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PART 1 - GENERAL

1.0 OBJECTIVE

The purpose of this specification is to ensure that vehicle crossings are constructed and maintained to a safe and efficient standard in accordance with the requirements of the Shire of Chittering (hereinafter referred to as the Shire).

This document contains comprehensive technical information on crossovers, installation procedures, permissible materials, guidelines and specifications applicable to the construction of crossovers in the Shire.

1.1 DEFINITIONS

Applicant means the person who makes application to the Shire to construct a crossover;

Shire means the Shire of Chittering;

Contractor means the person or company who will be responsible for construction of the crossover;

Crossing has the same meaning as Crossover;

Crossover means that section of the 'drive in' to a property that replaces the verge and footpath or will ultimately form part of the future footpath;

Footpath means the paved or made portion of a thoroughfare used or intended for use by pedestrians and cyclists;

Local Government means the local government of the Shire of Chittering;

Local Government Act means the Western Australian Local Government Act 1995;

Subsidy means the contribution that the Shire is prepared to make towards the cost of an approved crossover as set by Council each year in the fees and charges;

Superintendent means the Executive Manager Technical Services or his/her nominated representative;

Verge means that portion of a thoroughfare which lies between the boundary of a carriageway and the adjacent property boundary but does not include a footpath.

1.2 STATUTORY REQUIREMENTS

Under the provisions of Schedule 9.1, Clause 7 of the Local Government Act 1995 and Regulation 12, 13 and 15 of the Local Government (Uniform Local Provisions) Regulations 1996, all landowners within the Shire of Chittering must make application to Council to construct a vehicle crossover.

All crossovers must be constructed to the satisfaction of the Shire's Executive Manager Technical Services or his/her nominated representative.

1.2.1 Council Subsidy

Schedule 9.1, Clause 7(4) of the Local Government Act 1995 states:

Regulations may provide for the local government to bear some of the cost of making a crossing in certain circumstances.

Regulation 15 of the Local Government (Uniform Local Provisions) Regulations 1996 states:

(1) *Where -*

(a) *a local government -*

(i) *under regulation 12 constructs or approves the construction of; or*

(ii) *under regulation 13(1) requires the construction of,*

a crossing giving access from a public thoroughfare to private land or a private thoroughfare serving the land;

(b) *the crossing is the first crossing in respect of the land; and*

(c) *the crossing is a standard crossing or is of a type that is superior to a standard crossing,*

the local government is obliged to bear 50% of the cost, as estimated by the local government, of a standard crossing, but otherwise the local government is not obliged to bear, nor prevented from bearing, any of the cost.

(2) *In subregulation (1) -*

“first crossing” in respect of land, means the first crossing to the land or a private thoroughfare serving the land constructed under regulation 12 or section 358² of the Local Government Act 1960 as in force at any time before 1 July 1996;

“standard crossing” means, subject to any local law as to what is or is not a standard crossing, a crossing of a kind that the local government, by resolution, decides is a standard crossing.

1.2.2 Standard Crossing

Council has resolved that a standard crossing or crossover has the following minimum features:

- a minimum width at the property boundary of 4.0 metres for residential and rural crossovers and 6.0 metres for commercial / industrial crossovers;
- a maximum width at the property boundary of 6.0 metres for residential and rural crossovers and 10.0 metres for commercial / industrial crossovers (this requires approval by Executive Manager Technical Services);
- 1.5metre wide tapers or wings at the kerb line for residential and rural crossovers and 2 meters for commercial/industrial crossovers;
- where constructed in concrete, the crossover shall be coloured to match the internal driveway (i.e. if the driveway is paved or coloured concrete, the crossover must be coloured to match. If the driveway is grey concrete then there is no requirement to colour the crossover);
- a choice of concrete, brick paved or asphalt crossover is available for residential properties;
- a choice of concrete, brick paved, bitumen seal or asphalt crossover is available for rural properties (gravel crossover will only be approved on an existing gravel road only); and
- a choice of concrete, brick paved or asphalt crossover is available for commercial and industrial properties. A bitumen sealed crossover is not an option in this case.

1.3 HOW TO APPLY FOR A CROSSOVER

If it is the first vehicle crossing constructed to the premises, the Shire of Chittering may contribute towards the actual construction cost of a residential crossover. The contribution is determined at the time of the inspection and is calculated on a standard 4.0 metres wide crossover. Currently, only crossovers constructed to residential, rural, industrial and commercial properties are eligible for a Council contribution, this therefore excludes subdivision developments.

To claim the contribution, the applicant should complete the attached [Application for Subsidy](#) form (see pages 17 & 18), attach all receipts for the labour and materials and lodge it with the Shire after completion of the crossover. Application for a contribution must be made in writing and submitted within six (6) months of the date that the crossover was constructed with the allowable contribution being up to a maximum of \$1650 including gst in accordance with the current years Council fees and charges.

Crossovers, eligible for subsidy may be claimed for at the subsidy rate that applies in the financial year construction is completed. Crossovers in excess of six months old shall have a reduced subsidy based on straight line depreciation, for age and type, as per the following: (Crossovers in excess of their life shall not be eligible).

Crossover Type	Maximum Life of Crossover
Gravel	10 years
2 Coat Seal	10 years
Asphalt	15 years
Brick/Block	20 years
Concrete	25 years

Reconstruction of one crossover to a property shall attract a second subsidy where that crossover has exceeded its expected life (taken as 20 years) as determined by the Executive Manager Technical Services.

Upon receipt of the application, a site inspection will be undertaken by an Officer from the Technical Services Department to verify that the crossover has been constructed in accordance with the specification. Should the constructed crossover comply with all of the Shire's requirements, then the applicable subsidy payment will be forwarded to the property owner by mail, within 2-4 working weeks after the final inspection.

A fee applies to all applications to construct crossovers. This fee is reviewed annually and identified in the Shire's annual fees and charges.

The Shire's Technical Services Department may provide a quotation for the construction of a crossover if requested. Should it be decided that the crossover is to be constructed through a private Contractor then the Contractor must include and undertake the set out and levels, kerb removal disposal and reinstatement, pathway removal and disposal, pathway reinstatement, verge reinstatement, any other associated works and services location (dial before you dig). The applicant will be responsible for the cost of service relocations if required and all costs associated with damage to any services.

1.3.1 Application Process

When a new dwelling is being constructed, the owner or the builder on behalf of the owner of the property (the Applicant) is required to complete the attached "[Application for Crossover and / or Application for Subsidy](#)" form (pages 17 & 18) and forward it to:

Shire of Chittering
 Technical Services Department
 PO Box 70
 BINDOON WA 6502 (or fax to 9576 1250)

On receipt of the Application and applicable Fee, the Technical Services Department will investigate and provide a quotation, if requested, to the owner/builder.

If the Shire's subsidy only is to be claimed, then on receipt of the Application and Fee the crossover will be inspected and if approved, the subsidy application will be processed. This process will normally take a minimum of 2 to 4 working weeks.

1.3.2 Contacts

Queries on all matters related to crossovers, including requests for information, application forms for subsidies, quotations, notification for inspections and as otherwise described in this document should be directed to:

- Shire of Chittering Customer Service Officer for Technical Services on 9576 4600.

1.4 TYPE AND METHOD OF CONSTRUCTION

Crossovers to residential properties must be constructed in either concrete, brick paving or asphalt. For rural properties, crossovers may only be constructed in concrete, brick paving, bitumen seal or asphalt. For commercial and Industrial properties, crossovers may only be constructed in concrete, brick paving or asphalt. The construction of crossovers shall be executed in accordance with this specification and any variance must first be approved in writing by the Executive Manager Technical Services.

Crossovers can be constructed in either the following ways:

1. Privately constructed –

- a) The applicant constructs the crossover; or
- b) The owner/agent arranges for a private contractor to construct the approved crossover.

2. Constructed by Council –

The owner/agent authorises the Shire or the Shire's contractor to construct a crossover. This only applies to the construction of concrete, asphalt or bitumen seal crossovers.

1.5 BUILDING LICENCE

The Building Licence is for building construction inside the property boundary and does not include approval for the construction of the crossover. Hence, a separate application is required for the construction of a crossover within the road verge, which is vested with the Shire of Chittering.

The position, width, and construction of the crossover shall be in accordance with this crossover specification.

1.6 MAINTENANCE RESPONSIBILITY

The crossover is that section of driveway that extends from the road kerb or edge of road seal to the front or side property boundary line, across the verge. The property owner is responsible for the cost of construction and all future maintenance and repairs to the crossover, including any damage resulting from the roots of street trees and water run-off from private property. The Shire will not undertake any maintenance or repairs to the crossover or accept any liability as a result of poorly constructed or maintained crossovers.

1.7 PROTECTION OF EXISTING SERVICES, STREET TREES AND THE PUBLIC

- 1) Existing services within the vicinity of the proposed crossover shall be protected at all times. The owner or authorised representative may be contacted to provide advice in relation to the protection of services;
- 2) Where damage is caused to the Shire's infrastructure (i.e. kerb, pathway, road etc) as a result of the construction of the crossover, the infrastructure shall be repaired at the expense of the property owner to the satisfaction of the Executive Manager Technical Services;

- 3) Conflicting public utility services shall be adjusted or relocated at the applicant's expense, subject to formal approval of the relevant authority;
- 4) The Shire's existing drainage structures (i.e. pits drains or culverts) that conflict with the location of the proposed crossover are to be adjusted by the Shire's Technical Services Department and all costs associated with this work shall be borne by the Applicant;
- 5) The removal, adjustment, or reinstatement of reticulation is the responsibility of the Applicant;
- 6) Street trees shall not be removed without the prior approval of the Shire's Executive Manager Technical Services. Crossovers shall be located a minimum of 2 metres from a tree and removal will only be undertaken where it can be demonstrated that this is the only option available. All costs associated with the removal of the street tree shall be borne by the Applicant;
- 7) The Applicant shall be responsible for the protection of the public at all times. Signage, lighting, barricades, and/or any other protection measure deemed necessary shall be provided by the applicant to ensure that the public are protected during the execution of the works;
- 8) Safe access for pedestrians on the verge shall be maintained at all times. The Shire will not permit pedestrians being forced to walk on the road pavement unless appropriate measures are put in place for the protection of pedestrians; and
- 9) Vehicle crossings abutting major roads shall be subject to the approval of Main Roads WA in conjunction with the Shire of Chittering.

1.8 LEVELS AND SHAPE

The levels and shape of the crossover shall be as shown on the attached Drawing 14-STD-001 (page 18). The standard longitudinal slope shall be positive 2% (1:50) from the top of kerb. However for the verges having natural gradients above 2%, the first 3.0m of the crossing from the top of the kerb or road edge shall have positive 2% and the remainder of the crossing to the property boundary line and beyond shall be formed as shown on Drawing 14-STD-001 (page 18).

Where the difference in level between the front boundary and the road edge exceeds the above gradients, or the house finished floor is considerably lower than the road level, then special requirements will apply and the proposed design shall be referred to the Technical Services Department for consideration and approval.

In no case shall the crossover junction at the property boundary be stepped unless specifically authorised by the Executive Manager Technical Services.

1.9 EXCAVATION, FILLING AND COMPACTION

The excavation for the crossing bed shall be taken out to the levels, lines and grades in accordance with Drawing 14-STD-001 (Page 18).

Excavation shall be cleanly and evenly executed, watered and vibrator rolled to give a compaction of 95% maximum dry density as determined by modified compaction test under RMS T112 or AS 1289 – 2014 to provide for a sound base free of depressions, soft spots and any deleterious materials for example to accommodate a minimum 100mm thick concrete pavement (residential/rural crossing), minimum 150mm thick concrete pavement (commercial / industrial crossing) or 190mm for brick paving (100mm deep base layer, 30mm sand and 60mm brick) or 250mm of gravel base. The sub-grade, including any filling shall be moistened and thoroughly compacted using a 300mm plate compactor over a minimum of three passes.

All surplus material resulting from site preparation and construction of the crossing is deemed to be the property of the Contractor and shall be completely removed from the site at the expense of the Contractor.

1.10 REMOVAL OF EXISTING KERBING AND FOOTPATH

1.10.1 Barrier or Semi-Mountable Kerbing

Where only barrier or semi mountable kerbing is in place at the crossing entrance, the length of kerbing equal to the appropriate entrance width of the crossing shall be removed and replaced with trafficable mountable kerbing with a 1 meter transition back into the existing kerb. If no kerb exists a mountable kerb beam with 25mm high lip is to be installed for the width of the crossover including wings allowing crossover construction to blend in flush as in accordance with drawing 14-STD-001 (page 18) to enable the construction of the crossing

1.10.2 Mountable Kerbing

Where mountable kerbing is in place at the crossing entrance, the crossing shall be installed to abut the kerbing with the level of the crossing installed to align with the level of the top of the mountable kerb. The mountable kerbing equal to the appropriate entrance width of the crossover shall only be removed if:

- (I) The mountable kerbing is cracked in one or two places and the cracking is likely to affect the structural integrity or cause further deterioration of the kerbing; or
- (II) The average depth between the road surface and front edge of the mountable kerbing exceeds 25mm, where the final hot mix (asphalt or bitumen seal) surface has been placed.

Note:

The cracking in (I) above does not refer to hairline cracking but rather cracking which affects the structural integrity of the kerbing. Where the applicant is unsure as to whether or not the kerbing needs to be removed, the Technical Services Department shall be consulted.

1.10.3 Cutting of Kerb

Where kerbing is to be removed, it shall be neatly cut and removed carefully so as to not disturb the wearing surface and road pavement. Where any doubt exists regarding the removal of kerbing, advice shall be obtained by the contractor from the Executive Manager Technical Services to see if such work shall meet his/her satisfaction.

1.10.4 Existing Footpath

Generally, an existing footpath should be left in place if it is insitu concrete, is in good condition, and is a minimum of 100mm thick adjacent to the property boundary line or kerb, and is not a slab footpath. Where slab footpaths exist they shall be completely removed and disposed of at the contractor's expense.

Where deemed absolutely necessary and approved by the Executive Manager Technical Services, existing footpaths may be removed by neatly saw cutting the existing footpath to allow construction of the new crossover. The footpath shall be cut perpendicular to the existing footpath alignment and 12mm expansion joints shall be constructed either side of the crossover.

Where the footpath is damaged on respective sides of the proposed crossover, the footpath shall be removed back to the nearest construction/expansion joint and the section of path relayed to meet the requirements of the specification and satisfaction of the Technical Services Department.

The expansion joint for concrete crossovers shall be continuous from 'form to form' and extend vertically for the full depth of the slab. 'Meljoint', bitumen impregnated canite or similar approved material shall be used. The joint shall not protrude above the surface of the crossover or abutting kerb.

1.11 Path Reinstatement (Concrete and Brick Paved)

Where the existing footpath or dual use path is pre-cast concrete slabs, these may be discarded or otherwise disposed of to the satisfaction of the Technical Services Department. The slabs shall be replaced by the crossover and the junction with the path made good to the satisfaction of the Executive Manager Technical Services.

Where the existing footpath or dual use path (DUP) is insitu concrete, is in good condition, and is a minimum of 100mm thick adjacent to the property boundary line or kerb, the crossover shall be constructed either side of the concrete path and match up with it provided the grade of the crossover from the property boundary to road channel does not exceed 4%.

Where the existing footpath or DUP is insitu concrete is in poor condition, or less than 100mm thick adjacent to the property boundary line or kerb, the pathway shall be neatly sawn cut along the alignment of the crossover to provide the necessary opening. The section of redundant path shall then be removed and reinstated up to the edge and level of the new crossing.

The path shall be kept in a safe condition at all times until reinstatement work is completed and appropriate signage installed warning pedestrians of construction works. All surplus material resulting from the removal of concrete pathway is deemed to be the property of the Contractor and shall be completely removed from the site at the expense of the Contractor.

1.12 CROSSING ENTRANCE

Where kerbing has been removed to permit the construction of a crossing, the water channel shall be restored by constructing a crossing entrance shown hatched on attached Drawing 14-STD-001 (page 18).

A lip 25mm high shall be created between the road surface and the top of the front edge of the crossing entrance to allow for the future resurfacing of the road. Brick pavers shall not be permitted on the crossing entrance.

Any damage caused to the edge of the road surface shall not be corrected with concrete. The Executive Manager Technical Services shall be advised of the damage and such damage will be repaired by the Shire with all of the costs associated with the repair to be met by the Contractor.

1.13 WIDE CROSSINGS (CONCRETE AND BRICK PAVED)

Where two residential crossings abut each other, they may be combined, providing that the combined width does not exceed 10.0m. Where the combined width is likely to exceed 10.0m, a pedestrian refuge of 2.0 metre minimum width shall separate the two (2) crossings.

1.14 PROTECTION OF WORKS AND PUBLIC

All signage installed to manage the traffic and pedestrians must comply with the current Australian Standards. Care shall be taken during construction of the crossing to protect the public from any accident and the works from damage.

1.15 DAMAGE TO EXISTING FACILITIES

Care shall be taken to avoid damage to any public facilities located in the verge. Therefore, the Contractor should contact "Dial Before You Dig" to obtain information about the location of all services in the area prior to undertaking any excavation.

The constructor shall repair any damage caused during construction to a standard acceptable to the owner of the facility.

PART 2: TECHNICAL SPECIFICATION - CONCRETE CROSSOVERS

2.0 CONCRETE SPECIFICATIONS

2.01 RESIDENTIAL AND RURAL CROSSOVERS

Concrete shall comply with AS1379-2007.

All concrete used in the crossing shall develop a minimum compressive strength of 20 Megapascals (Mpa) at 28 days and shall have high early strength additive to give rapid hardening. All concrete used shall have a maximum slump of 75mm delivered by transit truck from an approved mixing plant.

The concrete thickness shall be a minimum of 100mm, with SL62 reinforcing mesh.

Hand or machine mixing of concrete on site is not permitted. Documentation on the concrete used for the construction of the vehicle crossing shall be made available to the Shire when requested.

The minimum and maximum widths at the property boundary (excluding splays or wings) for residential crossovers are 4.0 metres to 6.0 metres and rural 6.0 meters to 10.0 meters respectively.

2.02 COMMERCIAL AND INDUSTRIAL CROSSOVERS

Concrete shall comply with AS1379-2007.

All concrete used in the crossing shall develop a minimum compressive strength of 25 Megapascals (Mpa) at 28 days and shall have high early strength additive to give rapid hardening. All concrete used shall have a maximum slump of 75mm delivered by transit truck from an approved mixing plant.

The concrete thickness shall be a minimum of 150mm, with SL72 reinforcing mesh. However, commercial/industrial crossovers shall be designed to meet the requirements of traffic loads and suitable access; therefore the thickness and reinforcing noted above are only the minimum standards.

Hand or machine mixing of concrete on site is not permitted. Documentation on concrete used for the construction of the vehicle crossing shall be made available to the Shire when requested.

The minimum and maximum widths at the property boundary (excluding splays or wings) for commercial crossovers are 6.0 metres and 10.0 metres respectively, for one and two way traffic flow.

2.1 PLACING CONCRETE

The base shall be thoroughly and evenly moistened, but not saturated, prior to placing the concrete. In addition, deleterious material shall be removed from the base before pouring the concrete.

The concrete shall be evenly placed to the depth specified in one continuous operation, and shovelled into position continuously and spaded, or vibrated, especially at the edges, to give maximum density. No break in operations shall be permitted from the time of placing to finishing except as authorised by the Executive Manager Technical Services.

2.2 PLACING CONCRETE IN HIGH TEMPERATURE

Concrete shall not be placed on days for which the official forecasted temperature is higher than 35 degrees Celsius, unless the following requirements are adhered to:

- (i) The formwork shall be continuously sprayed with water in advance of the placement of concrete. Excess water shall be removed from the inside of the formwork immediately prior to the placement of concrete.
- (ii) Steel reinforcement and metal formwork shall be suitably protected from the effects of excessive temperature.

- (iii) Suitable barriers shall be provided to protect the freshly placed concrete from the environment, until the concrete has hardened sufficiently to allow curing to begin.
- (iv) The concrete shall be held to a temperature not higher than 32 degrees Celsius when placed by:
 - a) Using chilled water for mixing; or
 - b) Spraying the coarse aggregate with cold water; or
 - c) Covering the container in which the concrete is transported to the formwork; or
 - d) Using any combinations of these methods.
- (v) The concrete shall be mixed, transported, placed, compacted and finished as rapidly as possible, and then immediately curing shall begin. Concrete shall not be allowed to dry out before curing begins.
- (vi) Curing compounds shall not be used as an alternative to the requirements of (iii) and (iv) above.

2.3 FINISHING CONCRETE

The finish shall be obtained by screeding to the correct levels and wood floating to provide a non-slip dense surface free of any depressions, float marks, irregularities, honeycomb sections or slurry liable to cause excessive surface wear.

A steel trowel finish is not permitted on a vehicle crossing. The surface shall be treated with a transverse brooming tool to provide a non-slip, dense surface free of any depressions, marks, jointing marks, honeycomb sections or accumulation of fine dusty accretions liable to excessive surface water. The final surface finish shall be to the entire satisfaction of the Executive Manager Technical Services who reserves the right to require the removal of or the correction of any surface deficiencies or finish.

Colouring and texturing of the surface is permissible at full cost to the owner, that is, Council will not subsidise the cost of surface colouring or texturing

Concrete edges shall be finished with a 100mm wide edging tool.

Light vehicles should refrain from traversing the concrete for at least three (3) days and heavy vehicles for seven (7) days.

2.4 JOINTING CONCRETE

- (i) Contraction joints shall be made with an approved jointing tool. The distance either laterally or longitudinally between contraction joints shall not exceed 2.0 metres.
- (ii) Expansion joints shall be full depth joints of minimum 14mm width and shall be filled with bitumen-impregnated canite or similar approved material and located at the property boundary and at the ends of existing kerbing where kerbing has been removed. Long crossing shall have expansion joints at 6.0 metre maximum spacings.

2.5 CURING CONCRETE

The concrete crossing shall be cured either by water sprayed on the exposed concrete surface after setting or be covered with plastic film immediately after finishing and be cured for at least 3 days.

As stated in clause 2.3, light vehicles should refrain from traversing the concrete for at least three (3) days and heavy vehicles for seven (7) days.

2.6 AESTHETICS

If due to the alignment of the road or boundary or any other reason the installation of a standard crossover shape is difficult or would result in a shape that detracts from the specification, the Contractor must make immediate contact with the Technical Services Department and must not proceed with the work until the crossover alignment has been approved by the Executive Manager Technical Services.

PART 3: TECHNICAL SPECIFICATION - BRICK PAVED CROSSOVERS

3.0 PAVER TYPE AND THICKNESS

All materials used in the construction of brick paved crossovers shall be concrete or clay pavers in accordance with the manufactures specifications and any materials used which is inferior to those specified or directed by the Executive Manager Technical Services shall be liable to rejected and replaced at the Contractors costs.

Minimum 60mm heavy duty rectangular or square concrete or clay pavers are to be used.

3.1 BASE LAYER PREPARATION

The base layer shall comprise minimum 100mm deep limestone, gravel or road base and compacted to provide a consolidated, sound base free of depressions, soft spots and any deleterious materials.

The base material shall be loosely spread in a single layer to the required level and compacted using overlapping passes of a vibrating plate compactor or suitable vibrating/pedestrian roller.

The base finished surface shall be trimmed so that it does not deviate by more than 10mm from the base of a 2.0m long straight edge placed in any direction.

3.2 EDGE RESTRAINT

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

Where the crossover has required the removal of existing kerbing or abut the road seal, the Contractor must 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 respective ends or blend back into the road surface if no kerbing exists. Paving bricks shall be laid commencing from the rear face of the kerb.

The perimeter of all paved areas shall be provided with a header course laid on a solid brick or concrete footing to prevent lateral movement of the bricks. Header bricks shall be mortared to the footing.

3.3 SAND BEDDING LAYER

The bedding material needs to be well graded sand passing a 5mm sieve. Bricklayers sand and single sized dune sands are not suitable for use. The bedding sand shall be non-plastic and free from deleterious materials such as stones, tree roots, clay lumps and excessive organic material.

At the time of placing, the sand should have uniform moisture content. The sand must be screed slightly ahead of laying and protected from the compaction. The pre-depth of the sand bedding layer shall be 30mm minimum (+/- 5mm) just before the laying of bricks.

3.4 LAYING PATTERNS

The pavers shall be laid to the patterns shown on Drawing 14-STD-001 (page 18).

3.5 LAYING OF PAVERS

Bricks can be either clay or concrete, rectangular or interlocking. Bricks shall be placed on the bedding sand by hand with 2 to 4mm gaps between adjacent bricks. All full bricks shall be laid first. Closure bricks shall be cut with a saw and fitted subsequently. It is desirable that bricks be laid to the herringbone pattern as superior strength is obtained, however, other patterns that achieve the necessary interlocking characteristics are acceptable.

3.6 COMPACTION AND JOINT FILLING

The bricks shall be immediately compacted and brought to level by not less than three (3) passes of the vibrating plate compactor. The plate should have sufficient area to simultaneously cover twelve (12) bricks. To prevent damage to pavers, sheets of plywood of 12mm minimum thickness should be laid on the bricks to prevent the compactor coming into contact with the paved surface.

As soon as possible after compaction, dry sand for joint filling shall be broomed over the pavement and into the joints. Excess sand shall be removed as soon as the joints are filled.

Ideally, the sand used for joint filling should be finer than the bedding layer with a nominal maximum particle size of 2mm. Sand used for joint filling should be free from salts or contaminants likely to cause efflorescence. However, the use of bricklayer's sand or the addition of a small amount of silty material to the joint filling sand can be of benefit in reducing water penetration in the early life of the pavement.

PART 4: TECHNICAL SPECIFICATION – ASPHALT AND HOT BITUMEN SEAL CROSSOVERS

4.0 Asphalt and Hot Bitumen Seal

4.1 Residential Rural, Commercial and Industrial

Asphalt surfaces to be dense graded asphalt with coarse 10mm stone laid 40mm thick.

Minimum 2 coat Hot bitumen seal being 14mm Diorite prime coat and 7mm Diorite second coat seal.

4.2 Earthworks

The Contractor shall cut and fill as required to achieve the required earthwork levels of 250mm base. The Contractor shall supply fill to make-up any shortfall in quantity of fill. Any surplus shall be disposed off site by the Contractor. The Contractor shall make his own estimate of the quantity of fill required or surplus to be disposed of. Fill shall be sandy material free of roots, vegetable and other deleterious matter.

The sub-grade materials shall be compacted to 95% modified A.A.S.H.O maximum density when the material is not sand and shall be compacted to 7 blows per 300 when the subgrade material is sand.

The prepared subgrade shall present a smooth even surface free from depressions and wheel ruts.

4.3 Gravel Base Course

The gravel base shall consist of a combination of soil binder, sand and gravel. It shall be free of vegetable matter and lumps or balls of clay and shall not contain objectionable quantities of pyrites or other deleterious substances.

Coarse aggregate retained on the 2.36 sieve shall consist of hard, durable particles or fragments of gravel; materials that break up when alternatively wetted and dried shall not be used.

Coarse aggregate shall have a percentage wear by the Los Angeles Abrasion Test of not more than forty-five (45).

Fine aggregate passing the 2.36 sieve shall consist of natural or crushed sand and fine mineral particles passing the 75 micron sieve. The ratio of the portion passing the 75 micron sieve to the portion passing the 425 micron shall not exceed 0.67.

The portion of the sample which passes the 425 micron sieve (Soil Mortar) shall conform to the following requirements:

- Liquid limit shall not exceed 25%
- Plasticity index shall not exceed 6%
- Linear shrinkage shall not exceed 2%
- Dry compressive strength shall not be less than 1.75 MPa.
- Dust ratio shall not exceed 2/3
- The portion of the total sample retained on the BS19 Sieve shall not exceed 5% of the total Sample

Alternatively, material having a maximum size of 13 in lieu of 19 may be approved.

The particle size distribution shall be in accordance with the requirement of section 5.2 of the NMSRA Guide to the Selection and Testing of Gravel for Pavement Construction and shall be submitted to the Executive Manager Technical Services for approval.

Notwithstanding this specification, and sample which in the opinion of the Executive Manager Technical Services is composed of unsuitable material or composed of material which would break down with ageing or weathering to such an extent that it would then fall outside the limits of this specification, shall be rejected.

The placing, spreading and compaction of the Ferricrete Course shall be undertaken using such methods and equipment as will ensure that a full width course of the required thickness is obtained without damage to any other work or course.

The required width is shown on the drawing 09-107 and must be achieved within -0 +300.

The required course thickness is shown on the drawing and must be achieved within -0 +10.

Should the course upon testing be deficient in thickness then the full depth of the course shall be scarified and additional material added to achieve the thickness specified.

After preliminary placement and compaction the Ferricrete shall be scarified or bladed and sufficient Ferricrete material added to achieve the designed thickness. The loose layer shall be thoroughly blade mixed and watered to its full depth by alternatively blading the entire layer to the centre and back to the edge of the road. The material shall have water added and subsequently allowed to dry back to facilitate eventual compaction. When the Ferricrete is uniformly mixed it shall be spread over the required width to give the required thickness when compacted.

The material shall be compacted using suitable equipment operated by skilled competent operators. Vibratory, steel rimmed and rubber multi-tyred rollers shall be used to ensure full depth compaction and an even dense tight surface layer. Rolling shall proceed along the line of the formation and not across the crossfall (if any).

4.4 BASECOURSE SURFACE

The pavement surface to be surfaced with bitumen shall be swept clean of all loose sand, stones, dust and other foreign matter before surfacing. Adherent patches or foreign matter shall be removed by using hand brooming and steel scrappers or similar methods. The contractor shall confine the amount of pavement sweeping done prior to receiving the bituminous surfacing, only immediately prior to each lot anticipated to receive bitumen surfacing, to prevent contractor's traffic and local traffic from compromising the state of the swept pavement surface prior to receiving the bitumen surfacing.

Loose material shall be swept a sufficient distance off the pavement to permit execution of the bitumen surfacing.

No binder shall be applied until the basecourse has dried back and this dryback has been maintained such that the Characteristic Moisture Content is less than or equal to the proportion of the Optimum Moisture Content (OMC) as specified in "Application Details", and the surface is sufficiently dry to permit application of the binder. The OMC shall be determined by Main Roads WA 133.1.

Where no such proportion of OMC is specified in "Application Details", the Characteristic Moisture Content of the basecourse shall be dried back to 85% of OMC.

The Characteristic Moisture Content (Mc) is defined by the expression:

$$Mc = m + 0.6s$$

Where m = average of 9 sample moisture content determinations
 s = standard deviation of the nine (9) samples moisture content determinations
 calculated in accordance with the Quality System Specification.

The Contractor shall set out and mark the edge of the binder at a position to achieve the specified tolerance and to suit the method of work employed. Details of any line markers established by the Principal are given in "Application Details". The Contractor shall provide such additional markers as are necessary to achieve the specified tolerances.

Application of a light water spray shall precede the application of either a prime or primerseal. The application of the light spray shall be consistent across the width of the proposed seal works.

Prior to any bituminous surfacing as an initial surfacing treatment, the Contractor shall certify to the Technical Service Department Representative that the basecourse complies in all respects with the requirements of the Technical Specification, and that the basecourse surface is suitable to receive a bituminous surfacing.

4.5 AGGREGATE PRIMERSEALS AND SEALS

The dry aggregate shall be uniformly spread over the sprayed area by means of a suitable type of mechanical spreader. The mechanical spreader shall be fitted with removable cut-off attachments to allow the aggregate spread width to match the required width on the pavement. The time lag between spraying and spreading shall be kept to a minimum and all sprayed areas, with the exception of approved lapping strips, shall be covered with aggregate within ten (10) minutes of spraying the binder. The length of spray runs shall be limited to ensure compliance with the requirement.

Prior to the spreading of the aggregate the load in each truck shall be levelled in the body for measurement purposes.

The aggregate shall be placed to form a uniform stone mosaic of single particle thickness, in almost continuous interlocked contact, generally orientated with their least dimension vertical. In order to meet this requirement it may be necessary to apply the aggregate initially at a rate slightly less than appears optimum so that some binder is visible between the stones. Specified aggregate application rates are nominal and should be adjusted to suite the aggregate used to give the correct stone mosaic.

The surface to be sealed shall be dry and no binder shall be applied during wet or rainy conditions, or when adverse weather conditions may prevail at any time during such work. No binder shall be applied whilst the pavement surface temperature is less than:

25°C for seals and reseals or
 20°C for primes or primer seals

The Contractor shall, if requested, provide the Technical Services Department's Representative with safe and convenient access to the sprayer at all times for the purpose of checking the volume before and after spraying by means of the dipstick.

PART 5 - SUMMARY OF MAIN REQUIREMENTS

5.0. RESIDENTIAL CROSSOVERS

- Concrete depth minimum 100mm.
- Reinforced with SL62 mesh.
- Minimum width at front boundary – 4.0m.
- Maximum width at front boundary - 6.0m.
- Minimum strength - 20 MPa at 28 days.
- Surface finish - Transverse broomed.
- 60mm thick bricks and classified as heavy duty by the manufacturer with the base layer to be minimum 100mm deep compacted limestone, gravel or road base. Plus 30mm minimum of bedding sand.
- Wings must be 1.5m wide on both sides of crossover.
- Minimum 40mm thick asphalt on 250mm gravel or 50mm gravel on 200mm crushed limestone.
- If Council requires, the owner must install a minimum 375mm diameter Class 4 Reinforced Concrete pipe including precast headwalls, to cater for the table drain. However, the pipe shall be appropriately sized to convey flows from within the table drain.
- Existing deep open drains (Deeper than 1 meter) will be piped by the Shire to accommodate 4.0m wide (minimum) crossover. For greater width than 4.0m the applicant may be required to pay for the extra works at the current market rates.

5.1 RURAL CROSSOVERS

- Concrete depth - minimum 100mm.
- Reinforced with SL62 mesh.
- Minimum width at front boundary – 4.0m
- Maximum width at front boundary - 10.0m.
- Minimum strength - 20 MPa at 28 days.
- Surface finish -Transverse broomed.
- 60mm thick bricks and classified as heavy duty by the manufacturer with the base layer to be minimum 100mm deep compacted limestone or gravel or road base.
- Wings must be 1.5m wide on both sides of crossover.
- Minimum 40mm thick asphalt on 250mm road base or 50mm gravel on 200mm crushed limestone.
- Minimum 2 coat hot bitumen seal being 14mm Diorite prime and 7mm Diorite second coat on a 250mm gravel base.
- If council requires, the owner must install a minimum 375mm diameter Class 4 Reinforced Concrete pipe including precast headwalls, to cater for the table drain. However, the pipe shall be appropriately sized to convey flows from within the table drain.
- Existing deep open drains (Deeper than 1 Meter) will be piped by the Shire to accommodate 4.0m wide (minimum) crossover. For greater width than 4.0m the applicant maybe required to pay for the extra works at the current market rates.

5.2 COMMERCIAL & INDUSTRIAL CROSSOVERS

- Concrete depth - minimum 150mm.
- Reinforced with SL72 mesh.
- Minimum width at front boundary - 6.0m.
- Maximum width at front boundary – 10m or as approved by Executive Manager Technical Services.
- Minimum strength - 25 MPa at 28 days.
- Surface finish -Transverse broomed.
- 60mm thick bricks and classified as heavy duty by the manufacturer with the base layer to be minimum 100mm deep compacted limestone, gravel or road base.
- Wings must be 2.0 m wide on both sides of crossover
- Minimum 40mm thick asphalt on 250mm-road base or 50mm gravel on 200mm crushed limestone.
- If council requires, the owner must install a minimum 375mm diameter Class 4 Reinforced Concrete pipe including precast headwalls, to cater for the table drain. However, the pipe shall be appropriately sized to convey flows from within the table drain.
- Existing deep open drains (Deeper than 1 meter) will be piped by the Shire to accommodate 6.0m wide (minimum) crossover. For greater width than 6.0m the applicant may be required to pay for the extra works at the current market rates.

Office Use Only

QUOTE DETAILS: (If Applicable)

Actual cost	\$	This quotation is valid for 60 days. No work will commence until the price quoted has been received in full. Upon receipt of the quoted cost your application will be processed and included into our current works programme.
Council Contribution	\$	
Cost payable by you	\$	

Construction / Subsidy application approved / not approved officer:..... Date:

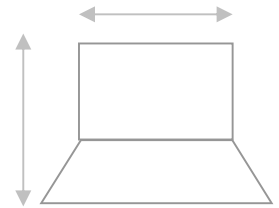
Synergy ID No: Assessment No: Payment Receipt No

Job No: Purchase Order No: Anticipated Completion Date:

Should this crossover be constructed concurrent with any pathway? **YES / NO**

INSPECTION FOR SUBSIDY PAYMENT:

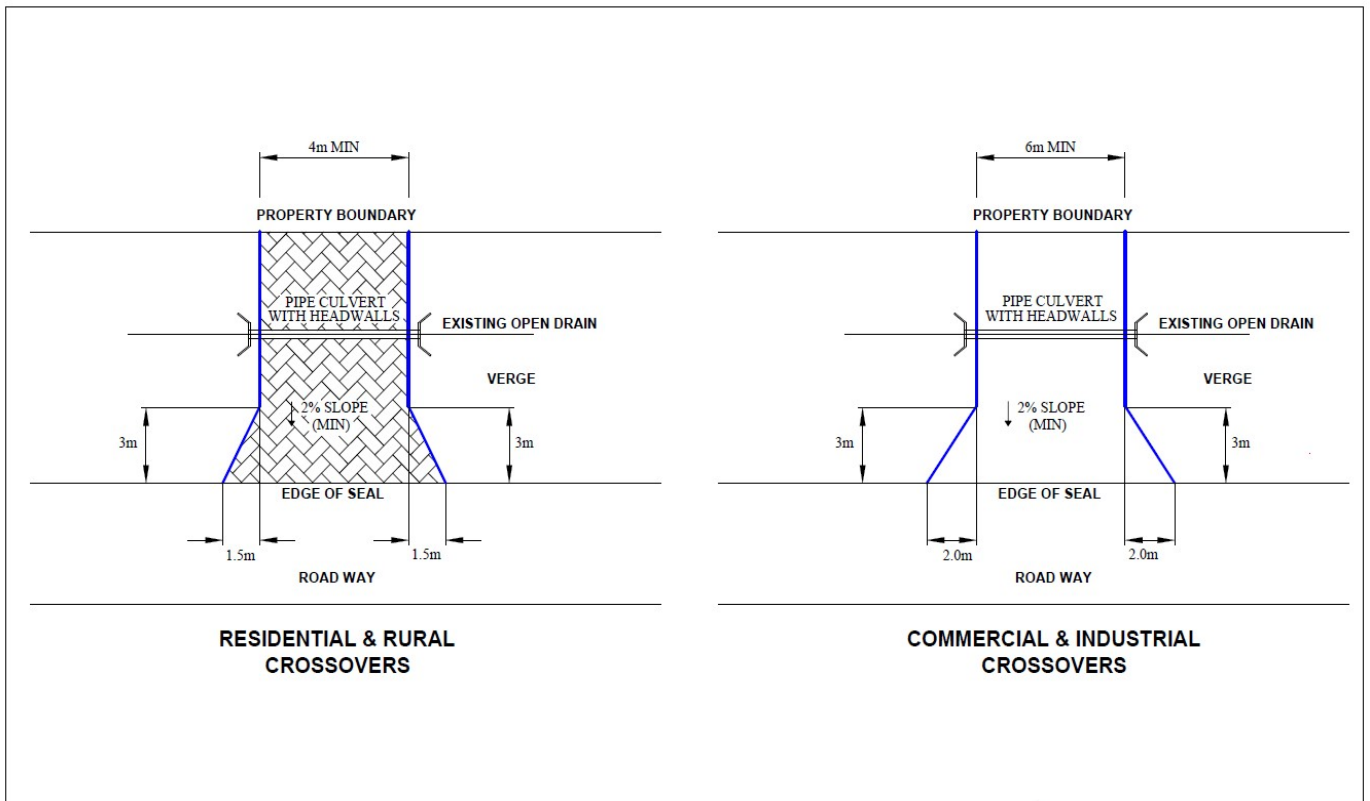
Crossing Slope (2% - 10%)	<input type="checkbox"/>	Edge Restraint	<input type="checkbox"/>	Thickness (100mm)	<input type="checkbox"/>
Crossing Entrance	<input type="checkbox"/>	Header Course	<input type="checkbox"/>	Joints	<input type="checkbox"/>
Kerb Reinstatement	<input type="checkbox"/>	L/Stone Base	<input type="checkbox"/>	Expansion	<input type="checkbox"/>
Footpath Reinstatement	<input type="checkbox"/>	Gravel Base	<input type="checkbox"/>	Surface Texture	<input type="checkbox"/>
Crossing Shape	<input type="checkbox"/>	Sand Base	<input type="checkbox"/>	Paver ≤ 60mm	<input type="checkbox"/>



Payment Approved: By: Signature: Date:

\$

Comments:



RESIDENTIAL & RURAL CROSSOVERS

COMMERCIAL & INDUSTRIAL CROSSOVERS

	<table border="1"> <tr><td>BP</td><td>BOUNDARY PEG</td></tr> <tr><td>GV</td><td>GAS VALVE</td></tr> <tr><td>HB</td><td>FIRE HYDRANT</td></tr> <tr><td>LP</td><td>LIGHT POLE</td></tr> <tr><td>MHT</td><td>TEL. MANHOLE</td></tr> <tr><td>SGN</td><td>ROAD SIGN - EXISTING</td></tr> <tr><td>SP</td><td>STAY POLE</td></tr> <tr><td>I-T-I-T</td><td>EXIST. TELSTRA</td></tr> <tr><td>GAS-GAS</td><td>EXIST. GAS (ALINTA)</td></tr> <tr><td>S-S-S</td><td>EXIST. SEWER</td></tr> <tr><td>W-W-W</td><td>EXIST. WATER</td></tr> <tr><td>P-P-P</td><td>EXIST. U/G POWER</td></tr> </table>	BP	BOUNDARY PEG	GV	GAS VALVE	HB	FIRE HYDRANT	LP	LIGHT POLE	MHT	TEL. MANHOLE	SGN	ROAD SIGN - EXISTING	SP	STAY POLE	I-T-I-T	EXIST. TELSTRA	GAS-GAS	EXIST. GAS (ALINTA)	S-S-S	EXIST. SEWER	W-W-W	EXIST. WATER	P-P-P	EXIST. U/G POWER		<p>SHIRE OF CHITTERING</p> <p>PO Box 70, Bindoon W.A. 6502 6177 Great Northern Hwy, Bindoon W.A.</p> <p>PH: 08 9576 4600 FAX: 08 9576 1250</p>	<p>NORTH POINT</p>	<p>STANDARD CROSSOVERS</p>
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			<p>DRAWN: MDZ</p> <p>DATE: 14/6/2014</p>	<p>SCALE: NTS</p> <p>DRAWING No.</p> <p>14-STD-001</p> <p>SHEET 1 of 1</p>																									

Jim Garrett
Executive Manager Technical Services