



Technical Specifications for Residential Concrete Crossovers

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1.0 Technical specifications

The specifications must be read in conjunction with Crossover Guidelines.

1.1 Placing concrete in inclement weather conditions

- 1.1.1 Concrete to be placed when the ambient temperature is between 10° - 36° Celsius and when the weather is dry.
- 1.1.2 The concrete is to be mixed, transported, placed, compacted and finished as rapidly as possible to avoid the risk of reworking the concrete during the curing period. The concrete surface is to be covered to prevent excessive dehydration and the resultant loss of strength of the crossover.

1.2 Concrete thickness and dimension tolerances

- 1.2.1 The following dimensions and tolerances are required:
 - 1.2.1.1 The thickness of the finished concrete will be 100 mm (-0 mm, +10 mm);
 - 1.2.1.2 Crossover surfaces will be true to line and not deviate more than 10 mm under a metre straight edge; and
 - 1.2.1.3 Surface irregularities, including adjoining to service authority manholes, etc, will not exceed 3 mm.

1.3 Excavation

- 1.3.1 Excavation works shall:
 - 1.3.1.1 Be carried out to the levels, lines and grades as given for a job site.
 - 1.3.1.2 Be executed cleanly to produce a sound base, free of depressions or soft spots or any deleterious materials to give the minimum required depth of the concrete works.
 - 1.3.1.3 Ensure reticulation in close proximity to the work is either removed or capped prior to construction, and reinstated prior to backfill operation.
 - 1.3.1.4 Ensure that bitumen that adjoins an existing crossover is cut neatly to provide a straight interface between the bitumen and new paving.

1.3.1.5 Ensure that the excavated material is removed from the site and the site is left in a clean and tidy condition.

1.4 Compaction

1.4.1 All sub-grades (i.e. ground level at underside of concrete) to be thoroughly compacted to produce a minimum Perth penetrometer reading of seven (7) blows per 300 mm (calibrated to 95% Maximum Dry Density).

1.5 Formwork

1.5.1 Formwork will be of such cross-section and strength, so secured to resist the pressure of the concrete when placed, without springing or settlement.

1.5.2 The method of connection between sections will be such that the joints will not move in any direction.

1.5.3 The maximum deviation of the top surface of the form will not exceed 4 mm in 3 metres of the inside face and not more than 4 mm in 3 metres longitudinally.

1.5.4 When set, the form will be uniformly supported for its entire length at the specified elevation.

1.5.5 All forms will be clean prior to use and treated such that when stripped, concrete will not adhere to the form.

1.5.6 Forms are only to be removed from the concrete after a period of at least eight (8) hours has elapsed from time of placement.

1.6 Concrete

1.6.1 Only commercial pre-mixed concrete that complies with Australian Standard AS1379 is to be used. Concrete must have a minimum compressive strength of 25 MPA at 28 days.

1.6.2 The maximum aggregate size must be 20 mm.

1.6.3 The slump at the point of delivery shall be 75 mm (-0 mm, +15 mm).

1.6.4 A high early strength cement or additive to be used to give rapid hardening as per AS 1478 and AS 1479, "Chemical Admixtures for Concrete".

1.7 Placing and finishing

1.7.1 Placing

1.7.1.1 All work performed will be of the highest quality, uniform appearance and executed in a tradesman-like manner. In addition:

1.7.1.2 Concrete is to be placed by shovelling, or alternative suitable placement methods to ensure maximum density. The concrete is to be placed for the whole area being constructed in one continuous pour.

1.7.1.3 Thorough compaction of concrete against the faces of forms.

1.7.2 Finishing

1.7.2.1 The final finishing is not to be undertaken until the bleed water has disappeared from the surface.

1.7.2.2 All finished concrete surfaces to be non-slip.

1.7.2.3 The overall preferred final surface is to be a broom (scarification approximately 2 mm deep) with a picture-framing finish. This is mandatory in the footpath alignment of the crossover.

1.7.2.4 The final surface finish to be free of depressions, float marks, air voids, dust and deleterious material.

1.8 Concrete curing

1.8.1 To avoid premature stiffening of the fresh concrete mix and to reduce water absorption and evaporation losses, the following is required:

1.8.2 Immediately prior to placing concrete, the sub-grade (the ground directly under the crossover) is to be thoroughly and uniformly moistened.

1.8.3 The concrete will be cured for at least three (3) days after placement using a liquid membrane compound. Liquid membrane compounds shall comply with ASTM Standard Specification C309-74, "Liquid Membrane Forming Compounds for Curing Concrete".

1.8.4 Curing of the concrete is to occur after placement using a liquid membrane compound in accordance with the manufacturer's instructions.

- 1.8.5** Liquid membrane compounds which adversely affect the non-slip character of the concrete surface or decrease the quality of surface finish shall not be used.

1.9 Expansion / Contraction joints

- 1.9.1** Once laid, concrete can expand and contract and control joints are needed to make allowance for this movement. Cracking will eventually occur and the contraction joints are placed to accommodate these.

- 1.9.2** When paths are repaired any existing joints are to be reinstated.

- 1.9.3** Proprietary concrete edging and jointing tools are to be used on all joints and edges.

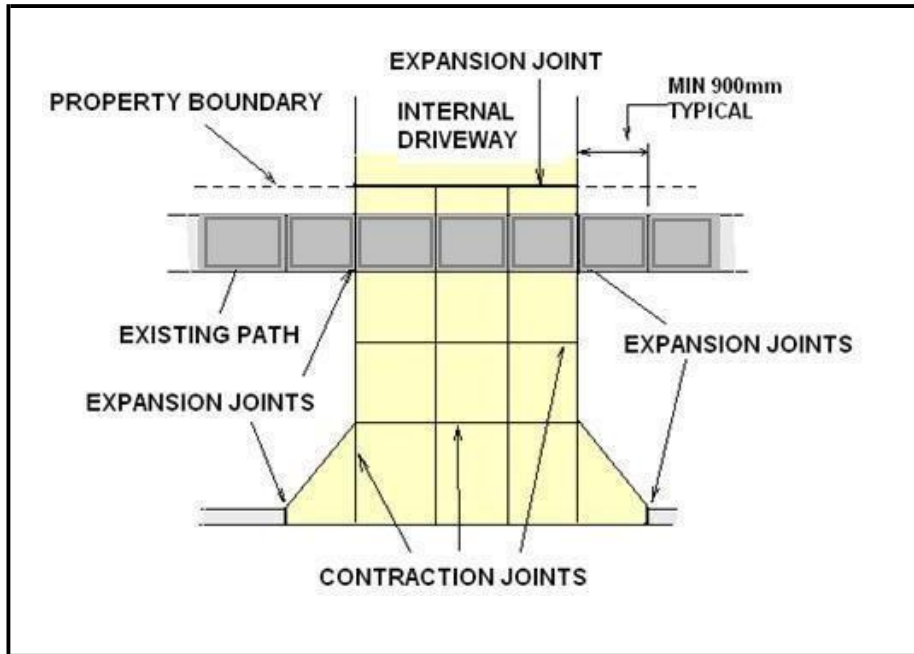
1.9.4 Expansion Joints*

- Are to be “Meljoint”, “Ableflex” or similar materials that are commonly used for the construction of concrete footpaths and crossovers
- Are to be 12 mm thick
- Are required at the property boundary line between the internal driveway and the new crossover
- Be spaced at a maximum interval of 10 metres
- To be installed at the junction of the crossover splay and the roadside kerb
- The expansion joint material will be continuous from form to form and extend vertically the full depth of the adjoining concrete
- The joint material shall at no point protrude above the surface of the concrete; and
- Expansion joints to be placed at right angles to the centre line of the footpath or crossover.

1.9.5 Contraction joints*

- To be a straight-line 'dummy' joint in the surface of the concrete;
- Along the centre of the crossover at 90 degrees to the kerb line and at no greater than 1.8 metres apart; and
- To match those existing on the adjoining internal driveway, where possible.

*See diagram next page

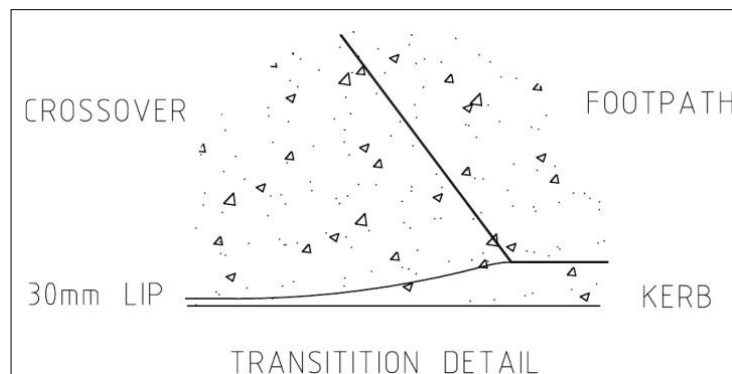


1.10 Backfill

1.10.1 Clean sand is to be used for backfill and uniformly compacted and levelled out to blend in with the existing verge.

1.11 Kerbing

1.11.1 Crossover splays shall be formed to rise gradually to blend into the existing adjoining kerbing as shown below:

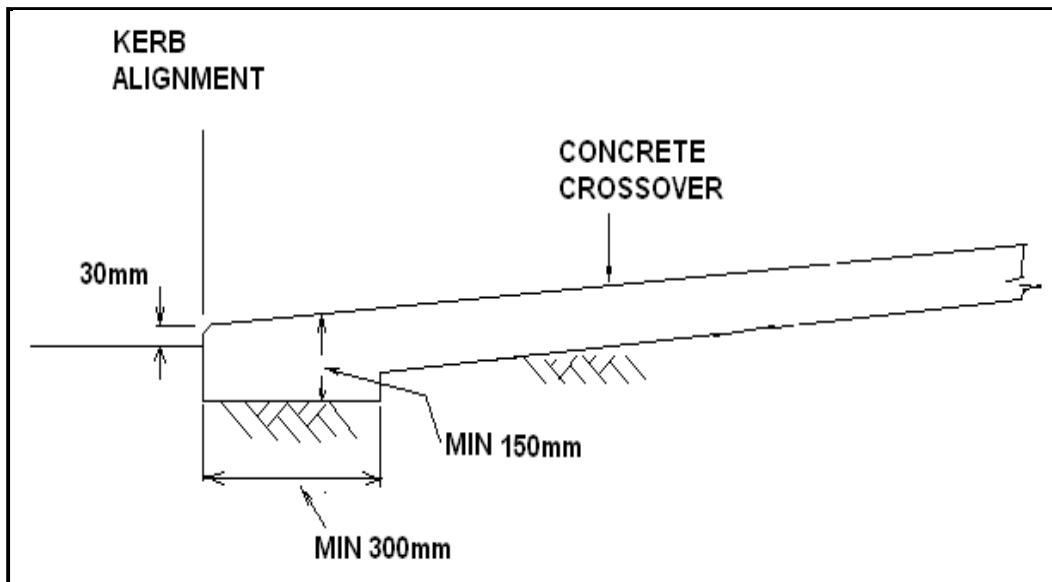


1.11.2 Existing kerbing in the alignment of the proposed concrete crossover is to be removed as part of the excavation works.

1.11.3 The kerbs are to be cut at full depth using a concrete cutting saw prior to its removal.

1.11.4 Existing pre-cast kerbing shall be removed in a manner not to cause damage to existing kerbs or road pavement.

1.11.5 The part of the new concrete crossover that is in the alignment of the existing kerb shall be thickened to a minimum of 150 mm as shown below:



1.12 Bitumen reinstatement

There are two acceptable methods to repair bitumen surfaces that have been damaged during crossover works, as described below:

1.12.1 Method 1

- Remove loose material and excess concrete from area to be reinstated
- Place and compact base course material utilising mechanical compaction
- Base course material will be emulsion-stabilised limestone or equivalent
- Provide single coat emulsion seal with aggregate (diorite or granite) maximum size 7mm
- Seal excess emulsion with aggregate
- Sweep excess aggregate away from the repair and remove excess material

1.12.2 Method 2

Repair the bitumen surface with hot or cold asphalt to a minimum thickness of 30 mm.

1.13 **Specialised materials**

1.13.1 Crossover constructed with other materials such as washed aggregate concrete or liquid limestone must be installed to the manufacturer's specifications for heavy vehicular traffic and comply with Australian Standards AS1379.

1.13.2 Thickness of washed aggregate and liquid limestone shall be as specified by the manufacturer, however no less than 100mm.