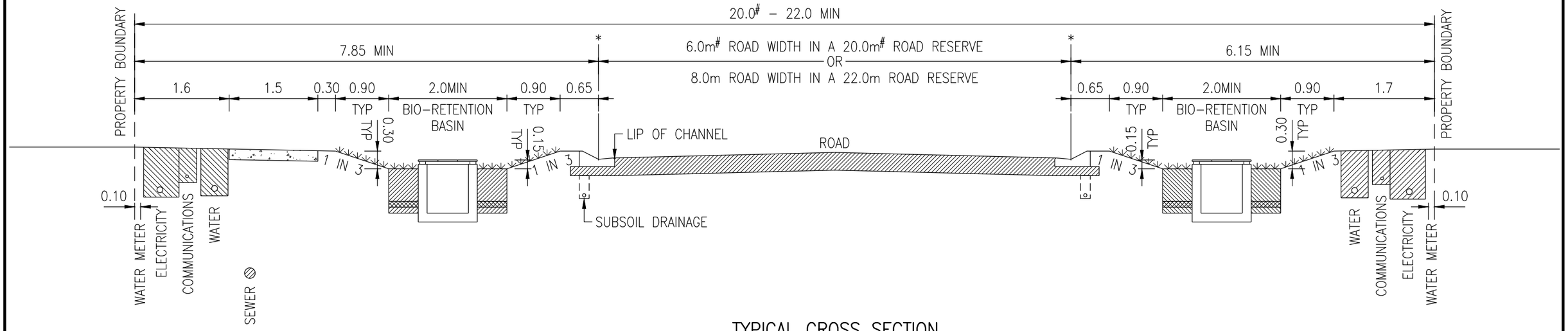


TYPICAL CROSS SECTION

LEGEND

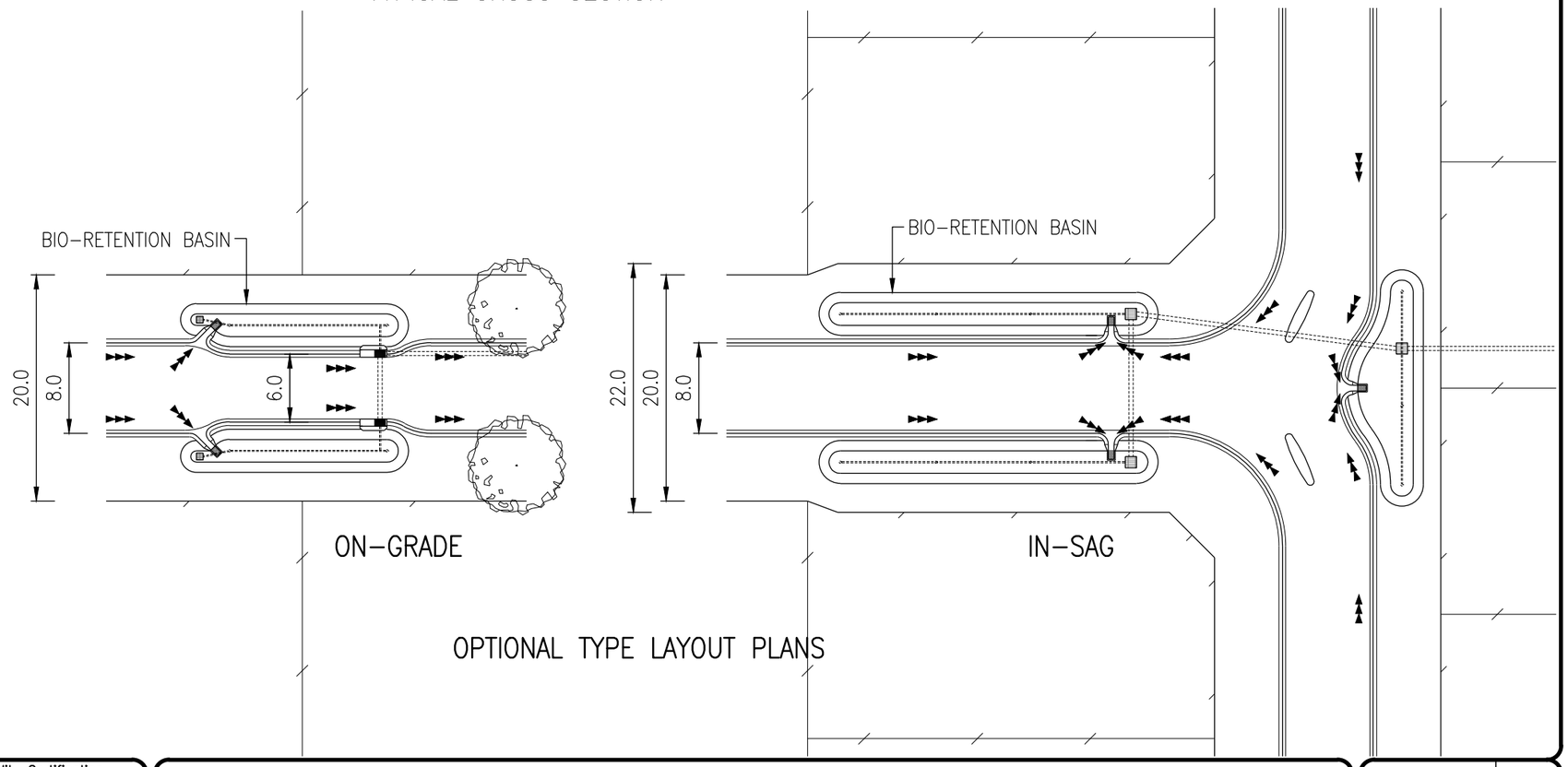
* NOMINAL KERB LINE.

\# REDUCED ROAD WIDTH ALLOWABLE ADJACENT TO BIORETENTION BASIN

►►► STORMWATER FALL DIRECTION

NOTES:

1. ALL DIMENSIONS ARE IN METRES.
2. REFER TO "HEALTHY WATERWAYS" AND "WATER BY DESIGN" GUIDELINES FOR WSUD SOLUTIONS. REFER IPWEAQ STANDARD DRAWINGS FOR DETAILS.
3. THIS STANDARD DRAWING IS A SAMPLE OUTLINE TO WSUD SOLUTION IN AN ACCESS STREET.
4. BIO–RETENTION BASINS CAN BE INCORPORATED INTO THE STREETSCAPE BY LOCALISED WIDENING OF THE ROAD RESERVE AND/OR THE REDUCTION OF THE NOMINAL ROAD WIDTH FOR A MAXIMUM LENGTH OF 20% OF THE ROAD LENGTH WITHIN THE DEVELOPMENT.
5. SWALES AND BIO–RETENTION SWALES ARE NOT ALLOWED AS A WSUD SOLUTION WITHIN BRC IN RESIDENTIAL NEIGHBOURHOOD COLLECTOR STREETS. ACCESS STREETS AND ACCESS PLACES WHERE THEY WILL BE TRAVERSED FOR PRIVATE PROPERTY ACCESS.



OPTIONAL TYPE LAYOUT PLANS

Scales	Revisions		Verified	Date
NOT TO SCALE				
	A	Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

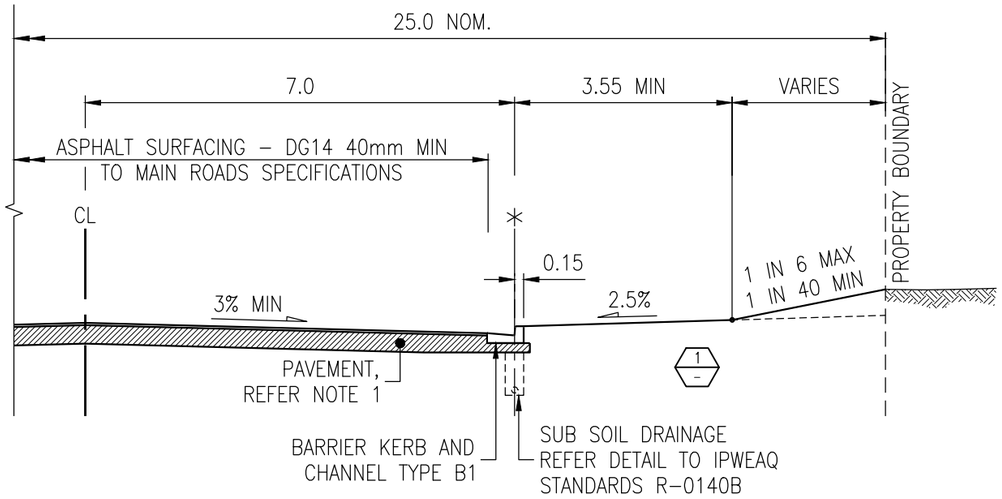
BUNDABERG REGIONAL COUNCIL

Residential Roads Optional Type Plans & Cross Section to suit WSUD

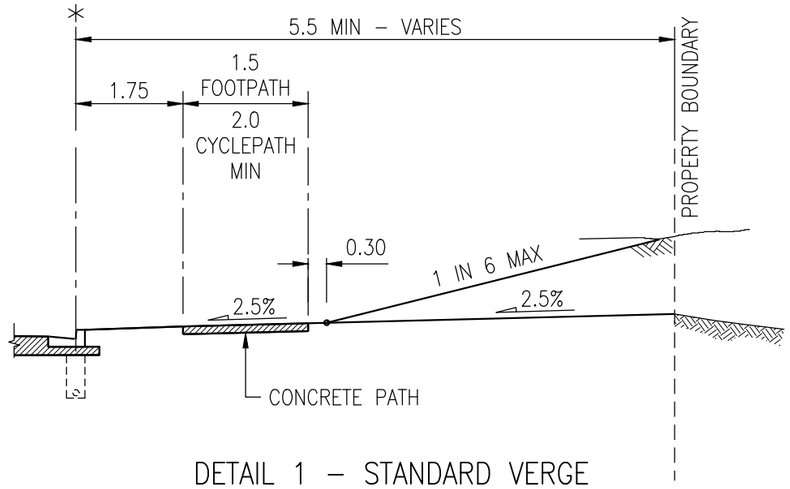
Standard Drawing No **R1002**

Sheet Size **A3**

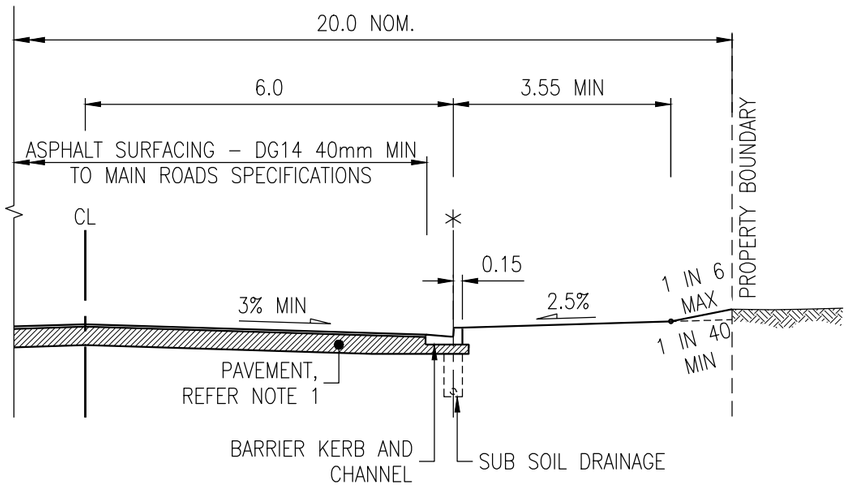
Rev



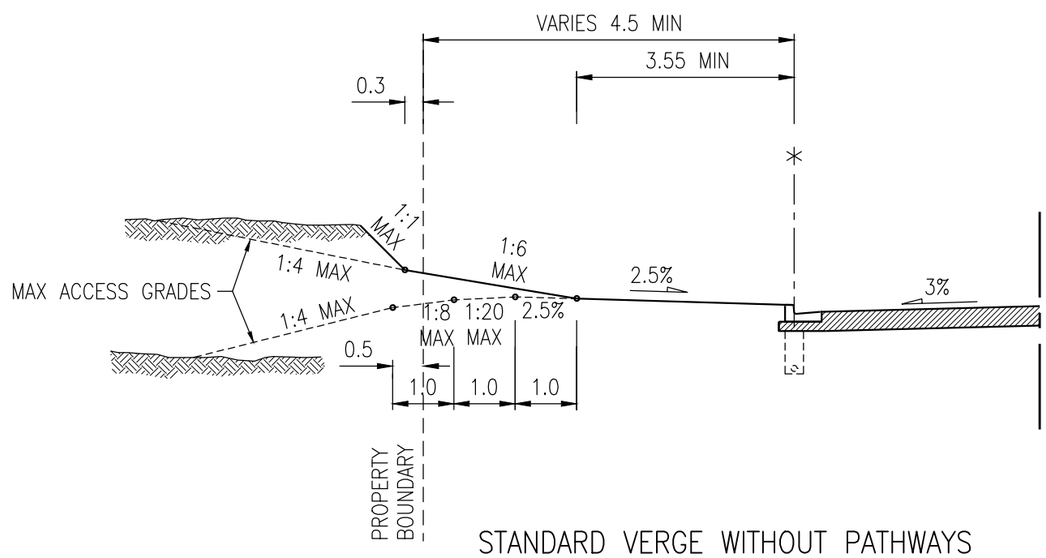
INDUSTRIAL COLLECTOR



DETAIL 1 – STANDARD VERGE



INDUSTRIAL ACCESS STREET



STANDARD VERGE WITHOUT PATHWAYS

NOTES:

1. PAVEMENT DESIGN IN ACCORDANCE WITH "AUSTROADS APRG–RPT–21 A GUIDE TO THE DESIGN OF PAVEMENTS FOR LIGHT TRAFFIC" OR "AUSTROADS PAVEMENT DESIGN – A GUIDE TO THE STRUCTURAL DESIGN OF ROAD PAVEMENTS" OR AP:G17–04.
2. ALL DIMENSIONS ARE IN METRES.
3. TURF TO BE LAID BEHIND KERB – 0.4 WIDE MIN AND/OR AS REQUIRED BY EROSION AND SEDIMENT CONTROL PLAN.
4. VEHICLE ACCESS IN FILL AREAS > 1m – COUNCIL WILL GIVE SPECIAL CONSIDERATION TO ACCESS TREATMENT – SUBMIT PROPOSAL FOR APPROVAL.

LEGEND

✳ NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

ROAD CLASSIFICATION	NOMINAL A.A.D.T.	ZONING AREA
INDUSTRIAL COLLECTOR ROAD	>750	8–30HA
INDUSTRIAL ACCESS ROAD	250–750	< 8HA

Scales	Revisions		Verified	Date
NOT TO SCALE				
	A	Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

BUNDABERG REGIONAL COUNCIL

TYPE CROSS SECTIONS
Industrial Collector and Access Street

Standard Drawing No **R1004**

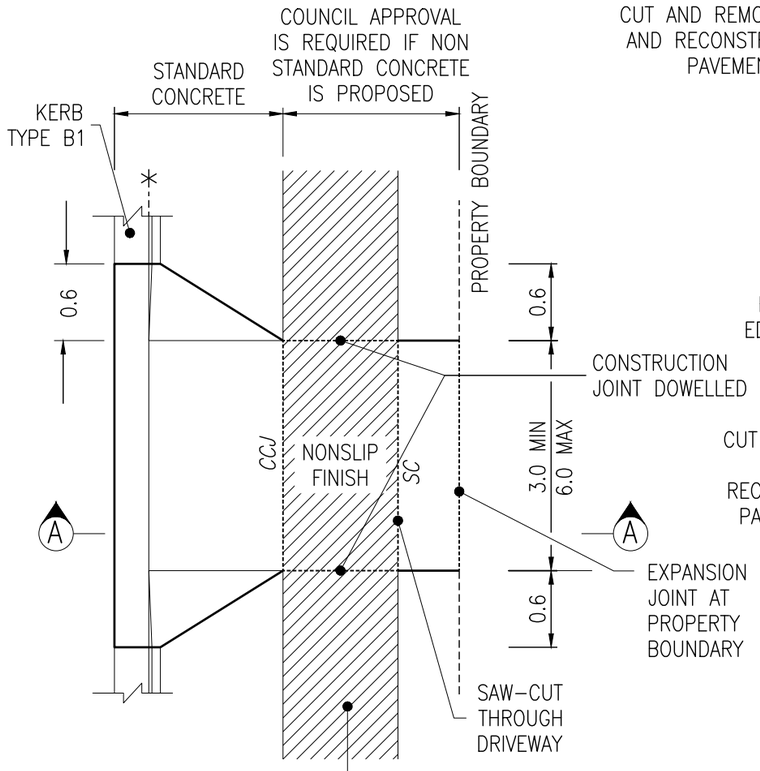
Sheet Size **A3**

Rev

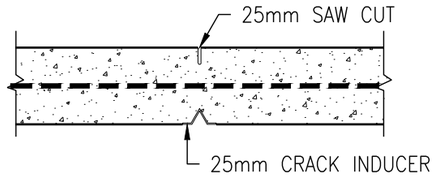
BRC(09/10)

LEGEND

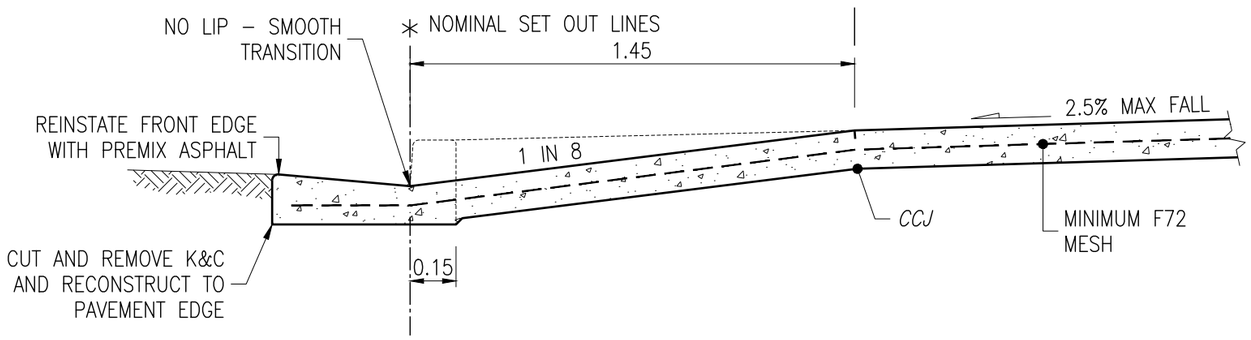
- ✳ NOMINAL KERB LINE (REFER BRC STANDARD DRAWING R1020).
- *SC* SAW CUT – 25mm
- *CCJ* CRACK CONTROL JOINT (SEE DETAIL)



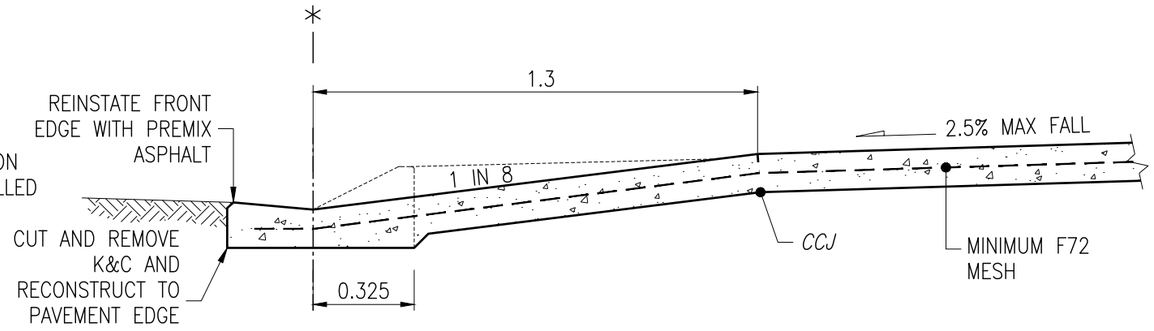
SLAB ABUTTING CHANNEL KERB (B1 SHOWN)



CRACK CONTROL JOINT DETAIL



SLAB TO KERB TYPE B1 – BREAKOUT



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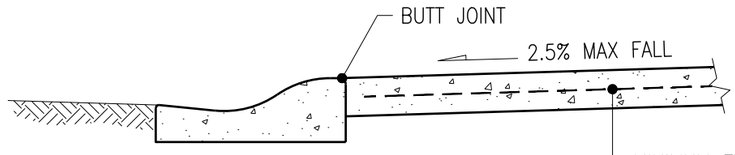
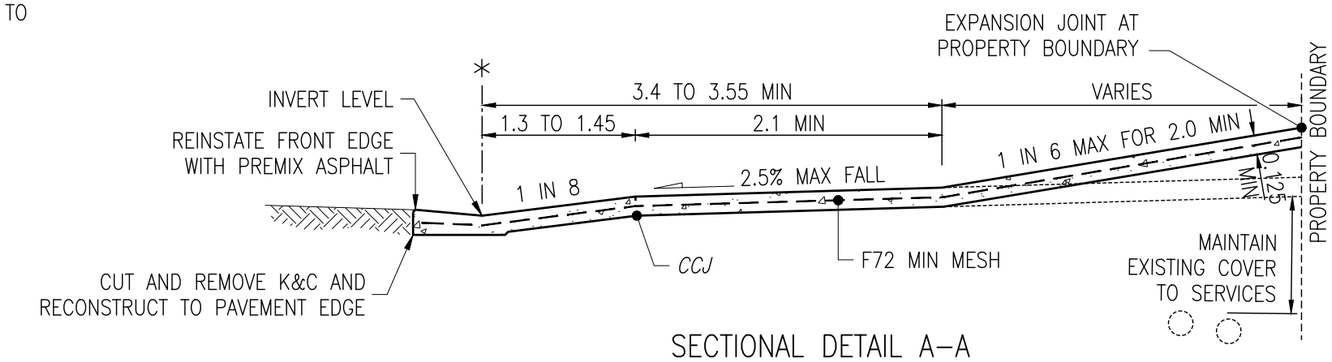


SLAB TO KERB TYPE M3 (NOTE 17)



SECTIONAL DETAIL A–A

NOTES:

1. CROSSINGS ARE NOT DESIGNED FOR COMMERCIAL VEHICLES.
2. FOOTPATH SECTION TO VARY WHERE NECESSARY TO MATCH CONCRETE FOOTPATHS AND VERGE PROFILES. FOOTPATH EARTHWORKS ADJOINING CONCRETE MUST BE WELL COMPACTED.
3. CONCRETE SURFACE TOLERANCE TO BE $^{+5mm}_{-0mm}$ OVER 3 METRE SECTIONS.
4. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
5. REINFORCEMENT MESH TO AS1304, 50 TOP AND EDGE COVER. LAP MESH 250.
6. DRIVEWAYS TO HAVE AN EXPANSION JOINT AT PROPERTY BOUNDARY.
7. EXPANSION JOINTS TO BE 10mm THICK, FULL DEPTH CLOSED CELL CROSS LINKED POLYETHYLENE FOAM (85–150kg/m^3), SEALED WITH SIKAFLEX OR EQUIVALENT.
8. ALL DIMENSIONS ARE IN METRES.
9. REINSTATE FOOTPATH TO ACCOMMODATE DRIVEWAY LOADING WITHOUT CHANGING THE FOOTPATH APPEARANCE.
10. CONCRETE PATHWAYS ARE TO BE TRANSITIONED OVER THE LONGITUDINAL GRADES NOT EXCEEDING 1 IN 20 TO COMPLY WITH AS1428 IF REQUIRED.
11. FOR DRIVEWAY WORK IN SANDY AREAS. COUNCIL MAY PERMIT THE EXISTING KERB & CHANNEL BE SAW CUT AT THE INVERT OR NOMINAL KERB LINE AND REMOVAL OF THE KERB.
12. REFER BRC R1014 FOR INVERT CROSSING DETAILS.
13. "QDC–NMP1.1 DRIVEWAY" MAY BE REFERENCED ONLY IF NOT IN CONFLICT WITH THIS DRAWING CONTENTS.
14. FOR KERB TYPES, REFER BRC STANDARD DRAWING R1020.
15. SHOULD DRIVEWAYS REQUIRE REINSTATEMENT DUE TO ANY COUNCIL CIVIL WORKS THEN COUNCIL WILL NOT GUARANTEE TO MATCH NON–STANDARD CONCRETE FINISHES WITHIN THOSE DRIVEWAYS.
16. SHOULD CONCRETE FOOTPATHS EXIST OR BE REQUIRED IN THE AREA, THEN THE THE CONCRETE FOOTPATH WILL BE CONTINUOUS THROUGH ANY DRIVEWAY ACCESS. CONSTRUCTION TO CONFORM TO OTHER DETAILS SHOWN ON THIS PLAN & AS1428.1–2009.
17. M3 – GENERALLY M3 IS TO REMAIN AS IS FOR VEHICLE CROSSING.

IF REMOVAL & RECONSTRUCTION OF M3 IS REQUIRED, THEN SPECIAL APPROVAL FROM COUNCIL IS REQUIRED.

Scales: NOT TO SCALE

Revisions		Verified	Date
B	M3 KERB ADDED	RMC	24/12/15
A	Original Issue		

Quality Certification
Design: Verified:
Drawn: Tifa Checked: RMC
Approved By Engineer: Date:
RPEQ:

BUNDABERG REGIONAL COUNCIL

DRIVEWAYS
Residential Driveway Slabs

Standard Drawing No.: R1010
Sheet Size: A3
Rev.: B

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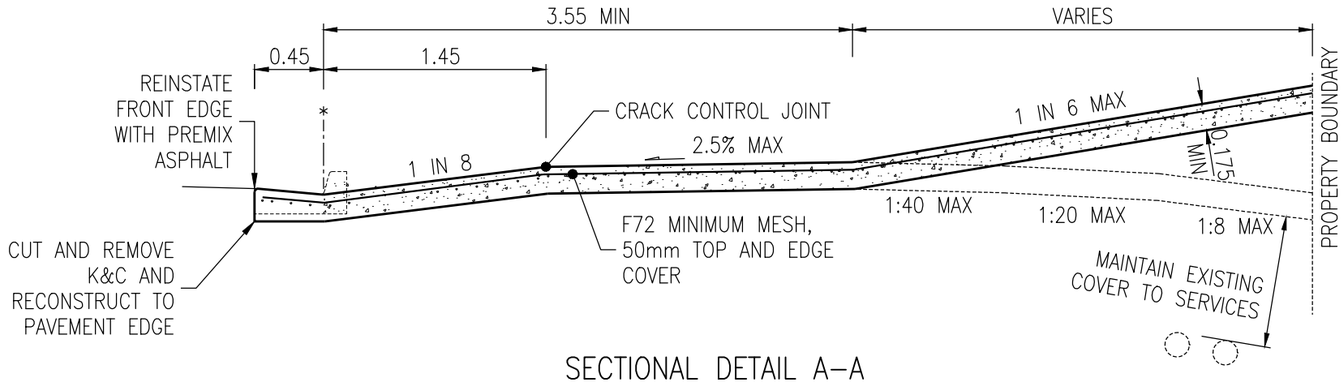
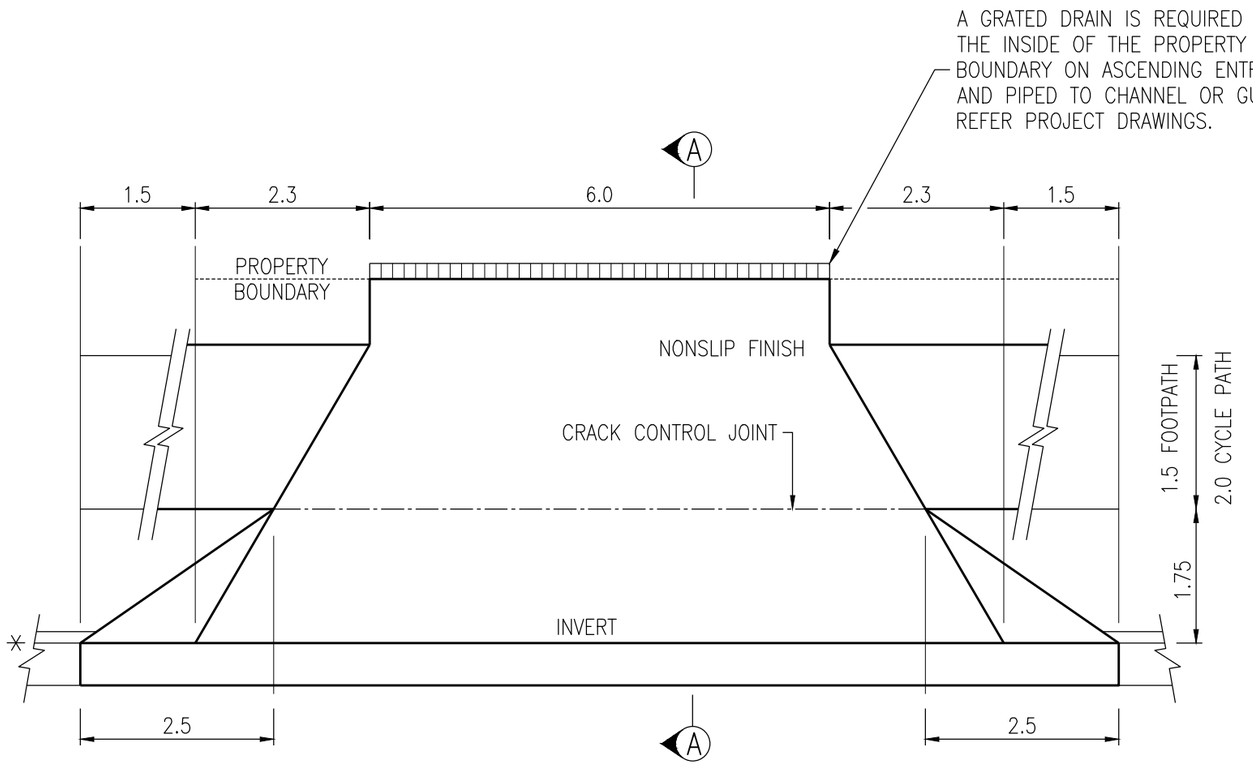


SECTIONAL DETAIL A–A

LEGEND

* NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).



PLAN – WIDE VERGE

NOTES:

1. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
2. REINFORCING MESH TO AS1304. LAP MESH 250mm.
3. DEPTHS OF CONCRETE AND REINFORCING STEEL SHOWN ARE THE MINIMUM REQUIREMENTS FOR GOOD FOUNDATION CONDITIONS, AND AVERAGE TRAFFIC LOADING. WHERE THIS DOES NOT APPLY, DEPTHS OF CONCRETE AND REINFORCING SHALL BE INCREASED TO SUIT SPECIFIC CONDITIONS.
4. DESIGN OF CROSSINGS MAY VARY WITH THE APPROVAL OF COUNCIL. REFER PROJECT DRAWINGS.
5. EXISTING FOOTPATH PROFILE TO BE MAINTAINED WHERE POSSIBLE.
6. REPROFILE ADJACENT FOOTPATH TO MATCH DRIVEWAY. FOOTPATH EARTHWORKS ADJOINING CONCRETE MUST BE WELL COMPACTED.
7. CONCRETE PATHWAYS ARE TO BE TRANSITIONED OVER THE LONGITUDINAL GRADES NOT EXCEEDING 1 IN 20 TO COMPLY WITH AS1428 IF REQUIRED.
8. FOR COMPACTED FILL SEE AUSPEC C213.36.2.
9. WHERE SUBGRADE IS LESS THAN CBR 5, EXCAVATE AND PROVIDE IMPORTED MATERIAL TO THE SATISFACTION OF THE COUNCIL ENGINEER.
10. DRIVEWAY TO BE CONCRETE WITH A CRACK CONTROL JOINT AT THE PROPERTY BOUNDARY UNLESS OTHERWISE APPROVED. GALV DOWEL BARS TO BE USED.
11. ALL DIMENSIONS ARE IN METRES.
12. COUNCIL WILL NOT GUARANTEE REINSTATEMENT OF NON–STANDARD CONCRETE FINISHES IF COUNCIL NEEDS TO ACCESS INFRASTRUCTURE UNDER DRIVEWAY(EG. PIPES, ETC) OR PROVIDE CONCRETE FOOTPATH ACROSS DRIVEWAY.
13. SHOULD CONCRETE FOOTPATHS EXIST OR BE REQUIRED IN THE AREA, THEN THE CONCRETE FOOTPATH WILL BE CONTINUOUS THROUGH THE PROPOSED DRIVEWAY ACCESS. CONSTRUCTION TO CONFORM TO OTHER DETAILS SHOWN ON THIS PLAN & AS1428.1–2001.
14. DOWEL BARS TO DRIVEWAY – PATH CONNECTION.

Scales	Revisions	Verified	Date
NOT TO SCALE	A Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

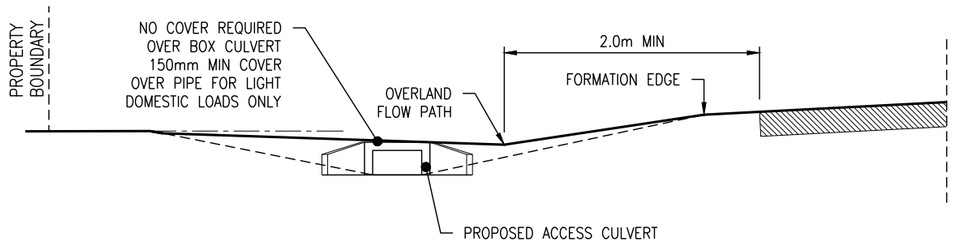
BUNDABERG REGIONAL COUNCIL

DRIVEWAYS
Industrial and Commercial Driveway Slab
Two Way Access

Standard Drawing No **R1011**

Sheet Size **A3**

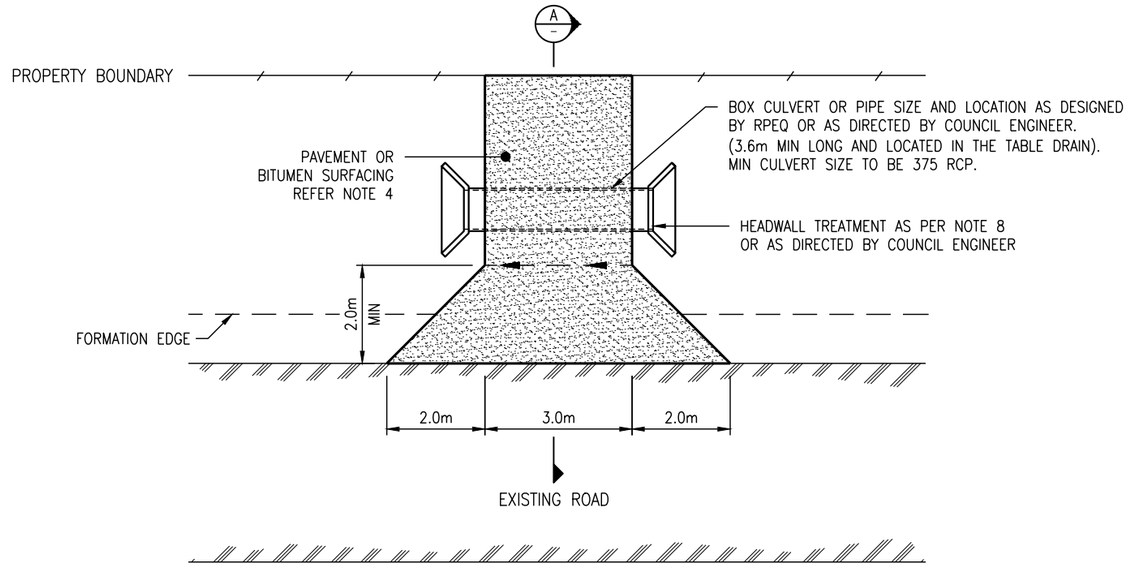
Rev



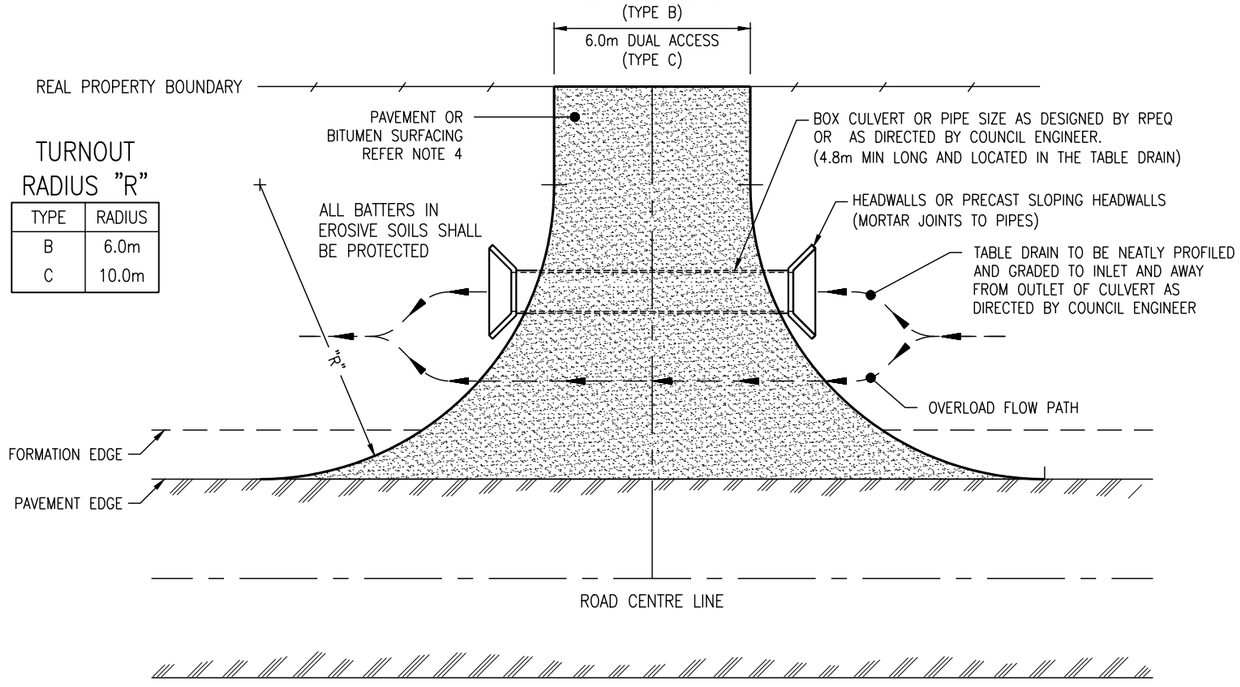
TYPICAL SECTION A–A

NOTES:

1. THE CONSTRUCTION & MAINTENANCE OF PROPERTY ACCESSES IS THE RESPONSIBILITY OF THE LAND OWNER.
2. BUNDABERG REGIONAL COUNCIL (BRC) APPROVAL TO UNDERTAKE CIVIL WORKS IN THE ROAD RESERVE IS REQUIRED PRIOR TO ANY CIVIL WORKS BEING UNDERTAKEN.
3. THE ACCESS CULVERT – RCBC OR RCP SIZE AND LOCATION UNDER THE ACCESS SHALL BE NOMINATED BY A COUNCIL REPRESENTATIVE. SHALLOW ROADSIDE DRAINS MAY REQUIRE THE INSTALLATION OF AN ACCESS AS PER BRC PLAN R1013.
4. PAVEMENT REQUIREMENTS IF NOMINATED: THE CIVIL CONTRACTOR SHOULD DETERMINE THE DEPTH OF PAVEMENT TO SUIT LOAD REQUIREMENTS AFTER EXCAVATION HAS BEEN COMPLETED;
   a. <u>PAVEMENT DRIVEWAYS:</u>
      - THE MINIMUM DEPTH OF PAVEMENT IS TO BE 150mm OF CBR 60. ZERO COVER IS ALLOWED OVER RCBC.
      - IF A BITUMEN SEALING IS REQUIRED, THEN IT SHALL BE A TWO COAT SEAL WITH 16mm & 10mm AGGREGATE TO COUNCIL STANDARDS.
      - IF ASPHALT IS REQUIRED, IT WILL ALSO BE TO COUNCIL STANDARDS (25mm MIN).
   b. <u>CONCRETE DRIVEWAYS:</u>
      - IF CONCRETE IS REQUIRED, IT WILL BE OFF FORMATION EDGE, OR 1m OFF BITUMEN EDGE WHICHEVER IS GREATER, OR AS DIRECTED BY COUNCIL REPRESENTATIVE.
      - MIN. CONCRETE ACCESS TO HAVE N32 CONCRETE, 100mm THICK ON 100mm THICK SUB–BASE GRAVEL. CONCRETE REINFORCED WITH F72 MESH (40mm TOP COVER)
5. FOR TRAFFIC CONTROL AND SAFETY, THE MINIMUM REQUIREMENTS FROM THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) MUST BE IN PLACE BEFORE WORK COMMENCES.
6. DRIVEWAY ACCESS IS TO BE CONSTRUCTED SO AS TO ALLOW AN OVERLAND FLOW PATH OVER THE ACCESS ROAD. THIS OVERLAND FLOW PATH IS TO BE GENERALLY BETWEEN THE ACCESS CULVERT AND THE EDGE OF ROAD OR AS DIRECTED BY COUNCIL ENGINEER. GENERALLY THE OVERLAND FLOW PATH IS TO BE 300MM BELOW ROAD CROWN.
7. BOX CULVERT ACCESS TO HAVE WINGWALLS AND APRON.
8. PIPE CULVERTS TO HAVE PRECAST HEADWALLS WITH WINGS (OR EQUAL CRS HUMES HEADWALLS) FOR SINGLE/MULTIPLE PIPES OR CAST INSITU ENDWALLS AS PER TMR DRAWINGS 1304,1305 & 1306.
9. COUNCIL MAY DIRECT THE USE OF SLOPING HEADWALLS IF REQUIRED IN LIEU OF THE HEADWALL TREATMENT MENTIONED IN NOTE 8.
10. MINIMUM LONGITUDINAL GRADE OF CULVERT IS 0.3%.



TYPE A – SINGLE ACCESS WITH CULVERT (LOW ORDER ROAD)



TURNOUT RADIUS "R"

TYPE	RADIUS
B	6.0m
C	10.0m

TYPE B AND C – ACCESS WITH CULVERT

Scales: NOT TO SCALE

	Revisions	Verified	Date
D	PLANS AND NOTES AMENDMENT	RMC	03/17
C	SECTIONAL DETAIL AND NOTES AMENDMENT	RMC	24/12/15
B	NOTE 4 AMENDMENT		12/10
A	Original Issue		

Quality Certification
Design: Verified:
Drawn: Tifa Checked: RMC
Approved By Engineer: Date:
RPEQ:

BUNDABERG REGIONAL COUNCIL

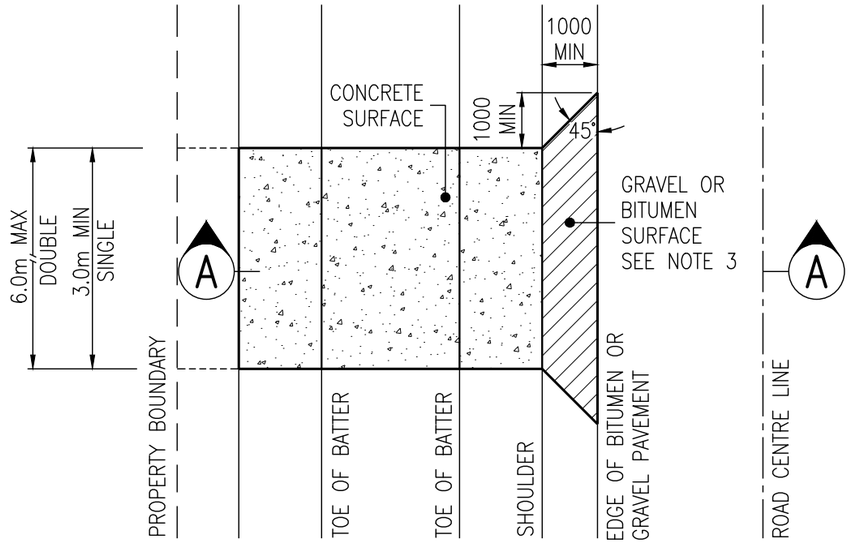
DRIVEWAYS
Rural and Urban Accesses Requiring Culverts No Kerb and Channel

Standard Drawing No.: R1012
Sheet Size: A3
Rev.: D

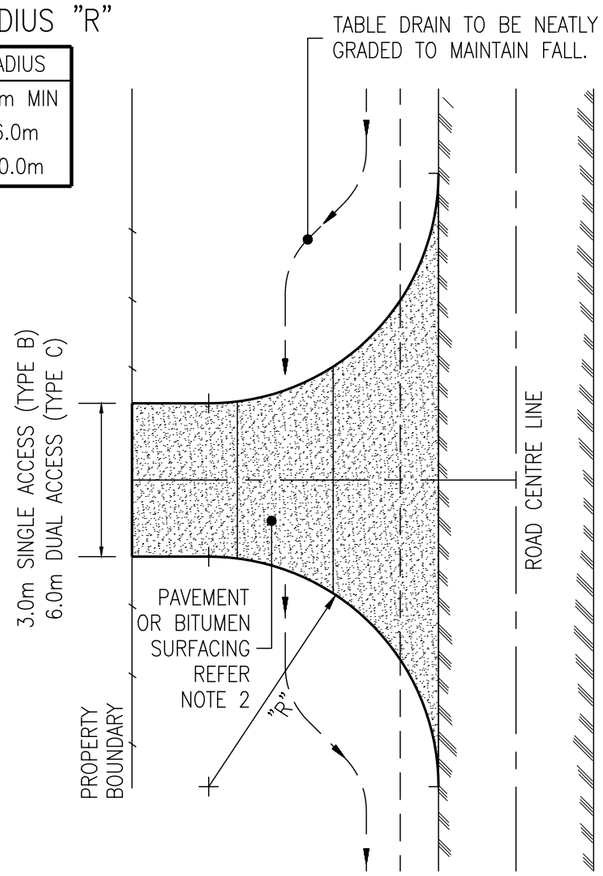
BRC(03/09)

TURNOUT RADIUS "R"

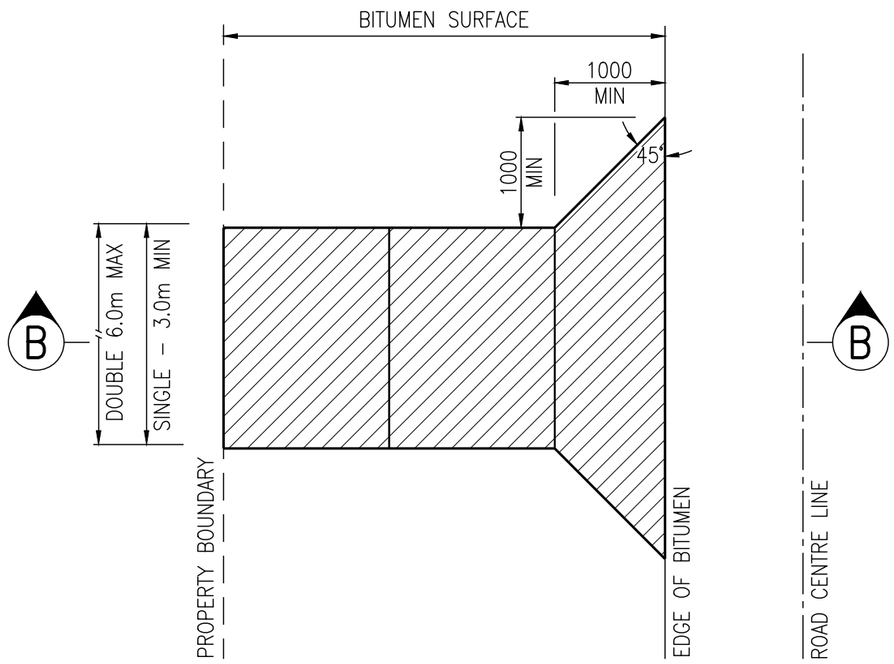
TYPE	RADIUS
A	1.0m MIN
B	6.0m
C	10.0m



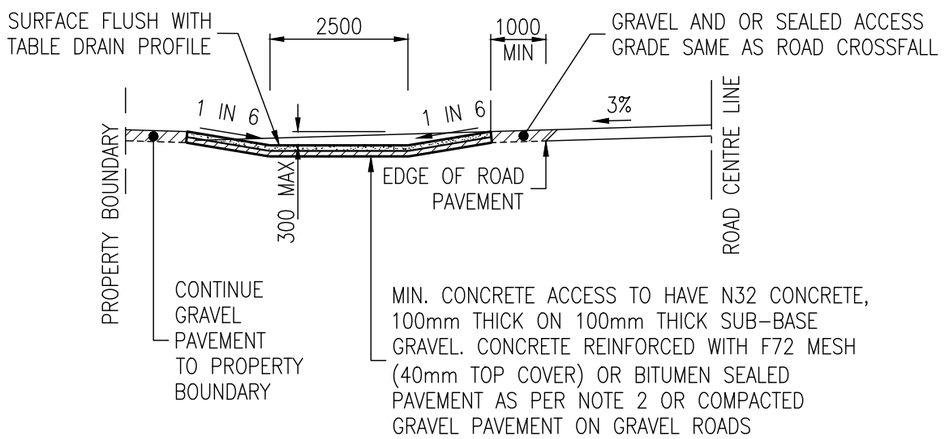
PLAN VIEW – CONCRETE INVERT CROSSING



PLAN VIEW – GRAVEL/BITUMEN INVERT CROSSING



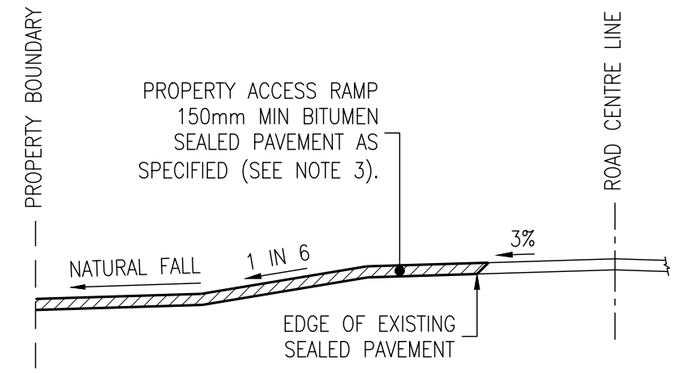
PLAN VIEW – ACCESS FALLING FROM ROAD EDGE



SECTION A–A
INVERT CROSSING

NOTES:

1. THE LAND OWNER IS RESPONSIBLE FOR THE CONSTRUCTION & MAINTENANCE OF PROPERTY ACCESSES.
2. THE CONTRACTOR SHOULD DETERMINE THE DEPTH OF PAVEMENT TO SUIT WORK AREA AFTER EXCAVATION. THE MINIMUM DEPTH OF PAVEMENT IS TO BE 150mm OF CBR 60. BITUMEN SEALING SHALL BE A TWO COAT HOT OR COLD SEAL WITH 16mm & 10mm AGGREGATE TO COUNCIL STANDARDS.
3. BITUMEN SEAL REQUIRED TO ACCESSES OFF EXISTING BITUMEN ROADS.
4. FINISHED CONCRETE/BITUMEN/OR GRAVEL SURFACE TO BE FLUSH WITH TABLE DRAIN PROFILE.
5. BROOM FINISH TO CONCRETE SURFACE.
6. FOR TRAFFIC CONTROL AND SAFETY, THE MINIMUM REQUIREMENTS FROM THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) MUST BE IN PLACE BEFORE WORK COMMENCES.
7. MINIMUM LONGITUDINAL FALL ACROSS INVERTS IS 0.3%.
8. WHERE JOINING A SEALED ROAD THERE MUST BE A 1600mm BITUMEN JOINT WITH 150mm OVERLAP OF COLD SEAL WITH 5mm AGGREGATE.



SECTION B–B
ACCESS FALLING FROM ROAD EDGE

Scales	Revisions		Verified	Date
NOT TO SCALE				
	B	General Note changes	rmc	13-2-18
	A	Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date: 13-2-18	RPEQ: PJ2454

BUNDABERG REGIONAL COUNCIL

DRIVEWAYS
Rural and Urban Invert Accesses No Kerb and Channel

Standard Drawing No **R1013**

Sheet Size **A3**

Rev **B**

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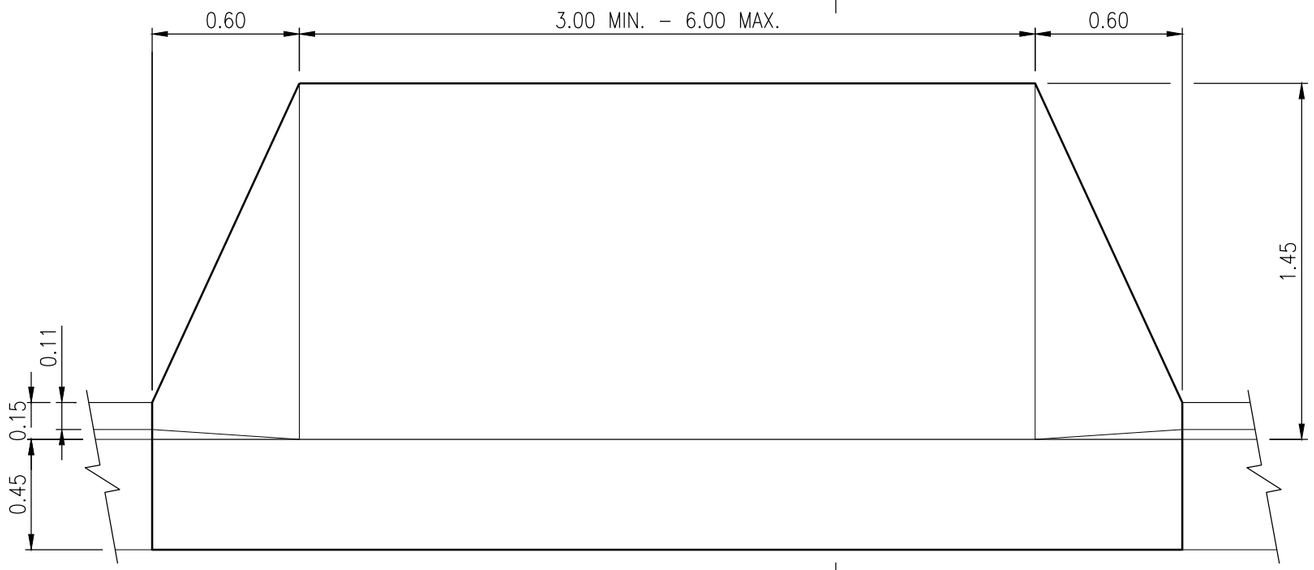
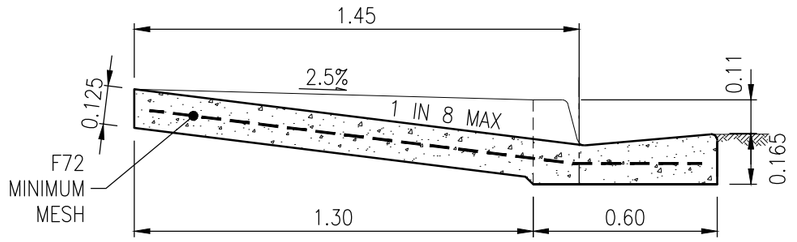
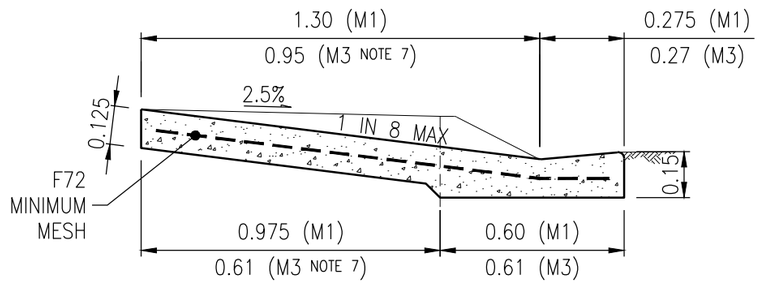
BRC(09/10)



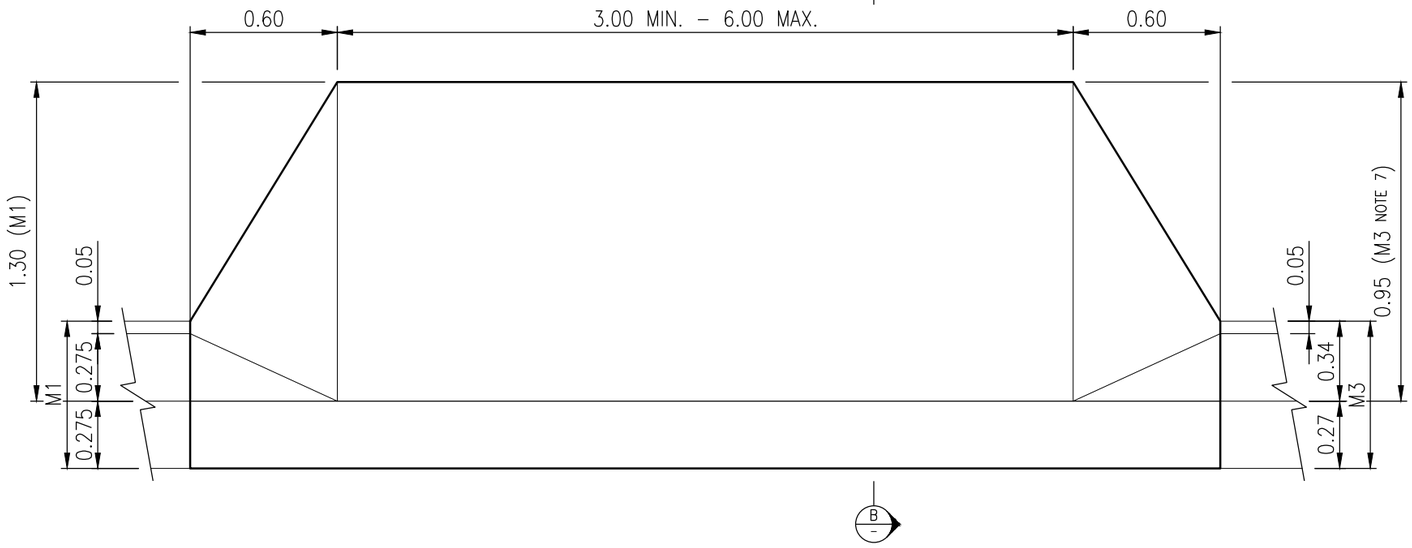
CHANNEL KERB B1
PLAN



SECTION A–A (RESIDENTIAL)
B1



SECTION B–B (RESIDENTIAL)
M1 / M3 (NOTE 7)



CHANNEL KERB M1 / M3 (NOTE 7)
PLAN

NOTES:

1. FOOTPATH SECTION TO VARY WHERE NECESSARY TO MATCH CONCRETE FOOTPATHS AND VERGE PROFILES. FOOTPATH EARTHWORKS ADJOINING CONCRETE MUST BE WELL COMPACTED.
2. RESIDENTIAL CROSSINGS CAN BE 3m MIN. TO 6m MAX.
3. ALL DIMENSIONS ARE IN METRES.
4. FOR KERB TYPES, REFER BRC STANDARD DRAWING R1020.
5. COUNCIL WILL NOT GUARANTEE REINSTATEMENT OF NON–STANDARD CONCRETE FINISHES IF COUNCIL NEEDS TO ACCESS INFRASTRUCTURE UNDER DRIVEWAY (EG. PIPES ETC) AND INSTALL CONCRETE FOOTPATHS TO COUNCIL STANDARDS.
6. FOR SECTIONAL DETAILS ON FOOTPATH/DRIVEWAY ACCESS SEE BUNDABERG REGIONAL COUNCIL PLAN R1010.
7. M3 – GENERALLY M3 IS TO REMAIN AS IS FOR VEHICLE CROSSING. IF REMOVAL & RECONSTRUCTION OF M3 IS REQUIRED, THEN SPECIAL APPROVAL FROM COUNCIL IS REQUIRED.

Scales

NOT TO SCALE

Revisions		Verified	Date
B	M3 KERB ADDED	RMC	07/15
A	Original Issue		

Quality Certification

Design: Verified:

Drawn: Tifa Checked: RMC

Approved By Engineer: Date:

RPEQ:

BUNDABERG REGIONAL COUNCIL

DRIVEWAYS
Residential Invert Crossings
(Layback M1 & M3, & Standard Kerb & Channel)

Standard Drawing No.: R1014

Sheet Size: A3

Rev.: B

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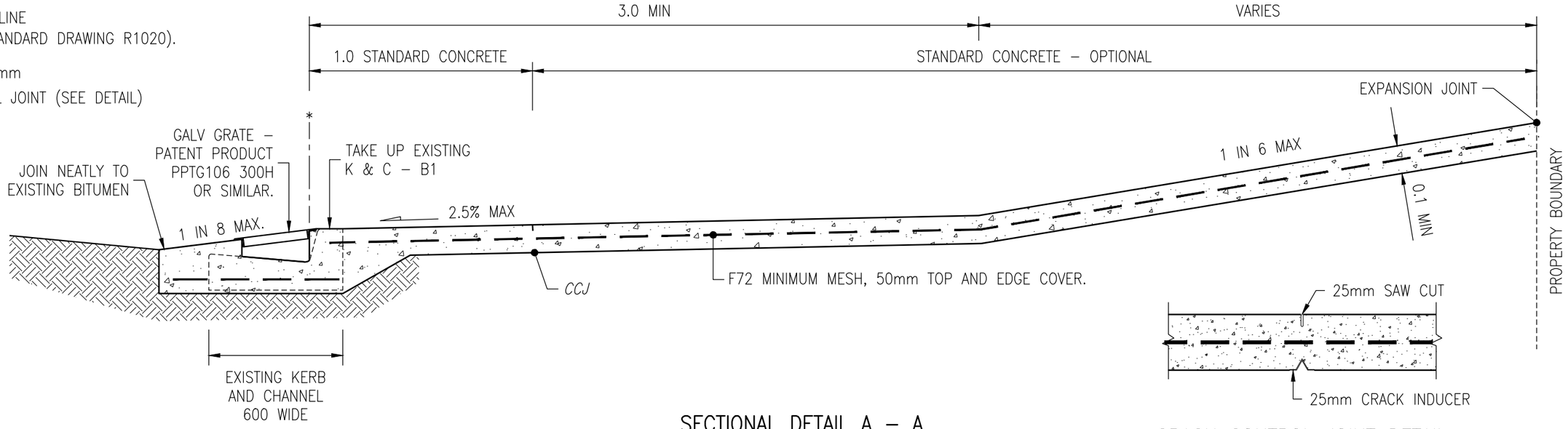
BRC(09/10)

LEGEND

* NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

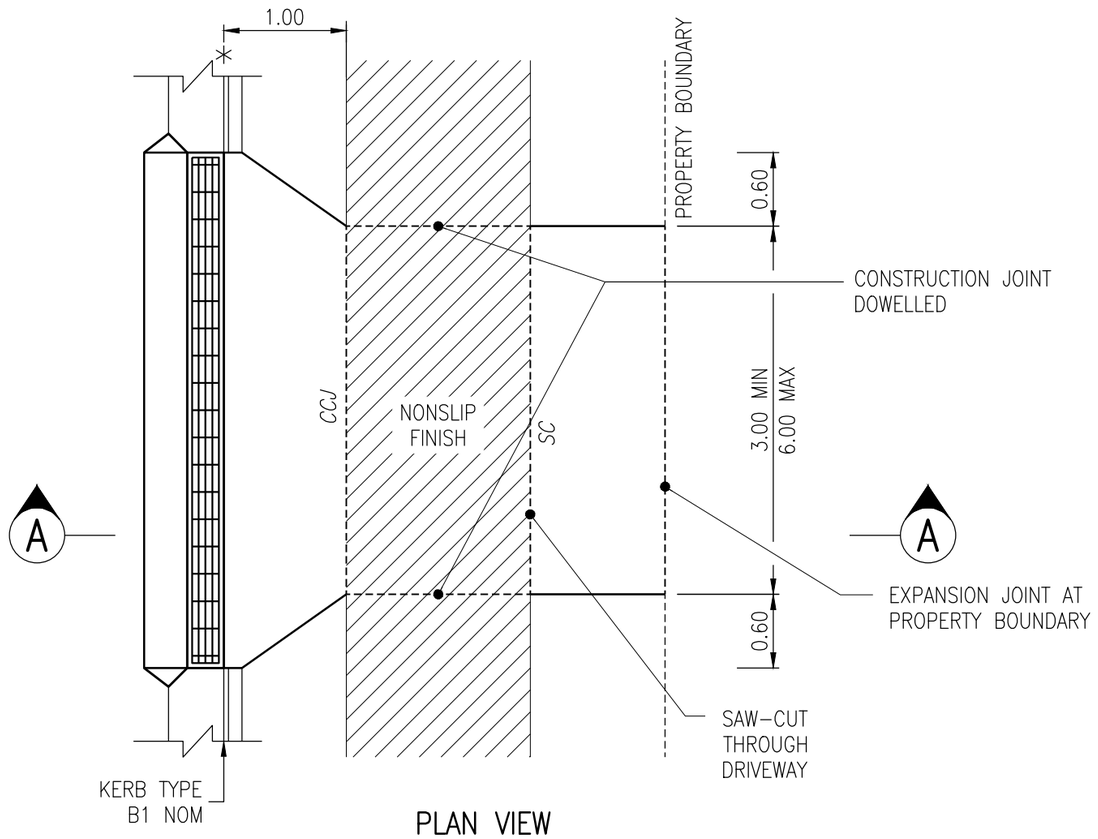
SC SAW CUT – 25mm

CCJ CRACK CONTROL JOINT (SEE DETAIL)



SECTIONAL DETAIL A – A

CRACK CONTROL JOINT DETAIL



PLAN VIEW

NOTES:

1. CROSSINGS ARE NOT DESIGNED FOR COMMERCIAL VEHICLES.
2. FOOTPATH SECTION TO VARY WHERE NECESSARY TO MATCH CONCRETE FOOTPATHS AND VERGE PROFILES. FOOTPATH EARTHWORKS ADJOINING CONCRETE MUST BE WELL COMPACTED.
3. CONCRETE SURFACE TOLERANCE TO BE $^{+5mm}_{-0mm}$ OVER 3 METRE SECTIONS.
4. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
5. REINFORCEMENT MESH TO AS1304, 50 TOP AND EDGE COVER. LAP MESH 250.
6. ALL DIMENSIONS IN METRES.
7. DRIVEWAYS TO HAVE AN EXPANSION JOINT AT PROPERTY BOUNDARY.
8. EXPANSION JOINTS TO BE 10mm THICK, FULL DEPTH CLOSED CELL CROSS LINKED POLYETHYLENE FOAM (85–150kg/m^3).
9. COUNCIL WILL NOT GUARANTEE REINSTATEMENT OF NON–STANDARD CONCRETE FINISHES IF COUNCIL NEEDS TO ACCESS INFRASTRUCTURE UNDER DRIVEWAY (EG. PIPES, ETC) OR PROVIDES CONCRETE FOOTPATH ACROSS DRIVEWAY.
10. SHOULD CONCRETE FOOTPATHS EXIST OR BE REQUIRED IN THE AREA, THEN THE CONCRETE FOOTPATH WILL BE CONTINUOUS THROUGH THE PROPOSED DRIVEWAY ACCESS. CONSTRUCTION TO CONFORM TO OTHER DETAILS SHOWN ON THIS PLAN & AS1428.1–2001.
11. FOR KERB TYPES, REFER BRC STANDARD DRAWING R1020.
12. THIS CROSSING SOLUTION IS FOR LIMITED USE ONLY. APPROVAL FROM COUNCIL IS REQUIRED BEFORE INSTALLATION COMMENCES.

Scales: NOT TO SCALE

Revisions		Verified	Date
B	CRACK CONTROL JOINTS ADDED		
A	Original Issue		

Quality Certification
Design: Verified:
Drawn: Tifa Checked: RMC
Approved By Engineer: Date:
RPEQ:

BUNDABERG REGIONAL COUNCIL

DRIVEWAYS
Residential Invert Crossing
Steep Driveways

Standard Drawing No.: R1015
Sheet Size: A3
Rev.: B

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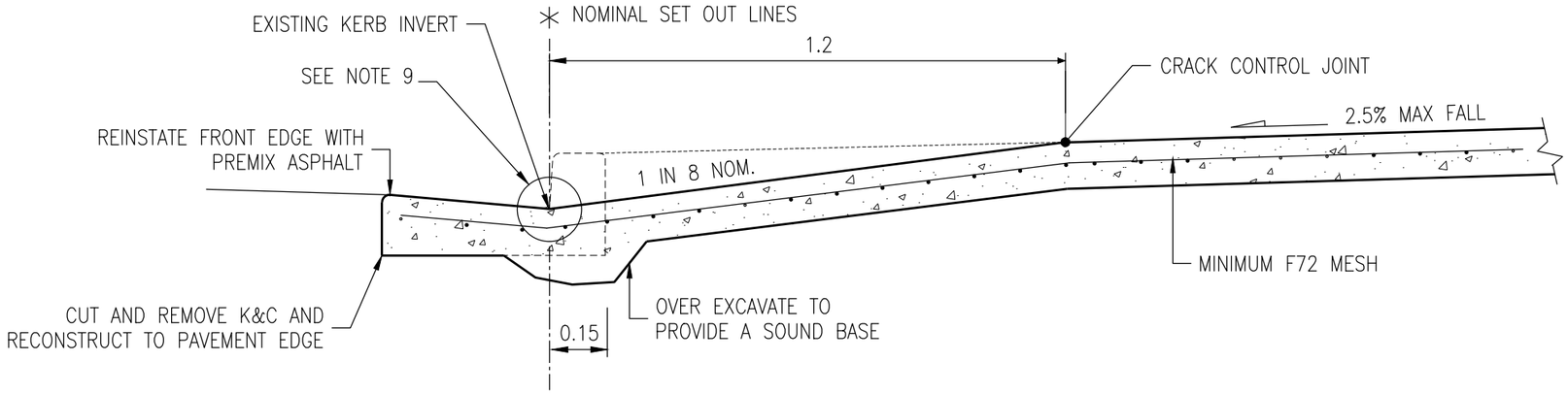
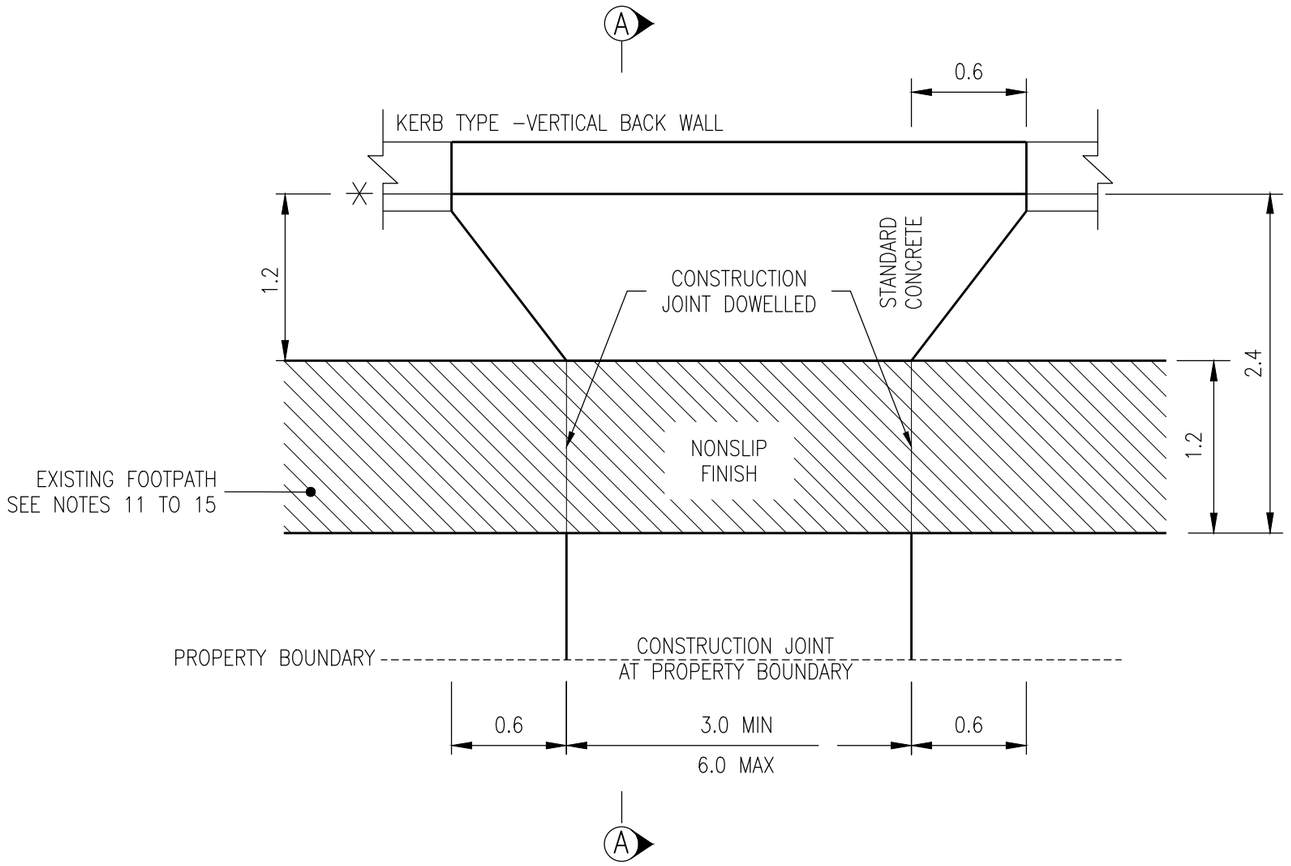


SECTION A–A SLAB TO KERB TYPE B1 – BREAKOUT



NOTES:

1. ALL DIMENSIONS ARE IN METRES.
2. CROSSINGS ARE NOT DESIGNED FOR COMMERCIAL VEHICLES.
3. CONCRETE SURFACE TOLERANCE TO BE $^{+5mm}_{-0mm}$ OVER 3 METRE SECTIONS.
4. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
5. REINFORCEMENT MESH TO AS1304, 50 TOP AND EDGE COVER. LAP MESH 250.
6. DRIVEWAYS TO HAVE AN EXPANSION JOINT AT PROPERTY BOUNDARY.
7. EXPANSION JOINTS TO BE 10mm THICK, FULL DEPTH CLOSED CELL CROSS LINKED POLYETHYLENE FOAM (85–150kg/m^3), SEALED WITH SIKAFLEX OR EQUIVALENT.
8. WHERE THE "CHANGE IN GRADE" FROM THE ROAD SURFACE TO THE PROPOSED DRIVEWAY IS GREATER THAN 12% THEN THE ACCESS SHOULD BE CONSTRUCTED IN ACCORDANCE WITH DRAWING R1015.
9. FOR DRIVEWAY WORK IN SANDY AREAS. COUNCIL MAY PERMIT THE EXISTING KERB & CHANNEL BE SAW CUT AT THE INVERT OR NOMINAL KERB LINE AND REMOVAL OF THE KERB.
10. FOR KERB TYPES, REFER BRC STANDARD DRAWING R1020.
11. REINSTATE EXISTING FOOTPATH TO ACCOMMODATE DRIVEWAY LOADING WITHOUT CHANGING THE FOOTPATH APPEARANCE.
12. RETAIN THE EXISTING TEXTURE AND COLOUR OF THE EXISTING FOOTPATH.
13. FOOTPATH SECTION TO VARY WHERE NECESSARY TO MATCH EXISTING CONCRETE FOOTPATHS, PROPOSED DRIVEWAY AND VERGE PROFILES.
14. FOOTPATH EARTHWORKS ADJOINING CONCRETE MUST BE WELL COMPACTED.
15. CONCRETE PATHWAYS ARE TO BE CONSTRUCTED GENERALLY IN ACCORDANCE WITH DRAWING R1030 AND TRANSITIONED OVER THE LONGITUDINAL GRADES NOT EXCEEDING 1 IN 20 TO COMPLY WITH AS1428 AS REQUIRED.
16. SHOULD DRIVEWAYS REQUIRE REINSTATEMENT DUE TO ANY COUNCIL CIVIL WORKS THEN COUNCIL WILL NOT GUARANTEE TO MATCH NON–STANDARD CONCRETE FINISHES WITHIN THOSE DRIVEWAYS.

LEGEND

✳ NOMINAL KERB LINE (REFER BRC STANDARD DRAWING R1020).

Change of grade at invert to be not more than 12%.

Scales	Revisions		Verified	Date
NOT TO SCALE				
	A	Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date: 16/7/10	RPEQ: PJ2454

BUNDABERG REGIONAL COUNCIL

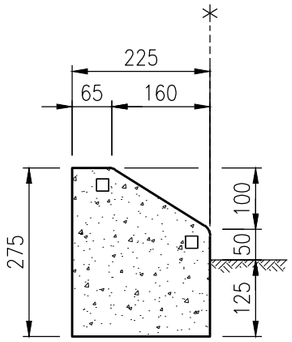
DRIVEWAYS
Residential Driveway Slabs for Brown Streets

Standard Drawing No **R1016**

Sheet Size **A3**

Rev

BRC(09/10)



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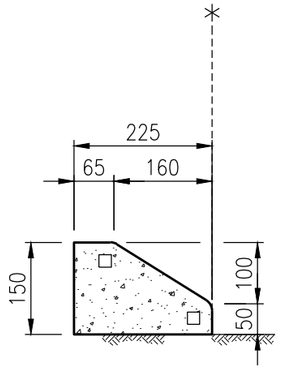

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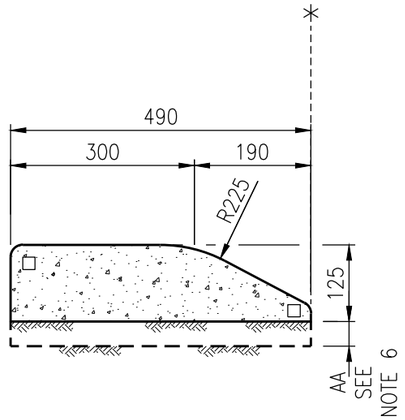
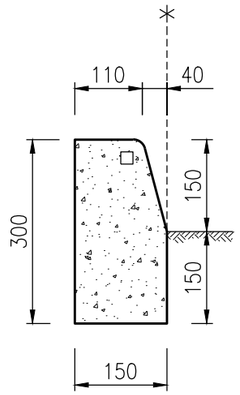
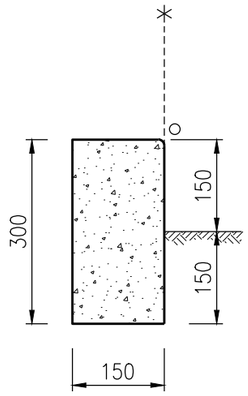


MR TYPE 10

SEMI–MOUNTABLE KERB



B2



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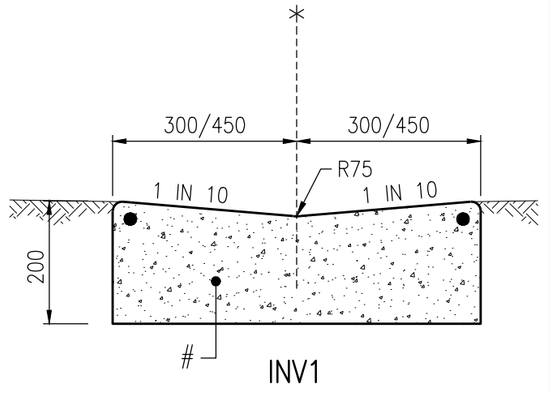
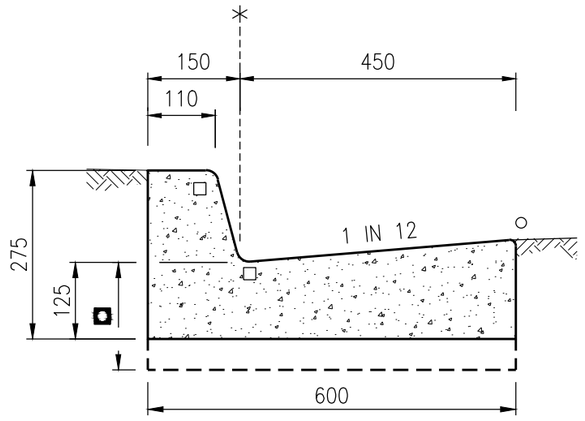
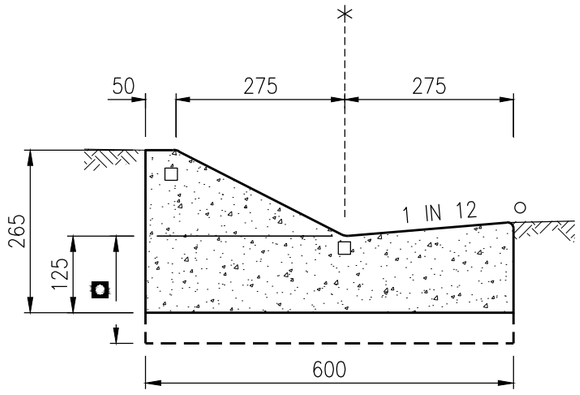


INVERT TYPE

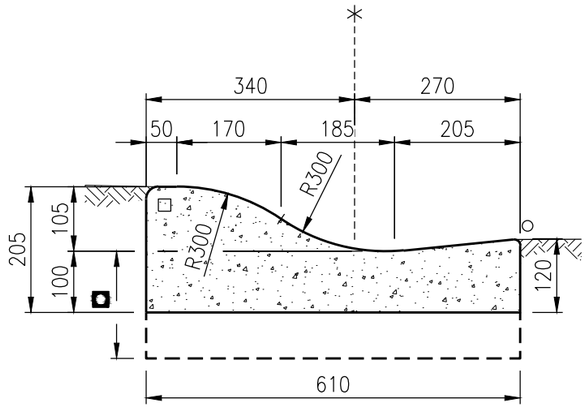
BARRIER KERB



B1



M1



M3

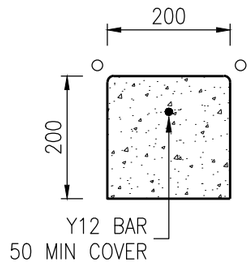
CHANNEL KERB

NOTES:

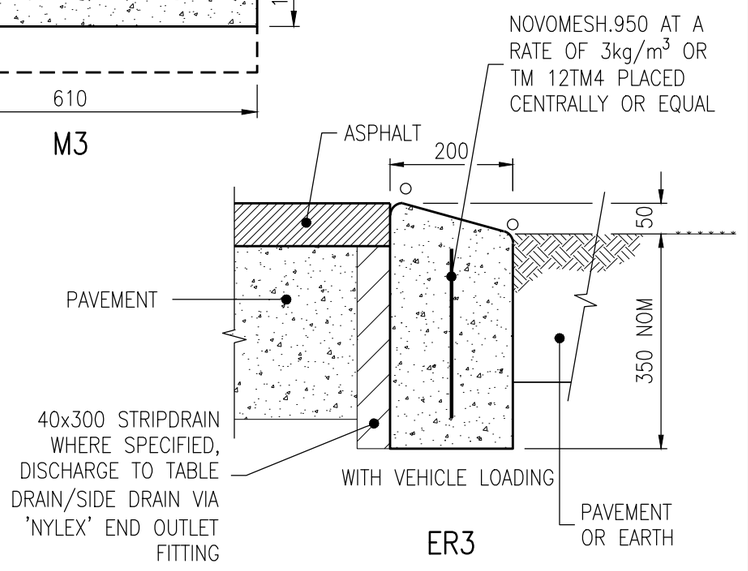
1. REFER. R1010, R1011, R1013 AND R1014 FOR ACCESS CROSSING DETAILS.
2. REFER TO SPECIFICATIONS FOR BED PREPARATION REQUIREMENTS.
3. CONCRETE FOR SLIPFORM MIN. N25.
4. CONCRETE FOR REINFORCED INVERTS MIN. N35.
5. FOR CONSTRUCTION & EXPANSION JOINTS, REFER AUSPEC. C244.12.5&6.
6. ASPHALT ALLOWANCE "AA" PROVIDES FOR INITIAL ASPHALT LAYER AND/OR FUTURE OVERLAY AS INDICATED IN THE DOCUMENTS.
7. M1 CHANNEL KERB IS FOR INFILL AREAS, AND REQUIRES SPECIAL APPROVAL FROM COUNCIL.

LEGEND

- ✱ NOMINAL KERB LINE FOR SETTING OUT.
- ○ R10 RADIUS.
- ● R15 RADIUS.
- □ R20 RADIUS.
- ◹ R50 RADIUS.
- ◘ 175 FOR HEAVY DUTY CROSSINGS.
- # PROVIDE F72 MESH OR NOVOMESH.950 AT A RATE OF 3kg/m^3 OR AS DIRECTED.



ER2



ER3

EDGE RESTRAINT

Scales	Revisions		Verified	Date
NOT TO SCALE				
	B	M3 KERB ADDED	RMC	07/15
	A	Original Issue		

Quality Certification
Design: Verified:
Drawn: Tifa Checked: RMC
Approved By Engineer: Date:
RPEQ:

BUNDABERG REGIONAL COUNCIL

KERB AND CHANNEL
Kerbs, Channels, & Inverts
Profiles & Dimensions

Standard Drawing No.: R1020

Sheet Size: A3

Rev.: B

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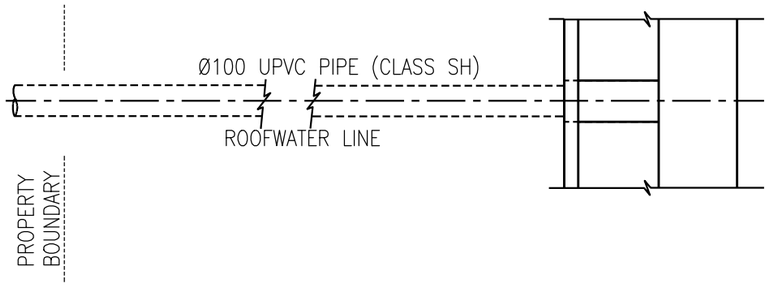
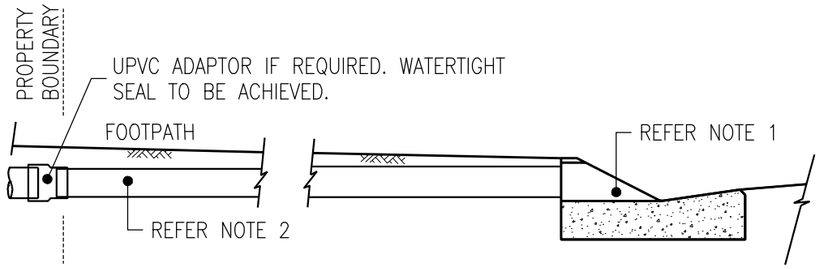


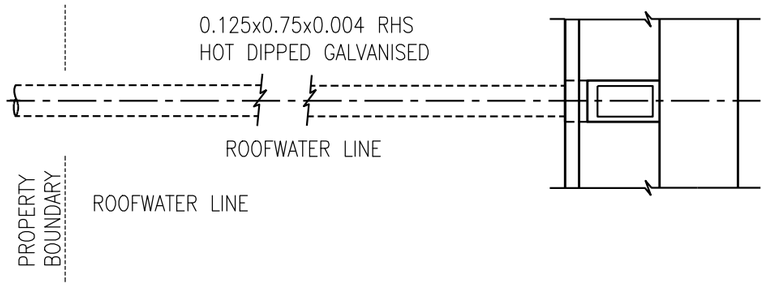
PLAN



SECTIONAL ELEVATION

ALTERNATIVE 1
KERB AND CHANNEL
WITH KERB ADAPTOR

DETACHED DWELLING



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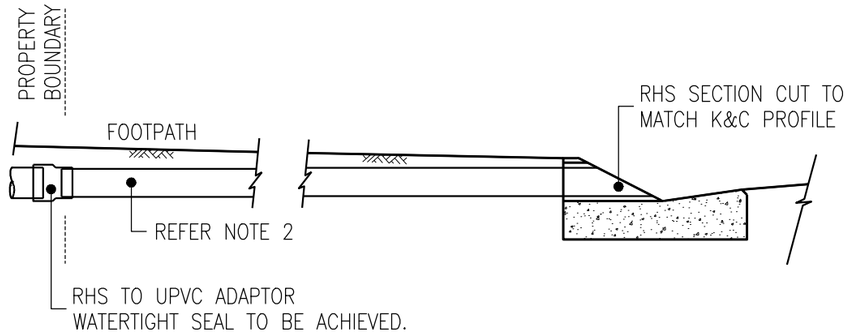


SECTIONAL ELEVATION

ALTERNATIVE 2
KERB AND CHANNEL
WITH RHS VERGE ADAPTOR

ALL OTHER AREAS

NOTES:

1. WHITE INDUSTRIES CAST KERB ADAPTORS TO SUIT K&C PROFILE (OR EQUIVALENT WITH FLANGED EDGES TO SET INTO KERB) INSTALLED AS DIRECTED BY COUNCIL AND IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.
2. PIPE ACROSS FOOTPATH TO BE LAID WITH A MINIMUM GRADE OF 1 IN 100.
3. REFER PROJECT DRAWINGS/SPECIFICATIONS FOR ALTERNATIVE TO BE ADOPTED.
4. AT NEW DEVELOPMENTS, SEAL INLET TO ADAPTOR.
5. ALL DIMENSIONS IN METRES.
6. WHERE FOOTPATHS ARE TO BE CONCRETE AND COVER IS LESS THAN 50mm THEN GALV 0.125x0.75 ENCASED IN CONCRETE OR GALV ø100 STEEL PIPE IS TO BE USED.
7. ENCASE PIPE UNDER PATHS (NOMINALLY 100mm).
8. RHS GAL TO BE USED FOR INDUSTRIAL, HIGH DENSITY RESIDENTIAL AND COMMERCIAL.
9. UPVC TO BE USED FOR LOW DENSITY RESIDENTIAL ONLY.

Scales: NOT TO SCALE

Revisions		Verified	Date
A	Original Issue		

Quality Certification
Design: Verified:
Drawing: Tifa Checked:
Approved by Engineer
Date: RPEQ:

BUNDABERG REGIONAL COUNCIL

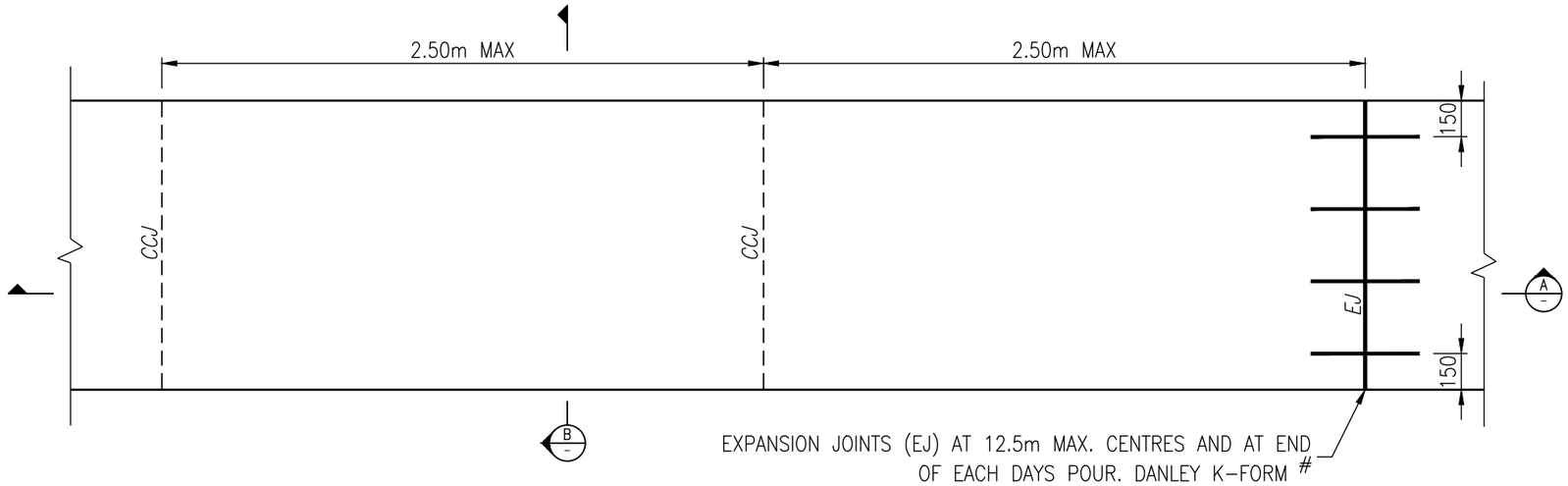
KERB AND CHANNEL
Kerb and Channel Drainage Connections

Standard Drawing No **R1021**

Sheet Size **A3**

Rev

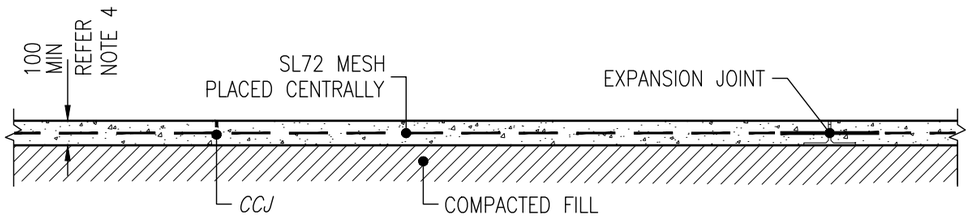
BRC(09/10)

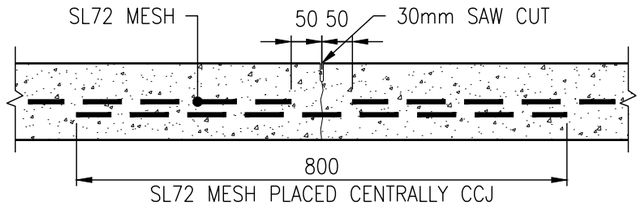


PLAN

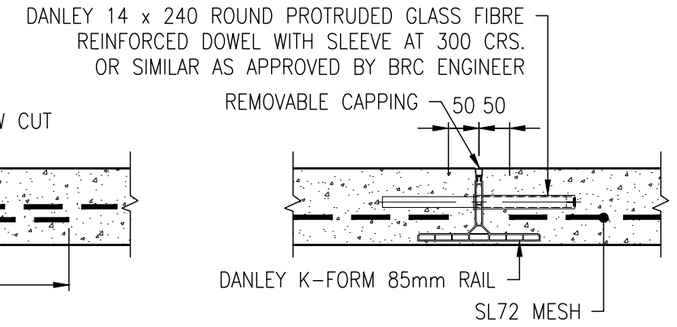
LEGEND

EJ	EXPANSION JOINT
CCJ	CRACK CONTROL JOINT
*	NOMINAL KERB LINE (REFER BRC STANDARD DRAWING R1020)
#	UNLESS OTHERWISE APPROVED BY BRC ENGINEER



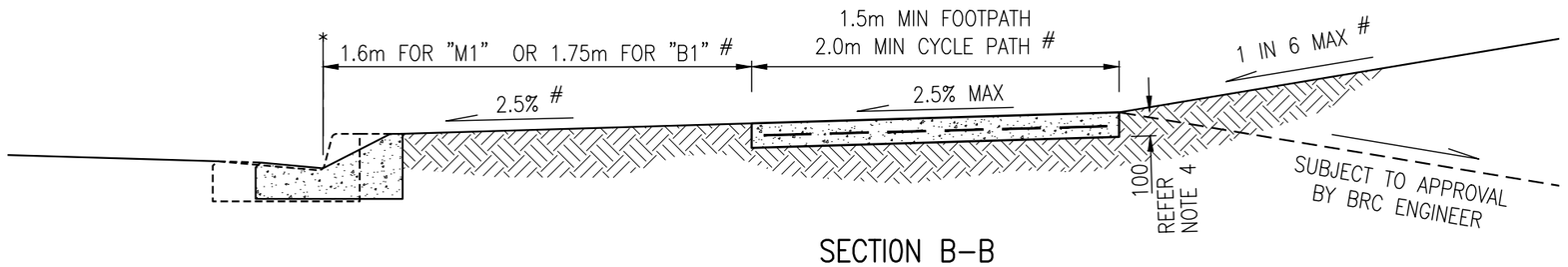


CRACK CONTROL JOINT (CCJ) DETAIL



EXPANSION JOINT (EJ) DETAIL

SECTION A–A



SECTION B–B

NOTES:

1. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
2. CRACK CONTROL JOINTS, 2.5m MAX SPACING.
3. ALL CONCRETE SURFACE TO HAVE A MEDIUM BROOM FINISH PERPENDICULAR TO DIRECTION OF PEDESTRIAN TRAVEL TO COMPLY WITH SLIP RESISTANCE REQUIREMENTS.
4. CONCRETE FOOTPATHS, ADJOINING EXISTING DRIVEWAYS ARE TO BE TRANSITIONED OVER LONGITUDINAL GRADES NOT TO EXCEED 1 IN 20 AND TO COMPLY WITH REQUIREMENTS OF AS1428–1–2009. THICKNESS TO BE INCREASED TO 125mm AT VEHICULAR CROSSOVERS.
5. AFTER CONSTRUCTION TOPSOIL TO BE PLACED ADJACENT TO FOOTPATH TO FINISH FLUSH WITH CONCRETE PATH.
6. IF REQUIRED, COMPACTED FILL TO BE IN ACCORDANCE WITH MRTS04, TOP 50mm TO BE TOP SOIL.
7. COLOURED CONCRETE (HERITAGE RED) TO BE USED IN ALL RED SOIL AREAS AS DIRECTED BY COUNCIL ENGINEER.
8. SAW CUTS TO BE UNDERTAKEN WITHIN 15 TO 24hrs OF CONCRETE POUR.
9. CROSS FALL MAY VARY IN ACCORDANCE WITH AS1428, OTHERWISE SUBJECT TO BRC ENGINEER APPROVAL.
10. OPTIONAL REINFORCEMENT – HIGH PERFORMANCE POLYMER FIBRES. REFER STD DRG R1033 FOR DETAILS.
11. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

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Scales

NOT TO SCALE

	Revisions	Verified	Date
D	MESH, FILL SPECIFICATION AND XFALL NOTE UPDATED	RMC	24/10/18
C	SLOPES CHANGED	CNP	09/16
B	CRACK CONTROL JOINTS ADDED	RMC	26/08/15
A	Original Issue		

Quality Certification

Design: Verified: RMC

Drawn: Tifa Checked:

Approved By Engineer: Date:

RPEQ:

BUNDABERG REGIONAL COUNCIL

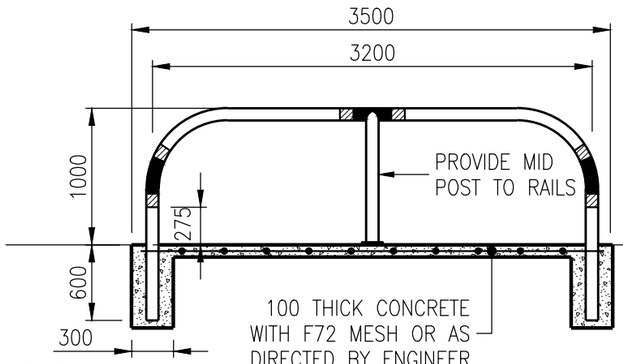
FOOTPATHS AND CYCLE PATHS

Concrete Strip Footpath - Mesh Reinforcement

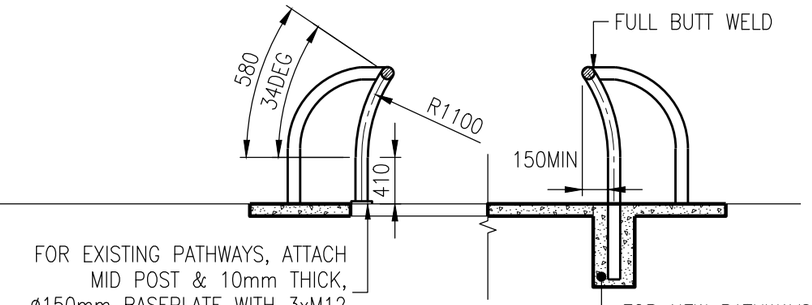
Standard Drawing No.: R1030

Sheet Size: A3

Rev.: D



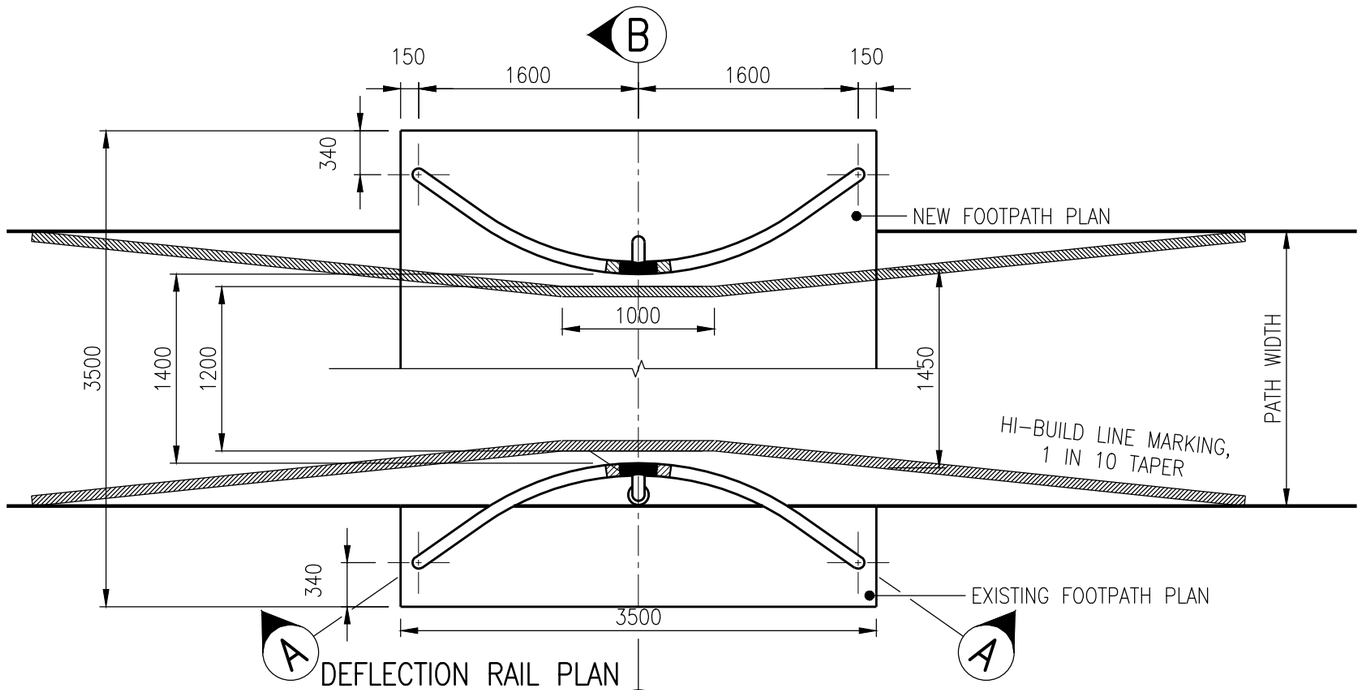
SECTION A–A



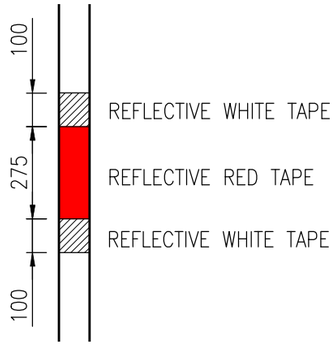
SECTION B–B

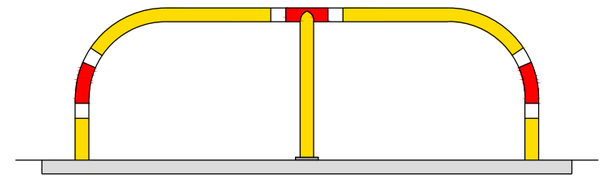
NOTES:

1. CONCRETE FOOTINGS N32 IN ACCORDANCE WITH AS1379 AND AS3600.
2. EACH UNIT TO BE FORMED FROM ONE (1) 6.5m LENGTH OF TUBE BY ROLL FORMING ONLY.
3. GALVANISED STEEL TUBE TO BE IN ACCORDANCE WITH AS1163.
4. ALL UNITS TO BE HOT DIPPED GALVANISED AFTER FABRICATION.
5. UNITS WITHIN 1km OF COASTLINE AND ALL COMPONENTS ARE TO BE CONSTRUCTED FROM STAINLESS STEEL (GRADE 304).
6. UNITS TO BE FINISHED WITH TWO (2) COATS OF TWO PACK 125micron MINIMUM TOTAL THICKNESS (EG WATTYL PARACRYL, EQUIVALENT PROCESS OR POWDER COATED). COLOUR TO BE YELLOW.
7. REFLECTIVE TAPE TO BE CLASS 2 (AS1906.1).
8. RAILS TO BE LOCATED IN ACCORDANCE WITH AUSTROADS "GUIDE TO TRAFFIC ENGINEERING PRACTICE PART 14 – BICYCLES".
9. DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.



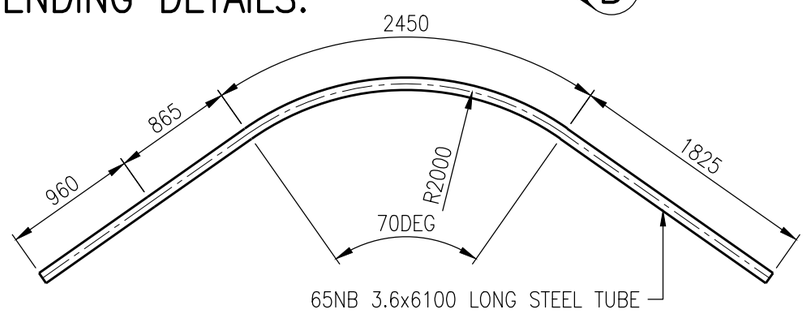
DEFLECTION RAIL PLAN



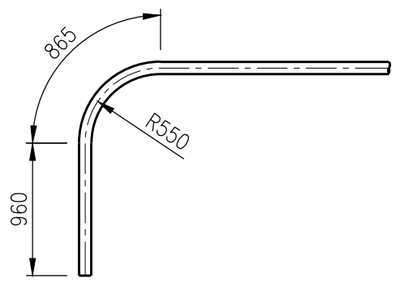


REFLECTIVE TAPE DETAIL & COLOUR EXAMPLE

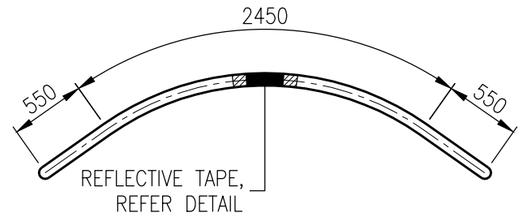
BENDING DETAILS:



PLAN – BEND 1



ELEVATION – BEND 2



PLAN – AFTER BEND 3

Scales	Revisions	Verified	Date
NOT TO SCALE	A Original Issue		

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Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

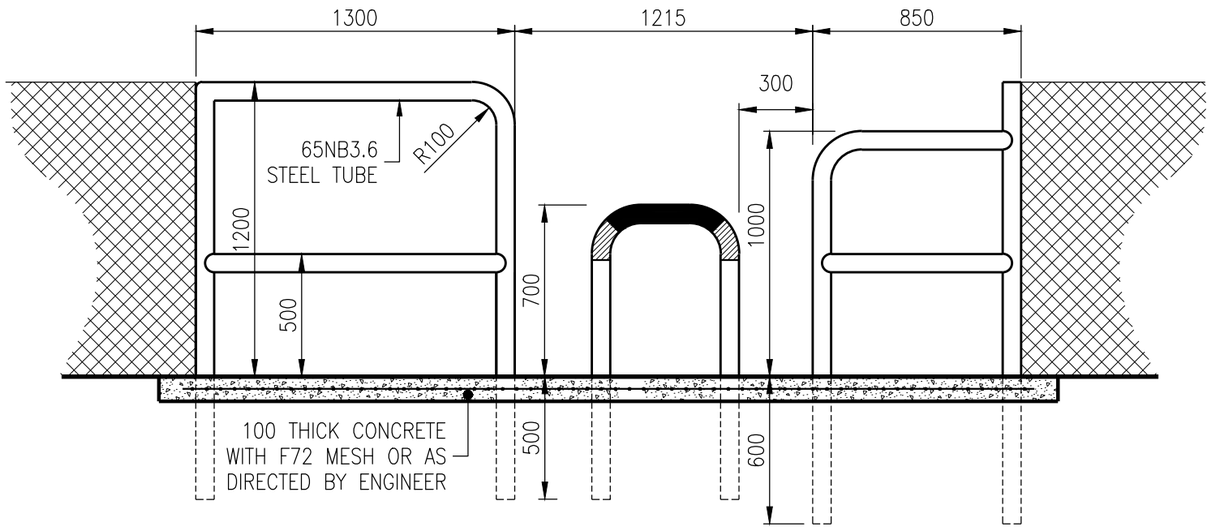
BUNDABERG REGIONAL COUNCIL

FOOTPATHS AND BIKE PATHS
Bicycle Deflection Rail

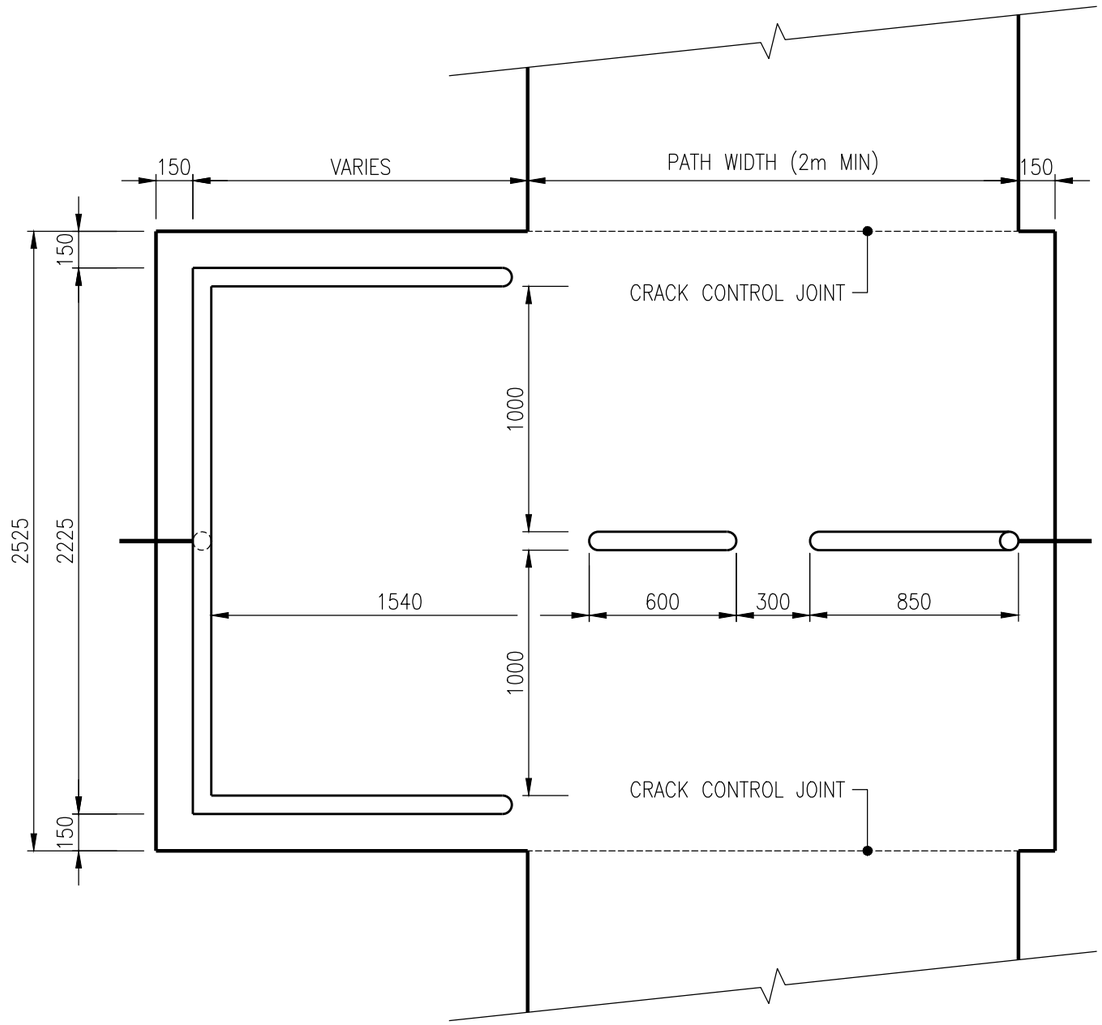
Standard Drawing No **R1031**

Sheet Size **A3**

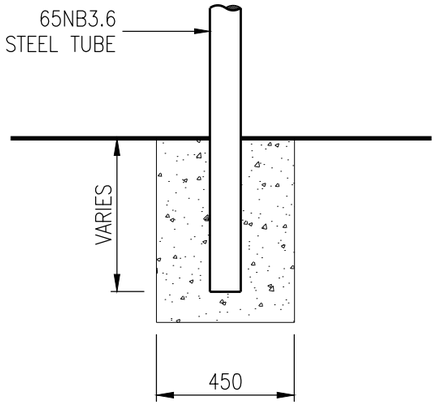
Rev



PATHWAY CHICANE ELEVATION



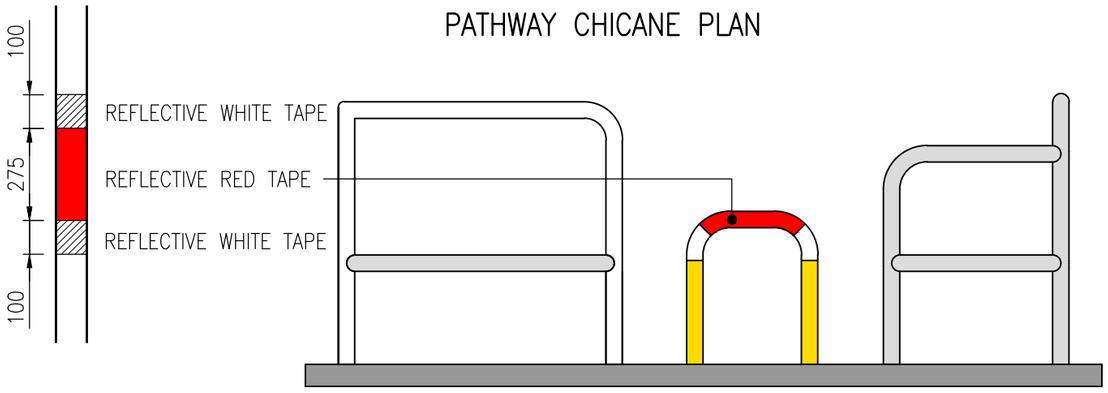
PATHWAY CHICANE PLAN



FOOTING DETAIL

NOTES:

1. CONCRETE FOOTINGS N32 IN ACCORDANCE WITH AS1379 AND AS3600.
2. GALVANISED STEEL TUBE TO BE IN ACCORDANCE WITH AS1163.
3. FULL BUTT WELDS ON JOINS.
4. ALL UNITS TO BE HOT DIPPED GALVANISED AFTER FABRICATION.
5. UNITS WITHIN 1km OF COASTLINE AND ALL COMPONENTS ARE TO BE CONSTRUCTED FROM STAINLESS STEEL (GRADE 304).
6. UNITS TO BE FINISHED WITH TWO (2) COATS OF TWO PACK 125micron MINIMUM TOTAL THICKNESS (EG WATTYL PARACRYL, EQUIVALENT PROCESS OR POWDER COATED). COLOUR AS DIRECTED BY COUNCIL ENGINEER.
7. REFLECTIVE TAPE TO BE CLASS 2 (AS1906.1).
8. RAILS TO BE LOCATED IN ACCORDANCE WITH AUSTROADS "GUIDE TO TRAFFIC ENGINEERING PRACTICE PART 14 – BICYCLES".
9. APPROPRIATE SIGNAGE IS TO BE PROVIDED TO INDICATE THAT CYCLISTS MUST DISMOUNT TO TRAVERSE THROUGH THE CHICANE.
10. DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE.



REFLECTIVE TAPE DETAIL & COLOUR SAMPLE

Scales	Revisions		Verified	Date
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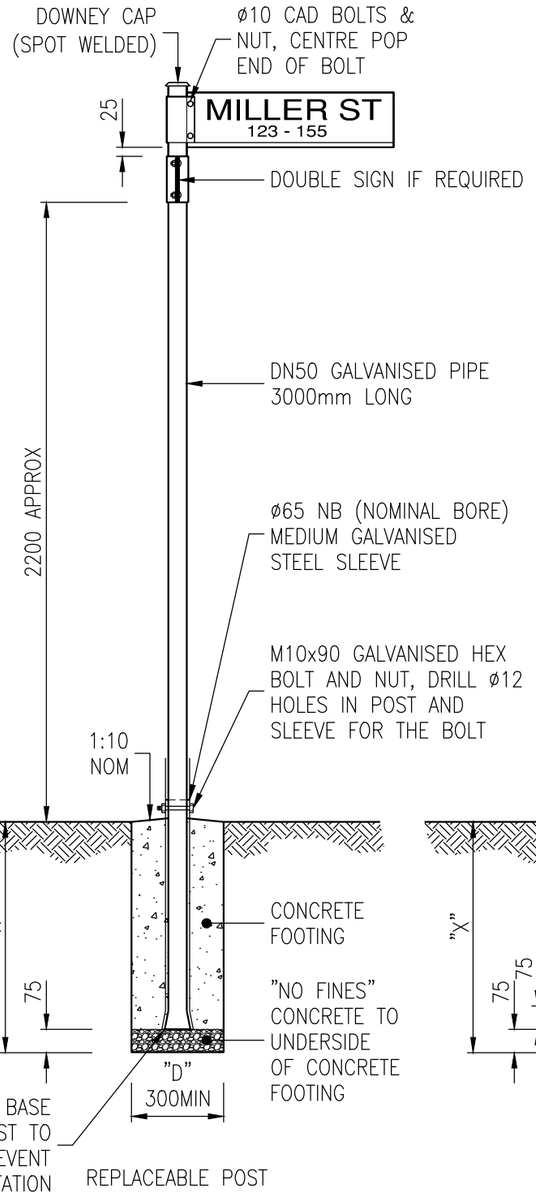
BUNDABERG REGIONAL COUNCIL

FOOTPATHS AND BIKE PATHS
Chicane Entrance Treatment

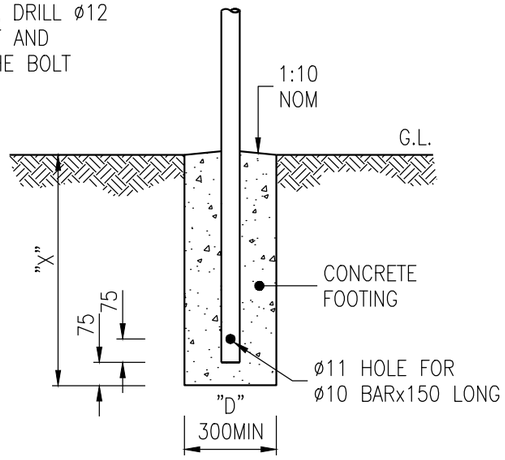
Standard Drawing No **R1032**

Sheet Size **A3**

Rev



REPLACEABLE POST

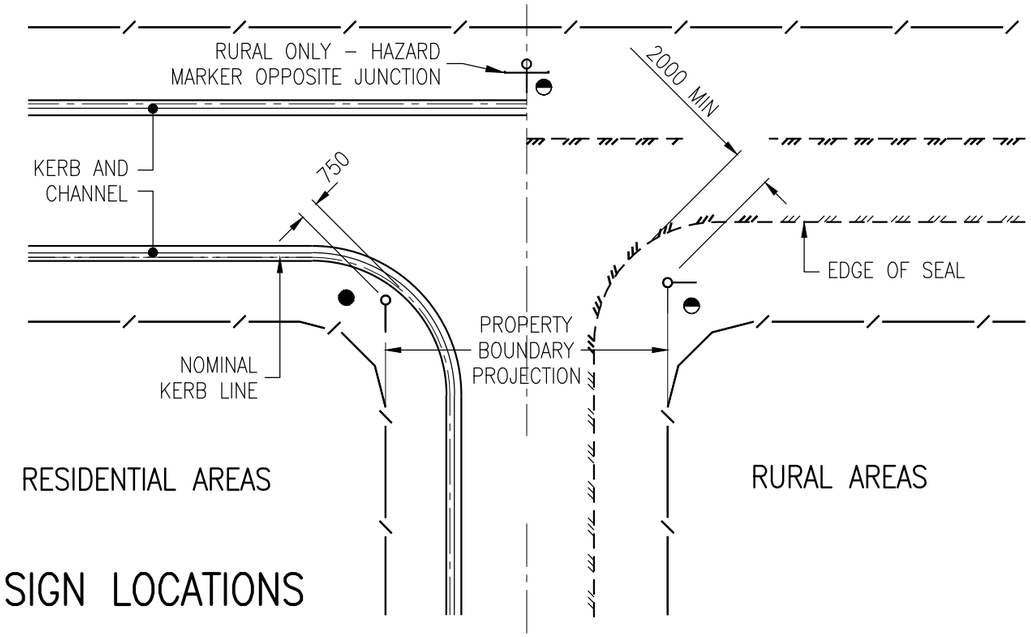


FIXED POST

LEGEND

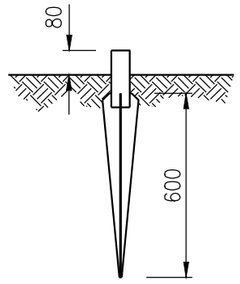
- SIGN TO BE LOCATED 750mm BEHIND NOMINAL KERB LINE.
- SIGN POST IS TO BE LOCATED 2000 MIN TO 4000 MAX FROM EDGE OF SEAL.
- SIGN POST.

TABLE OF ABBREVIATIONS	
AVENUE	AV
COURT	CT
CRESCENT	CR
DRIVE	DR
ESPLANADE	ESP
LANE	L
PARADE	PDE
ROAD	RD
STREET	ST
TERRACE	TCE



SIGN LOCATIONS

POST SPECIFICATION				CONCRETE FOOTINGS					
	POST DIMENSIONS (mm)	WALL THICKNESS (mm)	GRADE	COHESIVE CLAY SOILS		COHESIONLESS SAND SOILS			
						LOOSE TO MEDIUM		DENSE	
				"D"(mm)	"X"(mm)	"D"(mm)	"X"(mm)	"D"(mm)	"X"(mm)
CHS	50NB	2.9	C350	300	600	400	750	300	750



SPIKE

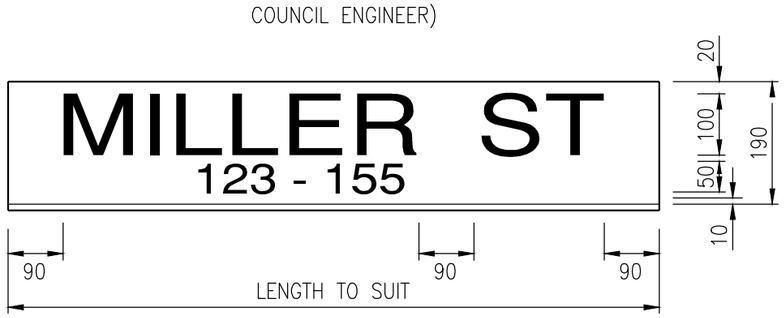
(WHERE APPROVED BY COUNCIL ENGINEER)

NOTES:

1. STREET NAMES MUST BE APPROVED BY COUNCIL.
2. NAME PLATES: ANTI–VANDAL SECTION, 200mm WIDE AND 3mm THICK EXTRUDED ALUMINIUM OR POLYPROPYLENE SECTION.
3. BRACKET: STANDARD 200mm WIDE AND 3mm THICK EXTRUDED ALUMINIUM (INCLUDING 2xø6 CAD BOLTS AND NUTS). CAD BOLTS AND NUTS TO AS1897.
4. LETTERS AND NUMBERS: ALL LETTERING TO BE FREEWAY GREEN, REFLECTIVE CLASS 2. BACKGROUND TO BE WHITE REFLECTIVE CLASS 1. LETTERS TO BE 100mm HIGH, SERIES B, MEDIUM SPACING. NUMBERS TO BE 50mm HIGH, SERIES C, NARROW SPACING. ALL TEXT TO AS1744.
5. POSTS SUPPLIED AND INSTALLED BY DEVELOPER.
6. SIGNS TO BE POSITIONED ON THE SIDE OF STREET/ROAD THAT PROVIDES BEST VISIBILITY.
7. CONCRETE N20 IN ACCORDANCE WITH AS1379 AND AS3600.
8. ALL DIMENSIONS IN MILLIMETRES.

CONCRETE FOOTING

SIGN DETAILS



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Drawing: Tifa Checked:
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Date: RPEQ:

BUNDABERG REGIONAL COUNCIL

SIGNAGE
Street Name Sign and Post

Standard Drawing No **R1040**

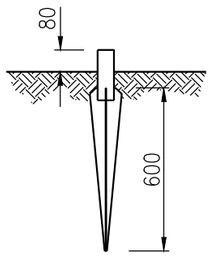
Sheet Size **A3**

Rev

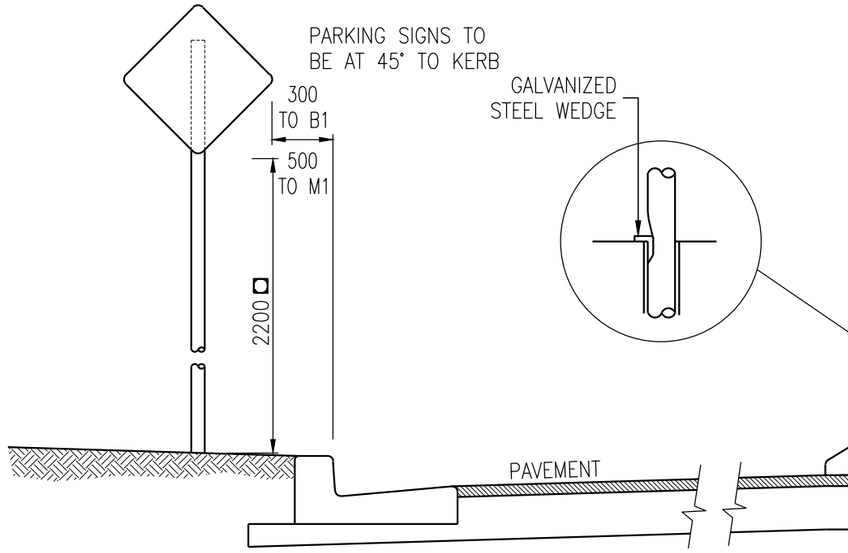
BRC(03/09)

LEGEND

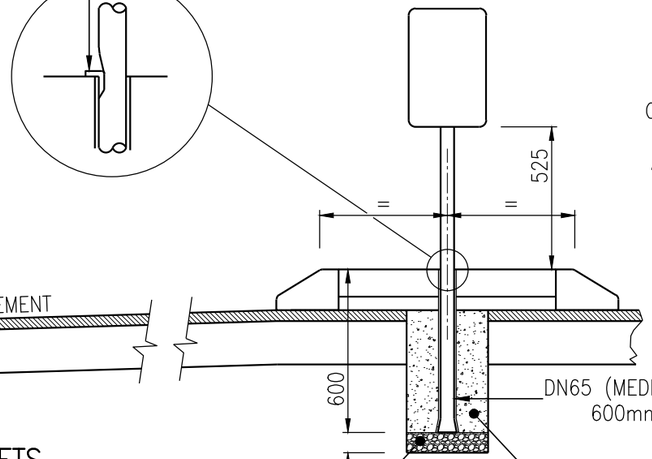
- # ON FOOTPATHS
- * ON MEDIANS
- ◓ AS DIRECTED BY COUNCIL ENGINEER
- □ MOUNTING HEIGHTS SHALL COMPLY WITH THE MUTCD 1.12.3



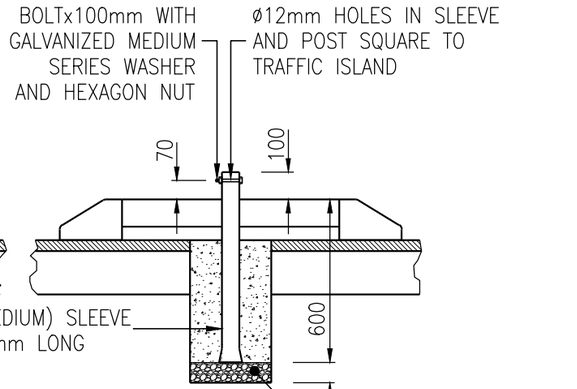
RURAL ROADS SPIKE ALTERNATIVE ◓



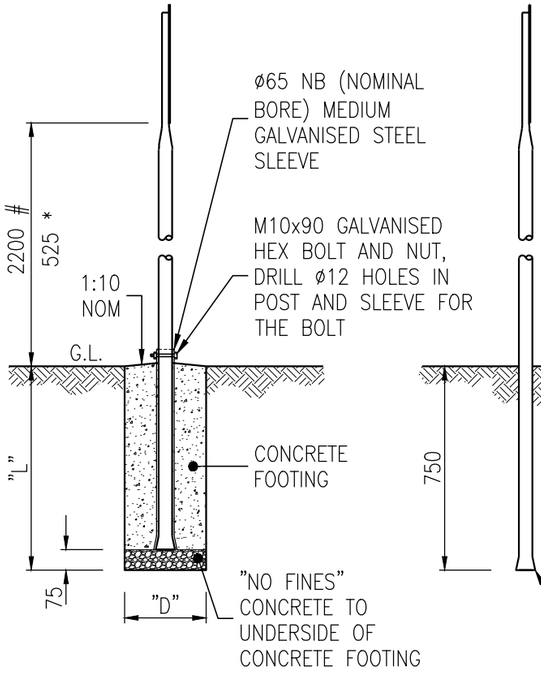
SIGN LOCATION ON RESIDENTIAL STREETS



TYPE 1 SIGN FIXING



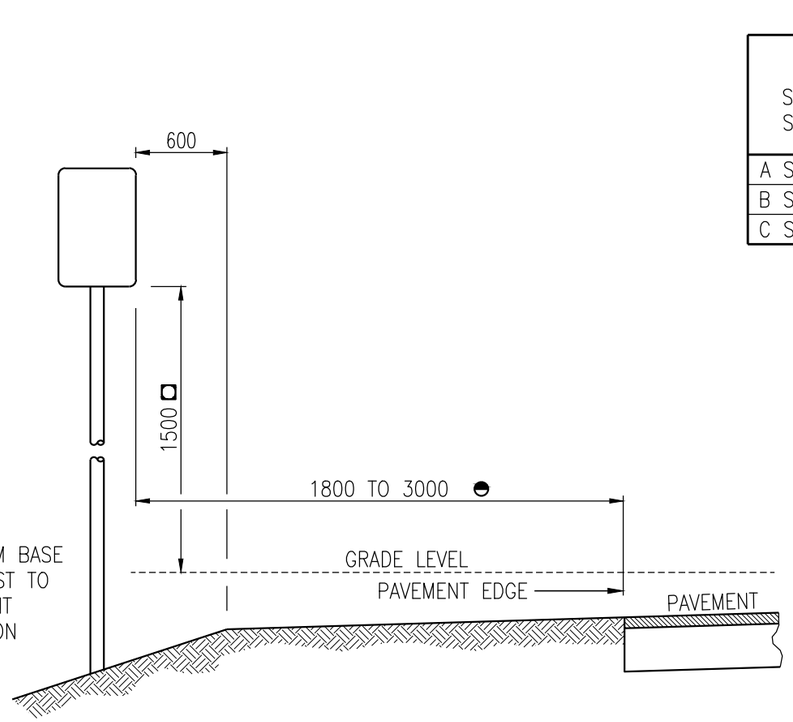
TYPE 2 SIGN FIXING



STREETS

RURAL ROADS

SIGN POST FOOTING



SIGN LOCATION ON RURAL ROADS

SIGN SIZE	FOOTINGS							
	COHESIVE CLAY SOILS				COHESIONLESS SAND SOILS			
	FIRM TO STIFF		VERY STIFF		LOOSE TO MEDIUM		DENSE	
	"D"(mm)	"L"(mm)	"D"(mm)	"L"(mm)	"D"(mm)	"L"(mm)	"D"(mm)	"L"(mm)
A SERIES	300	450	300	450	300	750	300	750
B SERIES	300	700	300	500	300	1000	300	800
C SERIES	300	900	300	600	300	1100	300	900

NOTES:

1. ALL SIGNS TO BE REFLECTORISED CLASS 1 TO AS1743 UNLESS NOTED OTHERWISE.
2. SIZE AND SIGN TYPE AS PER PROJECT DRAWINGS. SPECIAL STANDARDS ARE TO BE PROVIDED AT LARGE SIGNS WHEN INDICATED IN PROJECT DRAWINGS.
3. WHERE SIGNS ARE TO BE ERECTED IN STREETS WHERE FOOTPATHS ARE NOT CONSTRUCTED TO PERMANENT LEVELS LEVELS THE RURAL ROAD TYPE SHALL BE ADOPTED.
4. SIGNS SHALL BE OUT OF ALUMINIUM OR ALUMINIUM ALLOY NOT LESS THAN 2mm THICK TO AS2848.
5. THE DN65 SLEEVE AND SPIKE SHALL ONLY BE USED ON MEDIANS.
6. ALL PIPES TO BE GALVANIZED. STEEL PIPE TO AS1074. GALVANIZING TO AS1650.
7. CONCRETE N20 IN ACCORDANCE WITH AS1379 AND AS3600.
8. HEXAGONAL HEAD BOLTS TO AS1111, NUTS TO AS1112, WASHERS TO AS1237, GALVANIZING TO AS1214.
9. THE FINISHED PLATE SHALL COMPLY IN ALL RESPECTS TO THE REQUIREMENTS OF THE QUEENSLAND MAIN ROADS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES LATEST REVISION.

Scales	Revisions		Verified	Date
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Drawing: Tifa	Checked:
Approved by Engineer	
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BUNDABERG REGIONAL COUNCIL

SIGNAGE
Sign - Footings and Locations

Standard Drawing No **R1041**

Sheet Size **A3**

Rev

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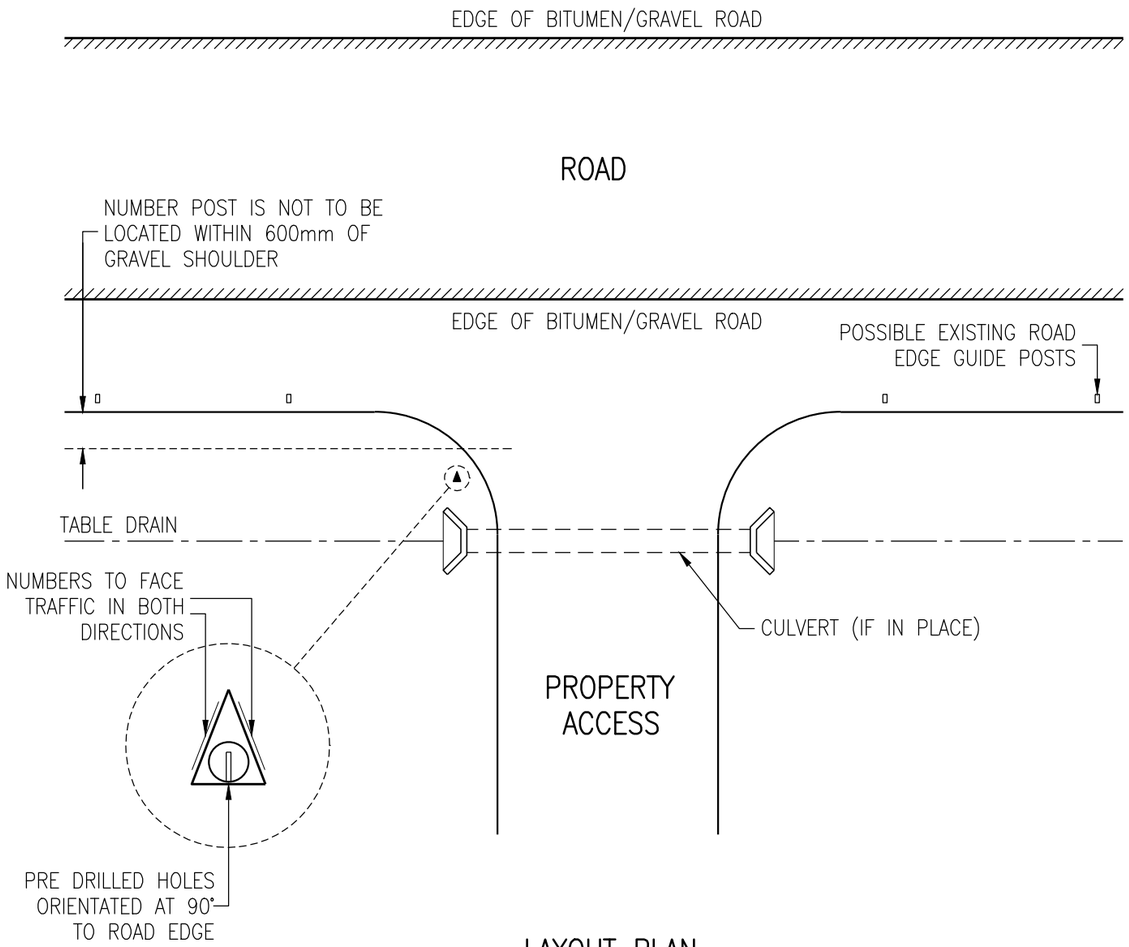

LAYOUT PLAN

LOCATION

1. THE NUMBER POST SHALL BE PLACED AT THE PROPERTY ACCESS POINT.
2. IF POSSIBLE, NUMBER POSTS SHOULD BE PLACED BETWEEN 1 AND 2 METRES OUTSIDE THE EDGE OF THE ROAD SHOULDER OR LINE OF GUIDE POSTS.
3. NUMBER POSTS SHOULD BE PLACED AT LEAST 1 METRE ABOVE GROUND FOR MAXIMUM VISIBILITY.
4. CONSIDERATION SHOULD BE GIVEN TO POSITIONING OF THE POST SO IT DOES NOT INTERFERE WITH SLASHER MOWING, MAINTENANCE OF DRAINS AND CULVERTS AND VEHICLES USING THE ACCESS.
5. ALIGN THE NUMBER SO IT IS CLEARLY VISIBLE FOR TRAFFIC TRAVELLING ALONG THE ROAD.
6. POSTS ARE COMMONLY PLACED ADJACENT TO THE PROPERTY'S LETTER BOX.

INSTALLATION

1. THE RURAL ADDRESS POST COMES AS A ROUND GALVANIZED POST, A PLASTIC NUMBER MODULE AND STICK ON NUMBERS.
2. TO INSTALL, DRIVE THE GALVANIZED POST INTO THE GROUND UNTIL IT IS FIRM. ENSURE THAT PRE DRILLED HOLE IN THE POST FACES THE PROPERTY AND IS SQUARE TO THE ROAD.

   *WARNING – CHECK WITH "DIAL BEFORE YOU DIG" (PHONE:1100/www.1100.com.au) BEFORE INSTALLING THE POST.
3. ONCE POST IS INSTALLED PLACE PLASTIC MODULE OVER THE POST AND FIX WITH THE SELF TAPPING SCREW PROVIDED.

Scales: NOT TO SCALE

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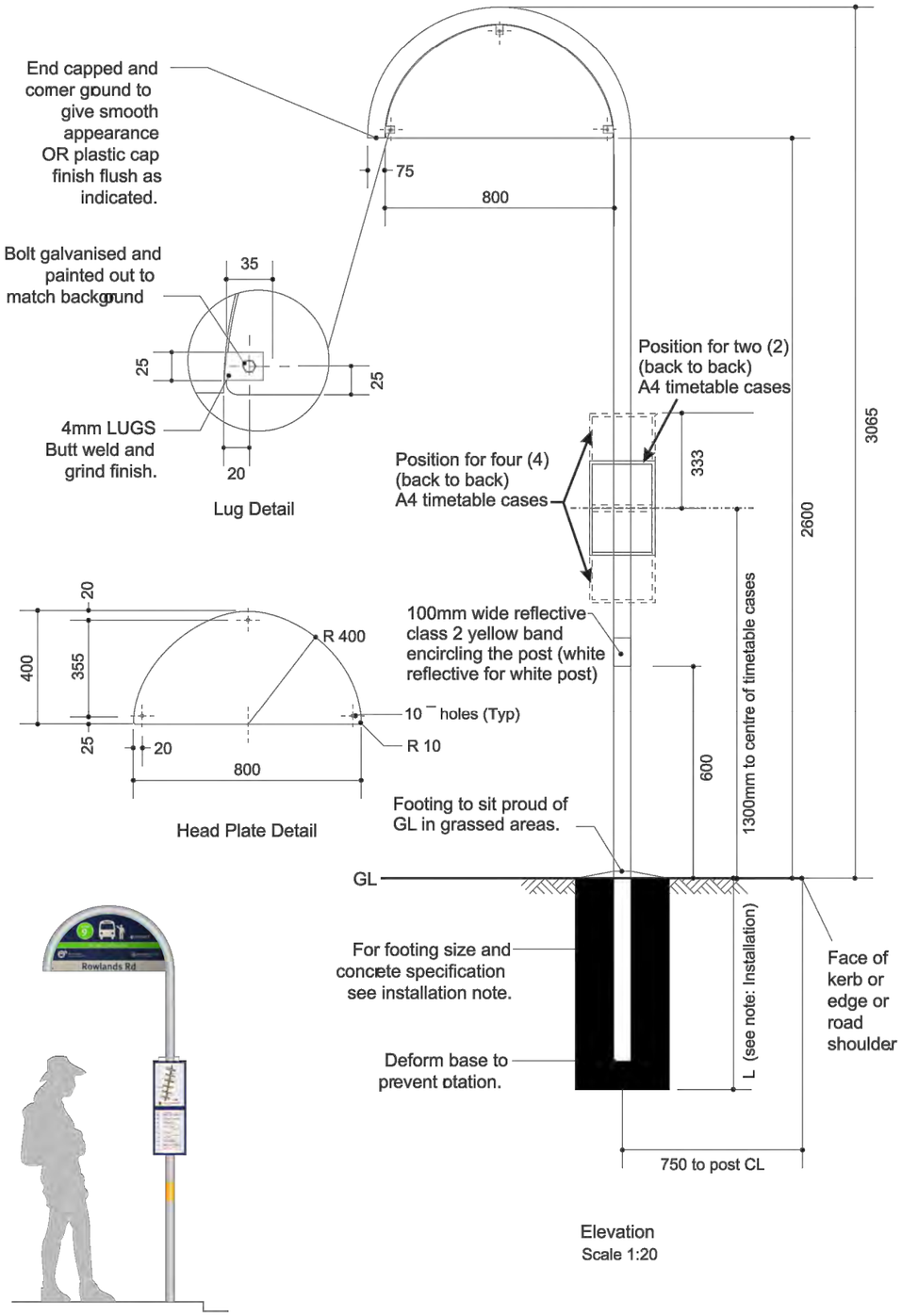
BUNDABERG REGIONAL COUNCIL

SIGNAGE
Location Plan of Rural Addressing Number Post

Standard Drawing No **R1042**

Sheet Size **A3**

Rev



Unless otherwise noted all dimensions in millimetres. Use figured dimensions in preference to scaling. Contractor to confirm all dimensions and details on site for all sign types prior to manufacture.

Note: Colours on this page may differ in appearance from those selected in artwork for final output.

Construction Specifications:

Post:
Materials: 65NB steel post, C350 grade, 3.2mm wall thickness, deformed base to prevent rotation. Spot weld 3 steel lugs to inside edge of curve to support head plate.
Finishes: Post hot dip galvanised and powder-coated in white (PMS White) or yellow (PMS 116). It should have a 100mm wide yellow engineers grade vinyl band to encircle the post 600mm from GL.

Posts may be painted when used in areas of high civic design standards or when used in situations with many other signs eg. at interchanges. Local councils may apply to paint post a suitable neutral colour to meet local design guidelines. Post colours must have a luminance contrast with the background of at least 30% to comply with the Disability Standards for Accessible Public Transport.

Sign Plate:
Materials: The head plate should be made from 1.6mm aluminium.
Finishes: The head plate should be double sided and made of reflective material to a Class 2 standard. All graphics to be screenprinted on reflective stock. An over coat of anti-graffiti (film or finish) is to be applied to seal sign.

Installation:
Footing size:
300mm Dia. with depth (L) according to strength of soil.

Firm Clay	Sand / Soft clay / Fill
700mm	900mm
Refer: Bus Stop Sign Post Details - Drawing 2005.192.1 (for other options)	
Selection of foundation type and strength category to be approved by engineer	

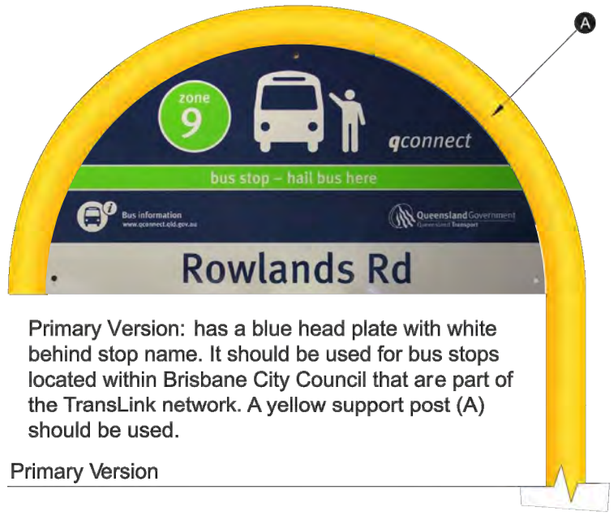
Concrete Specification: Concrete poured directly against auger hole unless approved otherwise. Mechanically vibrate full depth of concrete.

Concrete	Max. water/cement ratio	Min. cement content	Max. Aggregate	Slump
N25 to AS3600	0.55	250kg/m3	20mm	80mm

Paved surfaces are to be removed and replaced over footing and made good. In grassed locations footing is to sit proud of ground to prevent damage to post during mowing.

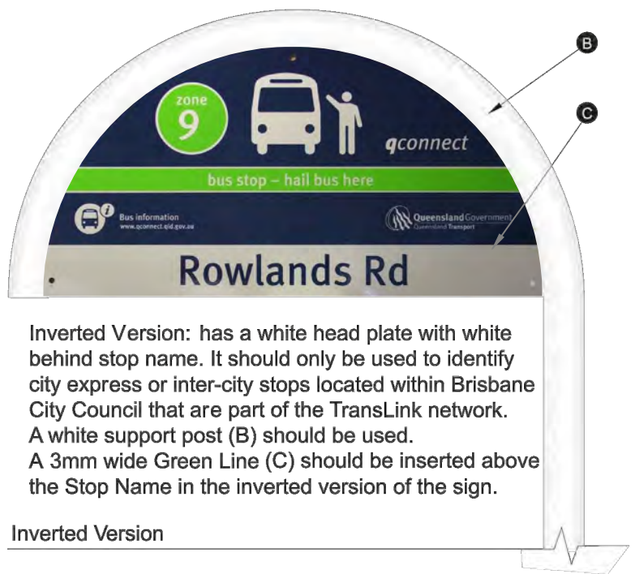
Location Plan:
The sign should be located at the down stream end of the bus stop and perpendicular to the traffic lane.
The post should be closest to the road and the sign away from the road.

On kerbed roads, signs should be located minimum 750mm back from the face of the kerb. Where mountable or semi mountable kerbs are used, the minimum clearance should be minimum 650mm from top of kerb. On unkerbed roads, signs should be minimum 750mm clear of the outer edge of the shoulder.



Primary Version: has a blue head plate with white behind stop name. It should be used for bus stops located within Brisbane City Council that are part of the TransLink network. A yellow support post (A) should be used.

Primary Version



Inverted Version: has a white head plate with white behind stop name. It should only be used to identify city express or inter-city stops located within Brisbane City Council that are part of the TransLink network.
A white support post (B) should be used.
A 3mm wide Green Line (C) should be inserted above the Stop Name in the inverted version of the sign.

Inverted Version

Scales: NOT TO SCALE

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A	Original Issue		

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Date: RPEQ:

BUNDABERG REGIONAL COUNCIL

SIGNAGE
Bus Stop Sign Details

Standard Drawing No **R1043**

Sheet Size **A3**

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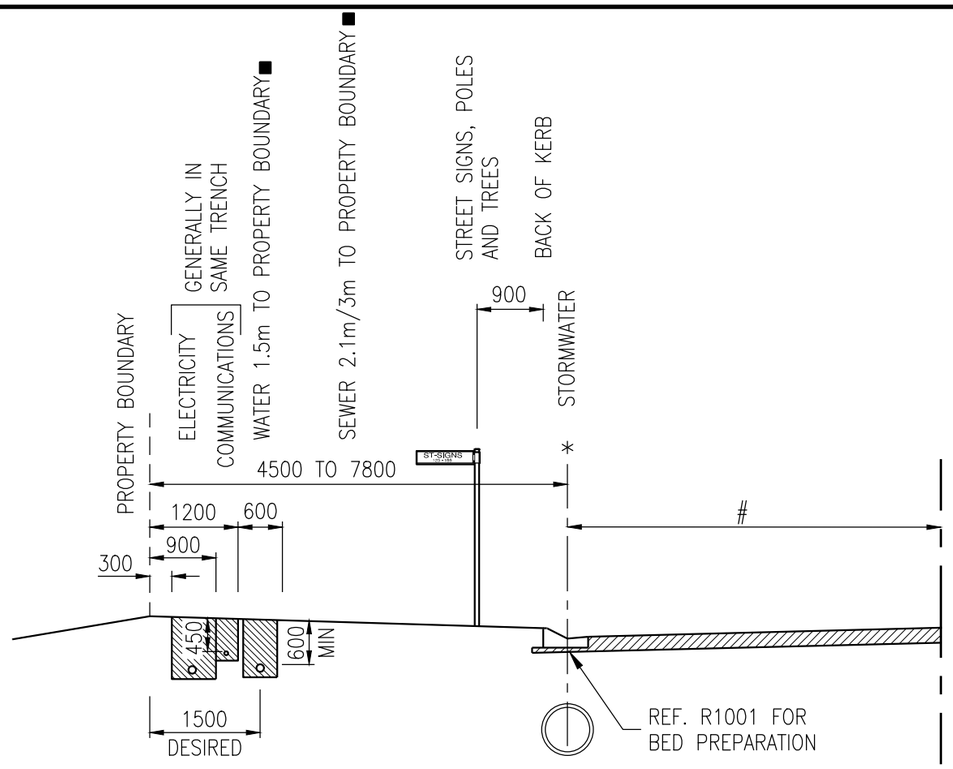


LEGEND

* NOMINAL KERB LINE.

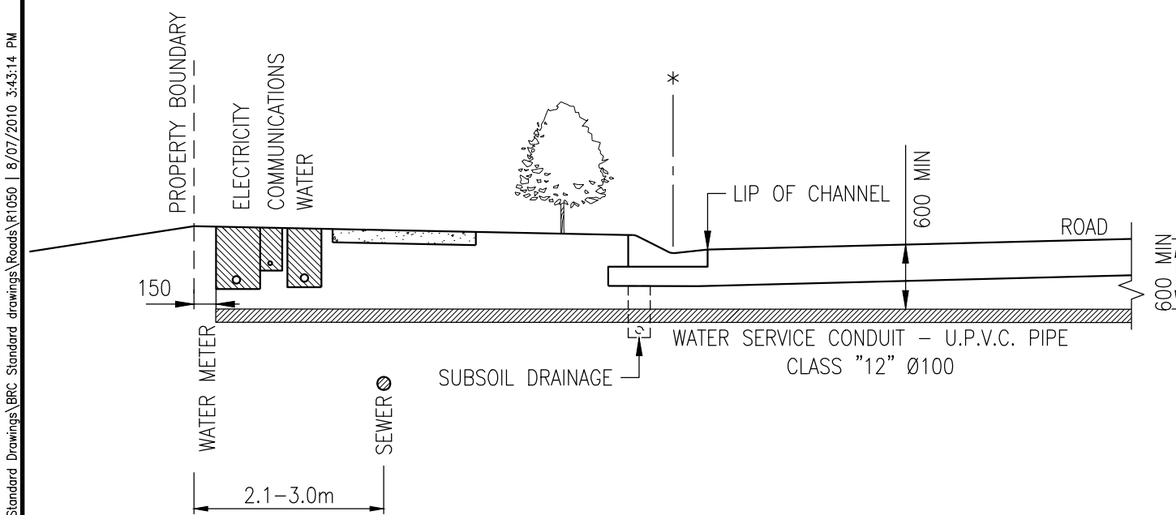
\# WIDTH AS APPROVED.

■ MAY VARY WITH APPROVAL FROM COUNCIL DEVELOPMENT ENGINEER.

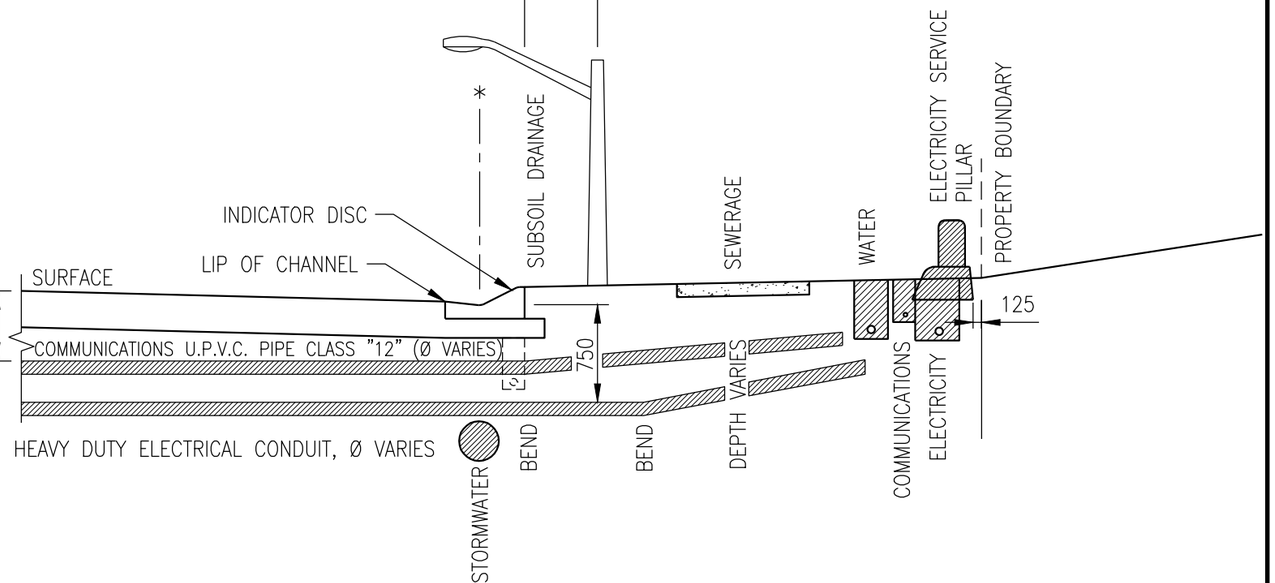
NOTES:

1. ELECTRICITY CONDUITS ADOPTED ARE TYPICALLY:
   Ø40 FOR STREET LIGHTING
   Ø80 FOR LV,
   Ø100, 11kv
   Ø100/125 FOR HV, 33kv
2. WATER CONDUIT TO BE ENCASED IN LEAN MIX CONCRETE IF LESS THAN 150mm COVER BELOW THE BOTTOM OF BOX.
3. BRASS INDICATOR DISCS TO BE PLACED IN KERB OVER ALL CONDUITS.
4. CONDUITS TO BE PLACED 150mm MIN BELOW PAVEMENT BOX.
5. DEPTHS SHOWN ARE MIN REQUIREMENTS BY COUNCIL.
6. CHECK WITH SERVICE PROVIDERS FOR RELEVANT STANDARD SPECS.
7. GAS CORRIDOR WILL BE BY SPECIAL APPROVAL BY COUNCIL.
8. OFFSET CONDUIT 500mm WHERE THERE IS A CLASH WITH LIGHT POLE FOUNDATIONS.

SERVICE CORRIDOR ON ROAD RESERVE



WATER OR GAS SERVICE CONDUIT SECTION



ELECTRICITY & COMMUNICATIONS SERVICE CONDUIT SECTION

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BUNDABERG REGIONAL COUNCIL

PUBLIC UTILITIES
Typical Service Conduit Alignments

Standard Drawing No **R1050**

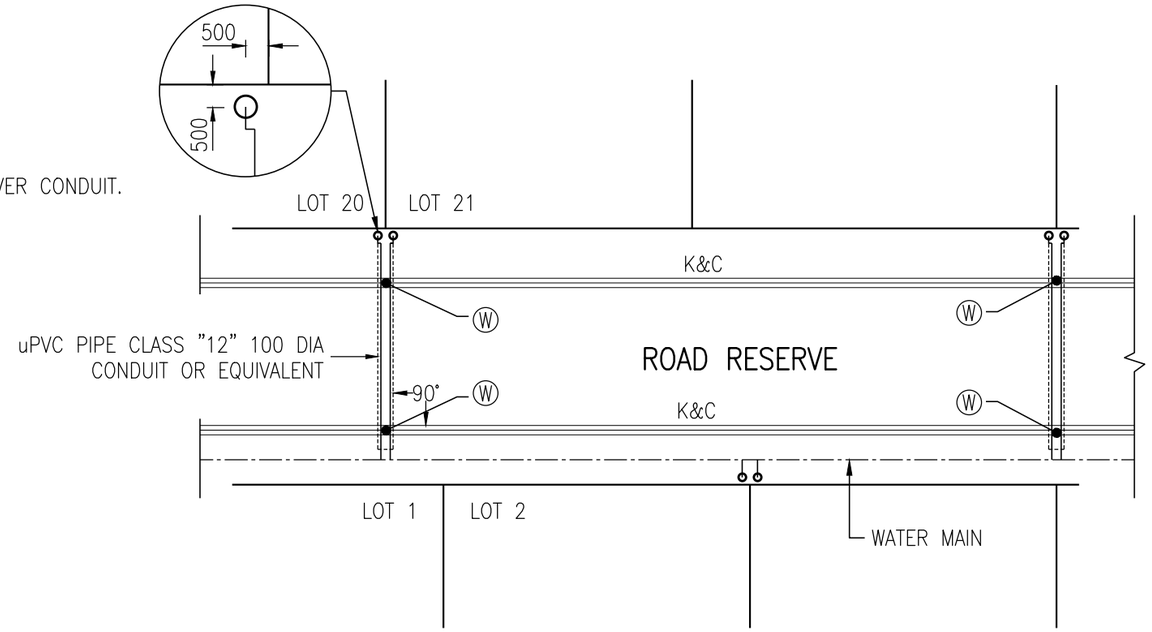
Sheet Size **A3**

Rev

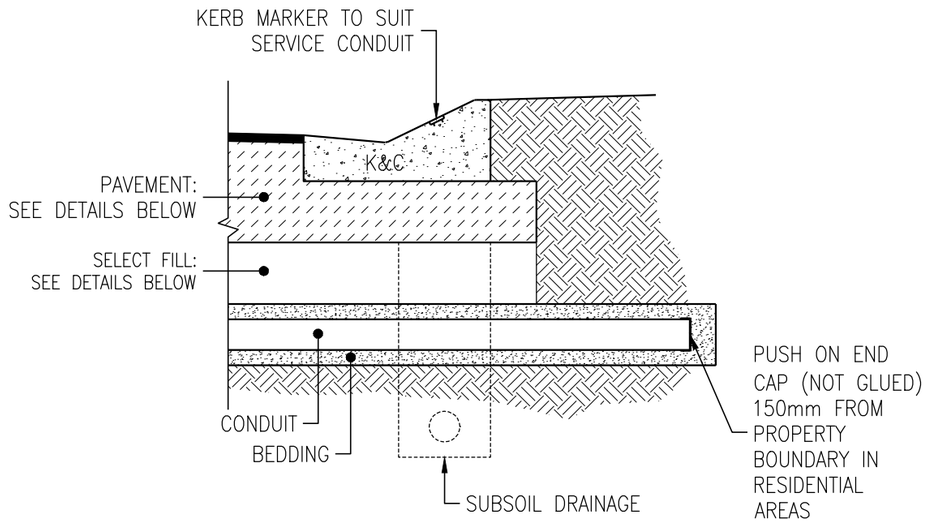
BRC(03/09)

LEGEND

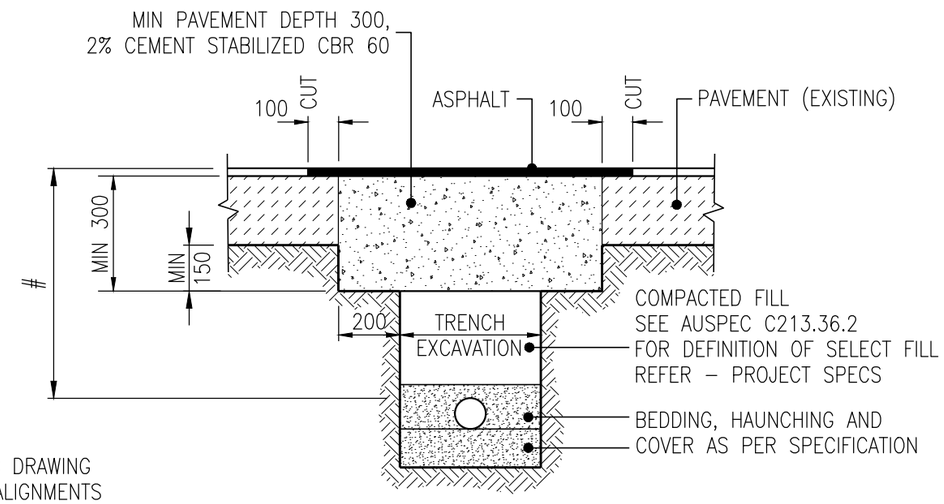
Ⓦ KERB MARKER OVER CONDUIT.



WATER SERVICE CONDUIT LOCATION PLAN



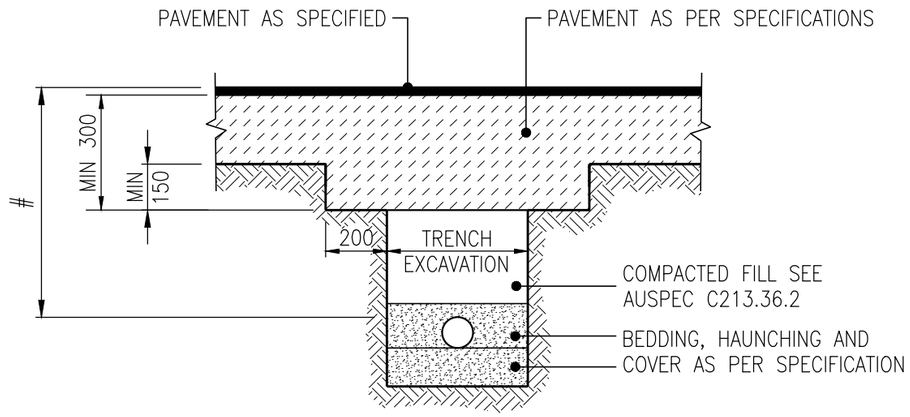
TYPICAL DETAIL AT KERB & CHANNEL



NOTES:

SEE BRC STANDARD DRAWING R1050 FOR SERVICE ALIGNMENTS AND INDICATIVE DEPTHS.

CONDUIT/SERVICE ROAD – CROSSING
TYPICAL DETAILS – EXISTING ROAD



CONDUIT/SERVICE ROAD – CROSSING
TYPICAL DETAILS – NEW ROAD

Scales	Revisions		Verified	Date
NOT TO SCALE				
	A	Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

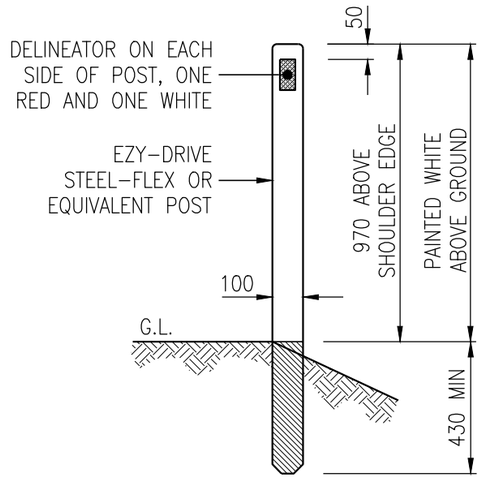
BUNDABERG REGIONAL COUNCIL

PUBLIC UTILITIES
Conduit/Service Road - Crossing Details

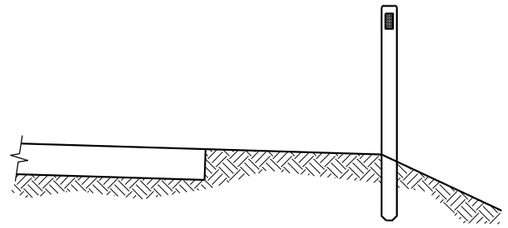
Standard Drawing No **R1051**

Sheet Size **A3**

Rev



STEEL-FLEX GUIDE POST



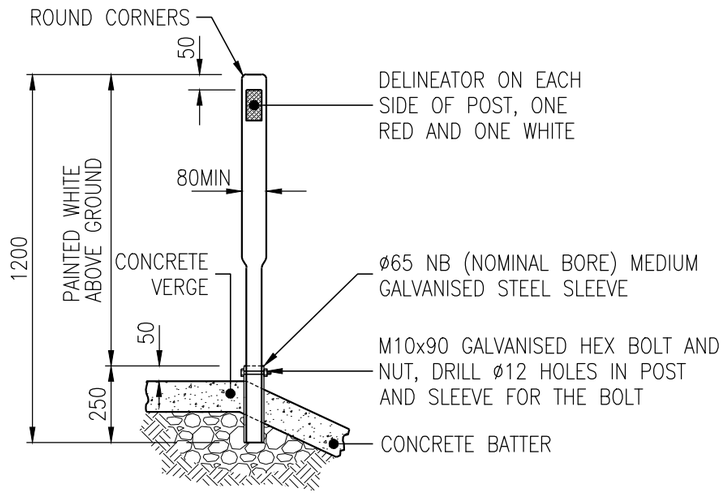
ROADWAY GENERALLY:

1. INSIDE FACE OF POST TO BE SET IN LINE WITH THE SHOULDER EDGE.
2. THE DISTANCE FROM THE PAVEMENT EDGE SHOULD BE UNIFORM.
3. POSTS SHOULD BE SET SO THAT THEIR TOPS ARE ON A SMOOTH GRADE.

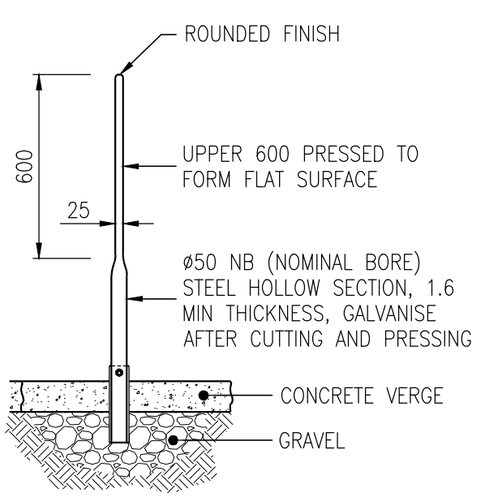
INSTALLATION DETAILS

NOTES:

1. GUIDE POSTS OTHER THAN THOSE SHOWN TO BE APPROVED BY COUNCIL ENGINEER BEFORE USE. GUIDE POSTS TO BE INSTALLED TO MANUFACTURERS SPECIFICATIONS.
2. DELINEATORS SHALL BE THE FOLLOWING REFLECTORISED PANELS WITH THE LONGER AXIS VERTICAL IN EACH CASE. RED DELINEATORS (100x50mm) SHALL BE ON THE LEFT HAND SIDE AND WHITE DELINEATORS (100x25mm) ON THE RIGHT HAND SIDE AS SEEN BY APPROACHING DRIVERS. COMPLYING WITH CLASS 1A MATERIAL AS/NZS1906.1.
3. POST SPACING: WHERE THE LOCATION OF ROAD EDGE GUIDE POSTS IS NOT SPECIFIED IN THE PROJECT DRAWINGS, THEN THE SPACING SHALL BE IN ACCORDANCE WITH MUTCD3.2.4.4.
4. ALL DIMENSIONS IN MILLIMETRES UNLESS OFTHER WISE SHOWN.



FRONT VIEW
CONCRETE VERGE/BATTER



SIDE VIEW
CONCRETE VERGE/BATTER

* REFER GENERAL MUTCD NOTES (F)

CURVE RADIUS (m)	SPACING (m)	
	OUTSIDE OF CURVE	INSIDE OF CURVE
< 100	6	12
100–199	10	20
200–299	15	30
300–399	20	40
400–599	30	60
600–799	40	60
800–1199	60	60
1200–2000	90 *	90 *
2000–UP TO STRAIGHTS	150 *	150 *

TABLE (1) GUIDE POST SPACING ON CURVES

POSTS ON INSIDE OF CURVE ARE TO BE LOCATED OPPOSITE A POST ON THE OUTSIDE OF THE CURVE WHERE POSSIBLE.

TUBULAR STEEL GUIDE POST

Scales: NOT TO SCALE

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A	Original Issue		

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Design: Verified:
Drawing: Tifa Checked:
Approved by Engineer
Date: RPEQ:

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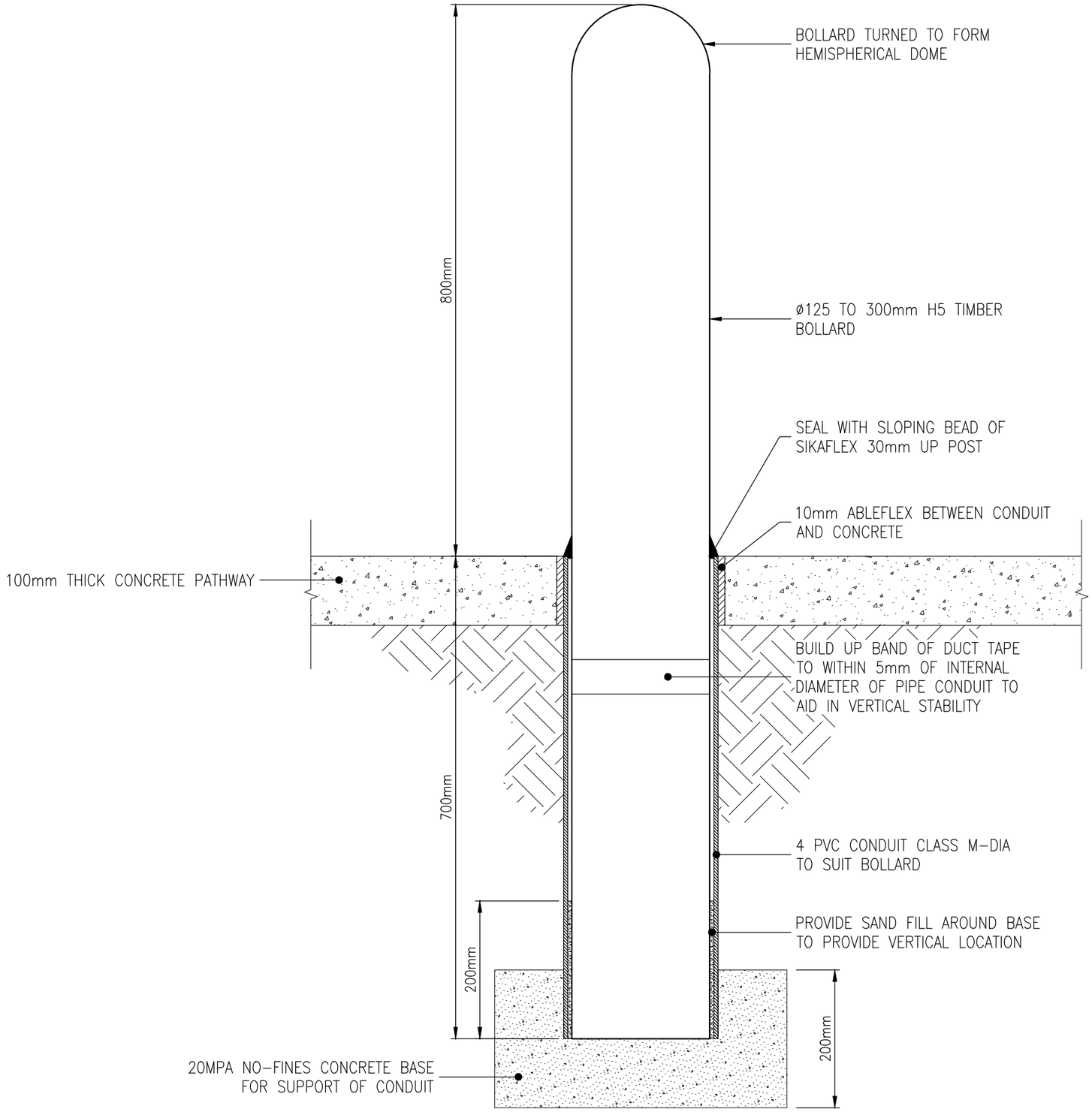
ROAD EDGE GUIDE POSTS AND BOLLARDS
Posts Types and Spacings

Standard Drawing No **R1060**

Sheet Size **A3**

Rev



NOTES:

1. ENSURE THE FIT OF SUPPLIED BOLLARDS BY INSERTING BOLLARDS INTO SPARE CONDUIT BEFORE PLACING INTO GROUND. PLANE ANY SPOTS WHICH ARE PREVENTING THE BOLLARD FROM FITTING INTO THE CONDUIT.
2. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
3. SEE R1030 FOR PATH CONSTRUCTION DETAILS.

Scales	Revisions		Verified	Date
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Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

BUNDABERG REGIONAL COUNCIL

ROAD EDGE GUIDE POSTS AND BOLLARDS
Standard Bollard Treatment With 4 PVC Casing

Standard Drawing No	Sheet Size	Rev
R1061	A3	

BRC(09/10)

ROAD FUNCTION

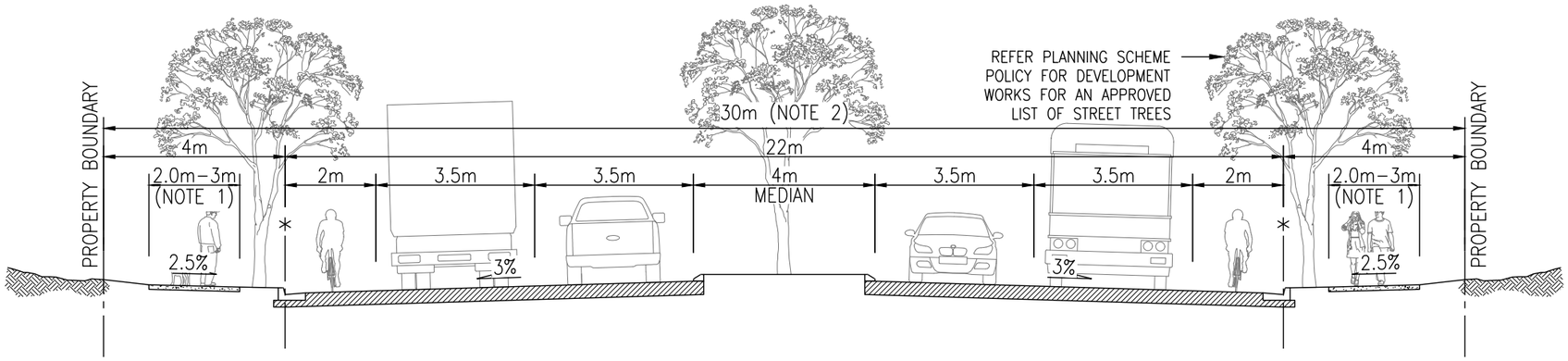
TO PROVIDE A HIGH VOLUME CONNECTION BETWEEN SUBURBS AND HIGHER ORDER ARTERIAL ROADS. DEDICATED LANES REDUCE CONFLICT BETWEEN ROAD USERS AND ALLOW FOR A SAFE AND EFFICIENT ENVIRONMENT. AMENITY IS IMPROVED THROUGH ATTRACTIVE LANDSCAPING AND APPROVED STREET TREES. IDEALLY THERE IS NO DIRECT PROPERTY ACCESS.

LEGEND

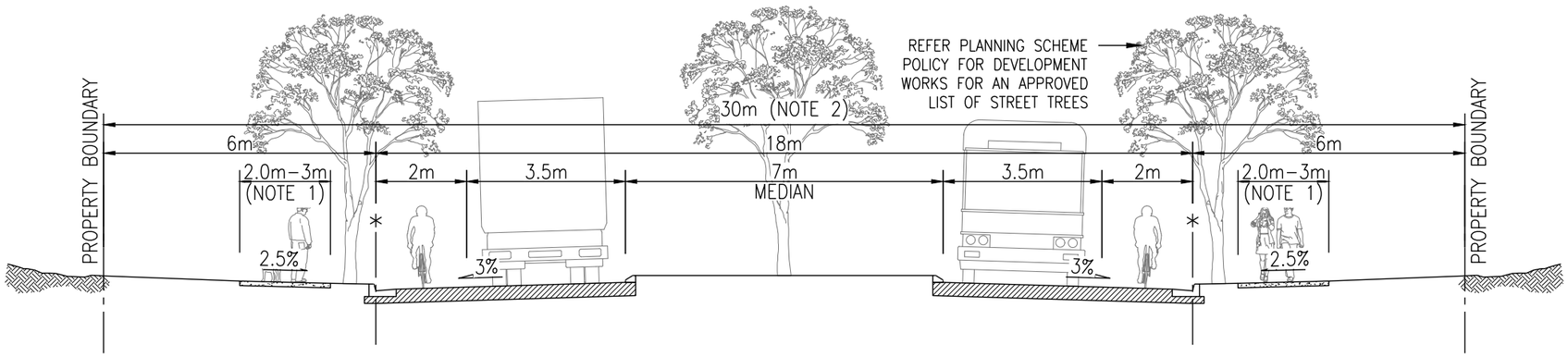
* NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

PAVEMENT DESIGN IN ACCORDANCE WITH:
- AP–T36–06 PAVEMENT DESIGN FOR LIGHT TRAFFIC – A SUPPLEMENT TO AUSTROADS PAVEMENT DESIGN GUIDE.
- AGPT02–12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

DESIGN CRITERIA	
LGIP TYPE	TRUNK
PRIORITY USERS	MOTORISTS
NOMINAL AADT	>18000 vpd (FOUR LANE) >10000 & <= 18000 (TWO LANE)
MAXIMUM LOTS/ DWELLINGS	N/A
DESIGN SPEED	70 km/h
DIRECT ACCESS	NO
KERB & CHANNEL	B1
LANE MARKING	YES
ASPHALT SURFACING MIN. DEPTH/ TYPE (NOTE 4)	50mm/DG14
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 5%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 30m MINIMUM SAG 28m
HORIZONTAL CURVE RADIUS	MINIMUM 240m
SUPERELEVATION	5%
TRAFFIC LOADING	2 X 10^6 ESA



SUB–ARTERIAL – FOUR LANE



SUB–ARTERIAL – TWO LANE

NOTES:

1. REFER "LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LGIP)" TO SEE IF IDENTIFIED AS A PART OF THE OFF–ROAD MULTI–MODAL PATHWAY NETWORK. THE PATH WIDTHS ARE AS FOLLOWS:
   - PRINCIPAL PATHWAY (3m).
   - DISTRIBUTOR PATHWAY (2.5m).
   - COLLECTOR PATHWAY (2.0m).
   - OFF–ROAD REGIONAL RECREATIONAL CYCLEWAY (3m).

   IF NOT IDENTIFIED IN LGIP, A 2.0m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.
2. ROAD RESERVE WIDTH WILL BE WIDER AT INTERSECTIONS AND MUST BE APPROVED BY COUNCIL'S DEVELOPMENT ENGINEERS.
3. FOR SUB SOIL DRAINAGE DETAILS REFER TO IPWEAQ STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
4. REFER TO DTMR SPECIFICATION "MRTS30 – DENSE GRADED AND OPEN GRADED ASPHALT".

Scales

NOT TO SCALE

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Design: ARW Verified:
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ROAD TYPE CROSS SECTIONS
URBAN ROAD - SUB-ARTERIAL

Standard Drawing No.: R2001

Sheet Size: A3

Rev.: A

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BRC(09/10)

ROAD FUNCTION

TO PROVIDE A CONNECTION BETWEEN SUBURBS AND HIGHER ORDER ARTERIAL ROADS. DEDICATED LANES REDUCE CONFLICT BETWEEN ROAD USERS AND ALLOW FOR A SAFE AND EFFICIENT ENVIRONMENT.
RESIDENTIAL AMENITY IS IMPROVED THROUGH DIRECT ACCESS TO PROPERTIES. PATHWAYS ARE PROVIDED ON BOTH SIDES OF THE ROAD TO PROMOTE ACTIVE TRANSPORT OPTIONS.
WHERE THE ROAD CORRIDOR IS CONSTRAINED TO 20m (I.E., INFILL AREAS) LANE WIDTHS CAN BE REDUCED TO MINIMUM ACCEPTABLE STANDARDS.

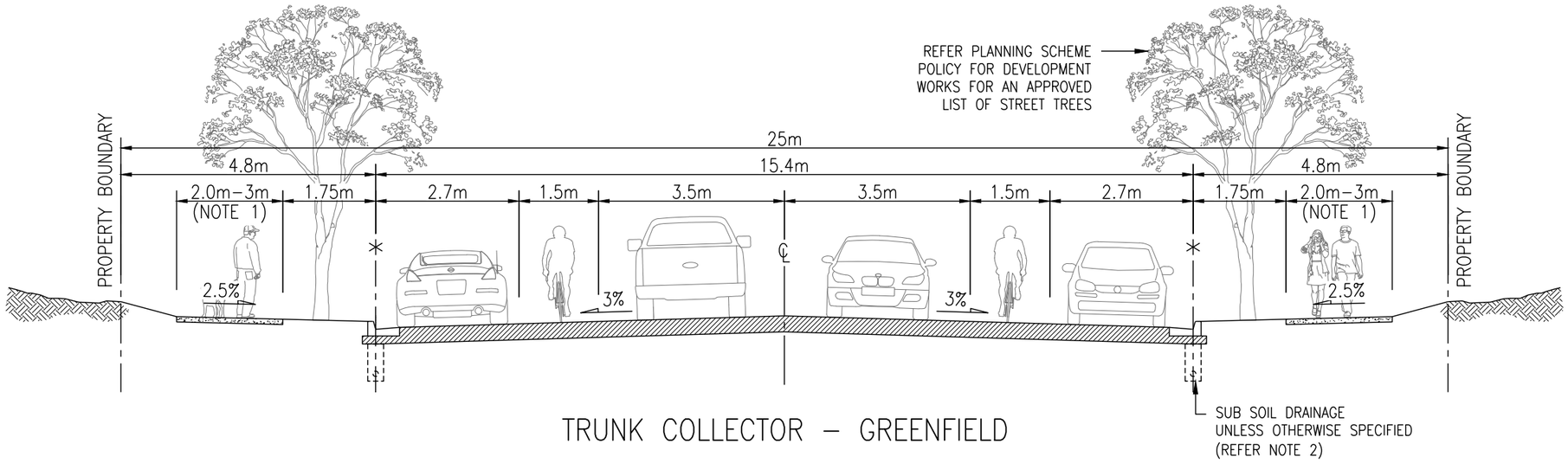
LEGEND

* NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

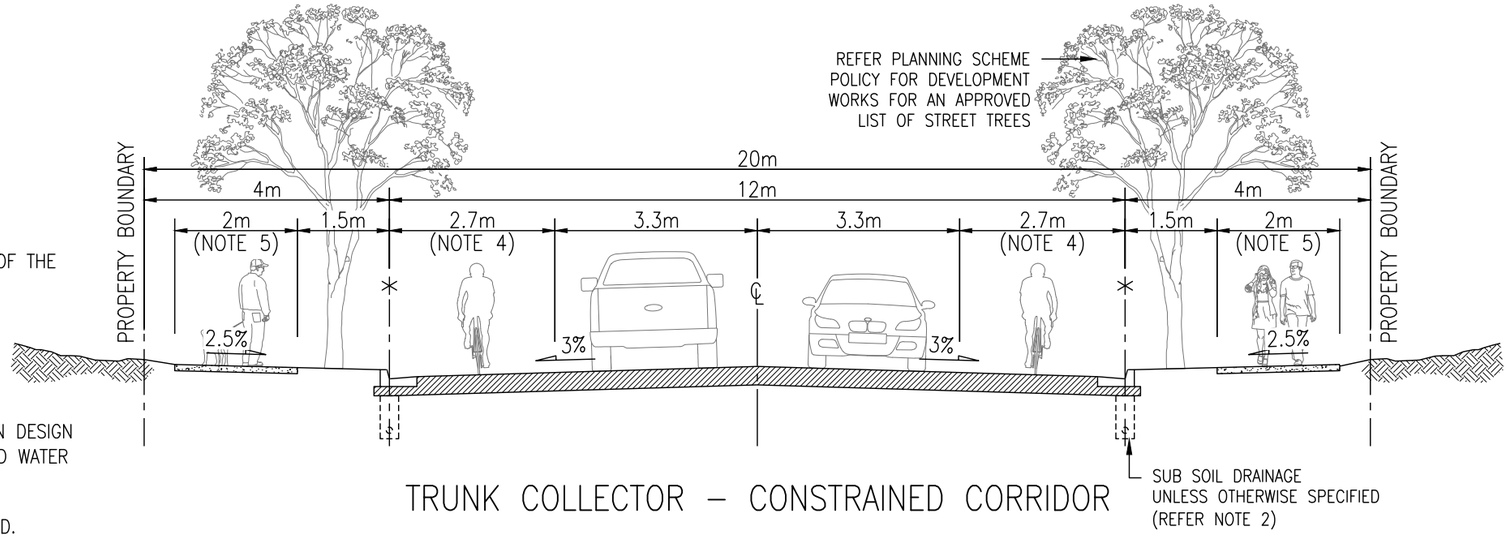
PAVEMENT DESIGN IN ACCORDANCE WITH:
- AP–T36–06 PAVEMENT DESIGN FOR LIGHT TRAFFIC – A SUPPLEMENT TO AUSTROADS PAVEMENT DESIGN GUIDE.
- AGPT02–12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

DESIGN CRITERIA

LGIP TYPE	TRUNK
PRIORITY USERS	MOTORISTS & CYCLISTS
NOMINAL AADT	>3000 & <=10000 vpd
MAXIMUM LOTS/ DWELLINGS	1000
DESIGN SPEED	60 km/h
DIRECT ACCESS	YES
KERB & CHANNEL	B1
LANE MARKING	YES
ASPHALT SURFACING MIN. DEPTH/ TYPE (NOTE 4)	30mm/DG10
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 5%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 12m MINIMUM SAG 16m
HORIZONTAL CURVE RADIUS	MINIMUM 98m
SUPERELEVATION	5%
TRAFFIC LOADING	1 X 10^6 ESA



TRUNK COLLECTOR – GREENFIELD



TRUNK COLLECTOR – CONSTRAINED CORRIDOR

NOTES:

1. REFER "LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LGIP)" TO SEE IF IDENTIFIED AS A PART OF THE OFF–ROAD MULTI–MODAL PATHWAY NETWORK. THE PATH WIDTHS ARE AS FOLLOWS:
   - PRINCIPAL PATHWAY (3m).
   - DISTRIBUTOR PATHWAY (2.5m).
   - COLLECTOR PATHWAY (2.0m).
   - OFF–ROAD REGIONAL RECREATIONAL CYCLEWAY (3m).

   IF NOT IDENTIFIED IN LGIP, A 2.0m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.
2. FOR SUB SOIL DRAINAGE DETAILS REFER TO IPWEAQ STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
3. REFER TO DTMR SPECIFICATION "MRTS30 – DENSE GRADED AND OPEN GRADED ASPHALT".
4. PARKING IS PERMITTED IN MARKED BICYCLE LANE UNLESS OTHERWISE MARKED OR SIGN POSTED.
5. FOR "CONSTRAINED CORRIDOR", A PATHWAY WIDTH OF 2.0m IS REQUIRED DESPITE WHAT MAY BE SHOWN IN LGIP. IF NOT IDENTIFIED IN LGIP, A 2.0m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.

Scales: NOT TO SCALE

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Quality Certification
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ROAD TYPE CROSS SECTIONS
URBAN ROAD - TRUNK COLLECTOR

Standard Drawing No.: R2002
Sheet Size: A3
Rev.: A

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BRC(09/10)

ROAD FUNCTION

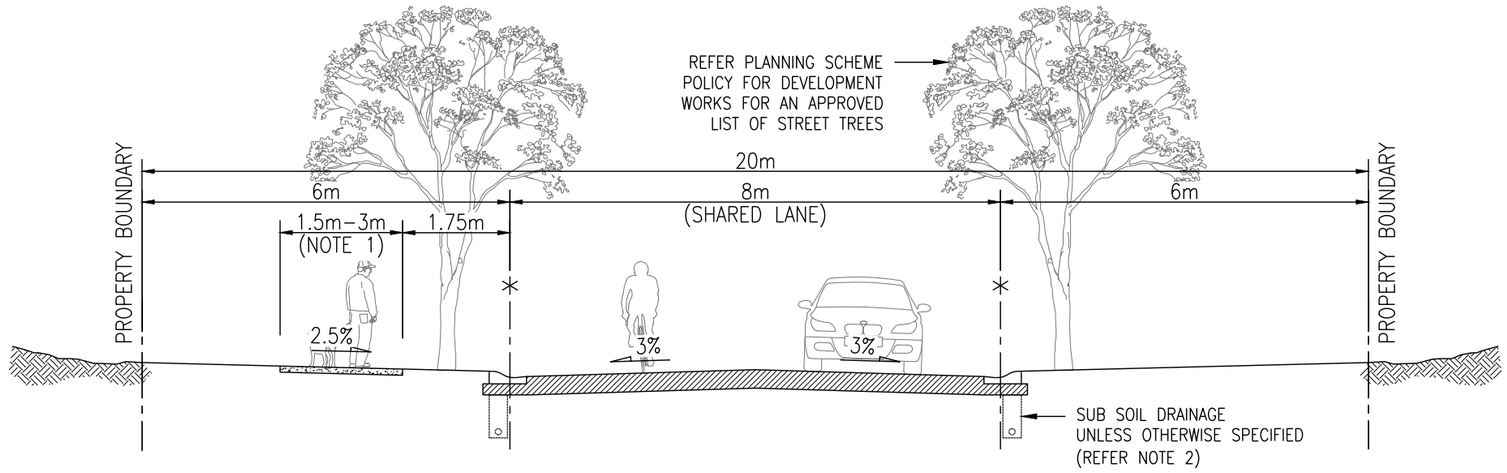
TO PROVIDE A CONNECTION BETWEEN RESIDENTIAL ACCESS STREETS AND HIGHER ORDER TRAFFIC CARRYING ROADS.
IN LOWER DENSITY AREAS WHERE ON-STREET PARKING DEMAND IS EXPECTED TO BE LOW, LANES ARE UNMARKED AND CYCLISTS, AND MOTORISTS SHARE THE AVAILABLE SPACE WITH INTERMITTENT PARKED CARS (I.E., OCCASIONALLY VEHICLES TRAVELING IN OPPOSITE DIRECTIONS WILL HAVE TO GIVE WAY TO ONCOMING VEHICLES).
IN HIGHER DENSITY AREAS INDENTED PARKING BAYS WILL BE REQUIRED TO CATER FOR A GREATER FLOW ON TRAFFIC.

LEGEND

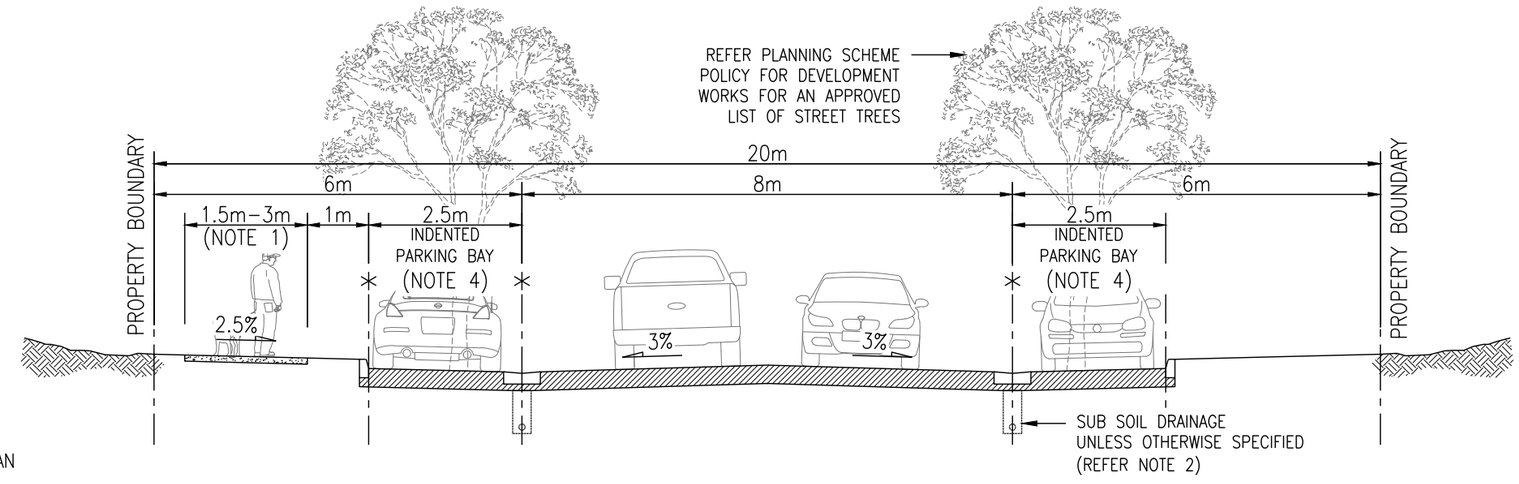
∗ NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

PAVEMENT DESIGN IN ACCORDANCE WITH:
- AP-T36-06 PAVEMENT DESIGN FOR LIGHT TRAFFIC – A SUPPLEMENT TO AUSTROADS PAVEMENT DESIGN GUIDE.
- AGPT02-12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

DESIGN CRITERIA	
LGIP TYPE	NON-TRUNK
PRIORITY USERS	ALL USERS EQUAL PRIORITY
NOMINAL AADT	>750 & <=3000 vpd
MAXIMUM LOTS/ DWELLINGS	300
DESIGN SPEED	50 km/h
DIRECT ACCESS	YES
KERB & CHANNEL	M3 (LOW DENSITY) INV1 & B2 (HIGH DENSITY)
LANE MARKING	NIL
ASPHALT SURFACING MIN. DEPTH/ TYPE (NOTE 4)	30mm/DG10
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 10%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 3.5m MINIMUM SAG 7m
HORIZONTAL CURVE RADIUS	MINIMUM 42m
SUPERELEVATION	NIL
TRAFFIC LOADING	3 X 10^5 ESA



COLLECTOR STREET – LOW DENSITY



COLLECTOR STREET – MEDIUM DENSITY

NOTES:

1. REFER "LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LGIP)" TO SEE IF IDENTIFIED AS A PART OF THE OFF-ROAD MULTI-MODAL PATHWAY NETWORK. THE PATH WIDTHS ARE AS FOLLOWS:
   - PRINCIPAL PATHWAY (3m).
   - DISTRIBUTOR PATHWAY (2.5m).
   - COLLECTOR PATHWAY (2.0m).
   - OFF-ROAD REGIONAL RECREATIONAL CYCLEWAY (3m).

   IF NOT IDENTIFIED IN LGIP, A 1.5m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.
2. FOR SUB SOIL DRAINAGE DETAILS REFER TO IPWEAQ STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
3. REFER TO DTMR SPECIFICATION "MRTS30 – DENSE GRADED AND OPEN GRADED ASPHALT".
4. INDENTED PARKING BAY TO BE DESIGNED IN ACCORDANCE WITH DTMR TN-138 AND MUST BE APPROVED BY COUNCIL'S DEVELOPMENT ENGINEERS.

Scales: NOT TO SCALE

Revisions	Verified	Date
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ROAD TYPE CROSS SECTIONS
URBAN ROAD - COLLECTOR STREET

Standard Drawing No.: R2003
Sheet Size: A3
Rev.: A

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BRC(09/10)

ROAD FUNCTION

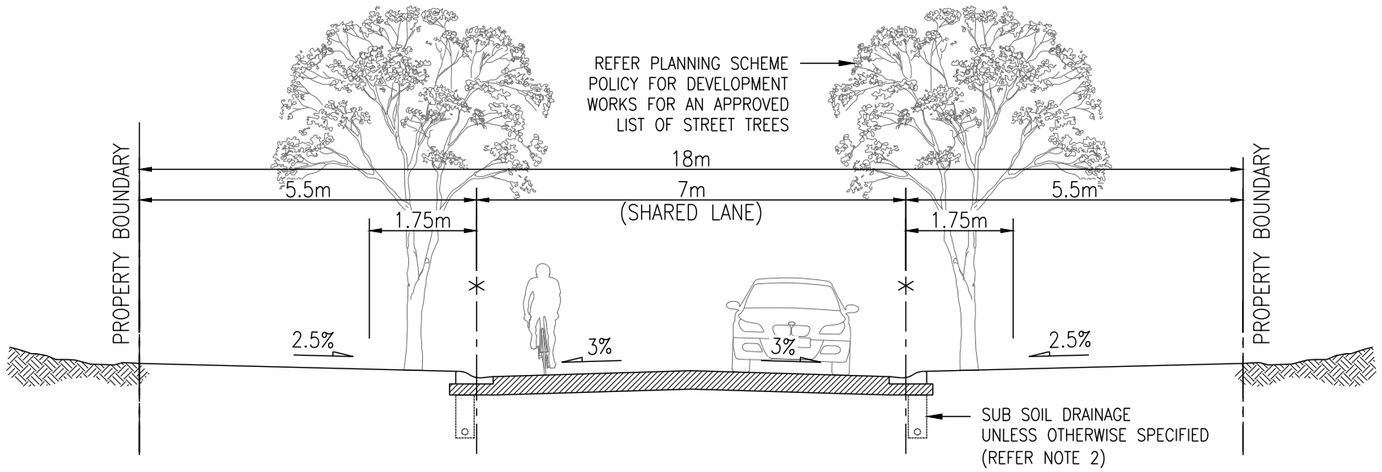
TO PROVIDE DIRECT ACCESS TO ADJOINING RESIDENTIAL PROPERTIES.
IN LOWER DENSITY AREAS WHERE ON-STREET PARKING DEMAND IS EXPECTED TO BE LOW, LANES ARE UNMARKED, AND CYCLISTS AND MOTORISTS SHARE THE AVAILABLE SPACE WITH INTERMITTENT PARKED CARS (I.E., OCCASIONALLY VEHICLES TRAVELLING IN OPPOSITE DIRECTIONS WILL HAVE TO GIVE WAY TO ONCOMING VEHICLES).
IN HIGHER DENSITY AREAS INDENTED PARKING BAYS WILL BE REQUIRED TO CATER FOR A GREATER FLOW OF TRAFFIC.

LEGEND

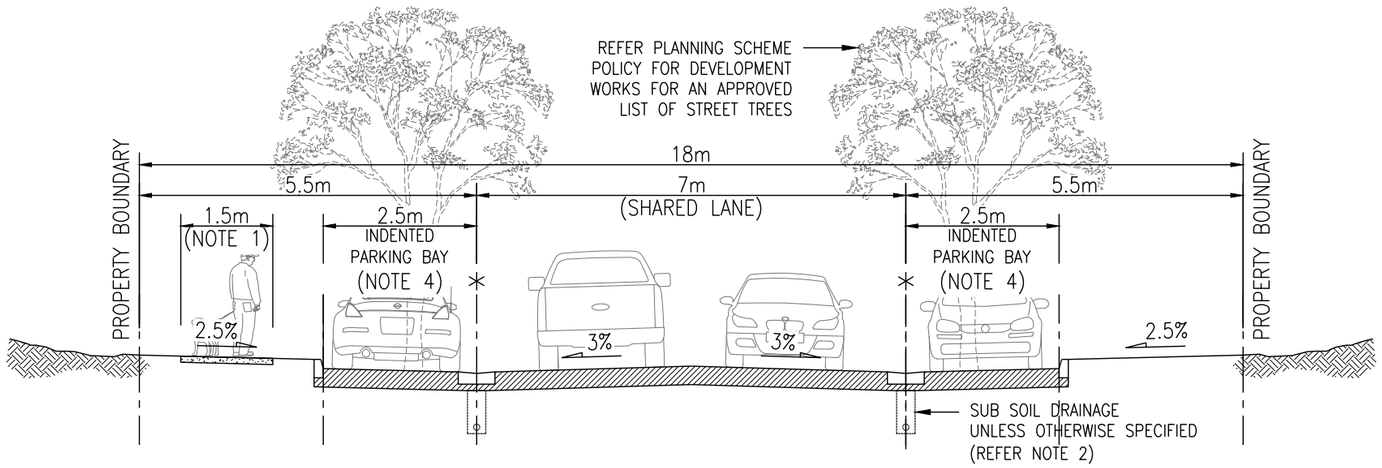
∗ NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

PAVEMENT DESIGN IN ACCORDANCE WITH:
- AP-T36-06 PAVEMENT DESIGN FOR LIGHT TRAFFIC – A SUPPLEMENT TO AUSTROADS PAVEMENT DESIGN GUIDE.
- AGPT02-12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

DESIGN CRITERIA	
LGIP TYPE	NON-TRUNK
PRIORITY USERS	ALL USERS EQUAL PRIORITY
NOMINAL AADT	>300 & <=750 vpd
MAXIMUM LOTS/ DWELLINGS	75
DESIGN SPEED	40 km/h
DIRECT ACCESS	YES
KERB & CHANNEL	M3 (LOW DENSITY) INV1 & B2 (HIGH DENSITY)
LANE MARKING	NIL
ASPHALT SURFACING MIN. DEPTH/ TYPE (NOTE 4)	25mm/DG7
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 10%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 3.5m MINIMUM SAG 7m
HORIZONTAL CURVE RADIUS	MINIMUM 24m
SUPERELEVATION	NIL
TRAFFIC LOADING	6 X 10^4 ESA



ACCESS STREET – LOW DENSITY



ACCESS STREET – MEDIUM DENSITY

NOTES:

1. 1.5m WIDE FOOTPATH IS REQUIRED ON ONE SIDE OF THE STREET, IT WILL GENERALLY BE LOCATED ON THE NORTHERN OR WESTERN SIDE OF THE ROAD.
2. FOR SUB SOIL DRAINAGE DETAILS REFER TO IPWEAQ STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
3. REFER TO DTMR SPECIFICATION "MRTS30 – DENSE GRADED AND OPEN GRADED ASPHALT".
4. INDENTED PARKING BAY TO BE DESIGNED IN ACCORDANCE WITH DTMR TN-138 AND MUST BE APPROVED BY COUNCIL'S DEVELOPMENT ENGINEERS.

Scales: NOT TO SCALE

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ROAD TYPE CROSS SECTIONS
URBAN ROAD - ACCESS STREET

Standard Drawing No.: R2004
Sheet Size: A3
Rev.: A

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BRC(09/10)

ROAD FUNCTION

TO PROVIDE DIRECT ACCESS TO ADJOINING RESIDENTIAL PROPERTIES.
CYCLISTS AND MOTORISTS SHARE A 5m LANE. THE STREET IS DESIGNED AS A SLOW SPEED ENVIRONMENT AND OCCASIONALLY VEHICLES TRAVELLING IN OPPOSITE DIRECTIONS WILL HAVE TO GIVE WAY TO ONCOMING VEHICLES.
IN LOW DENSITY AREAS, CARS MAY PARK PARTLY IN THE 5m (SHARED LANE).
IN HIGHER DENSITY AREAS, INTERMITTENT INDENTED PARKING BAYS WILL BE REQUIRED ON ONE OR ALTERNATING SIDES OF THE STREET TO CATER FOR A GREATER PARKING DEMAND.

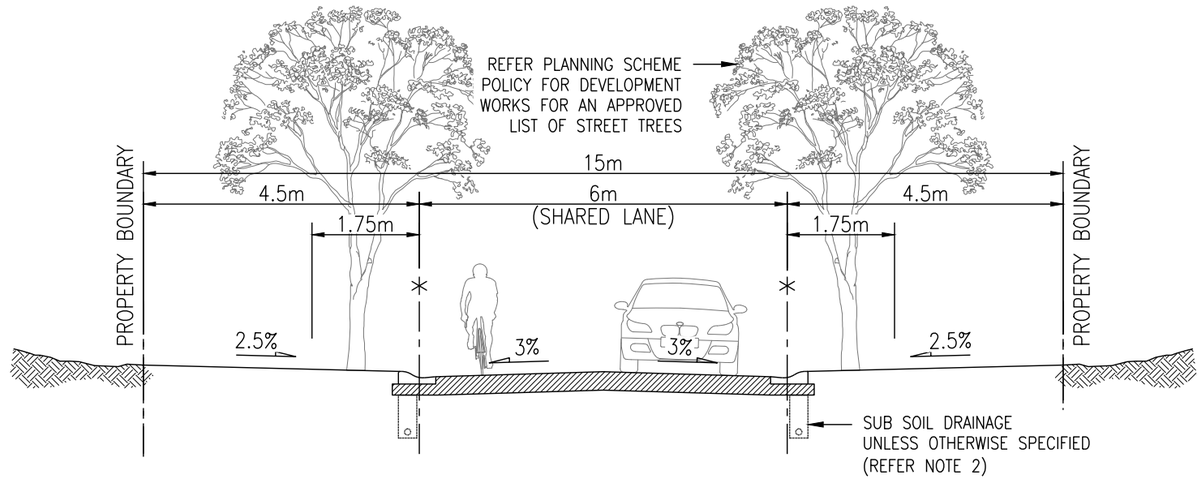
LEGEND

* NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

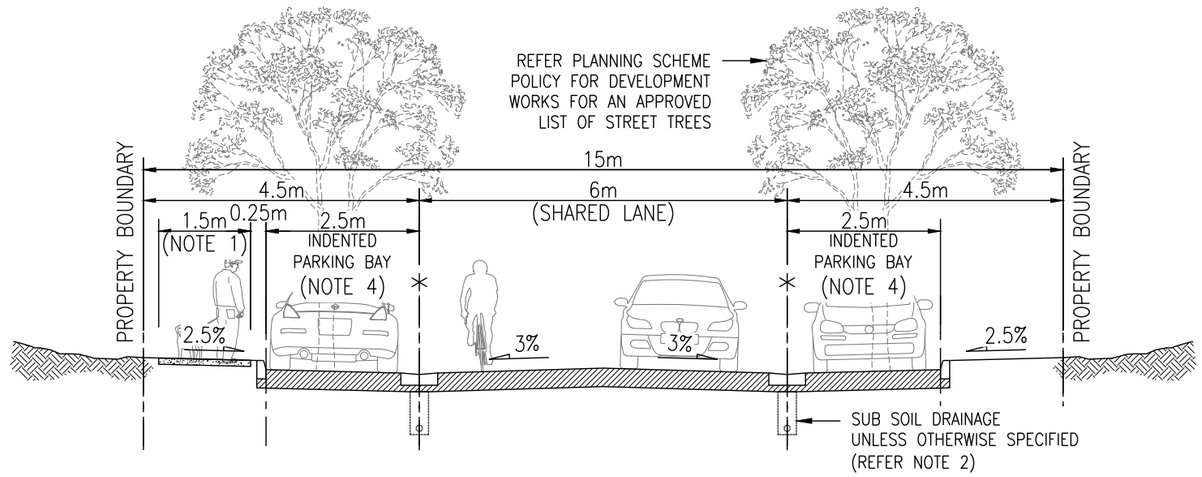
PAVEMENT DESIGN IN ACCORDANCE WITH:
- AP–T36–06 PAVEMENT DESIGN FOR LIGHT TRAFFIC – A SUPPLEMENT TO AUSTROADS PAVEMENT DESIGN GUIDE.
- AGPT02–12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

DESIGN CRITERIA

LGIP TYPE	NON–TRUNK
PRIORITY USERS	PEDESTRIANS AND CYCLISTS
NOMINAL AADT	<=300 vpd
MAXIMUM LOTS/ DWELLINGS	30
DESIGN SPEED	40 km/h
DIRECT ACCESS	YES
KERB & CHANNEL	M3 (LOW DENSITY) INV1 & B2 (HIGH DENSITY)
LANE MARKING	NIL
ASPHALT SURFACING MIN. DEPTH/ TYPE (NOTE 4)	25mm/DG7
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 12%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 3.5m MINIMUM SAG 7m
HORIZONTAL CURVE RADIUS	MINIMUM 24m
SUPERELEVATION	NIL
TRAFFIC LOADING	6 X 10^4 ESA



ACCESS PLACE – LOW DENSITY



ACCESS PLACE – MEDIUM DENSITY

NOTES:

1. 1.5m WIDE FOOTPATH IS REQUIRED ON ONE SIDE OF THE STREET, IT WILL GENERALLY BE LOCATED ON THE NORTHERN OR WESTERN SIDE OF THE ROAD.
2. FOR SUB SOIL DRAINAGE DETAILS REFER TO IPWEAQ STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
3. REFER TO DTMR SPECIFICATION "MRTS30 – DENSE GRADED AND OPEN GRADED ASPHALT".
4. INDENTED PARKING BAY TO BE DESIGNED IN ACCORDANCE WITH DTMR TN–138 AND MUST BE APPROVED BY COUNCIL'S DEVELOPMENT ENGINEERS.

Scales: NOT TO SCALE

	Revisions	Verified	Date
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Quality Certification
Design: AW Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
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ROAD TYPE CROSS SECTIONS
URBAN ROAD - ACCESS PLACE

Standard Drawing No.: R2005
Sheet Size: A3
Rev.:

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BRC(09/10)

ROAD FUNCTION

– TO PROVIDE ACCESS TO PROPERTIES AND BUSINESSES WITHIN THE CBD AND COMMERCIAL CENTRES. A SLOW SPEED MIXED TRAFFIC LANE SERVES BOTH MOTORISTS AND CYCLISTS ALIKE. THE STREET IS DESIGNED WITH AMPLE PEDESTRIAN CROSSINGS TO FACILITATE A VIBRANT COMMERCIAL SPACE. FOR CBD ACCESS STREETS NO STANDARD CROSS SECTION IS DEFINED. A TRAFFIC ASSESSMENT WOULD BE REQUIRED TO DETERMINE THE MOST SUITABLE DESIGN.

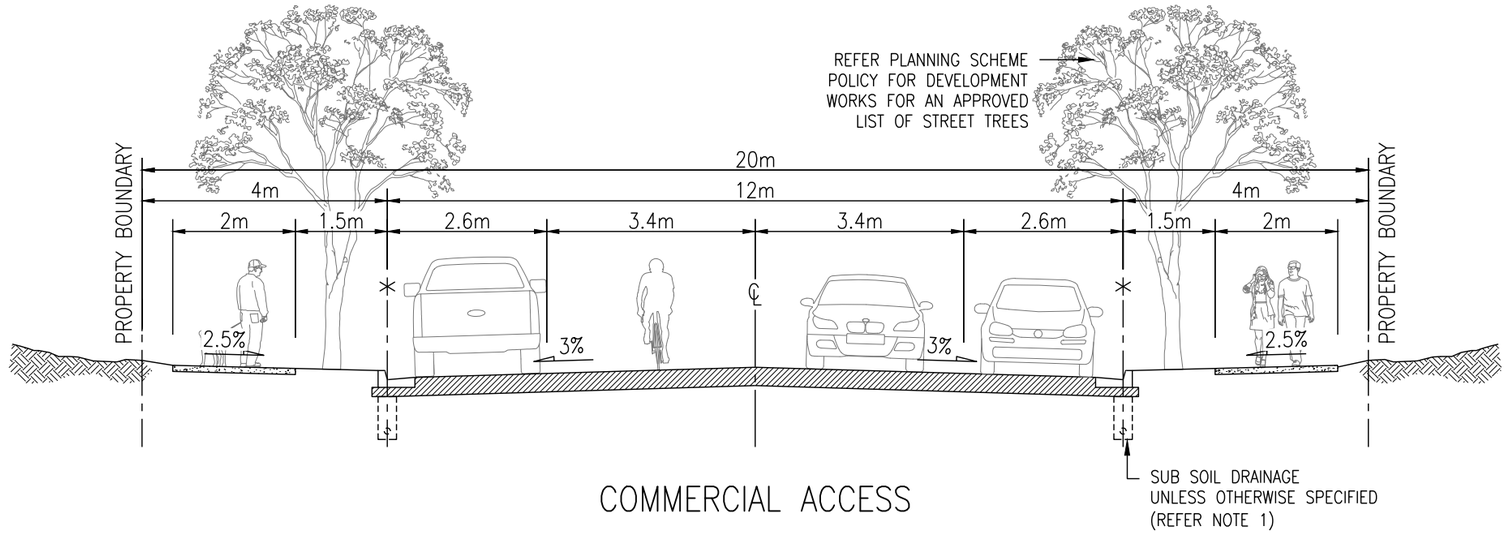
LEGEND

∗ NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

PAVEMENT DESIGN IN ACCORDANCE WITH:
- AP–T36–06 PAVEMENT DESIGN FOR LIGHT TRAFFIC – A SUPPLEMENT TO AUSTROADS PAVEMENT DESIGN GUIDE.
- AGPT02–12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

DESIGN CRITERIA

	CBD ACCESS	COMMERCIAL ACCESS
LGIP TYPE	NON–TRUNK	NON–TRUNK
PRIORITY USERS	PEDESTRIANS AND MOTORISTS	PEDESTRIANS AND MOTORISTS
NOMINAL AADT	TRAFFIC STUDY REQ.	TRAFFIC STUDY REQ.
MAXIMUM LOTS/ DWELLINGS	N/A	300
DESIGN SPEED	40 km/h	50 km/h
DIRECT ACCESS	NOT PERMITTED	NOT PERMITTED
KERB & CHANNEL	B1	B1
LANE MARKING	YES	YES
ASPHALT SURFACING MIN. DEPTH/ TYPE (NOTE 4)	50mm/DG14	50mm/DG14
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 5%	MINIMUM 0.3% MAXIMUM 10%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 3.5m MINIMUM SAG 7m	MINIMUM CREST 7m MINIMUM SAG 11m
HORIZONTAL CURVE RADIUS	MINIMUM 42m	MINIMUM 66m
SUPERELEVATION	NIL	NIL
TRAFFIC LOADING	5 X 10^6 ESA	5 X 10^6 ESA



COMMERCIAL ACCESS

"CROSS SECTION TO BE DETERMINED FROM TRAFFIC STUDY"

CBD ACCESS

NOTES:

1. FOR SUB SOIL DRAINAGE DETAILS REFER TO IPWEAQ STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
2. REFER TO DTMR SPECIFICATION "MRTS30 – DENSE GRADED AND OPEN GRADED ASPHALT".

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Revisions	Verified	Date
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Quality Certification
Design: AW Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
RPEQ:

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ROAD TYPE CROSS SECTIONS
URBAN ROAD - CBD / COMMERCIAL ACCESS

Standard Drawing No.: R2006
Sheet Size: A3
Rev.:

BRC(09/10)

ROAD FUNCTION

TO PROVIDE A CONNECTION BETWEEN INDUSTRIAL ACCESS AND HIGHER ORDER FREIGHT ROUTES. THIS ROAD IS DESIGNED TO CARRY HEAVY VEHICLES AS WELL AS PROVIDE A SAFE ENVIRONMENT FOR PEDESTRIANS AND CYCLISTS.

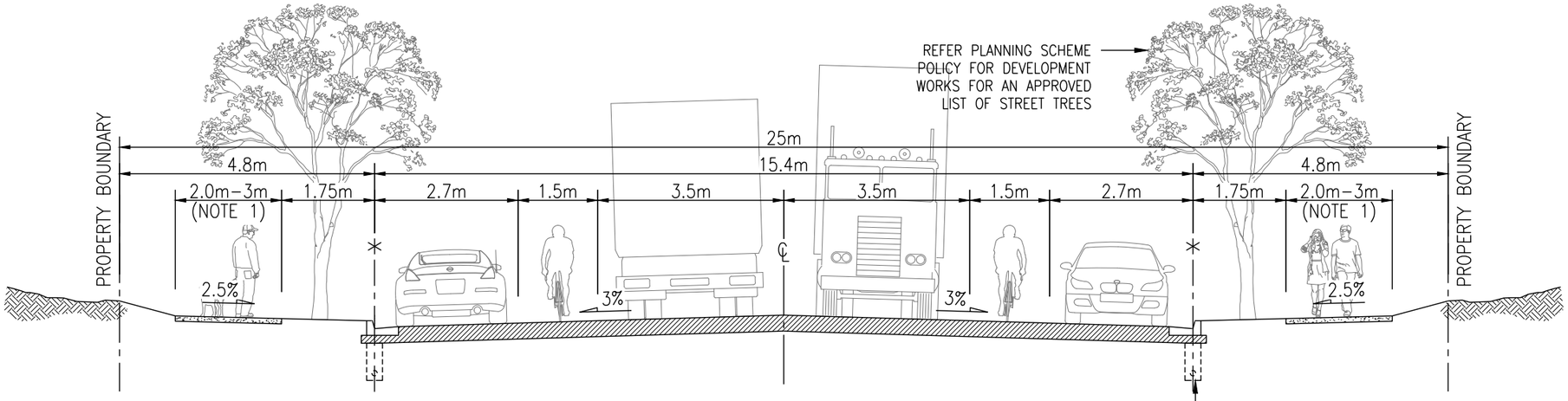
LEGEND

* NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

PAVEMENT DESIGN IN ACCORDANCE WITH:
- AP–T36–06 PAVEMENT DESIGN FOR LIGHT TRAFFIC – A SUPPLEMENT TO AUSTROADS PAVEMENT DESIGN GUIDE.
- AGPT02–12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

DESIGN CRITERIA

LGIP TYPE	TRUNK
PRIORITY USERS	HEAVY VEHICLES
NOMINAL AADT	>750 & <= 3000 vpd
MAXIMUM LOTS/ DWELLINGS	300
DESIGN SPEED	60 km/h
DIRECT ACCESS	YES
KERB & CHANNEL	B1
LANE MARKING	YES
ASPHALT SURFACING MIN. DEPTH/ TYPE (NOTE 4)	50mm/DG14
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 5%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 7m MINIMUM SAG 11m
HORIZONTAL CURVE RADIUS	MINIMUM 56m
SUPERELEVATION	5%
TRAFFIC LOADING	5 X 10^6 ESA



INDUSTRIAL COLLECTOR

NOTES:

1. REFER "LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LGIP)" TO SEE IF IDENTIFIED AS A PART OF THE OFF–ROAD MULTI–MODAL PATHWAY NETWORK. THE PATH WIDTHS ARE AS FOLLOWS:
   - PRINCIPAL PATHWAY (3m).
   - DISTRIBUTOR PATHWAY (2.5m).
   - COLLECTOR PATHWAY (2.0m).
   - OFF–ROAD REGIONAL RECREATIONAL CYCLEWAY (3m).

   IF NOT IDENTIFIED IN LGIP, A 2.0m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.
2. FOR SUB SOIL DRAINAGE DETAILS REFER TO IPWEAQ STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
3. REFER TO DTMR SPECIFICATION "MRTS30 – DENSE GRADED AND OPEN GRADED ASPHALT".

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Revisions	Verified	Date
A Original Issue		

Quality Certification
Design: AW Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
RPEQ:

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ROAD TYPE CROSS SECTIONS
URBAN ROAD - INDUSTRIAL COLLECTOR

Standard Drawing No.: R2007
Sheet Size: A3
Rev.:

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BRC(09/10)

ROAD FUNCTION

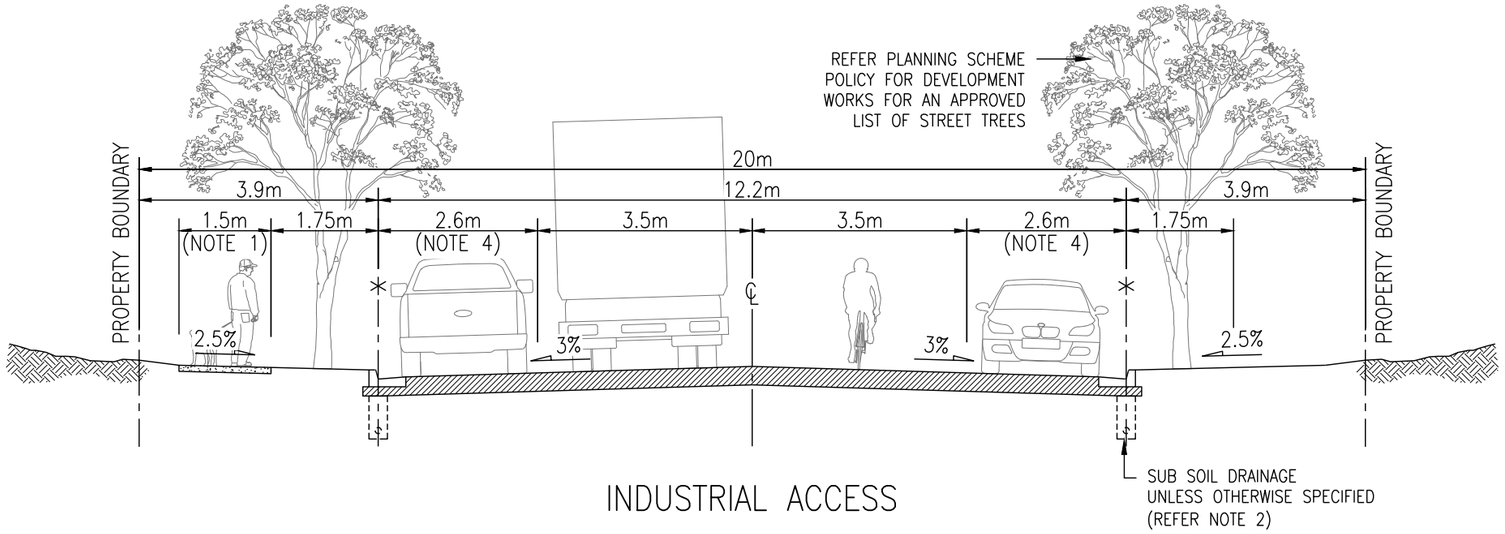
TO PROVIDE DIRECT ACCESS FOR HEAVY VEHICLES TO INDUSTRIAL PROPERTIES. A SLOW SPEED MIXED TRAFFIC LANE SERVES BOTH HEAVY VEHICLEs AND CYCLISTS ALIKE. HOWEVER, CYCLING DEMAND IS EXPECTED TO BE LOW AND LIMITED TO COMMUTER USE.

LEGEND

* NOMINAL KERB LINE
(REFER BRC STANDARD DRAWING R1020).

PAVEMENT DESIGN IN ACCORDANCE WITH:
- AP–T36–06 PAVEMENT DESIGN FOR LIGHT TRAFFIC – A SUPPLEMENT TO AUSTROADS PAVEMENT DESIGN GUIDE.
- AGPT02–12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

DESIGN CRITERIA	
LGIP TYPE	NON–TRUNK
PRIORITY USERS	HEAVY VEHICLES
NOMINAL AADT	<750 vpd
MAXIMUM LOTS/ DWELLINGS	75
DESIGN SPEED	40 km/h
DIRECT ACCESS	YES
KERB & CHANNEL	B1
LANE MARKING	YES
ASPHALT SURFACING MIN. DEPTH/ TYPE (NOTE 4)	50mm/DG14
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 5%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 3.5m MINIMUM SAG 7m
HORIZONTAL CURVE RADIUS	MINIMUM 42m
SUPERELEVATION	NIL
TRAFFIC LOADING	5 X 10^6 ESA



INDUSTRIAL ACCESS

NOTES:

1. 1.5m WIDE FOOTPATH IS REQUIRED ON ONE SIDE OF THE STREET, IT WILL GENERALLY BE LOCATED ON THE NORTHERN OR WESTERN SIDE OF THE ROAD.
2. FOR SUB SOIL DRAINAGE DETAILS REFER TO IPWEAQ STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
3. REFER TO DTMR SPECIFICATION "MRTS30 – DENSE GRADED AND OPEN GRADED ASPHALT".
4. IF CYCLING DEMAND IS EXPECTED TO BE HIGH, THE PARKING LANES IS TO BE UTILISED AS MARKED BICYCLE LANE.

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Revisions		Verified	Date
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Quality Certification
Design: AW Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
RPEQ:

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ROAD TYPE CROSS SECTIONS
URBAN ROAD - INDUSTRIAL ACCESS

Standard Drawing No.: R2008
Sheet Size: A3
Rev.:

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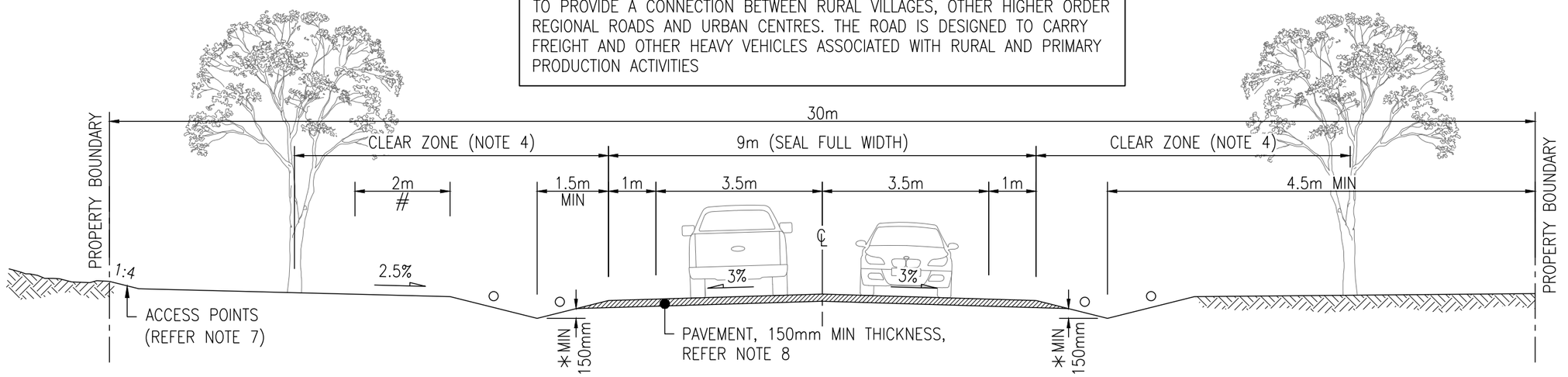
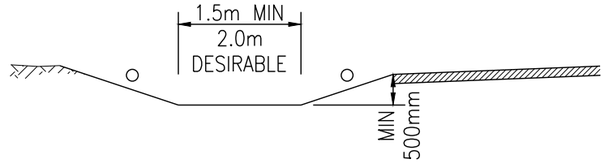
BRC(09/10)

ROAD FUNCTION

TO PROVIDE A CONNECTION BETWEEN RURAL VILLAGES, OTHER HIGHER ORDER REGIONAL ROADS AND URBAN CENTRES. THE ROAD IS DESIGNED TO CARRY FREIGHT AND OTHER HEAVY VEHICLES ASSOCIATED WITH RURAL AND PRIMARY PRODUCTION ACTIVITIES



PRINCIPAL RURAL ROAD



ALTERNATIVE FLAT BOTTOM TABLE DRAIN

LEGEND

- ○ EARTH BATTER–CUT/FILL – ROCK BATTER–CUT.
- # BERM FOR SERVICES WHERE SPECIFIED.
- * 150mm BELOW UNDERSIDE OF PAVEMENT.
- PAVEMENT DESIGN IN ACCORDANCE WITH "AUSTROADS – GUIDE TO PAVEMENT TECHNOLOGY" OR "AUSTROADS PAVEMENT DESIGN – A GUIDE TO THE STRUCTURAL DESIGN OF ROAD PAVEMENTS".

DESIGN CRITERIA	
LGIP TYPE	TRUNK
PRIORITY USERS	MOTORISTS
NOMINAL AADT	>1000 vpd
MAXIMUM LOTS/ DWELLINGS	N/A
DESIGN SPEED	100 km/h
DIRECT ACCESS	YES
LANE MARKING	YES (NOTE 9)
ROAD SURFACING.	PRIME AND 2 COAT SEAL (NOTE 13)
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 10%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 61m MINIMUM SAG 61m
HORIZONTAL CURVE RADIUS	MINIMUM 463m
SUPERELEVATION	5%
TRAFFIC LOADING	1 X 10^6 ESA

NOTES:

1. TABLE DRAINS STEEPER THAN 5% LONGITUDINAL GRADE (1:20) SHOULD HAVE EROSION PROTECTION MEASURES INSTALLED.
2. CUT AND FILL BATTER SLOPES MAY BE VARIED ON SITE TO ENSURE LONG TERM STABILITY OF BATTERS:
   ROCK BATTER – CUT 1 IN 0.5
   EARTH BATTER – CUT/ FILL:

≤ 0.5m DEEP	1 IN 6
0.5m – 1.0m DEEP	1 IN 4
1.0m – 2.0m DEEP	1 IN 3
> 2.0m DEEP	1 IN 2

   NOTE:
   - BATTER SLOPES SHOWN ARE TYPICAL AND MAY NEED TO BE VARIED TO SUIT SITE CONDITIONS.
   - SLOPES TO BE APPROVED BY COUNCIL ENGINEER.
   - FOR FILL SLOPES STEEPER THAN 1 IN 4, SAFETY BARRIERS TO BE CONSTRUCTED IN ACCORDANCE WITH AUSTROADS "GUIDE TO ROAD DESIGN–PART 6: ROADSIDE DESIGN, SAFETY AND BARRIERS".
3. MINIMUM LONGITUDINAL SLOPE OF TABLE DRAIN INVERTS SHALL BE 0.3% (1 IN 333) UNLESS APPROVED BY COUNCIL ENGINEER.
4. FLOODWAYS SHALL BE CONSTRUCTED WITH CROSS ROAD DRAINAGE.
5. UNSEALED ROADS SHALL BE DESIGNED USING PARAMETERS SET OUT IN AUSTROADS "UNSEALED ROADS MANUAL" UNLESS DIRECTED BY COUNCIL ENGINEER.
6. SEALED ROADS SHALL BE DESIGNED AS PER REQUIREMENTS OF AUSTROADS "GUIDE TO ROAD DESIGN – PART 3: GEOMETRIC DESIGN".
7. ONE ACCESS POINT TO BE CONSTRUCTED TO EACH LOT IN ACCORDANCE WITH STANDARD DRAWINGS R1012 & R1013.
8. PAVEMENT DESIGN AND SEAL TO BE SUBMITTED FOR APPROVAL BY COUNCIL ENGINEER FOR EACH APPLICATION OF OPERATIONAL WORKS.
9. LINEMARKING – CENTRE & EDGE LINE AS SET OUT IN MUTCD.
10. TABLE DRAIN MAY BE VARIED FROM "V" DRAINS TO FLAT BOTTOM WITH MIN WIDTH OF 1.0m, 2.0m DESIRABLE & SIDE SLOPES OF 1 IN 4 AS DIRECTED BY COUNCILS ENGINEER.
11. REFER TO MUTCD FOR PAVEMENT MARKING & EDGE MARKER INSTALLATIONS.
12. LOCAL ROADS OF REGIONAL SIGNIFICANCE (LRRS) ARE NOT COVERED BY THE ABOVE TABLE. CONSULT WITH COUNCIL ENGINEER.
13. IN ACCORDANCE WITH MRS11 AND PLANNING SCHEME POLICY FOR DEVELOPMENT WORKS.
14. REFER GUIDE TO ROAD DESIGN – PART 6: ROADSIDE DESIGN, SAFETY AND BARRIERS.

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Revisions		Verified	Date
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Quality Certification
Design: AW Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
RPEQ:

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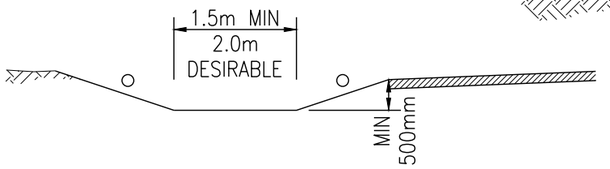
ROAD TYPE CROSS SECTIONS
RURAL ROAD - PRINCIPAL RURAL ROAD

Standard Drawing No.: R3001
Sheet Size: A3
Rev.:

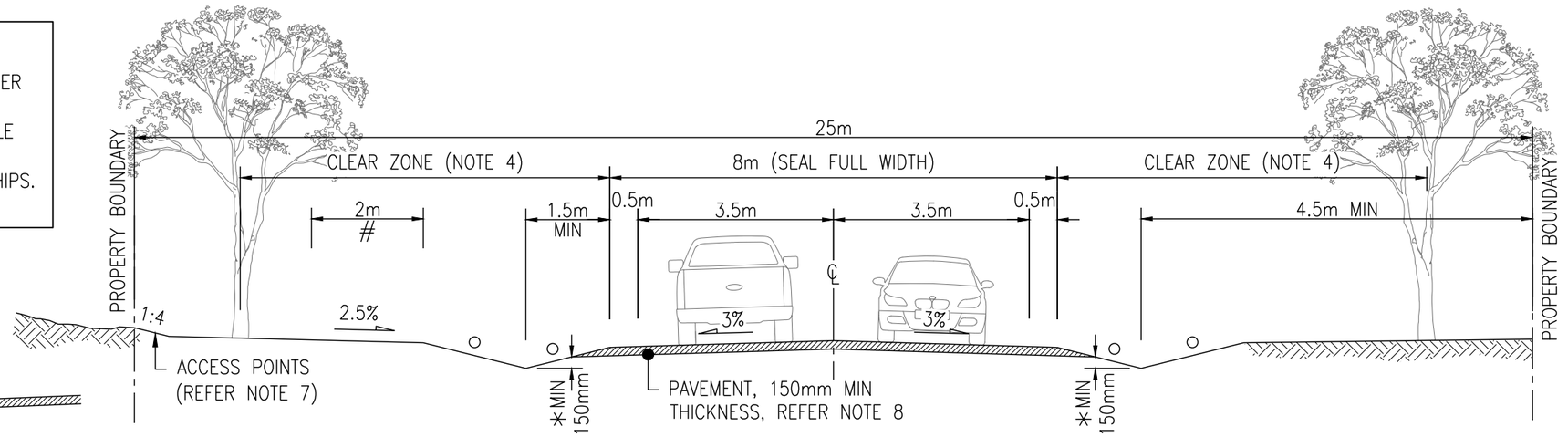
BRC(09/10)

ROAD FUNCTION

TO PROVIDE A CONNECTION BETWEEN ACCESS ROADS AND HIGHER ORDER PRINCILPAL ROADS. THE RURAL/RURAL RESIDENTIAL COLLECTOR ROADS PROVIDE A HIGHER SPEED CONNECTION WHILE THE VILLAGE/TOWNSHIP COLLECTOR ROADS ARE THE PRIMARY TRAFFIC CARRYING STREETS WITHIN RURALVILLAGES AND TOWNSHIPS. BOTH ROADS ARE DESIGNED TO CARRY HEAVY VEHICLES.



ALTERNATIVE FLAT BOTTOM TABLE DRAIN



RURAL/ RURAL RESIDENTIAL COLLECTOR ROAD
AND VILLAGE/ TOWNSHIP COLLECTOR ROAD

DESIGN CRITERIA		
ROAD TYPE	RURAL/ RURAL RESIDENTIAL COLLECTOR ROAD	VILLAGE/ TOWNSHIP COLLECTOR ROAD
LGIP TYPE	TRUNK	TRUNK
PRIORITY USERS	MOTORISTS	MOTORISTS
NOMINAL AADT	>250 <=1000 vpd	>250 <=1000 vpd
MAXIMUM LOTS/ DWELLINGS	<= 100	<= 300
DESIGN SPEED	100 km/h	60 km/h
DIRECT ACCESS	YES	YES
LANE MARKING	YES (NOTE 9)	YES (NOTE 9)
ROAD SURFACING.	PRIME AND 2 COAT SEAL (NOTE 13)	PRIME AND 2 COAT SEAL (NOTE 13)
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 10%	MINIMUM 0.3% MAXIMUM 12%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 61m MINIMUM SAG 61m	MINIMUM CREST 12m MINIMUM SAG 16m
HORIZONTAL CURVE RADIUS	MINIMUM 463m	MINIMUM 98m
SUPERELEVATION	5%	5%
TRAFFIC LOADING	5 X 10^5 ESA	3 X 10^5 ESA

LEGEND

- o EARTH BATTER–CUT/FILL – ROCK BATTER–CUT.
- # BERM FOR SERVICES WHERE SPECIFIED.
- * 150mm BELOW UNDERSIDE OF PAVEMENT.
- PAVEMENT DESIGN IN ACCORDANCE WITH "AUSTROADS – GUIDE TO PAVEMENT TECHNOLOGY" OR "AUSTROADS PAVEMENT DESIGN – A GUIDE TO THE STRUCTURAL DESIGN OF ROAD PAVEMENTS".

NOTES:

1. TABLE DRAINS STEEPER THAN 5% LONGITUDINAL GRADE (1:20) SHOULD HAVE EROSION PROTECTION MEASURES INSTALLED.
2. CUT AND FILL BATTER SLOPES MAY BE VARIED ON SITE TO ENSURE LONG TERM STABILITY OF BATTERS:
   ROCK BATTER – CUT 1 IN 0.5
   EARTH BATTER – CUT/ FILL:

≤ 0.5m DEEP	1 IN 6
0.5m – 1.0m DEEP	1 IN 4
1.0m – 2.0m DEEP	1 IN 3
> 2.0m DEEP	1 IN 2

NOTE:
- BATTER SLOPES SHOWN ARE TYPICAL AND MAY NEED TO BE VARIED TO SUIT SITE CONDITIONS.
- SLOPES TO BE APPROVED BY COUNCIL ENGINEER.
- FOR FILL SLOPES STEEPER THAN 1 IN 4, SAFETY BARRIERS TO BE CONSTRUCTED IN ACCORDANCE WITH AUSTROADS "GUIDE TO ROAD DESIGN–PART 6: ROADSIDE DESIGN, SAFETY AND BARRIERS".

3. MINIMUM LONGITUDINAL SLOPE OF TABLE DRAIN INVERTS SHALL BE 0.3% (1 IN 333) UNLESS APPROVED BY COUNCIL ENGINEER.
4. FLOODWAYS SHALL BE CONSTRUCTED WITH CROSS ROAD DRAINAGE.
5. UNSEALED ROADS SHALL BE DESIGNED USING PARAMETERS SET OUT IN AUSTROADS "UNSEALED ROADS MANUAL" UNLESS DIRECTED BY COUNCIL ENGINEER.
6. SEALED ROADS SHALL BE DESIGNED AS PER REQUIREMENTS OF AUSTROADS "GUIDE TO ROAD DESIGN – PART 3: GEOMETRIC DESIGN".
7. ONE ACCESS POINT TO BE CONSTRUCTED TO EACH LOT IN ACCORDANCE WITH STANDARD DRAWINGS R1012 & R1013.
8. PAVEMENT DESIGN AND SEAL TO BE SUBMITTED FOR APPROVAL BY COUNCIL ENGINEER FOR EACH APPLICATION OF OPERATIONAL WORKS.
9. LINEMARKING – CENTRE & EDGE LINE AS SET OUT IN MUTCD.
10. TABLE DRAIN MAY BE VARIED FROM "V" DRAINS TO FLAT BOTTOM WITH MIN WIDTH OF 1.0m, 2.0m DESIRABLE & SIDE SLOPES OF 1 IN 4 AS DIRECTED BY COUNCILS ENGINEER.
11. REFER TO MUTCD FOR PAVEMENT MARKING & EDGE MARKER INSTALLATIONS.
12. LOCAL ROADS OF REGIONAL SIGNIFICANCE (LRRS) ARE NOT COVERED BY THE ABOVE TABLE. CONSULT WITH COUNCIL ENGINEER.
13. IN ACCORDANCE WITH MRS11 AND PLANNING SCHEME POLICY FOR DEVELOPMENT WORKS.
14. REFER GUIDE TO ROAD DESIGN – PART 6: ROADSIDE DESIGN, SAFETY AND BARRIERS.

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Quality Certification
Design: AW Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
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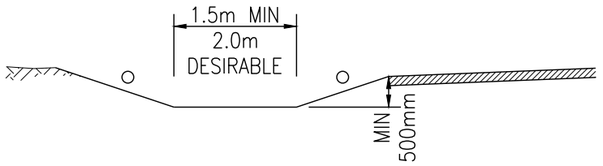
ROAD TYPE CROSS SECTIONS
RURAL ROAD - COLLECTOR ROADS

Standard Drawing No.: R3002
Sheet Size: A3
Rev.:

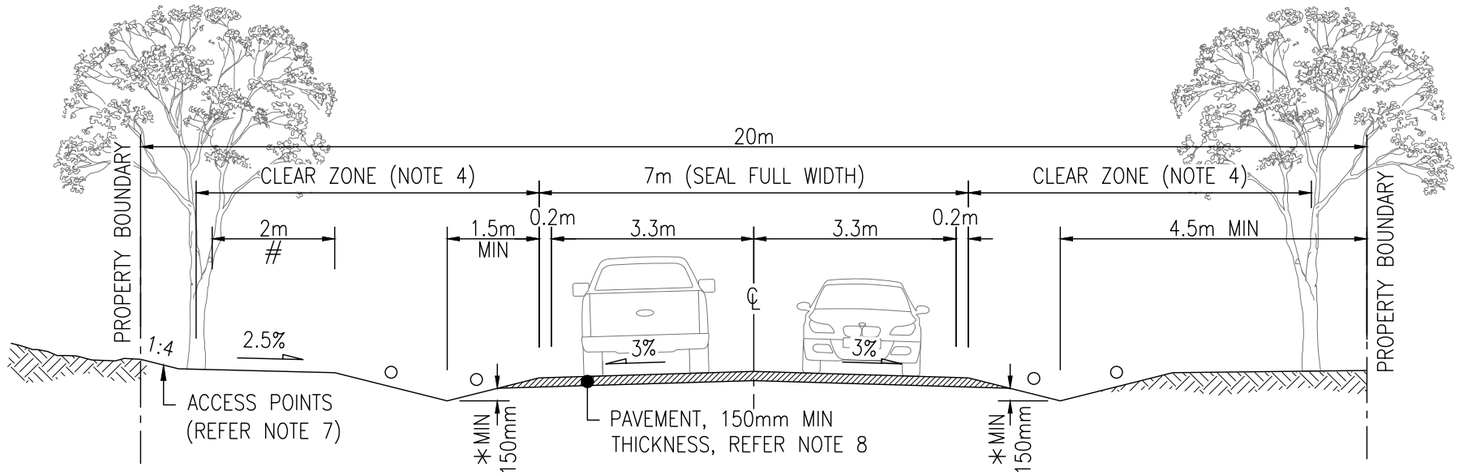
BRC(09/10)

ROAD FUNCTION

TO PROVIDE DIRECT ACCESS TO PROPERTIES IN RURAL, RUAL RESIDENTIAL VILLAGES AND TOWNSHIPS. FOR VILLAGE/TOWNSHIPS ACCESS ROADS CYCLISTS AND MOTORISTS SHARE THE AVAILABLE SPACE IN A LOW SPEED ENVIRONMENT.



ALTERNATIVE FLAT BOTTOM TABLE DRAIN



RURAL/ RURAL RESIDENTIAL ACCESS ROAD
AND VILLAGE/ TOWNSHIP ACCESS ROAD

DESIGN CRITERIA		
ROAD TYPE	RURAL/ RURAL RESIDENTIAL ACCESS ROAD	VILLAGE/ TOWNSHIP ACCESS ROAD
LGIP TYPE	NON–TRUNK	NON–TRUNK
PRIORITY USERS	MOTORISTS	CYCLISTS AND MOTORISTS
NOMINAL AADT	<=250 vpd	<=250 vpd
MAXIMUM LOTS/ DWELLINGS	<= 35	<= 35
DESIGN SPEED	80 km/h	50 km/h
DIRECT ACCESS	YES	YES
LANE MARKING	YES (NOTE 9)	YES (NOTE 9)
ROAD SURFACING.	PRIME AND 2 COAT SEAL (NOTE 13)	PRIME AND 2 COAT SEAL (NOTE 13)
LONGITUDINAL GRADE	MINIMUM 0.3% MAXIMUM 12%	MINIMUM 0.3% MAXIMUM 12%
VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER "GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN" (AUSTROADS 2010)	MINIMUM CREST 30m MINIMUM SAG 28m	MINIMUM CREST 7m MINIMUM SAG 11m
HORIZONTAL CURVE RADIUS	MINIMUM 240m	MINIMUM 56m
SUPERELEVATION	5%	NIL
TRAFFIC LOADING	3 X 10^5 ESA	3 X 10^5 ESA

LEGEND

- o EARTH BATTER–CUT/FILL – ROCK BATTER–CUT.
- # BERM FOR SERVICES WHERE SPECIFIED.
- ∗ 150mm BELOW UNDERSIDE OF PAVEMENT.
- PAVEMENT DESIGN IN ACCORDANCE WITH "AUSTROADS – GUIDE TO PAVEMENT TECHNOLOGY" OR "AUSTROADS PAVEMENT DESIGN – A GUIDE TO THE STRUCTURAL DESIGN OF ROAD PAVEMENTS".

NOTES:

1. TABLE DRAINS STEEPER THAN 5% LONGITUDINAL GRADE (1:20) SHOULD HAVE EROSION PROTECTION MEASURES INSTALLED.
2. CUT AND FILL BATTER SLOPES MAY BE VARIED ON SITE TO ENSURE LONG TERM STABILITY OF BATTERS:
   ROCK BATTER – CUT 1 IN 0.5
   EARTH BATTER – CUT/ FILL:

≤ 0.5m DEEP	1 IN 6
0.5m – 1.0m DEEP	1 IN 4
1.0m – 2.0m DEEP	1 IN 3
> 2.0m DEEP	1 IN 2

NOTE:
- BATTER SLOPES SHOWN ARE TYPICAL AND MAY NEED TO BE VARIED TO SUIT SITE CONDITIONS.
- SLOPES TO BE APPROVED BY COUNCIL ENGINEER.
- FOR FILL SLOPES STEEPER THAN 1 IN 4, SAFETY BARRIERS TO BE CONSTRUCTED IN ACCORDANCE WITH AUSTROADS "GUIDE TO ROAD DESIGN–PART 6: ROADSIDE DESIGN, SAFETY AND BARRIERS".

3. MINIMUM LONGITUDINAL SLOPE OF TABLE DRAIN INVERTS SHALL BE 0.3% (1 IN 333) UNLESS APPROVED BY COUNCIL ENGINEER.
4. FLOODWAYS SHALL BE CONSTRUCTED WITH CROSS ROAD DRAINAGE.
5. UNSEALED ROADS SHALL BE DESIGNED USING PARAMETERS SET OUT IN AUSTROADS "UNSEALED ROADS MANUAL" UNLESS DIRECTED BY COUNCIL ENGINEER.
6. SEALED ROADS SHALL BE DESIGNED AS PER REQUIREMENTS OF AUSTROADS "GUIDE TO ROAD DESIGN – PART 3: GEOMETRIC DESIGN".
7. ONE ACCESS POINT TO BE CONSTRUCTED TO EACH LOT IN ACCORDANCE WITH STANDARD DRAWINGS R1012 & R1013.
8. PAVEMENT DESIGN AND SEAL TO BE SUBMITTED FOR APPROVAL BY COUNCIL ENGINEER FOR EACH APPLICATION OF OPERATIONAL WORKS.
9. LINEMARKING – CENTRE & EDGE LINE AS SET OUT IN MUTCD.
10. TABLE DRAIN MAY BE VARIED FROM "V" DRAINS TO FLAT BOTTOM WITH MIN WIDTH OF 1.0m, 2.0m DESIRABLE & SIDE SLOPES OF 1 IN 4 AS DIRECTED BY COUNCILS ENGINEER.
11. REFER TO MUTCD FOR PAVEMENT MARKING & EDGE MARKER INSTALLATIONS.
12. LOCAL ROADS OF REGIONAL SIGNIFICANCE (LRRS) ARE NOT COVERED BY THE ABOVE TABLE. CONSULT WITH COUNCIL ENGINEER.
13. IN ACCORDANCE WITH MRS11 AND PLANNING SCHEME POLICY FOR DEVELOPMENT WORKS.
14. REFER GUIDE TO ROAD DESIGN – PART 6: ROADSIDE DESIGN, SAFETY AND BARRIERS.

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Revisions	Verified	Date
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Quality Certification
Design: AW Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
RPEQ:

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ROAD TYPE CROSS SECTIONS
RURAL ROAD - ACCESS ROADS

Standard Drawing No.: R3003
Sheet Size: A3
Rev.:

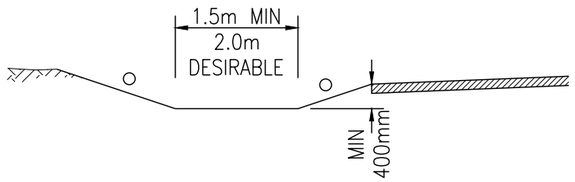
BRC(09/10)

ROAD FUNCTION

TO PROVIDE A RURAL LOW TRAFFIC VOLUME CONNECTION RURAL/RURAL RESIDENTIAL PROPEERTIES AND HIGHER ORDER SEALED ROADS.

DESIGN CRITERIA			
ROAD TYPE	UNSEALED MINOR RURAL ROAD	UNSEALED LOCAL ACCESS ROAD	UNSEALED RURAL TRACK
LGIP TYPE	NON–TRUNK	NON–TRUNK	NON–TRUNK
PRIORITY USERS	MOTORISTS	MOTORISTS	MOTORISTS
NOMINAL AADT	>50 <=150 vpd	>10 <=50 vpd	<=10 vpd
MAXIMUM LOTS/ DWELLINGS	>7 <=20	>2 <=7	<2
DESIGN SPEED	80 km/h	60 km/h	60 km/h
DIRECT ACCESS	YES	YES	YES

ALTERNATIVE FLAT BOTTOM TABLE DRAIN



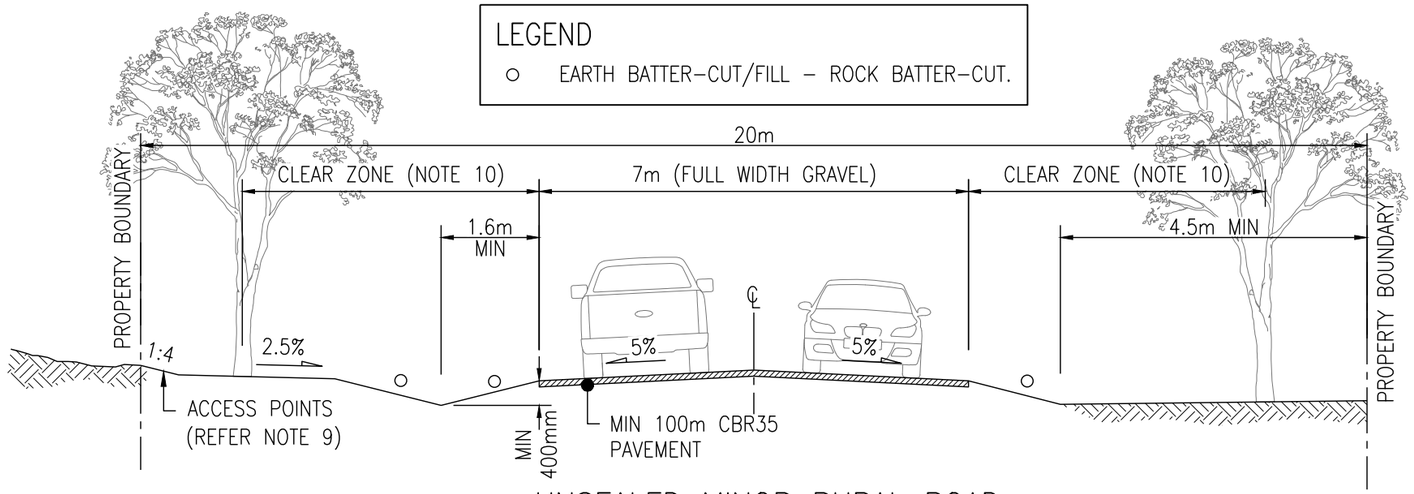
NOTES:

1. UNSEALED ROADS ARE FOR NON–COMMERCIAL USE ONLY AND ARE ONLY TO BE USED WHERE APPROVAL HAS BEEN GIVEN BY COUNCIL ENGINEER.
2. UNSEALED ROADS SHALL BE DESIGNED USING PARAMETERS SET OUT IN AUSTROADS "UNSEALED ROADS MANUAL" UNLESS DIRECTED BY COUNCIL ENGINEER.
3. TABLE DRAINS STEEPER THAN 5% LONGITUDINAL GRADE (1:20) SHOULD HAVE EROSION PROTECTION MEASURES INSTALLED.
4. MINIMUM LONGITUDINAL SLOPE OF TABLE DRAIN INVERTS SHALL BE 0.3% (1 IN 333) UNLESS APPROVED BY COUNCIL ENGINEER.
5. CUT AND FILL BATTER SLOPES GENERALLY TO BE 1 IN 4 BUT MAY BE VARIED ON SITE TO ENSURE LONG TERM STABILITY OF BATTERS:
   ROCK BATTER–CUT 1 IN 0.5
   EARTH BATTER–CUT/FILL:
   ≤ 0.5m DEEP 1 IN 6
   0.5m–1.0m DEEP 1 IN 4
   1.0m–2.0m DEEP 1 IN 3

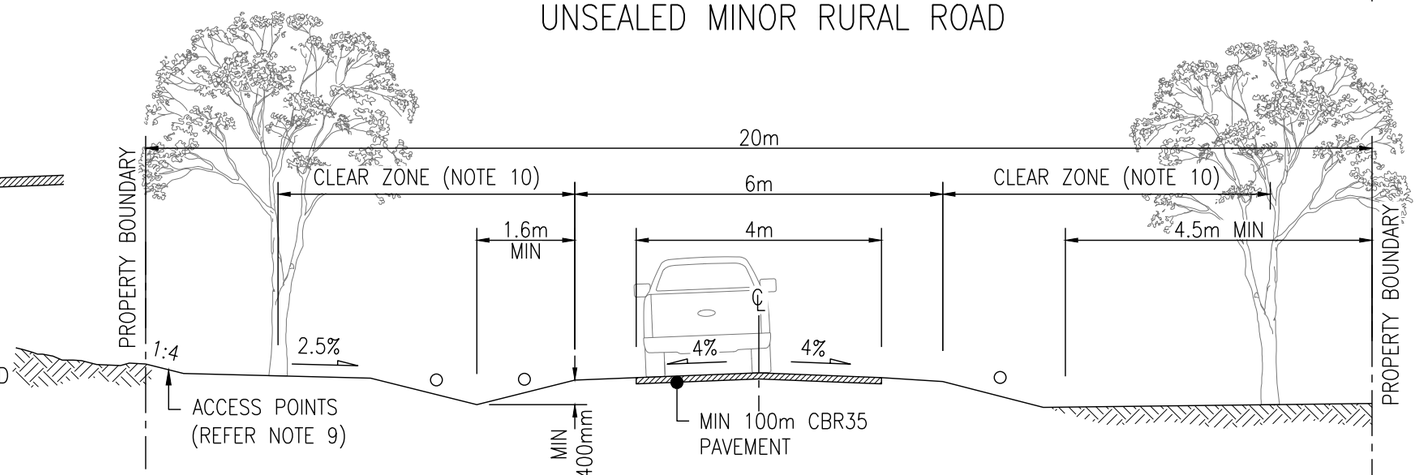
   NOTE:
   - BATTER SLOPES SHOWN ARE TYPICAL AND MAY NEED TO BE VARIED TO SUIT SITE CONDITIONS.
   - FINAL BATTER SLOPES TO BE APPROVED BY COUNCIL ENGINEER.
6. TABLE DRAINS TO BE TURNED OUT AS DIRECTED TO RETURN FLOWS TO OVERLAND FLOW PATHS.
7. TABLE DRAIN MAY BE VARIED FROM "V" DRAINS TO FLAT BOTTOM WITH MIN WIDTH OF 1m MIN, 2m DESIRABLE & SIDE SLOPES AS PER NOTE 5.
8. FLOODWAYS SHALL BE CONSTRUCTED WITH CROSS ROAD DRAINAGE.
9. ACCESS POINT TO BE CONSTRUCTED TO EACH LOT IN ACCORDANCE WITH STANDARD DRAWINGS R1012 & R1013 (UNSEALED).
10. REFER GUIDE TO ROAD DESIGN – PART 6: ROADSIDE SAFETY AND BARRIERS.

LEGEND

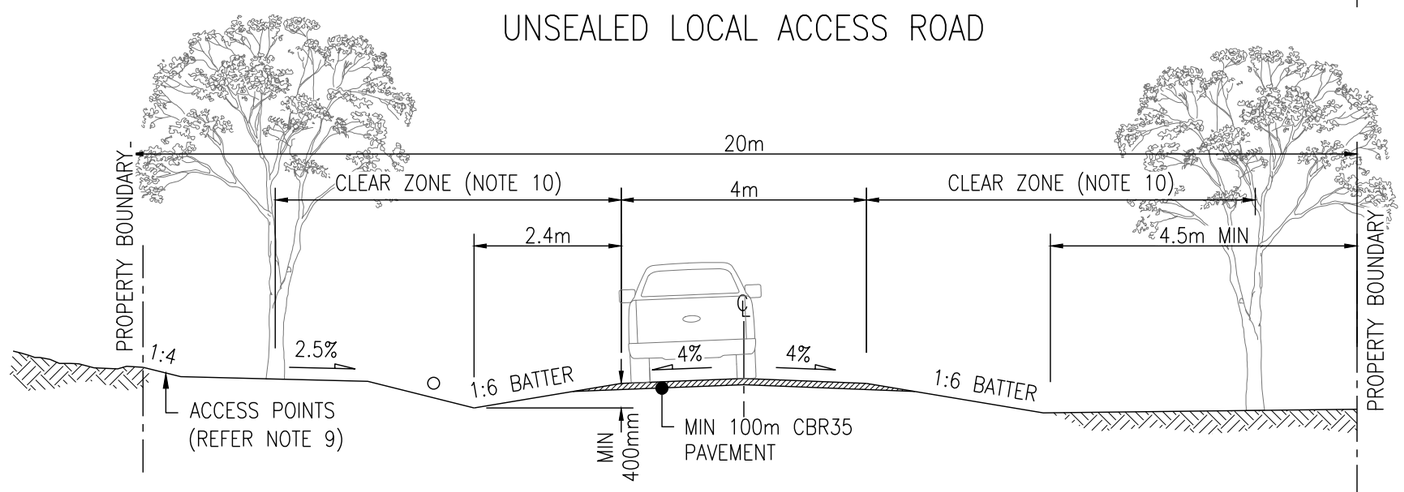
○ EARTH BATTER–CUT/FILL – ROCK BATTER–CUT.



UNSEALED MINOR RURAL ROAD



UNSEALED LOCAL ACCESS ROAD



UNSEALED RURAL TRACK

Scales	Revisions	Verified	Date
NOT TO SCALE	A Original Issue		

Quality Certification

Design: AW Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
RPEQ:

BUNDABERG REGIONAL COUNCIL

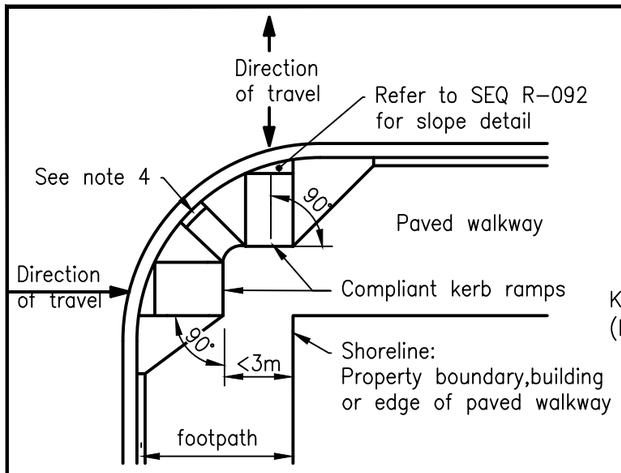
ROAD TYPE CROSS SECTIONS
RURAL ROAD - UNSEALED ROADS

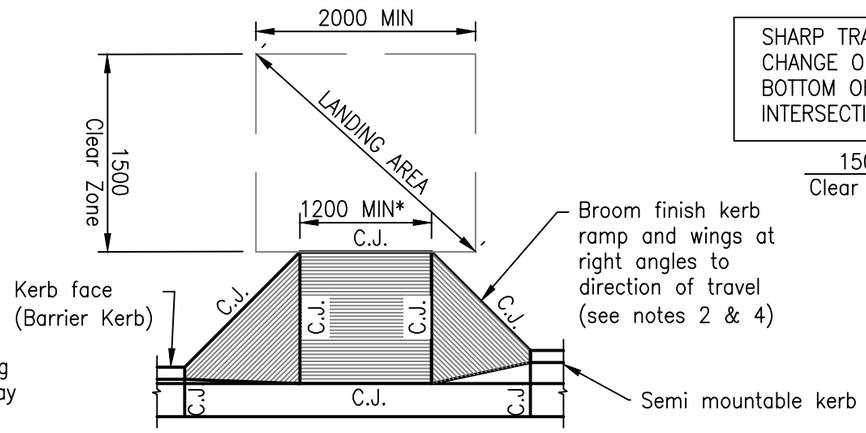
Standard Drawing No.: R3004

Sheet Size: A3

Rev.:

R:\Support Services\Design\Standards & Manuals\Standard Drawings\BRC Standard drawings\Roads\Rural Road Type Cross Sections | 18/12/2017 11:24:07 AM

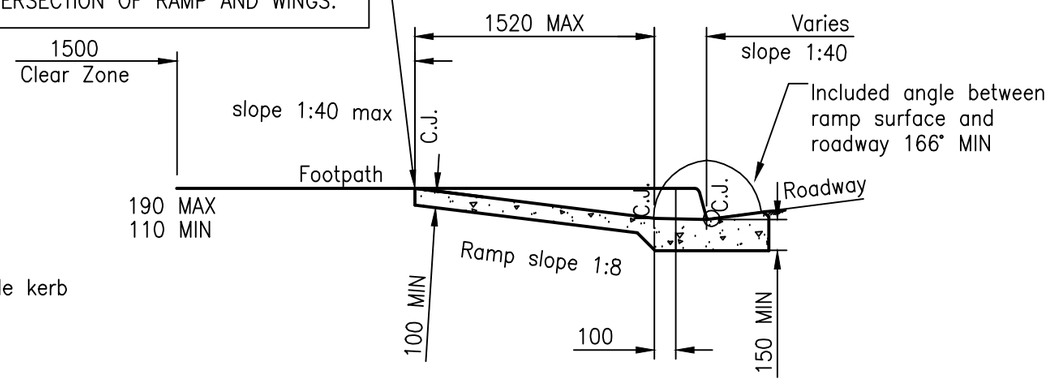




COMPLIANT KERB RAMP ALIGNMENT

SHARP TRANSITION (NO ROUNDING) AT CHANGE OF GRADE AT TOP AND BOTTOM OF RAMP AND AT INTERSECTION OF RAMP AND WINGS.

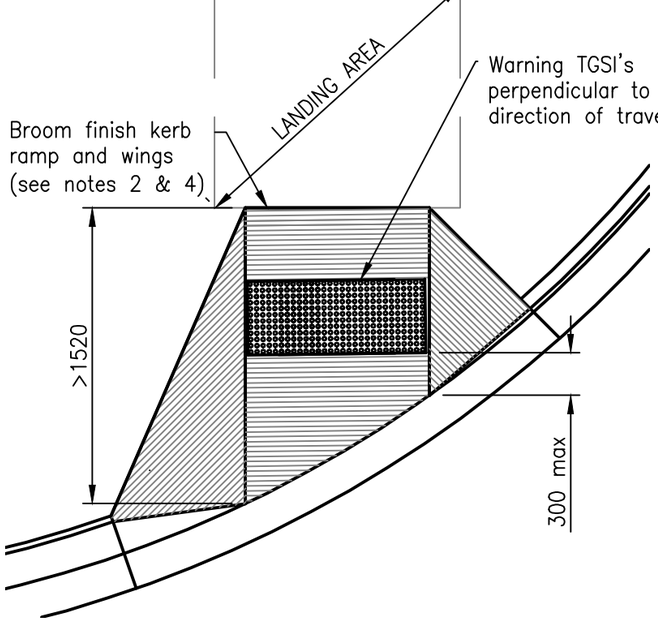
Barrier kerb shown. Details similar for semi mountable kerb



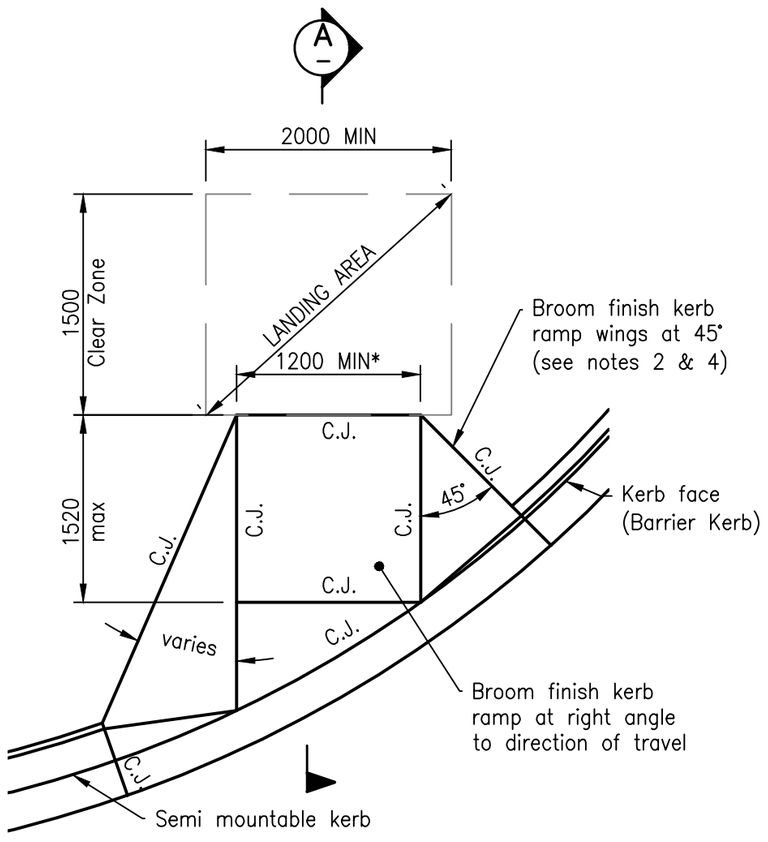
SECTION A

COMPLIANT KERB RAMP ALIGNMENT

Refer drawing SEQ R–092 for criteria where TGSI's are required.



NON–COMPLIANT KERB RAMP PLAN VIEW



COMPLIANT KERB RAMP PLAN VIEW

*Kerb ramp to be 1200 MIN. wide or as specified on construction drawings.

NOTES:

A compliant kerb ramp exists where all the following are satisfied:

1. TOP OF RAMP: There shall be a minimum obstruction free wheelchair turnaround distance of 1500 beyond the top of the ramp. The sharp transition at the top and bottom of the ramp shall be perpendicular to the direction of travel. The top of ramp landing area shall have a minimum of 2000 long by 1500 wide clear zone.
2. RAMP: Maximum ramp slope for wheelchair access shall be 1:8. A sharp transition (no rounding) is to be maintained at the intersection of graded plane surfaces (top & bottom of ramp and intersection of ramp and wings). The intersection of the ramp and wings should be a tooled joint.
3. RAMP ALIGNMENT: Ramps shall be aligned parallel to the pedestrian direction of travel. Ramps on both sides of a carriageway shall be aligned with one another and the direction of travel.
4. KERB RAMP WINGS: The required wing angle is 45°. Subject to the approval of the superintendent, wings may be angled at less than 45° if the wing is required to be clear of traffic signals hardware, other wings or utility pits/manholes. Wing angle may also be reduced at obtuse angled intersections. Wing widths shall be between 600 and 1500. A maximum slope of 1 on 4 is to be maintained on the wings at the kerb face (ie min. 600 wide wing for a 150 kerb). At least a 1 metre kerb upstand is desirable between adjacent kerb ramps wings on an intersection corner.
5. SURFACE OF RAMP and sloping sides shall be slip resistant as specified in AS/NZS 1428.1.

General:

6. CONCRETE to be Class N32/10. All concrete to be broom finished. Ramp to be cast monolithically with the channel or tray.
7. All dimensions are in millimetres unless shown otherwise.

Australian Standards:

AS 2876–2000 Concrete kerbs and channels (gutters) – Manually or Machine Placed

AS 1428.1–2009 Design for access and mobility – Part 1 General requirements for access – New building work

AS/NZS 1428.4.1–2009 Design for access and mobility – Part 4.1 Means to assist the orientation of people with vision impairment – Tactile Ground Surface Indicators

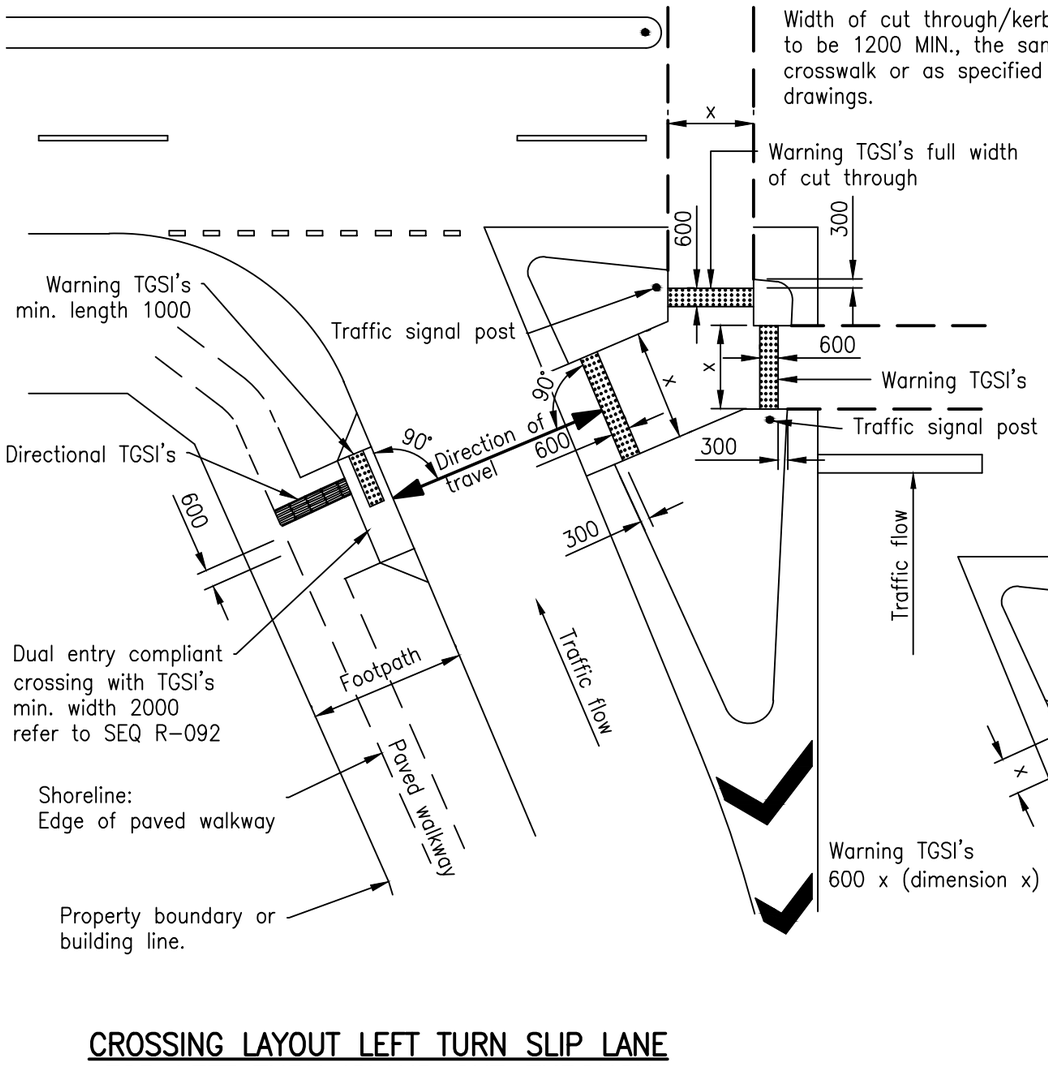
These drawings have been developed in consultation between the participating Councils.
BEFORE USE, the user shall confirm that the drawing has been adopted by the appropriate Council.

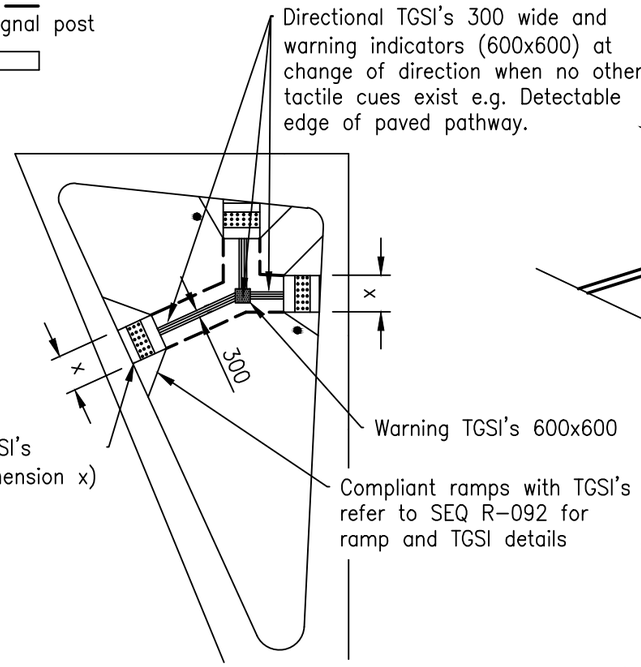
Rv.	DATE	REVISIONS
D	6/11	REVIEW
C	6/10	REVIEW
B	6/09	REVIEW
A	3/08	ORIGINAL ISSUE

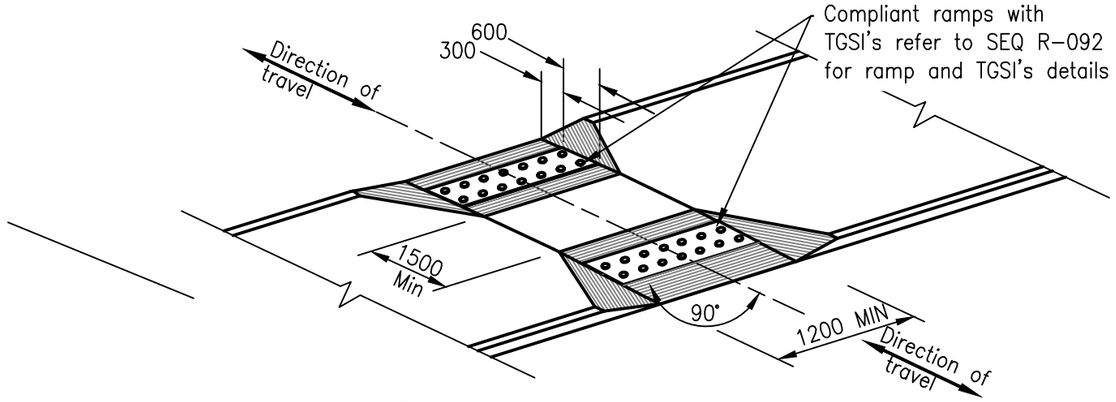
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

KERB RAMP
RAMPED PEDESTRIAN CROSSINGS

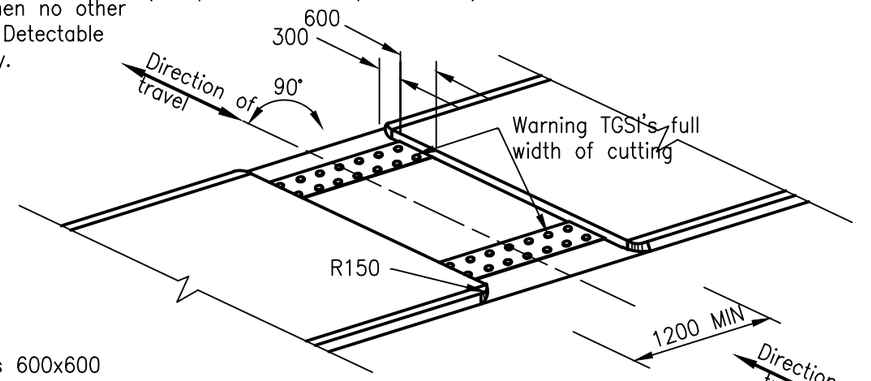
SEQ R–090



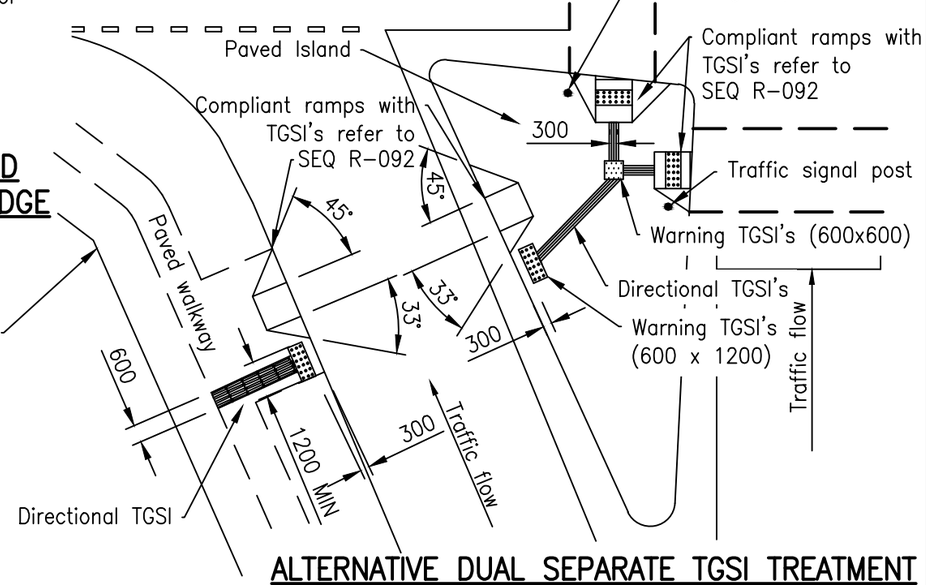




RAMPED CROSSING
(Compliant kerb ramps installed)



ISLAND CUT–THROUGH CROSSING



ALTERNATIVE DUAL SEPARATE TGSI TREATMENT ACROSS LEFT TURN SLIP LANE

ALTERNATIVE TREATMENT ACROSS LEFT TURN ISLAND KERB RAMPS WITH DIRECTIONAL TGSI OR WALKWAY EDGE

CROSSING LAYOUT LEFT TURN SLIP LANE FOR LEFT TURN ISLAND CUT–THROUGH

NOTES:

1. Ramp details and notes as for Kerb Ramps refer to SEQ R–090.
2. Tactile ground surface indicators (TGSI's) shall be in accordance with AS 1428.4.1–2009.
3. Directional TGSI's to continue to the top of kerb ramp, unless edge of paved walkway provides consistent detectable cue for pedestrians with vision impairment.
4. Cut–through islands are to be constructed parallel to the direction of travel.
5. Installation of TGSI's on ramped kerb crossings Refer to SEQ R–092 & SEQ R–093.
6. TGSI's to be provided at designated crossing points when new designs or modifications are being carried out to island or median cut throughs.
7. All dimensions are in millimetres unless shown otherwise.

REFERENCED DOCUMENTS:
Australian Standards:

AS 2876–2000 Concrete kerbs and channels (gutters) – Manually or Machine Placed
AS 1428.1–2009 Design for access and mobility – Part 1 General requirements for access – New building work
AS/NZS 1428.4.1–2009 Design for access and mobility – Part 4.1 Means to assist the orientation of people with vision impairment – Tactile Ground Surface Indicators

Rv.	DATE	REVISIONS
D	6/11	REVIEW
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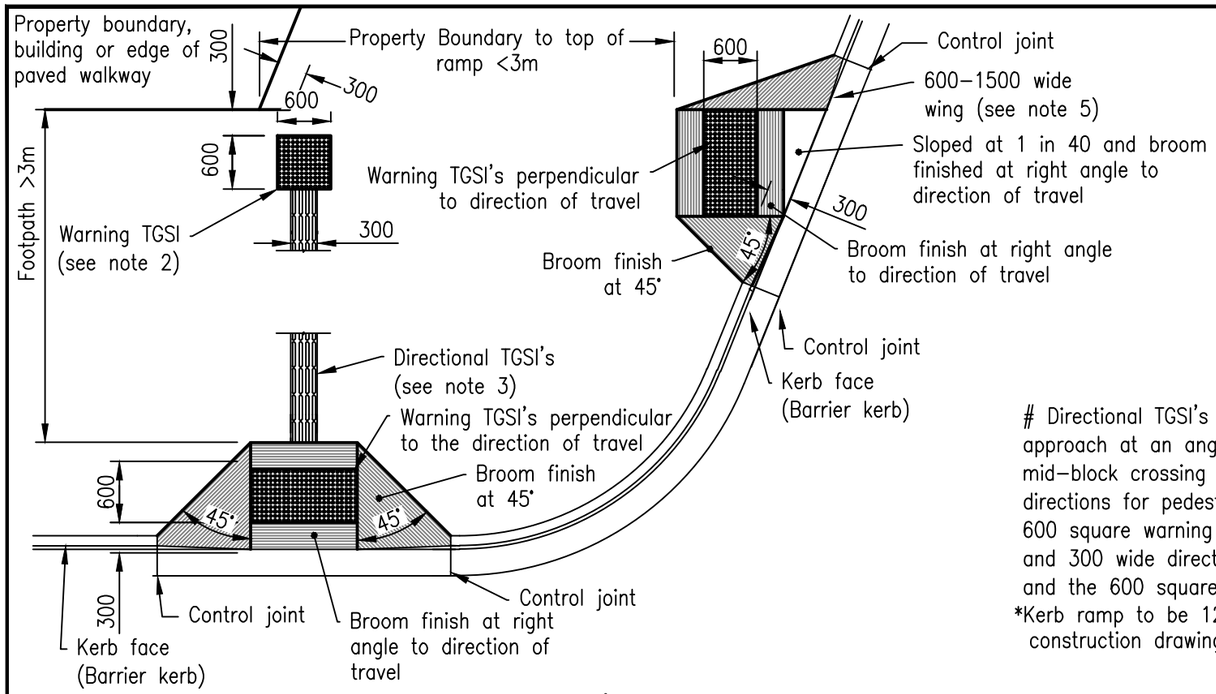
A	3/08	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

KERB RAMP
RAMPED AND CUT THROUGH TREATMENTS
FOR PEDESTRIAN CROSSINGS
SLIP LANES AND MEDIANS

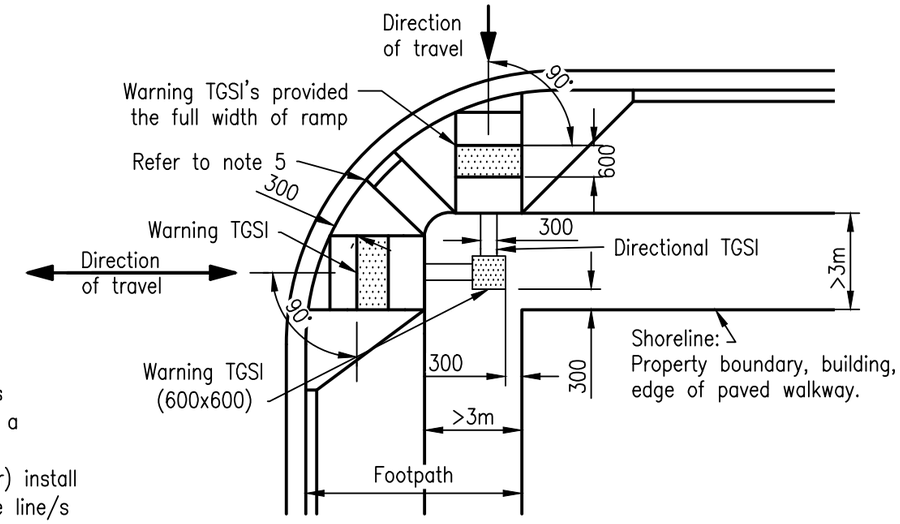
SEQ R–091



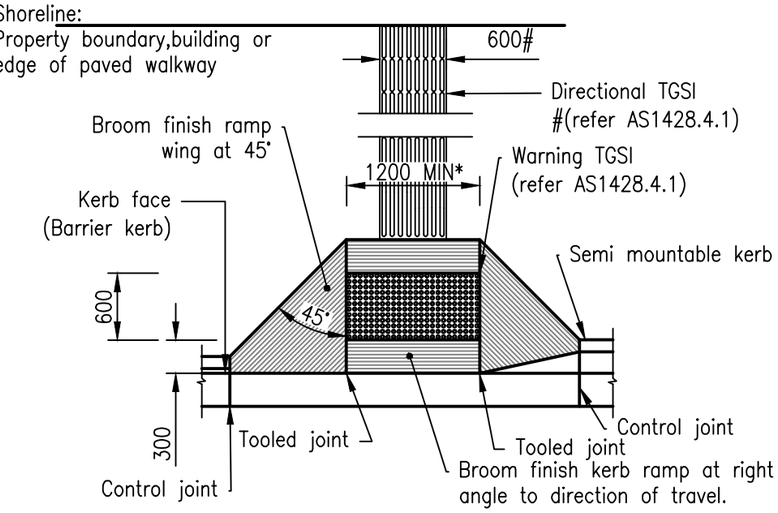
COMPLIANT KERB RAMPS AND TGSI's APPLICATION EXAMPLE PLAN VIEW

Directional TGSI's are 600 wide where pedestrians approach at an angle to the path of travel (eg at a mid–block crossing point). If there is a choice of directions for pedestrians (eg on intersection corner) install 600 square warning TGSI's pad 300 from the shore line/s and 300 wide directional TGSI's between top of kerb ramp and the 600 square warning TGSI's pad.

*Kerb ramp to be 1200 MIN. wide or as specified on construction drawings.



COMPLIANT KERB RAMP ALIGNMENT – incl. TGSI's



COMPLIANT MID BLOCK KERB RAMP – incl. TGSI's

GUIDELINES

GUIDELINES For the installation of Tactile Ground Surface Indicators (TGSI) for pedestrians with a vision impairment at ramped kerb crossings (kerb ramps):

A. Warning and directional TGSI's shall conform with AS/NZS 1428.4.1 – 2009 Design for Access and Mobility – Part 4: Tactile Indicators.

B. Tactile indicators shall have 30% minimum luminance contrast to the surrounding surfaces, and be of contrasting colour, preferably safety yellow (Golden Yellow Y14 or Sunflower Y15 – AS2700). Luminance contrast shall be achieved in all conditions (eg wet/dry, day/night). Tactile indicators and their base shall be slip resistant. Refer AS/NZS 1428.4.1–2009 for luminance contrast and slip resistance requirements.

C. Warning TGSI's shall be installed (dimensions in brackets are warning TGSI dimensions):
   a) to warn pedestrians with a vision impairment of hazards.
   b) 300 from any hazard e.g. roadway (600 deep x full width of kerb ramp, path of travel or cut through median/island)
   c) perpendicular to the direction of travel.
   d) at the intersection of 2 (or more) directional indicator strips to indicate a change of direction (600 x 600).
   e) When kerb ramp gradient is shallower than 1:8.5.

D. Directional TGSI's shall be installed (dimensions in brackets are directional TGSI dimensions):
   a) to give directional guidance to pedestrians with a vision impairment in the absence of normally available cues.
   b) along the centreline of the direction of travel.
   d) at mid–block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crossing point (600 x property boundary to top of kerb ramp).
   e) between a warning indicator pad indicating a choice of directions and the top of kerb ramps where 2 pedestrian crossings exist on a corner of an intersection.

E. The installation of TGSI should be prioritised as follows:
   a) NO TGSI's REQUIRED when all criteria at Note G are satisfied;
   b) Multiple entry kerb ramp treatment installed (Dual entry or Dual separate). Multiple entry kerb ramps must only be installed when there is sufficient space on both sides of the crossing (see AS/NZS 1428.4.1–2009 for details of multiple entry treatments);
   c) Warning TGSI on the face of a compliant kerb ramp.

F. If a warning TGSI treatment is installed, a warning TGSI treatment must be installed on the other side of the crossing.

G. TGSI's are not required at a crossing point if:
   a) a compliant kerb ramp is installed refer to SEQ R–090.
   b) the top of ramp is within 3 metres of the end of the shore line (property boundary, building line or edge of paved walkway), and
   c) the ramp is in direct continuous accessible path of travel from the shore line (property line, building line or paved walkway) orientated in terms of normally available cues.
   In these situations, a colour treatment of the full width and length of the face of the ramp may assist pedestrians with a vision impairment.

H. Examples of normally available cues that aid people with a vision impairment are:
   a) sharp transitions in grade between surfaces eg top and bottom of a 1 on 8 kerb ramp; change in grade between ramp and ramp wings.
   b) audio tactile push buttons, refer MUTCD Parts 10 and 14 for location and orientation of pedestrian push buttons. Note, an audio tactile push button alone is an insufficient cue for a pedestrian with a vision impairment to find the crossing point.
   c) a detectable edge of a paved walkway or cut through island.

NOTES:

1. For details of compliant kerb ramps refer to SEQ R–090 and SEQ R–091.
2. Warning indicators required adjacent to shoreline (property boundary) to indicate change/choice of direction.
3. Directional indicators are required from the warning indicator pad to the top of the kerb ramps.
4. Warning indicators are required on the kerb ramp to warn of the hazard (the road/traffic). Can be omitted if kerb ramp is in accordance with AS 1428.1–2009 & < 3 metres from the building line.
5. Kerb ramp wings may be angled at less than 45° if required to be clear of signals hardware, other kerb ramps or utility pits/manholes. Kerb ramp wings may also be reduced at obtuse angled intersections, wings shall have a width between 600mm and 1500mm. A maximum of 1:4 slope on kerb ramp wings should be maintained (600mm wide wing for a 150mm kerb). A 1m kerb upstand is desirable between adjacent ramp wings (which may necessitate reduced wing angles).
6. All Dimensions are in millimetres unless shown otherwise

These drawings have been developed in consultation between the participating Councils.
BEFORE USE, the user shall confirm that the drawing has been adopted by the appropriate Council.

Rv.	DATE	REVISIONS
C	6/11	REVIEW
B	6/10	REVIEW
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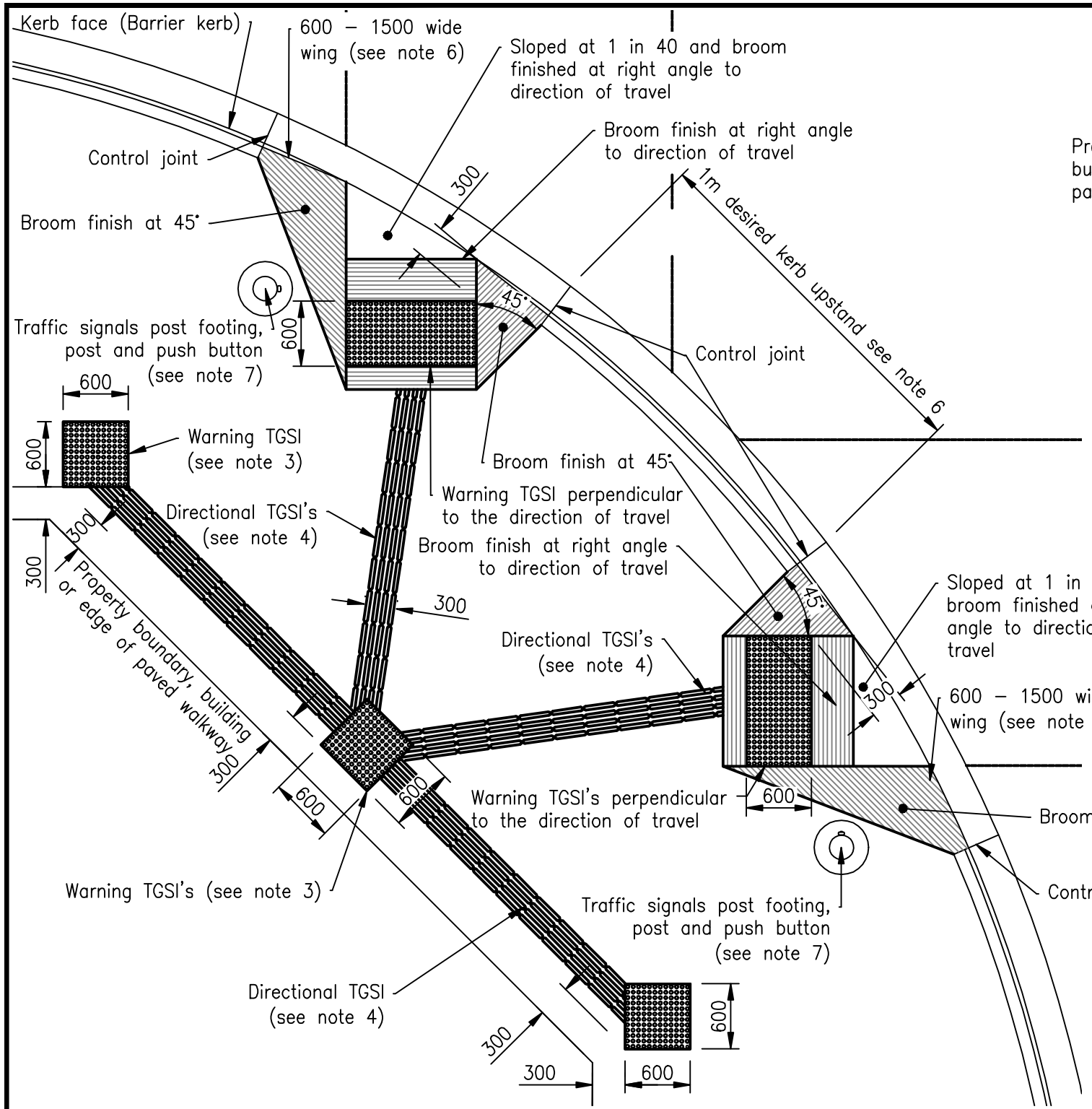
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

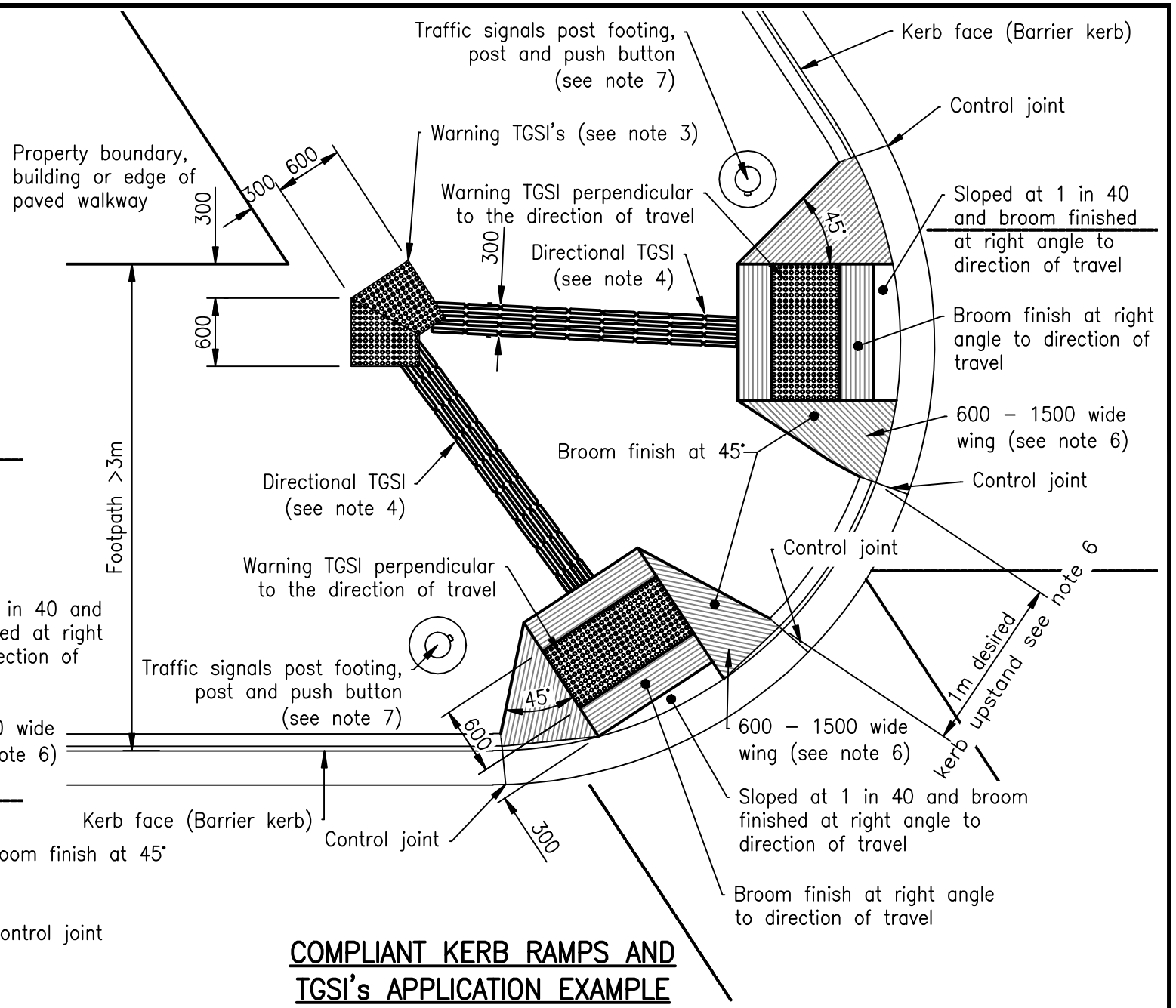
INSTALLATION OF TGSI's
ON RAMPED KERB CROSSINGS

SEQ R–092

Rv. C B A



COMPLIANT KERB RAMPS AND TGSI's APPLICATION EXAMPLE PLAN VIEW



COMPLIANT KERB RAMPS AND TGSI's APPLICATION EXAMPLE PLAN VIEW

NOTES:

1. For details of compliant kerb ramps refer to SEQ R–090.
2. For details of warning and directional TGSI's, refer to AS 1428.4.1–2009.
3. Warning indicators required adjacent to property boundary to indicate change of direction.
4. Directional indicators are required from the warning indicator pad to the top of the kerb ramps.
5. Warning indicators are required on the kerb ramp to warn of the hazard (the road/traffic)
6. Kerb ramp wings may be angled at less than 45° if required to be clear of signals hardware, other kerb ramps or utility pits/manholes. Kerb ramp wings may also be reduced at obtuse angled intersections, wings shall have a width between 600mm and 1500mm. A maximum of 1:4 slope on kerb ramp wings should be maintained (600mm wide wing for a 150mm kerb). A 1m kerb upstand is desirable between adjacent ramp wings (which may necessitate reduced wing angles).
7. For location of traffic signal posts and location and orientation of pedestrian push button assemblies refer to MUTCD Part 14. The push button post should be located on a level surface and the push button assembly located within the zone of common reach. Refer to AS 1428.2 i.e. button to be no more than 400mm outside the edge of a pathway or kerb ramp.
8. All dimensions are in millimetres unless shown otherwise.

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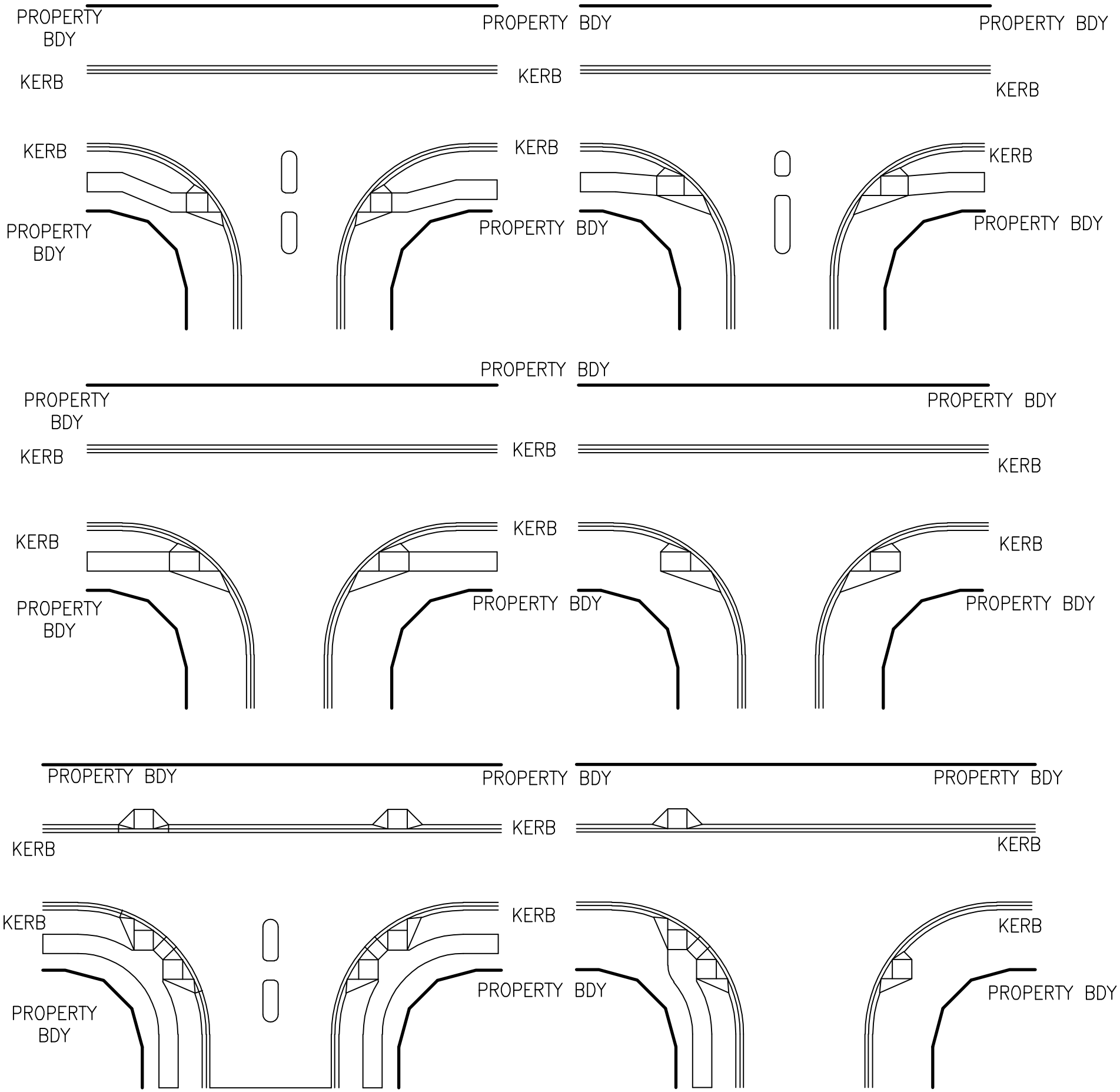
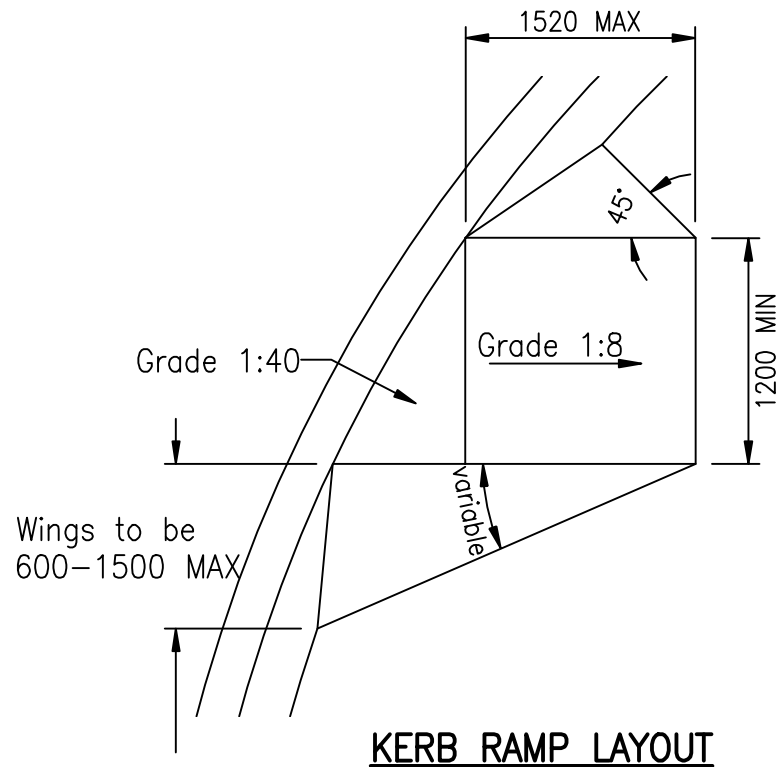
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

INSTALLATION OF TGSI's
ON RAMPED KERB CROSSINGS
APPLICATION EXAMPLES

SEQ R–093

Rv. B A





KERB RAMP LAYOUT

KERB RAMPS MUST ALWAYS ALIGN WITH THE OPPOSITE KERB RAMP & MEDIAN/ISLAND CUT THROUGHS

NOTES:

1. For details of compliant kerb ramps refer to SEQ R–090.
2. For details of warning and directional TGSI's, refer to AS1428.4.1–2009.
3. Kerb ramp wings may be angled at less than 45° if required to be clear of signals hardware, other kerb ramps or utility pits/manholes. Kerb ramp wings may also be reduced at obtuse angled intersections, wings shall have a width between 600mm and 1500mm. A maximum of 1:4 slope on kerb ramp wings should be maintained (600mm wide wing for a 150mm kerb). A 1m kerb upstand is desirable between adjacent ramp wings (which may necessitate reduced wing angles).
4. All dimensions are in millimetres unless shown otherwise.

Rv.	DATE	REVISIONS
B	6/10	REVIEW
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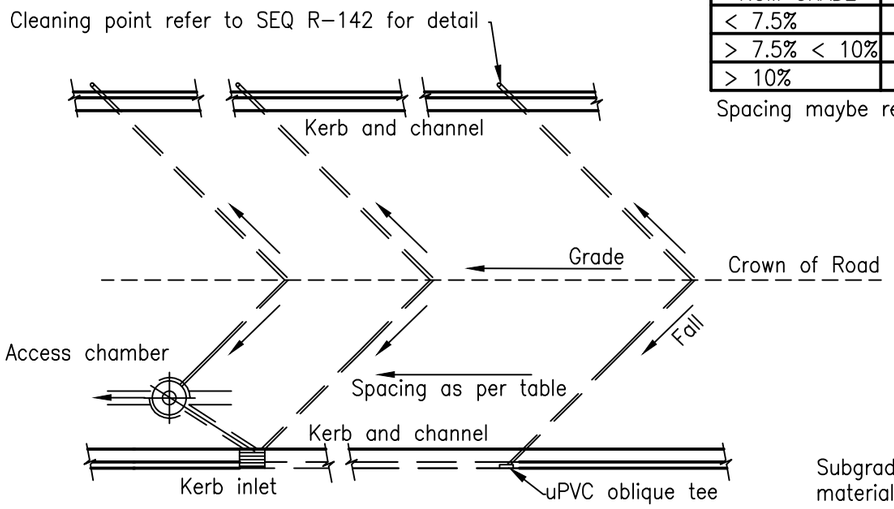
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

KERB RAMP
LOCATIONS AND CONFIGURATIONS

SEQ R–094

Rv. B A

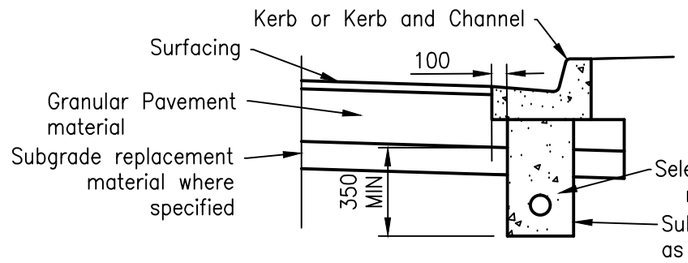


TYPICAL MITRE DRAIN LOCATIONS

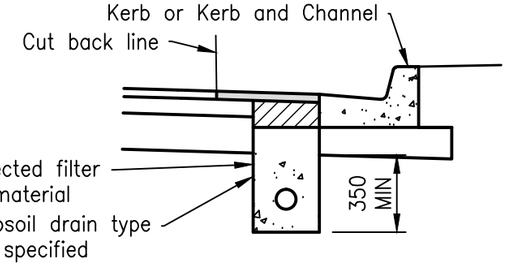
MITRE DRAIN SPACING

NOM GRADE	SPACING
< 7.5%	40m centres
> 7.5% < 10%	30m centres
> 10%	20m centres

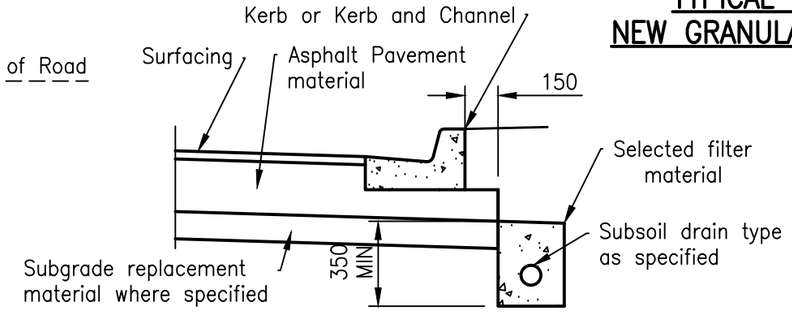
Spacing maybe reduced if required



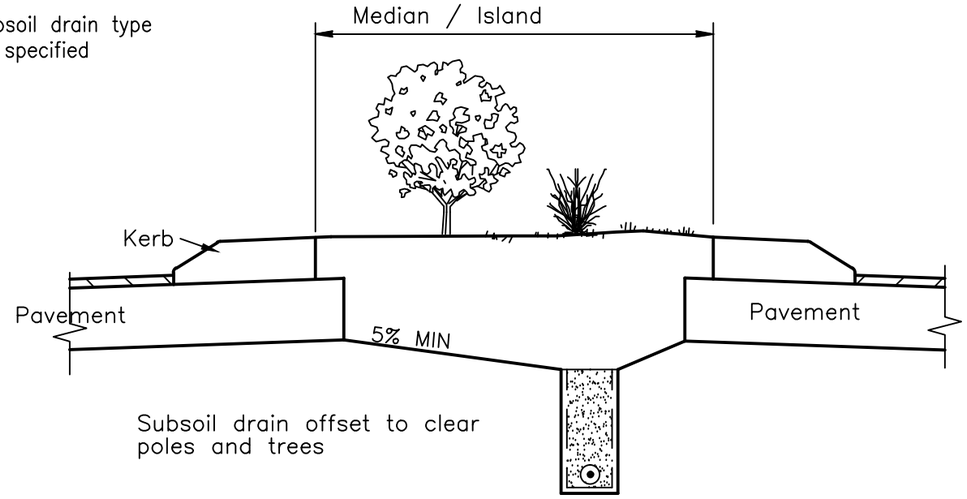
TYPICAL LOCATION NEW GRANULAR PAVEMENT



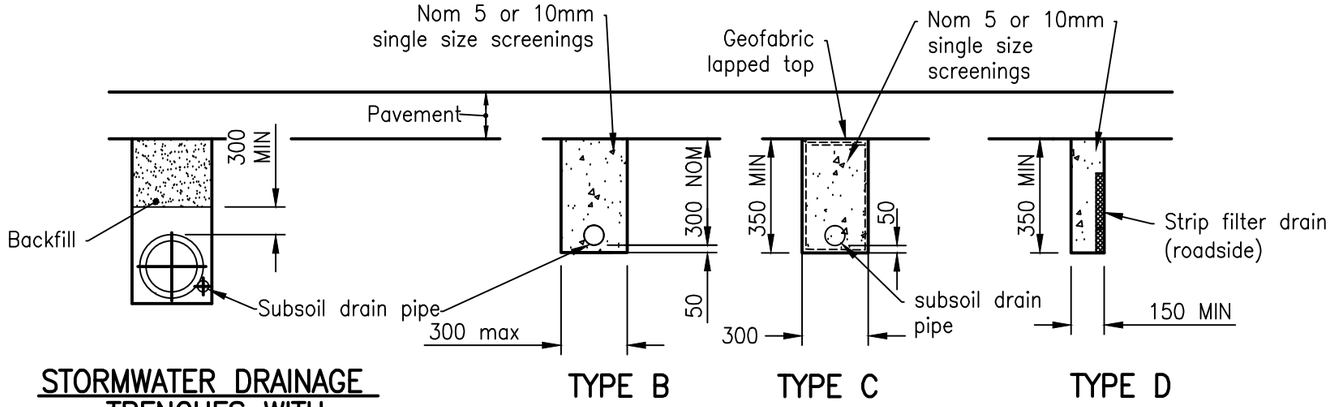
TYPICAL LOCATION WITH EXISTING K&C



TYPICAL LOCATION NEW ASPHALT PAVEMENT



ALTERNATIVE LOCATION LANDSCAPE MEDIAN



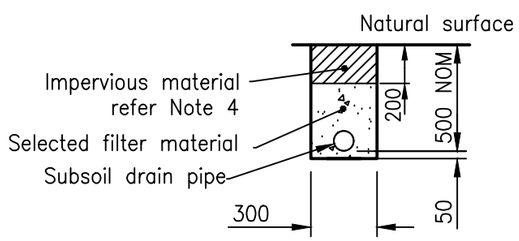
STORMWATER DRAINAGE TRENCHES WITH SUBSOIL DRAINAGE

TYPE B TYPE C TYPE D

	5mm NOM size	10mm NOM size
A.S. SIEVE SIZE	% BY WT. PASSING	% BY WT. PASSING
13.20 mm	–	100
9.50 mm	–	85 – 100
6.70 mm	100	–
4.75 mm	85 – 100	0 – 20
2.36 mm	0 – 40	0 – 5
75 µm	0 – 2	0 – 2

FILTER MATERIAL GRADING

Unless otherwise specified



TYPE E

STANDARD SUBSOIL DRAIN

NOTES:

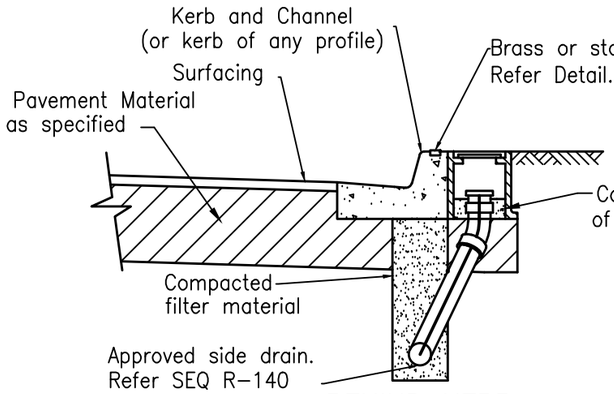
1. All subsoil drains to be Class 1000 polyethylene corrugated slotted pipe to AS 2439.1. Drains shall outlet at drainage pit, preferably or stormwater pipe 200mm above invert min. grade 0.5%, unless approved otherwise. Other pipes and fittings to be uPVC to AS 1254.
2. Filter materials not complying with the specified grading requirements may be used when approved by the relevant Council. A geofabric may be used to line trenches where approved by the relevant Council.
3. Refer to SEQ R–142 for subsoil drainage access point details.
4. Impervious material to be provided where subsoil drainage is not under a pavement. When impervious material is omitted the backfill/selected filter material shall extend to underside of pavement.
5. Subsoil drainage details shall be in accordance with DTMR specification MRTS03.
6. All dimensions are in millimetres unless shown otherwise.

Rv.	DATE	REVISIONS
D	6/11	REVIEW
C	6/10	REVIEW
B	6/09	REVIEW
A	3/09	ORIGINAL ISSUE

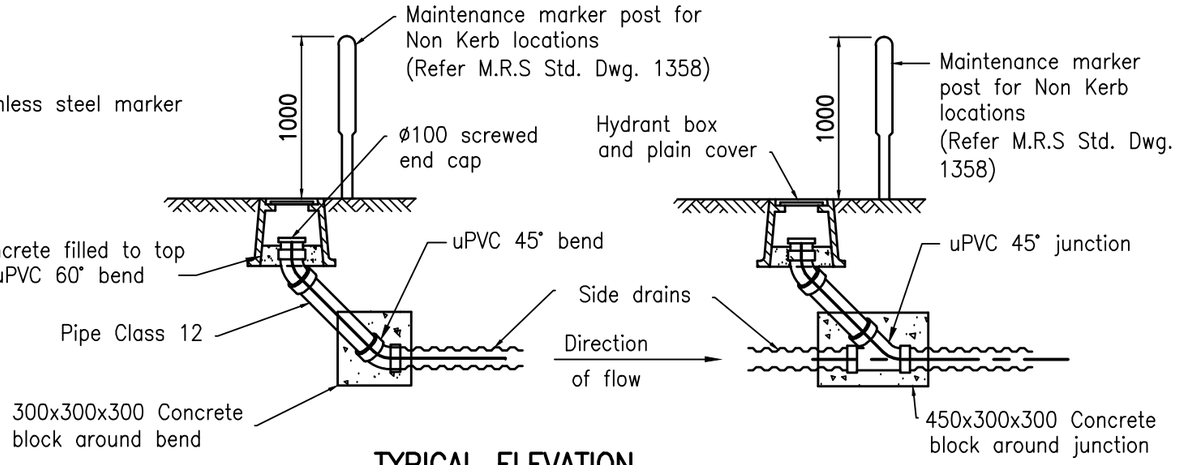
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

SUBSOIL DRAINS DETAILS AND LOCATIONS

SEQ R–140

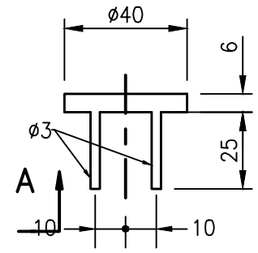


BEHIND KERB



TYPICAL ELEVATION

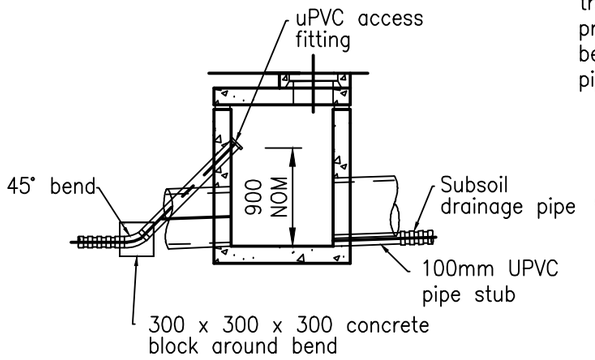
PLAN



SECTION

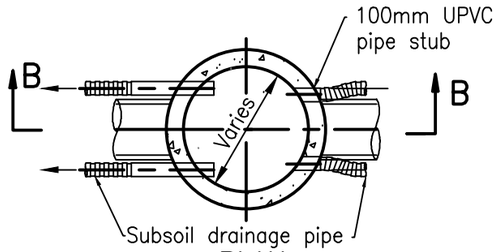
Approved propriety stainless steel markers also permitted.

BRASS MARKER DETAIL

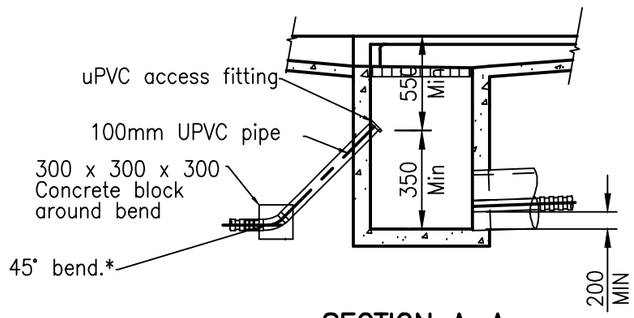


SECTION B–B

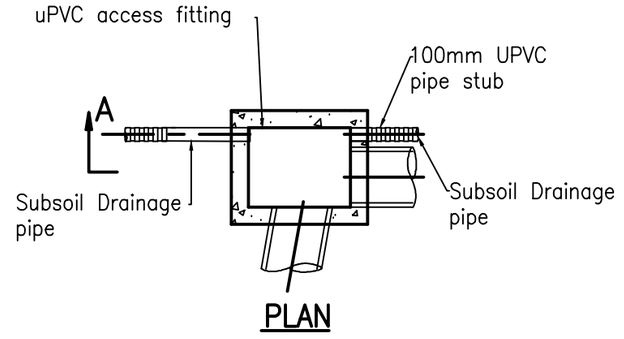
* Bend may be omitted where there is insufficient depth to the side drain trench. A min. fall of 100mm is to be provided in the connection pipe between the cap and the side drain pipe.



PLAN



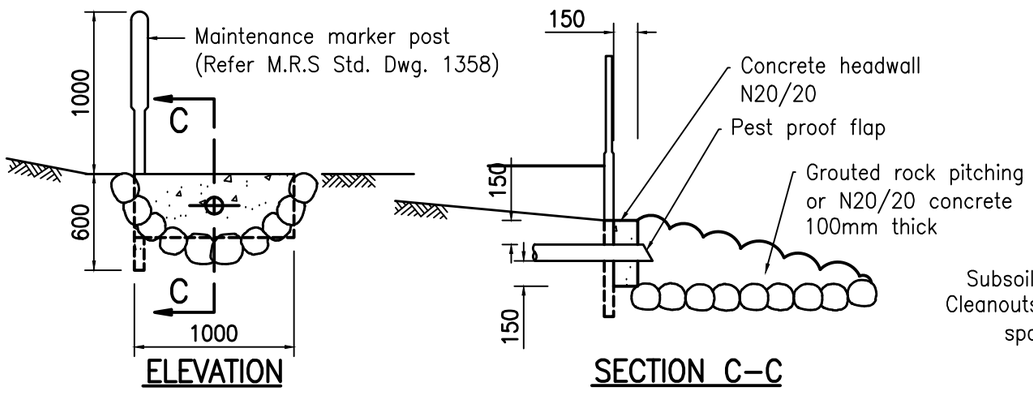
SECTION A–A



PLAN

CONNECTION DETAIL – KERB INLET

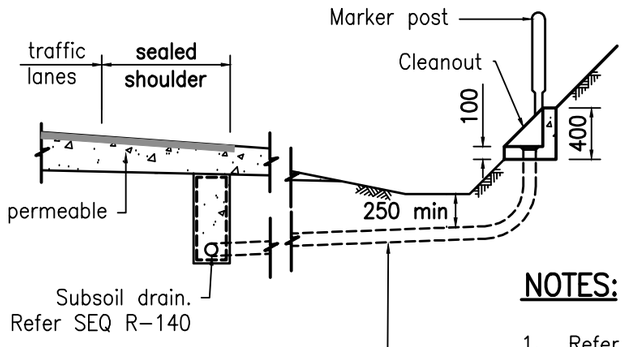
CONNECTION DETAIL – ACCESS CHAMBER



ELEVATION

SECTION C–C

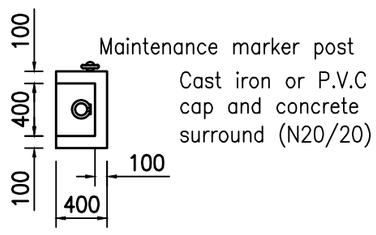
OUTLET TO NATURAL SURFACE



Subsoil drain cleanout – 100 dia drainage pipe
Cleanouts at head of pipe and at 60m maximum spacings(50m spacing for strip filter drains)

CUTTING CROSS SECTION

SUBSOIL DRAIN AND CLEANOUT



CLEANOUT

NOTES:

1. Refer to SEQ R–140 for subsoil drain details and locations.
2. All pipes and fittings other than subsoil drains to be 100 dia Class 12 pipe.
3. All subsoil drains shall be in accordance with DTMR specification MRTS03.
4. Concrete anchors to be N20 in accordance with AS 1379 and AS 3600.
5. All dimensions are in millimetres unless shown otherwise.

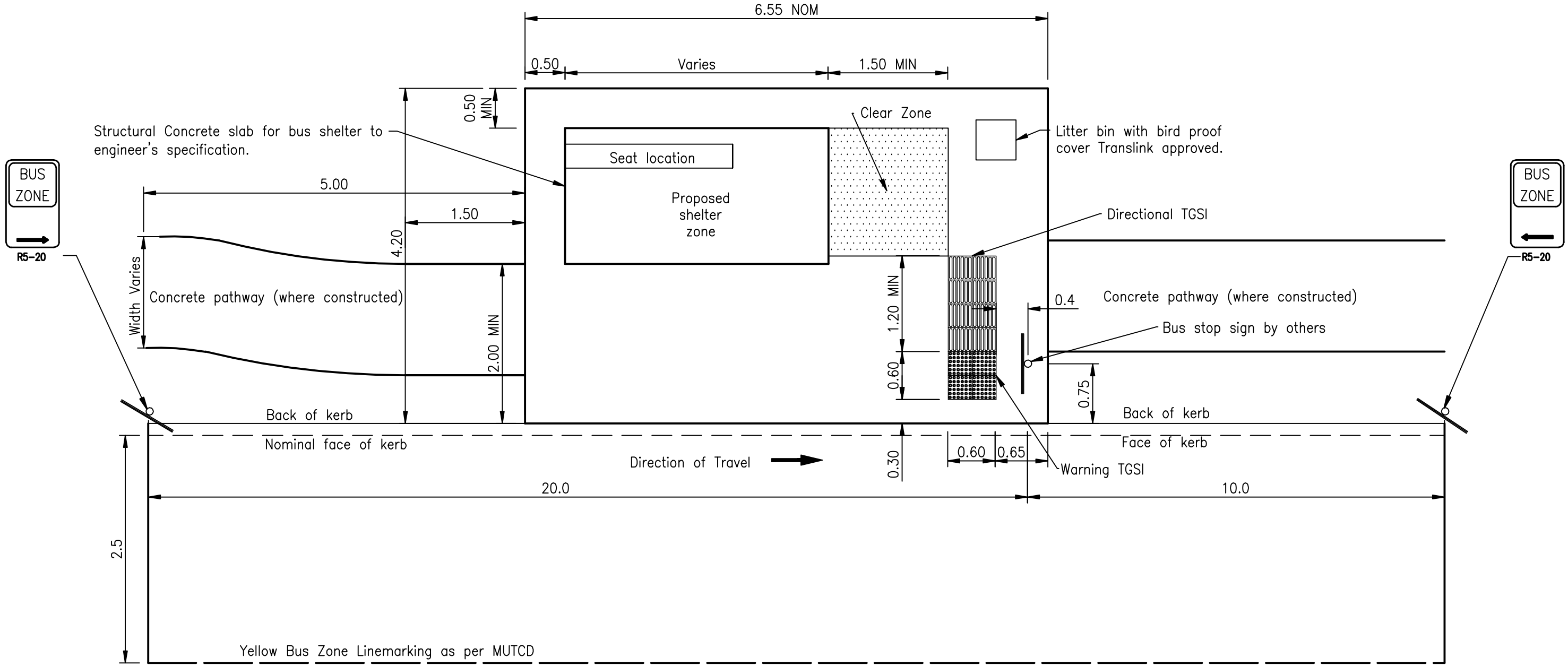
Rv.	DATE	REVISIONS
C	6/11	REVIEW
B	6/09	REVIEW
A	3/08	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

SUBSOIL DRAINS
ACCESS POINTS

SEQ R–142

Rv. C B A



DETAIL PLAN

LEGEND

Directional TGSI to AS 1428.4.1–2009 Luminance Contrast

Warning TGSI to AS 1428.4.1–2009 Luminance Contrast

NOTES:

1. Should the hardstand area (Pathway) extend beyond the bus stop area on the upstream side, a sign sleeve is to be set flush 25mm and capped, at the location of the bus stop sign as shown.
2. Refer to Translink Bus Stop guidelines – Bus layby concrete slab Dwg TL B01 to illustrate required crossfall through bus stop slab.
3. Bus shelter dimensions and pathways may vary however the layout for tactile ground surface indicators is to remain as per detail plan.
4. All dimensions are in metres unless shown otherwise.

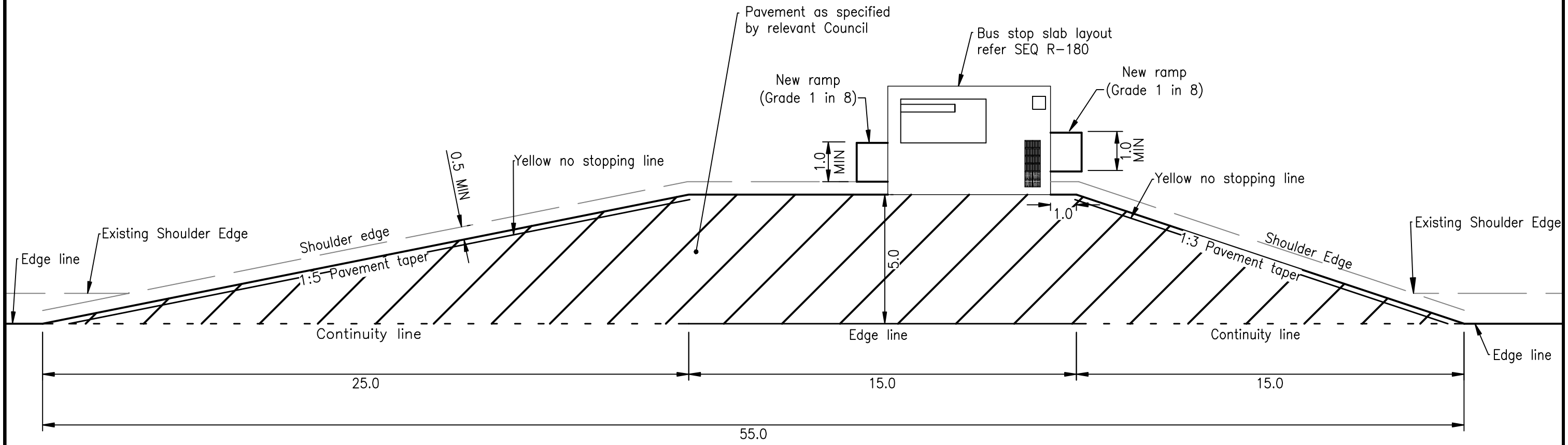
Rv.	DATE	REVISIONS
C	6/10	REVIEW
B	6/09	REVIEW
A	2/09	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

TYPICAL BUS STOP LAYOUT

SEQ R–180

Rv. C B A



PLAN

NOTES:

1. Slab height to be 150mm above road surface.
2. Slab ramps where required to be minimum width of 1.0m and accordance with AS 1428.1
3. All dimensions are in metres unless shown otherwise.

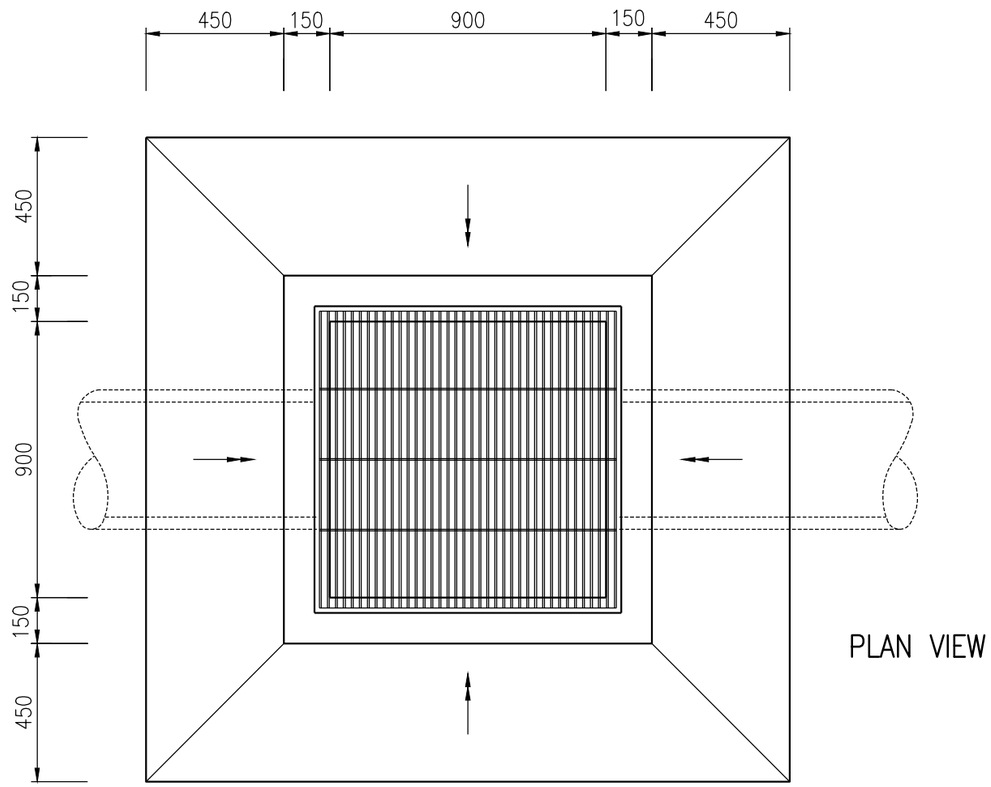
Rv.	DATE	REVISIONS
C	6/10	REVIEW
B	6/09	REVIEW
A	2/09	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

INDENTED RURAL BUSBAY

SEQ R–181

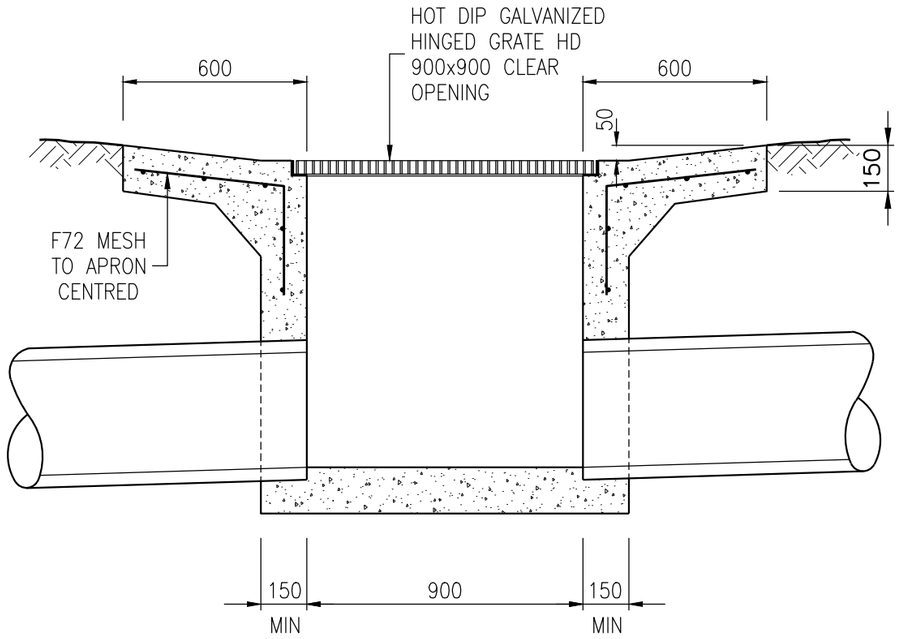
C B A Rv.



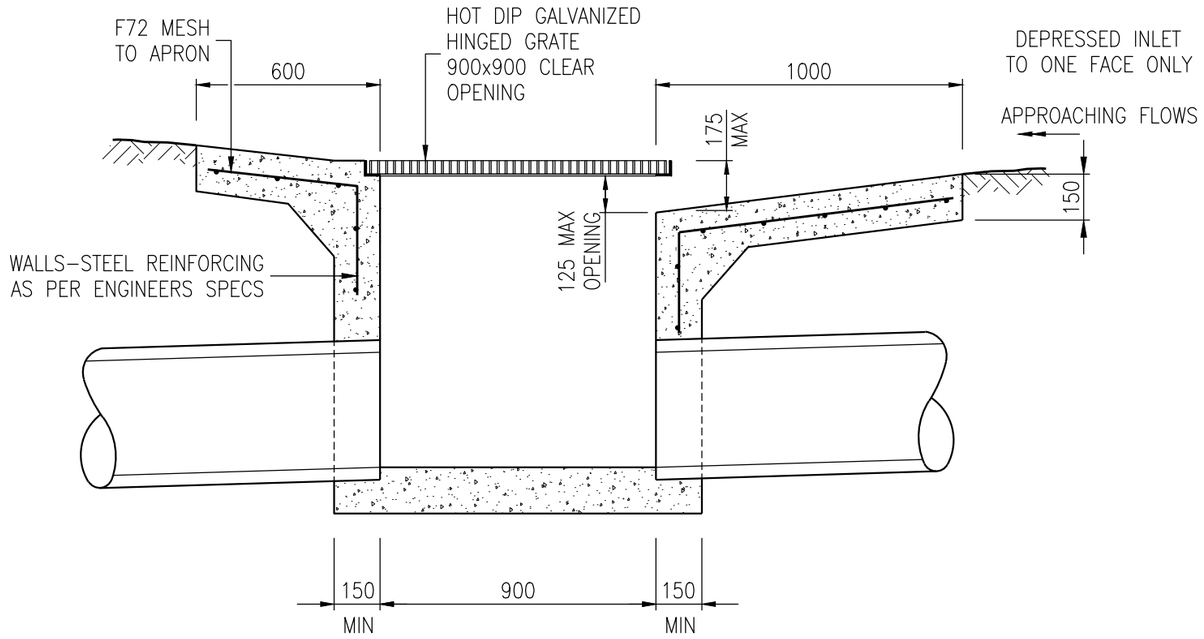
PLAN VIEW

NOTES:

1. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
2. ALL WELDS TO AS1554.
3. GRATE AND FRAME TO BE HOT DIP GALVANIZED AFTER FABRICATION TO AS1101.3.
4. REINFORCING BARS GRADE 250 TO AS1302 – 50mm COVER MIN.
5. ALL FLATS GRADE 250 TO AS3678.
6. ALL ANGLES GRADE 250 TO AS3679.
7. HEXAGONAL HEAD BOLTS TO AS1111.
   NUTS TO AS1112.
   WASHERS TO AS1237.
   GALVANIZING TO AS1214.
8. GRATE TOP TO BE DESIGNED TO WITHSTAND LOADS TO AS3996–92.
9. GRATE TOPS TO BE DESIGNED TO SUIT TO REQUIRED USE. EG. PEDESTRIAN SAFE BICYCLE SAFE.
10. LID DESIGN TO BE SUBMITTED TO COUNCIL FOR APPROVAL.
11. ALL DIMENSIONS IN MILLIMETRES.
12. BOLLARD/FENCE TO COUNCIL ENGINEER DIRECTIONS.
13. SQUARE PIT MAYBE REPLACED WITH CYLINDRICAL PIT 900mm DIAMETER.



TYPICAL FIELD INLET



TYPICAL DEPRESSED INLET

Scales	Revisions	Verified	Date
NOT TO SCALE	A Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

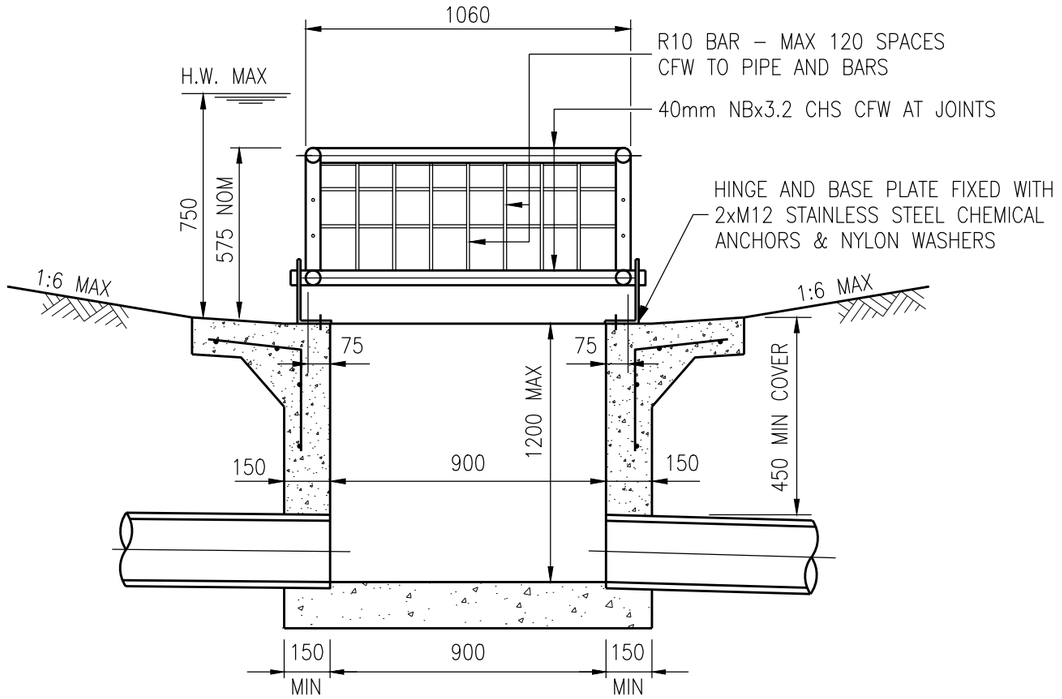
BUNDABERG REGIONAL COUNCIL

FIELD INLET
Field Inlet / Grated Gully Pit
Profiles And Dimensions

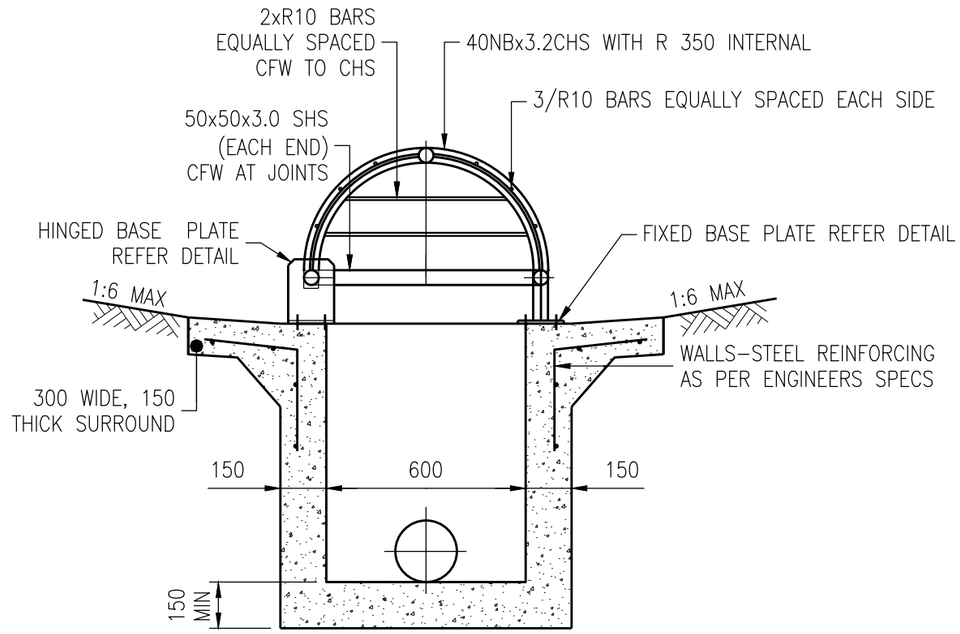
Standard Drawing No **D1001**

Sheet Size **A3**

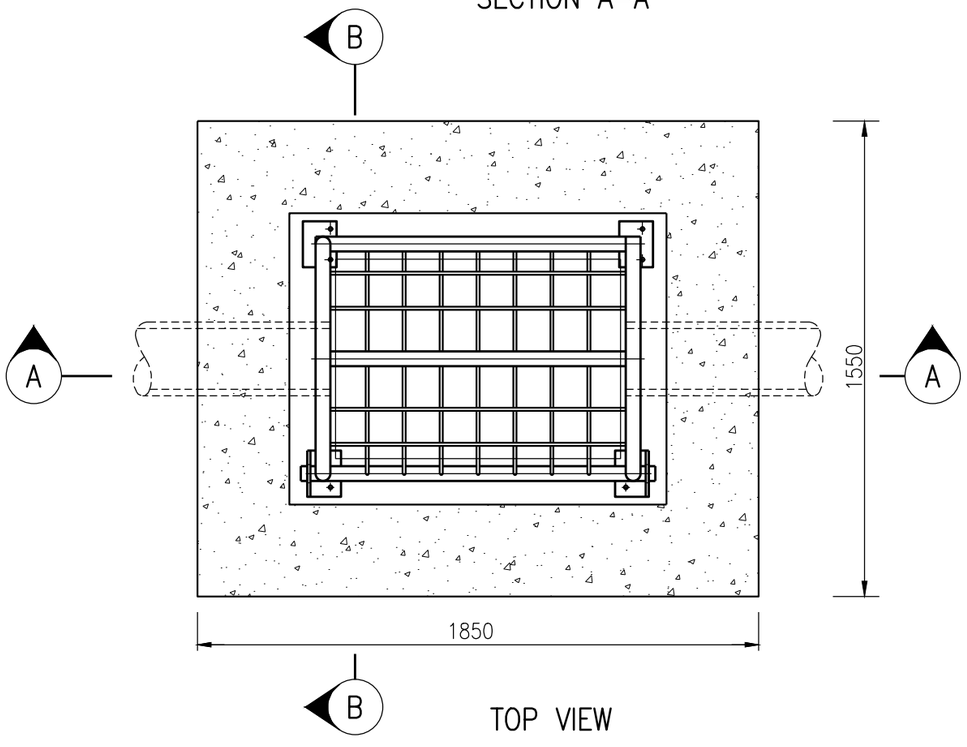
Rev



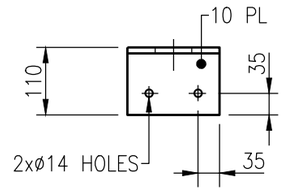
SECTION A–A



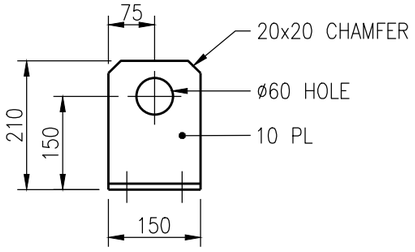
SECTION B–B



TOP VIEW

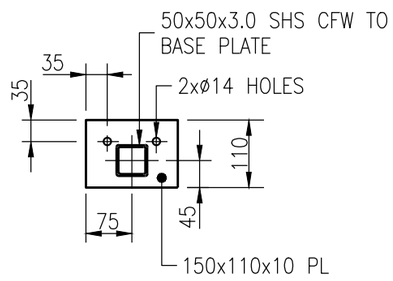


TOP VIEW



FRONT VIEW

HINGED BASE PLATE



TOP VIEW

FIXED BASE PLATE

NOTES:

1. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
2. GRATE AND HINGE TO BE HOT DIP GALVANISED AFTER FABRICATION, THEN POWDERCOATED 'DULUX – COLORBOND CAULFIELD GREEN' OR APPROVED EQUIVALENT.
3. ALL DIMENSIONS ARE IN MILLIMETRES.

Scales	Revisions	Verified	Date
NOT TO SCALE	A Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

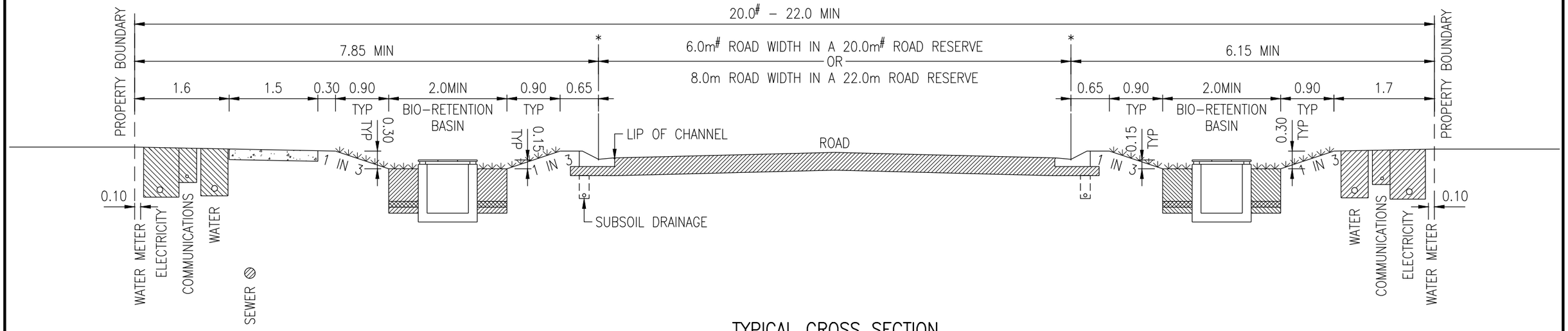
BUNDABERG REGIONAL COUNCIL

FIELD INLET
Field Inlet Pit Dome Top Cover
Partially Submerged Inlet

Standard Drawing No **D1002**

Sheet Size **A3**

Rev



TYPICAL CROSS SECTION

LEGEND

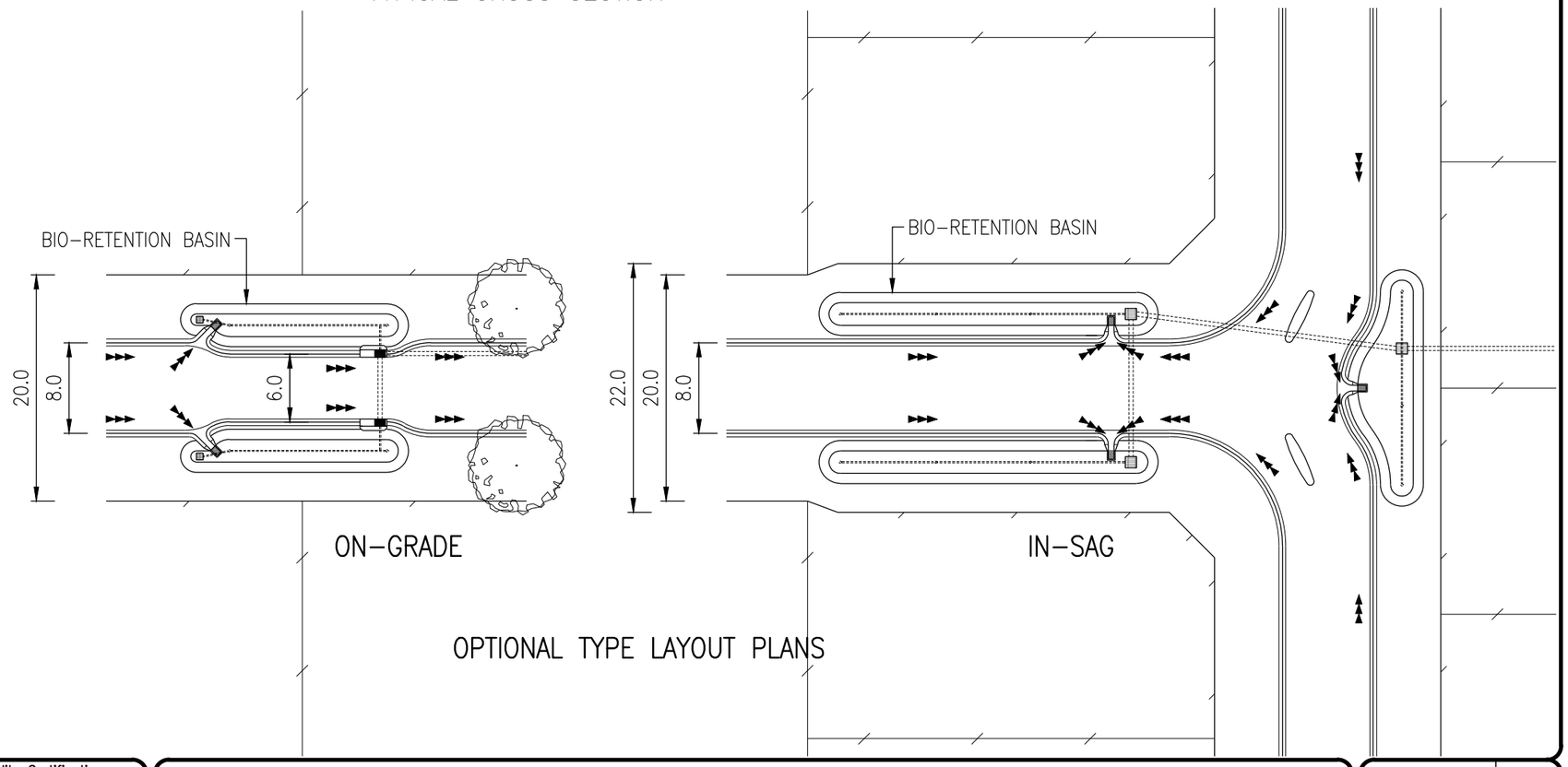
* NOMINAL KERB LINE.

\# REDUCED ROAD WIDTH ALLOWABLE ADJACENT TO BIORETENTION BASIN

►►► STORMWATER FALL DIRECTION

NOTES:

1. ALL DIMENSIONS ARE IN METRES.
2. REFER TO "HEALTHY WATERWAYS" AND "WATER BY DESIGN" GUIDELINES FOR WSUD SOLUTIONS. REFER IPWEAQ STANDARD DRAWINGS FOR DETAILS.
3. THIS STANDARD DRAWING IS A SAMPLE OUTLINE TO WSUD SOLUTION IN AN ACCESS STREET.
4. BIO–RETENTION BASINS CAN BE INCORPORATED INTO THE STREETSCAPE BY LOCALISED WIDENING OF THE ROAD RESERVE AND/OR THE REDUCTION OF THE NOMINAL ROAD WIDTH FOR A MAXIMUM LENGTH OF 20% OF THE ROAD LENGTH WITHIN THE DEVELOPMENT.
5. SWALES AND BIO–RETENTION SWALES ARE NOT ALLOWED AS A WSUD SOLUTION WITHIN BRC IN RESIDENTIAL NEIGHBOURHOOD COLLECTOR STREETS. ACCESS STREETS AND ACCESS PLACES WHERE THEY WILL BE TRAVERSED FOR PRIVATE PROPERTY ACCESS.



OPTIONAL TYPE LAYOUT PLANS

Scales	Revisions		Verified	Date
NOT TO SCALE				
	A	Original Issue		

Quality Certification	
Design:	Verified:
Drawing: Tifa	Checked:
Approved by Engineer	
Date:	RPEQ:

BUNDABERG REGIONAL COUNCIL

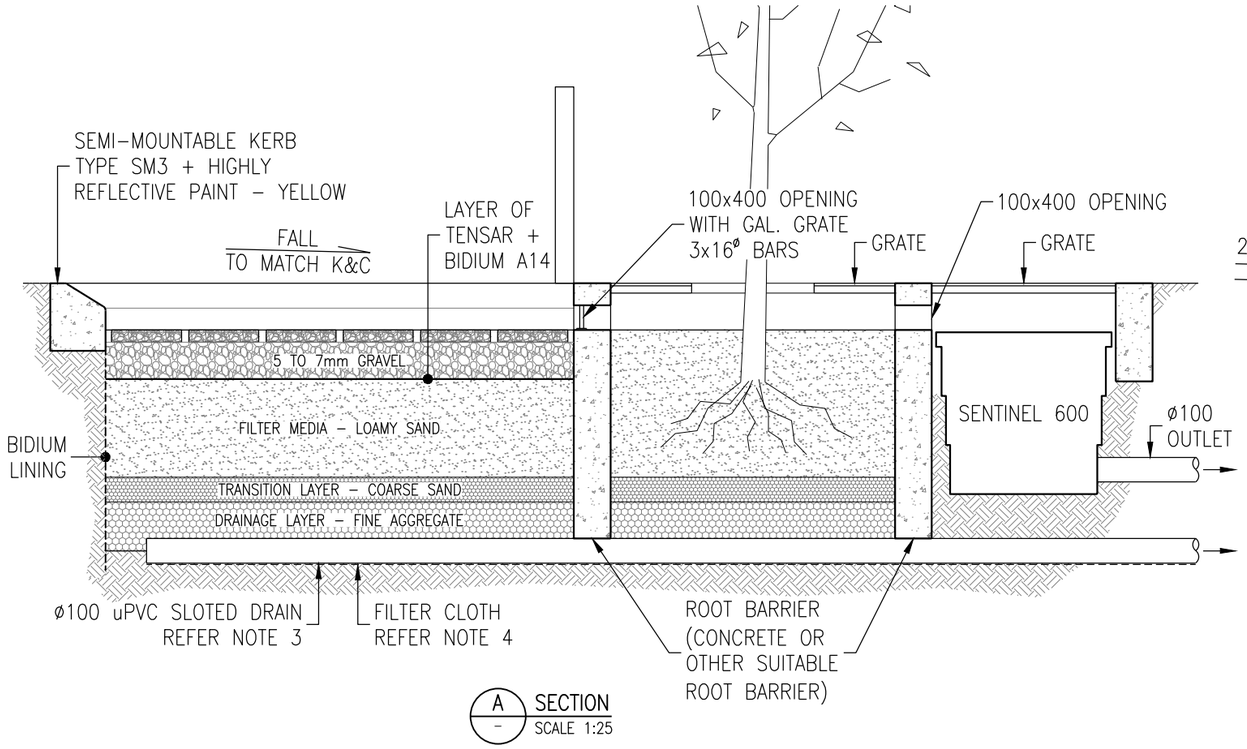
Residential Roads Optional Type Plans & Cross Section to suit WSUD

Standard Drawing No **R1002**

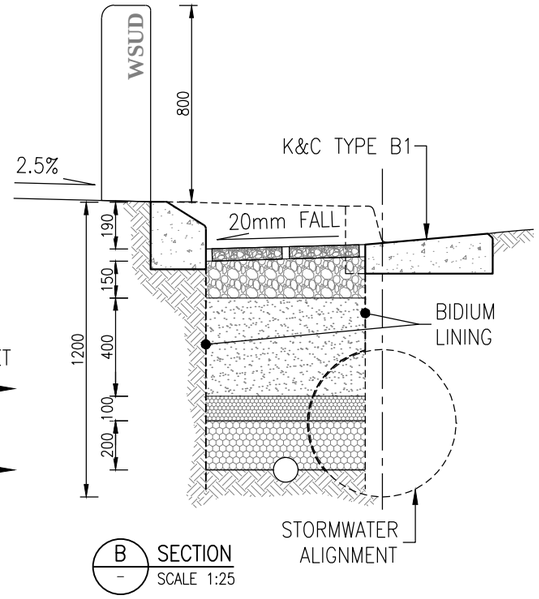
Sheet Size **A3**

Rev

BRC(12/10)



A SECTION
SCALE 1:25



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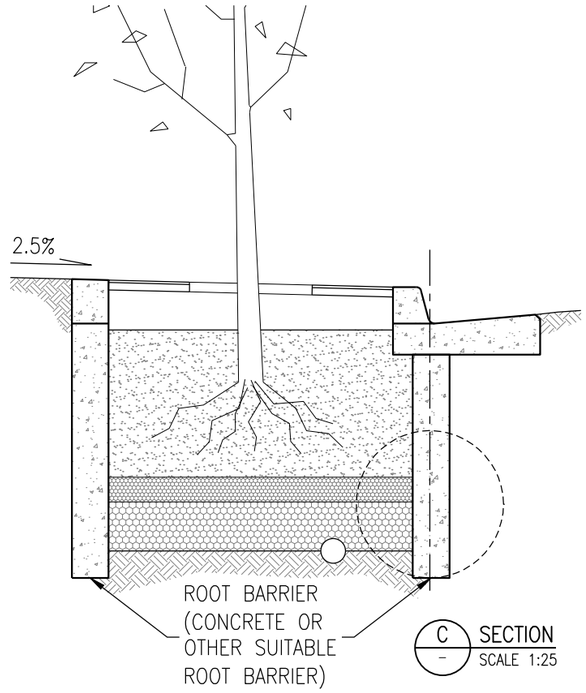
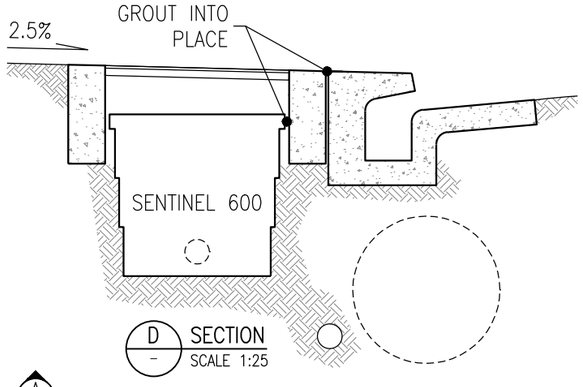
SCALE 1:25



C SECTION
SCALE 1:25



D SECTION
SCALE 1:25

PLAN
SCALE 1:25

Notes:

1. THIS WSUD SOLUTION IS SUITABLE FOR A MAX. OF 3 LOTS (800m² MAX. LOTS) OR 6 LOTS WITH ECOSOL RSF 100 OR EQUIVALENT U/S ON GRAY PIT.
2. BIORETENTION MEDIA SPECIFICATION SHALL BE IN ACCORDANCE WITH THE FACILITY FOR ADVANCING BIOFILTRATION "GUIDELINES FOR SOIL FILTER MEDIA IN BIORETENTION SYSTEMS". BIORETENTION HYDRAULIC CONDUCTIVITY SHALL BE IN ACCORDANCE WITH THE FACILITY FOR ADVANCING BIOFILTRATION "PRACTICE NOTE 1: IN SITU MEASUREMENT OF HYDRAULIC CONDUCTIVITY". THE NUMBER OF SAMPLES TO BE TESTED SHALL BE IN ACCORDANCE WITH THE "WATER SENSITIVE URBAN DESIGN CONSTRUCTION AND ESTABLISHMENT GUIDELINES - SWALES, BIORETENTION SYSTEMS AND WETLANDS (WATER BY DESIGN).
3. UNDER-DRAIN: SLOTTED RIGID ø100 PIPE (uPVC OR SIMILAR TO AS 2439.1) OR APPROVED EQUIVALENT, 0.5% MIN. GRADE. UNDER-DRAINAGE PIPES TO BE INSTALLED WITHOUT FILTER SOCK AND SHALL BE SEALED INTO PITS USING GROUT OR OTHER APPROVED WATERTIGHT SEAL.
4. FILTER CLOTH - NON-WOVEN GEOTEXTILE. FILTER CLOTH NOT TO BE PLACED BETWEEN ANY FILTER LAYERS. IMPERVIOUS LINER MAY BE REQUIRED SUBJECT TO SOIL TESTING REQUIREMENTS IN ACCORDANCE WITH THE "WATER SENSITIVE URBAN DESIGN TECHNICAL DESIGN GUIDELINES" (WATER BY DESIGN).
5. MEDIA IN BIORETENTION AREA TO BE PLATE COMPACTED.
6. THE FOLLOWING TREE SPECIES ARE TO BE USED WITH ONLY ONE SPECIES PER STREET:
   - -Callistemon viminalis
   - -Callistemon salignus
   - -Elaeocarpus eumundi
   - -Elaeocarpus "Prima Donna"
   - -Flindersia australis
   - -Glochidion ferdinandii
   - -Syzygium leuhmannii
   - -Waterhousea floribunda
   - -Xanthostemon chrysanthus
7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.

Survey Data	
Survey No.:	
Height Datum:	AHD
Horiz. Datum:	"MGA 94, ZONE 56"
Scale Factor:	MGA GROUND (See Survey Notes)
Level Books:	Surveyor:

Scales: 1:25 — 0, 0.25, 0.5, 0.75m

	Revisions	Verified	Date
B	ECOSOL + 6 LOTS		7/12
A	ORIGINAL ISSUE		

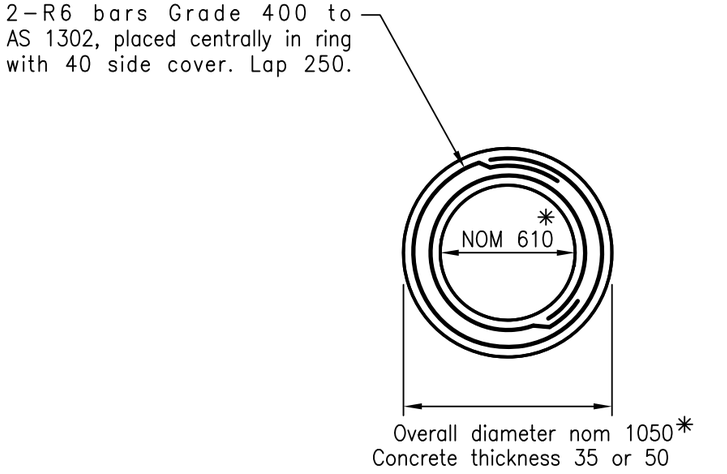
Quality Certification
Design: Verified:
Drawn: Tifa Checked:
Approved By Engineer: Date:
RPEQ:

BUNDABERG REGIONAL COUNCIL

Locality:
Facility Name:
Asset Name:
Details: **WSUD - Bioretention - Infill Sites**

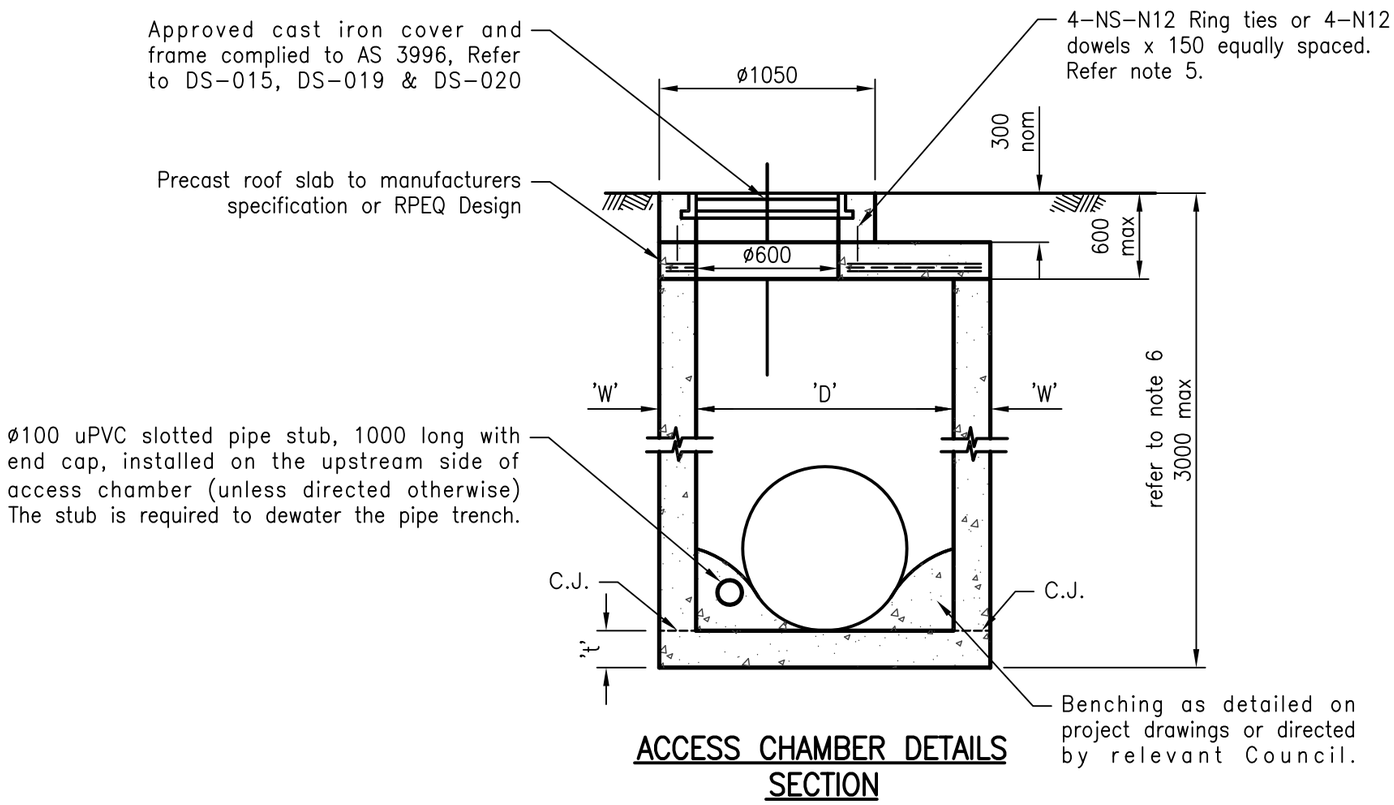
Associated Drawing No.:
1 of 1
Project No.:
Sheet Size: A3
Drawing No.: 37133
Rev.: B

S:\Support Services\Design\Users\Tifa S\WSUD - Bioretention - Infill Sites\WSUD - Bioretention - Infill Sites - Rev B | 2/07/2012 10:53:57 AM



ROOF RING PLAN

For use in raising covers and frames of existing access chambers
* Size to suit existing access chamber



ACCESS CHAMBER DETAILS SECTION

DIMENSION

Access chamber DIA 'D'	FLOOR THICKNESS 't'		Wall thickness 'W'	Roof/Floor slab DIA
	INLET	OUTLET		
1050	175	150	150	1350
1200	250	225	225	1650
1350	250	225	225	1800
1500	250	225	225	1950
1800	250	225	250	2300
2100	275	250	275	2650

NOTES:

1. Concrete: Benching N25, Structural N40 (precast), N32 (Cast insitu) in accordance with AS1379 and AS 3600.
2. Access chambers which are proprietary items are required to be designed and certified to AS 3996–1992. Access covers subject to road traffic shall be of Class D design, where Minimum Ultimate Limit State Design Load = 210kN. Access covers subject to pedestrian traffic and occasional vehicle load shall be of Class C design, where Minimum Ultimate Limit State Design Load =150kN. (Ref: AS 3996–1992 and Austroads Bridge Design Code 1992).
3. Cover and frame, gray cast iron, Grade > T220 to AS 1830.
4. Refer Project Drawings for size and level of culverts, chamber cover level and setout point details.
5. Precast manhole top slabs are to be supplied with four (4) factory installed ring ties or alternately dowel bars may be accepted, subject to approval from the relevant Council.
6. Manholes deeper than 3000 require individual design and certification.
7. All dimensions are in millimetres unless shown otherwise.

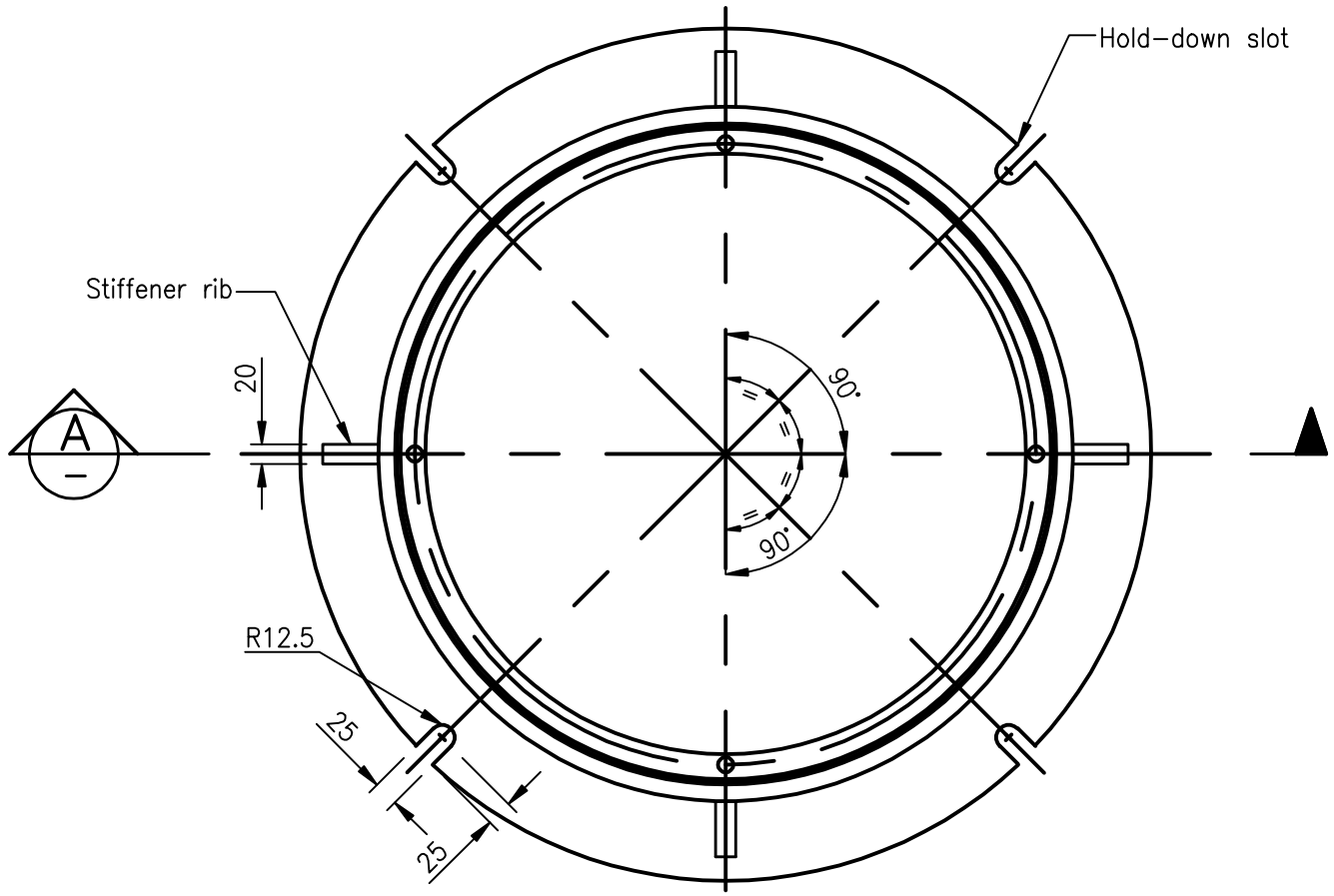
Rv.	DATE	REVISIONS
D	06/14	Review
C	03/14	Amended Drawing Number
B	11/12	Concrete Strength Amended
A	10/12	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA
STANDARD DRAWINGS

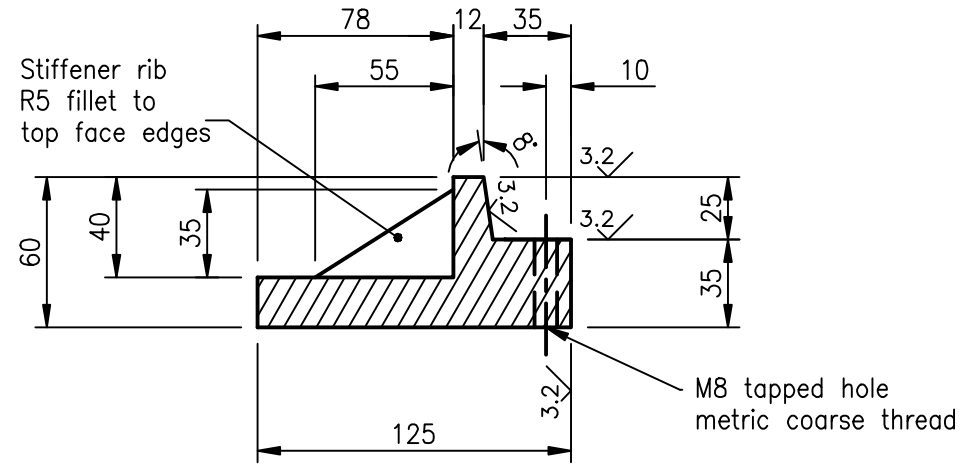
STORMWATER ACCESS CHAMBER DETAIL
1050 TO 2100 DIAMETER

DS–010

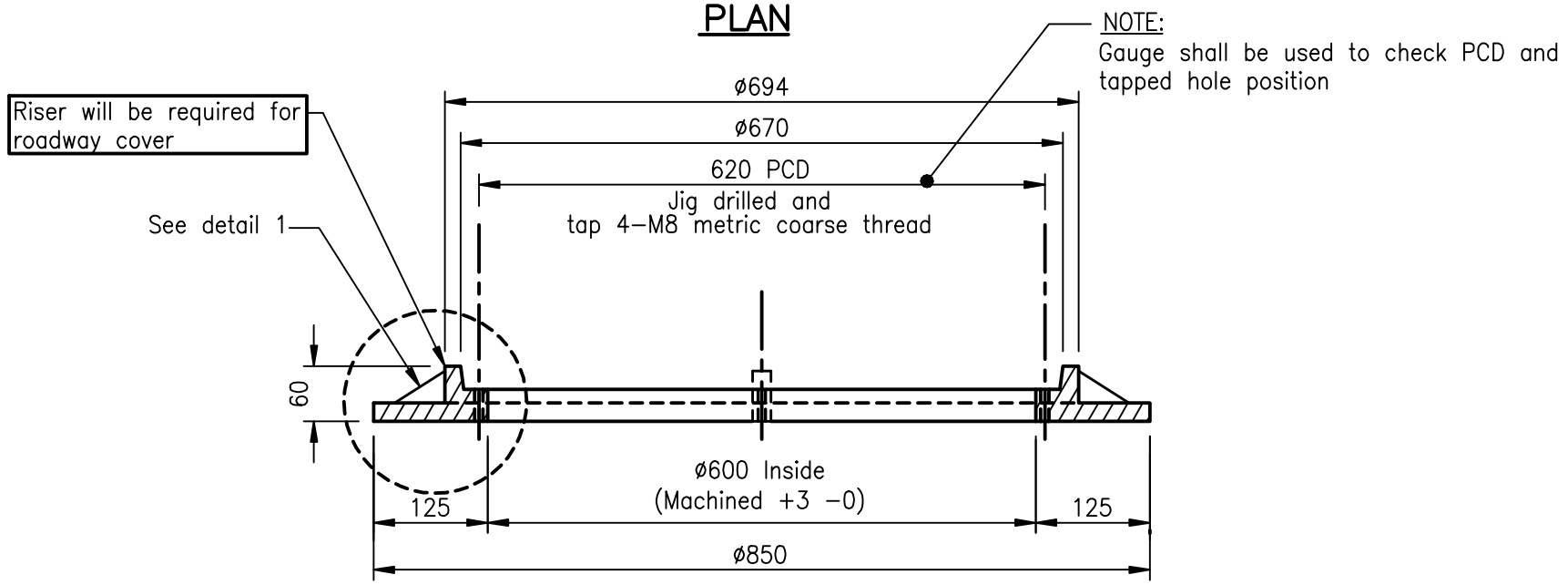
D C B A Rv.



PLAN



DETAIL 1



SECTION A–A

NOTES:

1. All edges to be square.
2. Casting to be free of burrs and pits.
3. Material
   Grey Cast iron (AS 1830)
   Tensile strength : T220
   Hardness : 145–185 (HB)
   Design Load = 210kN (AS 3996)
   Mass = 59.5Kg
4. Tolerances
   Cast size ± 1.00mm
   Angle Profile ± 0.25°
   Machined size ± 0.125mm
   Overall diameter of cover + 0mm–0.25mm
   DFT of coating 50 µm
5. Machine surface symbol: 3.2
6. All machined surfaces shall have a coating approved as fit for the purpose of providing a rust proof, non–stick and gas/water proof joint.
7. Refer Std Dwg No SEQ D–018 for manhole riser details.
8. Refer Std Dwg No SEQ D–019, SEQ D–020 and SEQ D–021 for manhole cover details.
9. All dimensions are in millimetres unless shown otherwise.

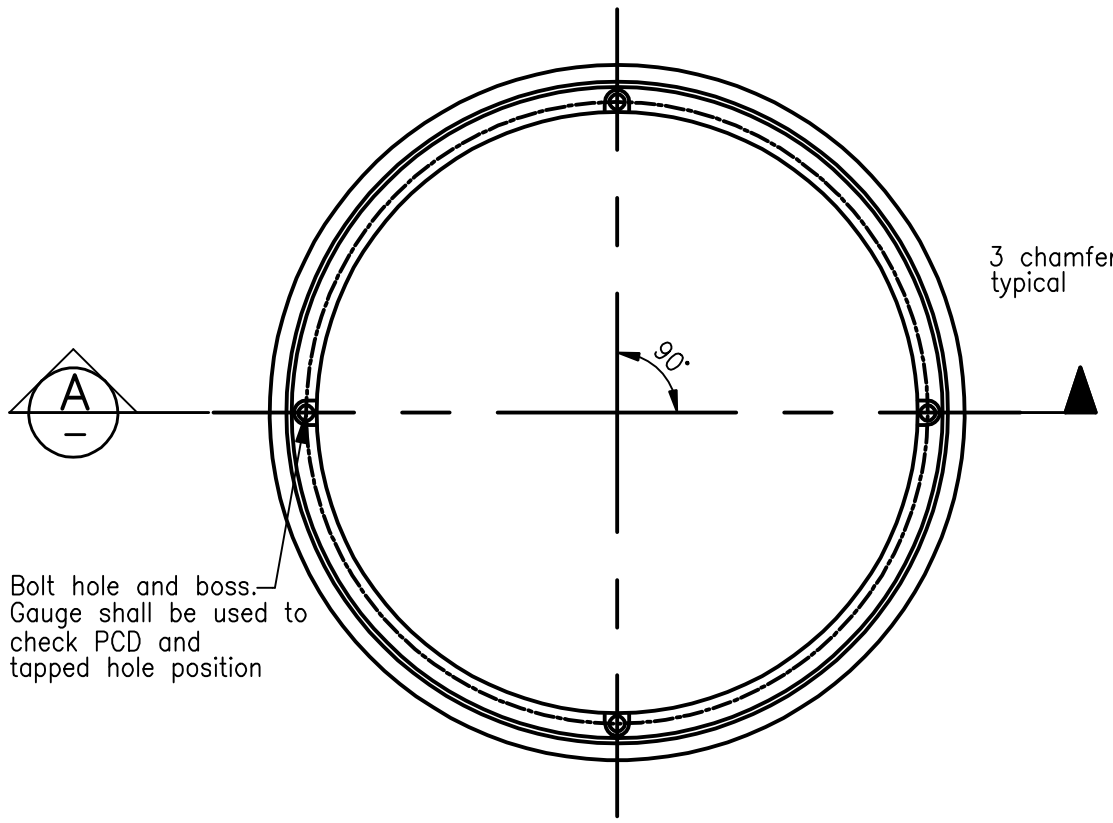
Rv.	DATE	REVISIONS
B	5/10	REVIEW
A	6/09	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

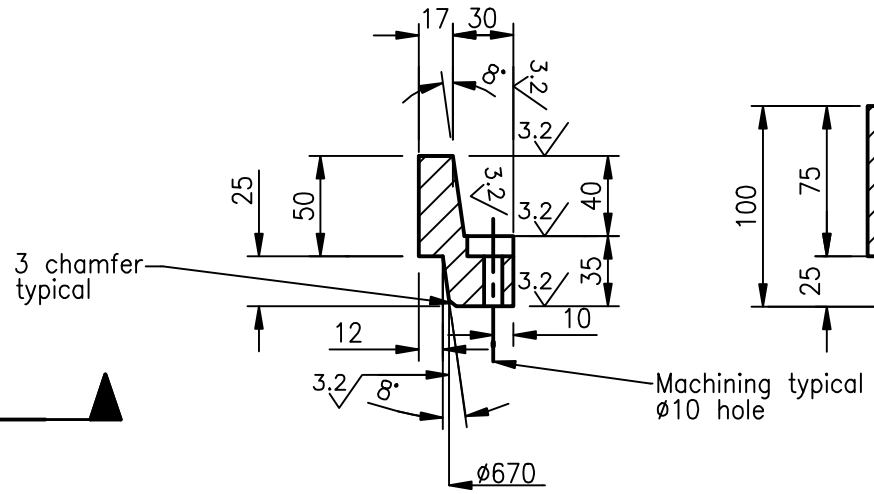
MANHOLE FRAME
(ROADWAY AND NON–ROADWAY)
1050 TO 2100 DIAMETER

SEQ D–014

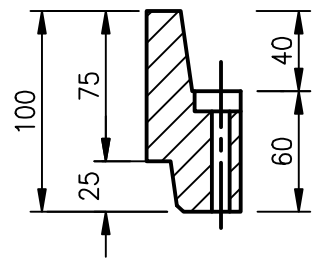
Rv. B A



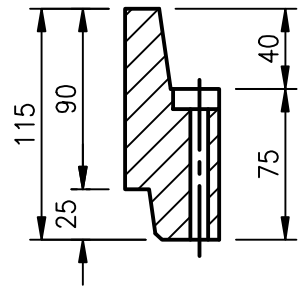
PLAN



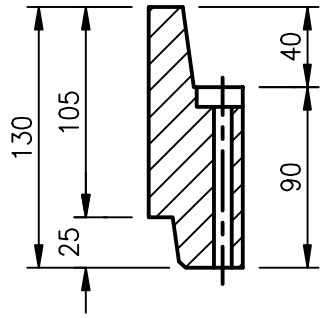
35 RISER
MASS: 27.5kg



60 RISER
MASS: 32kg



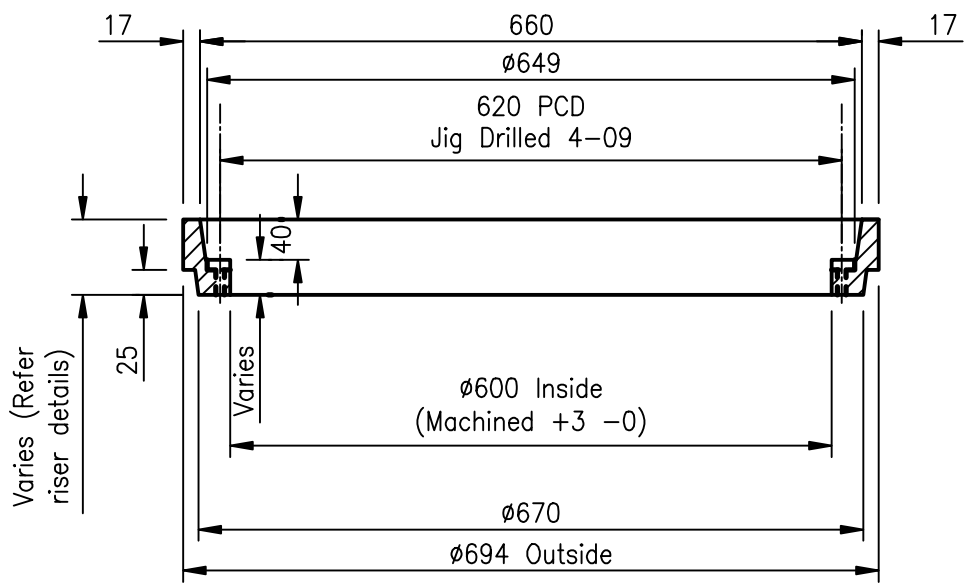
75 RISER
MASS: 38kg



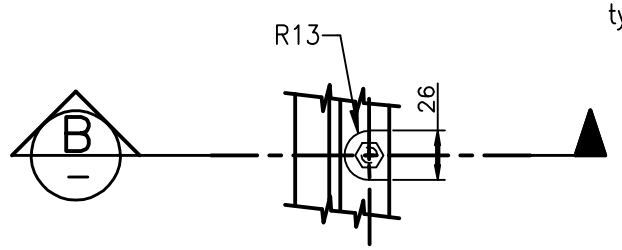
90 RISER
MASS: 44kg

RISER DETAILS

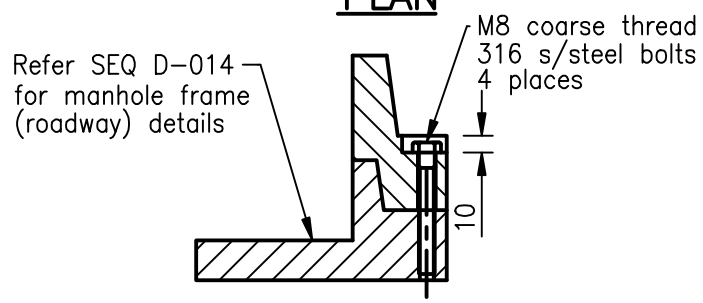
(Refer to 35 riser for typical dimensions for all risers)



SECTION A



BOLTING BOSS PLAN



SECTION B

TYPICAL ASSEMBLY

Bolts: 60 long for 35 riser
90 long for 60 riser
110 long for 75 riser
115 long for 90 riser

NOTES:

1. All edges to be square.
2. Casting to be free of burrs and pits.
3. Material
   Ductile cast iron
   Tensile strength : 600–3 (AS 1831)
   Hardness : 145–185 (HB)
   Design load = 210kN (AS 3996)
   Mass = varies
4. Tolerances
   Cast size ± 1.00mm
   Angle profile ± 0.25°
   Machined size ± 0.125mm
   Overall diameter of cover +0mm–0.25mm
   DFT of coating 50 µm
5. Machine surface symbol: 3.2
6. All machined surfaces shall have a coating approved as fit for the purpose of providing a rust proof, non stick and gas/water proof joint.
7. Refer Std Dwg SEQ D–014 for manhole frame details.
8. Refer Std Dwg SEQ D–019, SEQ D–020 and SEQ D–021 for manhole cover details.
9. All dimensions are in millimetres unless shown otherwise.

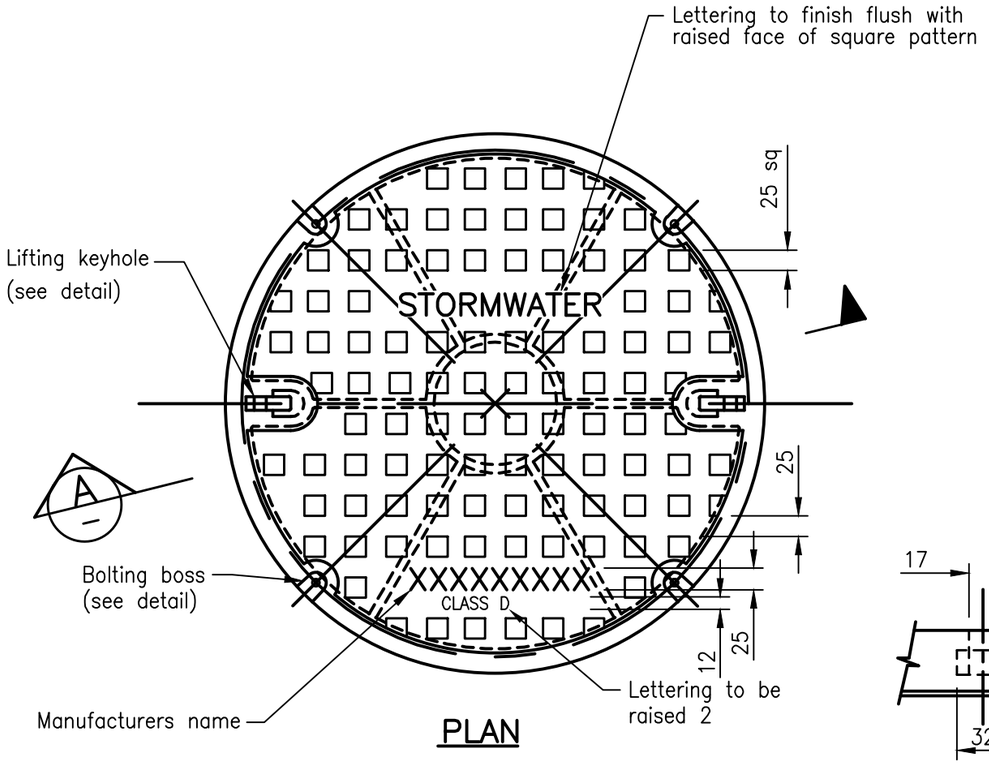
Rv.	DATE	REVISIONS
A	6/09	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

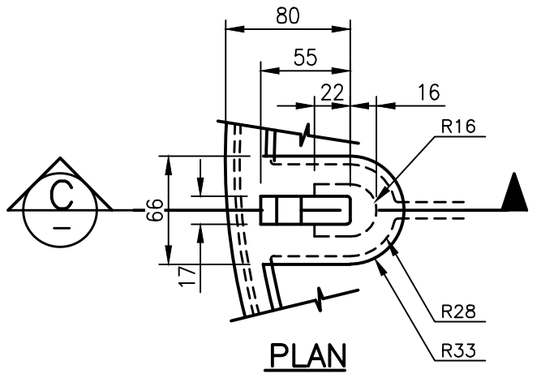
MANHOLE RISER DETAILS
(ROADWAY)

SEQ D–018

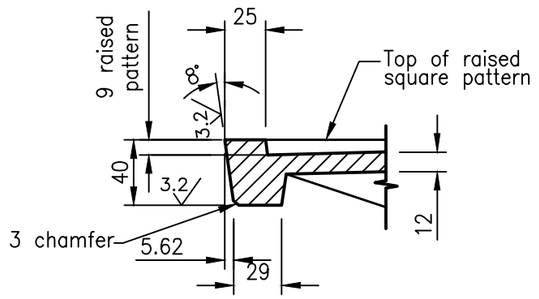
Rv. A



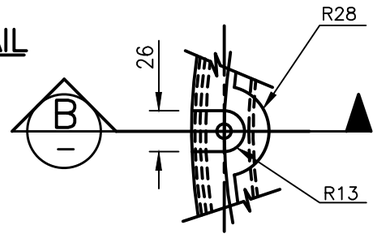
PLAN



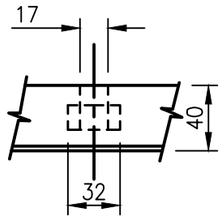
PLAN



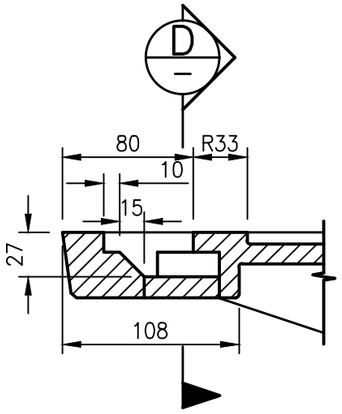
TYPICAL EDGE DETAIL



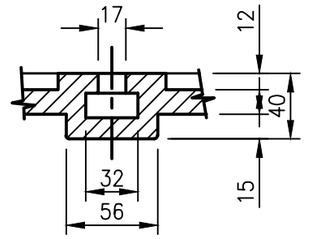
PLAN



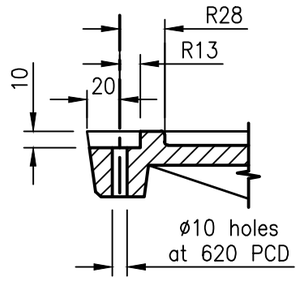
END ELEVATION



SECTION C



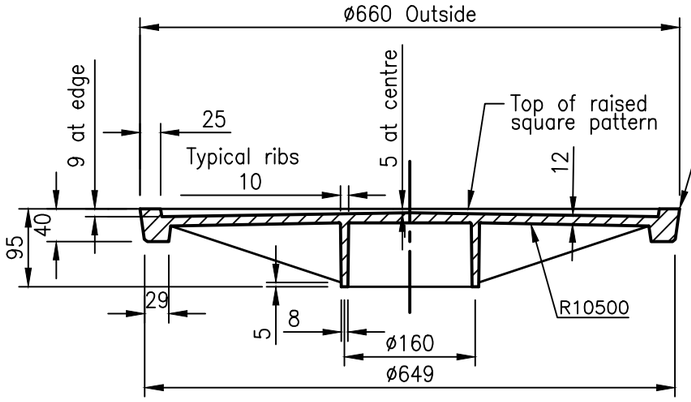
SECTION D



SECTION B

LIFTING KEYHOLE DETAIL

BOLTING BOSS DETAIL



SECTION A

NOTES:

1. All edges to be square.
2. Casting to be free of burrs and pits.
3. Material
   Ductile cast iron
   Tensile Strength: 600–3 (AS 1831)
   Hardness: 145–185 (HB)
   Design Load = 210kN (AS 3996)
   Mass = 49kg
4. Tolerances
   Cast Size ± 1.00mm
   Angle profile ± 0.25°
   Machined Size ± 0.125mm
   Overall diameter of cover +0mm–0.25mm
   DFT of coating 50 µm
5. Machine surface symbol: 3.2
6. All machine surfaces shall have a coating approved as fit for purpose of providing a rust proof, non–stick and gas/water proof joint.
7. Lids to be bolted down if required by Design, using M8 coarse thread 316 stainless steel bolts in four (4) places.
8. Refer Std Dwg SEQ D–014 for manhole frame details.
9. Refer Std Dwg SEQ D–018 for manhole riser details.
10. Refer Std Dwg SEQ D–020 and SEQ D–021 for alternate cover details.
11. All dimensions are in millimetres unless shown otherwise.

These drawings have been developed in consultation between the participating Councils.
BEFORE USE, the user shall confirm that the drawing has been adopted by the appropriate Council.

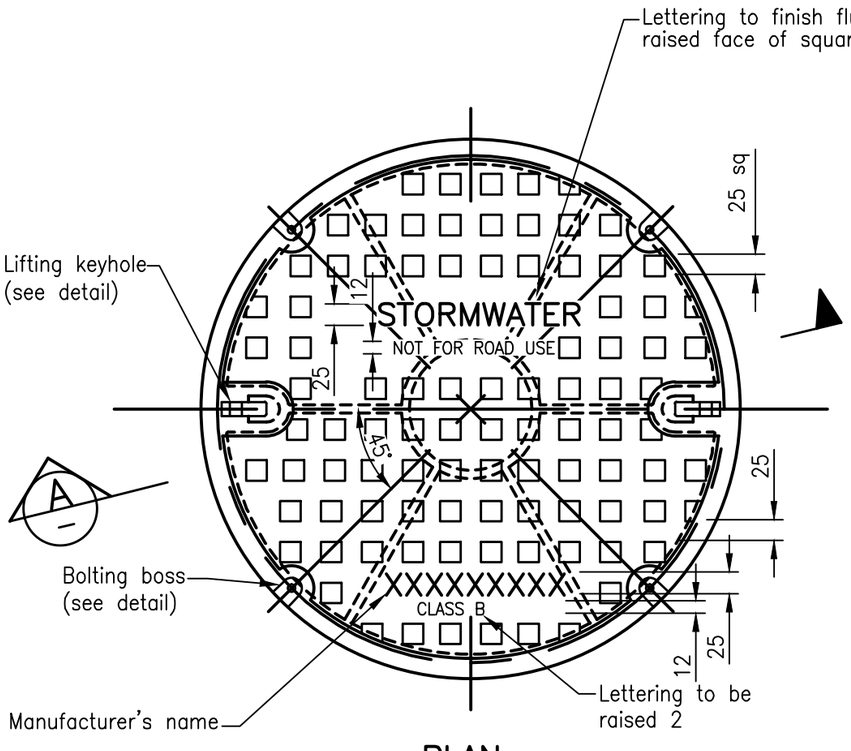
Rv.	DATE	REVISIONS
C	6/11	REVIEW
B	5/10	REVIEW
A	6/09	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

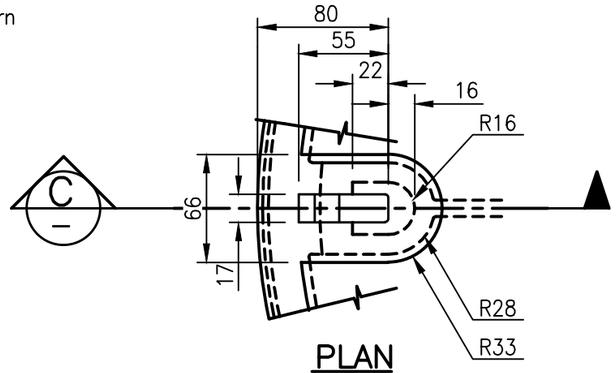
MANHOLE COVER
(ROADWAY)
1050 TO 2100 DIAMETER

SEQ D–019

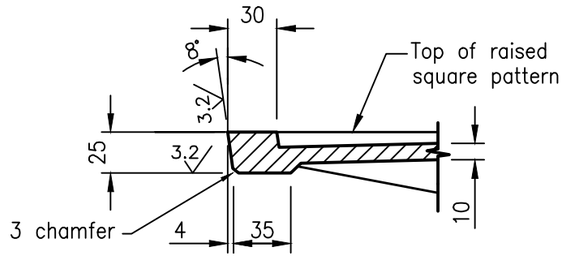
C B A Rv.



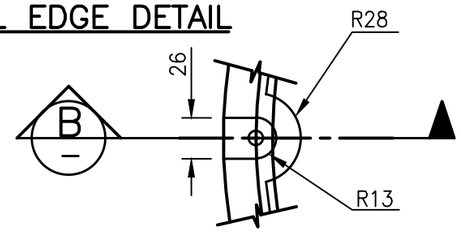
PLAN



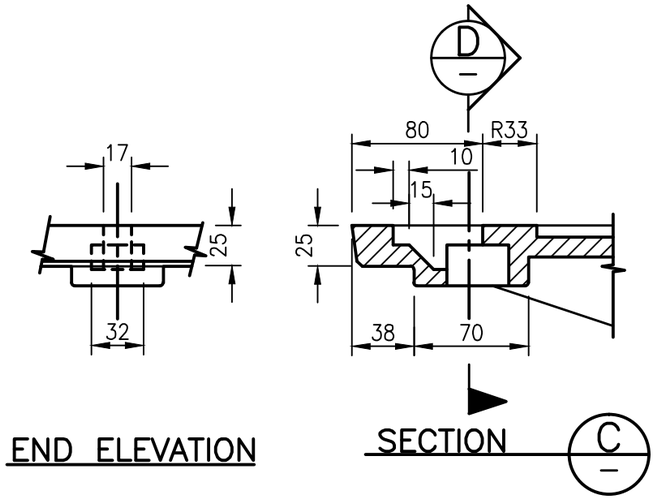
PLAN



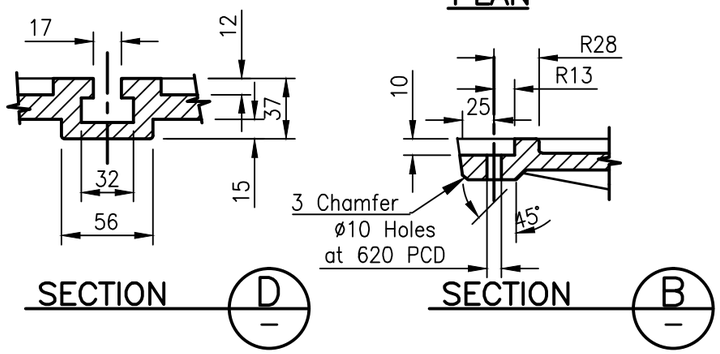
TYPICAL EDGE DETAIL



PLAN



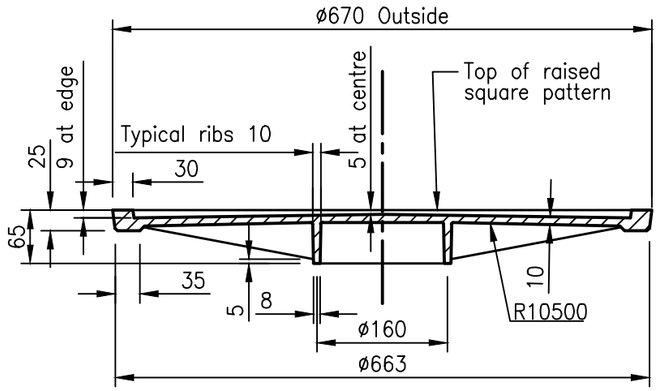
SECTION C



SECTION D

SECTION B

END ELEVATION



SECTION A

LIFTING KEYHOLE DETAIL

BOLTING BOSS DETAIL

NOTES:

1. This drawing is for use in non commercial loading applications where vehicle loads are less than 3.5t.
2. All edges to be square.
3. Casting to be free of burrs and pits.
4. Material
   Ductile cast iron
   Tensile strength : 600–3 (AS 1831)
   Hardness : 145–185 (HB)
   Design load = 80kN (AS 3996)
   Mass = 39kg
5. Tolerances
   Cast size ± 1.00mm
   Angle profile ± 0.25°
   Machined size ± 0.125mm
   Overall diameter of cover +0mm–0.25mm
   DFT of coating 50 μm
6. Machine surface symbol: 3.2
7. All machine surfaces shall have a coating approved as fit for purpose of providing a rust proof, non–stick and gas/water proof joint.
8. Lids to be bolted down if required by Design, using M8 coarse thread 316 stainless steel bolts in four (4) places.
9. Refer Std Dwg SEQ D–014 for manhole frame details.
10. Refer Std Dwg SEQ D–018 for manhole riser details.
11. Refer Std Dwg SEQ D–019 and SEQ D–021 for alternate cover details.
12. All dimensions are in millimetres unless shown otherwise.

These drawings have been developed in consultation between the participating Councils.
BEFORE USE, the user shall confirm that the drawing has been adopted by the appropriate Council.

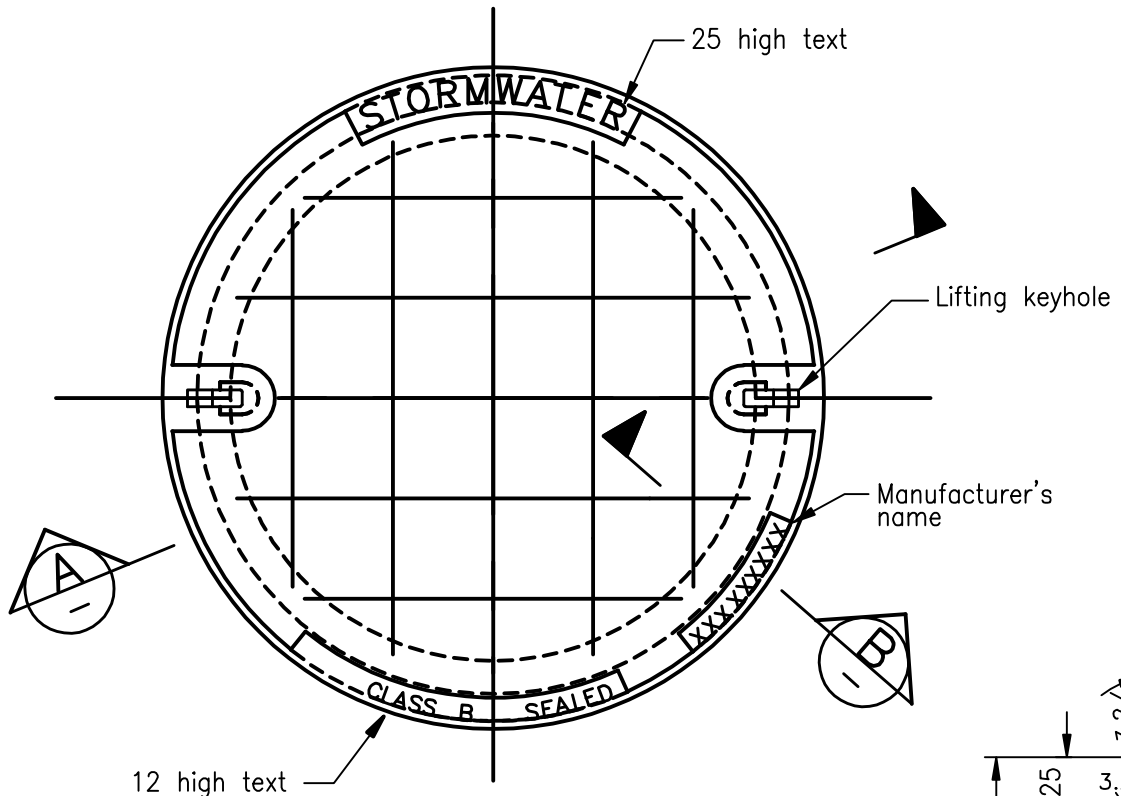
Rv.	DATE	REVISIONS
C	6/11	REVIEW
B	5/10	REVIEW
A	6/09	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

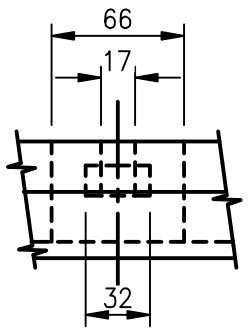
MANHOLE COVER
(NON ROADWAY)
1050 TO 2100 DIAMETER

SEQ D–020

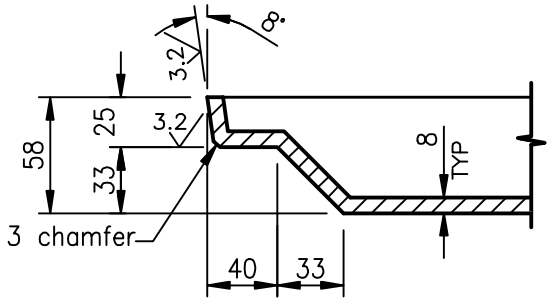
Rv. C B A



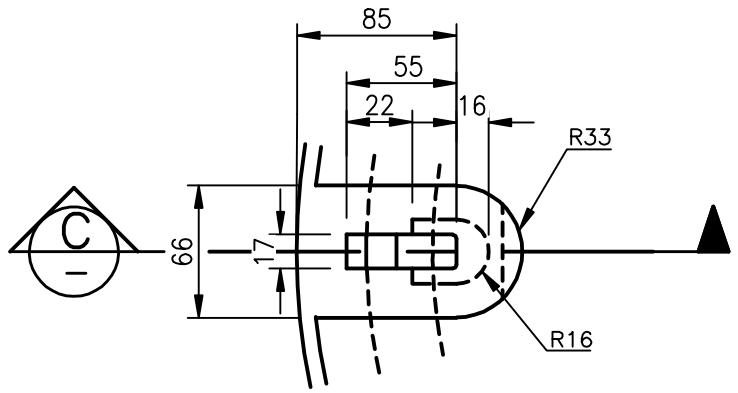
PLAN



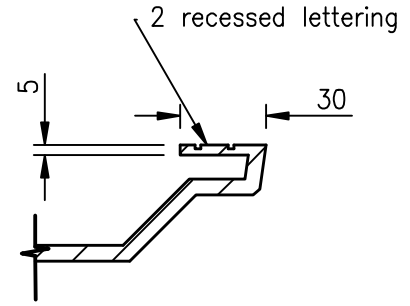
END ELEVATION



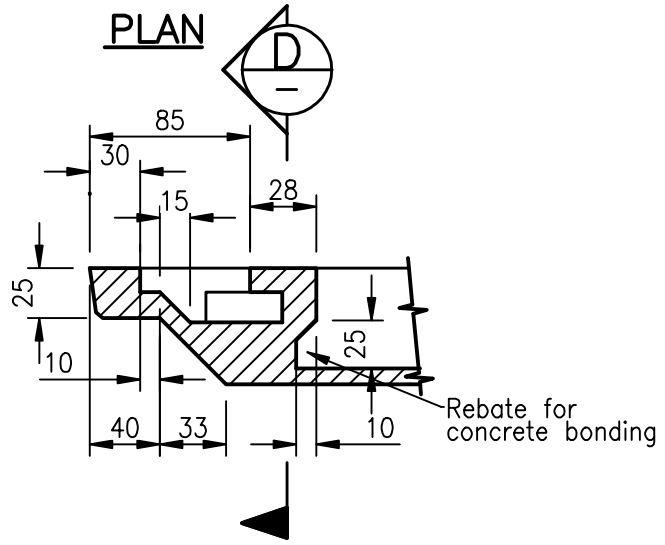
DETAIL 1

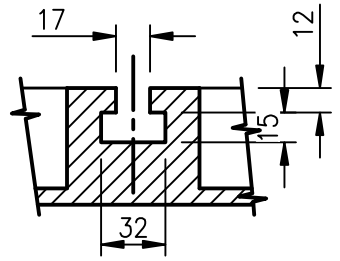


PLAN



SECTION B

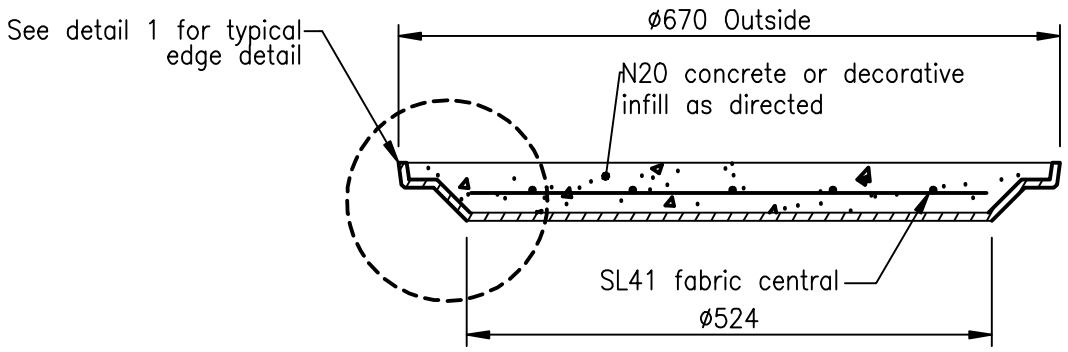




SECTION C

SECTION D

LIFTING KEYHOLE DETAILS



SECTION A

NOTES:

1. This drawing is for use in non roadway application subject to pedestrian loadings only.
2. All edges to be square
3. Casting to be free of burrs and pits.
4. Material
   Ductile cast iron
   Tensile strength : 600–3 (AS 1831)
   Hardness : 145–185 (HB)
   Design Load : 80kN (AS 3996)
   Mass = 59.5kg
5. Tolerances
   Cast size ± 1.00mm
   Angle profile ± 0.25°
   Machined size ± 0.125mm
   Overall diameter of cover +0mm–0.25mm
   DFT of coating 50µm
6. Machine surface symbol: 3.2
7. All machined surfaces shall have a coating approved as fit for the purpose of providing a rust proof non–stick and gas/water proof joint.
8. Refer Std Dwg SEQ D–014 for manhole frame details.
9. Refer Std Dwg SEQ D–018 for manhole riser details.
10. Refer Std Dwg SEQ D–019 and SEQ D–020 for alternate cover details.
11. All dimensions are in millimetres unless shown otherwise.

These drawings have been developed in consultation between the participating Councils.
BEFORE USE, the user shall confirm that the drawing has been adopted by the appropriate Council.

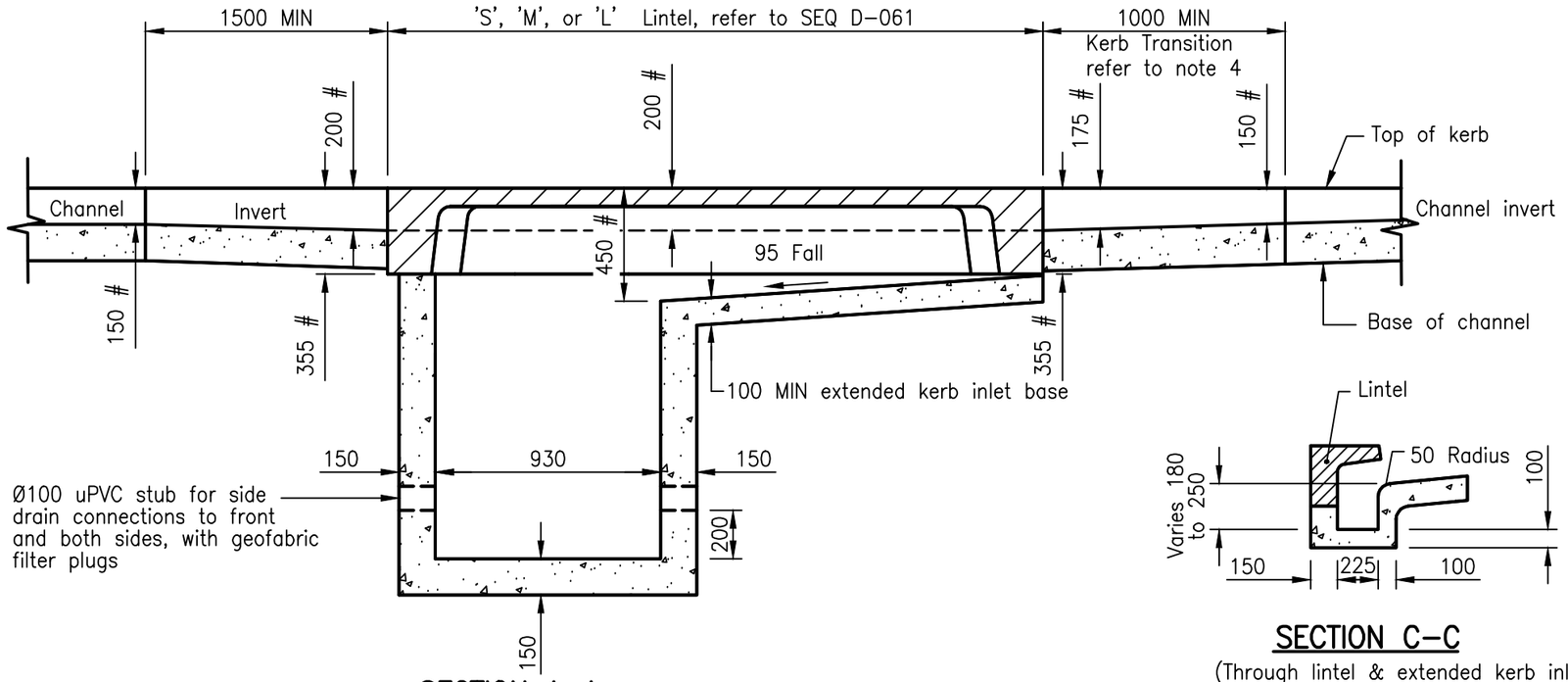
Rv.	DATE	REVISIONS
B	5/10	REVIEW
A	6/09	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

MANHOLE COVER CONCRETE
INFILL (PEDESTRIAN TRAFFIC)
1050 TO 2100 DIAMETER

SEQ D–021

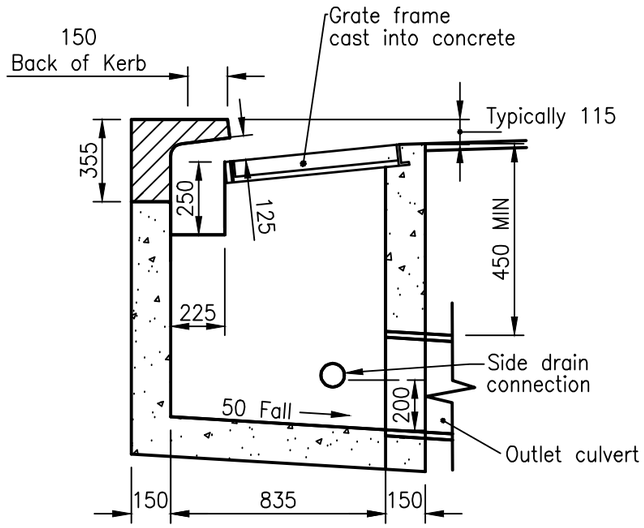
Rv. B A



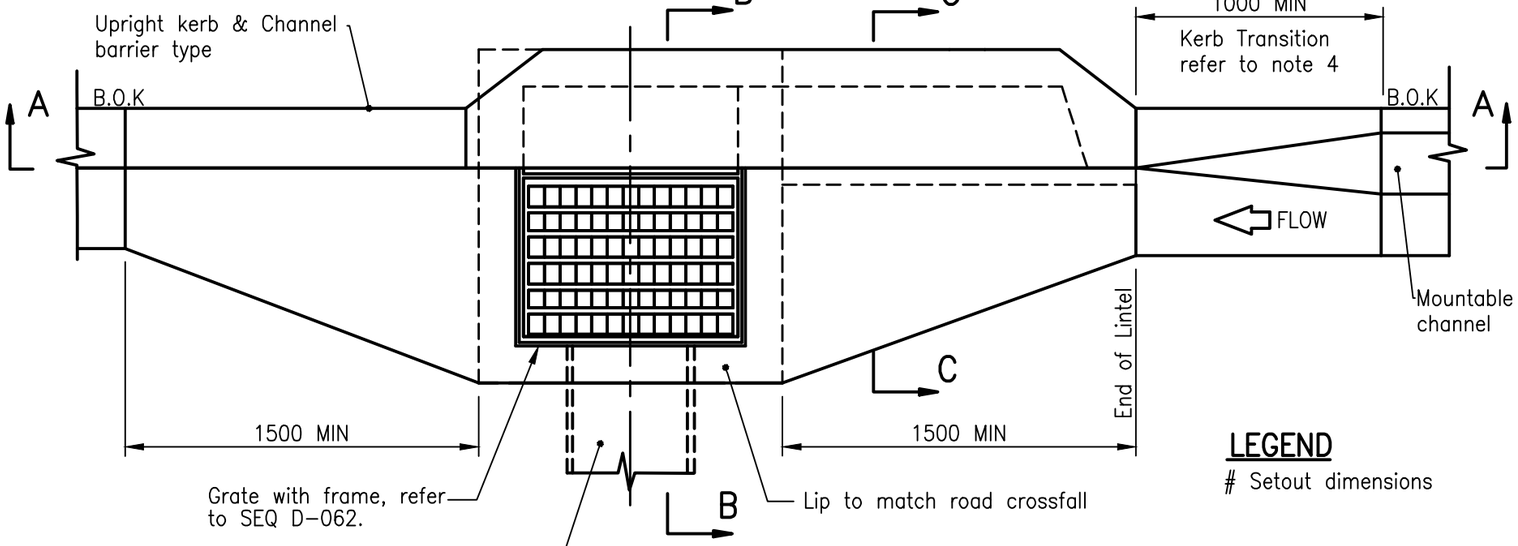
SECTION A–A

SECTION C–C

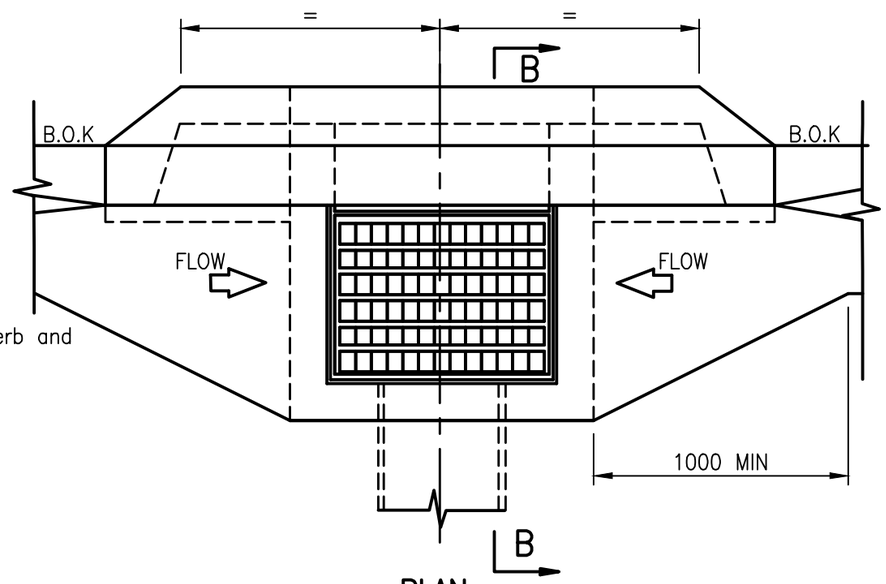
(Through lintel & extended kerb inlet)



SECTION B – B



PLAN
INLET ON GRADE



PLAN
INLET IN SAG

LEGEND

Setout dimensions

NOTES:

1. Insitu concrete N25 in accordance with AS 1379 and AS 3600.
2. An alternative precast concrete, kerb inlet, apron and pit surround may be provided subject to the approval from the relevant Council. Precast concrete to be N32 in accordance with AS1379 and AS3600.
3. Refer to project drawings for setout point detail.
4. Kerb transition for M2 kerb type to be 1500 long.
5. Pits deeper then 3000 require individual design and certification.
6. All dimensions are in millimetres unless shown otherwise.

These drawings have been developed in consultation between the participating Councils.
BEFORE USE, the user shall confirm that the drawing has been adopted by the appropriate Council.

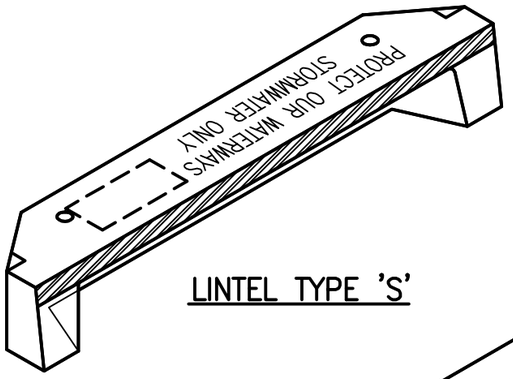
Rv.	DATE	REVISIONS
D	6/11	REVIEW
C	5/10	REVIEW
B	6/09	REVIEW
A	3/08	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

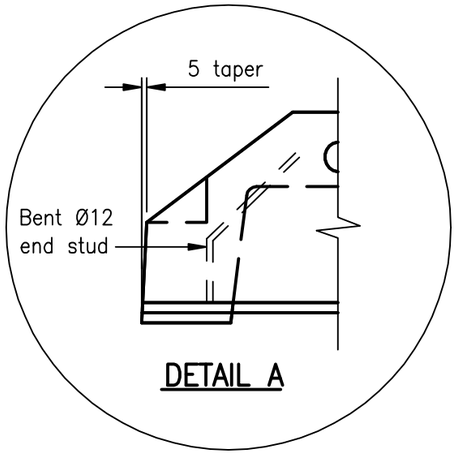
DRAINAGE PITS
KERB INLET – KERB IN LINE
GENERAL ARRANGEMENT

SEQ D–060

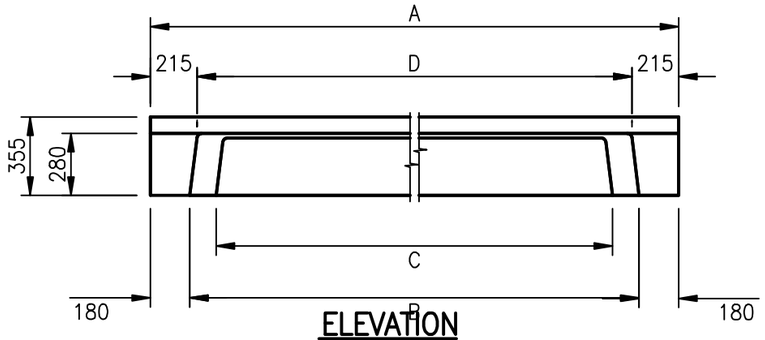
Rv. D C B A



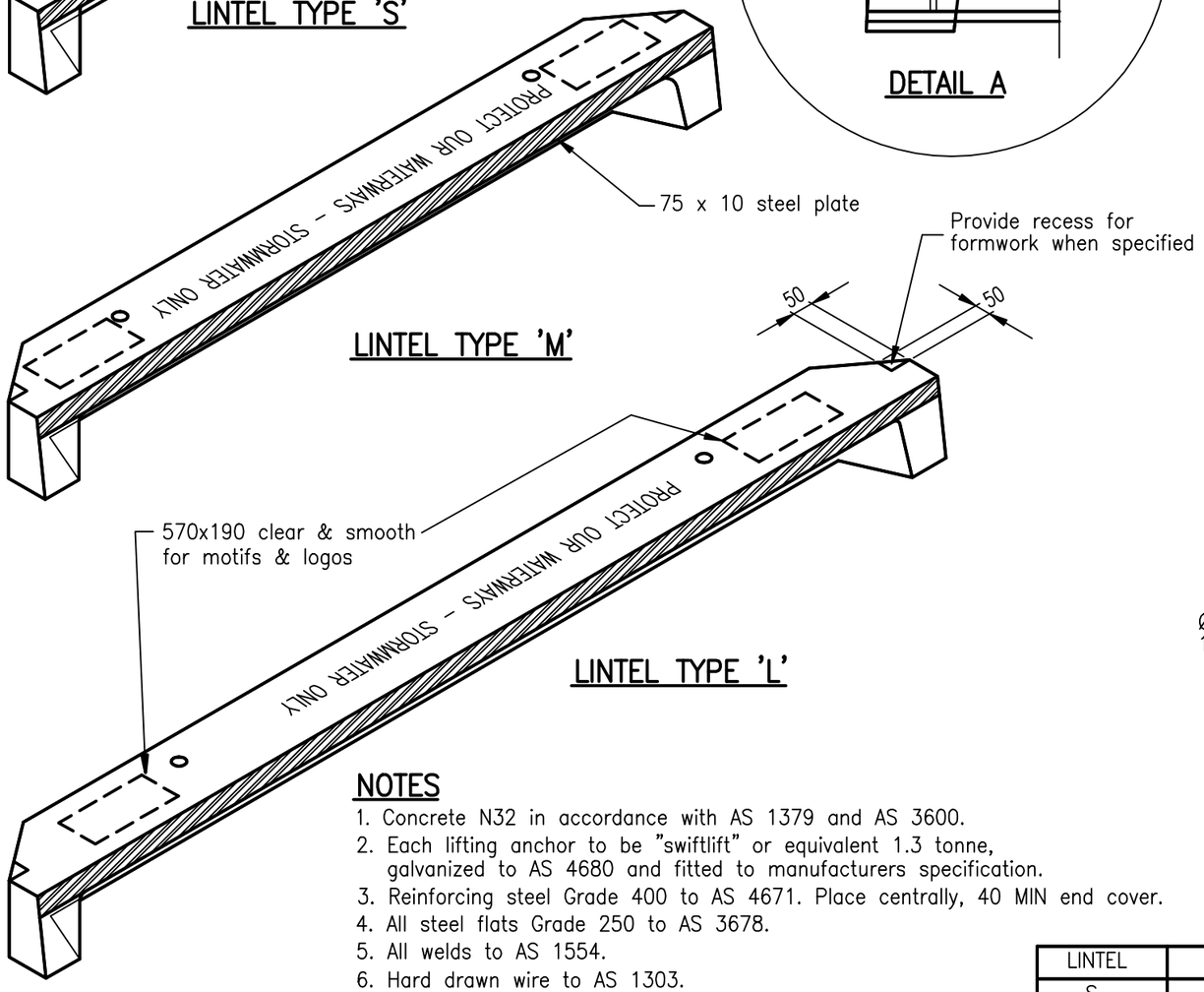
LINTEL TYPE 'S'



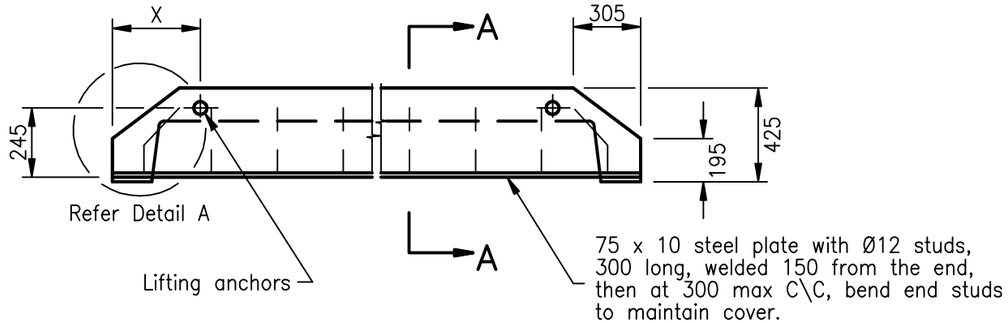
DETAIL A



ELEVATION

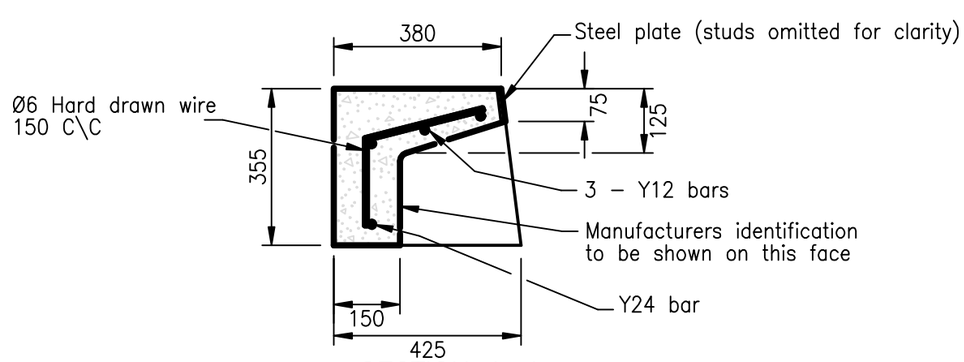


LINTEL TYPE 'M'



PLAN

LINTEL TYPE 'L'



SECTION A–A

NOTES

1. Concrete N32 in accordance with AS 1379 and AS 3600.
2. Each lifting anchor to be "swiftlift" or equivalent 1.3 tonne, galvanized to AS 4680 and fitted to manufacturers specification.
3. Reinforcing steel Grade 400 to AS 4671. Place centrally, 40 MIN end cover.
4. All steel flats Grade 250 to AS 3678.
5. All welds to AS 1554.
6. Hard drawn wire to AS 1303.
7. Steel plate hot dip galvanized after fabrication to AS 4680.
8. All dimensions in millimetres.
9. Lintel text 40mm high letters imprinted 5mm into concrete. Words face footpath.

LINTEL	A	B	C	D	X	MASS (kg)
S	2400	2040	1800	1970	400	445
M	3600	3240	3000	3170	690	550
L	4800	4440	4200	4370	1000	725

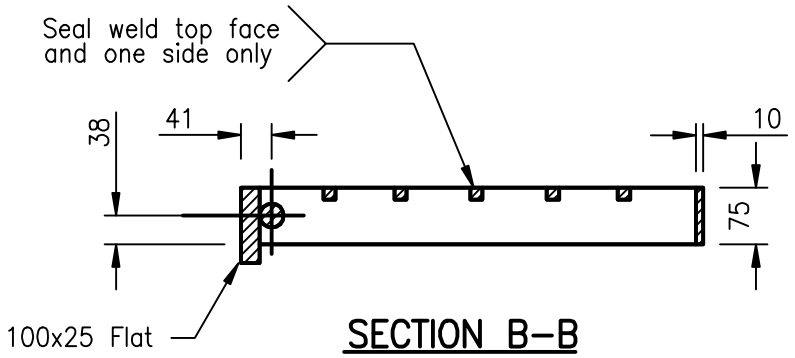
Rv.	DATE	REVISIONS
A	3/08	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

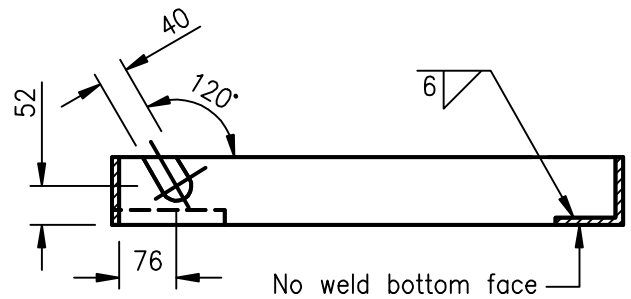
DRAINAGE PITS
KERB INLET
PRECAST LINTEL DETAILS

SEQ D–061

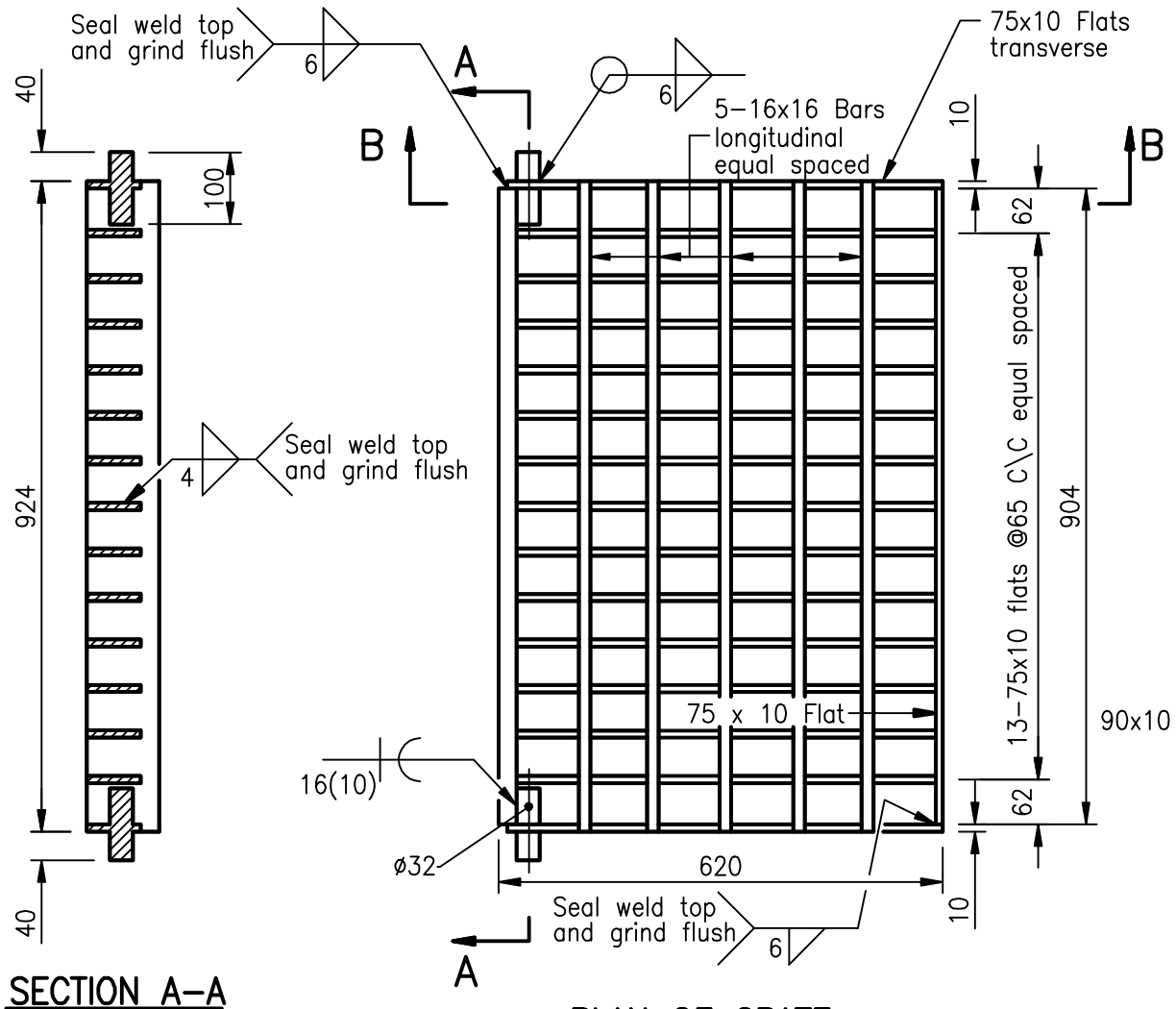
Rv. A



SECTION B–B

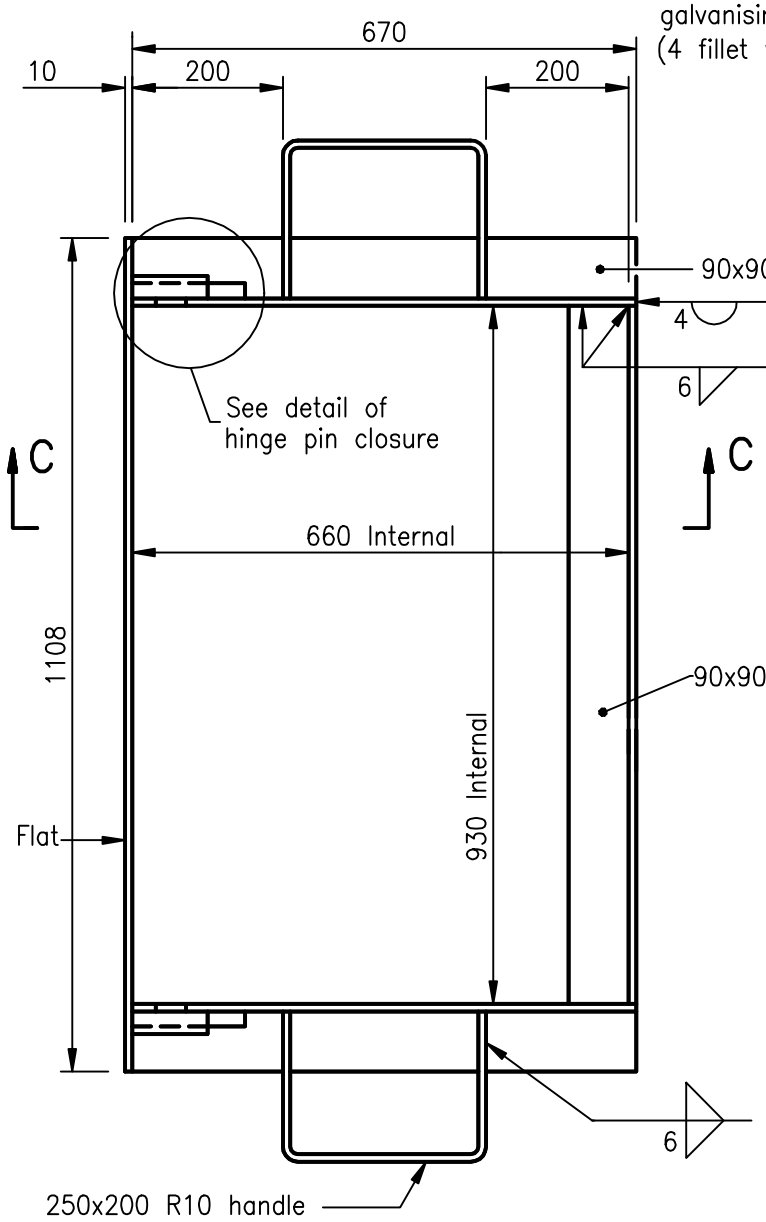


SECTION C–C

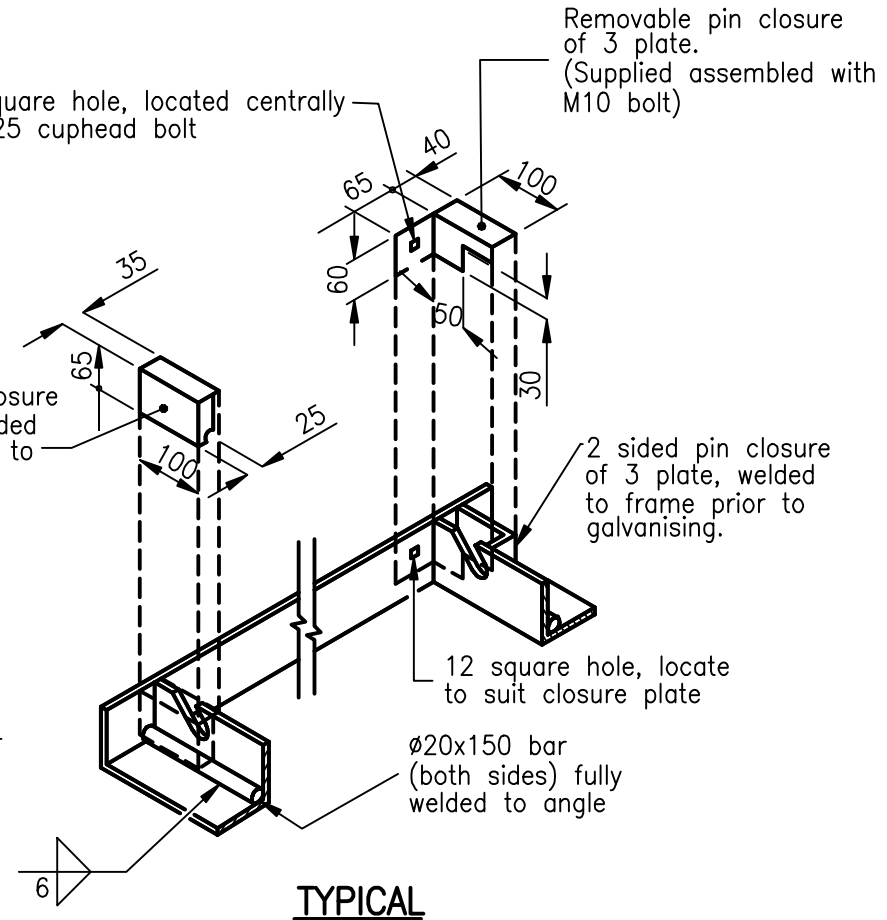


SECTION A–A

PLAN OF GRATE



PLAN OF FRAME



TYPICAL DETAIL OF HINGE PIN CLOSURES

A locking device shall be provided in accordance with clause 3.2.1.4 of AS 3996.

NOTES:

1. Mass of grate = 85 kg.
2. Mass of frame = 39 kg.
3. All steel flats Grade 250 to AS 3678.
4. All steel bars and angles Grade 250 to AS 3679.
5. Grate, frame and hinge to be hot dip galvanised, after fabrication to AS 4680.
6. All bolt hexagonal heads to AS 1111, nuts to AS 1112, washers to AS 1237, galv. to AS 1214.
7. All welds to AS 1554. Welding symbols to AS 1101.3.
8. Refer Std Dwg SEQ D–060 for kerb inlet details.
   Refer Std Dwg SEQ D–061 for precast lintel details.
9. Grate and frame Class D bicycle safe to AS 3996.
10. Alternative fabricated steel grate and frame may be used when approved by relevant Council.
11. All dimensions are in millimetres unless shown otherwise.

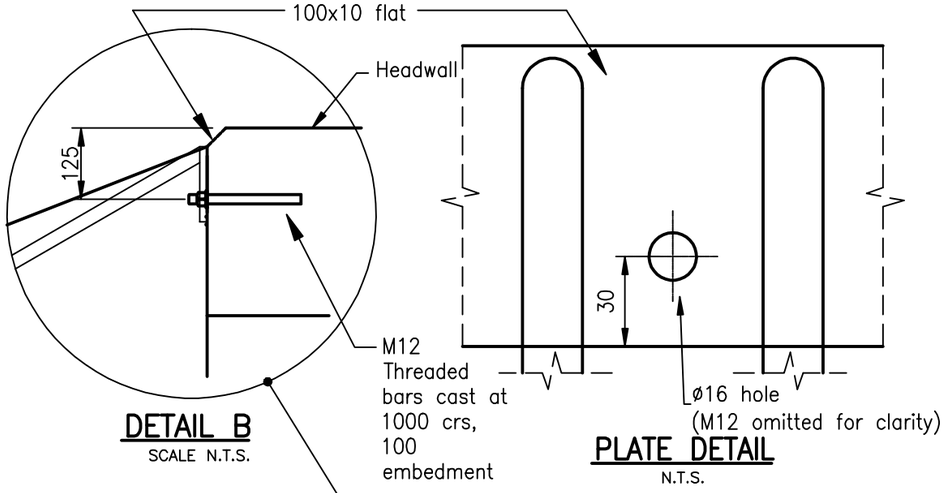
Rv.	DATE	REVISIONS
B	6/09	REVIEW
A	3/08	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

DRAINAGE PITS
KERB INLET
GRATE AND FRAME

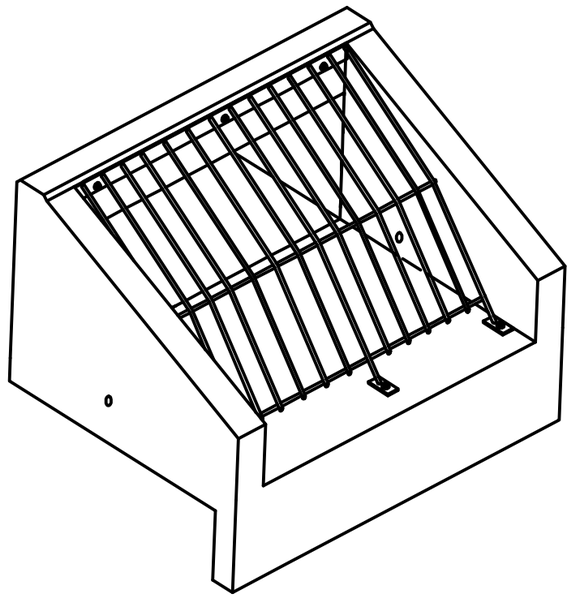
SEQ D–062

Rv. B A



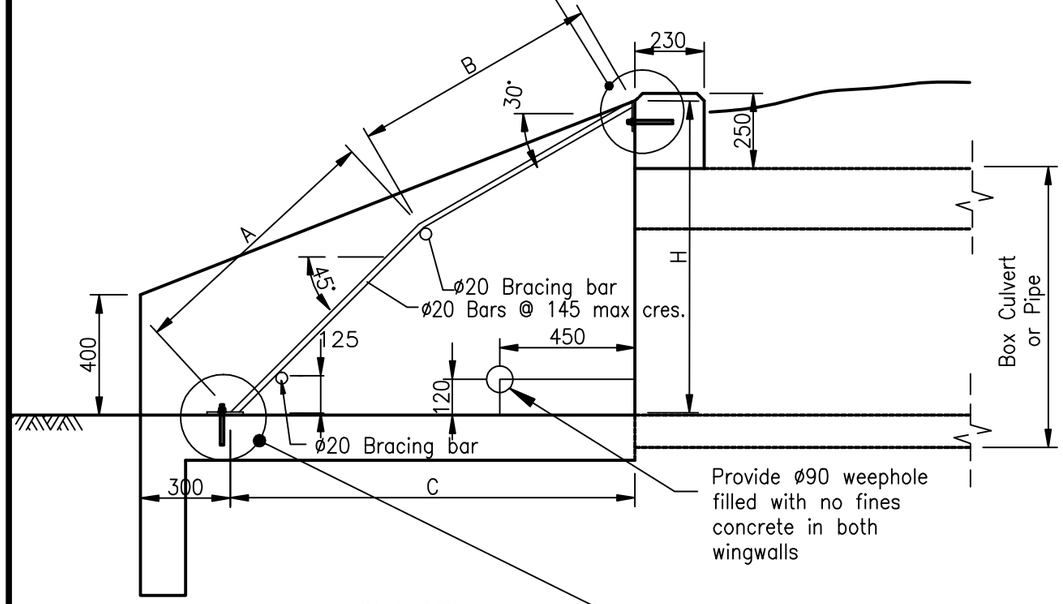
DETAIL B
SCALE N.T.S.

PLATE DETAIL
N.T.S.

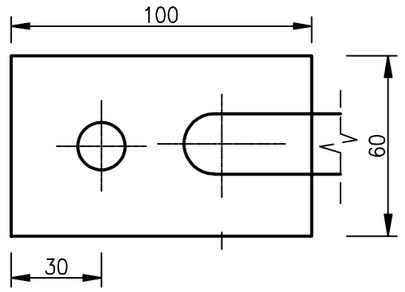


NOTES:

1. For Wingwall and Headwall details and reinforcement, refer MRD Std Drg 1303
2. For Apron details and reinforcement, refer MR Std Drg 1318 (Type 3 Apron)
3. Concrete to be Class N32/20 AS1379–3600.
4. All cover to reinforcement to be 50mm min.
5. Cover in aggressive environments refer MRD Std Drg 1303.
6. All sections to be grade 300 and all bar to be grade 400.
7. All welds to conform to AS1554 and be 6m continuous fillet welds unless otherwise noted.
8. All steelwork to be hot dip galvanised after fabrication to AS4680.
9. All nuts, bolts and washers to be stainless steel grade 316. with isolation washers.
10. Refer to MRD Standards for safe distances to carriageways.



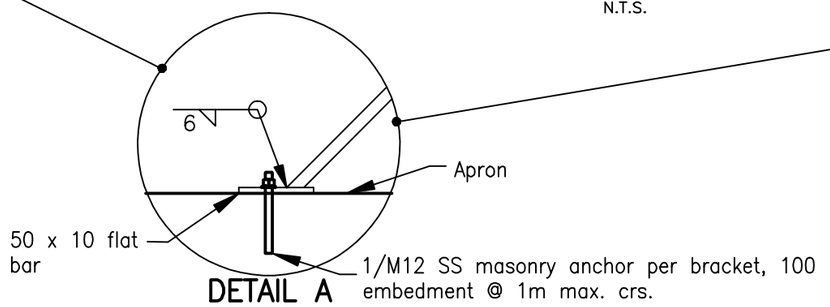
SECTION A–A
N.T.S.
Reinforcement omitted for clarity



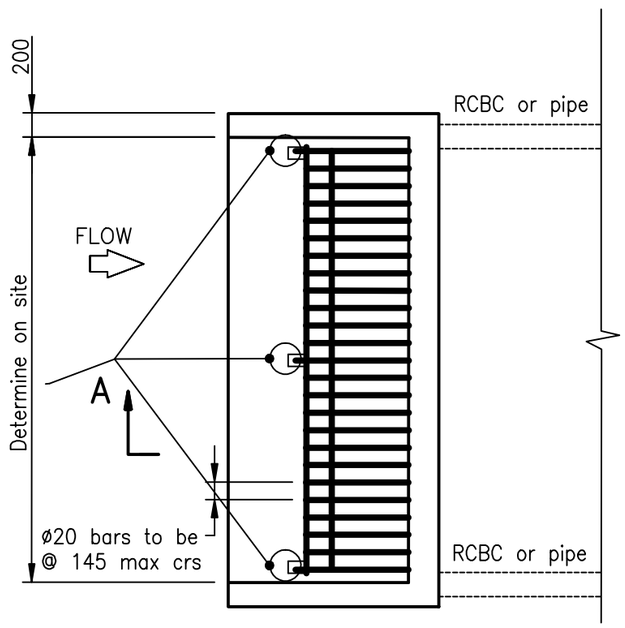
ANCHOR PLATE DETAIL
N.T.S.

TABLE 1

CULVERT HEIGHT	A	B	C	SCREEN HEIGHT H
375	500	613	884	660
450	575	671	988	742
600	675	841	1206	898
750	800	977	1411	1054
900	900	1181	1659	1227
1200	1150	1478	2093	1552



DETAIL A
N.T.S.



PLAN
N.T.S.

These drawings have been developed in consultation between the participating councils.
BEFORE USE, the user shall confirm that the drawing has been adopted by the appropriate council

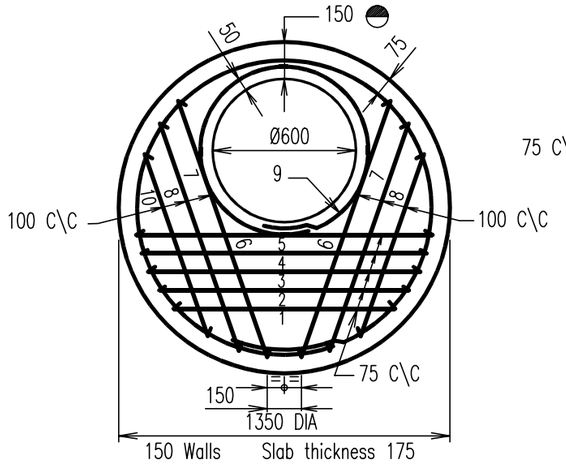
Rv.	DATE	REVISIONS
A	3/08	ORIGINAL ISSUE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

DRAINAGE DETAILS
CULVERT INLET SCREEN

SEQ D–082

Rv. A

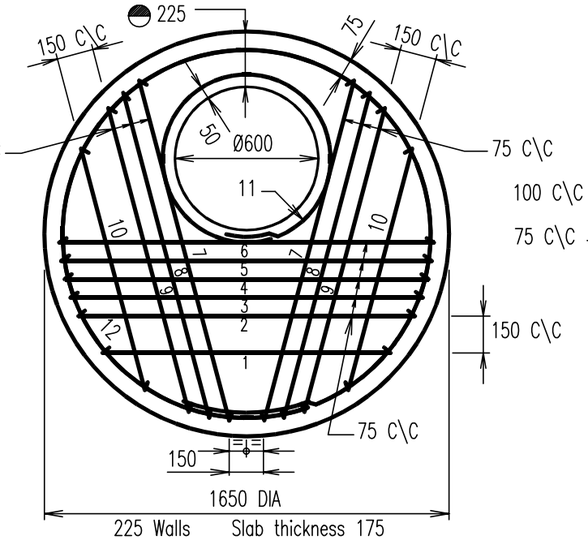


150 Walls Slab thickness 175

BAR No.	SHAPE	'a'/'b'	OVERALL LENGTH	No. OFF	TOTAL LENGTH
1	'a'	937	1175	1	1175
2		1030	1255	1	1255
3		1125	1350	1	1350
4		1175	1400	1	1400
5		1225	1450	1	1450
6		1125	1350	2	2700
7		1000	1225	2	2450
8		812	1050	2	2100
9	'b'	700	2600	1	2600
10		1200	4200	1	4200
				TOTAL	20680

STEEL MASS : 19kg
CONCRETE : 0.20m³
TOTAL MASS : 508kg

1050 DIA ACCESS CHAMBER

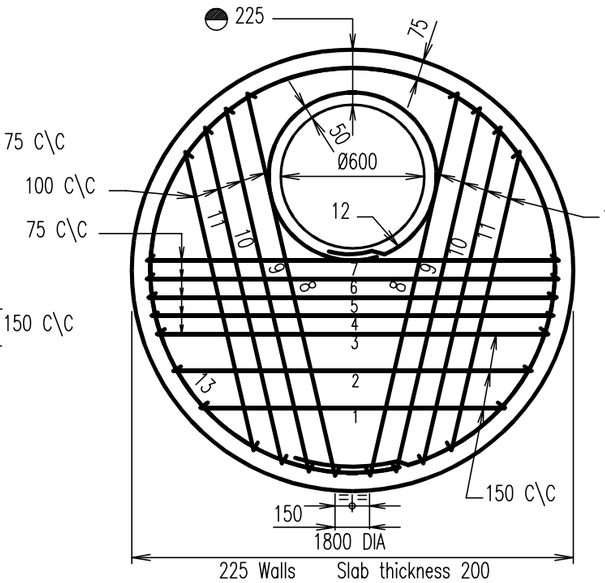


225 Walls Slab thickness 175

BAR No.	SHAPE	'a'/'b'	OVERALL LENGTH	No. OFF	TOTAL LENGTH
1	'a'	1200	1425	1	1425
2		1400	1625	1	1625
3		1450	1675	1	1675
4		1500	1725	1	1725
5		1520	1745	1	1745
6		1537	1775	1	1775
7		1450	1675	2	3350
8		1375	1600	2	3200
9		1300	1525	2	3050
10		1050	1275	2	2550
11	'b'	700	2600	1	2600
12		1500	5150	1	5150
				TOTAL	23250

STEEL MASS : 27kg
CONCRETE : 0.33m³
TOTAL MASS : 818kg

1200 DIA ACCESS CHAMBER

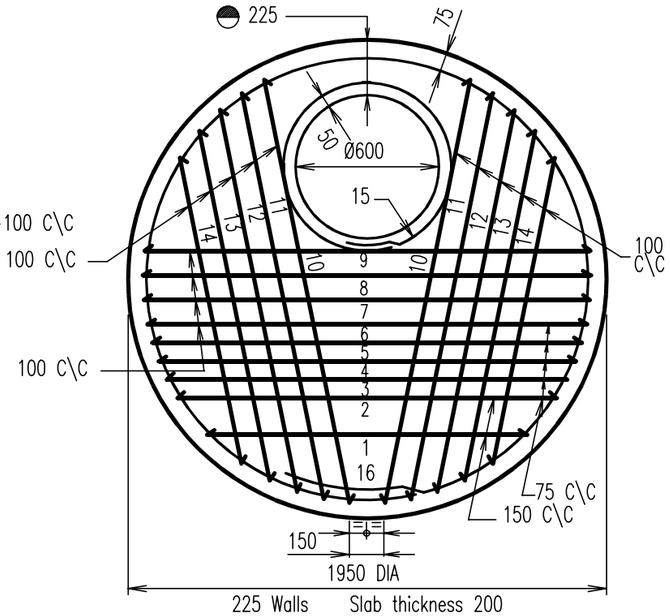


225 Walls Slab thickness 200

BAR No.	SHAPE	'a'/'b'	OVERALL LENGTH	No. OFF	TOTAL LENGTH
1	'a'	1275	1500	1	1500
2		1488	1725	1	1725
3		1612	1850	1	1850
4		1645	1870	1	1870
5		1675	1900	1	1900
6		1675	1900	1	1900
7		1675	1900	1	1900
8		1600	1825	2	3650
9		1525	1750	2	3500
10		1412	1650	2	3300
11		1262	1500	2	3000
12	'b'	700	2600	1	2600
13		1650	5625	1	5625
				TOTAL	34320

STEEL MASS : 31kg
CONCRETE : 0.45m³
TOTAL MASS : 1138kg

1350 DIA ACCESS CHAMBER

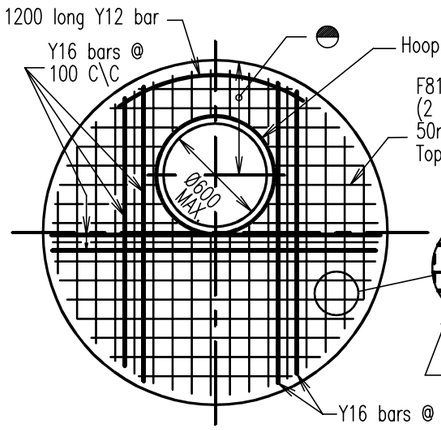


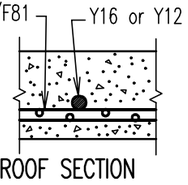
225 Walls Slab thickness 200

BAR No.	SHAPE	'a'/'b'	OVERALL LENGTH	No. OFF	TOTAL LENGTH
1	'a'	1337	1575	1	1575
2		1575	1800	1	1800
3		1645	1870	1	1870
4		1712	1950	1	1950
5		1756	1980	1	1980
6		1800	2025	1	2025
7		1825	2050	1	2050
8		1837	2075	1	2075
9		1825	2050	1	2050
10		1762	2000	2	4000
11		1700	1925	2	3850
12		1600	1825	2	3650
13		1462	1700	2	3400
14		1275	1500	2	3000
15	'b'	700	2600	1	2600
16		1800	6100	1	6100
				TOTAL	43975

STEEL MASS : 39kg
CONCRETE : 0.55m³
TOTAL MASS : 1360kg

1500 DIA ACCESS CHAMBER





FABRIC REINFORCED SLAB

NOM CHAMBER DIA	ROOF THICKNESS
1050	175
1200	175
1350	200
1500	250
1800	250
2100	250

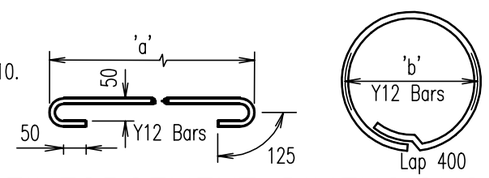
FABRIC REINFORCEMENT ALTERNATIVE AND ø1800 AND ø2100 CHAMBERS

LEGEND

Offset to access hole varies :–
a) Hole in line with chamber wall, or
b) Hole offset from wall 460mm
(refer Alternative 2 on Standard Drawing D–0010).

NOTES

1. Concrete N40 in accordance with AS 1379 and AS 3600.
2. Reinforcement cover 30 MIN (bottom cover)
3. Reinforcement :– F81 Fabric to AS 1304
   Bars Y12 and Y16, Grade 400 to AS 1302.
4. For lifting anchor locations and details, refer Standard Drawing D–0010.
5. Roof design based on Austroads bridge code, W7 wheel load, dynamic factor 0.4.
6. All dimensions in millimetres.



REINFORCEMENT DIMENSIONS

REVISIONS		DATE
C	Opening Diameter 600	3/4/00
B	ø1800 and ø2100 Chamber roofs added	3/2/97
A	ORIGINAL ISSUE	8/12/95

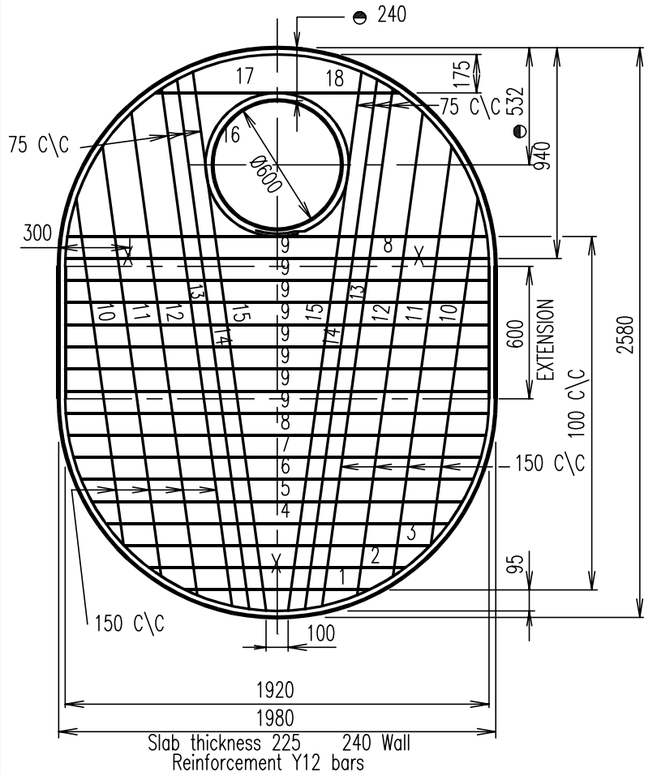
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

ACCESS CHAMBER ROOF SLABS DIA 1050 – 2100

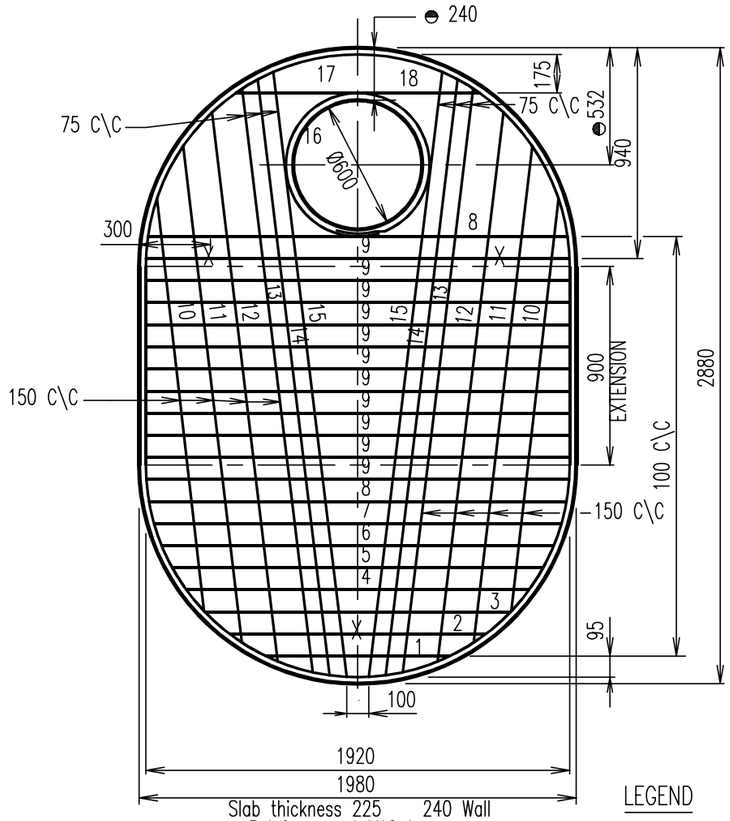
DRAINAGE
Standard Drawing
D–0011

A | B | C

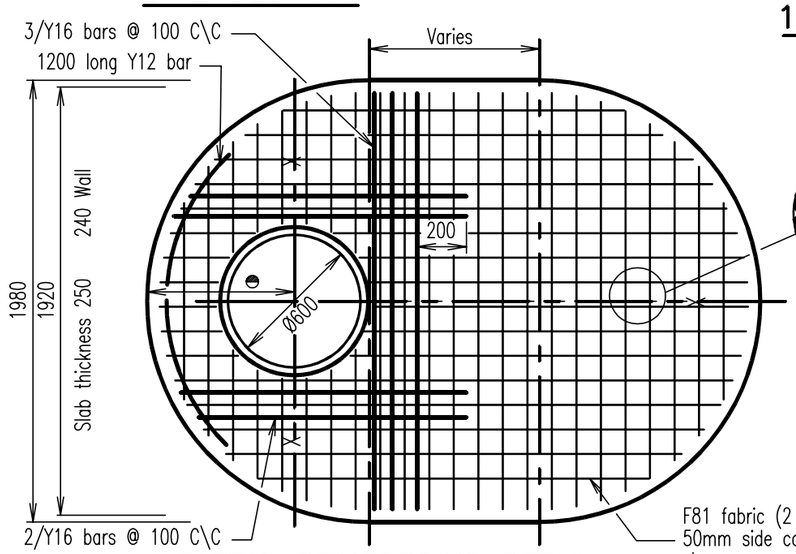
JWP – CADENZA 113327–D–0011



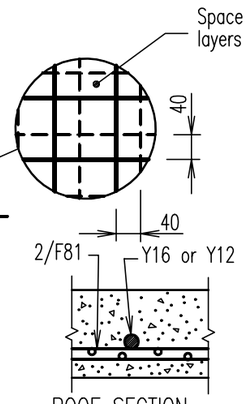
1500 DIA ACCESS CHAMBER EXTENDED 600



1500 DIA ACCESS CHAMBER EXTENDED 900



FABRIC REINFORCING DETAIL



ROOF SECTION

F81 fabric (2 layers tied together) 50mm side cover. Top layer only shown.

LEGEND

- Offset to access hole varies :–
  a) Hole in line with chamber wall, or
  b) Hole offset from wall 460mm (refer Alternative 2 on Standard Drawing D–0010).

NOTES

1. Roof design based on Austroads Bridge code, W7 wheel load, dynamic factor 0.4.
2. Concrete N40 in accordance with AS 1379 and AS 3600.
3. Reinforcement cover 30 MIN (bottom face).
4. Reinforcement :– F81 Fabric to AS 1304
   Bars Y12 and Y16, Grade 400 to AS 1302.
5. Refer Standard Drawing D–0011 for 'reinforcement dimensions'.
6. Lifting anchors to be "swiftlift" or equivalent. 1.8 tonne, galvanized to AS 1650 and fitted to manufacturer's specification at points shown 'X'.
7. Lifting capacity of mechanical devices to be no less than 4 tonnes.
8. All dimensions in millimetres.

1500 DIA ACCESS CHAMBER EXTENDED 600

BAR NO.	SHAPE	LENGTH	NO. OFF	TOTAL
1		835	1	835
2		1160	1	1160
3		1385	1	1385
4		1550	1	1550
5		1680	1	1680
6		1775	1	1775
7		1845	1	1845
8		1890	2	3780
9		1920	8	15360
10		1560	2	3120
11		1920	2	3840
12		2170	2	4340
13		2300	2	4600
14		2375	2	4750
15		2450	2	4900
16		2600	1	2600
17		7195	1	7195
18		1105	1	1105
			TOTAL LENGTH	65820

Steel Mass 59 kg
Concrete Volume 0.90 m³
Total Mass 2250 kg

1500 DIA ACCESS CHAMBER EXTENDED 900

BAR NO.	SHAPE	LENGTH	NO. OFF	TOTAL
1		835	1	835
2		1160	1	1160
3		1385	1	1385
4		1550	1	1550
5		1680	1	1680
6		1775	1	1775
7		1845	1	1845
8		1890	2	3780
9		1920	11	21120
10		1800	2	3600
11		2200	2	4400
12		2470	2	4940
13		2650	2	5300
14		2700	2	5400
15		2750	2	5500
16		2600	1	2600
17		7795	1	7795
18		1105	1	1105
			TOTAL LENGTH	75770

Steel Mass 67 kg
Concrete Volume 1.03 m³
Total Mass 2575 kg

B	Opening Diameter 600	3/4/00
A	ORIGINAL ISSUE	8/12/95
REVISIONS		DATE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

ACCESS CHAMBER ROOF SLABS DIA. 1500 EXTENDED 600 AND 900

DRAINAGE
Standard Drawing
D–0012

A | B

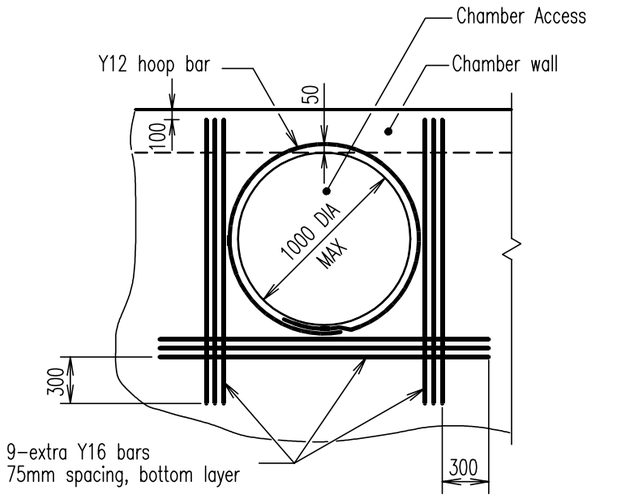
JWP – CADENZA 113327–D–0012

SHORT SPAN \ LONG SPAN	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	SLAB DEPTH
1200	Y12 AT 150	Y16 AT 200	Y16 AT 200	Y16 AT 200	Y16 AT 175	Y16 AT 175	Y16 AT 175	Y16 AT 150	Y16 AT 150	Y16 AT 150	200
1400		Y12 AT 150	Y16 AT 200	Y16 AT 200	Y16 AT 175	Y16 AT 175	Y16 AT 150	Y16 AT 150	Y16 AT 150	Y16 AT 150	200
1600			Y12 AT 150	Y16 AT 200	Y16 AT 200	Y16 AT 175	Y16 AT 150	Y16 AT 150	Y16 AT 150	Y16 AT 150	200
1800				Y12 AT 150	Y16 AT 200	Y16 AT 200	Y16 AT 200	Y16 AT 175	Y16 AT 175	Y16 AT 175	225
2000					Y12 AT 150	Y16 AT 200	Y16 AT 200	Y16 AT 200	Y16 AT 175	Y16 AT 175	225
2200						Y12 AT 150	Y16 AT 200	Y16 AT 200	Y16 AT 175	Y16 AT 175	225
2400							Y16 AT 200	Y16 AT 200	Y16 AT 200	Y16 AT 175	225
2600								Y16 AT 200	Y16 AT 200	Y16 AT 175	250
2800									Y16 AT 200	Y16 AT 175	250
3000										Y16 AT 175	250

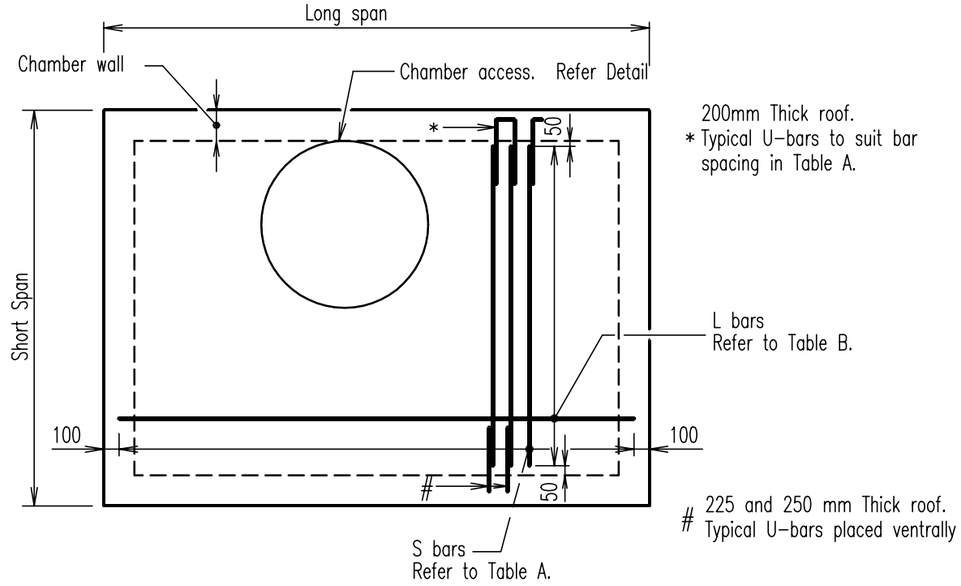
TABLE A : S BARS

SHORT SPAN \ LONG SPAN	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	SLAB DEPTH
1200	Y12 AT 150	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	200
1400		Y12 AT 150	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	200
1600			Y12 AT 150	Y12 AT 150	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	200
1800				Y12 AT 150	Y12 AT 150	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	225
2000					Y12 AT 150	Y12 AT 150	Y12 AT 200	Y12 AT 200	Y12 AT 200	Y12 AT 200	225
2200						Y12 AT 150	Y12 AT 150	Y12 AT 150	Y12 AT 200	Y12 AT 200	225
2400							Y16 AT 200	Y12 AT 150	Y12 AT 150	Y16 AT 150	225
2600								Y16 AT 200	Y16 AT 200	Y16 AT 200	250
2800									Y16 AT 200	Y16 AT 200	250
3000										Y16 AT 175	250

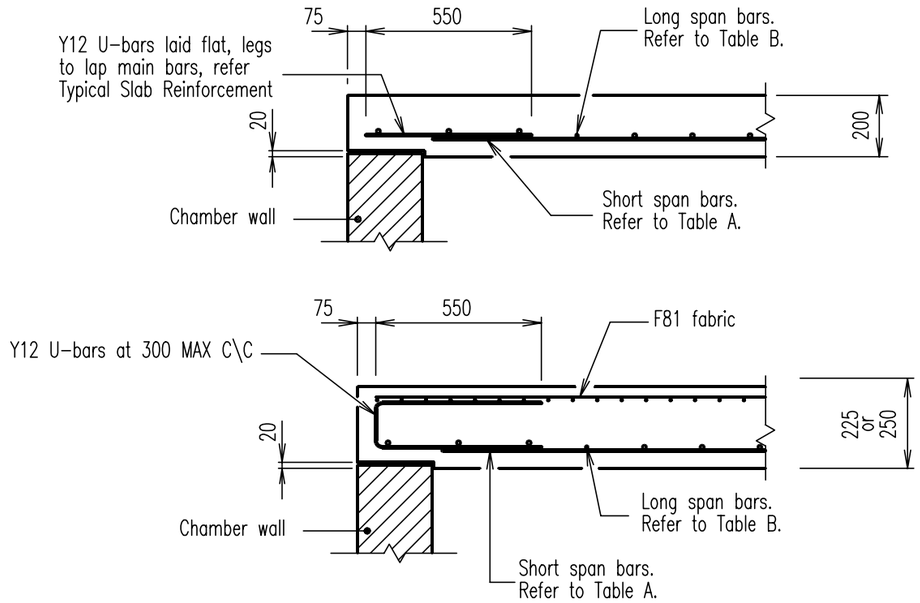
TABLE B : L BARS



SLAB REINFORCEMENT AROUND CHAMBER ACCESS



TYPICAL SLAB REINFORCEMENT



TYPICAL SECTIONS

NOTES

1. Concrete N32/20 in accordance with AS 1379 and AS 3600.
2. Reinforcement :– F81 Fabric to AS 1304
   Bars Y12 and Y16, Grade 400 to AS 1302.
3. All laps in reinforcment shall be :–
   Y12 – 300, Y16 – 400
4. Formwork in accordance with AS 3610.
5. Designed to Austroads Bridge Code, W7 wheel load, dynamic factor 0.4.
6. Maximum fill over roof slab shall be 3000mm.
7. Reinforcement cover 45 MIN.
8. Refer Service Authority for access hole diameter to be adopted.
9. Refer project drawings for details of chamber walls and floors.
10. For sections at chamber access refer Standard Drawing D–0010.
11. All dimensions in millimetres.

B	TITLE ALTERED	16/1/97
A	ORIGINAL ISSUE	8/12/95
	REVISIONS	DATE

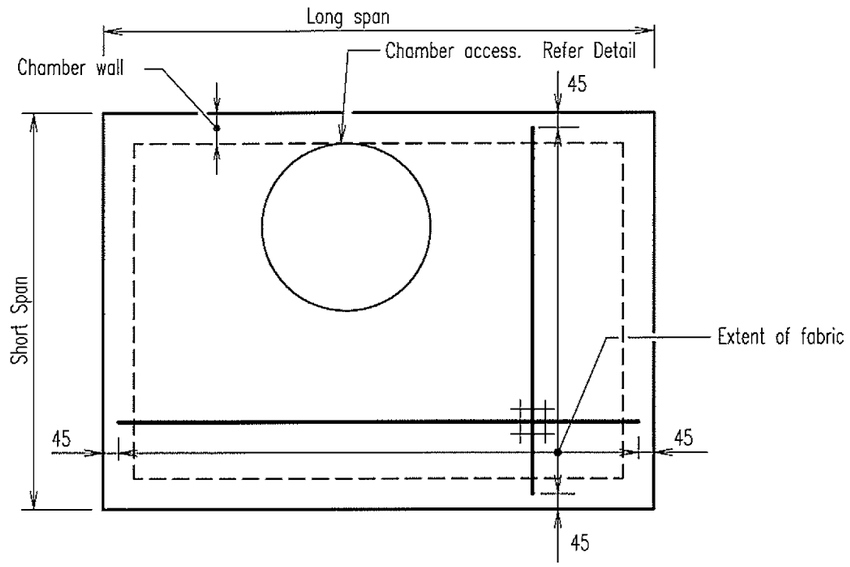
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

ACCESS CHAMBER
ROOF SLAB – RECTANGULAR
STANDARD REINFORCEMENT

DRAINAGE
Standard Drawing
D–0013

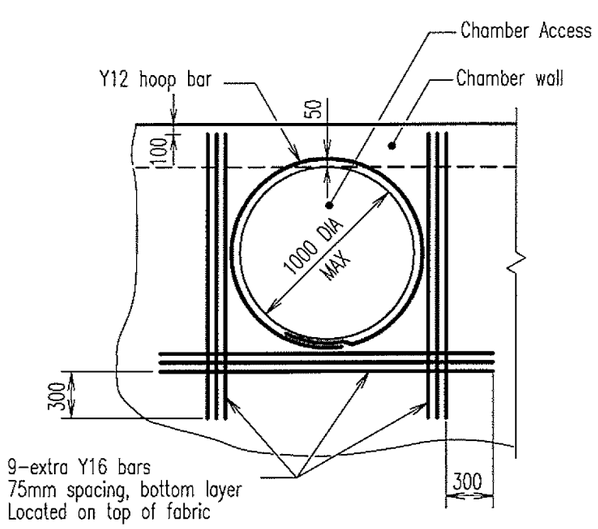
A | B

JWP – CADENZA 113327–D–0013

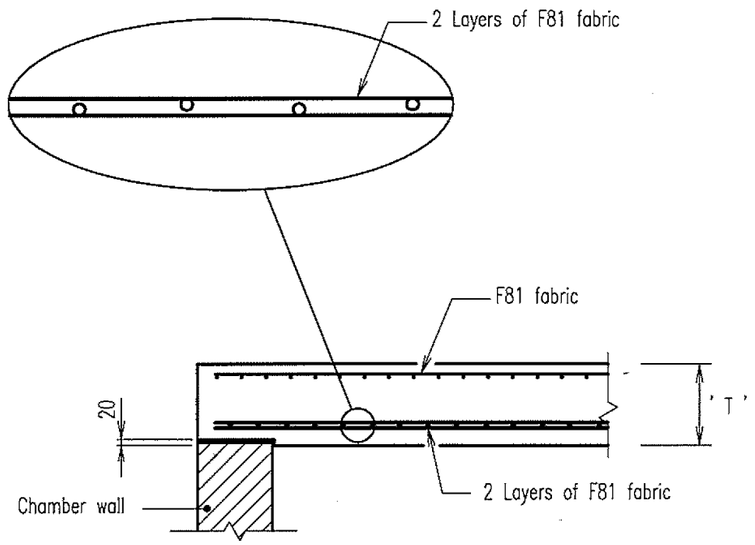


TYPICAL SLAB REINFORCEMENT

FABRIC REINFORCED SLAB	
SHORT SPAN	SLAB THICKNESS 'T'
1200 TO 1600	225
1800 TO 2400	250
2600 TO 3000	275



SLAB REINFORCEMENT AROUND CHAMBER ACCESS



TYPICAL SECTION

NOTES

1. Concrete N32/20 in accordance with AS 1379 and AS 3600.
2. Reinforcement :- F81 Fabric to AS 1304
   Bars Y16, Grade 400 to AS 1302.
3. All laps in reinforcement shall be :-
   Y12 - 300, Y16 - 400, Fabric - 250
4. Formwork in accordance with AS 3610.
5. Designed to Austroads Bridge Code, W7 wheel load, dynamic factor 0.4.
6. Maximum fill over roof slab shall be 3000mm.
7. Reinforcement cover 45 MIN.
8. Refer Service Authority for access hole diameter to be adopted.
9. Refer project drawings for details of chamber walls and floors.
10. For sections at chamber access refer Standard Drawing D-0010.
11. All dimensions in millimetres.

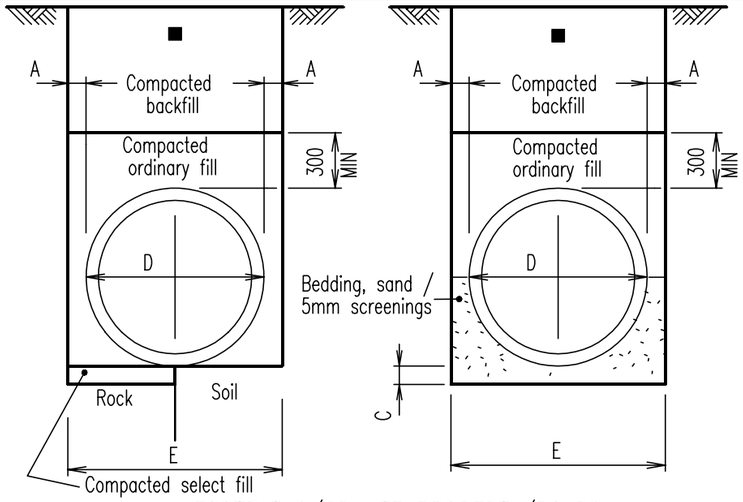
A	ORIGINAL ISSUE	25/2/97
	REVISIONS	DATE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

ACCESS CHAMBER
ROOF SLAB - RECTANGULAR
FABRIC REINFORCEMENT

DRAINAGE
Standard Drawing
D-0017
A

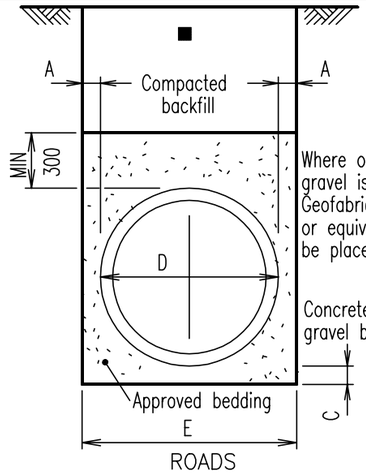
JWP - CADENZA 113327-D-0017



FOOTPATHS/PRIVATE PROPERTY/ROADS

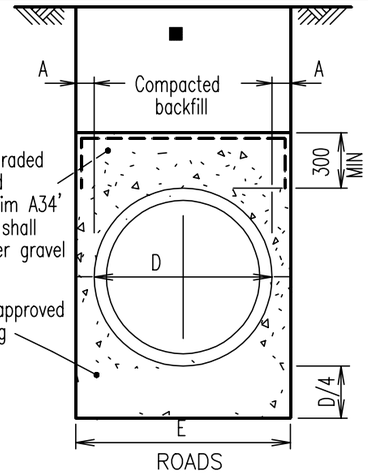
TYPE 1
Conforms to Support Type U AS 3725

TYPE 2
Conforms to Support Type H1 AS 3725



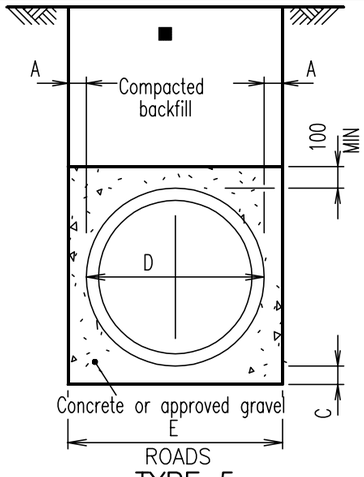
ROADS

TYPE 3
SAND SURROUND



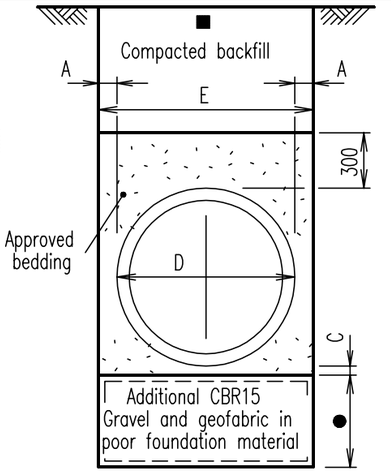
ROADS

TYPE 4
CONCRETE OR GRAVEL SURROUND



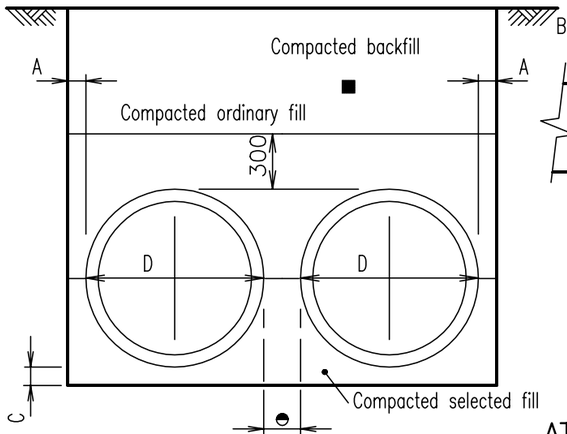
ROADS

TYPE 5
CONCRETE OR GRAVEL ENCASEMENT



Footpath / Private Property / Roads

TYPE 6
BEDDING IN POOR GROUND

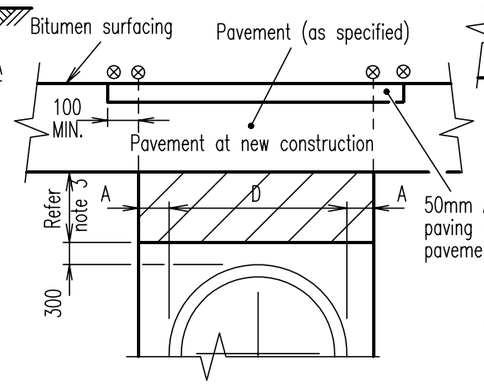


TYPE 7
BEDDING OF MULTIPLE PIPES

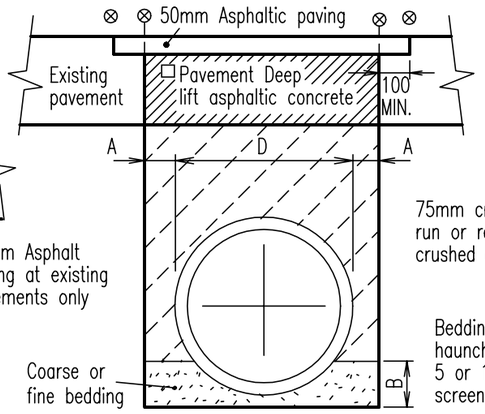
Conforms to Support Type H1

Bedding & Haunch material (Gravel, loam, sand or mixture) grading

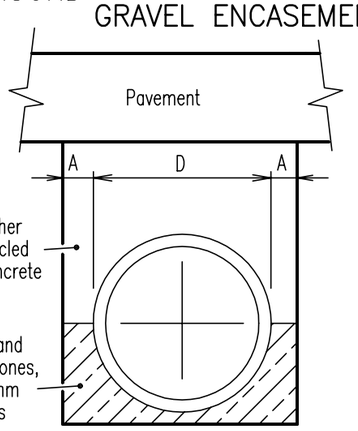
AS Sieve Size	% Passing by mass	
	Type 1 – Pipes ≤ ø1200	Type 2 – Pipes > ø1350
19.0	100	98 – 100
9.5	–	35 – 50
4.75	–	5 – 10
2.36	40 – 100	0 – 2
0.425	15 – 70	0 – 1
0.075	3 – 30	0 – 1



ALTERNATIVE A
AT NEW PAVEMENTS ON RESIDENTIAL STREETS & RURAL ROADS AND EXISTING SEALED PAVEMENTS



ALTERNATIVE B
AT EXISTING SURFACED PAVEMENTS ON INDUSTRIAL, TRUNK COLLECTOR, SUB–ARTERIAL & ARTERIAL STREETS / ROADS



ALTERNATVE C
AT EXISTING SURFACED PAVEMENTS ON INDUSTRIAL, TRUNK COLLECTOR, SUB–ARTERIAL & ARTERIAL STREETS / ROADS

LEGEND

- □ Pavement. Refer project documentation for detail
- ⊗ Saw cut at existing pavement
- ◓ Pipes : 300 when NOMINAL D < 600
  600 when NOMINAL D 600 – 1800
  900 when NOMINAL D > 1800
  Dimensions can be reduced to 150 MIN for non mechanical compaction of backfill
- ■ Refer Alternative A, B and C for backfill requirements at existing and new pavements.
- ● Depth to be approved by the Superintendent
- Gravel (MIN CBR15) backfill
- No fines concrete backfill (8 parts 10mm NOM size aggregate to 1 part cement).

NOTES:

1. Selected backfill in all cases shall be carried through to the wings and continued 300 thick for the length and height of wings.
2. Bedding compaction (Compacted selected fill / sand bedding)
   Cohesive material – 95% standard compaction
   Non–cohesive material – density index of 70 MIN, refer AS 1289.E5.1
   Sand – compact by flooding and use of vibrators.
3. Backfill compaction
   Compacted gravel (300mm) layer under road pavement 95% standard compaction.
   Compacted ordinary fill / CBR15 Gravel 90% standard compaction – below 300mm zone.
   Compacted backfill – at footpaths / private property 90% standard compaction.
   MAX. densities determined by standard compaction tests to AS 1289.5.1.1.
4. Refer project drawings for types and/or alternatives to be adopted.
5. Type U & Type H1 to conform to AS 3725.
6. Dimension A can be reduced to 150 MIN for non mechanical compaction of backfill
7. Pipes are to be designed to their correct strength class under all construction loads, dead loads and in–service loads.
8. All dimensions in millimetres.

NOMINAL Ø culvert D(mm)	MINIMUM width A (mm)	HAUNCH depth B	Bedding depth C	Allowable width,E(m)	
				DES	MAX
300	300	36	100	1.0	1.1
375	300	45	100	1.1	1.2
450	300	53	100	1.1	1.3
525	300	61	100	1.2	1.5
600	300	69	100	1.3	1.6
750	300	85	100	1.5	1.8
900	300	103	100	1.6	1.9
1050	300	120	100	1.8	2.1
1200	300	135	100	2.0	2.2
1350	300	150	100	2.1	2.4
1500	300	169	100	2.3	2.7
1650	330	184	150	2.6	2.9
1800	360	200	150	2.8	3.1
1950	390	222	150	3.1	3.3
2100	420	239	150	3.4	3.5
2400	480	270	150	3.9	4.2
2700	540	303	150	4.3	4.6
3000	600	335	150	4.9	5.0

	REVISIONS	DATE
C	Note 7 added	6/1/00
B	Bedding modification Type 2, 4, 7 and	16/1/97
	Alternative B	
A	ORIGINAL ISSUE	8/12/95

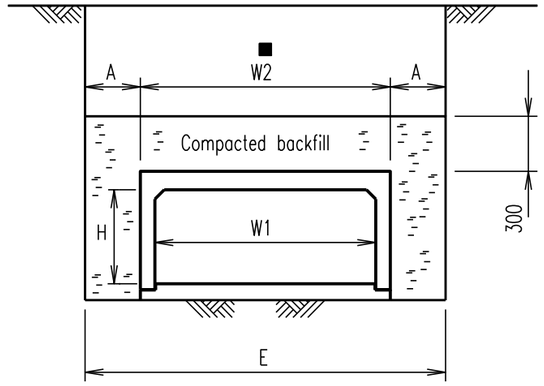
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

EXCAVATION, BEDDING AND BACKFILLING OF STORMWATER DRAINAGE PIPES

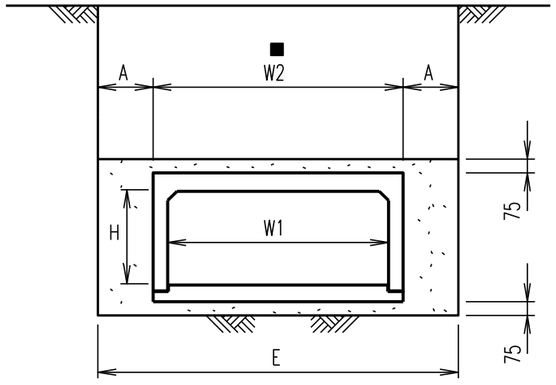
DRAINAGE
Standard Drawing
D–0030

A | B | C

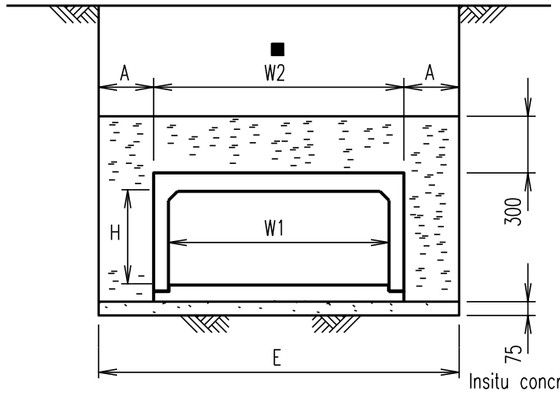
JWP – CADENZA 113327–D–0030



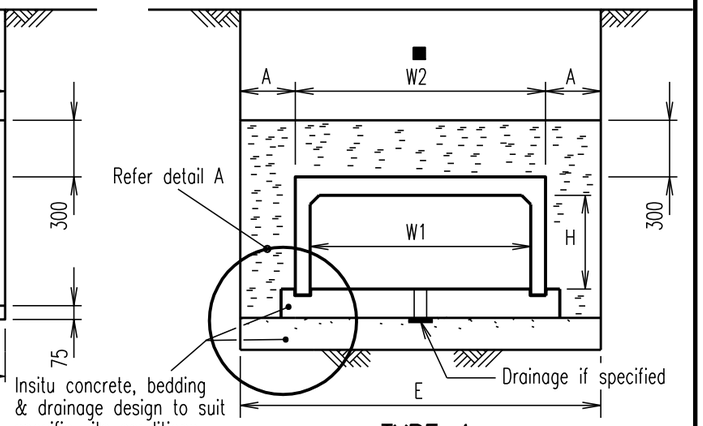
TYPE 1
NATURAL BEDDING



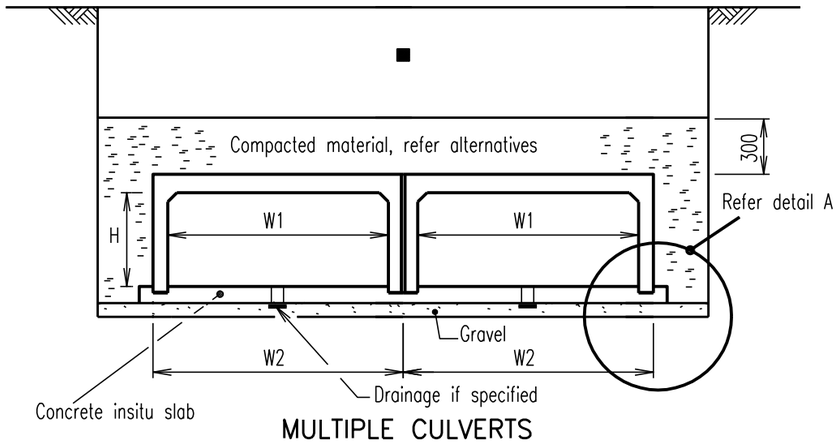
TYPE 2
SAND SURROUND



TYPE 3
SAND BEDDING



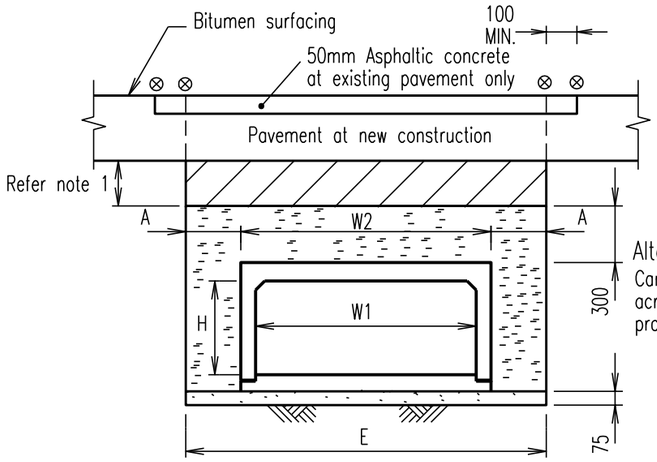
TYPE 4
INSITU BASE SLAB



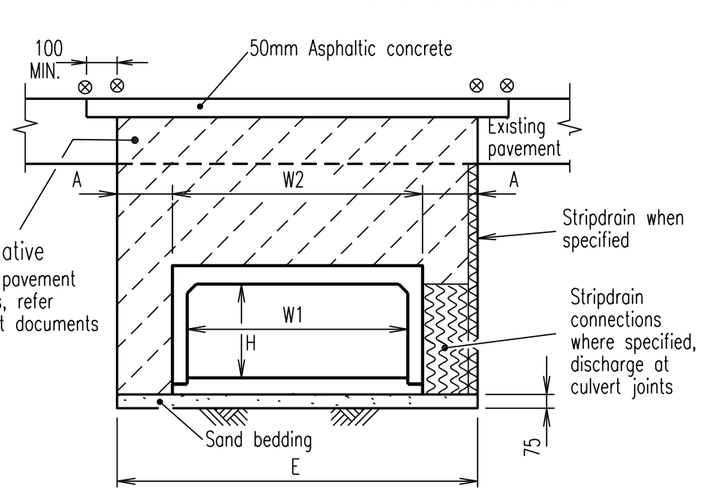
MULTIPLE CULVERTS

W1	W2	E NOM.
300	420	1000
375	500	1100
450	570	1200
600	730	1300
750	890	1500
900	1050	1700
1200	1360	2000
1520	1700	2300
1820	2010	2600
2130	2340	3000
2440	2670	3300

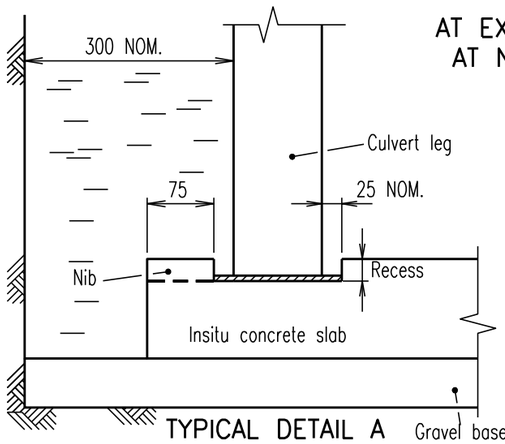
EXCAVATION WIDTH



ALTERNATIVE A
AT EXISTING SURFACED PAVEMENTS OR
AT NEW PAVEMENTS ON RESIDENTIAL
STREETS & RURAL ROADS



ALTERNATIVE B
AT EXISTING SURFACED PAVEMENTS
ON INDUSTRIAL, TRUNK COLLECTOR,
SUB-ARTERIAL & ARTERIAL STREETS / ROADS



TYPICAL DETAIL A Gravel base, site specific design

LEGEND

- A 300mm NOMINAL
- ■ Refer Alternative A for backfill requirements at new pavement
- ⊗ Saw cut at existing pavement
- Gravel (MIN CBR15) or 75mm crusher run backfill
- Lean mix concrete backfill (1:15 mix)
- 10mm Cement mortar bed, 1:3 mix

NOTES:

1. Backfill compaction
   Approved fill / approved bedding / compacted backfill / CBR15 Gravel 90%
   Compacted gravel (300mm layer) under road pavement 95%
   Compacted fill – at footpaths / private property 90%
   MAX. densities determined by Standard compaction tests to AS 1289.E5.1.
2. Refer to Main Roads Std Drg 1316 for installation of precast culverts.
3. Tape all joints with 75mm wide Denso (600) Tape or equivalent.
4. All dimensions in millimetres.

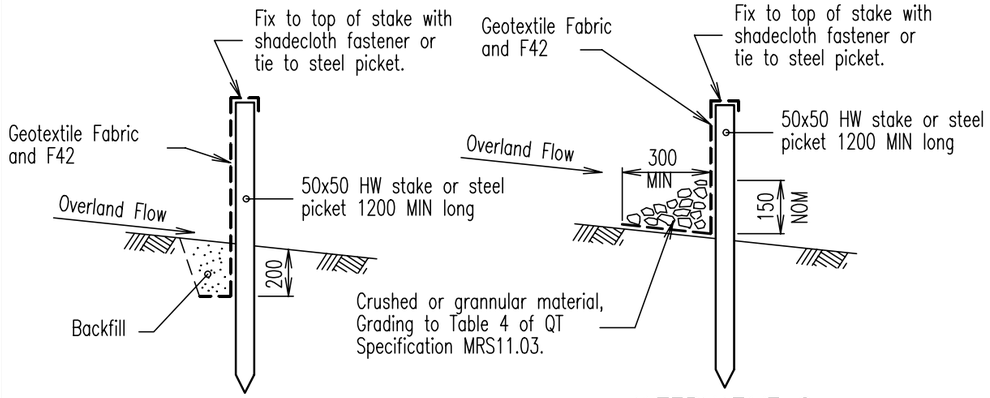
B	Note 2 added	6/1/00
A	ORIGINAL ISSUE	8/12/95
	REVISIONS	DATE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

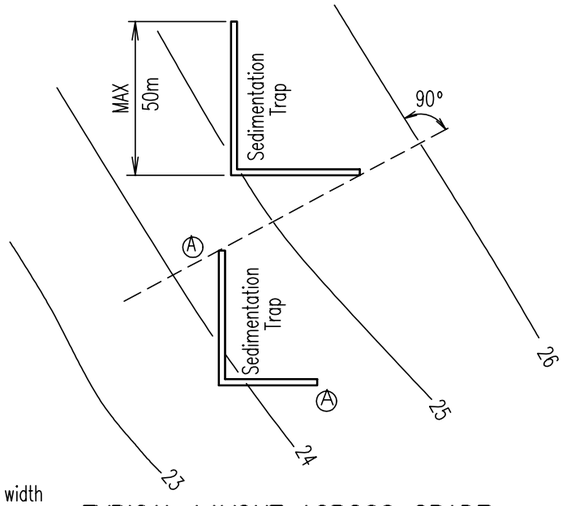
EXCAVATION, BEDDING AND BACKFILLING OF PRECAST BOX CULVERTS

DRAINAGE
Standard Drawing
D-0031
A

JWP - CADENZA 113327-D-0031

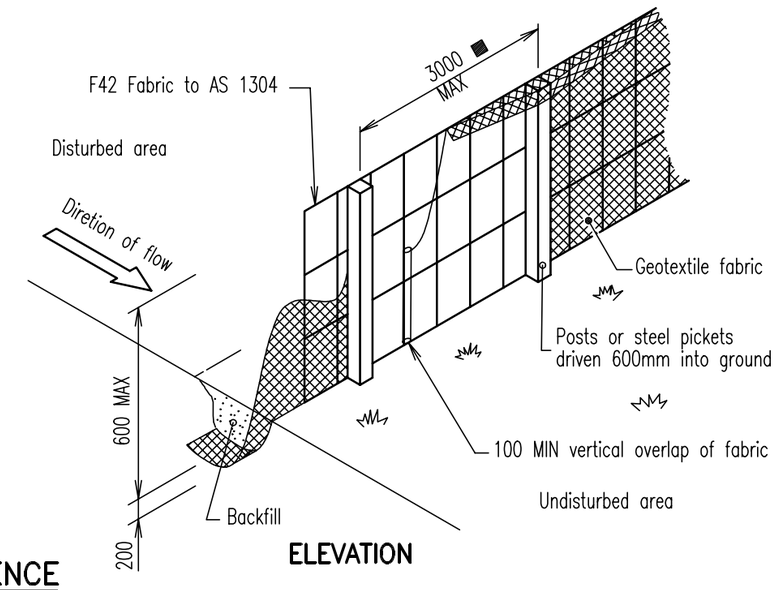


ALTERNATIVE 1 ALTERNATIVE 2

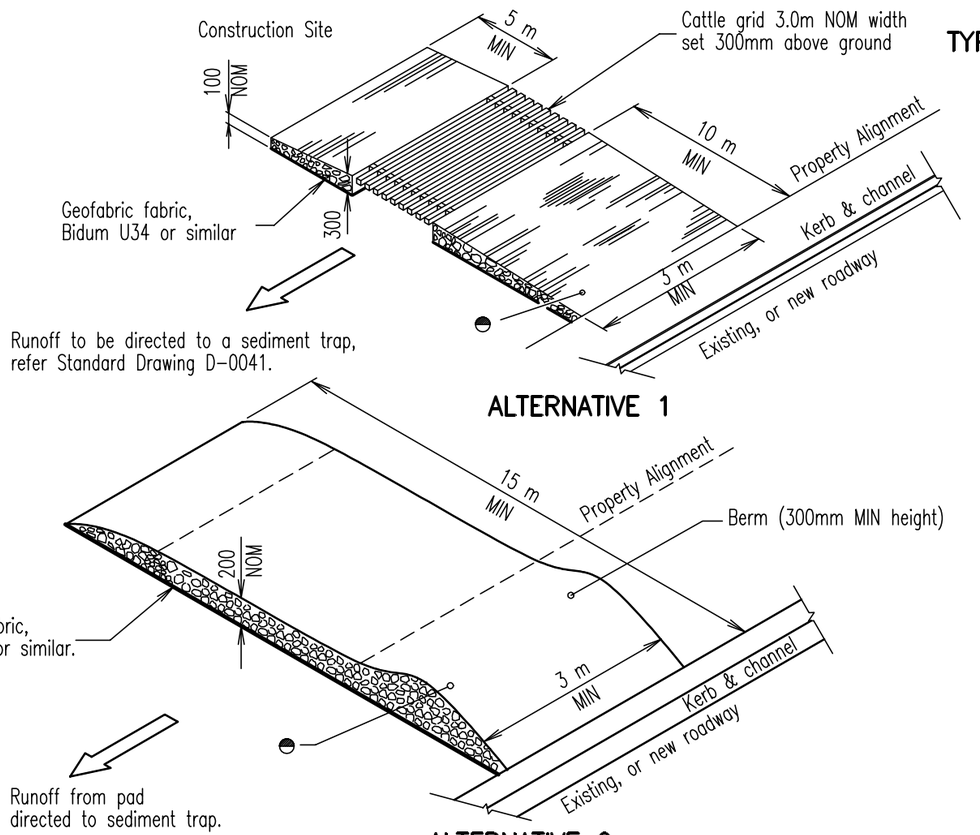


TYPICAL LAYOUT ACROSS GRADE

Points A at same elevation



ELEVATION



ALTERNATIVE 1

ALTERNATIVE 2

TEMPORARY CONSTRUCTION ENTRY / EXIT SEDIMENT TRAP

SEDIMENT FENCE

LEGEND

- ◓ Unbound pavement material (gravel) to Grading B, Table 9 of QT Specification MRS11.05, exclude material finer than AS sieve 2.36mm.
- ■ Without F42 fabric, 2000 MAX C\C

NOTES

1. General
   - (a) Temporary drainage control. Flow should be diverted around the work site where possible.
   - (b) All drainage, erosion and sediment controls to be installed and be operational before commencing up-slope earthworks.
   - (c) All control measures to be inspected at least weekly and after significant runoff producing storms.
   - (d) Control measures may be removed when on-site erosion is controlled and 70% permanent soil coverage is obtained over all upstream disturbed land.
   - (e) In areas where runoff turbidity is to be controlled, exposed surfaces to be either mulched, covered with erosion control blankets or turfed if earthworks are expected to be delayed for more than 14 days.
   - (f) Straw bale sediment traps are a secondary option which generally should not be used if other options are available.
2. Sediment Fence
   - (a) Not to be located in areas of concentrated flow.
   - (b) Normally located along the contour with a maximum catchment area 0.6 ha per 100m length of fence.
   - (c) Woven fabrics are preferred, non-woven fabrics may be used on small work sites, i.e. operational period less than 6 months or on sites where significant sediment runoff is not expected.
   - (d) Where fences need to be located across the contour the layout shall conform to 'Typical Layout Across Grade'.
   - (e) Fences are required 2m MIN from toe of cut or fill batters, where not practical one fence can be at the toe with a second fence 1m MIN away. Fence should not be located parallel with toe if concentration of flow will occur behind the fence.
3. Temp Construction Entry/Exit Sediment Trap.
   - (a) Adjacent stormwater runoff to be diverted away from entry/exit.
   - (b) Wheel – wash or spray unit may be required during wet weather.
4. Safety issues must be considered at all times, incorporate traffic control devices to the satisfaction of the Superintendent.
5. All dimensions in millimetres unless indicated otherwise.

A	ORIGINAL ISSUE	8/12/95
REVISIONS		DATE

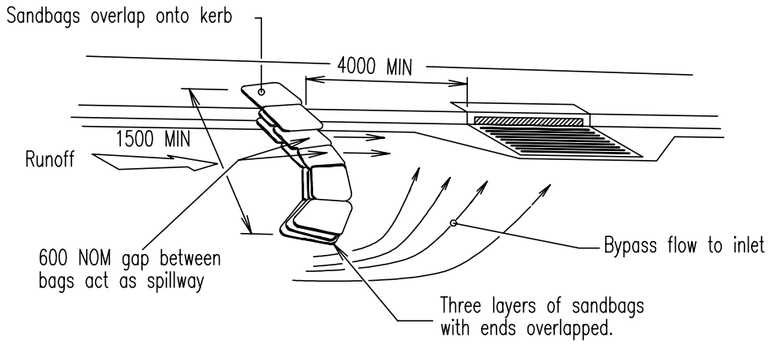
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA QUEENSLAND DIVISION INC.

SEDIMENT CONTROL DEVICES
SEDIMENT FENCE
ENTRY/EXIT SEDIMENT TRAP

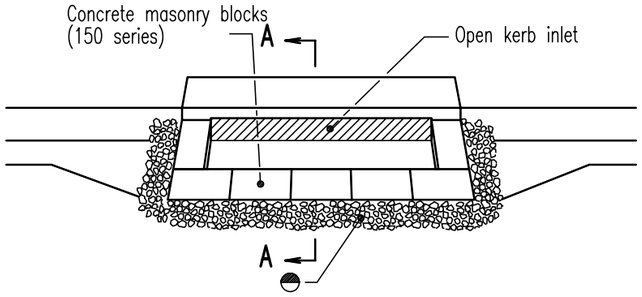
DRAINAGE
Standard Drawing
D-0040

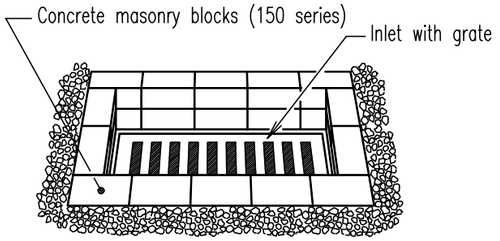
A

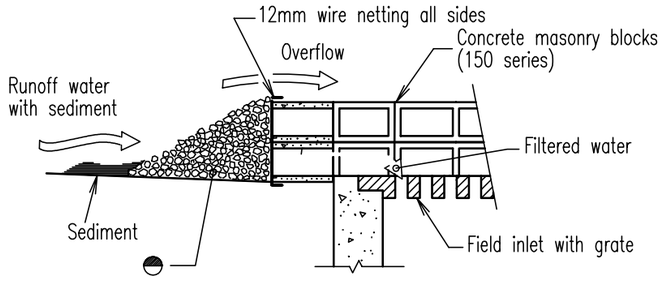
JWP – CADENZA 113327-D-0040



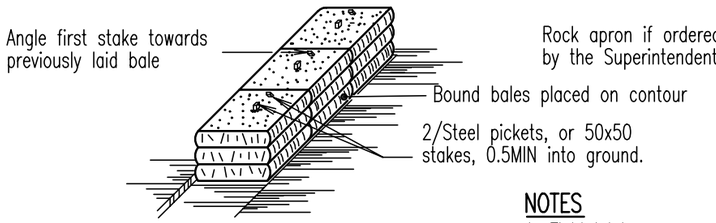
ON GRADE KERB INLET SEDIMENT TRAP



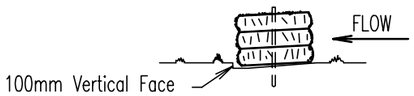




FIELD INLET SEDIMENT TRAP

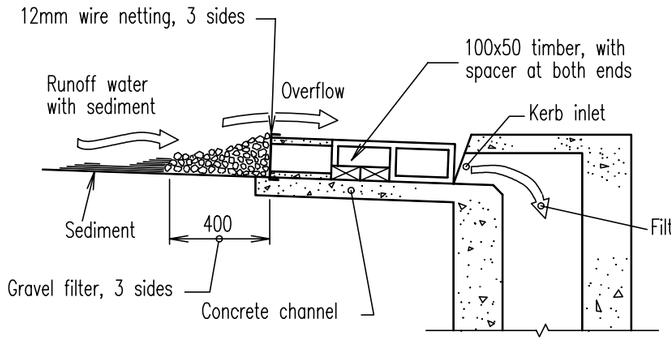


ANCHORING DETAIL



BEDDING DETAIL

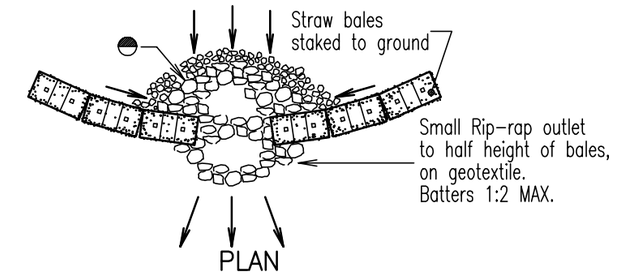
STRAW BALE BANK SEDIMENT CONTROL



SECTION A–A

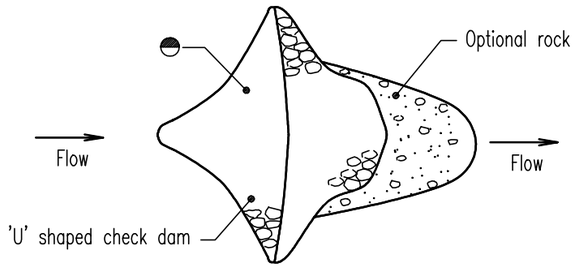
SAG INLET SEDIMENT TRAP

A stabilised bypass 'overland flow path' should exist adjacent to inlet in genuine sags.

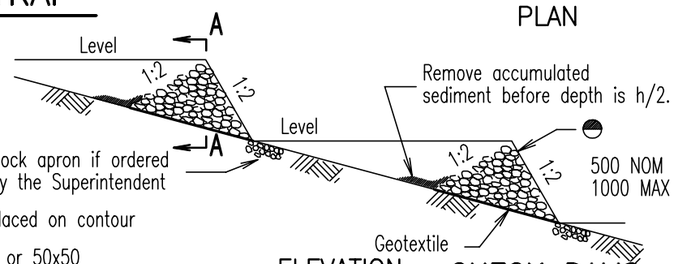


PLAN

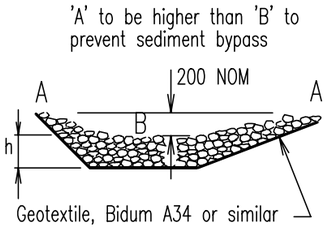
STRAW BALE AND STONE TRAP SEDIMENT CONTROL – CONCENTRATED FLOW



PLAN



ELEVATION



SECTION A–A

CHECK DAMS FLOW CONTROL

NOTES

1. Field Inlet
   a) A stabilised bypass overland flow path should exist adjacent to the field inlet.
   b) Water level control perimeter banks may be required.
   c) Blocks to be restrained by a horizontal timber rail at block joint height fixed to timber stakes at corners.
2. Check Dams
   a) Catchment area limited to 4 ha.
   b) Use in minor open drains only, (velocity control), sediment collection is a secondary purpose.
3. Straw Bale Banks
   a) Bales shall be placed at the toe of a slope or on the contour,in a row with ends tighly abutting the adjacent bales.
   b) Each bale shall be embedded in the soil a minmum of 100mm on the downstream side and placed so the bindings are horizontal.
   c) Bales shall be securely anchored in place with either two stakes or steel pickets driven through the bale. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together.
   d) Inspections shall be frequent and repair or replacement shall be made promptly as needed. Replace at least 3 monthly.
4. Safety issues must be considered at all times, incorporate traffic control devices to the satisfaction of the Superintendent.
5. All dimensions in millimetres.

LEGEND

Gravel filter, refer Grading B, Table 9 of QT Specification MRS11.05, exculde material finer then AS sieve 2.36mm.

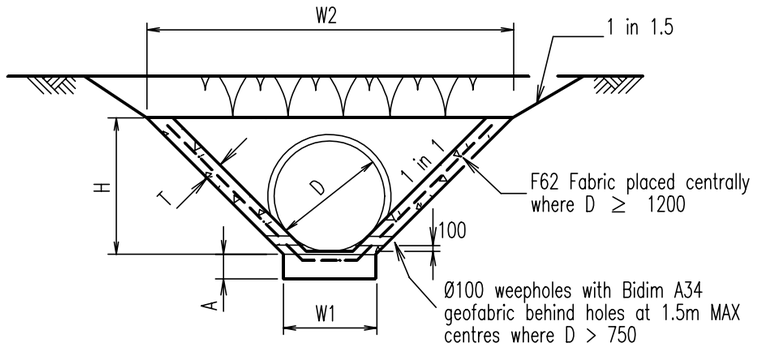
A	ORIGINAL ISSUE	8/12/95
	REVISIONS	DATE

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

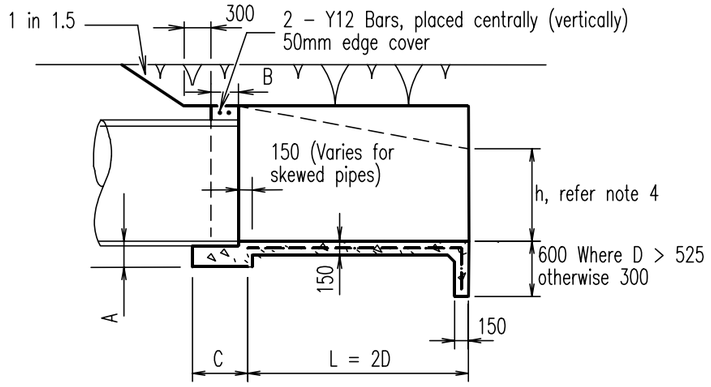
SEDIMENT CONTROL DEVICES KERB AND FIELD INLETS, CHECK DAMS & STRAW BALE BANK

DRAINAGE
Standard Drawing
D–0041
A

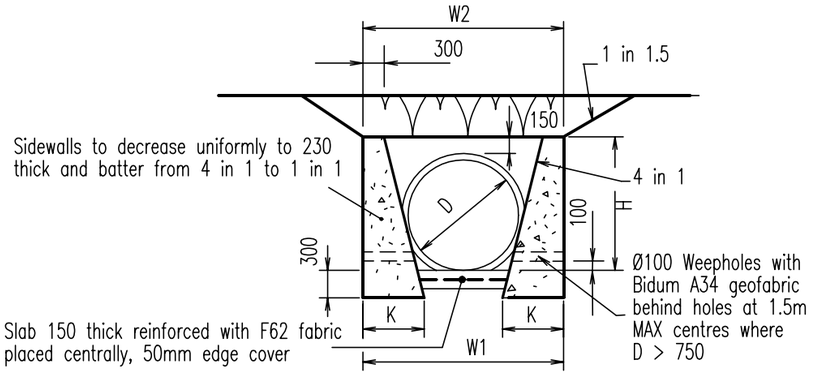
JWP – CADENZA 113327–D–0041



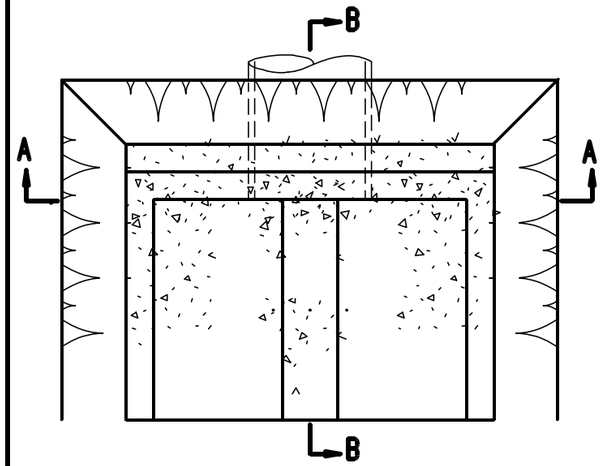
SECTION A–A



SECTION B–B



SECTION C–C



PLAN

TYPE A INLET / OUTLET

Pipe skew	5° – 15°	16° – 25°	26° – 35°	36° –45°
Skew factor	1.02	1.07	1.16	1.32

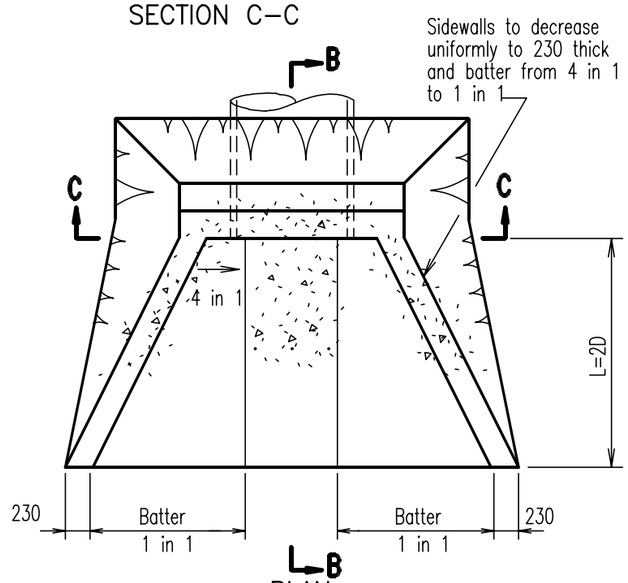
For multiple pipes – increase W1 and W2 for each additional pipe by the external diameter + : 300 when NOMINAL D < 600
600 when NOMINAL D 600 – 1800
900 when NOMINAL D > 1800

For skewed pipes – multiply W1 and W2 by skew factor

MULTIPLE / SKEW PIPES

DIMENSION	PIPE DIAMETER D				
	1350	1500	1650	1800	1950
K	800	840	875	920	960
H	2000	2160	2300	2460	2640
W1	2060	2250	2440	2630	2840
W2	2060	2250	2440	2630	2840

DIMENSIONS
TYPE B INLET AND OUTLET
DIA. = 1350 to 1950



PLAN

TYPE B INLET / OUTLET

DIMENSION	PIPE DIAMETER D															
	300	375	450	525	600	675	750	825	900	1050	1200	1350	1500	1650	1800	1950
A	150	150	150	200	200	200	250	250	250	250	250	300	300	300	300	300
B	225	225	225	300	300	300	300	300	300	300	300	300	300	300	300	300
C	450	450	450	450	450	450	600	600	600	600	600	600	600	600	600	600
H	580	670	750	830	900	980	1060	1140	1220	1370	1530	1690	1840	2000	2160	2340
T	150	150	150	200	200	200	200	200	200	200	200	200	200	200	200	200
W1	700	730	760	790	820	850	880	920	950	1010	1070	1140	1200	1260	1320	1380
W2	1860	2070	2260	2450	2620	2810	3000	3200	3390	3750	4130	4520	4880	5260	5640	6060

DIMENSIONS

TYPE A INLET DIA. = 300 to 1200
TYPE A OUTLET DIA. = 300 to 1950

NOTES:

1. Design bearing pressure 75 KPa. Where this bearing pressure cannot be obtained, the Superintendent may direct that a wider footing be used.
2. Concrete N20 or Grade S32/10 shotcrete may be used in accordance with AS 1379 and AS 3600.
3. In tidal areas where fabric reinforcement is specified, concrete is to be sulphate resistant Grade S40 to AS 1379 and AS 3600.
4. In embankment situations, the height of the wingwall at the toe should be reduced to "h" so that the slope of the top of the wingwall equals the adjacent embankment batter. Refer project drawings.
5. See project drawings for the following : No. and diameter of pipes; Skew angles of pipes if applicable; Invert levels of pipes; Height of wingwall "h" at toe if applicable.
6. If directed (by the Superintendent), the apron slab to a Type A outlet may be lowered by the pipe wall thickness to allow for future pipe extension.
7. At inlets or outlets, transition uniformly from concrete to open channel over 5m to 10m.
8. Refer project drawings for protection proposed between end of outlet structure and open drain / creek.
9. Reinforcement : Bars Grade 400 to AS 1302. Fabric to AS 1304.
10. All dimensions in millimetres, unless shown otherwise.

A	ORIGINAL ISSUE	8/12/95
REVISIONS		DATE

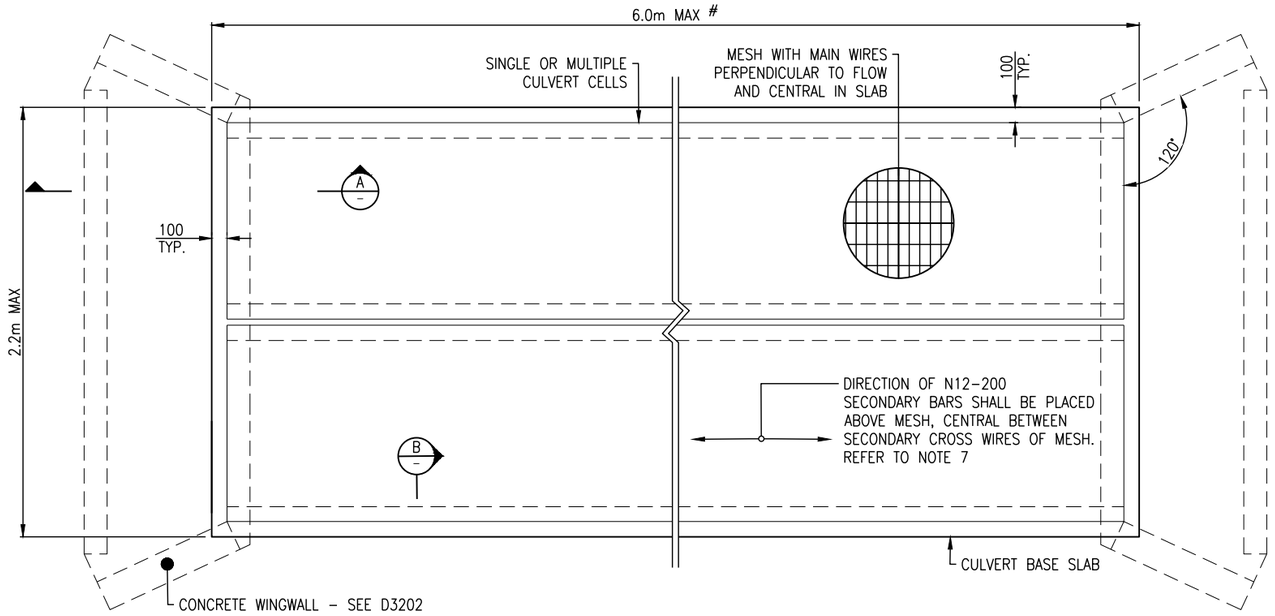
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.

INLETS AND OUTLETS TO STORMWATER DRAINS (CONCRETE)

DRAINAGE
Standard Drawing
D–0080
A

JWP – CADENZA 113327–D–0080

BRC(09/10)



CULVERT BASE SLAB PLAN

LEGEND

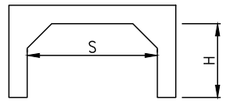
\# UNLESS OTHERWISE APPROVED BY BRC ENGINEER

BASE SLAB DETAILS

SPAN "S"	SLAB DEPTH "D"	MESH	SECONDARY BARS
≤ 900	130	RL918	N12-200
1200	150	RL1018	N12-200
> 1200	REFER TMR STD DWG 1317, 1318		

CULVERT BASE SLAB NOTES

1. DESIGN VEHICLE LOADING: 5.0kPa OR 31kN IN ACCORDANCE WITH AS/NZS1170.1
2. FILL HEIGHT: MAXIMUM FILL HEIGHT OVER THE CULVERT CROWN IS 300mm.
3. UNIT DIMENSIONS:

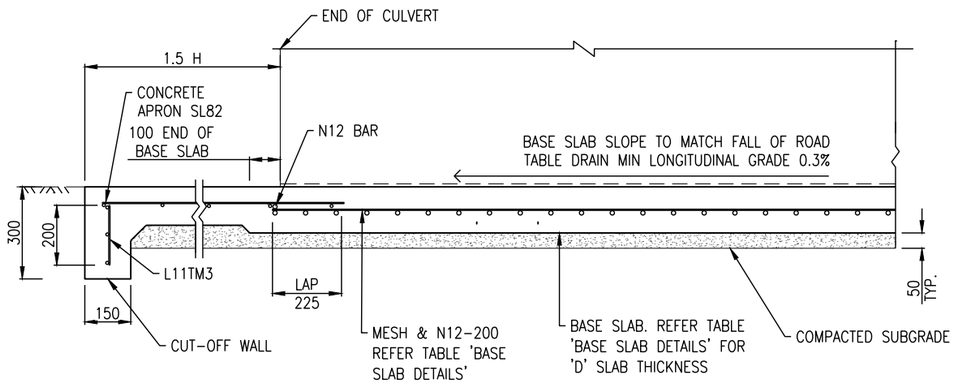


H = CLEAR HEIGHT OF CULVERT OPENING
S = CLEAR SPAN/WIDTH OF CULVERT OPENING

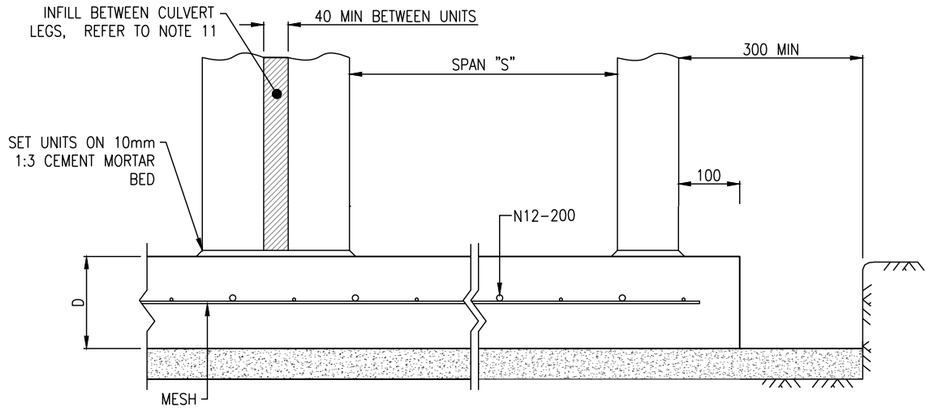
4. CONCRETE SHALL BE IN ACCORDANCE WITH AS3600. REQUIREMENTS FOR CONCRETE ARE INDICATED IN THE TABLE BELOW:

MINIMUM EXPOSURE CLASSIFICATION	B2
MINIMUM CONCRETE CLASS	N32/20
MINIMUM COVER TO REINFORCEMENT UNO	45mm

5. ALL EXPOSED EDGES SHALL HAVE 19 x 19 CHAMFERS.
6. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH AS/NZS4671 – DEFORMED BARS GRADE D500N AND REINFORCING MESH GRADE D500L. REINFORCEMENT SHALL BE HOT DIP GALVANISED TO AS/NZS4680 WHERE SHOWN.
7. REINFORCEMENT BARS IN THE SECONDARY DIRECTION SHALL BE OFFSET FROM THE SECONDARY (CROSS) WIRES OF THE MESH BY 100mm.
8. FOUNDATION: MINIMUM ALLOWABLE BEARING PRESSURE IS 100kPa. CONSULT BRC ENGINEER IF MINIMUM ALLOWABLE BEARING PRESSURE CANNOT BE ACHIEVED.
9. THIS DRAWING DOCUMENTS THE CULVERT BASE SLAB AND APRON ONLY. CONCRETE WINGWALL SEE D3202.
10. BASE SLAB HAS BEEN DESIGNED TO SUIT SINGLE OR DOUBLE RCBC.
11. 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.
12. DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



A – SECTION
NTS
FOR SPANS OF 900 & 1200



B – SECTION
NTS
FOR SPANS OF 900 & 1200

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Scales

NOT TO SCALE

	Revisions	Verified	Date
B	NIBS REMOVED AND NOTES AMENDED	RMC	24/10/18
A	Original Issue		

Quality Certification

Design: GB Verified: CG
Drawn: LWN Checked: GB
Approved By Engineer: Date:
RPEQ:

BUNDABERG REGIONAL COUNCIL

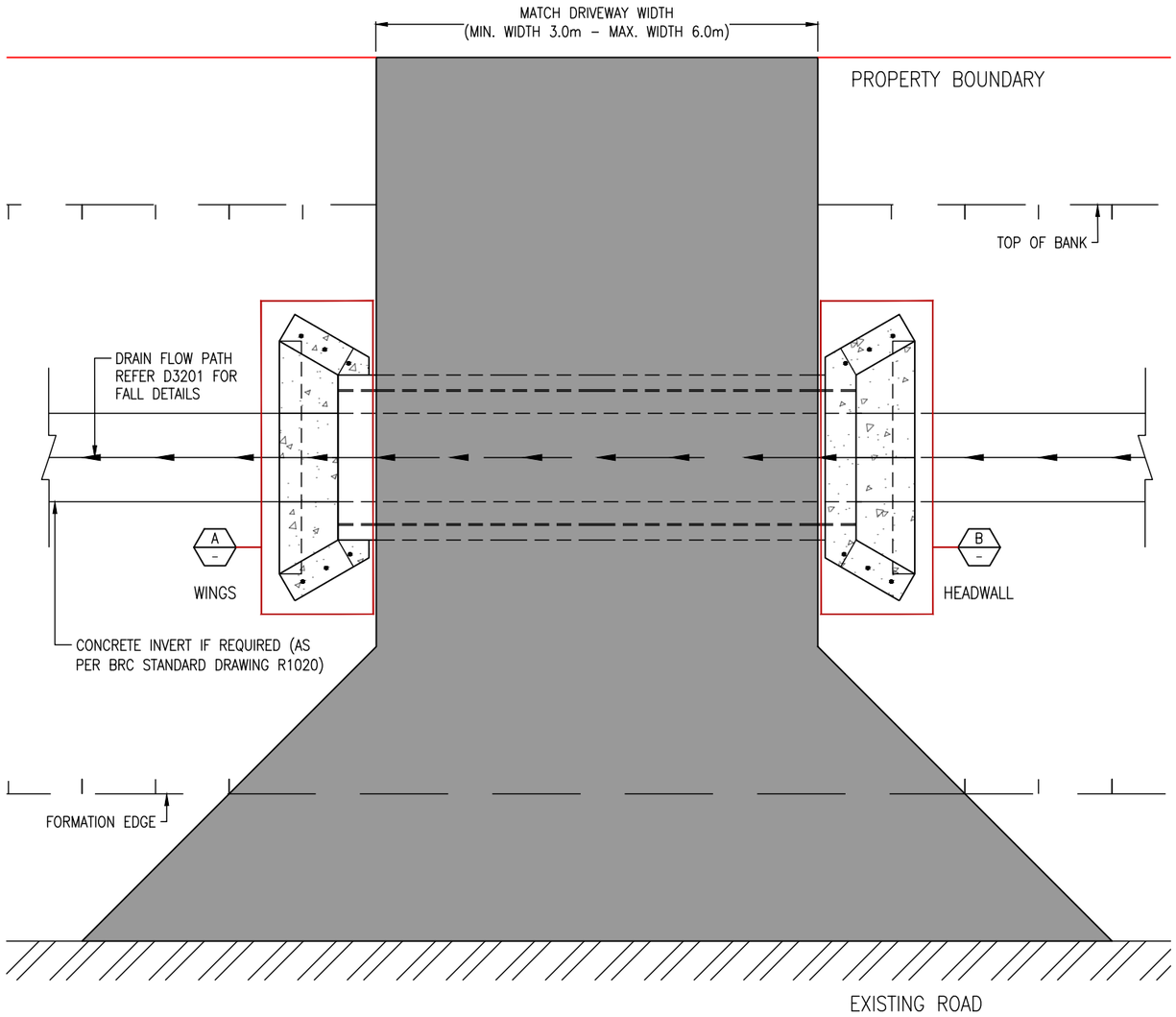
Residential Property Access
Standard Box Culvert Base Slabs

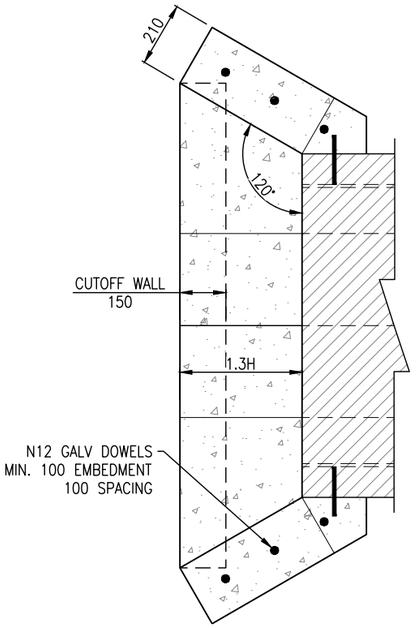
Standard Drawing No.: D3201

Sheet Size: A3

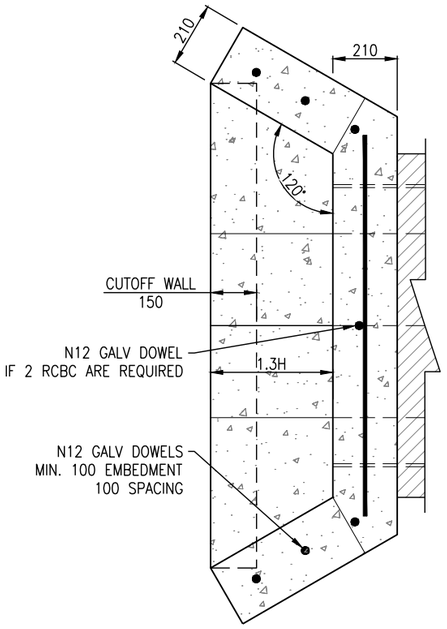
Rev.: B

BRC(09/10)





A – DETAIL – PLAN
NTS
WINGS



B – DETAIL – PLAN
NTS
HEADWALL

NOTES:

1. ALL CONCRETE TO BE N32.
2. REINFORCING STEEL:
   D500N DEFORMED BARS N12.
   N12 GALV. DOWELS.
3. MINIMUM 45mm COVER TO REINFORCING
4. DOWELS TO BE EPOXY SET INTO EXISTING CONCRETE
5. DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

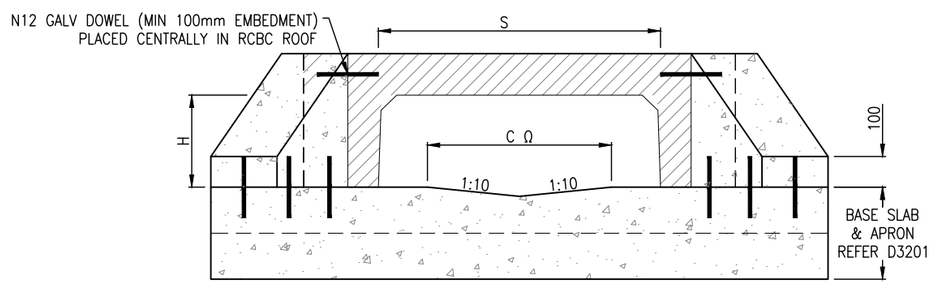
LEGEND: DIMENSIONS

S	RCBC SPAN (MAX 1200)
H	RCBC HEIGHT (MAX 600)
HwH	HEADWALL HEIGHT (MIN 150 – MAX 300)
C	600 OR 900 AS DIRECTED REFER BRC STD DRG R1020

LEGEND: MATERIAL

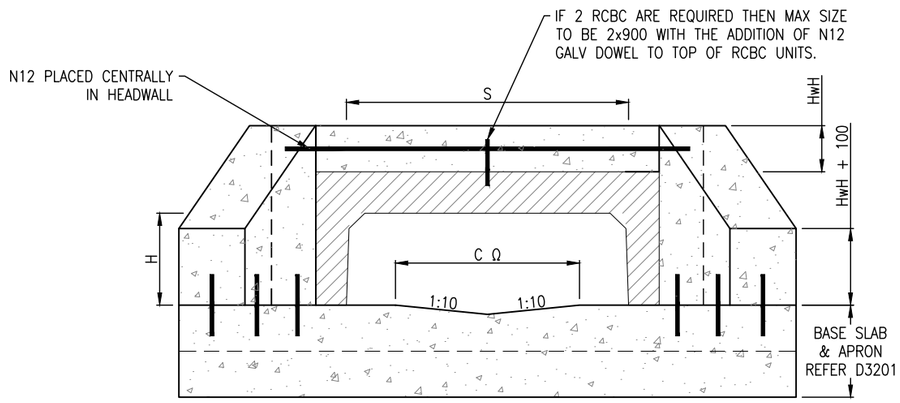
DRIVEWAY CONSTRUCTED AS PER BRC STANDARD DRAWING R1012

CONCRETE END WALL ARRANGEMENT AND RCBC



Ω WHEN CONCRETE INVERT IS NOT REQUIRED UPSTREAM OR DOWNSTREAM OF PROPOSED RCBC IGNORE DIMENSION "C" AND DELETE INVERT THROUGH PROPOSED BASE SLAB

A – DETAIL – ELEVATION
NTS
WINGS



Ω WHEN CONCRETE INVERT IS NOT REQUIRED UPSTREAM OR DOWNSTREAM OF PROPOSED RCBC IGNORE DIMENSION "C" AND DELETE INVERT THROUGH PROPOSED BASE SLAB

B – DETAIL – ELEVATION
NTS
HEADWALL

Scales

NOT TO SCALE

Revisions	Verified	Date
A Original Issue		

Quality Certification

Design: Verified:

Drawn: LWN Checked:

Approved By Engineer: Date:

RPEQ:

BUNDABERG REGIONAL COUNCIL

Residential Property Access
Standard Box Culvert Wings/ Headwalls

Standard Drawing No.: D3202

Sheet Size: A3

Rev.: A

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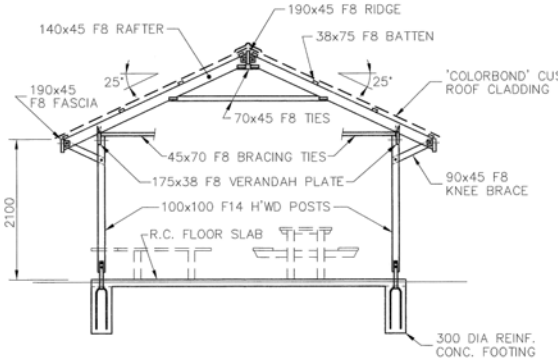
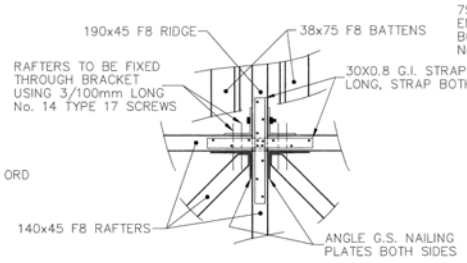


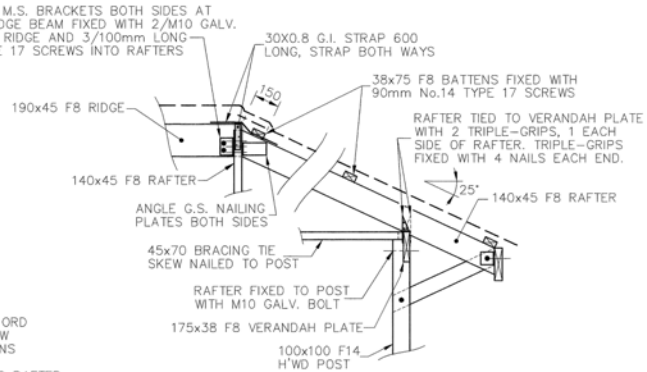
SECTION (A)

SCALE 1:50



DETAIL 'B'

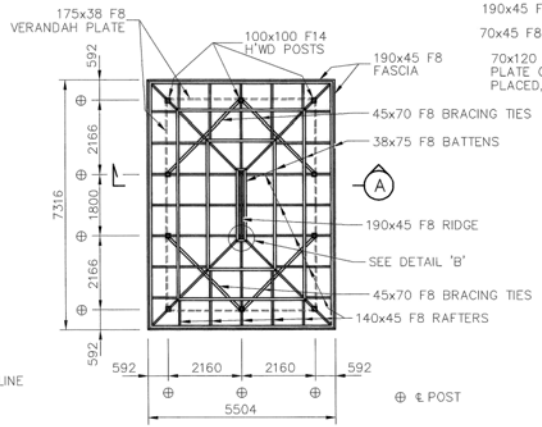
SCALE 1:10



END FRAME DETAIL

SCALE 1:20

NOTE:- ALL DETAILS NOT GIVEN TO BE AS FOR SIDE FRAME DETAIL.

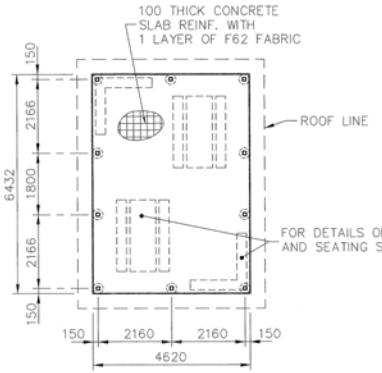


ROOF LAYOUT

SCALE 1:100

SIDE FRAME DETAIL

SCALE 1:20

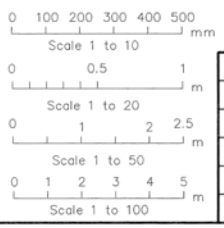


FOUNDATION PLAN

SCALE 1:100

NOTES:-

1. DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. SITE COVERAGE IS 38.6 m^2.
3. CONCRETE STRENGTH TO BE 20 MPa AT 28 DAYS.
4. ALL F8 & F11 PINE TIMBER TO BE C.C.A. TREATED (DRIED AFTER TREATMENT).
5. ALL F14 HARDWOOD TIMBER TO BE WATER PROOFED WITH 3 COATS OF 100% ACRYLIC BASED EXTERIOR PAINT.
6. MAXIMUM DESIGN WIND VELOCITY 65 m/s.
7. THIS STRUCTURE IS NOT TO HAVE SHEETING FIXED TO SIDES.
8. ALL FIXINGS TO BE GALVANISED.
9. THE FOOTING HAS BEEN DESIGNED ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 100 kPa AND SOIL ADHESION OF 15 kPa TO BE VERIFIED ON SITE.



	REVISIONS	DATE	CERTIFIED
A	ORIGINAL ISSUE	27-10-95	
B	VARIOUS	27-11-95	
C	BATTEN SIZE CHANGED	28-3-96	
D	VARIOUS	22-4-96	
E	BRACING ADDED	12-5-98	

ENGINEER	RPEQ

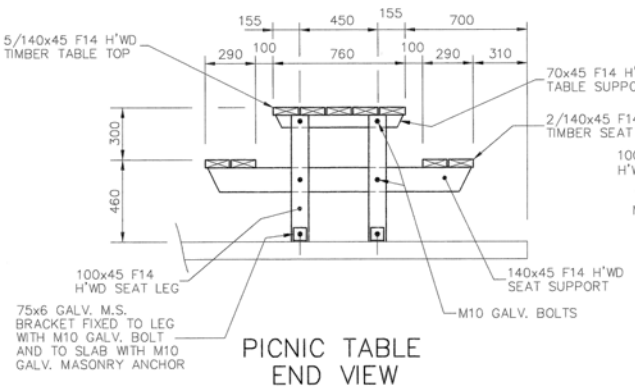
BUNDABERG CITY COUNCIL

STANDARD DRAWING

PICNIC SHELTER SHED

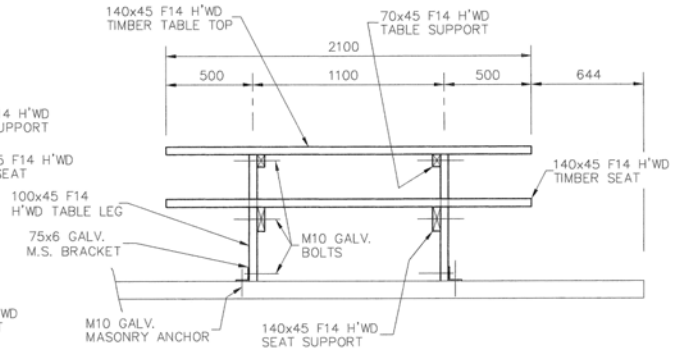
LAYOUT & CONSTRUCTION DETAILS

REFER	16566				
SCALE	AS SHOWN				
SURVEY		PLAN No.			
DESIGN		16566			
DRAWN	GJA				
REVISION	A	B	C	D	E



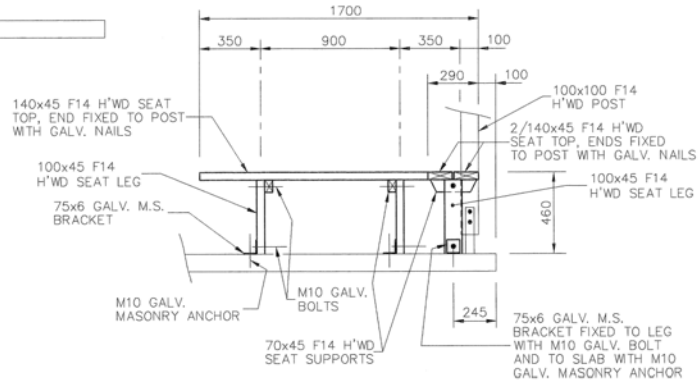
PICNIC TABLE
END VIEW

SCALE 1:20



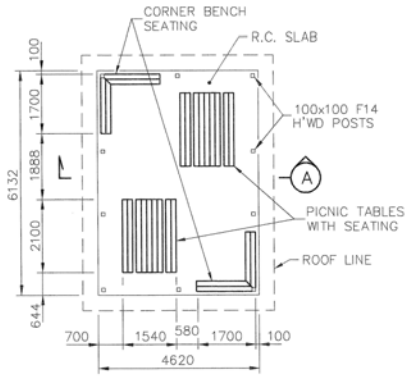
PICNIC TABLE
FRONT VIEW

SCALE 1:20



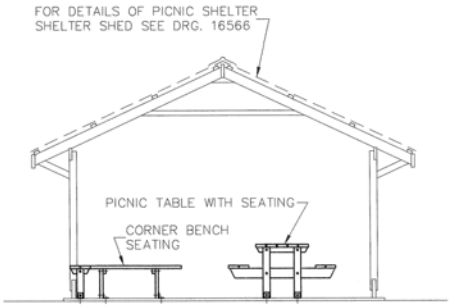
CORNER BENCH SEATING
FRONT VIEW

SCALE 1:20



FOUNDATION PLAN

SCALE 1:100



SECTION (A)

SCALE 1:50

NOTES: –

1. DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. ALL F14 HARDWOOD TIMBER TO BE WATER PROOFED WITH 3 COATS OF 100% ACRYLIC BASED EXTERIOR PAINT.
3. ALL FIXINGS NOT SHOWN TO BE 75x3.75mm GALV. BULLET HEAD NAILS.

0 0.5 1 m
Scale 1 to 20

0 1 2 2.5 m
Scale 1 to 50

0 1 2 3 4 5 m
Scale 1 to 100

	REVISIONS	DATE	CERTIFIED
A	ORIGINAL ISSUE	27-10-95	
B	VARIOUS	28-11-95	
C	DIST. BETWEEN SEATING	22-4-96	

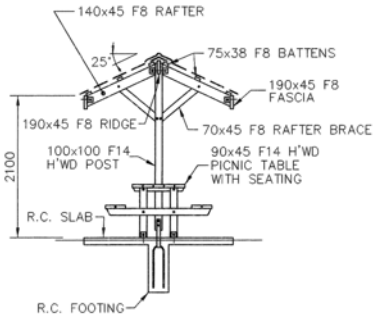
ENGINEER | RPEQ

BUNDABERG CITY COUNCIL

STANDARD DRAWING

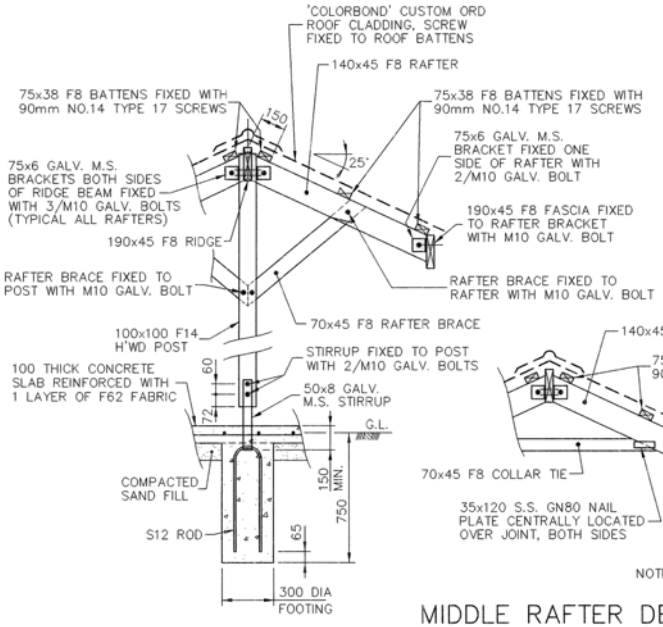
PICNIC SHELTER TABLE & SEATING LAYOUT & CONSTRUCTION DETAILS

REFER	16567		
SCALE	AS SHOWN		
SURVEY		PLAN No.	
DESIGN		16567	
DRAWN	GJA		
REVISION	A B C		



SECTION (A)

SCALE 1:50



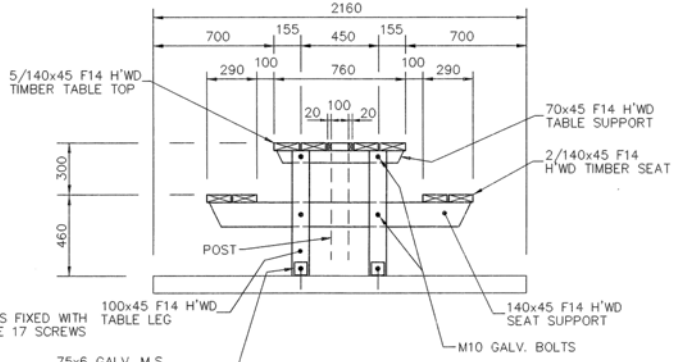
END FRAME DETAIL

SCALE 1:20

NOTE:- ALL DETAILS NOT GIVEN TO BE AS FOR END FRAME DETAIL.

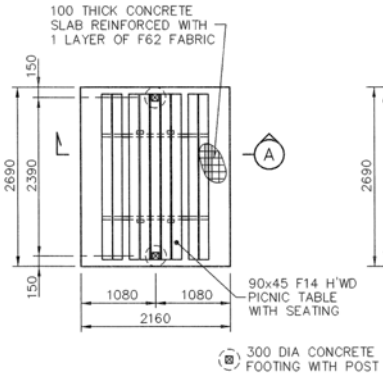
MIDDLE RAFTER DETAIL

SCALE 1:20



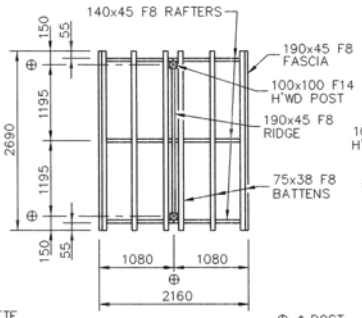
PICNIC TABLE END VIEW

SCALE 1:20



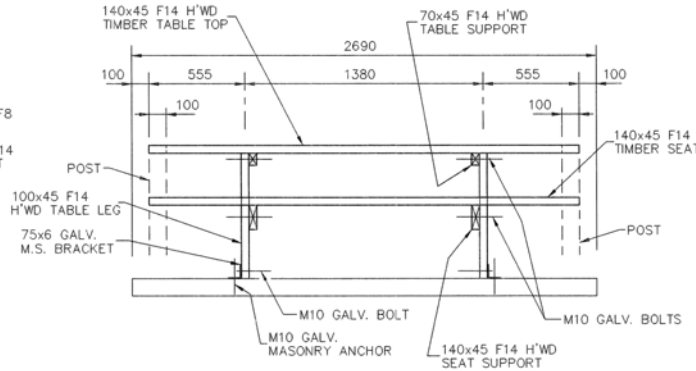
FOUNDATION PLAN

SCALE 1:50



ROOF LAYOUT

SCALE 1:50



PICNIC TABLE FRONT VIEW

SCALE 1:20

NOTES:-

1. DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
2. SITE COVERAGE IS 5.8 m^3.
3. CONCRETE STRENGTH TO BE 20 MPa AT 28 DAYS.
4. ALL F8 PINE TIMBER TO BE C.C.A. TREATED (DRIED AFTER TREATMENT).
5. ALL F14 HARDWOOD TIMBER TO BE WATER PROOFED WITH 3 COATS OF 100% ACRYLIC BASED EXTERIOR PAINT.
6. ALL FIXINGS NOT SHOWN TO BE 75x38mm GALV. BULLET HEAD NAILS.
7. MAXIMUM DESIGN WIND VELOCITY 65 m/s.
8. THIS STRUCTURE IS NOT TO HAVE SHEETING FIXED TO SIDES.
9. ALL FIXINGS TO BE GALVANISED.
10. THE FOOTING HAS BEEN DESIGNED ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 100 kPa AND SOIL ADHESION OF 15 kPa TO BE VERIFIED ON SITE.

0 0.5 1 m
Scale 1 to 20

0 1 2 2.5 m
Scale 1 to 50

	REVISIONS	DATE	CERTIFIED
A	ORIGINAL ISSUE	27-10-95	
B	VARIOUS	28-11-95	

ENGINEER RPEQ

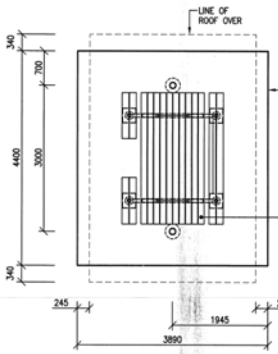
BUNDABERG CITY COUNCIL

STANDARD DRAWING

PICNIC TABLE WITH ROOF

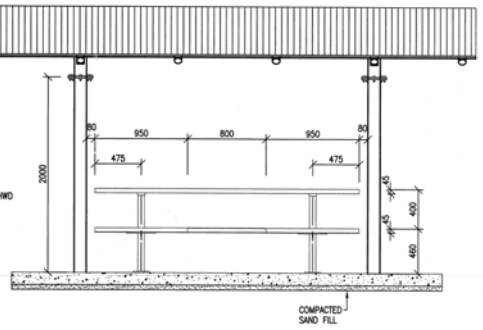
LAYOUT & CONSTRUCTION DETAILS

REFER	16568		
SCALE	AS SHOWN		
SURVEY		PLAN No.	
DESIGN		16568	
DRAWN	GJA		
REVISION	A	B	



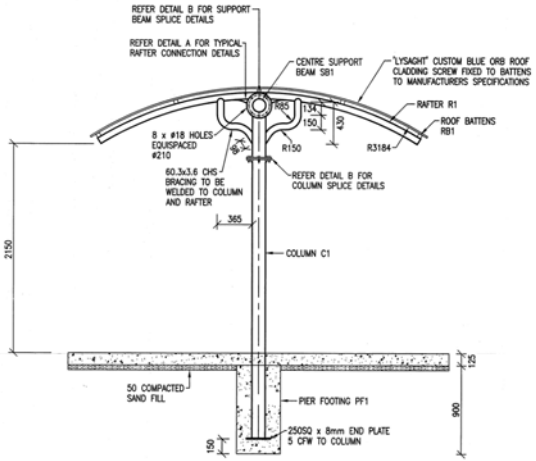
SHELTER LAYOUT

SCALE 1:50



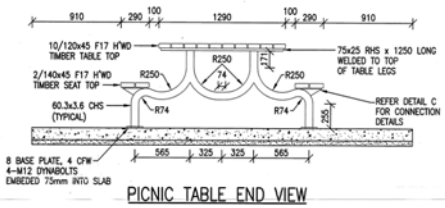
SIDE ELEVATION

SCALE 1:25



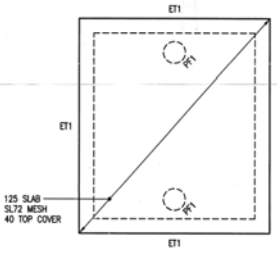
TYPICAL SECTION

SCALE 1:25



PICNIC TABLE END VIEW

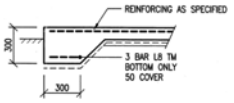
SCALE 1:25



FOOTING/SLAB PLAN

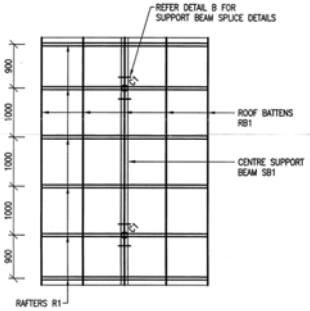
SCALE 1:50

PF1 – 450ø x 900 deep



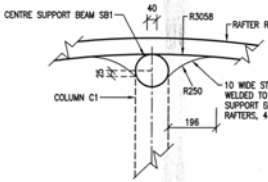
EDGE THICKENING ET1

SCALE 1:20



ROOF FRAMING PLAN

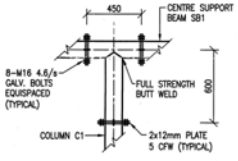
SCALE 1:50



TYPICAL RAFTER CONNECTION

DETAIL A

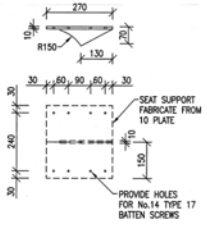
SCALE 1:10



BEAM/COLUMN SPLICE

DETAIL B

SCALE 1:20



TYPICAL SEAT CONNECTION

DETAIL C

SCALE 1:10

MEMBER SCHEDULE

MARK	MEMBER	STRUCTURAL NOTES
C1	139.7x5.0 CHS COLUMN	CAST IN FOOTING 2505Q x 8 BASE PLATE, 5 CFW REFER DETAIL B FOR COLUMN SPLICE.
SB1	139.7x5.0 CHS CENTRE SUPPORT BEAM	FULL STRENGTH BUTT WELD TO COLUMN. REFER DETAIL B FOR BEAM SPLICE.
R1	60.3x3.6 CHS RAFTERS	SPACE AS INDICATED ON ROOF LAYOUT REFER DETAIL A FOR CONNECTION TO CENTRE SUPPORT BEAM
RB1	40x40x4 SHS ROOF BATTENS	SPACE AS INDICATED ON ROOF LAYOUT 1–M10 GALV. BOLT (VERTICAL) TO EACH RAFTER.

NOTE: ALL STEEL MEMBERS SHALL BE HOT DIP GALVANISED.

GENERAL NOTES

1. These drawings to be read in conjunction with all architectural and other consultants drawings and specifications and with such other written instructions issued during construction. All discrepancies to be referred to the engineer for decision before proceeding with the work.
2. Dimensions shall not be obtained by scaling the engineers drawings. Verify all dimensions relating to setting out and off-site work prior to the commencement of construction and/or fabrication.
3. 'UNO' denotes 'Unless Noted Otherwise.
4. All dimensions in millimetres UNO.
5. All levels in metres to AHD datum UNO.
6. During construction the structure is to be maintained in a stable condition and no part is to be overstressed. Supply temporary bracing as required to comply.
7. All workmanship and materials to be in accordance with the requirements of the current editions and amendments of the SAA codes and the by-laws and ordinances of the relevant building authority.
8. Trade names have been used to establish a basic requirement. Any substitution is to be submitted for approval to the engineer. Any such approval does not constitute an authorisation for an extra unless approval is obtained from the architect before commencement of the work.
9. Contractor to be responsible for the location of all existing services whether indicated or note and any damage caused to be repaired at the contractors expense.
10. Safety requirements to be in accordance with occupational health and safety management regulations as specified.
11. All propping and formwork for floor beams and slabs to be removed as specified prior to construction of any masonry walls on that floor.
12. All non-loadbearing walls to be kept 20 clear of the soffit of the structure over UNO.
13. All footings to bear on material of safe working bearing capacity not less than 100kPa. Founding depth to be checked by geotechnical engineer after excavation – depth may be varied from that documented to achieve minimum bearing requirements.

LOADING NOTES

1. The structural work shown on these drawings has been designed for the following loads:
2. Dead Loads
   Determined from materials and thicknesses to AS1170.1 UNO. Additional superimposed dead loads:

Location	kPa
General	nil

3. Live Loads

Location	kPa
Roof	0.25
Ground Floor	4.0

4. Wind Loads
   Wind Class: C2
   Design Wind Velocity: 61m/s (limit state)
5. Earthquake Loads
   To AS1170.4 and the following:
   $S = 1.0$
   $a = 0.12$
   $I = 1.0$
   Structure Type = I
   Design Category = B

CONCRETE NOTES

1. Materials and workmanship to comply with the current editions and amendments of AS3600 UNO.
2. Concrete Strength:

Element	Min Age	Size	Slump	f'c(MPa)
Bored Piers	20		80	N25
Raft Slab	20		80	N32

   N32 = Normal class and project assessment.
   S32 = Special class with maximum shrinkage of 650 microstrain and project assessment.
   Concrete to be normal density UNO.
   Cement to be type GP UNO.
   Obtain written approval from engineer for any proposed admixtures.
   Use of calcium chloride is prohibited.
3. Clear Cover to Reinforcement UNO:

Element	Exposure Condition 1	2	3	4
Bored Piers	–	–	50	–
Raft Slab	–	40	50	40

   1 = finished and cured surface or cast against form – interior, exposure classification A1.
   2 = as 1 but exposed, exposure classification B1.
   3 = cast in contact with ground – exposure classification A2.
   4 = cast on WPM against the ground – exposure classification A2.
   Exposed denotes surface, edge or soffit not in 'interior' environment.
4. Documented element sizes do not include the thickness of applied finishes. Beam sizes show depth first and include slab thickness. Formed edges and corners to have 20 chamfers UNO.
5. Exact size and location of penetrations to be obtained from workshop drawings prior to scheduling reinforcement and are not to exceed dimensions shown on engineer's drawings.
6. No chases, holes greater than 150 diameter, or embedment of pipes over 40 diameter UNO to be made in slabs, beams or walls. For all other elements no penetrations, chases or embedments to be made without engineer's prior approval.
   Conduits cast into members to be spaced at maximum possible separation and under no circumstances closer than a clear spacing of twice the larger conduit diameter from parallel reinforcement or any other conduit.
7. Construction break locations and details to be approved by the engineer prior to construction.
   All construction joints to be thoroughly scabbled and cleaned exposing the aggregate matrix prior to next pour.
8. All concrete to be mechanically vibrated without segregation and vibrator not to be used to spread concrete.
9. All concrete to be cured by keeping wet for 7 days. Apply water as soon as concrete becomes firm. Alternative curing methods conforming to AS3799 and compatible with the finishes to be submitted for approval.
10. Ceramic tile finishes to be laid on a flexible adhesive minimum 3 months after floor construction.
11. Reinforcement grades to AS1302, AS1303, AS1304 or AS/NZS4671 as applicable.
    N: Deformed Bar, D500N, fsy = 500MPa
    R: Plain Bar, R250N, fsy = 250MPa
    SL: Slab Mesh, D500L, fsy = 500MPa
    TM: Trench Mesh, D500L, fsy = 500MPa
    L: Fitments, D500L, fsy = 500MPa
    The number following the bar symbol is the numerical bar diameter.
12. Reinforcement is shown diagrammatically and not necessarily in true projection.
13. All reinforcement to be placed in the position shown, tied and adequately supported with steel or plastic chairs to give specified cover. Bar chair material to suite the exposure classification. Maximum bar chair centres to be 600 for fabric and bars up to 12 diameter fitment 800.
14. Do not cut reinforcement in clear penetrations without engineer's approval. Displace reinforcement slightly as necessary to clear blockouts.
15. Welding of reinforcement is not permitted without engineer's approval.
16. Reinforcement to be bent cold to AS3600 except where approved by the engineer. No rebending is permitted unless approved by the engineer. Hot bending is prohibited.
17. Laps in reinforcement to be made only in the position shown unless approved by the engineer and to be sufficient to develop the full strength of the reinforcement.
    Minimum laps in beams and slabs to be:

Type	Lap
N12	500mm
N16	600mm
Trench Mesh	500mm
Floor Mesh	2 cross wires + 25mm

18. 'Continuous' denotes bar to be full length of member, cogging vertically (if top or bottom bar) and horizontally (side bars) at form ends. Lap as scheduled where required, continue into slab or shotting beam where possible for a distance equal to the lap length UNO.
19. Where distribution bars are not shown provide N12–300 where necessary and lap with main bars 300.
20. Slabs and beams to bear only on the columns, walls etc shown on the documents. All other non-loadbearing elements including windows, architectural attachments, non-loadbearing masonry walls or partitions etc to be kept 20 clear from walls of structure over. Allowance for 20 deflection to be made in any connections to walls.
21. Where slabs or beams bear on masonry, top course to be level, smooth and covered with approved sliding joint material UNO.
22. Formwork to be designed and constructed to AS3710. Stripping of forms and removal of formwork supports to be in accordance with AS3710 unless specifically approved by engineer. Reshoring is not permitted.
    Refer to architectural specification for classes of surface finish.

SITE PREPARATION

1. Allowable bearing capacity to exceed 100 kPa.
2. Loose soil and water to be removed from excavations prior to placement of concrete.
3. Bedding sand – use a 50mm thick layer of coarse sand (2mm maximum size).
4. Waterproof membrane (W.P.membrane) to extend continuously under floor slab and to consist of polythene film not less than 0.2mm thick (or other approved products).
5. All joints between sheets to be lapped at least 200mm and all joints and penetrations to be sealed with an approved pressure sensitive tape.

STRUCTURAL STEEL NOTES

1. Materials and workmanship to comply with current editions and amendments of AS4100 and AS1554.
2. During construction the structure is to be maintained in a stable condition and no part is to be overstressed. Supply temporary bracing as required to comply.
3. All steel to be in accordance with the following UNO:
   300 PLUSTW grade 300 for open sections
   AS1163 grade 350 for SHS and RHS
   AS1163 grades 350 and 250 for CHS
   AS/NZS4600 for cold formed sections
4. Fabricator to prepare workshop drawings and submit 2 copies for review prior to commencing fabrication.
5. Welds noted as follows:
   CFW = continuous fillet weld, structural purpose E48XX
   CPBW = completed penetration butt weld, structural purpose E48XX
   All welds to be CFW UNO with throat of 6mm or the thickness of the smaller plate UNO.
6. All bolts to be M20 grade 8.8/S hot dip galvanised minimum 2 per connection UNO.
   All holdown bolts to be grade 4.6/S hot dip galvanised.
   Grade 8.8 (high strength) bolts and nuts to comply with AS1252.
   Grade 4.6 bolts and nuts to comply with AS1111 and AS1112.
7. All bolt holes at steel to steel connections to be 2mm larger than the nominal bolt diameter.
   All bolt holes at holdown bolts to concrete elements to be 8mm larger than the nominal bolt diameter UNO.
8. Ends of all tubular members to be sealed with nominal thickness plates and continuous fillet welds UNO.
9. All plates to be 10mm UNO.
   Provide all cleats and holes for fixing of steel to steel, timber to steel and timber to timber required by engineering and architectural detail whether or not specifically detailed.
10. Surface treatment to comply with architect's specification with the following as minimum UNO:
    - Interior steel to be abrasive blast cleaned to Class 2 finish and painted with 1 coat of red oxide zinc chromate primer.
    - Exposed steel to be blast cleaned to Class 2 finish and hot dip galvanised to AS/NZS4680.

    Touch up all site welding with an approved treatment matching the existing coating.
    Members cast in concrete or interfaces of friction-type joints must not be painted UNO.
11. Install sheeting, purlins and accessories to comply with manufacturer's specification.
    Purlins to be at maximum centres noted with 3M12 4.6/S per connection UNO.
12. Bracing members to be hung from purlins at 3000 maximum centres.
13. Concrete encased members to be wrapped with 10 gauge 3.25mm) wire at 100 pitch and 50 cover.
14. Members in the ground to be encased with 75 minimum mass concrete.
15. Grout under base plates to be high strength non-shrink cement based.
16. All mechanical and chemical anchors to be hot dip galvanised. Install and test anchors in accordance with manufacturer's recommendation.
    CIA = Ramset chemical injection anchor or equal.
    Test anchors to below the specified working tension at the following rates:

All chemical anchors installed from below:	100%
Other chemical capsule anchors:	20%
Other chemical injection anchors:	10%
All mechanical anchors:	5%

    If a test results in a failure, carry out additional testing to engineer's direction.

SCALES: AS NOTED (A1 SIZE)

DRAWN	TB
CHECKED	GB
DESIGNED	GB
APPROVED	
DATE	8/07

ACN 010 855 697

ENGINEERING & ENVIRONMENTAL CONSULTANTS
◆ PROJECT MANAGERS & PLANNERS ◆
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CLIENT: **BUNDABERG CITY COUNCIL**

PROJECT: **PICNIC SHELTER**

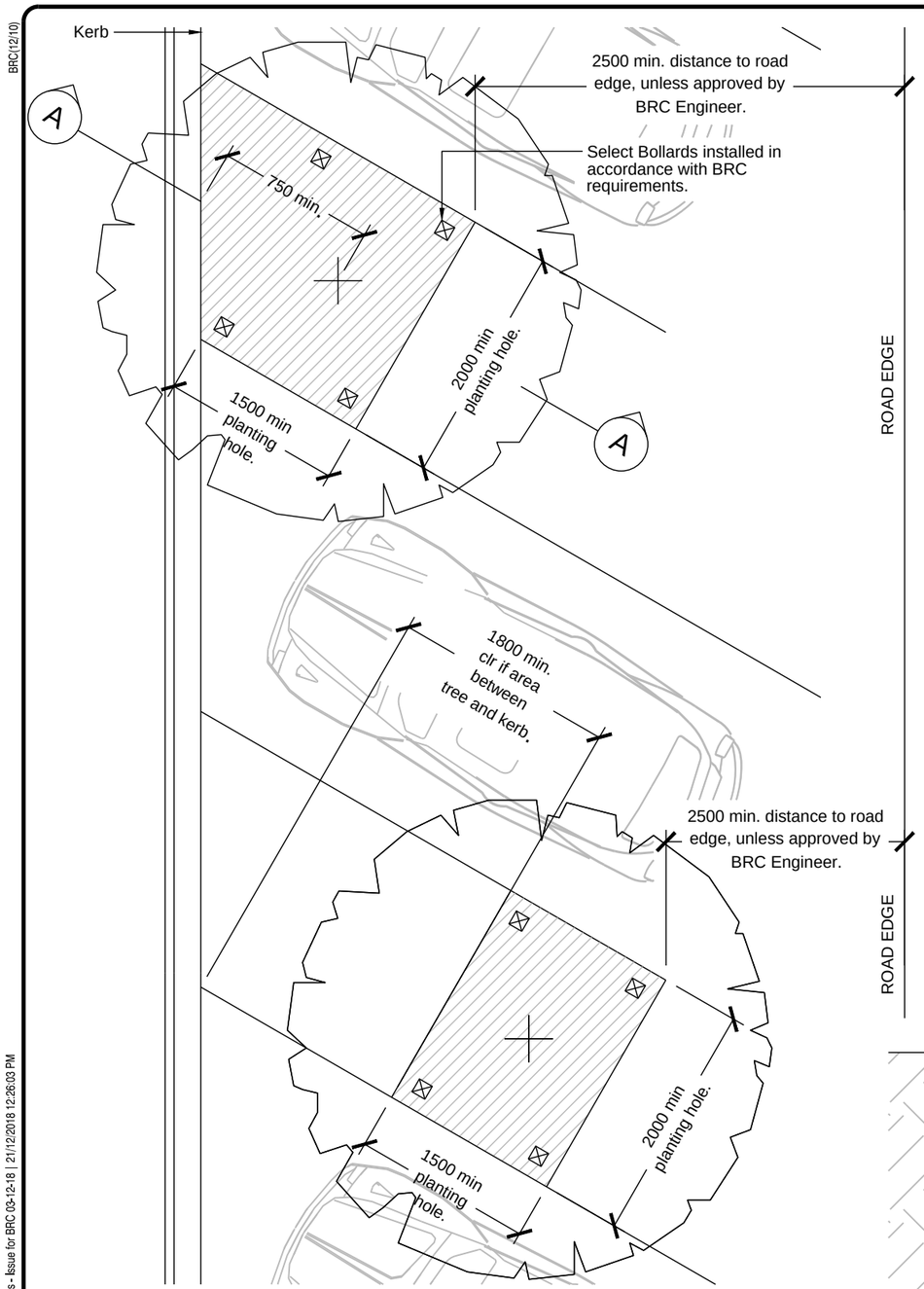
LOCATION: **STANDARD DESIGN** 21611

TITLE: **LAYOUT AND CONSTRUCTION DETAILS**

DRAWING NO. **16478-S01**

SHEET 1 OF 1

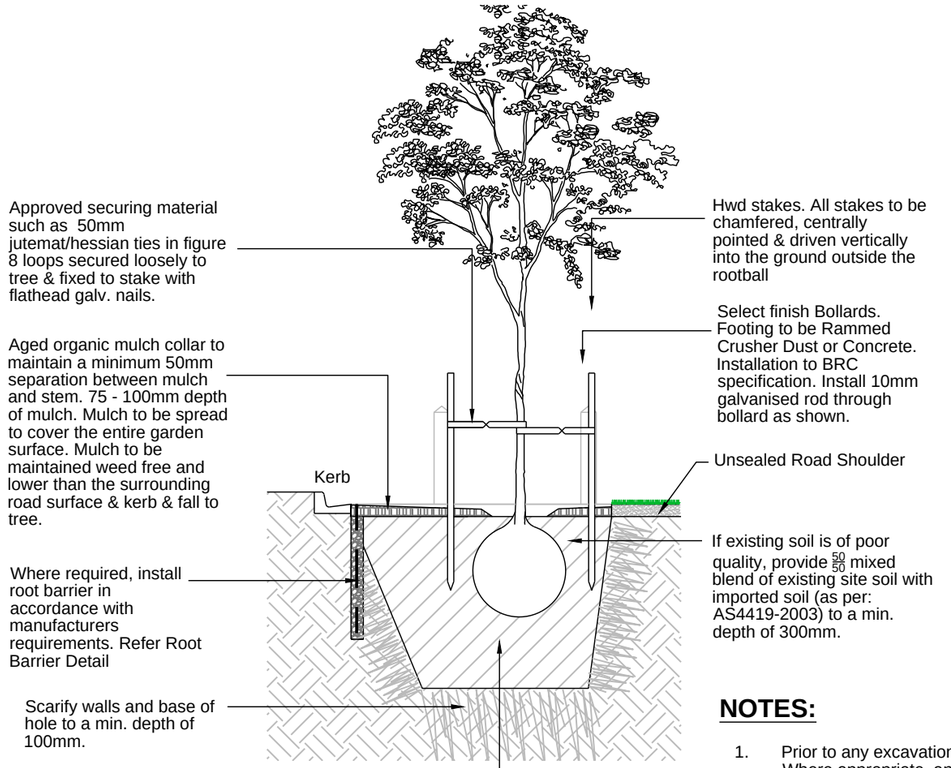
REV. -



ROAD SHOULDER PLANTING - Typical

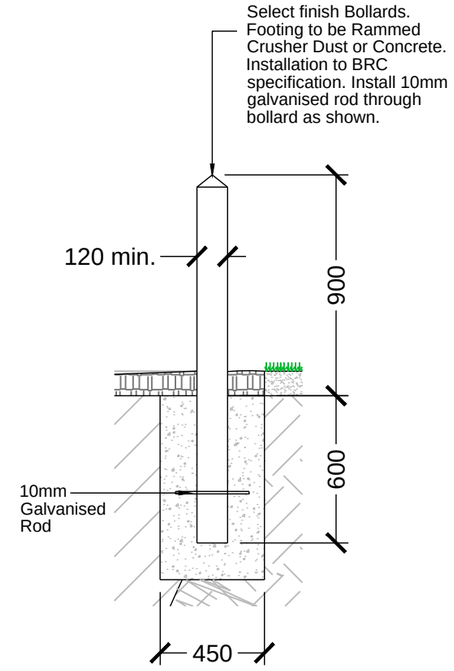
Scale 1:50.

NOTE: Final shape of garden bed to coincide with parking angle. Orientation shown is INDICATIVE ONLY and is subject to change according to site conditions.



SECTION A-A

Scale 1:50.

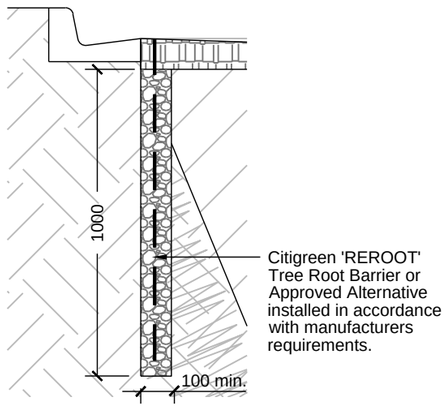


BOLLARD DETAIL

Scale 1:25.

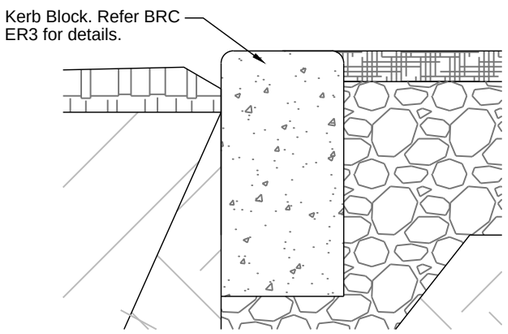
NOTES:

1. Prior to any excavation being undertaken, a Dial Before You Dig search is to be undertaken. Where appropriate, an underground service locator is to be engaged to undertake an inspection of site to locate and mark underground service locations.
2. Trees to be selected which are appropriate for the location.Trees to be selected from the Bundaberg Regional Council (BRC) approved street tree list. Minimum distsance to overhead power pole to be equal to the height of the mature tree.
3. Tree Staking: All 300mm and larger plant material is to be staked and supported using double hessian straps, as per detail provided. Stakes to be located outside root ball. 2 - 4 stakes (1800 x 50 x 50mm Hardwood) to be used and driven 600mm into ground. Once tree is established, tree stakes are to be removed.
4. Supply and place non petroleum based soil wetting agent or water crystals in accordance with Manufacturer's instructions.
5. Soil wetting agent with fertiliser additive to be mixed through full depth of existing and imported top soil.
6. Soil Test to be carried out to determine whether any soil amelioration works are necessary to improve soil condition.
7. A suitable root barrier treatment to be used to minimise damage to adjacent infrstructure. Trees with known invasive roots are not to be used. Refer to BRC approved street tree list for options.
8. Where bollards are not to be used on sealed road shoulders, trees are to be protected with a concrete kerb level with the road surface.Refer to BRC drawing ER3 for more details.



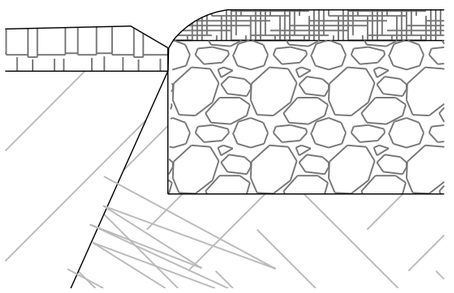
ROOT BARRIER DETAIL

Scale 1:20.



SEALED SHOULDER WITH KERB BLOCK

Scale 1:10.



SEALED SHOULDER WITH BITUMEN EDGE

Scale 1:10.

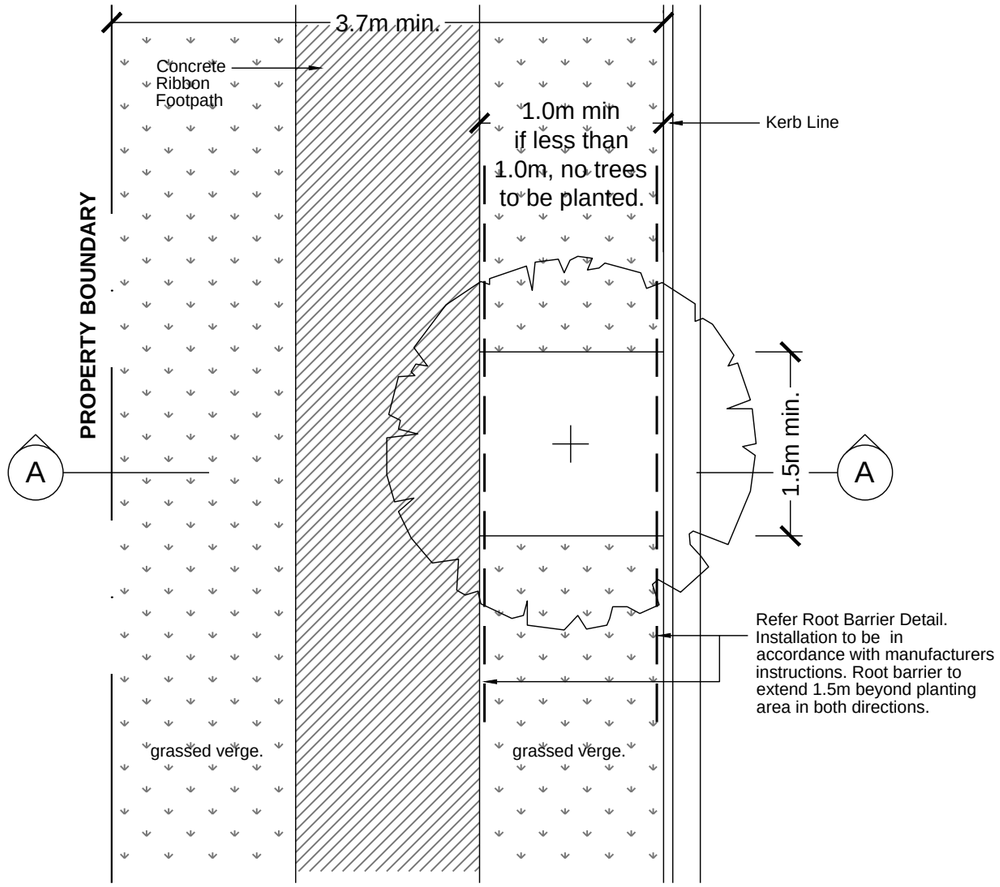
Scales	Revisions	Verified	Date
SCALE: AS SHOWN @ A3	A ORIGINAL ISSUE		

Quality Certification
Design: C.M. Verified: C.M.
Drawn: M.J. Checked: C.M.
Approved By Engineer:

BUNDABERG REGIONAL COUNCIL

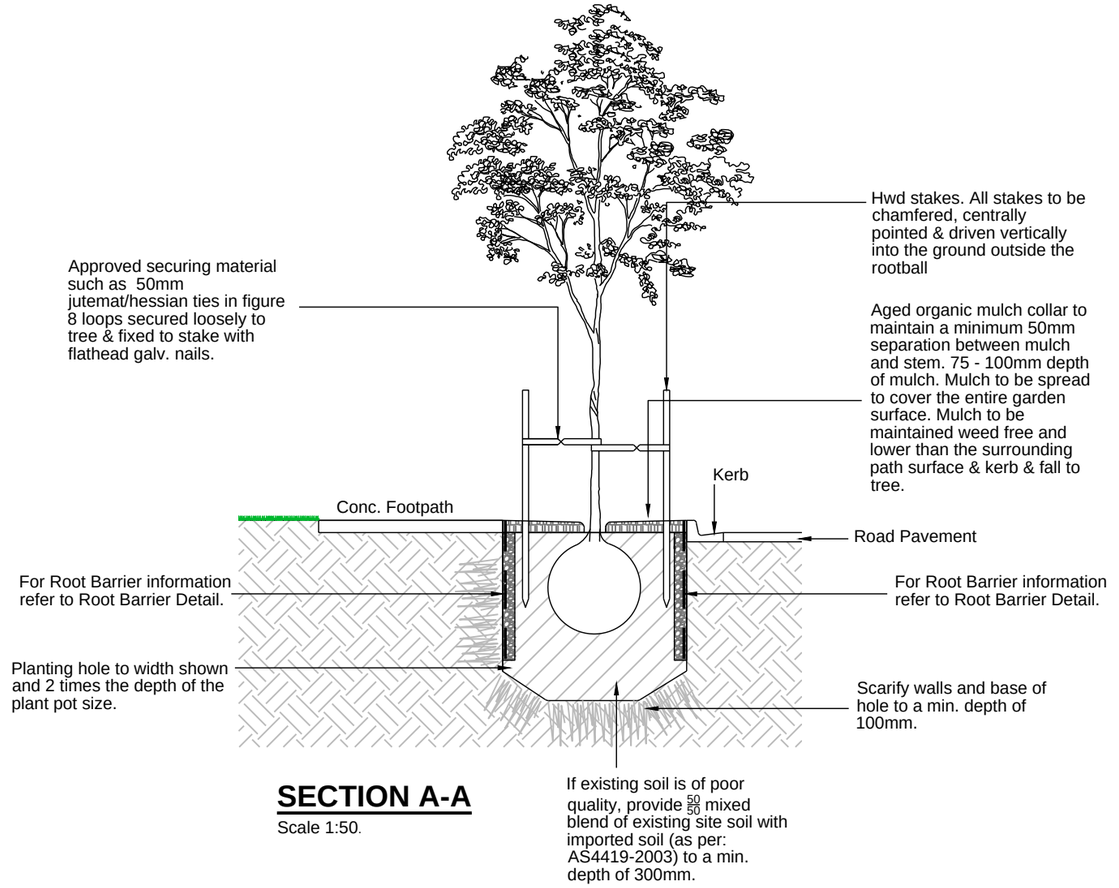
Locality: BUNDABERG REGIONAL COUNCIL
Facility Name:
Asset Name: STREET TREES
Details: STANDARD STREET PLANTING DETAILS
TYPICAL DETAIL - ROAD SHOULDER PLANTING

Standard Drawing
No.: P6111
Sheet Size: A3
Rev.: A



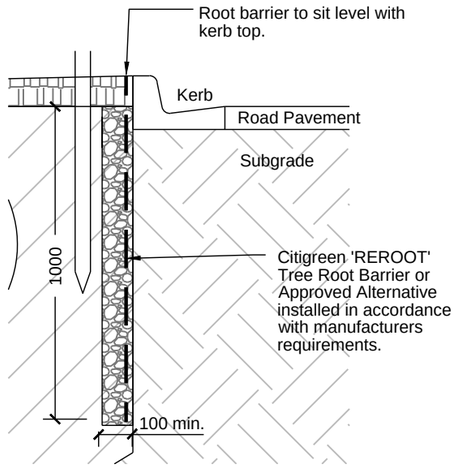
BACK OF KERB PLANTING - Typical

Scale 1:50.



SECTION A-A

Scale 1:50.



ROOT BARRIER DETAIL

Scale 1:10.

NOTES:

1. Prior to any excavation being undertaken, a Dial Before You Dig search is to be undertaken. Where appropriate, an underground service locator is to be engaged to undertake an inspection of site to locate and mark underground service locations.
2. Trees to be selected which are appropriate for the location.Trees to be selected from the Bundaberg Regional Council (BRC) approved street tree list. Minimum distsance to overhead power pole to be equal to the height of the mature tree.
3. Tree Staking: All 300mm and larger plant material is to be staked and supported using double hessian straps, as per detail provided. Stakes to be located outside root ball. 2 - 4 stakes (1800 x 50 x 50mm Hardwood) to be used and driven 600mm into ground. Once tree is established, tree stakes are to be removed.
4. Supply and place non petroleum based soil wetting agent or water crystals in accordance with Manufacturer's instructions.
5. Soil wetting agent with fertiliser additive to be mixed through full depth of existing and imported top soil.
6. Soil Test to be carried out to determine whether any soil amelioration works are necessary to improve soil condition.
7. A suitable root barrier treatment to be used to minimise damage to adjacent infrstructure. Trees with known invasive roots are not to be used. Refer to BRC approved street tree list for options.

Scales

SCALE: AS SHOWN @ A3

Revisions		Verified	Date
A	ORIGINAL ISSUE		

Quality Certification

Design: C.M. Verified: C.M.

Drawn: M.J. Checked: C.M.

Approved By Engineer:

BUNDABERG REGIONAL COUNCIL

Locality: BUNDABERG REGIONAL COUNCIL

Facility Name:

Asset Name: STREET TREES

Details: STANDARD STREET PLANTING DETAILS
TYPICAL DETAIL - BACK OF KERB PLANTING

Standard Drawing

No.: P6211

Sheet Size: A3

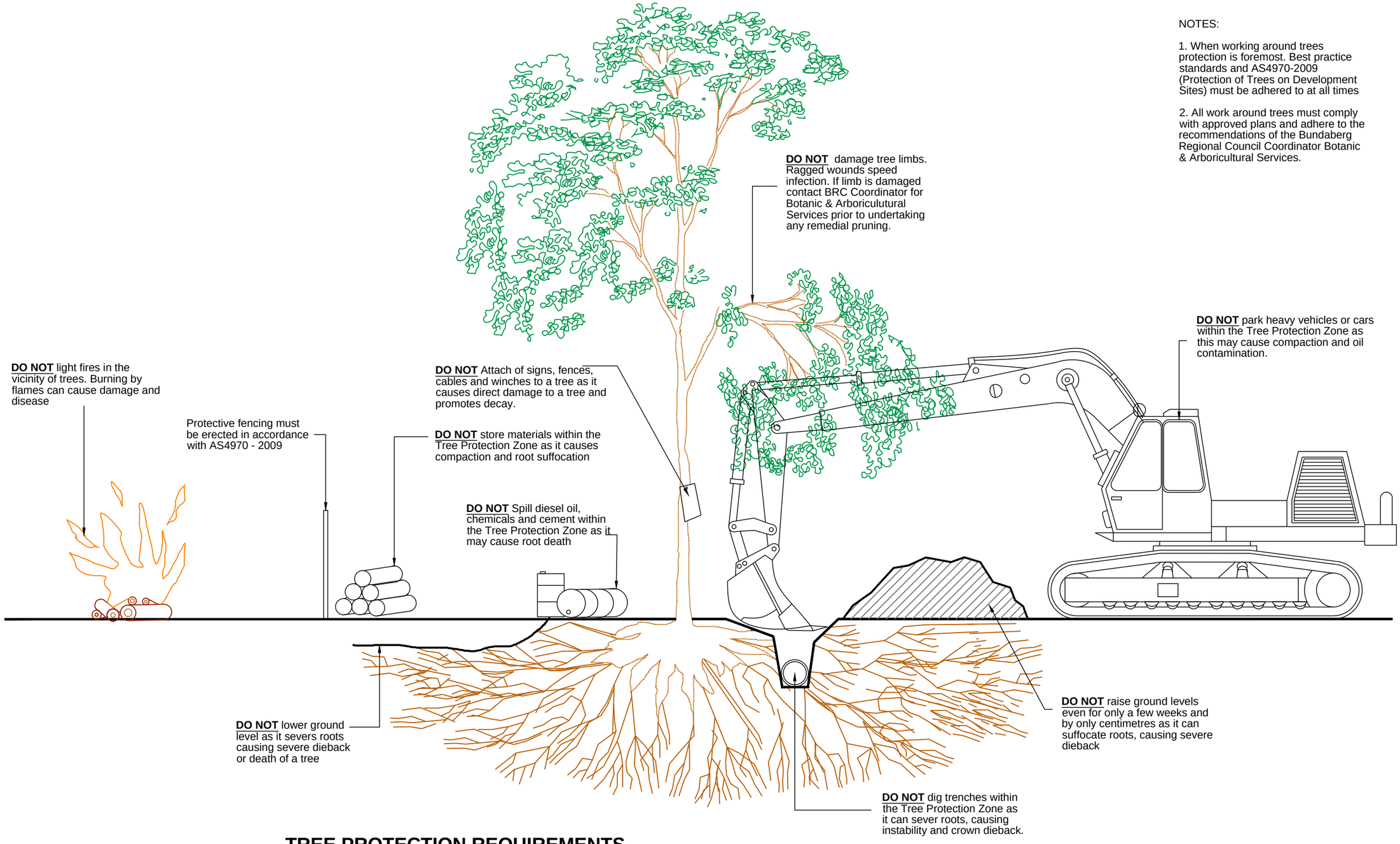
Rev.: A

BRC(12/10)

NOTES:

1. When working around trees protection is foremost. Best practice standards and AS4970-2009 (Protection of Trees on Development Sites) must be adhered to at all times

2. All work around trees must comply with approved plans and adhere to the recommendations of the Bundaberg Regional Council Coordinator Botanic & Arboricultural Services.



TREE PROTECTION REQUIREMENTS

Scale nts.

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Scales

SCALE: Not To Scale

Revisions	Verified	Date
A ORIGINAL ISSUE		

Quality Certification

Design: **C.M.** Verified: **C.M.**

Drawn: **M.J.** Checked: **C.M.**

Approved By Engineer:

BUNDABERG REGIONAL COUNCIL

Locality: BUNDABERG REGIONAL COUNCIL

Facility Name:

Asset Name: STREET TREES

Details: **STANDARD STREET PLANTING DETAILS**
TYPICAL DETAIL - TREE PROTECTION REQUIREMENTS

Standard Drawing

No.: **P6311**

Sheet Size: **A3**

Rev.: **A**