

Crossover and Street Tree Guidance

Purpose

This guidance outlines the City's requirements for constructing crossovers where they may conflict with existing street trees.

Approval

- It is a statutory requirement that Approval is sought before installing a crossover. Applicants are encouraged to submit a Crossover Permit Application at the same time as their Development Application to determine the required Street Tree clearance for location of a proposed crossover.
- All crossovers must be constructed in accordance with a formal Approval Notice and the City's General Requirements and Specifications (refer to Attachment 1).
- Information on how to lodge a crossover application can be found on the City's website - [Construct a crossover | City of Belmont](#).

Protection of Street Trees

- Street trees must be protected in accordance with Australian Standard AS 4970:2025 (as updated) at all times during crossover construction.
- Protection measures may include but are not limited to:
 - Installation of protective fencing.
 - Use of trunk guards.
 - Avoiding excavation within the root zone unless specifically approved by the City.

Minimum Clearance

The minimum clearance between the edge of a crossover and a street tree trunk is 1.5 metres.

Reduced Clearance

A clearance of less than 1.5 metres will only be considered where:

- It can be demonstrated that alternative crossover locations and designs have been explored and are found to not be feasible; and
- The City's Parks Technical Officer has assessed the tree to determine whether a reduced setback can be supported. Where a reduced setback is supported, alternative construction methods may be required to avoid damage to the tree or its roots.

Tree Removal and Replacement

If tree removal is required, the Applicant is responsible for funding the planting of three replacement trees, with all works undertaken by the City at the Applicant's cost.

Compliance

Where unauthorised tree damage leading to the death of a tree or removal of a tree occurs, the landowner may be subject to compliance action and will be required to fund the planting of three replacement trees.

Attachment 1 – Technical Specifications

CITY OF BELMONT

VEHICULAR CROSSOVERS

(Concrete, Brick Paved & Bitumen)

GENERAL REQUIREMENTS AND SPECIFICATIONS

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Creating opportunities



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Specification Schedule 2 – Specification Schedule for Bitumen Crossovers

Specification Schedule 3 – Specification Schedule for Construction of Footpaths and Kerbs

Drawing No. CoB10 – Sheets 1

Drawing No. CoB11 – Sheet 1

Drawing No. CoB12 – Sheet 1

Drawing No. CoB13 – Sheet 1

Drawing No. CoB15 – Sheet 1

GENERAL REQUIREMENTS

1. Introduction

This document has been prepared to provide customers of the City of Belmont with information regarding the City's requirements for vehicular crossovers and ensure a uniform approach to the construction of vehicle crossovers within the City of Belmont.

2. Statutory Requirements

Under the provisions of the Local Government Act 1995 (Schedule 9) and the Local Government (Uniform Local Provisions) Regulations 1996 (Regulation 12), property owners must make application to the City of Belmont for approval to construct a crossover prior to the works on the verge commencing.

3. Road Reserves (Verges)

The portion of land between a road and the boundary of private property is called the road reserve or verge. The purpose of a road reserve (verge) is to allow the placement of services and infrastructure such as communication cables, drainage, gas, power, street furniture (bus stops) and footpaths. As and when works are required to these services, they are accessible to service authorities and Local Government with minimal disruption to the property owner.

Approval to undertake any works on a verge is to be obtained from the City prior to works commencing.

The type of road e.g., main road, regional road or local road, determines which area of government has 'ownership' or 'management' of the road reserve abutting that road. Therefore, roads within the City of Belmont fall into three categories and these are defined as follows: -

Main Roads and Highways

Main Roads Western Australia is responsible for major roads, highways, and freeways and within the City of Belmont this means, Brearley Avenue, Orrong Road, Great Eastern Highway and Leach Highway.

Blue Roads

These are roads specifically labelled under the Metropolitan Regional Scheme and within the City of Belmont this means Abernethy Road, Fairbrother Street, Belgravia Street and Kewdale Road.

Local and Regional Roads

For the City of Belmont this means any road that is not a major road or highway or a blue road.

3.1. Regional and Local Roads

Where a crossover connects the property boundary with a regional or local road, approval for the crossover shall, in the first instance be sought from the City of Belmont

3.2. Main Roads (e.g., highways, major roads)

Where a crossover connects the property boundary with a main road (e.g., Great Eastern Highway, Leach Highway, and Orrong Road), approval for the crossover shall in the first instance be sought from the Commissioner Main Roads WA. If not already obtained by the applicant during the planning approval stage of their development, the City will liaise with Main Roads on the applicant's behalf.

3.3. Other Roads

Where a crossover connects a property with a blue road (as defined by the Metropolitan Region Plan) e.g., Kewdale Rd, Abernethy Rd, and the City and Western Australian Planning Commission (WAPC) are to issue joint approval for the crossover. If not already obtained by the applicant during the planning approval stage of their development, the City will liaise with the WAPC on the applicant's behalf.

4. Approval Process

4.1. General

If you are upgrading or modifying an existing crossover and for an existing property you need to submit an application to Upgrade or Modify an Existing Crossover to the City for approval prior to the construction of your crossover. A non-refundable fee of \$55.00 is applicable for all Crossover Applications. If you require a building permit your crossover will be assessed as part of the Infrastructure Services Clearance application, you are not required to submit a separate crossover application as you will be issued an approval notice which covers your crossover. Both Application forms are available from the City's website at www.belmont.wa.gov.au, in person from the City's Information Officers at the Civic Centre 215 Wright Street Cloverdale or by contacting the Administration Officer- Infrastructure Development on the number stated on the front of this document.

Processing of your application may take up to 30 working days and the assessment will look at (as a minimum) the proposed location of the crossover, proximity to power poles, proximity to street trees, any footpath on the verge and scheduled road/drainage/footpath works over the next 12 months. Should your application be approved, an Infrastructure Services Approval Notice will be sent to you in the mail and this notice will detail any conditions applicable to the construction of the crossover and generally, a copy of the approved plan for the crossover.

Once your Crossover Application has been approved you must ensure that a copy of the City's General Requirements and Specifications for Vehicular Crossovers and your Crossover Approval Notice is provided to your Contractor or Builder so that they are aware of the obligations associated with the content of these documents or if you are constructing the crossover yourself, you also need to read this document carefully.

4.2. Who Can Construct My Crossover?

The construction of your crossover, once approved by the City, can be constructed by any of the following: -

(a) By your Builder

You may have already included the construction of the crossover in the contract between you and your builder. An Application is still required to be submitted for approval as the construction of the crossover does not fall within the approval of your Building Permit. You will need to ensure that your Builder has a current copy of the City's Vehicular Crossovers (Concrete, Brick Paved and Bitumen) General Requirements and Specifications and a copy of your Crossover Approval Notice.

(b) A Private Contractor of your choice.

Again, you will need to ensure that the Contractor you engage has a current copy of the City's Vehicular Crossovers (Concrete, Brick Paved and Bitumen) General Requirements and Specifications and a copy of your Approval Notice.

5. COUNCIL SUBSIDY

5.1. Residential Properties

Regulation 15 of the Local Government (Uniform Local Provisions) Regulations 1996 states that where a crossing (hereafter called a crossover) constructed is:

- (a) to the first crossover constructed to the private land and
- (b) a standard crossover or a type that is superior to a standard crossing.

How the Subsidy Payment is calculated by the City

The City is obliged to bear 50% of the cost, as defined by the Local Government (through Council Tendered rates), of a standard, 3.0 metre wide, grey concrete crossover.

A Standard crossover is defined by the City of Belmont as: -

- 3.0 metres wide at the property boundary.
- constructed in either reinforced coloured concrete or 60mm trafficable brick pavers to match the internal driveway.
- a crossover that is constructed to the City's Specifications; and
- a crossover that is for a residential property.

5.2. Commercial and Industrial Properties

There is no subsidy applicable to crossovers for commercial or industrial properties.

5.3. Eligibility for a Crossover Subsidy

To be eligible to claim the Crossover Subsidy you must submit a Crossover Subsidy Application Form and meet the following eligibility criteria: -

- a) The crossover is the first crossover to the property or an upgrade from a bitumen crossover to a standard crossover.
- b) The crossover is a standard crossover as defined in clause 5.1.
- c) Crossover Subsidy Application is received within 6 months of the crossover being constructed.
- d) The crossover accesses a residential property.
- e) Documentary evidence (delivery receipt or tax invoice) is attached to the Crossover Subsidy Application Form which clearly states that either F62 reinforcement mesh (for concrete crossovers) or limestone sub-base (or equivalent for brick paved crossovers) has been included in the construction of the crossover (refer to the City's Technical Specifications) at the applicant's property address; and
- f) All conditions of the Crossover Approval Notice/Infrastructure Services Clearance have been met.

A desktop assessment of the Crossover Subsidy Application will be undertaken and where criteria (a) to (e) inclusive are in order, a site inspection will be undertaken to confirm compliance with eligibility criteria (f) and the City's Technical Specification.

6. CROSSOVER CONSTRUCTION MATERIALS

6.1. Residential Crossovers

Crossovers to residential properties must be constructed in either reinforced grey or coloured concrete or brick paving in accordance with the City's specifications.

Concrete products such as "liquid limestone" **are not** an approved construction material for crossovers within the City of Belmont for the following reasons:

- Reinforcement mesh cannot be used as the limestone eats away (rusts) the mesh prematurely, thus reducing the crossovers structural integrity.
- The City has concerns over the durability because the addition of limestone to concrete weakens the mix and test certificates have not been provided to prove its structural strength against the City's specification for concrete crossovers;
- Discolouration/staining is more prevalent should sealing not be maintained.
- Should the City (or any service authority) be required to undertake works through the verge where "liquid limestone" crossovers are located i.e. road, drainage, underground power, gas, telecommunications, the reinstatement of the affected portion of the crossover to match the existing section i.e. limestone/concrete mix ratio and colour cannot be achieved.

6.2. Commercial/Industrial Crossovers

Crossovers for commercial and industrial properties may be constructed in bitumen, concrete or brick paving in accordance with the City's specifications.

7. CROSSOVER CONSTRUCTION

The construction of crossovers shall be executed in accordance with the City's Specifications. Any variation to these Specifications must be approved in writing by the Director Infrastructure Services prior to the construction of the crossover. Where a property owner fails to obtain prior written approval for any variation to the City's Specifications, the City may give written notice of corrective works to be undertaken by the property owner at the property owners cost.

8. WARRANTIES

All materials and workmanship used in the construction of crossovers shall be in accordance with the City's Specification and any materials or workmanship that are inferior to those specified shall be rejected and the works made good to the City's satisfaction.

The work shall be carried out with minimum disruption to pedestrians and vehicular traffic. Every precaution shall be taken to ensure the safety of persons and property. All excavations, materials, plant, and equipment must be made safe, barricaded and provided with warning lights, during the hours of darkness to the satisfaction of the Director Infrastructure Services. All works are to be carried out in accordance with the Occupational Safety and Health Act 1984 and its Regulations as amended.

Any damage which may occur to any City infrastructure assets or private property during works or which subsequently becomes evident shall be the sole responsibility of the Applicant or their Contractor. The Applicant or their Contractor shall be held responsible for the repair, replacement, legal claims, or any other claim which may arise from the carrying out of any such work.

9. RESPONSIBILITY OF THE APPLICANT AND/OR THE CONTRACTOR

The Applicant and/or their Contractor is responsible for the following items: -

- (a) Where required, the cutting of the existing semi-mountable or barrier kerbing with a concrete saw and removing existing kerbing without damage to remaining kerbing and road pavement.
- (b) The removal and disposal of all surplus materials from the site of the works and always leaving the site in a clean and tidy condition.
- (c) The reinstatement of kerbing, concrete, brick paving or bituminous road surfaces damaged during the work during the construction of the crossover.
- (d) The reinstatement of verge area adjoining the crossover.
- (e) Crossovers that are no longer required or no longer connect with an internal driveway are deemed redundant. Under the Division 2 – Vehicle Crossings, Subdivision 2 – Redundant Vehicle Crossovers, Clause 2.5 of City's Local Laws for Activities on Thoroughfares and Trading Thoroughfares and Public Places, redundant crossovers must be removed, and the verge and kerb reinstated at the cost of the Applicant.
- (f) Application to the relevant public utility authorities for approval to alter any utility service that conflicts with the proposed crossover. Any costs incurred in the alteration of any service and subsequent reinstatement of the verge shall be borne by the Applicant.
- (g) Regarding footpaths, comply with the requirements of Clause 10.4 of the Technical Specification.
- (h) The cost of any traffic management that may be required to ensure the safety of road users, Contractors, and pedestrians during the construction of the crossover. Only qualified traffic management personnel shall be used, and all traffic management shall be in accordance with Main Roads Western Australia's code of Practice "Traffic Management for Roadworks" and Australian Standard AS1742.3-2002.
- (i) That [BYD \(Before You Dig\)](#) - has been contacted to determine the location of services such as water mains, telecommunications cables, gas mains and sewer mains within the section of the verge to be excavated.
- (j) The property owner is required to maintain the crossover once constructed.

VEHICULAR CROSSOVER TECHNICAL SPECIFICATION

GENERAL PROVISIONS

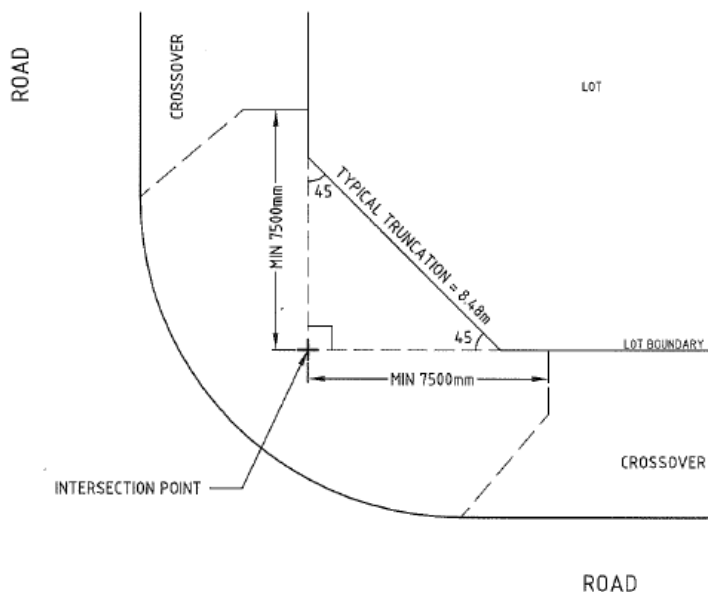
10. LEVELS, FOOTPATHS AND OTHER FEATURES

All levels for grading, surface finishing, jointing or other construction requirements shall be as outlined in the Specification and attached Drawings, or as directed in writing by the Director Infrastructure Services or his delegated representative.

10.1. Clearances

Crossover shall have the following minimum clearances:

Side Boundary (at front property line)	0.5m
Street Trees	1.5m
Drainage side entry pits	1.0m
Western Power poles	0.6m
Minimum distance from intersection point at corner sites (refer diagram below)	7.5m



MINIMUM DISTANCE OF CROSSOVER (ALONG LOT BOUNDARY)
FROM INTERSECTION POINT AT CORNER SITES
FOR A TYPICAL ROAD INTERSECTION

10.2. Crossover Location

Crossovers are to be constructed perpendicular to the adjoining road alignment with a minimum clearance of 0.5 metres from the side boundary and shall align with the internal access (driveway) into the property.

10.3. Street Trees

Where a street tree is within 1.5 metres of the proposed crossover, the Applicant shall submit a written request to the City's Parks Technical Officer requesting an assessment of the street tree regarding the street tree's relocation or removal and replacement (size and species dependant). For public liability purposes, all works associated with the removal and replacement of any street tree shall be undertaken by the City at the Applicant's/Owner's cost.

10.4. Footpaths and Kerbs

A footpath is to take priority over any crossover constructed within a verge. Where a crossover is required to cross a footpath, the Applicant or their Contractor shall execute the following: -

10.4.1. Residential

- Where the existing footpath is in-situ concrete, in good condition, and is a minimum of 100mm thick, the footpath shall be retained, and the crossover constructed to match up with it.
- Where the existing footpath is in-situ concrete, is in poor condition, or is less than 100mm thick, the footpath is to be neatly saw cut along the nearest expansion joints to the proposed crossover alignment and removed. The footpath is then to be reinstated in 100mm thick grey in-situ concrete and including F62 reinforcement mesh and the balance of the crossover constructed either side of the footpath in accordance with the City's Specifications. Also refer to Specification Schedule 3.
- Where the footpath is situated along the edge of the kerb, the footpath and kerb shall be modified in accordance with Drawing No. CoB10 and CoB11. Applicants have the option to either: -
 - (a) Remove the section of footpath to the nearest expansion joint closest to the proposed crossover and reinstate in grey 100mm thick in-situ concrete and including F62 reinforcement mesh and forming a ramp from the road to the footpath and crossover; or
 - (b) Removing the kerb, saw cutting and removing a 500mm wide section to the width of the proposed crossover and then constructing a concrete ramp up to the remaining section of the footpath.

10.4.2. Commercial/Industrial

Where existing footpath is situated within the proposed crossover, the footpath shall be removed.

10.5. Verge Levels

Where necessary, the Contractor shall liaise with the Director Infrastructure Services or his delegated representative on construction levels, setting out, inspection and measuring-up of works and adjustment of footpath heights abutting proposed crossover for the purpose of matching into an existing internal pavement level. However, in general crossover levels shall match up with:-

- (a) The existing verge level if it is of uniform height with the adjacent verges.
- (b) The average of the two adjacent crossover level or verge levels (where there are no crossovers).
- (c) Where the verge at the property line is above the road channel, the crossover shall have a grade of at least 2% from the property line to a bullnose at road channel.
- (d) Where the verge at the property line is lower than the road channel, the crossover must incorporate a bullnose of a minimum of 20mm above the road gutter level and extend to a height of no less than 125mm above the gutter level at a point 1.5m behind the kerb line.
- (e) Where a doubt exists on any of the above all queries to be referred to the Director Infrastructure Services or his delegated representative for determination prior to construction.

10.6. Manholes/Service Pits

Where the crossover conflicts with an existing City of Belmont manhole, the lid is to be adjusted to be flush with the finished surface. The lid of the City's drainage manhole is to be replaced with a trafficable (heavy-duty) type. (To protect the integrity of the City's Drainage Asset Network.) Where the manhole or service pit belongs to a Public Utility, the applicant is to liaise with the relevant public utility and ensure that their requirements are satisfied prior to the construction of the crossover.

Where a doubt exists on the above, all queries are to be referred to the Director Infrastructure Services or his delegated representative for determination prior to construction.

10.7. Australian Standards

These specifications are to be read, where applicable, in conjunction with the most current version of the following Australian Standards and where any discrepancy arises between the two, the City's specifications shall prevail.

- AS3727: Guide to residential pavements.
- ASTM Standard Specification C309-74 "Liquid Membrane Forming Compounds for Curing Concrete".
- AS1379: Ready Mixed Concrete.
- AS1289.5: Methods of Testing Soil for Engineering Purposes.
- AS1012: Methods of Testing Concrete.
- AS1160-1996 and Amendments: Bituminous Emulsions for the Construction and Maintenance of Pavements.
- AS2150-2005: Hot Mix Asphalt – A Guide to Good Practice; and
- Relevant parts of AS 2891.

BRICK PAVED CROSSOVERS

11. BRICK PAVED CROSSOVERS

11.1. Brick Pavers

Brick pavers used for vehicular crossovers shall be fit for purpose in accordance with the manufacturer's specifications and be either concrete or clay brick pavers with a minimum thickness of 60mm. Any materials used which are inferior to those specified or directed by the Director Infrastructure Services shall be liable to rejection and replacement at the Applicants or Contractor's cost. Please refer to Specification Schedule 1 and Drawing No. CoB11.

11.2. Concrete Kerbing

Fully mountable kerb shall, if not already existing along the road kerb line, be installed for the crossover. Approved transition road kerbing shall be provided at each end of the fully mountable kerb to match the existing kerb section. Refer to Drawing No. CoB15 and Specification Schedule 3.

11.3. Sub-Grade Preparation - Formation

Excavation for the crossover shall be undertaken to the levels, lines and grades as set out on the site by the Contractor as per these specifications and attached schedules, and all excavation shall be executed cleanly and efficiently to provide for a compacted sound sub-grade, free of depressions or soft spots or any deleterious materials to the required depths.

The surface shall be levelled and compacted using a mechanical plate compactor or similar approved method, until a compaction of 95% modified compaction as provided under AS1289.5 (Methods of Testing Soil for Engineering Purposes - Soil Compaction & Density Tests) is achieved. In sand, this may be deemed to be satisfied if a Standard Penetrometer Test result of 7 blows per 300mm is achieved within the first 450mm.

The whole of the sub-grade shall be prepared in a manner to ensure adequate drainage and protection against storm water and sub-soil flows. Sub-grade preparation shall extend to the rear face of all edge restraints.

11.4. Base Preparation

The base material (limestone or approved equivalent) shall be placed at optimum moisture content and spread such that the final minimum compacted thickness is achieved as per Specification Schedule 1. The materials shall be worked to the correct lines and levels and thoroughly compacted. Alternative base materials such as rock base and natural gravel are permitted.

The base course shall extend in width to at least the rear face of all edge constraints. The upper layer of base course shall be sufficiently dense to prevent downward infiltration of bedding sand. Base course tolerance shall be $\pm 5\text{mm}$ of nominated design levels. The surface of the base course shall not deviate by more than 10mm from the base of a 2-metre-long straight edge placed in any direction of an area of specified uniform gradient or crossfall. No ponding shall be permitted on base course surface. Sand bedding material shall not be used as a levelling material to compensate for base course not complying with the approved tolerance.

11.5. Edge Restraint

The perimeter of the crossover shall be provided with restraining barriers. Restraints shall be robust enough to withstand vehicle impact and prevent lateral movement of bricks as such movement could cause pavement failure.

Where the crossover has required the removal of existing kerbing, the contractor SHALL construct a fully mountable kerb prior to laying the brick paving. The mountable kerb shall be parallel to the roadway and blend into the existing kerbing at each end. Paving bricks shall be laid commencing from the rear face of the kerb. Refer Specification Schedule 3.

Edge restraints shall be taken vertically down to base course and shall be supported on the compacted base course which shall not be less than 100mm thickness below the restraint. All concrete edge restraints shall have minimum compressive strength of 32MPa.

11.6. Sand Bedding

Only even graded siliceous sand shall be used. Sand shall be non-plastic and free from deleterious materials such as stones, roots, clay lumps and excessive organic material. Sand shall be protected from excessive change in moisture content and shall have uniform moisture content when laid.

Bedding sand shall be screeded slightly ahead of laying operations and maintained in a loose condition and protected from pre-compaction (including rain and pedestrian traffic) Any surface irregularities exceeding 5mm shall be loosened, raked and re-screeded before laying pavers.

For manual placing of paving units, the bedding sand shall be maintained at a uniform density, but as loose as screeding operations will permit. For mechanical placing, bedding sand shall be uniformly and firmly, but not fully, compacted.

11.7. Laying Paving Units

Paving units shall be laid in accordance with the manufacturer's specifications in a herringbone, basket weave or stretcher bond pattern.

Paving units shall be placed by hand or mechanically in clusters on the screeded sand bedding to nominated patterns as per schedule. Care shall be taken to ensure that a gap of 2-4mm (nominal 3mm) is maintained between paving bricks and that no units are in direct contact with each other.

The first row shall be laid against an edge restraint or previously completed paving or an established straight line. It shall be laid at a suitable angle to achieve the required orientation and pattern.

Full units shall be used first followed by edge or closer units. Closer units shall consist of not less than 25% of full units and shall be cut to size to suit the joint widths. Spaces of less than 20% paving brick size shall be in-filled with concrete of 1 part cement and 2 parts fine aggregate and sand by weight.

11.8. Compaction of Brick Pavement

After laying the paving units, sheets of plywood of minimum thickness 12mm shall be laid on the pavement which shall then be compacted with 2 passes of high frequency low amplitude plate compactor having an area sufficient to cover a minimum of 12 pavers. Compaction shall continue, where necessary, until lipping between adjoining units has been eliminated.

Any units damaged during compaction shall be removed and replaced. Compaction shall be complete, and the crossover shall be brought to design profile before spreading or placing of sand filling in the joints.

11.9. Filling Joint

As soon as practicable after compaction and prior to acceptance of traffic, dry sand for joint filling shall be spread over the pavement and swept into the joints. Sand used for bedding is NOT suitable for joint filling. Sand shall be free of soluble salts or contaminants that could cause efflorescence. Cement in joint filling is not permitted.

To ensure complete filling of joint, both sand and paving units shall be as dry as practicable when spreading and brooming take place. A further two passes of the plate compactor shall be applied, and the joints refilled with sand as necessary until all joints are completely filled. Excess joint-filling sand shall be removed from the crossover on completing the works.

CONCRETE CROSSOVERS

12. CONCRETE CROSSOVERS

12.1. Base Preparation

Excavation for the crossover shall be undertaken to the levels, lines and grades as set out on the site by the contractor as per the specifications and attached schedules, and all excavation shall be executed cleanly and efficiently to provide for a compacted sound sub-grade, free of depressions or soft spots or any deleterious materials to the required depths.

Compaction is achieved by watering and vibratory compaction to give a result of 7 blows per 300mm of Standard Penetrometer Test.

The base shall be thoroughly and evenly moistened but not saturated prior to placing concrete. All deleterious material shall be removed from the base before placing concrete. Please refer to Specification Schedule 1 and Drawing No. CoB10.

12.2. Saw Cutting

Where existing pavement requires saw-cutting at the fence-line, it should be performed with particular care to ensure a straight cut.

12.3. Reinforcement

F62 reinforcement mesh is to be placed with a minimum cover of 40mm to the bottom of the slab.

12.4. Laying of Concrete

Concrete shall be evenly placed to the depth stated in Specification Schedule 1 of these Specifications and shovelled into position continuously and spaded, especially at all edges to give maximum density. No break in operation shall be permitted from time of placing to finish.

The concrete strength shall be in accordance with Specification Schedule 1 and shall be coloured to match the internal driveway.

Colouring shall be applied in strict accordance with the manufacturer's specification. Any early defects that show up should be immediately rectified to the satisfaction of the property owner.

The applicant/contractor shall be wholly responsible for the consistency of colour of the crossover and shall indemnify the property owner/client and make good all defects for the duration of any defect's liability period.

12.5. Finishing

The finish shall be obtained by rendering to correct levels, and wood float or boom finished to provide a non-slip surface free of any depressions, marks, irregularities, honeycomb sections or accumulation of the fine density secretions liable to cause excessive surface wear. The final surface finish shall be to the satisfaction of the Director Infrastructure Services or his delegated representative who shall reserve the right to require the removal of or the correction of any surface deficiencies or finish.

Where required, and/or where directed, any portion of the surface may be required to be treated with a multi-grooved grooving tool with grooving of 200mm centres worked parallel to kerb line to minimise the slipping effect. A steel trowel finish is NOT PERMITTED on a vehicle crossing.

Exposed Aggregate

An exposed aggregate finish removes the top layer of the concrete matrix to expose the top surface of the aggregates in the concrete mix. Chemical retarders are often applied to the surface to etch away the concrete matrix without sacrificing the aggregate. Alternatively, a water washing technique may be used.

It is difficult to match exposed aggregate and therefore it is important to note.

1. There is no obligation for Public Utilities or the City to replace/match the material, should works be required to be undertaken on the verge.
2. Should the City require undertaking road resurfacing or kerb reinstatement, a 600 mm wide, plain concrete apron would be installed into any existing crossover.

12.6. Jointing

Plain contraction joints finished with an approved jointing tool shall be located as follows:

- (a) along the crossover-property line junction.
- (b) along the edges of existing or future footpath construction.
- (c) across the crossover from the flaring points on opposite sides parallel to the kerb, and additional joints parallel and not greater than 1.5 metres apart.
- (d) along the centre of the crossover at 90° to the kerb line and at not greater than 1.8 metres apart.

Expansion joints are required at the junction with kerbing and all service pits or manholes. Joint filler shall consist of 12mm wide by 100mm deep bituminous impregnated canite material or other approved material.

12.7. Wet Weather Protection

The applicant/contractor will be responsible for wet weather damage. Materials to protect the surface of new works should be available and used during wet weather periods.

12.8. Hot Weather Protection

During hot weather when the air temperature exceeds 35° C, precautions should be taken by the applicant/contractor to avoid premature stiffening of the fresh concrete mix and to reduce water absorption and evaporation losses.

The subgrade is to be thoroughly moistened, but not saturated, immediately before concrete placement begins to reduce water absorption.

12.9. Clean-up and Make Good

The applicant/contractor shall remove and cart all rubbish, debris and waste resulting from its activities from the crossover construction site to a registered land fill tip site that is managed in a socially and environmentally responsible manner.

Any damage to footpaths, verges (including reticulation) and to the work area, generally which occurred as a result of the applicant/contractor carrying out works, shall be made good at the applicant/contractor's cost.

BITUMINOUS CROSSOVERS

(COMMERCIAL / INDUSTRIAL PROPERTIES ONLY)

13. BITUMINOUS CROSSOVERS

Bituminous crossovers are permitted for commercial and industrial properties and a general specification is located at Specification Schedule 2. Please refer to Drawing CoB 12.

13.1. Base Course and Water Binding

13.1.1. Subbase and Base Course Material

This may be either approved gravel of “road base” and is to be placed to the various minimum consolidated thicknesses as set out in the schedule.

It is to be noted that crushed limestone shall not generally be permitted as a base course material but may be used where a subbase course is required.

13.1.2. Water Binding

The surface shall be shaped and corrected as necessary to ensure that the final shape of the paved surface can be achieved with not less than the minimum thickness specified of bituminous concrete.

The surface when water bound shall be compacted with a vibrating roller and swept clean of any loose material.

13.2. Surfacing

When the base course has been completed to the Director Infrastructure Services or his delegated representative's satisfaction and dried sufficiently to permit the successful application of the asphalt wearing course, the surface shall be thoroughly swept, and tack coat applied.

The tack coat shall be an anionic bitumen emulsion (slow setting) applied uniformly and thinly over the whole area to be treated. It shall be applied only to a clean dry surface at an application rate of 0.55 litres per square metre.

A 7mm nominal aggregate asphalt wearing course of 25mm compacted thickness shall then be applied in accordance with the following:

13.2.1. Metal

Metal shall be a mixture of clean aggregate of 6.5mm, 4.75mm and 3.2mm to be rescreened and held in storage bins for direct use in the mixing plant. The flakiness index of the aggregate shall not exceed 35%.

13.2.2. Sand

Sand shall be clean, sharp, and free from any silt, clay, salt or other foreign matter.

13.2.3. Bitumen

Bitumen shall be class 160 residual asphaltic bitumen conforming to the requirements of the separation for bitumen when sampled and tested in accordance with Australian Standard AS 2891. The mixing temperature of the bitumen shall not be more than 160° C or less than 40° C. Only black coloured asphalt is accepted by the City at this time for crossover construction.

NOTE: In certain instances, 50mm compacted thickness of 10mm nominal aggregate asphalt is required in accordance with Specification Schedule 2.

13.2.4. The Mix

The mix - shall be of the following proportions:

AS Sieve	% Mineral Aggregate Passing Sieve (by weight)
9.5mm Sieve	100%
4.75mm Sieve	68-88%
2.36mm Sieve	49-67%
1.18mm Sieve	37-53%
600 um Sieve	25-41%
300 um Sieve	15-27%
150 um Sieve	8-16%
75 um Sieve	4-8%
Bitumen	5-7%
Stability (Marshall)	5.5 kilo newtons
Marshall Flow Values	2-4mm
Voids	3-5%

The mix should contain 1.5% by weight of hydrated lime. The mixing time shall be controlled to ensure a minimum dry mixing time of 15 seconds and a mixing time of 30 seconds.

13.2.5. Temperatures

Maximum Aggregate Temperature	190°c
Maximum Bitumen Binder Temperature	160°c
Temperature of Mix at Delivery to Work Site	Between 120°c & 150°c

13.3. Surfacing Procedures

The mix shall be spread only during daylight hours and when weather conditions are suitable.

Workmanship is required adjacent to kerbs, manholes and other Public Utility fittings in the crossover. The method of placing the mixture shall be to the entire satisfaction of the Director Infrastructure Services or his delegated representative.

Joints between old and new pavements shall be carefully made in such a manner as to ensure a thorough and continuous bond between the old and the new surfaces. The edge of the old surface course may require to be cut back for its full depth and sufficient distance to expose a fresh face. The fresh mixture shall be raked against the joint to the proper depth and grade.

After spreading and striking off, and while still hot, the mixture shall be thoroughly compacted by a vibrating roller with a minimum static weight of 0.4 tonne and a minimum drum width of 700mm. Rolling shall commence on the outer edges and progress towards the centre then continue until all roller marks are eliminated and no further compression is possible, or as directed by the engineer. At places not accessible to the roller thorough compaction must be achieved by means of hot tampers.

The surface, after compaction and rolling, shall be smooth and true to the required shape and grade. Any mixture which becomes loose or broken, mixed with dirt, or is in any way defective, shall be removed and replaced with fresh mixture compacted to conform with the surrounding area.

13.4. Concrete Kerb Tapering

The existing concrete kerb at each end of the crossover shall be tapered down gently to blend in with the level of the crossover as shown on Drawing No. CoB15.

SCHEDULES AND DRAWINGS

SPECIFICATION SCHEDULE 1: CONSTRUCTION OF CONCRETE & BRICK PAVED CROSSOVERS

ITEM	CROSSOVER TYPE			
	Residential	Stables & Multi Residential (>10 Car Bays)	Light Industrial & Commercial (<30 Car Bays)	Heavy Duty Industrial & Commercial
GENERAL CONDITIONS				
Minimum width of crossover at property line	3m	6m but stables & small residential developments 4.5m subject to approval by Dir Infrastructure Services or his delegated Rep.		
Maximum width of crossover at property line	6m	6m	11m	11m
Minimum width of crossover at kerb line	4.7m	7.5m	12m	17m
Maximum width of crossover at kerb line	8m	9m	17m	22m
Alignment of crossover	90° to the property line and road unless otherwise approved by Director Infrastructure Services or his delegated representative.			
Crossover flaring ratio (verge: kerb line)	3m: 1m	3m: 1m	Refer Drawing No. COB10 and COB11	
Step-up at road channel (brick paved & concrete)	20mm	20mm	20mm	20mm
Minimum setback from side boundary	0.5m	0.5m	0.5m	0.5m
Minimum distance of crossover (along Lot Boundary) from corner truncation (intersection point) for 90° intersection	7.5m	7.5m	7.5m	7.5m
BRICK PAVED CROSSOVERS				
Minimum compacted thickness of base (unbound fine crushed rock or gravel)	100mm	150mm	175mm	200mm
Compacted thickness of graded sand	20-40mm	20-40mm	20-40mm	20-40mm
Minimum thickness of pavers in herringbone (H), basket weave (B) or stretcher bond (S): -				
• Concrete paver units interlocking on 2 faces in H, B or S	60mm (H, B or S)	60mm (H)	80mm (H)	Not permitted
• Concrete paver units interlocking on 4 faces in H, B or S	60mm (H, B or S)	60mm (H)	80mm (H, B or S)	80mm (H)
• Concrete pavers unkeyed units H, B or S	60mm (H)	80mm (H, B or S)	80mm (H)	Not permitted
• Clay pavers minimum thickness in herringbone pattern only	60mm (H)	60mm (H)	75mm (H)	75mm (H)
CONCRETE CROSSOVERS				
Concrete thickness	100mm	125mm	150mm	200mm
Steel reinforcement mesh	F62	F62	F62	F62
Minimum high strength at 28 days	25 MPa	25 MPa	32 MPa	32 MPa
Concrete Colour	Grey or to match internal driveway		Grey	Grey
* Note: the above schedule shall be read in conjunction with Drawing No. CoB10, CoB11 CoB13.				

SPECIFICATION SCHEDULE 2

CONSTRUCTION OF BITUMEN CROSSOVERS

(Industrial / Commercial Properties only)

ITEM	LIGHT INDUSTRIAL & COMMERCIAL (< 30 Car Bays)	HEAVY DUTY INDUSTRIAL & COMMERCIAL
Minimum depth of excavation	275mm	300mm
Minimum compacted thickness:	See Note 1	See Note 2
Sub-base	150mm limestone	150mm limestone
Base	100mm gravel/ road base	100mm gravel/ road base
Asphalt (Black)	30mm minimum	50mm minimum

Note 1: 225mm road base with 25mm asphalt is acceptable.

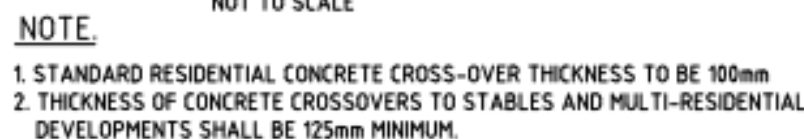
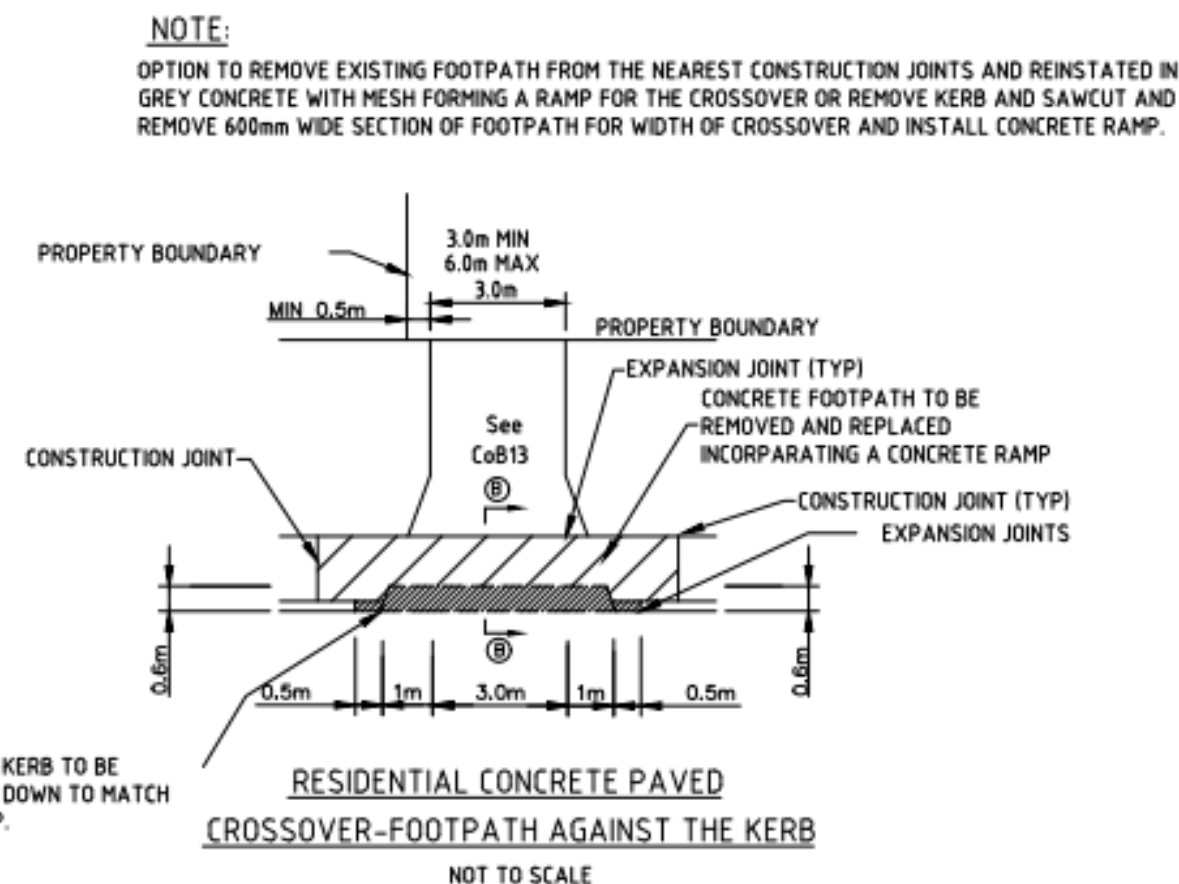
Note 2: 250mm road base with 50mm asphalt is acceptable.

SPECIFICATION SCHEDULE 3

CONSTRUCTION OF FOOTPATHS AND KERBS

FOOTPATHS AND KERBS TO BE LAID TO COUNCIL SPECIFICATIONS

ITEM	FOOTPATHS	KERBS (Fully Mountable)
Excavation Works		
Minimum depth of excavation	100mm	150mm
Existing sub-grade and sub-base of existing footpath and kerb to be retained for construction of new footpath and mountable kerb.		
Width	To match width of existing footpath either side of crossover	300mm
Step up at road channel	Not Applicable	20mm
Concrete		
• Thickness	100mm	As per Drawing CoB10
• Minimum high strength at 28 days	25MPa	32MPa
• Colour	Grey	Grey
Reinforcement	F62 steel mesh	Fibre reinforcement
In-situ Concrete Finish	Non-slip wood float or broom	Smooth and even
Contraction joints	"Lock Joint" ribbed joint moulding at 4.0m (approx) spacing	Every 2.5m and 12mm wide and an approved butyl mastic compound filler and foam or polyurethane backing placed in each expansion joint.

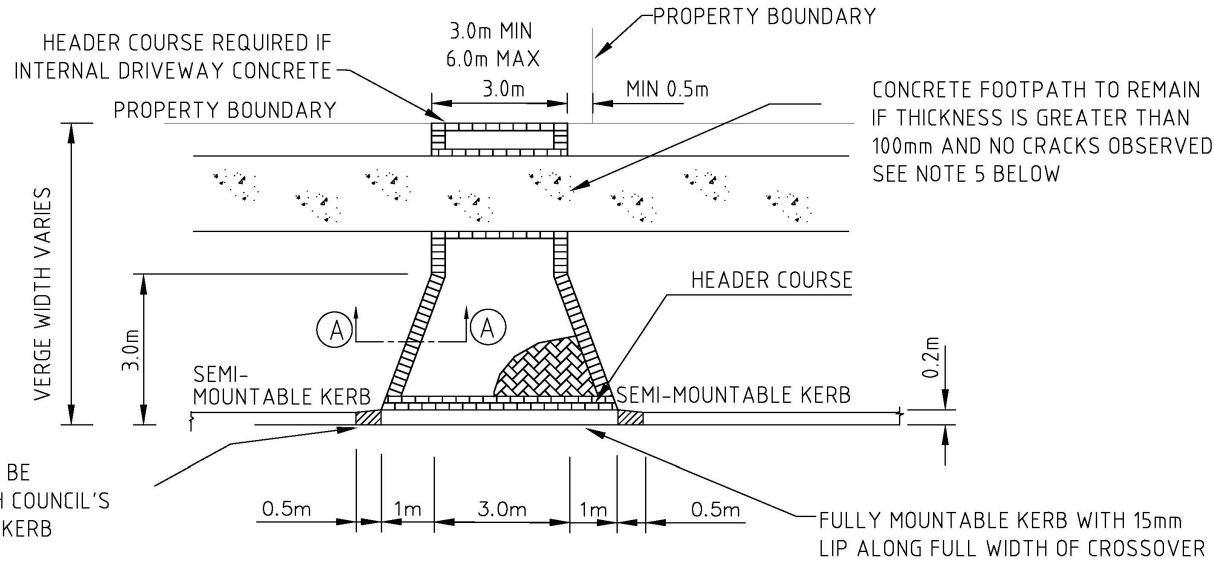


1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE CITY OF BELMONT'S "VEHICULAR CROSSOVERS (CONCRETE, BRICK PAVED AND BITUMEN) GENERAL REQUIREMENTS AND SPECIFICATIONS"
2. SHOULD ANY STREET TREE, MANHOLE, SIGN OR OTHER SERVICE INFRASTRUCTURE CONFLICT WITH THE PROPOSED CROSSOVER ALIGNMENT, THE APPLICANT SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY APPROVALS AND ALL COSTS ASSOCIATED WITH ANY RELOCATION AND/OR ALTERATIONS TO THOSE FEATURES CAUSING THE CONFLICT.
3. CROSSOVER INTERSECTION POINT AT THE KERB LINE IS TO BE NOT LESS THAN 7.5m FROM THE INTERSECTION POINT (I.P.) OF ANY TRUNCATION.
4. REFER TO THE CITY'S CROSSOVER SPECIFICATIONS SCHEDULE 1 FOR THE DIMENSIONS OF CONCRETE CROSSOVERS TO STABLES AND MULTI-RESIDENTIAL DEVELOPMENTS.
5. THE CONCRETE USED FOR CROSSOVERS IS TO BE GREY OR COLOURED TO MATCH THE INTERNAL DRIVEWAY
6. CONCRETE FOOTPATHS TAKE PRIORITY OVER THE CROSSOVER AND ARE TO REMAIN WHERE IN GOOD CONDITION (NO CRACKS/BREAKAGES) AND A MINIMUM OF 100mm THICK. HOWEVER IF A CONCRETE PATH IS DAMAGED OR LESS THAN 100mm THICK, IT SHALL BE REMOVED AND REINSTATED IN 100mm THICK GREY CONCRETE TO THE CITY'S SPECIFICATIONS AND AT THE APPLICANT'S COST
7. FOR SECTION B-B SEE CoB13 (COMMON CROSSOVER DETAILS)

NOTE:
IT IS RECOMMENDED THAT THIS DRAWING IS TO BE USED AS A GUIDE ONLY. IT IS THE CONTRACTORS/CONSULTANTS RESPONSIBILITY TO DETERMINE THE SUITABILITY FOR USE WITH THEIR SPECIFIC PROJECT. SHOULD AN ALTERNATIVE PRODUCT BE REQUIRED, CITY OF BELMONT WRITTEN APPROVAL SHOULD BE ATTAINED.

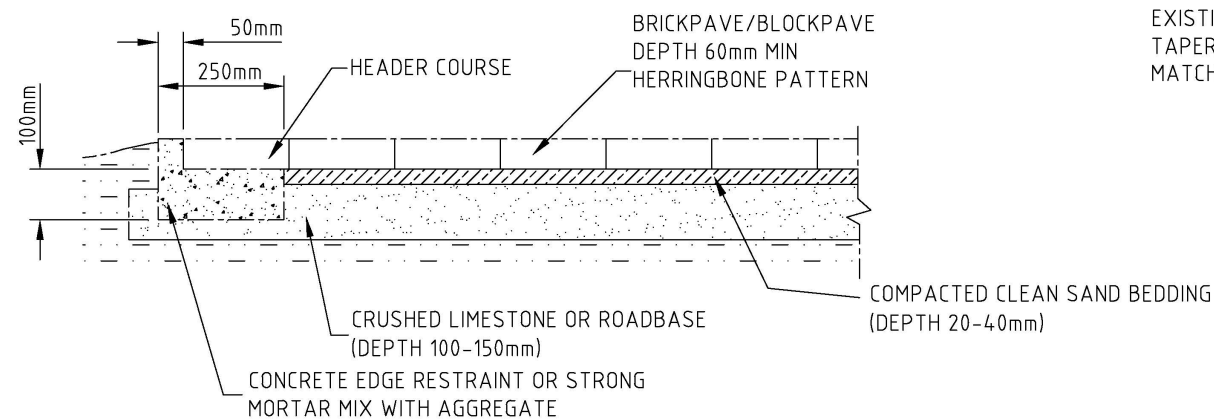


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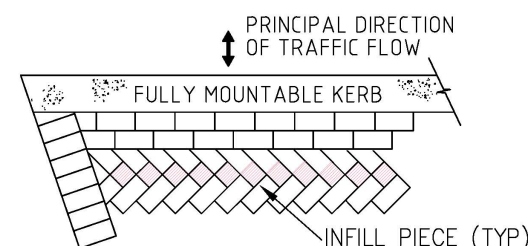
RESIDENTIAL BRICK PAVED CROSSOVER
PLAN

NOT TO SCALE



SECTION A-A

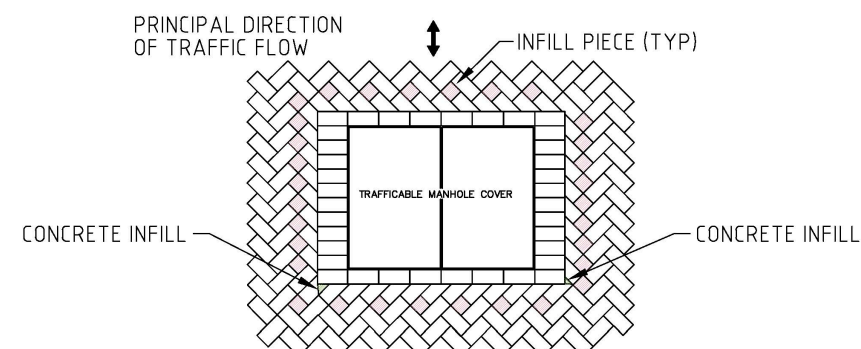
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DETAIL 1

BRICK PAVING DETAILS

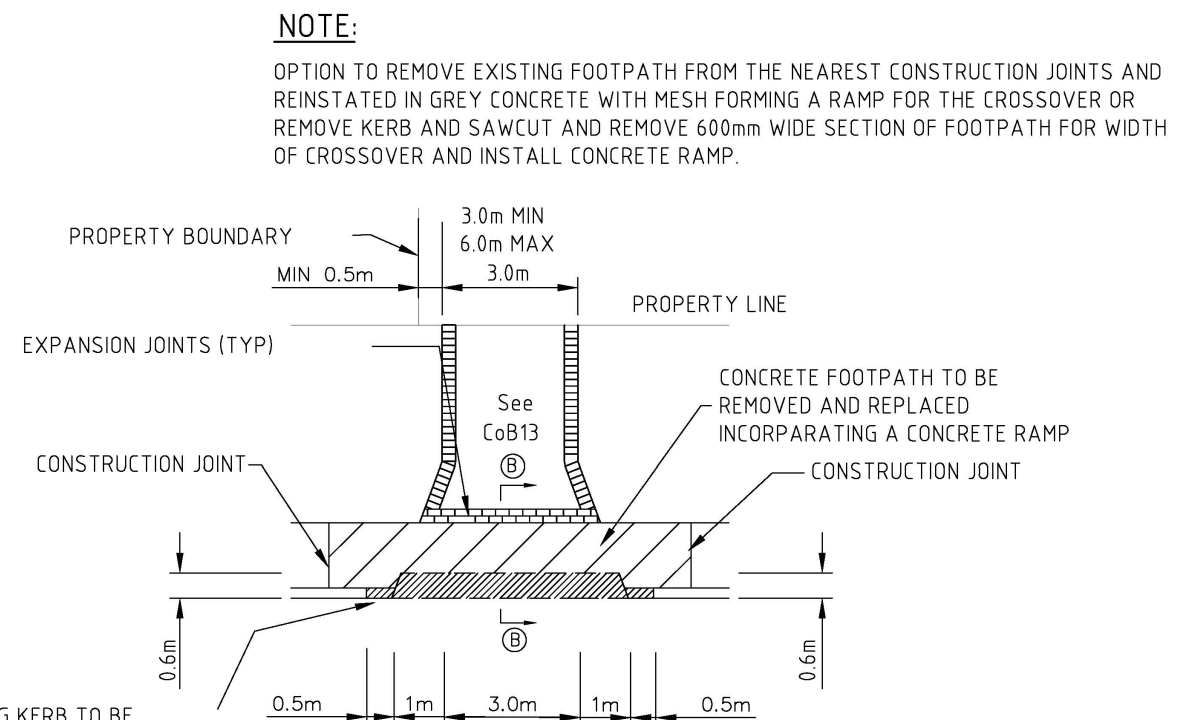
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DETAIL 2

NOTE:

1. DETAILS 1+2 SHALL BE EMPLOYED TO MINIMISE SMALL SEGMENTS AT BOUNDARIES OF PAVING.



RESIDENTIAL CROSSOVER-FOOTPATH AGAINST THE KERB

NOT TO SCALE

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE CITY OF BELMONT'S VEHICULAR CROSSOVERS (CONCRETE, BRICK PAVED AND BITUMEN) GENERAL REQUIREMENTS AND SPECIFICATIONS
2. SHOULD ANY STREET TREE, MANHOLE, SIGN OR OTHER SERVICE INFRASTRUCTURE CONFLICT WITH THE PROPOSED CROSSOVER ALIGNMENT, THE APPLICANT SHALL BE RESPONSIBLE FOR OBTAINING ALL THE NECESSARY APPROVALS AND ALL COSTS ASSOCIATED WITH ANY RELOCATION AND/OR ALTERATIONS TO THOSE FEATURES CAUSING THE CONFLICT.
3. CROSSOVER INTERSECTION POINT AT KERBLINE TO BE NOT LESS THAN 7.5m FROM THE INTERSECTION POINT (I.P.) OF ANY TRUNCATION.
4. REFER TO THE CITY'S CROSSOVER SPECIFICATION SCHEDULE 1 FOR THE DIMENSIONS OF BRICK PAVED CROSSOVERS TO STABLES AND MULTI-RESIDENTIAL DEVELOPMENTS.
5. CONCRETE FOOTPATHS TAKE PRIORITY OVER THE CROSSOVER AND ARE TO REMAIN WHERE IN GOOD CONDITION (NO CRACKS/BREAKAGES) AND A MINIMUM OF 100mm THICK. HOWEVER, IF A CONCRETE PATH IS DAMAGED OR LESS THAN 100mm THICK, IT SHALL BE REMOVED AND REINSTATED IN 100mm THICK GREY CONCRETE TO THE CITY'S SPECIFICATIONS AND AT THE APPLICANT'S COST.
6. FOR SECTION B-B SEE CoB13 (COMMON CROSSOVER DETAILS)

NOTE:

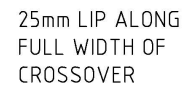
IT IS RECOMMENDED THAT THIS DRAWING IS TO BE USED AS A GUIDE ONLY. IT IS THE CONTRACTORS/CONSULTANTS RESPONSIBILITY TO DETERMINE THE SUITABILITY FOR USE WITH THEIR SPECIFIC PROJECT. SHOULD AN ALTERNATIVE PRODUCT BE REQUIRED, CITY OF BELMONT WRITTEN APPROVAL SHOULD BE ATTAINED.



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A.I.S.	D	ZR05-19	ISSUED FOR CONSTRUCTION
DRAWN	No.	DATE	DETAILS
			CAD BY NAME: C:\BIBI.Dwg



		<div style="text-align: center;"> <h1>RESIDENTIAL BRICK PAVED CROSSOVER DETAILS</h1> </div>				1	
JOB No.	-					TOTAL SHEETS	
DESIGNER	R.T.WHITE					1	
DRAWN	A.SARRIS						
E2	-						
CHECKED		SCALES	AS SHOWN	DATE DRAWN	9.95.13	ORIG DWG SIZE	DRAWING No.
AUTHORISED				DATUM HORIZONTAL - N/A VERTICAL - N/A		A1	CoB11



NOT TO SCALE



SECTION A-A

LIGHT INDUSTRIAL/COMMERCIAL CONCRETE CROSSOVER

NOT TO SCALE



PLAN VIEW

NOT TO SCALE



SECTION B-B

HEAVY DUTY INDUSTRIAL/COMMERCIAL ASPHALT

NOT TO SCALE

NOTES

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2. SHOULD ANY STREET TREE, MANHOLE, SIGN OR OTHER SERVICE INFRASTRUCTURE CONFLICT WITH THE PROPOSED CROSSOVER ALIGNMENT, THE APPLICANT SHALL BE RESPONSIBLE FOR OBTAINING ALL THE NECESSARY APPROVALS AND ALL COSTS ASSOCIATED WITH ANY RELOCATION AND/OR ALTERATIONS TO THOSE FEATURES CAUSING THE CONFLICT.
3. NO STREET TREE WILL BE REMOVED FROM THE VERGE WITHOUT PRIOR WRITTEN CONSENT FROM COUNCIL.
4. CROSSOVERS ABUTTING AN IMPORTANT REGIONAL ROAD SHALL BE SUBJECT TO APPROVAL BY COUNCIL AND THE MINISTRY OF PLANNING
5. WHERE A CROSSOVER CONNECTS A PROPERTY WITH A ROAD CONTROLLED BY THE COMMISSIONER OF MAIN ROADS, APPROVAL SHALL BE SOUGHT FROM THE COMMISSIONER OF MAIN ROADS WESTERN AUSTRALIA
6. CROSSOVER INTERSECTION POINT AT KERBLINE TO BE NOT LESS THAN 7.5m FROM THE INTERSECTION POINT (I.P.) OF ANY TRUNCATION
7. REFER TO THE CITY'S CROSSOVER SPECIFICATION SCHEDULE 1 FOR THE DIMENSIONS OF CROSSOVERS TO STABLES AND MULTI-RESIDENTIAL DEVELOPMENTS.
8. THE APPLICANT SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ANY EXISTING KERB WHICH IS REQUIRED TO BE REPLACED TO COMPLY WITH THE TYPE REQUIRED FOR CROSSOVERS.
9. FOR INDUSTRIAL AND COMMERCIAL PROPERTIES, EXISTING FOOTPATH SHALL BE REMOVED FOR CONSTRUCTION OF CROSSOVER

NOTE:

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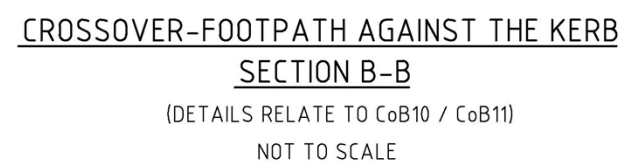
			REVISION
A.S.	D	28.05.19	ISSUED FOR CONSTRUCTION
PROJIN:	Nr.	DATE	DETAILS CAD IS ENAME CODE DRUG



JOB No.	.
DESIGNER	R.T.WHITE
DRAWN	A.SARRIS
E2	.
CHECKED	
AUTHORISED	

INDUSTRIAL / COMMERCIAL CROSSOVER DETAILS			
SCALES	AS SHOWN	DATE DRAWN	9/95/13
		DATUM HORIZONTAL - N/A <small>(SEE SHEET 11.1)</small>	ORIG DWG'S SIZE <div style="font-size: 2em; font-weight: bold;">A1</div>

	1
	TOTAL SHEETS 1
	DRAWING No. CoB12



LAND FOCUS



ENGINEERING CONSULTANTS

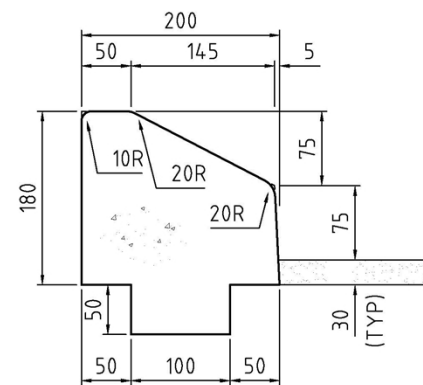
55 / 229 Adelaide Tce
Perth, Western Australia, 6000
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Perth, Western Australia, 6915

Telephone: (08) 9221-4722
Facsimile: (08) 9221-4755
Mobile: 0402-286-337
E-mail: admin@landfocus.com.au

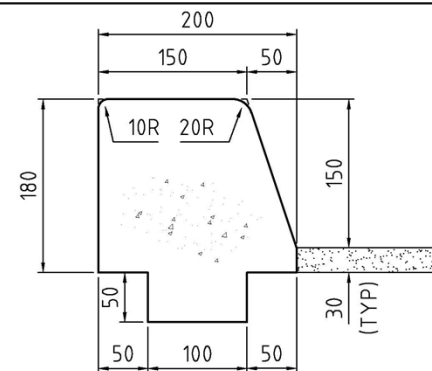


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OF
BELMONT

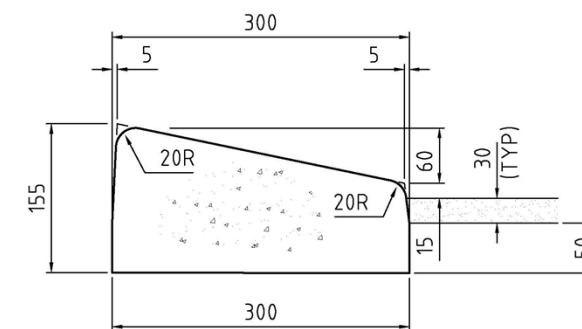
Document Control Specifications – Combined
Version: 16/01/2024 Date: 16/01/2024



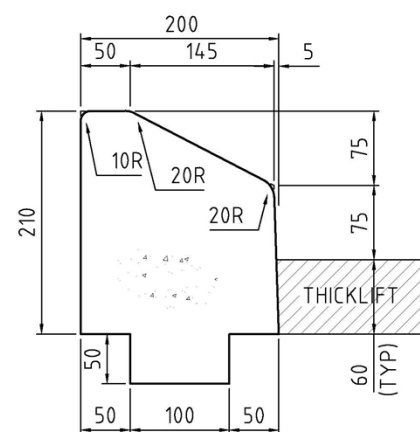
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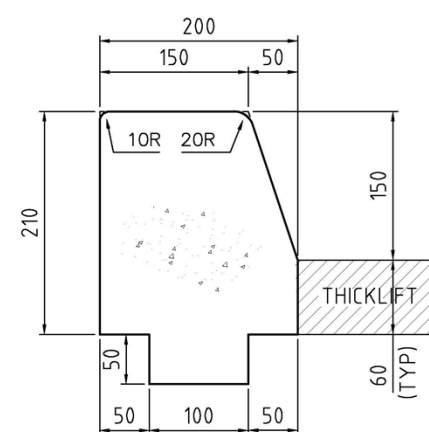
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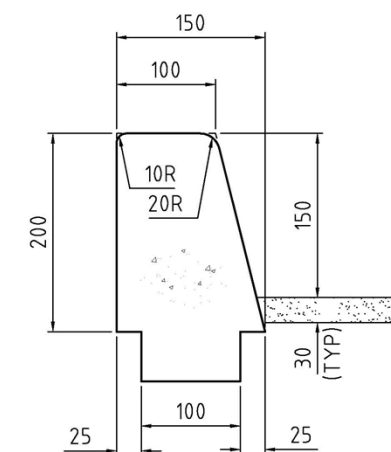
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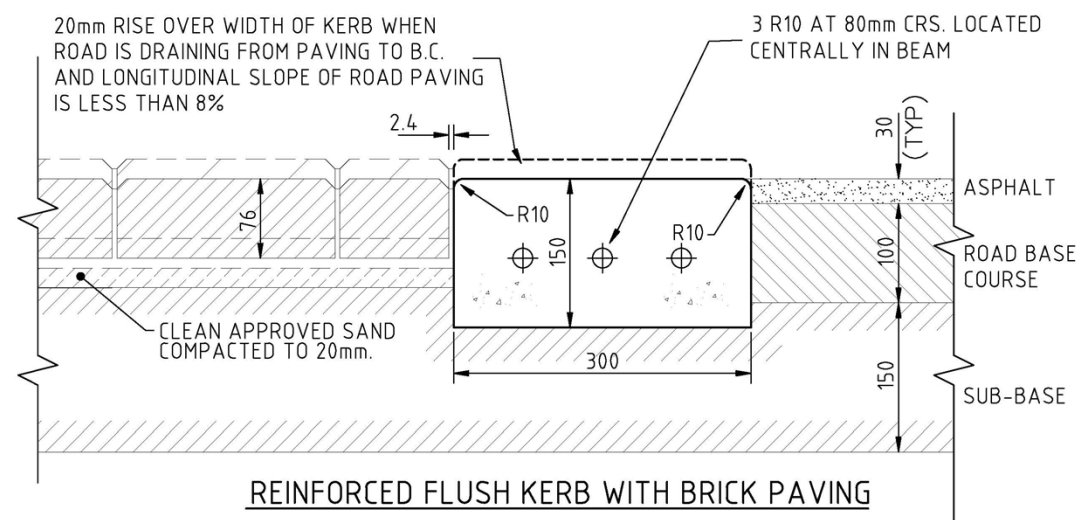
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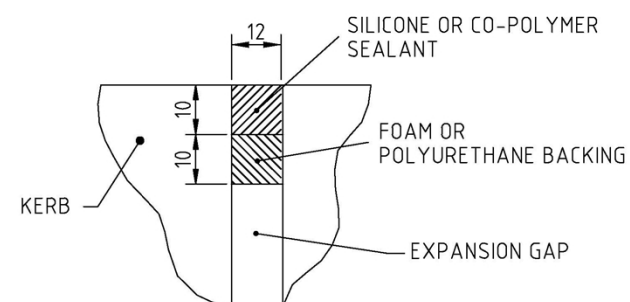
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NOT TO SCALE



NOT TO SCALE



NOT TO SCALE

KERBING NOTES

1. CONCRETE STRENGTH TO BE IN ACCORDANCE WITH STANDARD SPECIFICATION. REINFORCED FLUSH EDGE BEAM TO BE 25MPa F_c AT 28 DAYS.
2. EXPANSION JOINTS: PLACE AT 5m INTERVALS.
3. KERBING TO BE PROTECTED FROM TRAFFIC FOR A MINIMUM OF 7 DAYS AFTER INSTALLATION.
4. REINFORCED FLUSH EDGE BEAM NOT TO BE CUT.
5. REINFORCEMENT TO BE STRUCTURAL GRADE STEEL COMPLYING WITH AS1302 GRADE 410Y.

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A.I.S.	E	28.05.19	ISSUED FOR CONSTRUCTION		
DRAWN	No.	DATE	DETAILS	CAD FILENAME: C08T5.Dwg	



		<h1 style="text-align: center;">TYPICAL KERBING DETAILS</h1>				1	
JOB No.	-					TOTAL SHEETS	
DESIGNER	R.T. WHITE					1	
DRAWN	A.SARRIS						
EZ	-						
CHECKED		SCALES	AS SHOWN	DATE DRAWN	9.05.13	ORIG DWG SIZE	DRAWING No.
AUTHORISED				DATUM HORIZONTAL - N/A VERTICAL - N/A		A1	CoB15