## Book 400 - Amendments

### Version 1.0

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<th>V1.0</th>
<th>Book 400</th>
<th>29/06/2018</th>
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<th>Book 400</th>
<th>17/10/2018</th>
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<table>
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<tr>
<th>V1.1</th>
<th>403.01, 03 &amp; 04</th>
<th>09/06/2021</th>
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<tr>
<td></td>
<td><em>In-situ kerb details updated - addition of fibre reinforcement and keying</em></td>
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<th>V1.2</th>
<th>401.05 &amp; 402.00</th>
<th>17/11/2021</th>
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<td></td>
<td><em>Motor details amended on 401.05. Nominated supplier added and concrete strength increased to 40MPa for precast kerbs (402.00).</em></td>
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Standard Kerb Types and Installation Details

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Standard Kerb Types and Installation Details

Foreword

The City of Perth has adopted an approach for street enhancement projects to introduce more resilient granite kerbs to city centre streets; maintaining exposed aggregate concrete footpaths for the majority of situations; and identifying high profile locations for granite footpaths. This approach provides for a staged transition towards full granite footpaths in the future.

The kerb material required for street enhancement projects varies depending on the level of amenity proposed, as addressed in Book 300 - Standard Footpath Design and Installation Details. The various levels of amenity call for three types of kerb material to be used in street enhancement projects and can be found in the following chapters:

- Chapter 401 - Standard Granite Kerbs
- Chapter 402 - Standard Precast Concrete Kerbs
- Chapter 403 - Standard In-situ Concrete Kerbs

These chapters set out the standard dimensions and installation details for the different kerb types.

For further information regarding footpath design and installation details refer:
Book 300 - Standard Footpath Design and Installation Details
Granite Kerbs

1) Performance Specification:

<table>
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<tr>
<th>Property</th>
<th>Specification</th>
<th>Tested by Standard</th>
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<tbody>
<tr>
<td>Bulk Specific Gravity</td>
<td>Minimum 2.7 t/m³</td>
<td>ASTM C97</td>
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<tr>
<td>Water Absorption (mean)</td>
<td>(% by weight) 0.12%</td>
<td>ASTM C97</td>
</tr>
<tr>
<td>Modulus of Rupture (Dry)</td>
<td>15MPa</td>
<td>ASTM C99</td>
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<tr>
<td>Modulus of Rupture (Soaked)</td>
<td>12MPa</td>
<td>ASTM C99</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>140MPa</td>
<td>ASTM C99</td>
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Granite Kerbs must comply with the minimum specification requirements as set out in ASTM C615/C615M-11 - Standard Specification for Granite Dimension Stone.

2) Testing of Paving:

All proposed kerbs must have test results to confirm the above properties are fulfilled. Testing to be irrespective of orientation and be performed on exfoliated finished samples. The required methods and standards of testing are:

ASTM Standards:
- C97/C97M: Test methods for absorption and bulk specific gravity of dimension stone.
- C119: Terminology relating to dimension stone.
- C170/C170M: Test method for compressive strength of dimension stone.
- C241/C241M: Test method for abrasion resistance of stone subjected to foot traffic.
- C880/C880M: Test method for flexural strength of dimension stone.
- D7102: Test method –intact rock core specimens.

Australian Standards:
- AS4586-2004: Slip resistance classification of new pedestrian surface materials

3) Approval of Test Results:

The appropriate specimens should be prepared from the supplied samples and the above test work has to be done prior to supply of paving.
**Design and Construction Note 401.01**

**Standard Kerb Types and Installation Details**

**Granite Kerb Types**

**BARRIER KERB**
- LENGTH VARIES: 800-1200mm

**FLUSH KERB**
- LENGTH VARIES: 800-1200mm

**MOUNTABLE KERB**
- LENGTH VARIES: 800-1200mm

**LINTEL KERB**
- LENGTH: 1200mm

Reviewed: 17/10/2018
**Design and Construction Note**

**401.02**

**Standard Kerb Types and Installation Details**

**Granite Transition Kerbs**

Reviewed: 17/10/2018

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**MOUNTABLE TRANSITION KERB**
- LENGTH: 800mm

**FLUSH TRANSITION KERB (TYPE A)**
- LENGTH: 800mm (Pedestrian Ramps)
  1200mm (Vehicle Ramps/Cross-overs)

**FLUSH TRANSITION KERB (TYPE B)**
- LENGTH: 800mm (Pedestrian Ramps)
  1200mm (Vehicle Ramps/Cross-overs)
Standard Kerb Types and Installation Details
Granite Radius Kerbs

**550mm RADIUS PIECE**

**1300mm RADIUS PIECE - CONVEX**

**1300mm RADIUS PIECE - CONCAVE**

**3000mm RADIUS PIECE - CONVEX**

**3000mm RADIUS PIECE - CONCAVE**

**General Note:**

1. These standard pieces are to be used for square and splayed parking bays. For more information on parking bays in areas with granite kerbs refer Design & Construction Notes: Book 300 - Standard Footpath Design and Installation Details.
2. Other standard granite kerb radii (2m, 3m, 5m, 6m, 7m, 9m, 10m & 20m) convex or concave are available. These are costed per linear metre and procured on a project by project basis.
LINTEL KERB FOR SIDE ENTRY DRAINAGE

- LENGTH: 1200mm

General Note:

1. For more information on the installation of the Water Harvesting Lintel Kerb and surrounding 'Water Harvesting' structures, Refer Design & Construction Note 702.03 Water Harvesting Tree-Pit
2. For more information on the installation of the Side Entry Drainage Lintel Kerb and surrounding drainage structures, Refer Design & Construction Note 202.09 Standard Side Entry Pit - Granite Kerb
**Design and Construction Note**

**401.05**

Standard Kerb Types and Installation Details

Granite Kerb and Footing Cross-Sections

Reviewed: 17/11/2021

**BARRIER KERB**

- 30mm OF 32MPa 1:3 CEMENT SAND MORTAR MIX. PRIMER LAYER (DAVCO DAVALASTIC) LAID BETWEEN FOOTING & GRANITE
- 32MPa CONCRETE FOOTING. MAX 20mm AGGREGATE
- COMPACTED SUB-GRADE

**FLUSH KERB**

- 30mm OF 32MPa 1:3 CEMENT SAND MORTAR MIX. PRIMER LAYER (DAVCO DAVALASTIC) LAID BETWEEN FOOTING & GRANITE
- 32MPa CONCRETE FOOTING. MAX 20mm AGGREGATE
- 95% MMDD COMPACTED SUB-GRADE

**SEMI-MOUNTABLE KERB**

- 30mm OF 32MPa 1:3 CEMENT SAND MORTAR MIX. PRIMER LAYER (DAVCO DAVALASTIC) LAID BETWEEN FOOTING & GRANITE
- 32MPa CONCRETE FOOTING. MAX 20mm AGGREGATE
- 95% MMDD COMPACTED SUB-GRADE

**MOUNTABLE KERB**

- 30mm OF 32MPa 1:3 CEMENT SAND MORTAR MIX. PRIMER LAYER (DAVCO DAVALASTIC) LAID BETWEEN FOOTING & GRANITE
- 32MPa CONCRETE FOOTING. MAX 20mm AGGREGATE
- 95% MMDD COMPACTED SUB-GRADE
Granite Kerb Grout Joints and Expansion Joints

**Plan - Granite Kerb Grout and Expansion Joints**

**Elevation - Typ Expansion Joint**

**Design and Construction Note 401.06**

Standard Kerb Types and Installation Details

Reviewed: 17/10/2018
Design and Construction Note
401.07
Standard Kerb Types and Installation Details
Standard Granite Kerb
Grout and Expansion Joints
Reviewed: 17/10/2018

CONCRETE FOOTING

THROUGH GRANITE & CONCRETE FOOTING

TYP EXPANSION JOINT DETAILS

10

GRANITE KERB

EMER-SEAL PU40 POLYURETHANE SEALANT OR APPROVED EQUIVALENT COLOUR TO MATCH GRANITE KERB

STIFFJOINT FILLER (BY PARCHEM) NON-ABSORBENT, SEMI-RIGID, POLYETHYLENE. OR APPROVED EQUIVALENT

MORTAR MIX (MUST NOT EXTEND OVER JOINT OPENING)

STIFFJOINT FILLER (BY PARCHEM) NON-ABSORBENT, SEMI-RIGID, POLYETHYLENE. OR APPROVED EQUIVALENT
5mm KERB JOINT FILLED WITH EPOXY GROUT.
PAREX DAVCO SLATE AND QUARRY GROUT
AND PAREX DAVCO GROUT CURE (diluted 50/50
with water) COLOUR TO MATCH GRANITE KERB.
SUPPLY & INSTALL TO MANUFACTURER'S
RECOMMENDATIONS,
Precast Concrete Kerbs

1) Concrete
All concrete used in the manufacture of precast kerbing shall have a minimum compressive strength of 40MPa at 28 days. It shall have a maximum aggregate size of 14mm.

2) Mixing
The mixing shall be done with approved mechanical equipment and the quality of the concrete shall be in accordance with AS1379-1997. Compaction of the poured material shall be effected by an approved type vibrator. Care is to be taken to ensure that the materials are not separated by excessive vibration.

3) Casting Mould
The mould shall be of an approved strength and stiffness to resist vibration and ramming stresses. The mould shall be close-jointed to prevent leakage.

4) Tolerances
The finished kerb shall conform to the following tolerances:
- length: ±3.0mm
- width: ±1.5mm
- height: ±3.0mm

5) Demarcation
Curved kerbs shall have the radius clearly marked on one of the unexposed faces.

6) Nominated Supplier
   Perth Terrazzo and Concrete Solutions
   Angelo Versace (Mob. 0487 081 110)
   Misty Richards (Mob. 0429 311 775)
Design and Construction Note
402.01
Standard Kerb Types and Installation Details
Precast Concrete Barrier Kerb

END ELEVATION

SECTION A

PRECAST BARRIER KERB
LENGTH: 600mm

General Note:
1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 402.00 - Precast Concrete Kerbs General Specification.
2. Kerb heights at bus stops shall be 170mm.
**Design and Construction Note**

**402.02**

Standard Kerb Types and Installation Details

Precast Concrete Flush Kerb

**City of Perth**

Reviewed: 17/10/2018

**END ELEVATION**

**SECTION A**

**PRECAST FLUSH KERB**

LENGTH: 600mm

**General Note:**

1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 402.00 - Precast Concrete Kerbs General Specification.
Design and Construction Note

402.03

Standard Kerb Types and Installation Details

Precast Concrete Lintel Kerb
For Side Entry Drainage

Reviewed: 17/10/2018

General Note:

1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 402.00 - Precast Concrete Kerbs General Specification.
Design and Construction Note
402.04
Standard Kerb Types and Installation Details
Precast Concrete Radius Kerb
0.55m Radius
Reviewed: 17/10/2018

General Note:
1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 402.00 - Precast Concrete Kerbs General Specification.

PRECAST CONCRETE RADIUS KERB - 0.55m RADIUS
ARC LENGTH: 864mm
QTY PER QUADRANT: 1
Design and Construction Note

402.05

Standard Kerb Types and Installation Details

Precast Concrete Radius Kerb

1.30m Radius

Reviewed: 17/10/2018

CONVEX KERB

END ELEVATION

CONCAVE KERB

TYPICAL USE

PRECAST CONCRETE RADIUS KERB - 1.30m RADIUS

ARC LENGTH: 510.5mm
QTY PER QUADRANT: 4
CONVEX & CONCAVE

General Note:

1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 402.00 - Precast Concrete Kerbs General Specification.
PRECAST CONCRETE RADIUS KERB - 1.50m RADIUS
ARC LENGTH: 589mm
QTY PER QUADRANT: 4
CONVEX & CONCAVE

General Note:

1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 402.00 - Precast Concrete Kerbs General Specification.
General Note:

1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 402.00 - Precast Concrete Kerbs General Specification.
Design and Construction Note
402.08
Standard Kerb Types and Installation Details
Precast Concrete Radius Kerb
6.0m Radius
Reviewed: 17/10/2018

General Note:

1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 402.00 - Precast Concrete Kerbs General Specification.
Design and Construction Note

Concrete Pre-Cast Kerb

Water Harvesting - Concrete Kerb

Reviewed: 17/10/2018

GENERAL NOTES

1. 40MPa Concrete minimum.
2. 35mm Minimum cover.
3. 200mm Minimum lap.
In-situ Concrete Kerbs

1) Use of In-situ Concrete Kerbs
In-situ concrete kerbs is the preferred method of construction for semi-mountable and mountable kerbs in areas where concrete kerbs are to be used. Generally, in-situ kerbs shall only be used in locations when there is no possibility of using standard precast kerbs; for reasons such as precast radius pieces do not fit (and cannot be altered to fit) for on-site requirements.

2) Concrete
All concrete used in the manufacture of in-situ kerbing shall have a minimum compressive strength of 32MPa at 28 days in accordance with AS1379 with Fibre Reinforcement at a mixing rate of 0.9kg/m3. It shall have a maximum aggregate size of 10mm & slump 60mm maximum.

3) Bedding and Keying In
In-situ concrete kerbs shall be laid directly on to the base course material. Surface to receive kerb shall be swept clean of sand, loose stone and other foreign material prior to installation. Kerbs shall be keyed at curve radii less than 40m, car embayments and traffic islands.

4) Tolerances
The kerb shall have no deviation exceeding 5mm to the design line & level.

5) Shrinkage Joints
Shrinkage joints shall be provided at 1000mm intervals, sawn at right angles to the longitudinal line of the kerb.

6) Expansion Joints
Expansion joints shall be provided at 2000mm intervals and are to be sawn with a diamond saw, not less than 12 hours after the kerbing has been initially placed. The width of the joint shall be 7mm, extending the full section of the kerb except at gully pits and tangent points, where the expansion joints should be formed to be 13mm wide. All expansion joints shall be sealed with a strip of ‘Sarmprene’ foam to a depth of 25mm and top sealed with ‘Butyle’ mastic seal. The seal shall finish 3mm below the face and top of the kerb.

6) Curing
After initial set, Concrete surfaces shall be cured for a minimum period of 7 days with a sprayed application of CALCURE CR or approved equivalent, applied by the method and rate specified by the manufacturer. Curing compound is to be applied not less than two hours after surface finishing of the concrete.

For more information about kerbing design refer to www.mainroads.wa.gov.au
Design and Construction Note
403.01
Standard Kerb Types and Installation Details
In-situ Concrete Barrier Kerb

General Note:

1. For more information on concrete, mixing and tolerances of in-situ concrete kerbs refer Design and Construction Note 403.00 - In-situ Concrete Kerbs General Specification.
2. Kerb height at bus stops shall be 170mm.

IN-SITU CONCRETE BARRIER KERB

IN-SITU BARRIER KERB
TO BE APPROVED
BY AN ENGINEER

KERB DIMENSIONS

KERB TO HAVE
FLAT BACK

KERB TO HAVE
R50

CRUSHED LIMESTONE. MIN
98% MMDD COMPACTION

COMPACTED SUBGRADE

PAVING

IN-SITU BARRIER KERB

ROAD SURFACE

ROAD PAVEMENT

ASPHALT LAYER

IN-SITU KERBS SHALL BE
LAID DIRECTLY ON THE
BASE COURSE MATERIAL

KEY AT RADII < 40m

Reviewed: 09/06/2021
Design and Construction Note 403.02
Standard Kerb Types and Installation Details
In-situ Concrete Flush Kerb

General Note:

1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 403.00 - In-situ Concrete Kerbs General Specification.
General Note:

1. For more information on concrete, mixing and tolerances of precast concrete kerbs refer Design and Construction Note 403.00 - In-situ Concrete Kerbs General Specification.
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