


**WIRE ROPE BARRIER POST DETAILS**  
SCALE 1:25

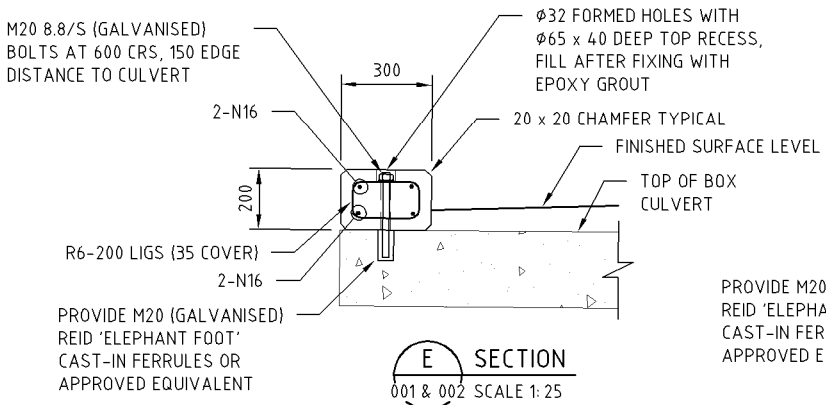
**NOTE:**  
ADOPT BARRIER MANUFACTURER'S FOOTING DETAILS WHERE DEPTH OF FILL ON TOP OF CULVERT EXCEEDS 800.



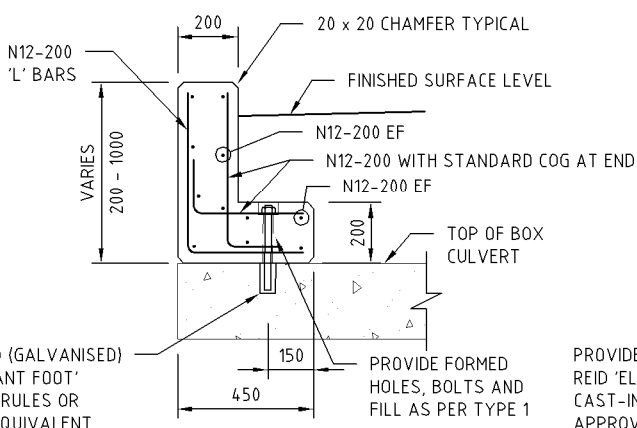
**CAST IN-SITU BASE SLAB CUT-OFF WALL**  
SCALE 1:25



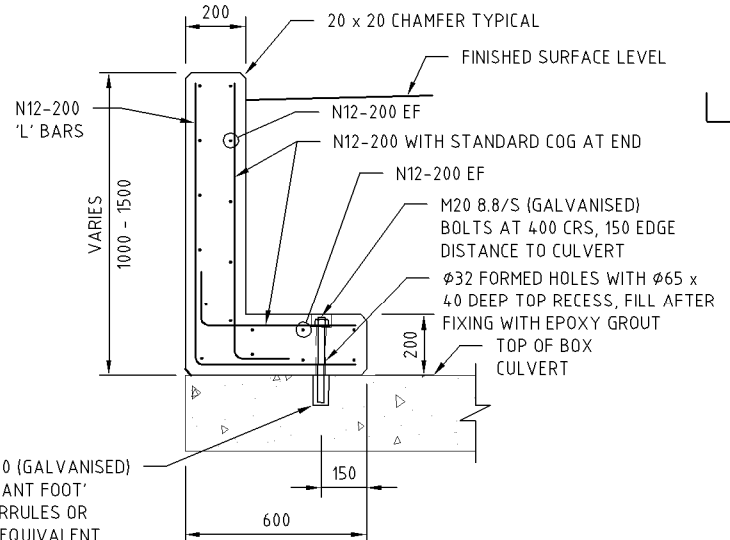
**PRECAST BASE SLAB CUT-OFF WALL**  
SCALE 1:25



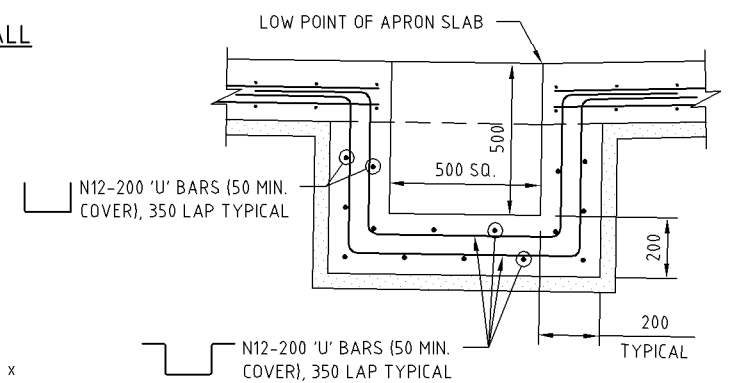
**BALLAST WALL / KERB - TYPE 1**  
SCALE 1:25



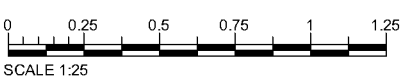
**BALLAST WALL / KERB - TYPE 2**  
SCALE 1:25



**BALLAST WALL / KERB - TYPE 3**  
SCALE 1:25



**SECTION F**  
SCALE 1:25



**NOTES:**  
1. APRON SLAB TO BE FOUNDED ON NATURAL SOILS WITH MINIMUM ALLOWABLE BEARING CAPACITY OF 100 kPa TO BE CONFIRMED ON SITE BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.  
2. PRECAST BASE SLABS TO BE LAID ON 25 BEDDING SAND. CAST IN-SITU SLABS TO BE CAST ON 50 MIN. BLINDING.  
3. REFER STANDARD NOTES ON SHEET SD-55.000.

DRAWING SD-55.004.dwg

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**REVIEWED:**  
D.GONANO (GHD)

**APPROVED:**  
A.PERCY (STATE GROWTH)  
ASSET ENGINEER BRIDGES



**Department of State Growth**  
DEPARTMENT OF STATE GROWTH STANDARD DRAWING  
STANDARD STOCK UNDERPASS  
TYPICAL ELEVATION, SECTIONS AND DETAILS

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<b>SD-55.004</b>	<b>02</b>