

# B4 Kerb and Gutter Construction



# Contents

## B4 KERB AND GUTTER CONSTRUCTION

<b>4.1</b>	<b>Scope</b> .....	<b>161</b>
<b>4.2</b>	<b>Standards and Guidelines</b> .....	<b>161</b>
<b>4.3</b>	<b>Materials and Components</b> .....	<b>161</b>
4.3.1	Stone Kerb .....	161
4.3.1.1	Replacement of Stone Kerb .....	161
4.3.1.2	Granite Kerbs (Austral 'Black' and 'Verde') .....	162
4.3.1.3	Trachyte Kerbs .....	163
4.3.1.4	Bluestone Kerbs .....	163
4.3.1.5	Sandstone Kerbs .....	164
4.3.2	Concrete Kerbs and Gutters .....	165
4.3.3	Concrete Gutters .....	165
4.3.4	Stone Gutters .....	166
4.3.5	Joints .....	166
4.3.5.1	Sandstone Kerbs.....	166
4.3.5.2	Concrete Kerbs .....	166
4.3.6	Concrete Extended Kerb Inlets (EKI) .....	166
4.3.7	Stone Extended Kerb Inlets (EKI).....	166
<b>4.4</b>	<b>Construction</b> .....	<b>166</b>
4.4.1	General .....	166
4.4.2	Excavation of Existing Kerb and Gutter .....	167
4.4.3	Sub-Base Course or Base Course.....	167
4.4.4	Concrete Kerb and Gutter .....	167
4.4.5	Resetting of Stone Kerbs and Gutters .....	168
4.4.5.1	Concrete Footing .....	168
4.4.5.2	No Slump Concrete Footing .....	168
4.4.6	Care of Street Trees .....	168
4.4.7	Road Gully Grate Adjustment .....	168
4.4.8	Working with Heritage Significant Infrastructure .....	168
4.4.9	Joints .....	169
4.4.9.1	Granite Stone Kerbs.....	169
4.4.9.2	Bluestone Kerbs .....	169
4.4.9.3	Sandstone Kerbs.....	169
4.4.9.4	Concrete Kerbs .....	169
4.4.10	Carriageway Adjustment.....	169
4.4.11	Curing and Protection of Concrete .....	169
4.4.12	Drainage Outlets .....	169
4.4.13	Dish Drains .....	170
4.4.14	Drop Kerb Across Kerb Ramps and Driveways.....	170
4.4.15	Stone Kerbs for Raingardens.....	170
<b>4.5</b>	<b>Quality</b> .....	<b>170</b>
4.5.1	Inspections .....	170
4.5.1.1	Hold and Witness Points .....	171
4.5.2	Tolerances.....	174

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## 4.1 SCOPE

This is the Technical Specification for the construction of kerb and gutter including the supply, quality and placement of various kerb and gutter materials.

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## 4.2 STANDARDS AND GUIDELINES

Unless stated otherwise in the Technical Specification, the approved drawings or elsewhere in the construction documents, the Work shall comply with the current and relevant Australian Standards and/or RMS Standards.

Any variations or ambiguity between the Technical Specification, other construction documents and Australian Standards shall be referred to the City's Representative for direction before proceeding with the Work.

The following list indicates the Australian Standards and/or RMS Standards applicable to this section. The list is not exhaustive and may not include all standards that may apply to the work to be undertaken. It is the responsibility of the Service Provider to ensure that all relevant standards are met.

- AS 2876 Concrete kerbs and channels (gutters) – Manually or machine placed
  - AS3600 Concrete structures
  - RMS QA Specification R15 Kerbs and Gutters
  - ASTM C615/C615M-11 Standard Specification for Granite Dimension Stone.
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## 4.3 MATERIALS AND COMPONENTS

### 4.3.1 STONE KERB

For direction on where to use each type of kerbing, refer to the Sydney Streets Design Code.

All stone supplied shall be natural, uniform quality in each grade, sound and free of defects – such as vents, cracks, fissures, seams, porous inclusions, foreign material, loose surface material striations, stains, discoloration and other defects – that are liable to affect its strength, appearance, durability or proper functioning under the intended conditions of use.

Stone kerb and gutter may be available from suppliers that are currently approved by the City (list supplied on request), or procured from the following quarries:

- Black Hill SA
- Fraser Range Norseman WA
- Deer Park VIC.

Other suppliers may be used, subject to approval by the City's Representative. All stone alternatives must be selected to match the colour, pattern and quality of the City's current supplied stone.

#### 4.3.1.1 REPLACEMENT OF STONE KERB

All existing stone is to be retained or re-laid and shall remain in the dimensions and condition as found, unless approved otherwise by the City's Representative. Refer to B1: Preliminaries and General Construction of the Technical Specifications for on-site storage requirements.

Stone that has been confirmed as unserviceable by the City's Representative may be replaced with stone sourced from the City's stone storage yard, if available. Fees and charges will apply for replacement stone in accordance with the City's adopted schedule of fees and charges, available on the City's website. Where stone is to be replaced, the replacement stone is to match the dimensions of the stone that is being replaced. New stone shall be sourced as above.

4.3.1.2 GRANITE KERBS (AUSTRAL 'BLACK' AND 'VERDE')

Granite shall have a flame exfoliated finish with a 15mm x 15mm chamfer to the exposed top edge.

Radial kerb and gutter stones are required to be cut to the specified radius for all radii up to 7.5m at the kerb face. Radii greater than 7.5m at the kerb face can be formed from straight sections of kerb.

The supplier shall provide written certification that the supplied granite stone products meet the international *ASTM C615/C615M-11 Standard Specification for Granite Dimension Stone* for the following quality criteria:

AUSTRAL BLACK

Property	Test Standard	Performance Criteria
Compression strength (dry/soaked)	ASTM C170/C170M	> 185MPa (soaked)
Water absorption	ASTM C97/C97M	< 0.1% by weight
Bulk density	ASTM C97/C97M	> 2900kg/m <sup>3</sup>
Flexural strength (dry and soaked)	ASTM C880/C880M	> 14MPa (soaked)
Resistance to salt attack	AS/NZS 4456.10A	Durability Class A
Coefficient of thermal expansion	ASTM E831	< 0.000005 mm/mm/°C
Abrasion Resistance	ASTM C1353	> 113 Ha
Slip Resistance Classification of new pedestrian surfaces		
Wet pendulum test method at manufacture and completion of construction	SA HB 198:2014 (Table 3B)	P5 for slopes steeper than 1:14 P4 for slopes under 1:14
Dimensional Stability	Draft SAA method	< 0.1 % (Wet-dry, hot-cold)
Secondary minerals content (petrographic)	AS 1141.26	< 2%

## AUSTRAL VERDE

Property	Test Standard	Performance Criteria
Compression strength (dry/saturated)	ASTM C170/C170M	> 140MPa (soaked)
Water absorption	ASTM C97/C97M	< 0.1% by weight
Bulk density	ASTM C97/C97M	> 2560kg/m <sup>3</sup>
Flexural strength (dry and saturated)	ASTM C880/C880M	> 12MPa (soaked)
Resistance to salt attack	AS/NZS 4456.10A	Durability Class A
Coefficient of thermal expansion	ASTM E831	N/A
Abrasion Resistance	ASTM C1353	> 54 Ha
Slip Resistance Classification of new pedestrian surfaces	SA HB 198:2014 (Table 3B)	P5 for slopes steeper than 1:14
Wet pendulum test method at manufacture and completion of construction		P4 for slopes under 1:14
Dimensional Stability	Draft SAA method	< 0.1 % (Wet-dry, hot-cold)
Secondary minerals content (petrographic)	AS 1141.26	< 2%

## 4.3.1.3 TRACHYTE KERBS

Trachyte stone kerbing used in the City is generally old hand-cut stone with highly variable dimensions.

Trachyte may be sourced from the City's stone storage yard, if available. If not available from the City's store or other supply, then an alternative approved stone material should be used as directed by the City's Representative.

## 4.3.1.4 BLUESTONE KERBS

Bluestone kerbs shall be sawn with 1mm arris or rubbed on all edges. The top front edge of the kerb shall be cut to a 15mm x15mm chamfer.

Radial kerb and gutter stones are required to be cut to the specified radius for all radii up to 7.5m at the kerb face. Radii greater than 7.5m at the kerb face can be formed from straight sections of kerb.

All cut stones shall be free from any defect relating to strength, durability and appearance, and comply with the following:

- Cut and machined from sound basaltic stone with less than 20 per cent secondary minerals as determined by methods of microscopic examination and quarry sampling by the Road Construction Authority of Victoria
- Supplied from a quarry that is not used for aggregate, and shall be quarried only with black powder or other approved soft blasting technique
- Clear of all clay, overburden, soft, friable or weathered material and other foreign matter
- Free of sawcuts on all exposed faces
- Wearing qualities shall not exceed a percentage loss of 30 per cent as determined by the Los Angeles Abrasion Test

- Vesicles, veining or fracture lines considered detrimental to strength will be rejected
- Colour variation, vesicles and veining shall be of an equivalent standard to the City's existing bluestone kerbing
- Flint or other discolorations are to be avoided.

All cut stones shall meet the following criteria:

Property	Test Standard	Performance Criteria
Compression strength (dry/saturated)	ASTM C170/C170M	> 100MPa (soaked)
Water absorption	ASTM C97/C97M	< 1.8% by weight
Bulk density	ASTM C97/C97M	> 2500kg/m <sup>3</sup>
Flexural strength (dry and saturated)	ASTM C880/C880M	> 14MPa (soaked)
Resistance to salt attack	AS/NZS 4456.10A	Durability Class A
Coefficient of thermal expansion	ASTM E831	< 0.000064 mm/mm/°C
Abrasion Resistance	ASTM C1353	> 19 Ha
Slip Resistance Classification of new pedestrian surfaces	SA HB 198:2014 (Table 3B)	P5 for slopes steeper than 1:14
Wet pendulum test method at manufacture and completion of construction		P4 for slopes under 1:14
Dimensional Stability	Draft SAA method	< 0.1 % (Wet-dry, hot-cold)
Secondary minerals content (petrographic)	AS 1141.26	< 2%

#### 4.3.1.5 SANDSTONE KERBS

Existing sandstone shall be re-used and retained, where possible unless approved by the City's Representative.

New sandstone shall be roughly cut, fine-grained plain buff sandstone, aged and coloured to match the surrounding sandstone in the area, and sourced from the City's approved quarry. Other suppliers may be used subject to approval by the City's Representative. Stone must be selected to match the colour, pattern and quality of the City's current supplied stone.

The sandstone shall be of a hard and durable quality, free from sand balls, excessive discolouration and staining (tea leaf), quartz pebbles, fissures, sealed joints, hard ball, shale inclusions or any other defect and without clearly defined, easily split bedding planes.

Sandstone shall be natural cut on exposed faces with kerb face or gutter surface cut parallel to the bedding planes of the stone. The top front edge of the kerb shall be cut to a 25mm bull-nose arris.

Sandstone kerbing and gutter stones shall be free of sawcuts on all exposed faces.

All cut stones shall be free from any defect relating to strength, durability and appearance, and comply with the following:

Property	Test Standard	Performance Criteria
Compression strength (dry/saturated)	ASTM C170/C170M	> 50Mpa
Water absorption	ASTM C97/C97M	< 8% by weight
Bulk density	ASTM C97/C97M	>2000kg/m3
Resistance to salt attack	AS/NZS 4456.10:2003	Durability Class B
Abrasion Resistance (Taber)	ASTM 1353-98	>2Ha
Slip Resistance Classification of new pedestrian surfaces	SA HB 198:2014 (Table 3B)	P5 for slopes steeper than 1:14
Wet pendulum test method at manufacture and completion of construction		P4 for slopes under 1:14

#### 4.3.2 CONCRETE KERBS AND GUTTERS

For locations where concrete kerb and gutter is to be used then this is to be constructed as cast in situ kerb and gutter unless specified and approved by the City’s Representative.

At locations where precast concrete kerbs are in good condition and are to be retained, then a separate concrete gutter shall be formed and poured to match the existing kerb.

All concrete shall be a minimum 25 MPa with a maximum aggregate size of 20mm. A slump at the forms shall be no greater than 75mm.

Kerbs and gutters shall have a steel trowel surface finish.

Laying of concrete by machine shall only be undertaken with prior approval from the City’s Representative.

All concrete shall comply with B3: Concrete Works Construction.

#### 4.3.3 CONCRETE GUTTERS

Generally, a 450mm wide concrete gutter will be used on all kerb types unless specified and approved otherwise by the City’s Representative. All concrete gutters shall be a minimum 25 MPa concrete with a maximum aggregate size of 20mm.

Where the adjacent gutter is not concrete, the Service Provider shall request direction from the City’s Representative.

All concrete shall comply with B3: Concrete Works Construction.

Where the gutter is subjected to highly repetitive medium and heavy traffic, the gutter shall be 200mm thick and reinforced with trench mesh to suit the loading. These areas include but not limited to gutter in bus lanes, bus stops with more than 40 buses in a day, commercial and industrial driveways.

#### 4.3.4 STONE GUTTERS

Existing stone gutters shall be retained or re-laid in the dimensions as found, unless directed otherwise by the City's Representative. If the City's Representative determines that the existing stone gutter is broken or substantially degraded, then a replacement stone must be used. The dimensions of new replacement stone shall match the existing stone, unless directed otherwise by the City's Representative.

Concrete gutter may be used instead of stone if directed by the City's Representative.

#### 4.3.5 JOINTS

All joints shall be filled with expansive filler and sealed with flexible UV-resistant sealant. Silicone sealant is the preferred type of UV-resistant sealant to be used.

##### 4.3.5.1 SANDSTONE KERBS

All sandstone kerbs shall have sandstone-coloured mortar joints. Refer to B3: Concrete Works Construction for mortar details.

##### 4.3.5.2 CONCRETE KERBS

Expansion joints 10mm in width for the full depth of the kerb and/or gutter shall consist of suitable preformed joint filler. The joint filler shall be a preformed self-expanding cork strip or alternative approved by the City's Representative.

##### 4.3.6 CONCRETE EXTENDED KERB INLETS (EKI)

Where extended kerb inlets are required in concrete kerb locations, they are to be constructed with precast concrete lintels as specified on the construction drawings.

Cast in situ lintels are not to be used unless shown on the construction plans or approved otherwise by the City's Representative.

##### 4.3.7 STONE EXTENDED KERB INLETS (EKI)

Where extended kerb inlets are required in stone kerb locations, stone lintels must be used to match the stone material being used.

For trachyte, if lintels are not available, an approved alternative as per the *Sydney Streets Design Code* is to be used.

## 4.4 CONSTRUCTION

### 4.4.1 GENERAL

All works executed shall be constructed in straight lines or curves, true to the alignment and grade shown on the construction drawings and in accordance with the standard drawings.

Stone kerb and gutter stone shall be set by any of the following methods:

- Stones laid on a bed of zero slump concrete (this is the preferred method of laying hand-cut kerbs)
- Stones laid on an extruded footing with a maximum 30mm mortar bed
- Stones laid on a formed in situ footing with a maximum 30mm mortar bed.



Concrete gutters for stone kerb shall be poured in formwork and cast against previously set kerb face.

Concrete kerb and gutter shall be cast in situ.

#### 4.4.2 EXCAVATION OF EXISTING KERB AND GUTTER

The Service Provider is responsible for excavating existing kerbs and gutters, including the removal and disposal of kerbs and gutters not made from natural stone.

Kerbs and gutters made from stone such as bluestone, trachyte, granite and sandstone are to be excavated and removed by the Service Provider with great care, by crane truck if necessary, to avoid damage to the stone. Stone, free of other excavated material, is to be transported by the Service Provider to the City's stone storage yard and unloaded and stacked, by crane truck if necessary, as directed by the City's Representative.

Kerb stone to be re-used on site can be stored on site if a suitable secure location is available, subject to approval by the City's Representative. Refer to B1 – Preliminaries and General Construction for on-site storage requirements.

All loose earth or stones are to be excavated and removed and the trench base graded to a smooth long section, reflecting the final kerb grade.

The subgrade or trench base shall be compacted to match the compaction specified for the adjoining road pavement subgrade, or to the satisfaction of the City's Representative, and shall be trimmed to a level to allow the full depth of the compacted bedding material to be achieved and ensuring that required levels are met.

Generally, the subgrade is to be compacted to achieve a California Bearing Ratio (CBR) of 4 per cent unless otherwise specified in the approved construction documents.

The width of the excavation shall allow for compaction of the adjacent pavement.

#### 4.4.3 SUB-BASE COURSE OR BASE COURSE

New concrete kerb and gutter shall be constructed on a minimum 150mm thick base course of DGB 20 compacted to 98 per cent standard maximum dry density. This course shall be extended a minimum 150mm into the footway from the back of kerb alignment – refer to the Standard Drawings.

Where stone kerbing is to be laid on a concrete base, the base shall be a minimum 150mm thick. The base course can be cast in situ or be extruded base with or without extruded gutter.

Footings/concrete base shall be at least 50mm wider than the thickness of kerb being laid and the same width as the gutter stone being laid.

Where there is a high risk of failure of the joints, adequate subsoil drainage shall be provided below the gutter. The subsoil drainage shall connect to the storm water drainage network.

#### 4.4.4 CONCRETE KERB AND GUTTER

Concrete kerb and gutters shall be cast in situ either by conventional methods of setting up forms and placing concrete or by a slip-form casting machine where approved by the City's Representative.

In flexible road pavements, a combined kerb and gutter shall be formed separate from the road. Where kerbs and/or gutters are to be constructed against an existing flexible pavement, a sawcut shall be made into the existing pavement 600mm off the gutter lip and the road reinstated as per the carriageway adjustment section below.

In concrete road pavements, concrete kerbs and gutters may be formed separately or formed together with the base or shoulder slab.

Where kerbs are constructed separately from the concrete base slab, they shall be dowelled to the base slab by steel tie bars, to dimensions shown on the Standard Drawings or inserted into holes drilled into the base slab and bonded with epoxy binder or other suitable methods.

#### 4.4.5 RESETTING OF STONE KERBS AND GUTTERS

Kerbs and gutter stones to be raised and reset by the Service Provider are not to be removed from site without prior approval of the City's Representative. The stones are to be stored on site until required for use. The City's Representative may reject individual stones and require that other stones be used from other sections of the work area.

Stones that do not comply with the above will be rejected by the City's Representative and shall be replaced.

Where existing sandstone is damaged on any visible face, the face shall be repaired with a sandstone-coloured mortar mix.

##### 4.4.5.1 CONCRETE FOOTING

New stone kerbs and gutters are to be bedded on the concrete footing with a 30mm layer of 4:1 sand/cement mortar, or another bedding agent approved by the City's Representative.

Mass concrete of a minimum strength of 25 MPa shall be laid behind the kerb to at least the height of the gutter to support the kerb.

Refer to Part C: Standard Drawings for further information.

##### 4.4.5.2 NO SLUMP CONCRETE FOOTING

Stone laid shall be plumb and true to design line and level on a bedding of "no slump" concrete having a minimum strength of 20 MPa at 28 days with a maximum aggregate size of 20mm.

Zero slump concrete shall be placed in a layer at least 150mm thick and form a bed at least 100mm wider than the stone being laid – refer to the Standard Drawings.

Kerb and gutter units are to be set into the concrete by compacting with a heavy wooden tamping device or another method approved by the City's Representative which will not damage the kerb.

Refer to Part C: Standard Drawings for further information.

#### 4.4.6 CARE OF STREET TREES

Where the base of the tree trunk is found to have grown over the existing kerb stone, the City's Tree Management unit must be contacted to assess the tree and the options available. The kerb stone must not be removed, and no works must be undertaken to the tree roots, without the prior consent of the City's Tree Management unit as the tree may be using the stone for structural support.

Refer to B1: Preliminaries and General Construction for tree care details.

#### 4.4.7 ROAD GULLY GRATE ADJUSTMENT

Gully grates, inspection covers and frames are to be adjusted to new gutter levels by the Service Provider when required by the City's Representative.

Refer to B10: Stormwater Drainage for more details.

#### 4.4.8 WORKING WITH HERITAGE SIGNIFICANT INFRASTRUCTURE

Kerb stones and/or gutter stones that are identified by the City as having heritage significance must be adequately identified and recorded before any approved works that would affect their position or state are carried out. Such stones shall be numbered, and their position recorded on a plan so that the stones can be re-laid in the same location. The documentation shall be submitted to and accepted by the City's Representative before work affecting the stones commences.

Refer to B1: Preliminaries and General Construction for requirements and details.

#### 4.4.9 JOINTS

A 5mm wide and 20mm deep joint shall be formed on either side of the stone kerbs unless approved by the City's Asset Management team.

The joint between the stone kern and the footpath and the joint between the gutter and stone kerb shall be sealed with UV-resistant silicone sealant.

##### 4.4.9.1 GRANITE STONE KERBS

Granite blocks shall be butt jointed with no gap.

##### 4.4.9.2 BLUESTONE KERBS

Bluestone blocks shall be butt jointed with no gap.

##### 4.4.9.3 SANDSTONE KERBS

All sandstone kerbs shall have concrete mortar joints between each block, finished in a smooth manner flush with the adjacent kerbs.

##### 4.4.9.4 CONCRETE KERBS

Expansion joints shall be constructed at 6m intervals and where the gutter abuts gully pits, vehicle crossings and fences, building walls or retaining walls. In the case of concrete pavements, the joints shall coincide with transverse joints in the concrete base.

#### 4.4.10 CARRIAGEWAY ADJUSTMENT

Carriageway works must be carried out after the completion of kerb and gutter construction.

At locations where carriageway resurfacing or reconstruction is not specified on the relevant designs, the existing carriageway shall be adjusted to match the new gutter by the following means:

- Sawcut to a depth of 50mm, a minimum of 600mm from and parallel to the gutter or dish gutter, sufficient to permit a fall into the gutter of between 1 per cent to 5 per cent
- Excavate the asphalt surface between the gutter and the sawcut, down to the existing base
- Resurface the excavated area with AC14 laid in accordance with the relevant sections of this Technical Specification.

#### 4.4.11 CURING AND PROTECTION OF CONCRETE

The curing and protection of freshly placed concrete shall be as per B3: Concrete Works Construction.

#### 4.4.12 DRAINAGE OUTLETS

Holes in stone for drainage shall be cut neatly through the kerb to the required size and shape of the connection. Connections shall be fitted neatly and sealed adequately up to 30mm into the back of the kerb.

For all kerbs, the maximum height of the outlets shall be 100mm from the invert level of the gutter and in accordance with the Standard Drawings. Where approved, multiple outlets shall be placed with a minimum 300mm gap between the centres of each outlet with a maximum of three (3) outlets in each set.

Pipes that end at the back of the kerb are to be sealed with mass concrete in accordance with the Standard Drawings.

#### 4.4.13 DISH DRAINS

Dish drains are to be constructed on a base and subgrade complying with the requirements for concrete kerb and gutter.

Refer to Part C: Standard Drawings for further information.

#### 4.4.14 DROP KERB ACROSS KERB RAMPS AND DRIVEWAYS

For concrete kerbs, the kerb is to be transitioned into a concrete lay back across driveways. At kerb ramps, the kerb is to be transitioned into the concrete kerb ramp.

For stone kerbing, the kerb is to continue across the driveway and kerb ramp, following the levels of the driveway and kerb ramp edge. The stone kerbing is to be laid on a continuous concrete base as per standard kerbing. Stone kerbs are to be cut as per the Standard Drawings to facilitate the change in the top of kerb levels across driveways and kerb ramps.

For trachyte stone kerbing, footing/base requirements for stone kerbs across driveways and kerb ramps are to be determined on a site-specific basis in consultation with the City's Representative, depending on available stones and their dimensions.

All stone kerbs are to have the top face angle to match the angle of the corresponding driveway and kerb ramp as per Part C: Standard Drawings.

#### 4.4.15 STONE KERBS FOR RAINGARDENS

Stone shall be laid plumb and true to the approved design alignments and levels, on a continuous reinforced concrete footing that extends up to the edges of the stone kerb. If visible, the rear of the kerb shall have a neat finish to match the other visible kerb faces. Refer to Part C: Standard Drawings.

For trachyte kerbs, the stone selected shall be as deep as possible and the footing shall be adjusted to suit the variable depth.

Refer to B10: Stormwater Drainage for further requirements for raingardens.

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## 4.5 QUALITY

### 4.5.1 INSPECTIONS

At least two working days' notice shall be given for all inspections.

4.5.1.1 HOLD AND WITNESS POINTS

<b>Construct New Concrete Kerb and Gutter</b>	
1. Process Held:	Kerb setout (refer Section 4.4.8)
Submission Details:	At least two (2) day before the new kerb is setout on site.
Release of Hold Point:	The City's Representative will inspect the proposed layout, prior to authorising the release of the Hold Point.
2. Process Held:	Compaction of Subgrade (refer Section 4.4.2)
Submission Details:	At least two (2) working days prior to compaction of subgrade.
Release of Witness Point:	The City's Representative will inspect the compacted subgrade, prior to authorising the release of the Witness Point unless advised otherwise.
3. Process Held:	Placement and compaction of DGB base (refer Section 4.4.3)
Submission Details:	At least two (2) working days prior to placing and compaction of DGB base.
Release of Witness Point:	The City's Representative will inspect the compacted DGB base, prior to authorising the release of the Witness Point unless advised otherwise.
4. Process Held:	Installing concrete formwork (refer Section 4.4.4)
Submission Details:	At least two (2) working days prior to installing concrete formwork.
Release of Hold Point:	The City's Representative will inspect the concrete forms and all corrections shall be made, prior to authorising the release of the Hold Point.
5. Process Held:	Carriageway adjustment compaction of subgrade (refer Section 4.4.10)
Submission Details:	At least two (2) working days prior to compaction subgrade for carriageway adjustment.
Release of Witness Point:	The City's Representative will inspect the compacted subgrade, prior to authorising the release of the Witness Point unless advised otherwise.
6. Process Held:	Carriageway adjustment placement and compaction of DGB base (refer Section 4.4.10)
Submission Details:	At least two (2) working days prior to placing and compaction of DGB base.
Release of Witness Point:	The City's Representative will inspect the compacted DGB base, prior to authorising the release of the Witness Point unless advised otherwise.
7. Process Held:	Cutting drainage outlets (refer Section 4.4.12)
Submission Details:	At least two (2) working days prior to cutting of drainage outlets.
Release of Hold Point:	The City's Representative will inspect the proposed layout, prior to authorising the release of the Hold Point.

## 4.5.1.1 HOLD AND WITNESS POINTS, CON'T

<b>Construct Stone Kerb with Concrete Gutter</b>	
1. Process Held	Inspection of existing stone (refer Section 4.4.2)
Submission Details:	At least two (2) working days before existing stone is to be removed.
Release of Hold Point:	The City's Representative will inspect the removed stone and determine if it is suitable for re-use or if it shall be disposed, prior to authorising the release of the Hold Point.
2. Process Held	Testing results for new stone (refer Section 4.3.1)
Submission Details:	At least ten (10) working days before stone is to be installed, all testing results for the new stone shall be submitted to the City's Representative.
Release of Witness Point:	The City's Representative will review the testing results, prior to authorising the release of the Witness Point unless advised otherwise.
3. Process Held:	Kerb setout (refer Section 4.4.8)
Submission Details:	At least two (2) days before the new kerb is setout on site.
Release of Hold Point:	The City's Representative will inspect the proposed layout, prior to authorising the release of the Hold Point.
4. Process Held:	Compaction of Subgrade (refer Section 4.4.2)
Submission Details:	At least two (2) working days prior to compaction of subgrade.
Release of Witness Point:	The City's Representative will inspect the compacted subgrade, prior to authorising the release of the Witness Point unless advised otherwise.
5. Process Held:	Placement and compaction of DGB base (refer Section 4.4.3)
Submission Details:	At least two (2) working days prior to placing and compaction of DGB base.
Release of Witness Point:	The City's Representative will inspect the compacted DGB base, prior to authorising the release of the Witness Point unless advised otherwise.
6. Process Held	Prior to accepting delivery of new stone (refer Section 4.3.1)
Submission Details:	At least two (2) working days before stone is to be delivered.
Release of Hold Point:	The City's Representative will inspect all stone to see if damaged or the wrong type, prior to authorising the release of the Hold Point.
7. Process Held:	Prior to pouring concrete footing (refer Section 4.4.5.1)
Submission Details:	At least two (2) working days before concrete footing is to be poured.
Release of Hold Point:	The City's Representative will inspect the concrete footings, prior to authorising the release of the Hold Point.
8. Process Held:	Installation of stone kerb (refer Section 4.4.5)
Submission Details:	At least two (2) working days prior to installation of stone kerb.
Release of Hold Point:	The City's Representative will inspect that the stone kerb has been installed correctly, prior to authorising the release of the Hold Point.

4.5.1.1 HOLD AND WITNESS POINTS, CON'T

<b>Construct Stone Kerb with Concrete Gutter</b>	
9. Process Held:	Pouring of concrete gutter (refer Section 4.4.4)
Submission Details:	At least two (2) working days prior to pouring of new concrete gutter.
Release of Hold Point:	The City's Representative will inspect the gutter has been poured correctly, prior to authorising the release of the Hold Point.
10. Process Held:	Carriageway adjustment compaction of subgrade (refer Section 4.4.10)
Submission Details:	At least two (2) working days prior to compaction subgrade for carriageway adjustment.
Release of Witness Point:	The City's Representative will inspect the compacted subgrade, prior to authorising the release of the Witness Point unless advised otherwise.
11. Process Held:	Carriageway adjustment placement and compaction of DGB base (refer Section 4.4.10)
Submission Details:	At least two (2) working days prior to placing and compaction of DGB base.
Release of Witness Point:	The City's Representative will inspect the compacted DGB base, prior to authorising the release of the Witness Point unless advised otherwise.
12. Process Held:	Cutting drainage outlets (refer Section 4.4.12)
Submission Details:	At least two (2) working days prior to cutting of drainage outlets.
Release of Hold Point:	The City's Representative will inspect the proposed layout, prior to authorising the release of the Hold Point.

<b>Construct Stone Gutter</b>	
1. Process Held	Inspection of existing stone (refer Section 4.4.2)
Submission Details:	At least two (2) working days before existing stone is to be removed.
Release of Hold Point:	The City's Representative will inspect the removed stone and determine if it is suitable for re-use or if it shall be disposed, prior to authorising the release of the Hold Point.
2. Process Held:	Compaction of Subgrade (refer Section 4.4.2)
Submission Details:	At least two (2) working days prior to compaction of subgrade.
Release of Witness Point:	The City's Representative will inspect the compacted subgrade, prior to authorising the release of the Witness Point unless advised otherwise.
3. Process Held:	Placement and compaction of DGB base (refer Section 4.4.3)
Submission Details:	At least two (2) working days prior to placing and compaction of DGB base.
Release of Witness Point:	The City's Representative will inspect the compacted DGB base, prior to authorising the release of the Witness Point unless advised otherwise.

**Construct Stone Gutter**

4. Process Held:	Prior to pouring concrete footing (refer Section 4.4.5.1)
Submission Details:	At least two (2) working days before concrete footing is to be poured.
Release of Hold Point:	The City’s Representative will inspect the concrete footings, prior to authorising the release of the Hold Point.
5. Process Held:	Installation of stone gutter (refer Section 4.4.5)
Submission Details:	At least two (2) working days prior to installation of stone gutter.
Release of Hold Point:	The City’s Representative will inspect that the stone gutter has been installed correctly, prior to authorising the release of the Hold Point.

4.5.2 TOLERANCES

Item	Activity	Tolerances
1.	<b>Level and Alignment</b>	<ul style="list-style-type: none"> <li>Finished construction level and alignment shall not vary more than 10mm from the specified design levels</li> <li>Finished construction level and alignment shall not deviate from a straight edge 3m long by more than 5mm, subject to any necessary allowances on vertical and horizontal curves</li> <li>Localised low spots where water is trapped along the gutter, particularly at kerb ramps, shall not be accepted</li> </ul>
2.	<b>Adjacent Kerbstones</b>	
	a. Machine cut	<ul style="list-style-type: none"> <li>Top and front faces of adjacent machine cut kerbstones shall not differ by more than 2mm</li> </ul>
	b. Hand cut	<ul style="list-style-type: none"> <li>Top and front faces of adjacent hand-cut kerbstones shall not differ by more than 5mm.</li> </ul>
3.	<b>Kerbstone Fall</b>	<ul style="list-style-type: none"> <li>Top faces of 150mm wide kerbstones shall be set horizontally or up to a 3mm fall to the gutter</li> <li>Top faces of 200mm to 300mm wide kerbstones shall be set horizontally or up to a 5mm fall to the gutter.</li> </ul>
4	<b>Kerb Radii and Chamfers</b>	<ul style="list-style-type: none"> <li>Radii and chamfers for kerbstones and cast in situ concrete shall be no more than +/-2mm.</li> </ul>