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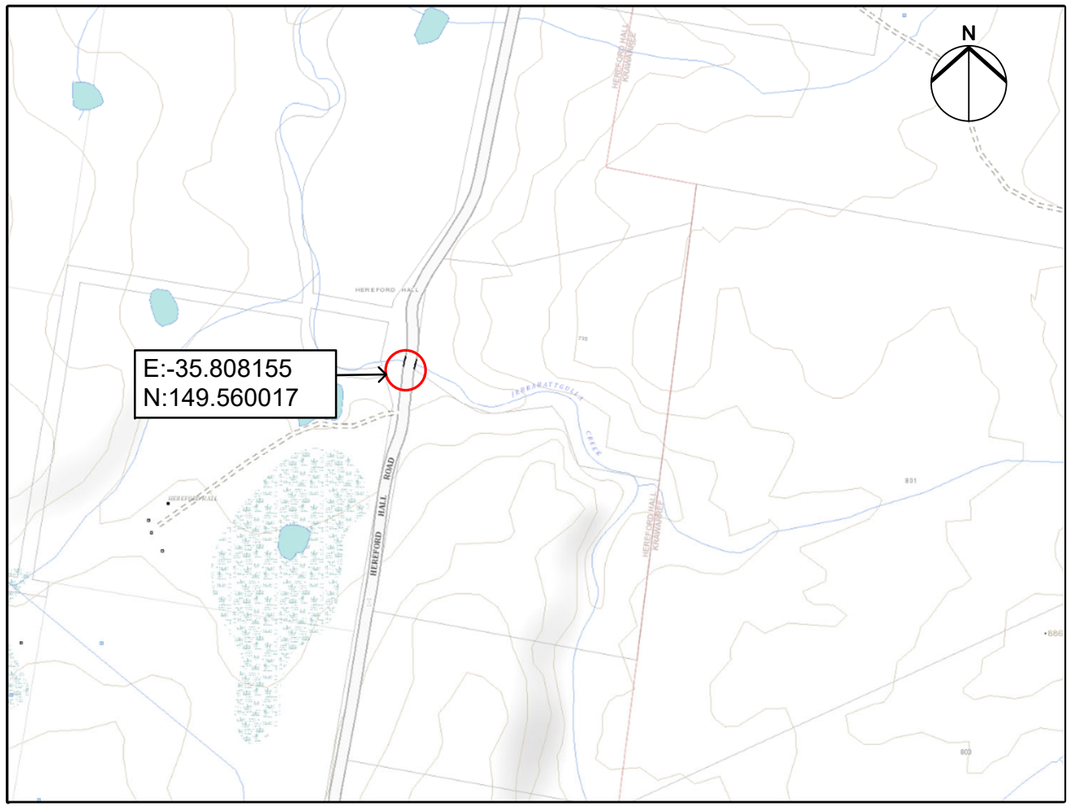
QPRC

PROJECT: PROPOSED NEW BRIDGE OVER JERRABATTGULLA CREEK ON HEREFORD HALL ROAD
STRUCTURAL PLANS & DETAILS
CLIENT: QUEANBEYAN PALERANG REGIONAL COUNCIL

Location Plan



DRAWING LIST	TITLE	REVISION
SHEET 1	TITLE SHEET	B
SHEET 2	GENERAL NOTES	B
SHEET 3	BRIDGE PLAN & ELEVATION	B
SHEET 4	TYPICAL ABUTMENT AND ROAD ELEVATIONS	B
SHEET 5	BRIDGE DETAILS AND SET OUT	B

ISSUE A: PRELIMINARY 30/11/2024
ISSUE B: 100% DESIGN 13/01/2025

DESIGNED BY

Stephen Debeck

Stephen Debeck
(BEng,MIEa, NER (Civil, Structural)

GENERAL NOTES

1. All Dimensions on these plans should be checked on site by the builder and verified on site and by using other other contract documents. Discrepancies should be referred to the Engineer.
2. It is not implied or guaranteed that all structural designs and details shown in these plans are complete. The scope of work has been determined by the engineer based on the information supplied by the client or the clients consultants. Further designs may be required.
3. Do not Scale from these plans
4. Design loads in accordance with AS 1170 and AS5100-2017 Bridge Design Code
5. Roadways W80/A160/S1600/M1600 vehicular loadings

BRIDGE DESIGN LOADING & CONSTRUCTION NOTES

1 – SM1600 as per AS5100.2 incl. Impact @ 100km/h
2 – Barrier performance is low as per AS5100.2-2017
3 – Earthquake loading Design Category = BEDC-1 (EQ analyses not req'd)
4 – WindLoading as per AS5100.2-2017 section 17
Wind Region=A3, Terrain Category=2, Average Recurrence Interval (1:2000 for ULS), Average Recurrence Interval (1:20 for SLS permanent effects only), Design Windspeed = 41m/s in conjunction with Traffic loads (see previous)
Net Pressure Coefficient as per APP D2 of AS1170
5 – Flood Data (as bridge relates to watercourse)

AEP	Flow Q(m3/s)	Vel(m/s)	Debris Height(m)	
1:20	123	1.62	3	SLS case scour & deflection
1:100	197	1.92	3	
1:2000	467	2.65	3	ULS case structural strength

EXCAVATIONS FOR EXTERNAL CONSTRUCTIONS
-excavate and/or fill as required for external area slabs and footings
consolidate ground under all paths, pads or paved areas.
EXISTING FOOTINGS
Maintain support to existing footings as required to ensure integrity of existing buildings.
CERTIFICATE
Provide a practising civil or structural Engineer's Certificate for bearing pressure of foundation material.
SOIL AND WATER MANAGEMENT
Ensure that soils from the site are not transported beyond the boundaries. Site clearing and soil retention measures must comply with the Act. Refer to PRELIMINARIES: Environmental Protection – Soil and Water Management
GROUND WORKS
Benchmark
Relate all levels to the survey benchmark
Foundation Test Pits/Bore logs
Where foundation test pits/bore logs have been carried out
- re-excavate pits found under footings, slabs or pavements or within the "zone of influence"
- angle of zone of influence below horizontal:
- 30^0 for sand foundation material
- 45^0 for clay foundation material
- replace the backfill material in compacted layers. (SEE COMPACTION)

SUPERVISION AND TESTING
Arrange for the site filling and compacting to be supervised by a qualified geotechnical engineer: .
-tests to be undertaken by a NATA registered laboratory
-provide 2 copies of test results to the Superintendent.
rejection:
-if compacting is not up to the standard specified: carry out further compacting uniformly over the whole area until the specified standard is achieved and provide a further series of tests.
-Provide certificate from practising soil laboratory or engineer for compaction of fill.
SITE CLEARING
GENERAL
- clear and remove all stumps & other impediments and retain good ground cover where possible
- remove old pavings, footings, rubbish and debris from the whole of the site

noxious plants :
- eradicate from whole of the site blackberries, onion &oxalis weeds, nut grass & any other plant classified by Pastures Protection Board for the area as a "Proclaimed Noxious Plant or Weed"
- remove by grubbing out roots and/or by poison spray if such treatment is approved as effective

removal of trees and stumps: remove trees only as noted on the drawings and grub all stumps including those of trees previously removed
TOPSOIL, STORAGE AND REMOVAL
- remove topsoil from those areas of the site to be built upon and/or excavated including buildings, carparks, driveways, driving areas, paving and stockpile on site ready for re-spreading. Protect stockpile from contamination
- remove 100mm minimum depth of the surface layer of the natural ground
- remove from site and replace any contaminated topsoil. Refer to PRELIMINARIES:

Environmental Protection Disposal of Contaminants and Refuse :
- remove surplus excavated material on completion

SITE EXCAVATIONS

GENERAL
Excavate in material "as found". No variation to the contract will be allowed with respect to the type of material excavated
- backfill excavations taken below contract depth with concrete of equivalent strength to work immediately above at no variation to the contract
- remove surplus excavated material from the site
- provide a minimum clearance of 400mm to the underside of timber floor structures

rock excavation : where rock or shale is encountered scabble surface to level and solid bearing. Remove loose boulders and treat holes as above in backfilling
trenches : provide and maintain all necessary planking and strutting to excavations in sand or any other loose formation:
- where bearing capacity is affected by the removal of tree stumps, fence posts, rock floaters, etc. , excavate to solid bearing and backfill with concrete.

SERVICE TRENCHES
Excavate trenches to required depths to allow regulation cover over service lines:
- maintain sides of excavations vertical
- generally maintain straight runs between access holes, inspection points, and the like
- grade bottoms of trenches to provide uniform bearing. Dig bell holes after grading trench bottom
- keep trench base free of objects greater than 75mm
- keep main runs 600mm minimum clear of footings and concrete paths.

sewer and stormwater drainage:
Refer to PLUMBING AND SANITARY PLUMBING and DRAINAGE.
underground electrical mains: Refer to ELECTRICAL WORKS.
underground water mains and gas lines: Refer to DRAINAGE and GAS SERVICE.**FILLING MATERIALS**
GENERAL
Provide filling free from organic matter, from soil recovered from the site excavations or imported onto the site from an approved source. Filling must be in accordance with Engineer's drawings.
FILLING TYPES
hardcore fill: Fill with hardcore, made up of broken brick or stone, not larger than 75mm gauge.
crushed rock fill: Fill with crushed igneous rock, not larger than 40mm gauge with a minimum clay content.
granular fill: Fill with loose granular fill with minimum clay content.
SITE PREPARATION AND BULK FILLING
AREAS UNDER CONSTRUCTION WORKS
Where cut and fill is required under the building areas, carparks, driveways and pavings:
-carry out filling in accordance with Engineer's drawings
-grade area to solid and undisturbed bearing before filling
-fill in layers not exceeding 200mm loose thickness and each layer compacted.
AREAS OTHER THAN THOSE UNDER CONSTRUCTION WORKS
Filling is to be clean sandy loam fill taken from site excavations, and clean imported fill.
imported fill:
-is to be a friable, sandy loam
-comprise not less than 65% sand and not more than 15% silt and clay
-to have a pH between 5.5 to 6.5.
GRADES AND FALLS
Carry out grading and filling of site to finished levels on drawings:
-grade site to fall from buildings & paths, having a fall of 1:100 at least one metre from building
-maximum slope for grassed areas is 1:4 (25%) and mowable.
backfilling: backfill as required and consolidate to level of surrounding area.
batters: cut and fill as required to banks and retaining walls to form batter.
FINISHED TOPSOIL AREAS
Fill in with approved topsoil. Refer to LANDSCAPE WORKS -Materials.
FINISH LEVELS
Grade site so that grassed and planting areas finish flush with paths and paving, or as detailed.
COMPACTION
GENERAL
-provide compaction to filled areas in accordance with Engineer's drawings
-under buildings, roads, carparks, driveways and paving and within zone of influence of footings (except for loose granular filling used as formwork) to 98% minimum dry density ratio
-In areas where excessive settlements create tripping hazards or result in the formation of differential levels (such as backfill around manholes, at back of kerbs and against other minor concrete structures (i.e., pits, headwalls, retaining walls, etc) or places where the extent of differential settlements justifies future maintenance by topping up backfill (sewer and drainage trenches), compact to 95% dry density ratio.
-over other areas including loose granular filling used as formwork to 85% minimum dry density ratio.

BITUMINOUS PAVINGS
Where bituminous pavings are required, all work must be carried out in accordance with an approved construction specification

CONSTRUCTION HOLD POINTS
(for inspection as per Specification requirements)
A) Suitable rock strength and socket length for bored piles
B) Pre-concrete pour reinforcement to Piles, Abutments, Decks, Wingwalls and Approach slabs
C) Abutment Backfilling & Road approach construction (compaction & CBR tests per AS3798 earthworks code)
D) Final (completion and certification) includes scour protection, guardrails, signage etc

FOUNDATIONS

1. If not otherwise specified footings design based on minimum allowable soil bearing pressure of 150KPa. See specific details in these plans where higher magnitude bearing pressures for certain structural elements are required.
2. The design only applies for ground and foundation levels as shown on the drawings
3. Backfill foundation walls so that the level of fill on one side of the wall is never more than 450 above the level on the other side except where detailed retaining walls are used

CONCRETE

1. All concrete work in accordance with AS 3600-2018 and all bridge/culvert construction work to be in accordance with AS5100-2017
2. Concrete to be formed as required by AS 3610 and compacted in accordance with AS 3600 and AS 3610 to achieve specified or relevant density durability and strength
3. All reinforcing fabric to be lapped one mesh panel minimum and reinforcement bars lapped 40 bar diameters U.N.O.
4. Provide concrete strengths below to relevant structural items

Pad Footings	f'c = 40 MPa	Strip footings	f'c = 40 MPa
Ground Slab	f'c = 40 MPa	Slabs Beams and Columns	f'c = 40 MPa
Other Specify	Slabs & Concrete Panels exposed to open environment within 1 km of coast f'c=40 MPa		
Maximum slump of	75mm	Maximum aggregate size	20mm

5. Sizes of concrete elements do not include thickness of applied finishes
6. Do not make any construction joints, holes or chases in the concrete elements unless shown or approved by the Engineer
7. Do not place pipes or conduits within the concrete cover to reinforcement
8. Reinforcement notation
   N = Grade 500 deformed bar to AS 4671 T = Top of element TM = Trench Mesh
   R = Grade 250 plain round bar to AS 4671 B = Bottom of element EW = Each Way
   SL = Grade 500 square mesh to AS 4671 UNO = Unless Noted Otherwise
   CTS = Centres C/S = Courses
   RL = Grade 500 rectangular mesh to AS 46 L = Grade 500 trench mesh to AS 4671
   eg 8 N16 @ 200T = 8 deformed bars 16 diameter at 200 centres placed at top of element
9. Provide clear concrete cover to reinforcement as follows: UNO

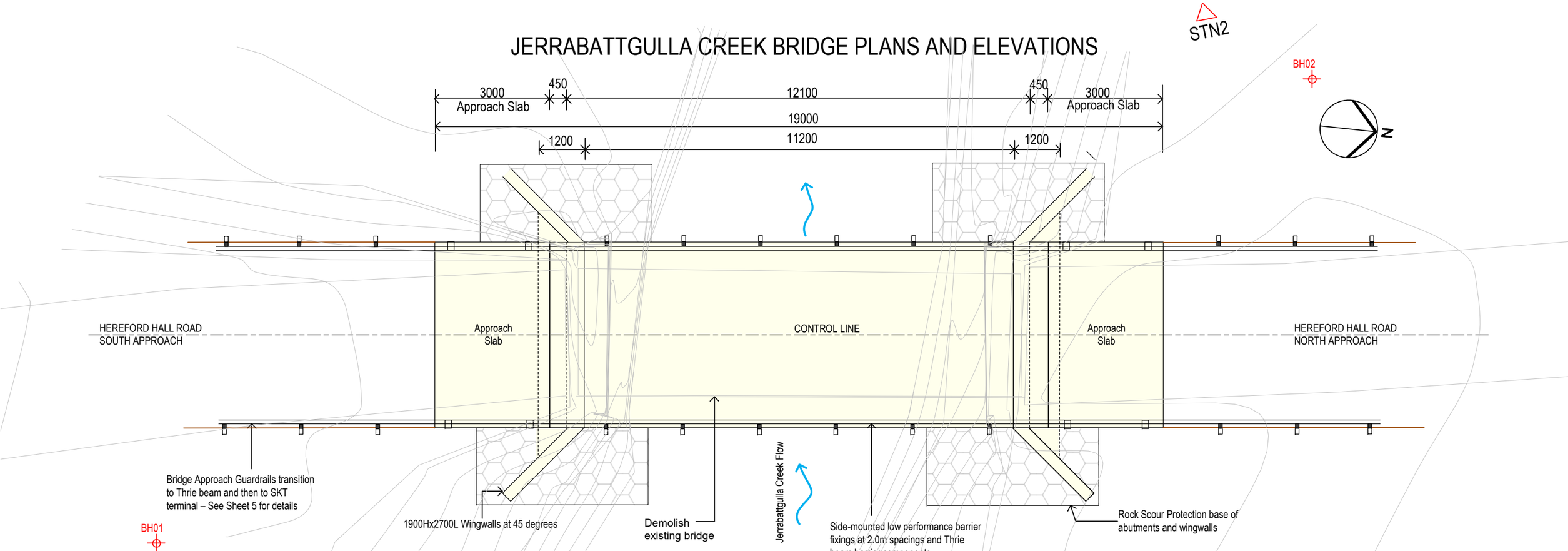
ELEMENT	INTERIOR	EXTERIOR	EXTERIOR(against ground)
Footings	NA	NA	45mm
Columns, Pedestals	30mm	50mm	45mm
Slabs, Walls	30mm	50mm	45mm
Beams	25mm	50mm	45mm
Block work	20mm from appropriate outside face		

10. Recommend using maximum bar chair spacing of 60 diameters for supporting bars and 75 diameters for fabric
11. Provide laps only at locations shown unless otherwise approved by the Engineer. Min.Lap length=40db UNO
12. For rectangular fabrics place top fabric main wires uppermost and bottom fabric main wires lowermost in direction of arrows
13. Supply and lay fabric in flat sheets., overlap 1st and 2nd cross wires of each sheet by 30mm at laps
14. Do not weld reinforcement unless shown or approved by the Engineer
15. Reinforcement is shown diagrammatically and not necessarily in true position
16. All concrete shall be placed and cured in accordance with Section 19 AS 3600. Where curing compound is used it must be applied (A) onto slabs within 2 hrs of finishing operation and (B) onto walls and columns immediately after removal of framework

DRAINAGE

1. Cover Levels given are to be used as a guide only. Actual levels to be determined on site
2. All survey set out shall be undertaken by a qualified &appropriately experienced surveyor
3. The contractor shall not disturb any existing benchmarks
4. All existing and finished surface levels are to Australian Height Datum AHD UNO
5. Connection of new stormwater pipes to existing pipes and stormwater structures to be undertaken by the contractor
6. Where new work abuts existing work the contractor shall ensure that a smooth even profile free from abrupt changes is attained
7. All earthworks batters and trench lines in non paved areas are to be top soiled with 100mm site topsoil , dry land grassed and bitumen straw mulched
8. All reinforced concrete pipes shall be rubber ring jointed class 2 UNO
9. The contractor is required to liaise with affected lessees regarding any disruption to of vehicle access to their properties and to program the works in such a way as minimise the affects of disruptions however access for emergency vehicles should be maintained at all times
10. Sawcut through A.C. and Concrete surfaces where trenching is required
11. All abandoned stormwater, sewer and water supply pipes are to be sealed with 100mm minimum thickness concrete UNO
12. Allow for placement of heavy duty covers and seating rings for all structures in paved areas. Allow for standard covers and seating rings for all other structures UNO.

JERRABATTGULLA CREEK BRIDGE PLANS AND ELEVATIONS



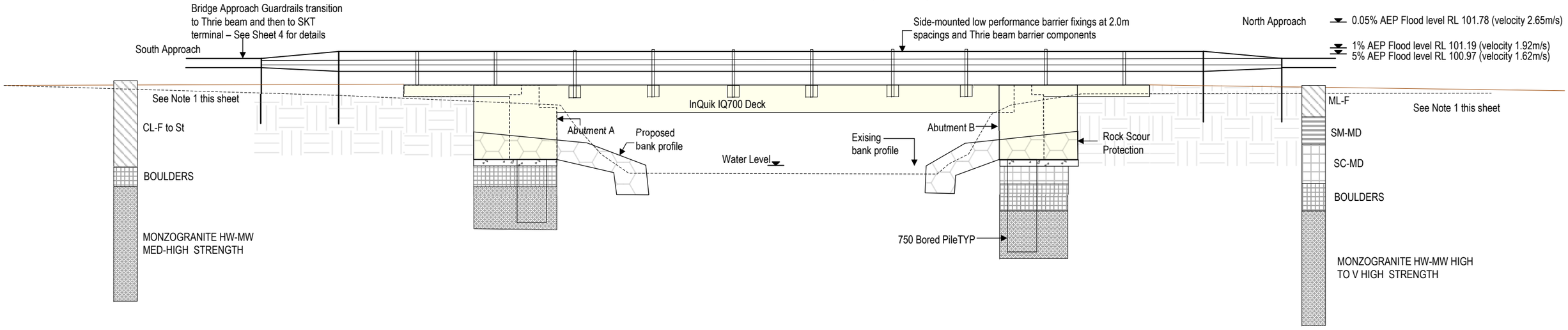
Note 1 – Approach roads to be ccompacted road gravel fill to bridge approaches phased into existing road surface using an acceptable safe approved vertical alignment – Works to be designed and constructed by QPRC

Note 2 - The placement of the bridge in relation to centerline of the creek should be such that the major flow path of the flood water is located approximately central between abutments.

Note 3: Contractor to physically locate and protect existing services prior to commencement of works

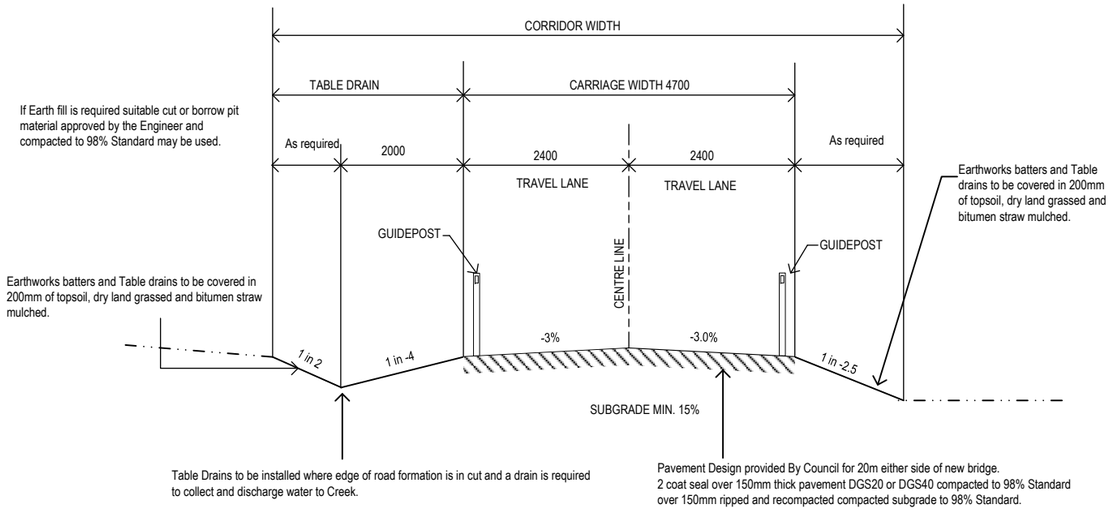
STN3

BRIDGE SIDE ELEVATION TYP (1:100)



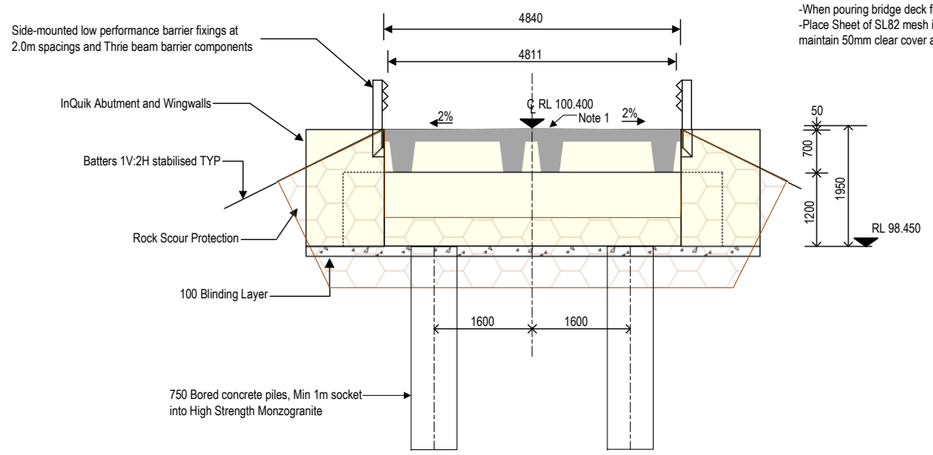
QPRC - BRIDGE OVER JERRABATTGULLA CREEK ON HEREFORD HALL ROAD	FAIRLIGHT CONSULTING ENGINEERS	Size: A3	Rev: B	Scale: 1:100	SHEET 3 OF 5

TYPICAL SECTION – APPROACH ROAD



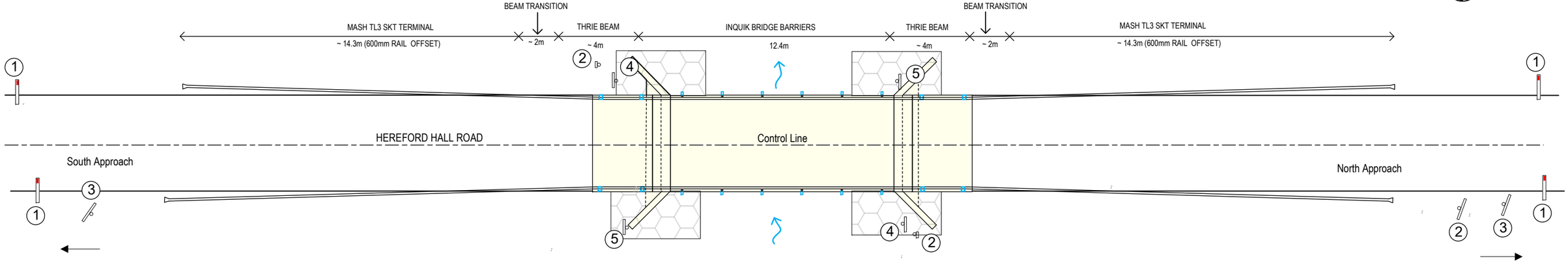
Note 2 – Approach roads to be compacted road gravel fill to bridge approaches phased into existing road surface using an acceptable safe approved vertical alignment – Works to be designed and constructed by QPRC

ABUTMENT ELEVATION TYP (1:100)



Note 1
-When pouring bridge deck form a crown on longitudinal centre line to facilitate 2% crossfall
-Place Sheet of SL82 mesh in additional depth of concrete for crack control, position to maintain 50mm clear cover at all edges

HEREFORD HALL ROAD BRIDGE SIGNAGE AND BARRIER LAYOUT (1:200)

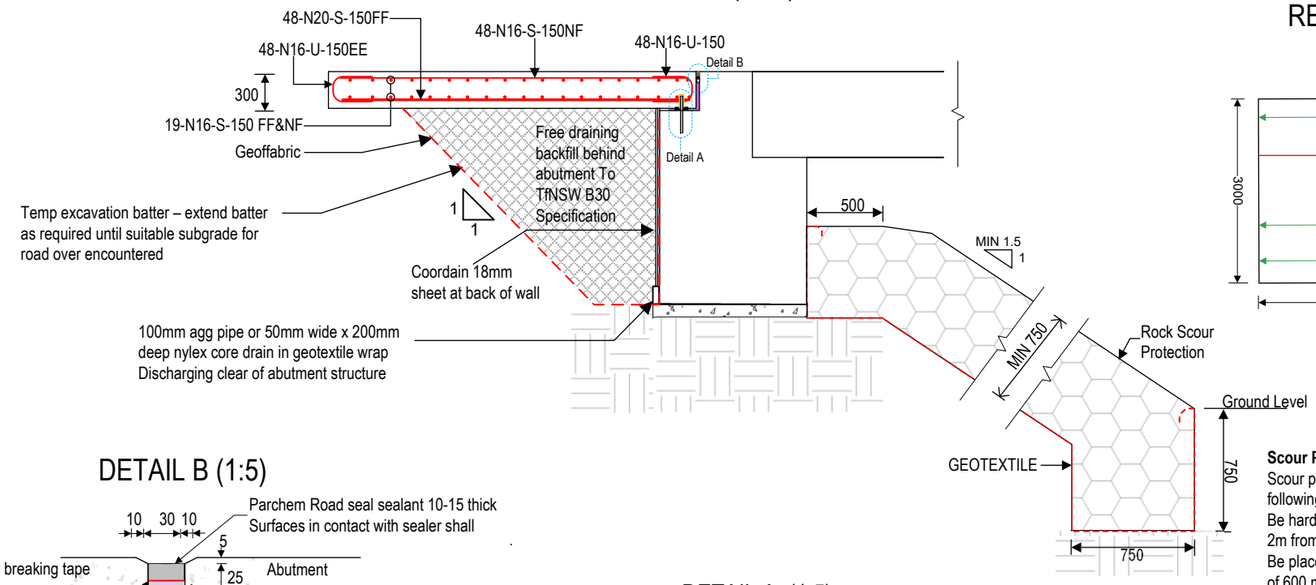


SIGNAGE TABLE

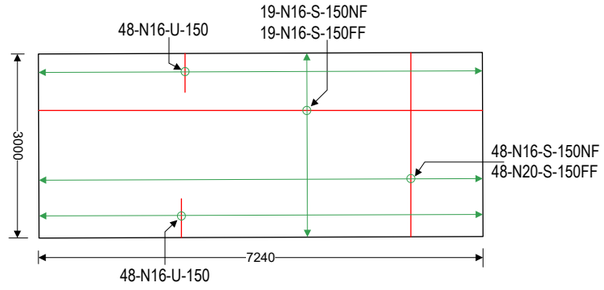
DWG ID	CODE	DESCRIPTION	LOCATION	DISTANCE OFFSET FROM EDGE OF LANE
1	N/A	FLEXIBLE GUIDEPOSTS WITH DELINEATORS	10m DISTANCE BETWEEN TWO GUIDEPOSTS	500mm
2	G9-22-2	DEPTH INDICATOR	0 TO 5m FROM BOTH ENDS OF BRIDGE	1200mm to 3000mm
3	R6-1	NO OVERTAKING OR PASSING	50m FROM ABUTMENT	1200mm to 3000mm
4	D4-3(L)	WIDTH MARKER	0 TO 5m FROM BOTH ENDS OF BRIDGE	500mm
5	D4-3(R)	WIDTH MARKER	0 TO 5m FROM BOTH ENDS OF BRIDGE	500mm

NOTES:
- ALL SIGNAGE SHOULD BER LOCATED ACCORDING TO FACING ORIENTATION, LATERAL CLEARANCE AND MOUNTING HEIGHT AS DEFINED IN AS1742.2 AND IN ACCORDANCE WITH SPECIFICATIONS
-GUIDE POSTS TO BE PLACED IN ACCORDANCE WITH AS1742.2 PART 2 SECTION 4.2.4
-REFLECTORS ARE TO BE MOUNTED ON THE BRIDGE BARRIER AS PER THE COLOUR AND SPACING OF THE GUIDEPOSTS IMMEDIATELY BEFORE AND AFTER THE BRIDGE BARRIER

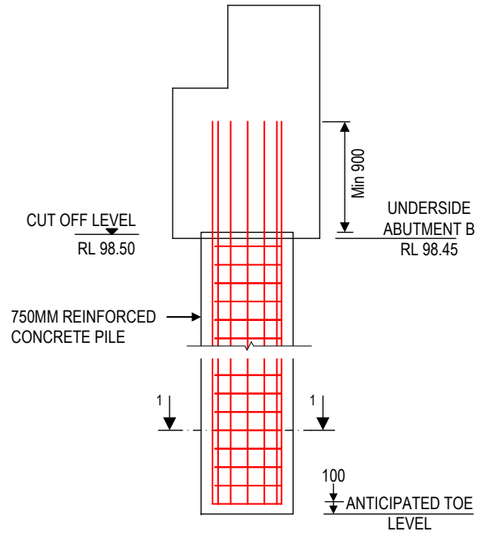
ABUTMENT DETAIL (1:50)



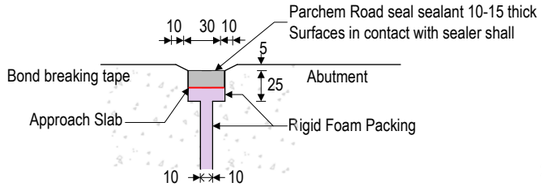
APPROACH SLAB REINFORCEMENT PLAN (1:100)



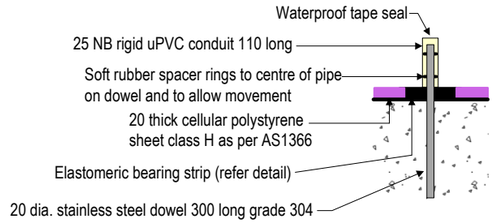
ABUTMENT PILE ELEVATION TYP (1:50)



DETAIL B (1:5)

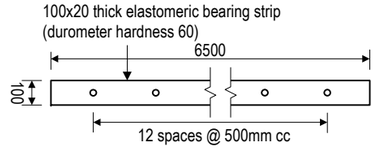


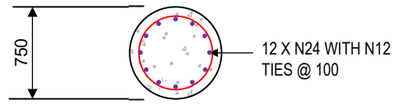
DETAIL A (1:5)



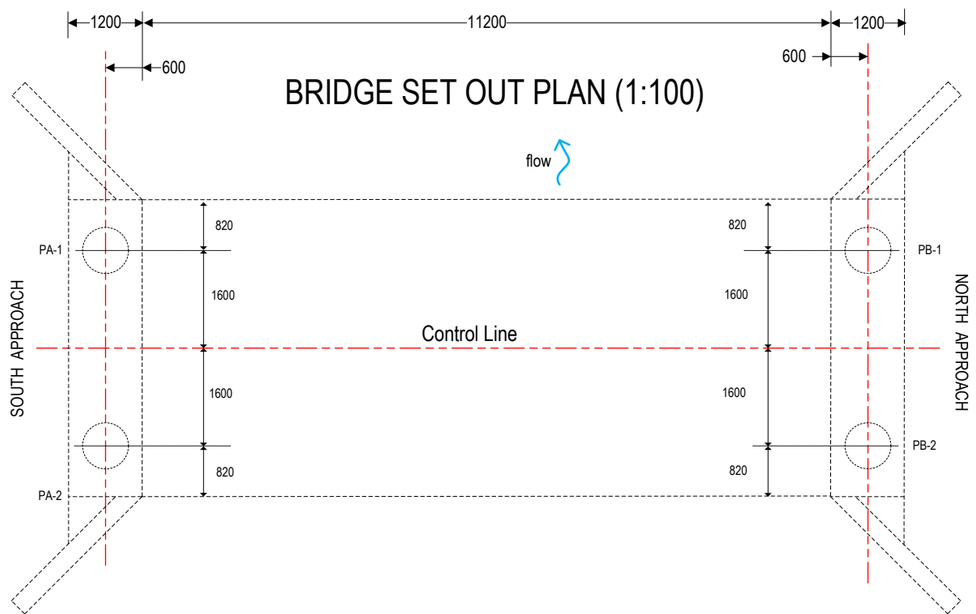
Scour Protection
Scour protection to be RIP rap rock facing at abutment embankments and meet the following requirements as a minimum:
Be hard dense durable angular and resistance to weathering extend in width to be at 2m from abutment edges and to bottom of embankment.
Be placed in their layout of minimum 750 mm thickness rock to have a minimum D50 of 600 mm and rock to be well graded throughout the rip rap layer.
Geotextile fabric shall be placed under rock in accordance with manufacturers specification and to be Bidim A39 or approved equivalent
During construction of the scour protection, geotextile shall be folded over edge of rock to maximise the contact area between rock and geotextile

APPROACH SLAB BEARING STRIP (1:0)





BRIDGE SET OUT PLAN (1:100)



PILE DETAILS

MARK	TYPE	ULTIMATE DESIGN LOADS			CUT OFF LEVEL (M)	ANTICIPATED TOE LEVEL (M)	MON SOCKET IN MED TO HIGH STRENGTH MONZOGRANITE	~ LENGTH (M)
		AXIAL (KN)	SHEAR (KN)	BENDING (KNm)				
PA-1	750 PIER	1083	320	470	98.50	96.75	1	1.75
PA-2	750 PIER	1083	320	470	98.50	96.75	1	1.75
PB-1	750 PIER	1083	320	470	98.50	96.14	1	2.36
PB-2	750 PIER	1083	320	470	98.50	96.14	1	2.36

Bored Pier Notes
-Dimensions in millimetres.
-Co-ordinates and reduced levels to local site datum only.
-Exposure Classification : Mild
-Concrete strength f'c 40MPa.
-Concrete exposure classification B1.
-Clear cover to reinforcement nearest to the concrete surface:
-Cast in forms or casing 45 mm
-Cast against ground 75 mm
-The nominated loads and moments apply to the structure as designed. Any proposed changes to the piles and pile layout may significantly alter the behaviour of the structure, as well as the pile loads and moments, and shall be submitted to the Engineer for approval.
-Cutoff level is given as 50mm above underside of headstock
-Founding Levels are indicative only
-Permanent pile casings are required as material overlying rock strata contains sands.
-Bored piles must be founded in High Strength Monzogranite bedrock material
-Minimum socket length specified is total socket length in bedrock material:
-Assumed minimum ultimate capacities for bedrock material are;
Medium to high Strength Monzogranite: 20MPa Ultimate end bearing and 800kPa Ultimate skin friction

Ggeotechnical Investigation Report
Hereford Hall Road Jerrabattgulla Creek - Geotechnical Investigation Report
Ref C-2409.00 R1 Dated 4/11/2024
By D&N Geotechnical
Survey
Detail survey plan by QPRC
Hereford Hall Road Jerrabattgulla Creek Bridge
Detail Survey
Rev A dated 8/10/2024
InQuik Specifications
Modular Bridge System – SM1600 Bridge – Integrated IQ700 decks
12.1mx4.84m Flat Side – 2m fixings
45 deg x 2.7m W/Walls