Residential Roads
Optional Type Plans & Cross Section to suit WSUD

NOTES:
1. ALL DIMENSIONS ARE IN METRES.
2. REFER TO "HEALTH" WATERWAYS AND "WATER BY DESIGN" GUIDELINES FOR WSUD SOLUTIONS. REFER FPAQ STANDARD DRAWINGS FOR DETAILS.
3. THIS STANDARD DRAWING IS A SAMPLE OUTLINE TO WSUD SOLUTION IN AN ACCESS STREET.
5. SWALES AND BIO-RETENTION SWALES ARE NOT ALLOWED AS A WSUD SOLUTION WITHIN BCC IN RESIDENTIAL NEIGHBOURHOOD COLLECTOR STREETS, ACCESS STREETS AND ACCESS PLACES WHERE THEY WILL BE TRAVERSED FOR PRIVATE PROPERTY ACCESS.
NOTES:

1. PAVEMENT DESIGN IN ACCORDANCE WITH "AUSTROADS AP001-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.017-04.

2. ALL DIMENSIONS ARE IN METRES.

3. TURF TO BE LAID BEHIND KERB - 0.4m 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

(RFER BRC STANDARD DRAWING R1020).

<table>
<thead>
<tr>
<th>ROAD CLASSIFICATION</th>
<th>NOMINAL A.A.D.T</th>
<th>ZONING AREA</th>
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<tbody>
<tr>
<td>INDUSTRIAL COLLECTOR ROAD</td>
<td>&gt;750</td>
<td>8-30HA</td>
</tr>
<tr>
<td>INDUSTRIAL ACCESS ROAD</td>
<td>250-750</td>
<td>&lt; 8HA</td>
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</table>

TYPE CROSS SECTIONS
Industrial Collector and Access Street

BUNDABERG REGIONAL COUNCIL
NOT TO SCALE

BUNDABERG REGIONAL COUNCIL

DRIVEWAYS
Residential Driveway Slabs

NOTES
1. CROSSINGS ARE NOT DESIGNED FOR
COMMERCIAL VEHICLES.
2. FOOTPATH SECTION TO VARY WHERE
NECESSARY TO MATCH CONCRETE FOOTPATHS
AND VARIOUS PROFILES. FOOTPATH
EARTHWORKS ADOPTING CONCRETE MUST BE
WELL COMPACTED.
3. CONCRETE SURFACE TO ALLOW
MINIMUM F72 MESH.
4. CONCRETE MUST BE PROVIDED IN
MIC. 3 METRE SECTIONS.
5. REINFORCEMENT MESH TO AS1554, 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/m²), SEALED
WITH SKAFLEX OR EQUIVALENT.
8. ALL DIMENSIONS ARE IN METRES.
9. RESTORE 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 AS1428.1 IF REQUIRED.
11. FOR DRIVEWAY WORK IN SANDY AREAS,
COUNCIL MAY PERMIT THE EXISTING KERBS &
CHANNELS TO BE SAW CUT AT THE INVERT OR
NON-CONCRETE KERB LINE AND REMOVAL OF THE
KERB.
12. REFER BRC R1014 FOR INVERT CROSSING
DETAILS.
13. "ODC-NMP1.1 DRIVEWAY" MAY BE
REFERRED TO ONLY IF NOT IN CONFLICT WITH
THE DRAWING CONTENTS.
14. FOR KERB TYPES, REFER BRC STANDARD
DRAWING R1020.
15. SHOULD DRIVEWAYS REQUIRE RESTAURATION
DUE TO ANY CIVIL WORKS THEN COUNCIL
WILL NOT GUARANTEE TO MATCH
STANDARD CONCRETE FINISHES WITHIN
THOSE DRIVEWAYS.
16. SHOULD CONCRETE FOOTPATHS EXIST OR BE
REQUIRED IN THE AREA THEN THE CONCRETE
FOOTPATHS WILL BE CONTINUOUS
TRANSMITTED FROM ANY DRIVEWAY ACCESS
CONSTRUCTION TO COMPLY WITH 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.
DRIVEWAYS
Industrial and Commercial Driveway Slab
Two Way Access

NOTES:
1. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
2. REINFORCING MESH TO AS1394. 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. REPAIR ADJACENT FOOTPATH TO MATCH DRIVEWAY. FOOTPATH EARTHWORKS ADJACING 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 AUSTRALIAN 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. ONLY 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 DRIVEWAYS (E.G. PIPES, ETC) OR PROVIDE CONCRETE FOOTPATH ACROSS DRIVEWAY.
14. DOWEL BARS TO DRIVEWAY – PATH CONNECTION.
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 PROPOSED CULVERT - BRC 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. PAYMENT REQUIREMENTS IF NOMINATED: THE CIVIL CONTRACTOR SHOULD DETERMINE THE DEPTH OF PAVEMENT TO SUIT LOAD REQUIREMENTS AFTER EXCAVATION HAS BEEN COMPLETED.
   a. PAVEMENT REQUIREMENTS:
      * THE MINIMUM DEPTH OF PAVEMENT IS TO BE 150mm OF CSR 60. ZERO COVER IS ALLOWED OVER RCP.
      * IF A SUMBAY SEALING IS REQUIRED, THEN IT SHALL BE A TWO COAT SEAL WITH 15mm & 10mm AGGREGATE TO COUNCIL STANDARDS.
      * IF ASPHALT IS REQUIRED, IT WILL ALSO BE TO COUNCIL STANDARDS (25mm MIN).
   b. CONCRETE REQUIREMENTS:
      * IF CONCRETE IS REQUIRED, IT WILL BE OFF FORMATION EDGE, OR 1m OFF FORMATION EDGE WHICHER 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. OVERLAND ACCESS IS TO BE CONSTRUCTED SO AS TO ALLOW AN OVERLAND FLOW PATH OVER THE ACCESS ROAD. THE OVERLAND FLOW PATH IS TO BE GENERAL BETWEEN THE ACCESS CULVERT AND THE EDGE OF ROAD OR AS DIRECTED BY COUNCIL ENGINEER. GENERAL THE OVERLAND FLOW PATH IS TO BE 300mm BELOW ROAD CROWN.
7. BOX CULVERT ACCESS TO HAVE MINIMUMS AND APPRON.
8. PIPE CULVERTS TO HAVE PRECAST HEADWALLS WITH WINGS (OR EQUAL CRS HUMES HEADWALLS) FOR SINGLE/MULTIPLE PIPES OR CAST IN SITU 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 R.
10. MINIMUM LONGITUDINAL GRADE OF CULVERT IS 0.3%.

DRIVEWAYS
Rural and Urban Accesses Requiring Culverts
No Kerb and Channel
DRIVEWAYS
Rural and Urban Invert Accesses
No Kerb and Channel

Turnout Radius "R"

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<td>1.5m</td>
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<tr>
<td>E</td>
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Table Drain to be Neatly Profiled and Graded to Maintain Fall

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 CSR 60. Bitumen sealing shall be a two coat hot or cold seal with 10mm & 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 invert 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.

Concrete Invert Crossing

Concrete Surface

Gravel or Bitumen Surface
See Note 3

Rural and Urban Invert Accesses
No Kerb and Channel

Access Falling from Road Edge

TWI NERT WANT H. 25000

NOT TO SCALE

Bundaberg Regional Council

Standard Drawing
A3

R1013

Original Image
NOTES:
1. FOOTPATH SECTION TO VARY WHERE NECESSARY TO MATCH CONCRETE FOOTPATHS AND VERGE PROFILES. FOOTPATH EARTHWORKS ASSUMING 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 (E.G. PIPES) 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.
NOTES:
1. CROSSINGS ARE NOT DESIGNED FOR COMMERCIAL VEHICLES.
2. FOOTPATH SECTION TO VARY WHERE NECESSARY TO MATCH CONCRETE FOOTPATHS AND VARIOUS PROFILES. FOOTPATH EARPARKS AND JOINING CONCRETE MUST BE WELL COMPACTED.
3. CONCRETE SURFACE TOLERANCES TO BE +5MM OVER 3 METRE SECTIONS.
4. CONCRETE 132 IN ACCORDANCE WITH AS1379 AND AS2600.
5. REINFORCEMENT MESH TO AS1394, 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/m²).
9. COUNCIL WILL NOT GUARANTEE REPLACEMENT OF NON-STANDARD CONCRETE FINISHES IF COUNCIL NEEDS TO ACCESS INFRASTRUCTURE UNDER DRIVEWAY (E.G. TUBES, ETC) OR PROVIDES CONCRETE FOOTPATH ACROSS DRIVEWAY.
10. SHOULD CONCRETE FOOTPATH 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 & AS1428.1-2007.
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.

DRIVEWAYS
Residential Invert Crossing
Steep Driveways
DRIVEWAYS

Residential Driveway Slabs for Brown Streets

NOTES:

1. ALL DIMENSIONS ARE IN METRES.
2. CROSSINGS ARE NOT DESIGNED FOR COMMERCIAL VEHICLES.
3. CONCRETE SURFACE TOLERANCE TO BE OVER 3 METRE SECTIONS.
4. CONCRETE N32 IN ACCORDANCE WITH AS1379 AND AS3600.
5. REINFORCEMENT MESH TO AS1394, 50 TOP AND EDGE LAPS, 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 (65-150kg/m³), SEALED WITH SIFAFLEX 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. RENSTATE 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 COMPACTION.
15. CONCRETE DRIVEWAYS ARE TO BE CONSTRUCTED GENERALLY IN ACCORDANCE WITH DRAWING R1030 AND TRANSITIONED OVER THE LONGITUDINAL GRADES NOT EXCEEDING 1 IN 25 TO COMPLY WITH AS1428 AS REQUIRED.
16. SHOULD DRIVEWAYS REQUIRE REINSTATEMENT DUE TO ANY CIVIL WORKS THEN COUNCIL WILL NOT GUARANTEE TO MATCH NON-STANDARD CONCRETE FINISHES WITHIN THOSE DRIVEWAYS.

Change of grade at invert to be not more than 12%.
NOTES:
1. REFER: R1010, R1011, R1013 AND R1014 FOR ACCESS CROSSING DETAILS.
2. REFER TO SPECIFICATIONS FOR BED PREPARATION REQUIREMENTS.
3. CONCRETE FOR SLIP-FORM MIN. N25.
4. CONCRETE FOR REINFORCED INVERTS MIN. N35.
5. FOR CONSTRUCTION & EXPANSION JOINTS, REFER ALSPEC. C244.12.566.
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 F7/2 MESH OR NOVOMESH 950 AT A RATE OF 3KG/M² OR AS DIRECTED.

EDGE RESTRAINT

KERB AND CHANNEL
Kerbs, Channels, & Inverts
Profiles & Dimensions
Kerb and Channel Drainage Connections

**SECTIONAL ELEVATION**

**ALTERNATIVE 1**
**KERB AND CHANNEL WITH KERB ADAPTOR**
**DETACHED DWELLING**

**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 100 STEEL PIPE IS TO BE USED.
7. ENCASE PIPE UNDER PATHS (NOMINALLY 100mm).
8. RHS GALV TO BE USED FOR INDUSTRIAL, HIGH DENSITY RESIDENTIAL AND COMMERCIAL.
9. UPVC TO BE USED FOR LOW DENSITY RESIDENTIAL ONLY.

**ALTERNATIVE 2**
**KERB AND CHANNEL WITH RHS VERGE ADAPTOR**

ALL OTHER AREAS
NOT TO SCALE

FOOTPATHS AND CYCLE PATHS
Concrete Strip Footpath - Mesh Reinforcement

REVISIONS

Scales

Verified Date

Original Issue

Checked: Drawn: Verified: Design:

BRC(09/10)

Quality Certification

Approved By Engineer:

R:
support services\Design\standards & manuals\standard drawings\brc standard drawings\Roads\R1030 - Rev D

Date:

RPEQ:

No.:

Rev.:

Sheet Size:

A3

Standard Drawing

24/10/18

RMC

MESH, FILL SPECIFICATION AND XFALL NOTE UPDATED

26/08/15

RMC

CRACK CONTROL JOINTS ADDED

24/10/18

RMC

TIFA

Concrete Strip Footpath - Mesh Reinforcement

FOOTPATHS AND CYCLE PATHS

NOT TO SCALE

LEGEND

\# EXPANSION JOINT
\# CRACK CONTROL JOINT
\# NOMINAL KERO LINE
\# UNLESS OTHERWISE APPROVED BY BRC ENGINEER

PLAN

EXPANSION JOINTS (EJ) AT 12.5m MAX CENTRES AND AT END OF EACH DAYS POUR. DANLEY K-FORM

DANLEY 14 x 240 ROUND PROTRODUCED GLASS FIBRE REINFORCED DOWEL WITH SLEEVE AT 300 CRS OR SIMILAR AS APPROVED BY BRC ENGINEER

CRACK CONTROL JOINT (CCJ) DETAIL

SL72 MESH PLACED CENTRALLY CCJ

SL72 MESH PLACED CENTRALLY CCJ

SL72 MESH

EXPANSION JOINT

SL72 MESH

COMPACTED FILL

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 SLP RESISTANCE REQUIREMENTS.
4. CONCRETE FOOTPATHS, ADJACENT EXISTING DRAIWWAYS ARE TO BE TRANSITIONED OVER LONGITUDINAL GROVES 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 WRT04, 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 10 TO 20h 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 ORG R1033 FOR DETAILS.
11. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
FOOTPATHS AND BIKE PATHS
Chicane Entrance Treatment

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 JOINTS.
4. ALL UNITS TO BE NOT DIRED 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 WATYL PARACRYL
   EQUIVALENT PROCESS OR POWDER COATED). COLOUR AS
   DIRECTED BY COUNCIL ENGINEER.
7. REFLECTIVE TAPE TO BE CLASS 2 (AS1906.1).
8. RAIS TO BE LOCATED IN ACCORDANCE WITH AUSTRROADS "GUIDE
   TO TRAFFIC ENGINEERING PRACTICE PART 14 - BICYCLES".
9. APPROPRIATE SIGNSAGE TO BE PROVIDED TO INDICATE THAT
    CYCLISTS MUST DISMOUNT TO TRAVERSE THROUGH THE CHICANE.
10. DIMENSIONS ARE IN MILLIEMETERS UNLESS SHOWN OTHERWISE.
**SIGNAGE**

**Street Name Sign and Post**

**LEGEND**
- SIGN TO BE LOCATED 750mm BEHIND NOMINAL KERB LINE
- SIGN POST IS TO BE LOCATED 2000MM TO REAR OF 4000 MAX FROM EDGE OF SEAL
- SIGN POST

**TABLE OF ABBREVIATIONS**

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<th>Avenue</th>
<th>Court</th>
<th>Crescent</th>
<th>Drive</th>
<th>Esplanade</th>
<th>Lane</th>
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**POST SPECIFICATION & CONCRETE FOOTINGS**

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- **CHS 50NB 29 C350**
  - 300 600 400 750 300 750

**NOTES:**
1. STREET NAMES MUST BE APPROVED BY COUNCIL
2. NAME PLATES: ANTI-VANDAL SECTION, 200mm WIDE AND 3mm THICK EXTRUDED ALUMINUM OR POLYPROPYLENE SECTION
3. BRACKET: STANDARD 200mm WIDE AND 3mm THICK EXTRUDED ALUMINUM (INCLUDING 2x#6 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 SURFACING OF STREET/ROAD THAT PROVIDES BEST VISIBILITY.
7. CONCRETE N20 IN ACCORDANCE WITH AS1379 AND AS3600.
8. ALL DIMENSIONS IN MILLIMETRES.
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 SLAUCHER 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.
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 750mm 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.

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.

**Construction Details**

- **Head Plate Detail**
  - 100mm wide reflective class 2 yellow band encircling the post (white reflective for white post)
  - 10 "noses (Typ)
  - R 10
  - Footing to sit proud of GL in grassed areas.
  - 1500mm to centre of base plate cases

- **Lug Detail**
  - Position for two (2) (back to back) A4 timelapse cases
  - 4mm LUGS Bolt welt and grind finish.

- **End Capped and corner ground to give smooth appearance OR plastic cap finish flush as indicated.**

- **Bolt galvanised and painted out to match background**

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

- **Paved surfaces are to be removed and replaced under 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.

**Construction Specifications:**

- **Post:**
  - Materials: 65NB steel post, C350 grade, 3.2mm wall thickness, deformed base to prevent rotation. Spot weld 3 steel nuts 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.

- **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 overlay 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

**Rowlands Rd**

**Bus Stop Sign Details**

- **R1043**
- **Signage**
- **Bus Stop Sign Details**
NOTES:
1. ELECTRICITY CONDUITS ADHERED ARE TYPICALLY:
   8/0 FOR STREET LIGHTING
   0/00 FOR LV,
   0/000, 11kV
   0/000/125 FOR HV, 33kV
2. WATER CONDUIT TO BE ENCASED IN LEAN MIX
   CONCRETE IF LESS THAN 150mm COVER BELOW
   THE BOTTOM OF BOX.
3. GRASS 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 SPEC.
7. GAS CORRIDOR WILL BE BY SPECIAL APPROVAL
   BY COUNCIL.
8. OFFSET CONDUIT 500mm WHERE THERE IS A
   CLASH WITH LIGHT POLE FOUNDATIONS.

LEGEND
* NOMINAL KERB LINE.
# WIDTH AS APPROVED.
- MAY VARY WITH APPROVAL FROM
  COUNCIL DEVELOPMENT ENGINEER.

PUBLIC UTILITIES
Typical Service
Conduit Alignments

WATER OR GAS SERVICE CONDUIT SECTION
ELECTRICITY & COMMUNICATIONS SERVICE CONDUIT SECTION
WATER SERVICE CONDUIT LOCATION PLAN

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
ROAD EDGE GUIDE POSTS AND BOLLARDS

Posts Types and Spacings

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 AND 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/NSZ 1986.1.
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 MUTCD 2.4.4.
4. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN.

* REFER GENERAL MUTCD NOTES (F)

<table>
<thead>
<tr>
<th>CURVE RADIUS (m)</th>
<th>OUTSIDE OF CURVE</th>
<th>INSIDE OF CURVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 100</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>100–199</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>200–299</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>300–399</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>400–599</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>600–799</td>
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<td>60</td>
</tr>
<tr>
<td>800–1199</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>1200–2000</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>2000–UP TO STRAIGHTS</td>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

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.
NOT TO SCALE

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

NOTES:

1. Ensure the flange of the bollards into the concrete base are tight and securely fixed by grouting the bollard into the base and surrounding the bollard with concrete around the base. This will ensure the bollard is fixed and secure.

2. From fitting into the concrete, the bollard should be fixed to the base of the concrete base using a suitable fix and secure method. The bollard should be fixed with at least two screws and a suitable adhesive to ensure it is fixed securely.

3. See ATBD for further construction details.

R1061

ROAD EDGE GUIDE POSTS AND BOLLARDS
Standard Bollard Treatment With 4 PVC Casing
ROAD FUNCTION
To provide for 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.

DESIGN CRITERIA

<table>
<thead>
<tr>
<th>LTP TYPE</th>
<th>TRUNK</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIORITIZED USERS</td>
<td>MOTORISTS</td>
</tr>
<tr>
<td>NOMINAL ADULT</td>
<td>&gt;16000 vpd (FOUR LANE)</td>
</tr>
<tr>
<td></td>
<td>&gt;10000 &amp; &lt;= 18000 (TWO LANE)</td>
</tr>
<tr>
<td>MAXIMUM LOTS/DWELLINGS</td>
<td>0/4</td>
</tr>
<tr>
<td>DESIGN SPEED</td>
<td>70 km/h</td>
</tr>
<tr>
<td>DIRECT ACCESS</td>
<td>NO</td>
</tr>
<tr>
<td>REPAIRS &amp; CHANNEL</td>
<td>YES</td>
</tr>
<tr>
<td>LANE MAPPING</td>
<td>YES</td>
</tr>
<tr>
<td>ASPHALT SURFACING MINIMUM DEPTH/TYPE (NOTE 4)</td>
<td>50mm/DC 014</td>
</tr>
<tr>
<td>LONGITUDINAL GRADE</td>
<td></td>
</tr>
<tr>
<td>VERTICAL CURVE LENGTH</td>
<td>50m/DC 014</td>
</tr>
<tr>
<td>MINIMUM CURVE LENGTH</td>
<td>50m</td>
</tr>
<tr>
<td>MAXIMUM SAG</td>
<td>0m</td>
</tr>
<tr>
<td>HORIZONTAL CURVE RADIUS</td>
<td>MINIMUM 200m</td>
</tr>
<tr>
<td>SUPERELEVATION</td>
<td>2%</td>
</tr>
<tr>
<td>TRAFFIC LOADING</td>
<td>2,100 ESA</td>
</tr>
</tbody>
</table>

NOTES:
1. REFER "LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LIP)" TO SEE IF IDENTIFIED AS A PART OF THE "OFF-ROAD MULTIMODAL 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 LIP, A 2.0m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.
2. ROAD RESERVE WIDTH WILL BE INFERRED AT INTERSECTIONS AND MUST BE APPROVED BY COUNCIL'S DEVELOPMENT ENGINEERS.
3. FOR SUB SOIL DRAINAGE DETAILS REFER TO PWODE 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 BUNDABERG SPECIFICATION "WRTS3D - DENSE GRADED AND OPEN GRADED ASPHALT"

LEGEND
- NOMINAL KERB LINE (REFER BRC STANDARD DRAWING R1020).
- PAVEMENT DESIGN IN ACCORDANCE WITH:
  - AP-T16-06 PAVEMENT DESIGN FOR LIGHT TRAFFIC - A SUPPLEMENT TO AUSTRADIS PAVEMENT DESIGN GUIDE.
  - ADOPTO12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

ROAD TYPE CROSS SECTIONS
URBAN ROAD - SUB-ARTERIAL

SUB-ARTERIAL - FOUR LANE

SUB-ARTERIAL - TWO LANE

R2001
**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.

---

### DESIGN CRITERIA

<table>
<thead>
<tr>
<th>LTP TYPE</th>
<th>TRUNK</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIORITY USERS</td>
<td>MOTORISTS &amp; CYCLISTS</td>
</tr>
<tr>
<td>NOMINAL ADT</td>
<td>&gt;3000 &amp; &lt;10000 vpd</td>
</tr>
<tr>
<td>MAXIMUM LOTS/DWELLINGS</td>
<td>1000</td>
</tr>
<tr>
<td>DESIGN SPEED</td>
<td>80 km/h</td>
</tr>
<tr>
<td>DIRECT ACCESS</td>
<td>YES</td>
</tr>
<tr>
<td>KERB &amp; CHANNEL</td>
<td>B1</td>
</tr>
<tr>
<td>LANE MARKING</td>
<td>YES</td>
</tr>
<tr>
<td>ASPHALT SURFACING MIN DEPTH/ TYPE (NOTE 4)</td>
<td>30mm/3C10</td>
</tr>
<tr>
<td>LONGITUDINAL GRADE</td>
<td>MINIMUM 0.3% MAXIMUM 5%</td>
</tr>
<tr>
<td>VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER &quot;GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN&quot; (AUSTRAS) 2010</td>
<td>MINIMUM CREST 12m MINIMUM SAG 16m</td>
</tr>
<tr>
<td>HORIZONTAL CURVE RADIUS</td>
<td>MINIMUM 98m</td>
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<tr>
<td>SUPERELEVATION</td>
<td>5%</td>
</tr>
<tr>
<td>TRAFFIC LOADING</td>
<td>1 X 10th ESA</td>
</tr>
</tbody>
</table>

---

**NOTES:**

1. REFER "LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LGP) TO SEE IF IDENTIFIED AS A PART OF THE OFF-ROAD MULTIMODAL 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 LGP, A 2.0m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.

2. FOR SUB SUR DRAINAGE DETAILS REFER TO PWBA STANDARDS. ANY "WATER SENSITIVE URBAN DESIGN (WSUD)" SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM WATERWAYS AND WATER BY DESIGN.

3. REFER TO OTHER SPECIFICATION "WATER - DENSE GRADED AND OPEN GRADED ASPHALT".

4. PARKING IS PERMITTED IN MARKED CYCLE 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 LGP. IF NOT IDENTIFIED IN LGP, A 2.0m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.

---

**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 AUSTRAS PAVEMENT DESIGN GUIDE
- AP-T02-12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

---

**ROAD TYPE CROSS SECTIONS**

**URBAN ROAD - TRUNK COLLECTOR**
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 INDIENTED PARKING BAYS WILL BE REQUIRED TO CATTER FOR A GREATER FLOW ON TRAFFIC.

### DESIGN CRITERIA

<table>
<thead>
<tr>
<th>LCIP TYPE</th>
<th>NON-TRUNK</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIORITY USERS</td>
<td>ALL USERS EQUAL PRIORITY</td>
</tr>
<tr>
<td>NOMINAL AADT</td>
<td>&gt;750 &amp; &lt;=3000 vpd</td>
</tr>
<tr>
<td>MAXIMUM LOTS/DWELLINGS</td>
<td>300</td>
</tr>
<tr>
<td>DESIGN SPEED</td>
<td>50 km/h</td>
</tr>
<tr>
<td>DIRECT ACCESS</td>
<td>YES</td>
</tr>
<tr>
<td>CURB &amp; CHANNEL</td>
<td>M3 (LOW DENSITY) INV1 &amp; B2 (HIGH DENSITY)</td>
</tr>
<tr>
<td>LANE MARKING</td>
<td>NIL</td>
</tr>
<tr>
<td>ASPHALT SURFACING MINIMUM TYPE (Note 4)</td>
<td>30mm/DD10</td>
</tr>
<tr>
<td>LONGITUDINAL GRADE</td>
<td>MINIMUM 0.3% MAXIMUM 10%</td>
</tr>
<tr>
<td>VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER &quot;GUIDE TO ROAD DESIGN PART 3 GEOMETRIC DESIGN&quot; (AUSTROADS 2010)</td>
<td>MINIMUM CREST 3.5m MINIMUM SAG 7m</td>
</tr>
<tr>
<td>HORIZONTAL CURVE RADIUS</td>
<td>MINIMUM 45m</td>
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<tr>
<td>SUPERELEVATION</td>
<td>NIL</td>
</tr>
<tr>
<td>TRAFFIC LOADING</td>
<td>3 x 10^3 ESA</td>
</tr>
</tbody>
</table>

### NOTES:

1. REFER "LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LCIP)" 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 LCIP, A 1.5m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.
2. FOR SUB SOIL DRAINAGE DETAILS REFER TO PIZED 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 BUNDABERG REGIONAL COUNCIL SPECIFICATION "WATS30 - DENSE GRADED AND OPEN GRADED ASPHALT".
4. INDIENTED PARKING BAY TO BE DESIGNED IN ACCORDANCE WITH BUNDABERG REGIONAL COUNCIL SPECIFICATION "BS210 - INDENTED PARKING BAY" AND MUST BE APPROVED BY COUNCIL'S DEVELOPMENT ENGG ENGINEERS.
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 (IE. OCCASIONALLY VEHICLES TRAVELLING
IN OPPOSITE DIRECTIONS WILL HAVE TO GIVE WAY TO ONCOMING VEHICLES).
IN HIGHER DENSITY AREAS INDEED PARKING BAYS WILL BE REQUIRED TO CATER
FOR A GREATER FLOW OF TRAFFIC.

**DESIGN CRITERIA**

**LID TYPE**
NON-TRUNK

**PRIORITY USERS**
ALL USERS EQUAL PRIORITY

**NOMINAL ADT**
>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

**LONGITUDINAL GRADE**
25mm/GS7

**VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER”GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN” (AUSTREROADS 2010)”**
MINIMUM CREST 3.5m
MINIMUM SAG 7m

**HORIZONTAL CURVE RADIUS**
MINIMUM 24m

**SUPER ELEVATION**
NIL

**TRAFFIC LOADING**
6 x 10t ESA

**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 AUSTRALIAN 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 STAND SPECIFICATION “WSUD = DENSE GRADED AND OPEN GRADED ASPHALT”.
4. INDEDED PARKING BAY TO BE DESIGNED IN ACCORDANCE WITH STAIR THN-138 AND MUST BE APPROVED BY COUNCIL’S DEVELOPMENT ENGINEERS.

---

**ROAD TYPE CROSS SECTIONS**

**URBAN ROAD - ACCESS STREET**

**LEGEND**

- NOMINAL KERB LINE
  (REFER BRC STANDARD DRAWING R1020).
- PAVEMENT DESIGN IN ACCORDANCE WITH:
  - AP-T08-06 PAVEMENT DESIGN FOR LIGHT TRAFFIC - A SUPPLEMENT TO AUSTRALIAN PAVEMENT DESIGN GUIDE.
  - ASP102-12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

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**Revisions**

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<thead>
<tr>
<th>Sheet</th>
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<th>Date</th>
<th>Sheet</th>
<th>Scale</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>NOT TO SCALE</td>
<td>18/12/2017 11:24:01 AM</td>
<td>A</td>
<td>NOT TO SCALE</td>
<td>18/12/2017 11:24:01 AM</td>
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</table>

**Quality Control**

<table>
<thead>
<tr>
<th>Date</th>
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<th>Sheet</th>
<th>Title</th>
<th>Engineer</th>
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</thead>
<tbody>
<tr>
<td></td>
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</table>
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.

Design Criteria:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Details</th>
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<tbody>
<tr>
<td>Lane Type</td>
<td>Non-Trunk</td>
</tr>
<tr>
<td>Priority Users</td>
<td>Pedestrians and Cyclists</td>
</tr>
<tr>
<td>Nominal ADT</td>
<td>&lt;=300 vpd</td>
</tr>
<tr>
<td>Maximum Lots/Dwellings</td>
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<td>Design Speed</td>
<td>40 km/h</td>
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<tr>
<td>Direct Access</td>
<td>Yes</td>
</tr>
<tr>
<td>Kerb &amp; Channel (Low Density)</td>
<td>INV1 &amp; B2 (High Density)</td>
</tr>
<tr>
<td>Asphalt Surfacing Min Depth</td>
<td>25mm/DS7</td>
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<tr>
<td>Longitudinal Grade</td>
<td>Minimum 0.3% Maximum 12%</td>
</tr>
<tr>
<td>Vertical Curve Length Per 1%</td>
<td>Minimum 3.5m Minimum 500 7m</td>
</tr>
<tr>
<td>Grade (K Value)</td>
<td>Refer &quot;Guide to Road Design&quot;</td>
</tr>
<tr>
<td>Part 3: Geometric Design</td>
<td>(Ausroads 2010)</td>
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<tr>
<td>Horizontal Curve Radius</td>
<td>Minimum 24m</td>
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<td>Super Elevation</td>
<td>Nil</td>
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<tr>
<td>Traffic Loading</td>
<td>6 x 10^5 ESA</td>
</tr>
</tbody>
</table>

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 Ausroads 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 Ausroads specification "Wood - dense graded and open graded asphalt". Indented parking bay to be designed in accordance with Ausroads 91-108 and must be approved by Council's development engineers.

Legend:
- Nominal Kerb Line
  (Refer BRC Standard Drawing R1020).

Pavement Design in accordance with:

Access Place - Low Density

Access Place - Medium Density

Road Type Cross Sections
Urban Road - Access Place
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.

**DESIGN CRITERIA**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>CBD Access</th>
<th>Commercial Access</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loft Type</td>
<td>Non-TRUNK</td>
<td>Non-TRUNK</td>
</tr>
<tr>
<td>Priority Users</td>
<td>Pedestrians and Motorists</td>
<td>Pedestrians and Motorists</td>
</tr>
<tr>
<td>Nominal ADT</td>
<td>Traffic Study Req.</td>
<td>Traffic Study Req.</td>
</tr>
<tr>
<td>Maximum Lots/Dwellings</td>
<td>N/A 300</td>
<td>300</td>
</tr>
<tr>
<td>Design Speed</td>
<td>40 km/h</td>
<td>50 km/h</td>
</tr>
<tr>
<td>Direct Access</td>
<td>Not Permitted</td>
<td>Not Permitted</td>
</tr>
<tr>
<td>Kerb &amp; Channel</td>
<td>B1</td>
<td>B1</td>
</tr>
<tr>
<td>Lane Marking</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Asphalt Surfacing Min. Depth Type (Note 4)</td>
<td>50mm/DS14</td>
<td>50mm/DS14</td>
</tr>
<tr>
<td>Longitudinal Grade</td>
<td>Minimum 0.3%</td>
<td>Maximum 3%</td>
</tr>
<tr>
<td>Vertical Curve Length Per 1% Change of Grade (x Value) Refer &quot;Guide to Road Design Part 3: Geometric Design&quot; (Austroads 2010)</td>
<td>Minimum Crest 3.5m</td>
<td>Minimum Sag 7m</td>
</tr>
<tr>
<td>Minimum Sag 11m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal Curve Radius</td>
<td>Minimum 42m</td>
<td>Minimum 66m</td>
</tr>
<tr>
<td>Super Elevation</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Traffic Loading</td>
<td>5 x 10^6 ESA</td>
<td>5 x 10^6 ESA</td>
</tr>
</tbody>
</table>

**NOTES:**
1. For subsoil drainage details refer to PWEA 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 SWMR Specification "WRS30 - Dense Graded and Open Graded Asphalt".

**ROAD TYPE CROSS SECTIONS**

**URBAN ROAD - CBD / COMMERCIAL ACCESS**

"Cross Section to be determined from traffic study"
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.

DESIGN CRITERIA

<table>
<thead>
<tr>
<th>LIDP TYPE</th>
<th>TRUNK</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIORITY USERS</td>
<td>HEAVY VEHICLES</td>
</tr>
<tr>
<td>NOMINAL AADT</td>
<td>&gt;750 &amp; &lt;= 3000 vpd</td>
</tr>
<tr>
<td>MAXIMUM LOTS/DWELLINGS</td>
<td>300</td>
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<tr>
<td>DESIGN SPEED</td>
<td>60 km/h</td>
</tr>
<tr>
<td>DIRECT ACCESS</td>
<td>YES</td>
</tr>
<tr>
<td>KERB &amp; CHANNEL</td>
<td>B1</td>
</tr>
<tr>
<td>LANE MARKING</td>
<td>YES</td>
</tr>
<tr>
<td>ASPHALT SURFACING MIN. DEPTH (TYPE 4)</td>
<td>50mm/DC14</td>
</tr>
<tr>
<td>LONGITUDINAL GRADE</td>
<td>MINIMUM 0.3%</td>
</tr>
<tr>
<td>VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER &quot;GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN&quot; (AUSTROADS 2010)</td>
<td>MINIMUM 30m</td>
</tr>
<tr>
<td>MINIMUM 50m</td>
<td></td>
</tr>
<tr>
<td>HORIZONTAL CURVE RADIUS</td>
<td>MINIMUM 50m</td>
</tr>
<tr>
<td>SUPERELEVATION</td>
<td>5%</td>
</tr>
<tr>
<td>TRAFFIC LOADING</td>
<td>5 X 10³ ESA</td>
</tr>
</tbody>
</table>

NOTES:
1. REFER "LOCAL GOVERNMENT INFRASTRUCTURE PLAN (LIDP)" TO SEE IF IDENTIFIED AS A PART OF THE OFF-ROAD MULTI-MODAL 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 LIDP, A 2.0m PATH IS TO BE PROVIDED ON ONE SIDE OF THE ROAD.
2. FOR SUB SOIL DRAINAGE DETAILS REFER TO AUSTROADS. ANY WATER SENSITIVE URBAN DESIGN (WISUD) SOLUTION IS TO BE IN ACCORDANCE WITH GUIDELINES FROM HEALTHY WATERWAYS AND WATER BY DESIGN.
3. REFER TO STMA SPECIFICATION "WRTS30 - DENSE GRADED AND OPEN GRADED ASPHALT".

NOT TO SCALE
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.

### DESIGN CRITERIA

<table>
<thead>
<tr>
<th>Design Criteria</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>LSP TYPE</td>
<td>NON-TRUNK</td>
</tr>
<tr>
<td>PRIORITY USERS</td>
<td>HEAVY VEHICLES</td>
</tr>
<tr>
<td>NOMINAL AADT</td>
<td>&lt;750 vpd</td>
</tr>
<tr>
<td>MAXIMUM LOTS/ DWELLINGS</td>
<td>75</td>
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<tr>
<td>DESIGN SPEED</td>
<td>40 km/h</td>
</tr>
<tr>
<td>DIRECT ACCESS</td>
<td>YES</td>
</tr>
<tr>
<td>KERB &amp; CHANNEL</td>
<td>B1</td>
</tr>
<tr>
<td>LANE MARKING</td>
<td>YES</td>
</tr>
<tr>
<td>ASPHALT SURFACING MIN. DEPTH/TYPE (NOTE 4)</td>
<td>50mm/DC14</td>
</tr>
<tr>
<td>LONGITUDINAL GRADE</td>
<td>MINIMUM 0.3% MAXIMUM 5%</td>
</tr>
<tr>
<td>VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER “GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN” (AUSTROADS 2010)</td>
<td>MINIMUM CREST 3.5m MINIMUM SAG 17m</td>
</tr>
<tr>
<td>HORIZONTAL CURVE RADIUS</td>
<td>MINIMUM 42m</td>
</tr>
<tr>
<td>SUPERELEVATION</td>
<td>N.L</td>
</tr>
<tr>
<td>TRAFFIC LOADING</td>
<td>5 x 10^9 ESA</td>
</tr>
</tbody>
</table>

### 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 PWRED 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 URBAN SPECIFICATION “WTS32” – DENSE GRADED AND OPEN GRADED ASPHALT.
4. IF CYCLING DEMAND IS EXPECTED TO BE HIGH, THE PARKING LANES IS TO BE UTILISED AS MARKED CYCLE LANE.

### 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.
- APTPD-12 GUIDE TO PAVEMENT TECHNOLOGY PART 2: PAVEMENT STRUCTURAL DESIGN.

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**NOT TO SCALE**

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**ROAD TYPE CROSS SECTIONS**

**URBAN ROAD - INDUSTRIAL ACCESS**

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**BUNDABERG REGIONAL COUNCIL**
NOT TO SCALE

ALTERNATIVE FLAT BOTTOM TABLE DRAIN

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 5
     - 0.5m - 1.0m DEEP 1 IN 4
     - 1.0m - 2.0m DEEP 1 IN 3
     - > 2.0m DEEP 1 IN 2
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 AUSTRACD'S "UNSEALED ROADS MANUAL" UNLESS DIRECTED BY COUNCIL ENGINEER.
6. SEALED ROADS SHALL BE DESIGNED AS PER REQUIREMENTS OF AUSTRACD'S "GUIDE TO ROAD DESIGN - PART 3: GEOMETRIC DESIGN".
7. ONE ACCESS POINT TO BE CONSTRUCTED TO EACH LOT IN ACCORDANCE WITH STANDARD DRAWINGS R101 & 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 "Y" DRAINS TO FLAT BOTTOM WITH MIN WIDTH OF 1.0m, 2.0m DESIRABLE & SIDE SLOPES OF 1 IN 4 AS DIRECTED BY COUNCIL ENGINEER.
11. REFER TO MUTCD FOR PAVEMENT MARKING & EDGE MARKER INSTALLATIONS.
12. LOCAL ROADS OF REGIONAL SIGNIFICANCE (LRS) 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 TO GUIDE TO ROAD DESIGN - PART 6: ROADSIDE DESIGN, SAFETY AND BARRIERS.
ROAD FUNCTION
TO PROVIDE A CONNECTION BETWEEN ACCESS ROADS AND HIGHER ORDER PRINCIPAL 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 RURAL/VILLAGES AND TOWNSHIPS, BOTH ROADS ARE DESIGNED TO CARRY HEAVY VEHICLES.

ALTERNATIVE FLAT BOTTOM TABLE DRAIN

DESIGN CRITERIA

<table>
<thead>
<tr>
<th>ROAD TYPE</th>
<th>RURAL/ RURAL RESIDENTIAL COLLECTOR ROAD</th>
<th>VILLAGE/ TOWNSHIP COLLECTOR ROAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSP TYPE</td>
<td>TRUNK</td>
<td>TRUNK</td>
</tr>
<tr>
<td>PRIORITY USES</td>
<td>MOTORS/TETS</td>
<td>MOTORS/TETS</td>
</tr>
<tr>
<td>NOMINAL AWT</td>
<td>&gt;250 &lt;=1000 vpd</td>
<td>&gt;250 &lt;=1000 vpd</td>
</tr>
<tr>
<td>MAXIMUM LOTS/ DWELLINGS</td>
<td>&lt;= 100</td>
<td>&lt;= 300</td>
</tr>
<tr>
<td>DESIGN SPEED</td>
<td>100 km/h</td>
<td>60 km/h</td>
</tr>
<tr>
<td>DIRECT ACCESS</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>LANE MARKING</td>
<td>YES (NOTE 9)</td>
<td>YES (NOTE 9)</td>
</tr>
<tr>
<td>ROAD SURFACING</td>
<td>PRIME AND 2 COAT SEAL (NOTE 13)</td>
<td>PRIME AND 2 COAT SEAL (NOTE 13)</td>
</tr>
<tr>
<td>LONGITUDINAL GRADE</td>
<td>MINIMUM 0.3%</td>
<td>MINIMUM 0.3%</td>
</tr>
<tr>
<td>VERTICAL CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE)</td>
<td>MINIMUM CREST 61m</td>
<td>MINIMUM CREST 61m</td>
</tr>
<tr>
<td>HORIZONTAL CURVE RADIUS</td>
<td>MINIMUM 48.3m</td>
<td>MINIMUM 98m</td>
</tr>
<tr>
<td>SUPER ELEVATION</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>TRAFFIC LOADING</td>
<td>5 x 10^3 ESA</td>
<td>3 x 10^3 ESA</td>
</tr>
</tbody>
</table>

NOT TO SCALE

LEGEND
- EARTH BATTER - CUT/FILL - ROCK BATTER - CUT.
- BEAM 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.
3. MINIMUM LONGITUDINAL SLOPE OF TABLE DRAIN INVERTS SHALL BE 0.3% (1 IN 333) UNLESS APPROVED BY COUNCIL ENGINEER.
4. FLOODWATERS SHALL BE CONSTRUCTED WITH CROSS ROAD DRAINAGE.
5. SEAL 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 MUTED 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 WR311 AND PLANNING SCHEME POLICY FOR DEVELOPMENT WORKS.
14. REFER GUIDE TO ROAD DESIGN - PART 6: ROADSIDE DESIGN, SAFETY AND BARRIERS.
ROAD FUNCTION
To provide direct access to properties in rural rural 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

DESIGN CRITERIA

<table>
<thead>
<tr>
<th>ROAD TYPE</th>
<th>RURAL/ RURAL RESIDENTIAL ACCESS ROAD</th>
<th>VILLAGE/ TOWNSHIP ACCESS ROAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSD TYPE</td>
<td>Non-Trunk</td>
<td>Non-Trunk</td>
</tr>
<tr>
<td>PRIORITY USERS</td>
<td>Motorists</td>
<td>Cyclists and Motorists</td>
</tr>
<tr>
<td>NOMINAL AUTF</td>
<td>&lt;=250 vpd</td>
<td>&lt;=250 vpd</td>
</tr>
<tr>
<td>MAXIMUM LOTS/ DWELLINGS</td>
<td>&lt;= 35</td>
<td>&lt;= 35</td>
</tr>
<tr>
<td>DESIGN SPEED</td>
<td>80 km/h</td>
<td>50 km/h</td>
</tr>
<tr>
<td>DIRECT ACCESS</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>LANE MARKING</td>
<td>Yes (Note 9)</td>
<td>Yes (Note 9)</td>
</tr>
<tr>
<td>ROAD SURFACING</td>
<td>Prime and 2 Coat Seal (Note 13)</td>
<td>Prime and 2 Coat Seal (Note 13)</td>
</tr>
<tr>
<td>LONGITUDINAL GRADE</td>
<td>Minimum 0.3% Maximum 12%</td>
<td>Minimum 0.3% Maximum 12%</td>
</tr>
<tr>
<td>CURVE LENGTH PER 1% CHANGE OF GRADE (K VALUE) REFER &quot;GUIDE TO ROAD DESIGN PART 3: GEOMETRIC DESIGN&quot; (AUSTROADS 2010)</td>
<td>Minimum Crest 30m Minimum Sag 29m</td>
<td>Minimum Crest 7m Minimum Sag 11m</td>
</tr>
<tr>
<td>HORIZONTAL CURVE RADIUS</td>
<td>240m</td>
<td>56m</td>
</tr>
<tr>
<td>SUPERELEVATION</td>
<td>5%</td>
<td>NIL</td>
</tr>
<tr>
<td>TRAFFIC LOADING</td>
<td>3 x 10^9 ESA</td>
<td>3 x 10^9 ESA</td>
</tr>
</tbody>
</table>

LEGEND
- Berm for Services WHERE SPECIFIED.
- Pavement Design in accordance with "Austroads - Guide to Pavement Technology" or "Austroads Pavement Design - A Guide to the Structural Design of Road Pavements".
- Minimum Longitudinal Slope of Table Drain Inverts shall be 0.3% (1 in 333) Unless Approved by Council Engineer.
- Floodways shall be Constructed with Cross Road Drainage.
- Sealed Roads shall be designed using Parameters set out in Austroads "Sealed Roads Manual" unless directed by Council Engineer.
- Pavement Design and Seal to be submitted for Approval by Council Engineer for Each Application of Operational Works.
- Linemarking - Centre & Edge Line as Set Out in MUTCD.
- Table Drain may be varied from "Y" drainage to Flat Bottom with MIN Width of 1.0m, 2.0m Desirable & Side Slopes of 1 in 4 as directed by Council Engineer.
- Refer to MUTCD for Pavement Marking & Edge Marker Installations.
- Local Roads of Regional Significance (LRRS) are not Covered by the above Table. consult with Council Engineer.
- In accordance with WR311 and Planning Scheme Policy for Development Works.

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.
3. ROCK BATTER - CUT 1 IN 0.5
4. EARTH BATTER - CUT/FILL:
   - 0.5m DEEP: 1 IN 6
   - 1.0m DEEP: 1 IN 4
   - 2.0m DEEP: 1 IN 3
5. Refer to MUTCD for Pavement Marking & Edge Marker Installations.
6. Local Roads of Regional Significance (LRRS) are not Covered by the above Table. Consult with Council Engineer.
ROAD FUNCTION
TO PROVIDE A RURAL LOW TRAFFIC VOLUME CONNECTION RURAL/RURAL RESIDENTIAL PROPERTIES AND HIGHER ORDER SEALED ROADS.

DESIGN CRITERIA

<table>
<thead>
<tr>
<th>ROAD TYPE</th>
<th>UNSEALED MINOR RURAL ROAD</th>
<th>UNSEALED LOCAL ACCESS ROAD</th>
<th>UNSEALED RURAL TRACK</th>
</tr>
</thead>
<tbody>
<tr>
<td>LSP TYPE</td>
<td>NON-TRUNK</td>
<td>NON-TRUNK</td>
<td>NON-TRUNK</td>
</tr>
<tr>
<td>PRIORITY USERS</td>
<td>MOTORISTS</td>
<td>MOTORISTS</td>
<td>MOTORISTS</td>
</tr>
<tr>
<td>NOMINAL AAD</td>
<td>&gt;50 &lt;=150 vpd</td>
<td>&gt;10 &lt;=50 vpd</td>
<td>&lt;=10 vpd</td>
</tr>
<tr>
<td>MAXIMUM LOTS/DWELLINGS</td>
<td>&gt;7 &lt;=20</td>
<td>&gt;2 &lt;=7</td>
<td>&lt;2</td>
</tr>
<tr>
<td>DESIGN SPEED</td>
<td>80 km/h</td>
<td>60 km/h</td>
<td>60 km/h</td>
</tr>
</tbody>
</table>

DIRECT ACCESS: 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 AUSTRALIAS "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 1 IN 6
   - 0.5m-1.0m DEEP 1 IN 4
   - 1.0m-2.0m DEEP 1 IN 3

NOTES:
- BATTER SLOPES SHOWN ARE TYPICAL AND MAY NEED TO BE VARIED TO SUIT SITE CONDITIONS.
- FINAL BATTER SLOPES TO BE APPROVED BY COUNCIL ENGINEER.

ROAD TYPE CROSS SECTIONS
RURAL ROAD - UNSEALED ROADS
COMPLIANT KERB RAMP ALIGNMENT

Refer drawing SEQ R-092 for criteria where TGSF's are required.

NOTES:
1. A compliant kerb ramp exists where all the following are satisfied:
   1.1 TIP OF RAMP: There shall be a minimum obstruction free wheelchair turnaround distance of 1500 beyond the top of the ramp. The ramp 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.
   1.2 Maximum ramp slope for wheelchair access shall be 1:8. A sharp transition (no rounding) is to be maintained close to the intersection of graded road surfaces (top of ramp and intersection of ramp and wings). The intersection of the ramp and wings should be a faired joint.
   1.3 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.
   1.4 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/units. Wing angles shall be reduced at obtuse angled intersections. Wing widths shall be between 500 and 1500. A maximum slope of 1:4 is to be maintained on the wings at the kerb face (i.e. min. 600 wide wing for a 150 kerb). At least a 1 metre kerb upstand is desirable where adjacent kerb wings intersect at an intersection corner.
   1.5 Surface of Ramp and sloping sides shall be slip resistant as specified in AS/NZS 1428.1.
   1.6 CONCRETE to be Class N3/10. All concrete to be broom finished. Ramp to be cast monolithically with the channel or tray.
   1.7 All dimensions are in millimetres unless shown otherwise.

These drawings have been developed in consultation with the participating Councils.

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

KERB RAMP
RAMPED PEDESTRIAN CROSSINGS

SEQ R-090
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) 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 cues 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 ramp 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 2986-2000 Concrete kerbs and channels (gutters) – Manually or Machine Placed
AS 1428.4.1-2009 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

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

SEQ R-091
**GUIDELINES**

**COMPLIANT KERB RAMPS AND TGSIs APPLICATION EXAMPLE**

**PLAN VIEW**

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

A. Tactile Ground Surface Indicators shall be used in conjunction 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 yellow (Golden-Yellow 114 to Sunbeam-Yellow 115 – AS2770). Luminance contrast shall be achieved by all conditions (e.g. wet/dry, day/night). Tactile indicators and their base shall be slip resistant. Refer to AS/NZS 1428.4.1 – 2009 for luminance contrast and slip resistance requirements.

C. Warning TGSIs shall be installed (where available) at kerb crossings:
   a) at a kerb ramp with a visual impairment at hazard.
   b) at the end of a pedestrian crossing, where the path of travel is not continuous (e.g. crosswalk on island).
   c) at the intersection of 2 or more directional indicators in the absence of normally available cues.
   d) along the kerb or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   e) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   f) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   g) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   h) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   i) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   j) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   k) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   l) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   m) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   n) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   o) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   p) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   q) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   r) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   s) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   t) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   u) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   v) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   w) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   x) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   y) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.
   z) at mid-block kerb ramps or street crossings to direct pedestrians with a vision impairment to the crosswalk.

**NOTES:**

1. For details of compliant kerb ramps refer to SDR – 008 and SDR – 091.
2. Warning indicators required adjacent to kerb ramps on property boundary to indicate change in direction.
3. Directional indicators are required from kerb ramp to the top of the kerb ramp.
4. Warning indicators are required on the kerb ramp to warn of the hazard (the road/traffic). Can be omitted if kerb ramp is to a kerb crossing (e.g. AS 1428.1–2009). A minimum of 600mm wide kerb ramps should be installed on a 300mm wide kerb ramp.
5. Kerb ramps to be 1200mm wide or specified on construction drawings.

**INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA**

**QUEENSLAND DIVISION INC.**

**STANDARD DRAWINGS**

**INSTALLATION OF TGSIs ON RAMPED KERB CROSSINGS**

**SEQ R-092**
**TYPICAL MITRE DRAIN LOCATIONS**

- **Kerb and channel**
- **Access chamber**
- **Kerb inlet**
- **PVC oblique tee**
- **Grade**
- **Crown of Road**
- **Spacing as per table**
- **Nom 5 or 10mm single size screenings**
- **Geofabric lapped top**
- **Subsoil drain pipe 300 max**
- **Strip filter drain (roadside)**
- **Median / Island**
- **Kerb**
- **Vesicular**

**STORMWATER DRAINAGE**

- **TRENCHES WITH SUBSOIL DRAINAGE**

<table>
<thead>
<tr>
<th>A.S. SIEVE SIZE</th>
<th>% BY WT. PASSING</th>
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<tr>
<td>5mm NOM size</td>
<td>10mm NOM size</td>
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<tr>
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<tr>
<td>9.50 mm</td>
<td>85 - 100</td>
<td>85 - 100</td>
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<tr>
<td>6.70 mm</td>
<td>100</td>
<td>100</td>
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<tr>
<td>4.75 mm</td>
<td>85 - 100</td>
<td>85 - 100</td>
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</tr>
<tr>
<td>75 µm</td>
<td>0 - 2</td>
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</tr>
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</table>

**FILTER MATERIAL GRADING**

- Unless otherwise specified

**STANDARD SUBSOIL DRAIN**

- Impervious material refer Note 4
- Selected filter material
- Subsoil drain pipe 300

**TYPICAL LOCATION**

- **NEW GRANULAR PAVEMENT**
  - **Typical location with existing K&C**

**TYPICAL LOCATION**

- **NEW ASPHALT PAVEMENT**

**ALTERNATIVE LOCATION**

- **LANDSCAPE MEDIAN**

**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 1264.
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 to be in accordance with DTMR specification WRTS03.
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.

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

SEQ R-140

SUBSOIL DRAINS DETAILS AND LOCATIONS
FIELD INLET
Field Inlet / Grated Gully Pit
Profiles And Dimensions

NOTES:
1. CONCRETE NO IN ACCORDANCE WITH AS1379 AND AS3600.
2. ALL WELLS TO AS1554.
3. GRATE AND FRAME TO BE HOT DIP GALVANISED AFTER FABRICATION TO AS1101.3.
4. REINFORCING BARS GRADE 250 TO AS1392 - 50mm COVER MIN.
5. ALL PLATS GRADE 250 TO AS3678.
6. ALL ANGLES GRADE 250 TO AS3679.
7. HEXAGONAL HEAD BOLTS TO AS1112.
   NUTS TO AS1112.
   WASHERS TO AS1237.
   GALVANIZING TO AS1214.
8. GRATE TOP TO BE DESIGNED TO WITHSTAND LOADS TO AS3906-32.
9. GRATE TOPS TO BE DESIGNED TO SUIT TO REQUIRED USE, EG.
   PEDESTRIAN SAFETY, BICYCLE SAFETY.
10. LC DESIGN TO BE SUBMITTED TO COUNCIL FOR APPROVAL.
11. ALL DIMENSIONS IN MILLIMETRES.
12. BOLLARD/FENCE TO COUNCIL ENGINEER DIRECTIONS.
13. SQUARE PIT MAY BE REPLACED WITH CYLINDRICAL PIT 900mm DIAMETER.

NOT TO SCALE

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<th>Verified</th>
<th>Date</th>
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</table>
FIELD INLET
Field Inlet Pit Dome Top Cover
Partially Submerged Inlet

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 CALLFIELD GREEN" OR APPROVED EQUIVALENT.
3. ALL DIMENSIONS ARE IN MILLIMETRES.

BUNDABERG REGIONAL COUNCIL

Scales: NOT TO SCALE

Revisions: 1

Quality Certification: Approved by Engineer

Original Issue: 2013

Sheet Size: A3

Standard Drawing No: D1002
Residential Roads
Optional Type Plans & Cross Section to suit WSUD

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 "HEALTH Waterways" AND "Water By Design" GUIDELINES FOR WSUD SOLUTIONS. REFER P-HEAD STANDARD DRAWINGS FOR DETAILS.
3. THIS STANDARD DRAWING IS A SAMPLE OUTLINE TO WSUD SOLUTION IN AN ACCESS STREET.
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.

Residential Roads
Optional Type Plans & Cross Section to suit WSUD
2-R6 bars Grade 400 to AS 1392, placed centrally in ring with 40 side cover. Lap 250.

Overall diameter nom 1050
Concrete thickness 35 or 50

ROOF RING
PLAN

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

Approved cast iron cover and frame comply to AS 3996. Refer to DS-015, DS-019 & DS-020

Precast roof slab to manufacturers specification or RPEQ Design

#1050

300 mm

4-NS-N12 Ring ties or 4-N12 dowels x 150 equally spaced. Refer note 5.

$100 uPVC slotted pipe stub, 1000 long with end cap, installed on the upstream side of access chamber (unless directed otherwise). The stub is required to dewater the pipe trench.

Benching as detailed on project drawings or directed by relevant Council.

NOTES:
1. Concrete: Benching N25, Structural N40 (precast), N32 (cast in situ) 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.

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.
NOTES:

9. All dimensions are in millimeters unless shown otherwise.

8. Scale 0:1 for mandatory cover details.

7. Refer to DWG No. 0:019 0:020 and

6. Refer to DWG No. 0:018 for

5. Machine tolerance ±2.0

4. Light of glanding 50 mm

3. Overall diameter of cover & rim 0:25mm

2. Measured size ±0:125mm

1. Refer to DWG No. 0:021

SECTION

PLAN

DETAIL
Lifting keyhole detail

Sections:

1. All edges to be square.
2. Casting to be free of burrs and pits.
3. Material:
   - Ductile cast iron
   - Tensile Strength: 800-3 (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
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. Lid 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 cover details.
11. All dimensions are in millimetres unless shown otherwise.
Lifting keyhole 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 : 145-195 (HB)
   Design load = 80kN (AS 3996)
   Mass = 39kg
5. Tolerances
   Cast size ± 1.00mm
   Angle profile ± 0.22
   Machined size ± 0.125mm
   Overall diameter of cover ø10mm=0.25mm
   DFT of coating 50 µm
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.
**NOTES:**

1. In situ 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 than 3000 require individual design and certification.
6. All dimensions are in millimetres unless shown otherwise.

**SECTION C-C**
(Through lintel & extended kerb inlet)

**SECTION B - B**

**PLAN**

**INLET IN SAG**

**INLET ON GRADE**

**LEGEND**

- Setout dimensions

**SECTION A-A**

- Upright kerb & Channel barrier type
- Grate with frame, refer to SEQ D-062.
- Lip to match road crossfall

**OUTLET CULVERT**

**FLOW**

- Side drain connection
- Grate frame cast into concrete

**TOP OF KERB**

- Back of Kerb
- Typically 115

**BASE OF CHANNEL**

- Channel invert

**100 MIN extended kerb inlet base**

**50 MIN**

**95 FALL**

**150 MIN**

**Ø100 uPVC stub for side drain connections to frost and both sides, with geotextile filter plugs**
NOTES
1. Concrete N32 in accordance with AS 1379 and AS 3600.
2. Each lifting anchor to be "swiftlift" or equivalent 1.3 tonnes, galvanized to AS 4680 and fitted to manufacturer's specification.
3. Reinforcing steel Grade 400 to AS 4671. Place centrally, 40 MN 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.

<table>
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<tr>
<th>LINTEL</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>X</th>
<th>MASS (kg)</th>
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<tbody>
<tr>
<td>S</td>
<td>2400</td>
<td>2040</td>
<td>1800</td>
<td>1970</td>
<td>400</td>
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<td>3240</td>
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<td>4440</td>
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<td>4370</td>
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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.

INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS
DRAINAGE PITS
KERB INLET
PRECAST LINTEL DETAILS

SEQ D-061
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.
FABRIC REINFORCED SLAB

<table>
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<tr>
<th>SHORT SPAN</th>
<th>SLAB THICKNESS</th>
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<tbody>
<tr>
<td>1200 TO 1600</td>
<td>225</td>
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<tr>
<td>1800 TO 2400</td>
<td>250</td>
</tr>
<tr>
<td>2500 TO 3000</td>
<td>275</td>
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TYPICAL SLAB REINFORCEMENT

TYPICAL SECTION

NOTES:
1. Concrete N32/28 in accordance with AS 1379 and AS 3600.
2. Reinforcement: F81 Fabric to AS 1304
   Bars Y15, Grade 400 to AS 1302.
3. All laps in reinforcement shall be:
   Y12 = 300, Y16 = 400, Fabric = 250
4. Farmwork in accordance with AS 3610.
5. Designed to Austroads Bridge Code, W7 wheel load, dynamic factor 0.9.
6. Maximum fill over roof slab shall be 3000mm.
7. Reinforcement cover 45 MN.
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.
**Type 1: Natural Bedding**

- Compacted backfill

**Type 2: Sand Surround**

- Compacted material, refer to alternatives

**Type 3: Sand Bedding**

- Drainage if specified

**Type 4: Insitu Base Slab**

- Insitu concrete, bedding & drainage design to suit specific site conditions

**Multiple Culverts**

- Concrete manhole slab
- Drainage if specified

**Excavation Width**

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<tr>
<th>W1</th>
<th>W2</th>
<th>E</th>
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<tr>
<td>2440</td>
<td>2670</td>
<td>3300</td>
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**Typical Detail A**

- Gravel base, site specific design

**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

**NOTES**

1. Backfill compaction:
   - Approved fill / approved bedding / compacted backfill / CB 15 Gavel 95%
   - Gravel (300mm inplace) under road pavement 95%
   - Compact fill - at levels / private property 95%

2. Refer to Main Roads Std Drg 1315 for installation of precast culverts.

3. Tape all joints with 75mm wide Densol (600) tape or equivalent.

4. All dimensions in millimeters.
ALTERNATIVE 1

Fix to top of stake with shadecloth fastener or tie to steel picket.

Geotextile Fabric and F42

Overland Flow

50x50 IW stake or steel picket 1200 MN long

Construction Site

Geotextile fabric, Bidum U34 or similar.

Runoff to be directed to a sediment trap, refer Standard Drawing D–0041.

ALTERNATIVE 2

Fix to top of stake with shadecloth fastener or tie to steel picket.

Geotextile Fabric and F42

Overland Flow

50x50 IW stake or steel picket 1200 MN long

Crushed or granular material, Grading to Table 4 of QT Specification MRS11.03.

TYPICAL LAYOUT ACROSS GRADE

Points A at same elevation

SEDIMENT FENCE

LEGEND

- Unbound pavement material (gravel) to Grading B, Table 9 of QT Specification MRS11.05, exclude material finer than AS sieve 2.5mm.
- Without F42 fabric, 2000 MAX CYC

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 upslope 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 turf 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 0.5 ha per 100m length of fence.
   (c) Woven fabrics are preferred, non-woven fabrics may be used on small works sites, i.e. operational period less than 6 months or on sites where significant sediment runoff is not expected.
   (d) Fences need to be located across the contour the layout shall conform to Typical Layout Across Grade.
   (e) Fences are required 2m MN from toe of cut or fill banks, where not practical one fence can be at the top with a second fence 1m MN 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.
   (c) Safety issues must be considered at all times, incorporates traffic control devices to the satisfaction of the Superintendent.
   (d) All dimensions in metres unless indicated otherwise.

<table>
<thead>
<tr>
<th>SEDIMENT CONTROL DEVICES</th>
<th>SEDIMENT FENCE</th>
<th>Entry/Exit Sediment Trap</th>
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A ORIGINAL ISSUE: 8/12/95

REVISIONS

DATE

DRAINAGE

Standard Drawing

D–0040

JEP – GLENDA 11322–D–0040
Prior to any excavation being undertaken, a Dial Before You Dig search is to be undertaken.

**NOTES:**

1. Prior to any excavation being undertaken, a Dial Before You Dig search is to be undertaken.
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 distance 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 infrastructure. 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.

**SCALE:**

- Road Shoulder Planting - Typical: Scale 1:50
- Root Barrier Detail: Scale 1:20
- Bollard Detail: Scale 1:25
- Standard Street Planting Details: Scale 1:10

**Location:**

- City of Bundaberg
- Bundaberg Regional Council

**Drawing Details:**

- Sheet: A
- Date: 21/12/2018
- Scale: AS SHOWN @ A3

**Revisions:**

- M.J. C.M.
- C.M. C.M.
- Approved By Engineer:
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 distance 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 800mm 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 infrastructure. Trees with known invasive roots are not to be used. Refer to BRC approved street tree list for options.
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.

DO NOT:
- Attach of signs, fencing, cables and winches to a tree as it causes direct damage to a tree and promotes decay.
- Store materials within the Tree Protection Zone as it causes compaction and root suffocation.
- Spill diesel oil, fertilizers and cement within the Tree Protection Zone as it may cause root death.
- Raise ground levels even for only a few weeks and by only centimetres as it can suffocate roots, causing severe dieback.
- Dig trenches within the Tree Protection Zone as it can sever roots, causing instability and crown dieback.
- Park heavy vehicles or cars within the Tree Protection Zone as this may cause compaction and oil contamination.

DO NOT:
- Light fires in the vicinity of trees. Burning by flames can cause damage and disease.
- Dig trenches within the Tree Protection Zone as it can sever roots, causing instability and crown dieback.
- Damage tree limbs. Pruning should not be done for aesthetic reasons.
- Lower ground level as it severs roots causing severe dieback or death of a tree.
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- Spill diesel oil, fertilizers and cement within the Tree Protection Zone as it may cause root death.
- Raise ground levels even for only a few weeks and by only centimetres as it can suffocate roots, causing severe dieback.
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