Local Government Guidelines for Restoration and Reinstatement in Western Australia

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IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

WALGA

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ACKNOWLEDGEMENT

This publication supersedes the document *'Restoration and Reinstatement Specification for Local Governments in Western Australia, 2002'*. The Authors acknowledge the benefit that this previous document has provided in the compilation of these Guidelines.

DISCLAIMER

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Foreword

To provide greater clarity and certainty for restoration and reinstatement works, the Institute of Public Works Engineering Australasia Western Australia Incorporated (IPWEA) has partnered with the Western Local Government Association (WALGA) to produce Edition No. 1 of the Local Government Guidelines for Restoration and Reinstatement in Western Australia.

These Guidelines are intended to support restoration and reinstatement conditions applied by Local Governments in Western Australia. The Guidelines encompass current legislation and best practice minimum engineering standards. They are intended to guide Local Governments and Persons working on Local Government controlled property, to provide a better understanding of what is required and expected by the community.

IPWEA has committed to updating the Guidelines in the future.

Utilities, Contractors and Local Governments are urged to use this document as their basis for planning, implementing, restoring and reinstating works.

The intent of these Guidelines is to provide a consistent approach to reinstatement and restoration requirements across the State. Local Governments are encouraged to formally adopt these Guidelines where it does not have its own restoration and reinstatement guidelines.

Acknowledgements

This production of Edition No.1 of the Local Government Guidelines for Restoration and Reinstatement was overseen by a Steering Committee on behalf of the Institute of Public Works Engineers Australasia Western Australia Incorporated (IPWEA) and the Western Australian Local Government Association (WALGA).

These Guidelines contain best practice and the latest statutory regulations for the restoration and reinstatement of land within Western Australia.

During the course of the review, the Steering Committee consisted of the following Members:

Mr Rob Willis *(Chair)*	Local Government Engineering Consultant
Mr Mark Bondietti	WALGA
Mr Om Gupta	City of Rockingham
Mr Anthony La Spada	Main Roads WA
Mr Mark Willson	Main Roads WA
Ms Seema Karami	City of Perth
Mr Kanwal Singh	City of Subiaco
Mr Sri Sriranjan	City of Fremantle
Mr Zanya Khama	City of Wanneroo
Mr John Wong	Town of Victoria Park
Mr Andrew Herwig	Town of Victoria Park
Mr Shaun Kan	Town of Cottesloe
Mr Colin Leek	Talis Consultants
Mrs Audra de Pina *(Admin Support)*	WALGA

The contributions of the individuals above and their organisations are recognised and acknowledged for the cooperation and supply of technical data and support for these Guidelines.

Updates

The original Local Government Guidelines for Restoration and Reinstatement in Western Australia Edition 1 was published in March 2020. Document updates are shown in the table below:

Date	Updates	Contents and purpose	Edition No.	Amended Modules

Each update will be listed above with the Guidelines, as amended, available at the following location:

IPWEA website: https://www.ipwea.org/westernaustralia/home

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1 Introduction

The Local Government is responsible for the care, control and management of the local road network within its jurisdiction. This comes with the responsibility of ensuring that all works in the road reserve and on Local Government controlled property are approved and comply with the requirements of relevant legislation and governing documents. Any person planning to undertake such works should first contact the Local Government to obtain information on the relevant permit conditions and approval procedures.

Any party planning works on Local Government controlled property has a duty of care to take all reasonable steps to prevent any person being injured or property being damaged while carrying out the works including reinstatement and restoration works. Under occupational safety and health legislation, an employer is required to provide a safe place of work for employees. Any person who is in control of a workplace shall take measures to ensure people who have access to that workplace – including road users are not exposed to hazards. In addition, there is an obligation to reinstate the site to a safe and functional condition in accordance with the Local Government specifications and permit conditions.

2 Responsibility for Reinstatement

The responsibility for all reinstatements and obtaining approvals remains with the Person working within the road reserve. For any disturbance of any Local Government owned property to install or maintain any service or asset, the owner of that service or asset shall take full responsibility to negotiate with the relevant Local Government officers and affected property owners. For each project, the asset or service provider will provide a contact who shall remain responsible for all discussions or negotiations with the Local Government. Local Government officers shall not be required to enforce standards on Persons; the responsibility remains with the provider.

3 Guideline Scope and Objectives

This Guideline applies to all works executed by Persons in the Local Government road reserve or on any other property under the care and control of a Local Government.

The objective of this Guide is to provide advice on the Local Government's requirements for restoration and reinstatement of works executed by Persons on property under the care and control of a Local Government.

Where work is undertaken on a Main Roads WA Ordinary Highway (all highways excluding Freeways and Controlled Access Highways) in an urban area or in a declared town site, then in most instances Main Roads WA is responsible for the carriageway and related stormwater infrastructure and the Local Government is responsible for the paths and verges. The Person shall liaise with both parties to establish requirements.

4 Related Policies, Standards, Guidelines and Procedures

All restoration and reinstatement of works (planned and unplanned) shall be in accordance with this Guideline and/or as specified by the relevant Local Government.

The following documents are relevant to this guideline:

- *Utility Providers Code of Practice for Western Australia* 2015 or latest version (Utility Services Providers Committee)
- *Traffic Management for Works on Roads Code of Practice* 2018 or latest version (Main Roads Western Australia)

- *Traffic Management for Events Code of Practice* 2017 or latest version (Main Roads Western Australia)
- *AS 1742.3-2009 Manual of uniform traffic control devices, Traffic control for works on roads*
- *WALGA Policy Template, Works in the Local Government road reserve*
- *WALGA Specification 1 – Granular Pavement Materials*
- *WALGA Specification 2 – Sprayed Bituminous Surfacing*
- *WALGA Guidelines and Specifications for Residential Crossovers*
- *WALGA / PTA Partnership Agreement: Defining and Roles and Responsibilities for the Planning, Installation and Maintenance of Bus Stop Infrastructure: 2018 – 2022/23*
- *Main Roads WA Specification 501: Pavements*
- *Main Roads WA Specification 604: Pavement Marking*
- *IPWEA/WALGA Specification for the Supply of Recycled Road Base*
- *IPWEA/AAPA Technical Specification for the Supply and Laying of Asphalt Road Surfacing.*
- *Australian Standard 4970-2009 – Protection of trees on development sites*.

5 Statutory Authority

Local Government Act 1995

Local Government (Uniform Local Provisions) Regulations 1996 (sections 5, 6 and 17)

Land Administration Act 1997

Occupational Safety and Health Act, WA 1984

Occupational Safety and Health Regulations, 1996

Environmental Protection (Noise) Regulations 1997

Relevant Local Law

Telecommunications Act 1997, this Act provides certain exemptions to telecommunications carriers from State and Territory laws including the powers and functions of a local government body. Notwithstanding, it is in the best interest of all concerned that in the majority of cases telecommunications carriers and other utility providers that have exemptions abide with the requirements of Local Government so as to mutually manage and maintain safety in the road reserve for the benefit of all users.

6 Definitions

6.1 Defects Liability Period

This period shall be 12 months unless otherwise determined by the Local Government.

6.2 Reinstatement

This is the process of reinstating existing infrastructure that has been removed or damaged to an approved functional state. This includes roads, footpaths, kerbs, pipes and structures.

6.3 Restoration

This is the work undertaken to restore disturbed areas to an acceptable state. This includes verges, landscaped areas and natural vegetation.

6.4 Person

Means any person, company, public body, association or body of persons corporate or unincorporated and includes an owner, occupier, licensee or permit holder.

6.5 General

CLSM means controlled low-strength material (see Appendix A).

Duty of care means the legal duty of all employers, employees and others including Contractors and Consultants who have an influence on the potential hazards at a work-site, which requires them to take reasonable care to protect the health and safety of others at the work-site including road users who may be at foreseeable risk of harm. [Source: Traffic Management for Works on Roads Code of Practice (Main Roads WA)].

Emergency works means works to address an immediate life-threatening situation or address an immediate event likely to cause substantial damage to public or private property and the consequences of not taking action are judged to be worse than if action is taken.

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

Kerb includes the edge of a carriageway.

Local Government means a Local Government established under the *Local Government Act 1995*.

Planned works means works that are planned for the future and do not require an immediate response. Planned works may be maintenance or capital type works.

Road means a thoroughfare which is defined in the *Local Government Act 1995* as meaning a road or other thoroughfare and includes structures or other things appurtenant to the thoroughfare that are within its limits, and nothing is prevented from being a thoroughfare only because it is not open at each end.

Road authority means the organisation that has responsibility for the care, control and management of the road(s) subject to any works or events.

Road reserve includes the land set aside, gazetted under an enactment, or commonly used by the public as a road and all verges, traffic islands, median strips and other provisions associated therein for the conveyance or travel of people but does not include tenements or freehold land.

Traffic management plan means a document containing Traffic Guidance Schemes and documentation of project details regarding traffic management at a work site. The documentation of project details includes, inter alia, responsible personnel, proposed timing of the works, approvals gained, traffic volumes/type details, documentation of risk management and special provisions for specific road user types e.g. pedestrians and cyclists. [Source: Traffic Management for Works on Roads Code of Practice (Main Roads WA)].

Unplanned works means works to address unanticipated day-to-day maintenance or rectification of failures/breakdowns that require a timely response.

Utility provider means an organisation that provides services consumed by the public, such as, electricity, gas, water, sewerage, communications, transportation, etc.

Verge means that part of a thoroughfare between the carriageway and the land which abuts the thoroughfare but does not include any footpath.

Works means construction and maintenance work or any other work in work-sites wholly or partly within the road reserve boundaries or other lands under the control of a Local Government.

7 Planning the Works

7.1 Application

All persons intending to perform works in road reserves or on property managed by the Local Government that affects Local Government infrastructure are required to give sufficient notice and make an application for works in all cases other than emergency works. The general process for this is contained in Appendix B and the *WALGA Policy Template Works in the Local Government Road Reserve* which can be found on the WALGA website. This document covers 3 categories of works being "Planned", "Unplanned" and "Emergency". Depending upon the category of works different actions will be required.

In addition to the above category of works, the extent of works will also have a large influence as to the actions required by the Local Government from the Person. Minor works for example may require little in the way of preliminaries whereas extensive works will require extensive planning possibly including a "Construction Management Plan" (CMP). Liaison with the particular Local Government will determine which level of planning is required. Examples of the types of activity that will require a "Works Permit" are, but not limited to:

- Permit to erect a gantry, overhead protective awning over the road or footpath
- Permit for a vehicle crossover (permanent or temporary)
- Permit to occupy space on road or footpath
- Permit to erect a hoarding (where it occupies Local Government space outside of an allotment whilst construction work is undertaken)
- Permit for a road opening
- Permit for a road closure
- Permit for a construction zone
- Permit to use a mobile crane, travel tower or lift on or above a road
- Permit for rubbish skips and builder's bins
- Permit for works and temporary structures in Local Government's parks and gardens
- Permit to work outside prescribed hours
- Permit for excavation, underground drilling or thrust boring and/or protection works
- Approval for a legal point of discharge or a temporary point of discharge.

The need for a CMP depends on the nature of work, the likelihood of disruptions, impact on local amenity, dangers or risks involved, traffic management or any other relevant issues required to be addressed to comply with Local Government requirements. A CMP shall be prepared and approved in accordance with directions from the Local Government.

The CMP shall address in detail a range of health (noise, dust, vibration, lighting, pollution, etc.), safety, traffic management, environmental considerations (including disturbance to existing vegetation) and amenity issues relating to the construction site and adjoining community. It shall also consider broader obligations including recycling, waste management and environmental initiatives. Further details of these requirements can be found in Appendix C.

7.2 Dilapidation Report (Condition Report)

A Person shall perform a condition inspection and report before commencing the works. The inspection shall include photographs and be formally documented. It records the current condition and any existing damage of all infrastructure, land and any other things that are likely to be affected by the works.

It shall help to identify if aspects of the works including excavation or vibration, have caused any damage to surrounding infrastructure or adjacent property including; roads, crossovers, driveways, footpaths, verges, landscaped areas, drainage, fences, walls and houses.

7.3 Traffic Management

In most instances, to fulfil duty of care obligations, works in the road reserve will require traffic management to ensure the safety of all road users and workers/staff associated with the site. A traffic management plan (TMP) endorsed by an appropriately qualified person shall be submitted with the application for a permit.

A detailed discussion is required with the Local Government if the works require closure of roads or major interference to vehicular or pedestrian traffic.

Traffic management plans for works on roads are to be prepared in accordance with the current version of the Traffic Management for Works on Roads Code of Practice (Main Roads WA).

For any work at a permanent traffic signal on a Local Government road requiring any of the following, then after authorisation of the TMP by the Local Government, the TMP shall be submitted to Main Roads WA for authorisation at least 15 working days prior to the works commencing.

1. Alteration to the function of the traffic signals or signal display (e.g. flashing yellow, masking displays, modifying movements or phasing); or
2. Closure of a traffic lane (including tapers or road closures):
    a. within a signalised intersection, or
    b. within 30 m of the stop line on the approach, or
    c. within 30 m of the adjacent stop line on the departure, or
3. Closure of any part of a signalised dedicated turning lane.

7.4 Safety at Site Works

Any parties performing restoration works in a Local Government Road reserve or on other property under the care and control of a Local Government has a duty of care and shall take all reasonable steps through hazard identification, risk assessment and implementing controls. This ensures that all workplace hazards and risks are systematically identified, eliminated or adequately controlled to prevent any person from being injured or property being damaged while carrying out the works. Excavations and site works shall be protected by applying traffic management and temporary road safety barrier systems in accordance with the Traffic Management for Works on Roads Code of Practice and the Local Government approval conditions. All temporary restorations and reinstatements shall be fit for purpose and maintained in a safe condition to the approval of the Local Government.

8 Reinstatement of Defined Asset Types

8.1 Roads

8.1.1 Pavement materials

8.1.1.1 Backfill / subgrade material

The trench shall be backfilled with clean sand or the excavated materials providing that the excavated materials are free draining and devoid of any asbestos or other contamination.

When backfilling a trench, the material shall be placed in layers and compacted for the full width of the trench, adding sufficient water to ensure density is achieved. Particular attention shall be taken to ensure compaction extends to the absolute edge of the excavation.

When an excavation is within a road carriageway or within 1.0 m of the edge of a road carriageway the minimum density requirement for trench backfill is 95% of Maximum Modified Dry Density (MMDD). Density may be confirmed using a Perth Sand Penetrometer (PSP).

Note: PSP is applicable only for Perth sand, for other materials testing shall be confirmed by a NATA accredited laboratory.

Where the Person elects or where PSP testing is not suitable, compaction can be determined by density testing. The minimum density requirements are 95% of MMDD and shall be determined in layers of not more than 300 mm.

No backfill material shall be placed more than 1.0 m in depth until that layer has been tested and confirmed that sufficient compaction has been achieved.

The following quantity of testing shall be performed as a minimum:

Table 8-1: Required minimum quantity of compaction testing for trench backfilling on roads

At each position, testing shall be undertaken on both edges and in the centre of the trench. To avoid damage, centre testing should not progress past 300mm above the service.

Length of trench	Positioning	Quantity per layer
< 5m	Each end	6
5m to <10m	Each end and centre	9
10m to <20 m	Each end and two evenly spaced cross sections	12
≥ 20m	Each end and at 5m intervals	≥15

Testing of the reinstated road layer works shall be in accordance with clause 8.1.2.4

Where controlled low-strength material (CLSM) is used, compaction testing is not required. CLSM shall not be used under verges and footways because of the high density of services.

Where surrounding material becomes saturated during excavation e.g. emergency repairs to water and sewerage services, the material shall be inspected by a qualified practitioner who shall document a decision regarding the suitability of retaining the material or authorising removal of all or a portion of the material to expose dry, stable material. The material shall be replaced with acceptable trench backfill material using the methods outlined above. In the case of contaminated effluent, or where asbestos ducting has been broken, all contaminated soil shall be removed.

Where trench shoring is used, backfilling shall be by use of CLSM or other suitable material or technique to ensure that all cavities are filled to provide suitable support. CLSM or Cement Stabilised Sand (CSS) shall be used in all instances where adequate compaction cannot be achieved by conventional means for example under and around pipes or in close proximity to services or structures that may be sensitive to damage from compaction.

8.1.1.2 Granular pavement materials

All granular pavement materials shall be approved by the Local Government and the material shall be either 19-20 mm Crushed Granite Roadbase or 75 mm limestone meeting the requirements of *Main Roads WA Specification 501: Pavements or WALGA Specification 1 – Granular Pavement Materials,* or 20 mm Recycled Crushed Concrete meeting the requirements of the *IPWEA/WALGA Specification for the Supply of Recycled Road Base.*

All pavement materials shall be sourced from reputable suppliers with proven process controls and Quality Assurance Systems. A NATA accredited test certificate for the material to be used dated within one month of material supply shall be submitted to the Local Government to show compliance.

For any extensive reinstatement of greater than 100 m², material test certificates for each granular material used shall be supplied to the Local Government. For any reinstatement greater than 1000 m², a test certificate for each 1000 m² or part thereof shall be supplied.

8.1.1.3 Stabilised pavements

Where an existing pavement is cement stabilised, or constructed of recycled crushed concrete which post hydrates into a bound layer, the pavement shall be reinstated as approved by the Local Government. The layers shall be stepped as shown in Figure 8-1.

Where an existing pavement is constructed of bitumen stabilised base, the pavement shall be reinstated as a full depth asphalt pavement as shown in Figure 8-2. The total depth of the full depth asphalt shall be equal to the stabilised depth.

8.1.1.4 Asphalt

All asphalt shall be supplied and laid in accordance with *IPWEA/AAPA Technical Specification for the Supply and Laying of Asphalt Road Surfacing* current at the time of reinstatement.

All asphalt shall be sourced from reputable suppliers with proven process controls and Quality Assurance Systems.

A NATA accredited test certificate for the specific asphalt types used showing all Marshall properties is to be dated within two weeks prior of material supply and shall be submitted to the Local Government to show compliance with material properties. A subsequent test of the same mix dated within two weeks post material supply shall also be supplied. The mean Marshall density of the two samples shall be used to determine compliance with compaction requirements.

For any reinstatement where more than 100 tonnes of any specific mix type is used, a specific reference sample shall be tested for that particular project.

Asphalt Marshall Blows and mix size shall match that of the adjoining material, but if this cannot be determined, the mix Marshall blows shall be selected in accordance with the *IPWEA/AAPA Technical Specification* for the traffic type and loading. The nominal aggregate size of the mix shall be approximately within the range of 3 to 5 times the laid layer thickness.

8.1.1.5 Sprayed seal pavement

Sprayed seals shall be designed and constructed in accordance with *WALGA Specification 2 – Sprayed Bituminous Surfacing.* The seal design shall be submitted to the Local Government at least one full working day prior to spray. Designs shall be accompanied by full and complete details showing all assumptions made.

The sprayed seals shall be designed to match the surface texture of the existing seal.

8.1.2 Pavement reinstatement

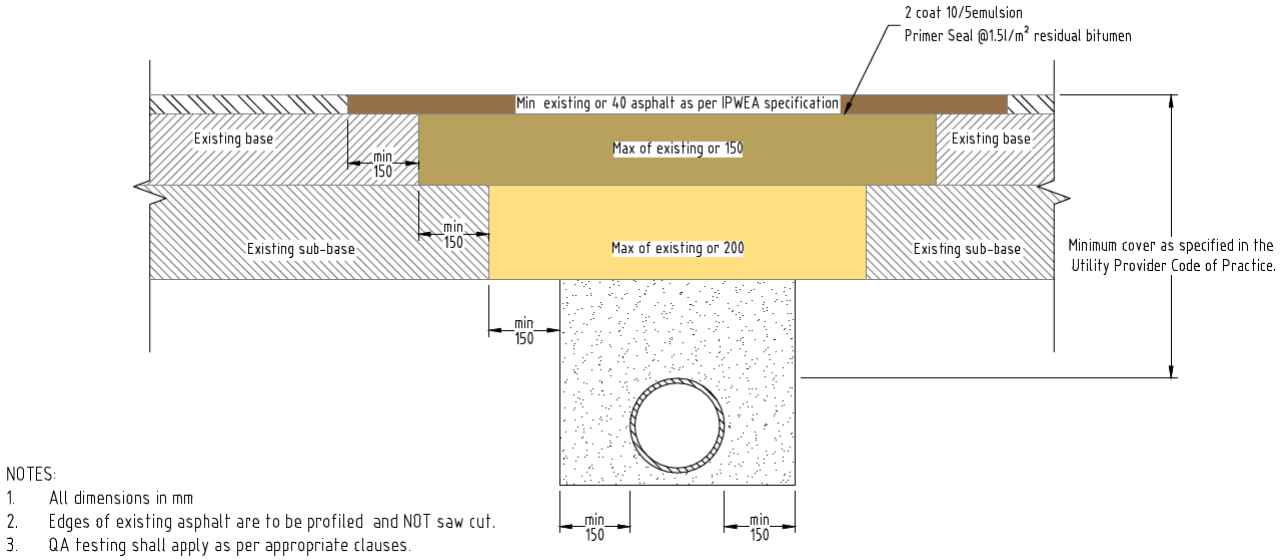
Pavement thickness shall match existing but as a minimum shall be in accordance with Appendix D or as specified by the Local Government. Pavement requirements for District and Regional Distributors and other roads with a high volume of heavy vehicle traffic shall be approved by the Local Government.

Pavement layers shall be stepped in accordance with Figure 8-1 or 8-2. Existing surfaces removed or disturbed by trench excavations shall be reinstated to match the texture, surface type and colour of the existing and adjacent work. Surface joints between old and new work shall be smooth and be undetectable to traffic. Other surface features including line marking, raised pavement markers, signal loops, manhole covers, valve covers and gullies disturbed or removed during excavation of trenches shall be reinstated to a standard that is at least equivalent to the previous standard.

8.1.2.1 Joints

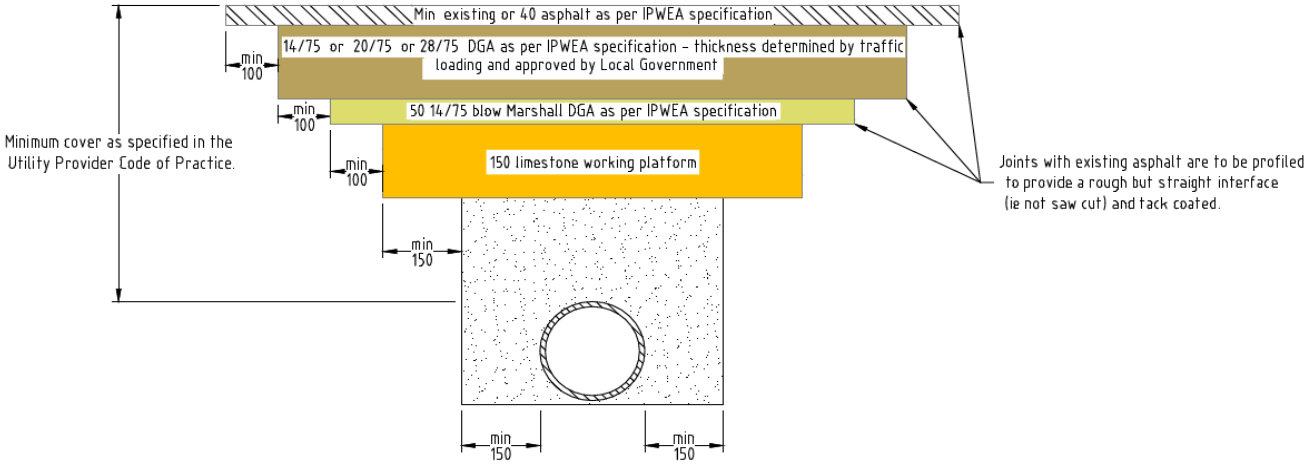
Where reinstatements of trenches are undertaken, the pavement shall be reinstated to such a width that joints are not located on wheel paths. Reinstatements shall be layered such that joints are vertically stepped as shown in Figure 8-1 or 8-2 in the case of a full depth asphalt reinstatement.

Figure 8-1: Typical cross section for reinstatement of trenches



Note: Specified layer thicknesses are a guide for District and Regional Distributor Roads. For Access Roads and Local Distributors, minimum layer thicknesses shall be maximum of existing or as specified in Appendix D.

Figure 8-2: Typical cross section for full depth asphalt reinstatement



8.1.2.2 Patching plan and minimum dimensions

Where trenches are excavated into an existing road that has lane markings, patches shall be reinstated from the lane line to the lane centre, or where the centre of the lane is excavated, for the full lane width.

Patches shall have a minimum dimension of 1.0 m x 1.0 m. in all cases, and no edge of any patch shall lie on the traffic wheel path. Where this is unavoidable, then the edge of the reinstatement shall be widened to the lane edge.

Where patches are closer spaced than 10 m edge to edge in the direction of traffic, the entire length shall be profiled and patched as one continuous patch.

8.1.2.3 Surface profile

Surface profile tolerances for roads and trafficked areas shall meet the following minimum standards:

- deviation from a 3.0 m straightedge shall not exceed 5 mm parallel to the centreline and 7 mm transverse to the centreline excepting at the crown
- deviation from a 1.2 m straightedge shall not exceed 5 mm excepting at the crown
- surfaces to match existing features such as pit covers to within 0 mm to + 3mm.

8.1.2.4 Pavement density testing

For any reinstatement of over 20 m², the Person shall undertake density testing on the subgrade, base and subbase. The subgrade shall be clean sand for a minimum of 300 mm below the bottom of base or subbase and compacted to 95% of MMDD. Subbase material shall be compacted to 95% of MMDD and base to 98% of MMDD.

Table 8-2: Required quantity of density testing for pavement reinstatement works

Surface area of reinstatement	Minimum quantity of density tests
< 20m²	1 test per layer or as directed by Local Government
20m² < 50m²	1 test per layer
50m² < 100m²	2 tests per layer
≥ 100m²	3 tests per layer plus 1 test for each additional 100m² up to 6 tests and then 1 additional test for each 200m² thereafter.

Asphalt density testing shall not be required until areas of over 100 m² are reached, when 1 test per each 100 m² shall be undertaken. Compaction shall meet the requirements of the IPWEA/AAPA specification.

All test results for the pavement and backfill shall be supplied to the Local Government upon request.

8.1.3 Pavement marking

The Contractor shall be responsible for the completion of all documentation required for the approval of pavement marking reinstatement. Documentation and designs shall be submitted to the Local Government prior to submission to Main Roads WA.

When a Stop/Holding line is removed, the Local Government shall immediately inform Main Roads WA on 138 138 or email enquiries@mainroads.wa.gov.au and is to provide the details and location of the lines removed. Temporary lines in the locations of the lines that have been removed shall be installed using 3M temporary tape or similar temporary tape as defined in *Main Roads Specification 604: Pavement Marking*. Stop signs shall not be removed unless approved by the Local Government. Fees for permanent reinstatement may apply.

For all road pavement markings that have been removed or require reinstatement, the Local Government shall organise the reinstatement by arrangement with Main Roads WA (fees may apply). Any signs damaged or removed in carrying out the works shall be replaced immediately.

Where pavement marking is associated with parking bays, the Person shall arrange with a competent Contractor to reinstate the pavement marking to pre-existing standards.

8.1.4 Temporary pavement structure

Where the CLSM or any other material is used as a temporary wearing surface under traffic, final pavement reinstatement shall be applied within 48 hours. The Person shall monitor the site and ensure any potholes or erosion of 25 mm or more is repaired immediately. In areas of pedestrian traffic, the stabilised sand may be left as a wearing surface for up to 4 days, but the Person shall monitor the surface and repair any trip hazards greater than 10 mm immediately.

8.2 Kerbs

8.2.1 General

The shape and dimension of extruded concrete kerbing shall be in accordance with the approved drawings of the Local Government.

8.2.2 Materials

The kerbing shall be constructed using pre-mixed concrete complying with the following:

- Compliance with *AS 1379: 2007 (R2017) Specification and Supply of Concrete*
- Conform to *AS 2876-2000 for Concrete kerbs and channels-manually or machine placed.*

Comply with the following requirements:

Table 8-3: Kerbing construction

Item	Value
Compressive Strength	Minimum 32MPa at 28 days
Aggregate Size	Maximum 10mm
Slump	Maximum 90mm at delivery

8.2.3 Preparation and placement

The road surface shall be thoroughly swept clean of all loose material prior to the kerb being extruded to ensure the maximum bond between the kerb and pavement material.

Kerbs on straight alignments exceeding 10.0 m and on curves of radii exceeding 3.0 m shall be placed by an approved extrusion machine equipped with an automatic levelling device. Kerbing to small radii that cannot be placed with the extrusion machine shall be cast in situ to the same cross-section as the extruded kerbing.

The first 150 mm of any new pour shall be cut away and removed. Any gap between the old and new work shall be filled by hand-placing, rodding and shaping of the concrete until a uniform shape and finish have been obtained.

8.2.4 Tolerances

The finished product shall be true to the dimensions specified and shall be to a smooth finish. Tolerances for kerbing shall be in accordance with the following requirements:

- The top surface of the kerb shall be parallel to the ruling grade of the pavement and free from depressions exceeding five millimetres when measured with a three-metre straight edge.

8.2.5 Contraction joints

Contraction joints shall be constructed at 2.5 m intervals along the new kerbline.

Contraction joints shall be 5 to 6 mm wide gap and shall be cut through the kerb above the road surface level with an approved tool immediately after extrusion. Care shall be taken to avoid disturbing joint edges, with any disturbance made good immediately.

Where the kerb adjoins a footpath, the contraction joints are to coincide with the footpath joints where possible.

8.2.6 Expansion joints

Not less than 24 hours or more than 72 hours after kerb placement, expansion joints shall be formed by completely cutting through the kerb with a suitable cutting wheel at five-metre intervals along the new kerbline, at sides of drainage gullies, at tangent points of all small radius horizontal curves and at junctions with existing kerbing. Expansion joints shall be a minimum of 10 mm +- 2mm wide.

Each expansion joint shall be filled with an approved butyl mastic compound filler and foam or polyurethane backing.

Where the kerb adjoins a footpath, the expansion joints are to coincide with the footpath joints where possible.

8.2.7 Curing

All exposed faces of the completed kerb shall be kept permanently moist for the curing period of a minimum 72 hours after placing. All exposed faces of the completed kerb shall be protected from moisture loss by covering with plastic sheeting or spraying with an approved curing compound.

The kerb shall be protected from rain for at least twenty four (24) hours following placement.

In the event of defacing or damage to the kerb, from the time of its construction until the practical completion stage, the kerb shall be removed and replaced at the Person's expense.

8.2.8 Backfilling

Backfilling to the kerbing shall be placed after curing the concrete and acceptance of the kerbing. Backfill material shall be free draining sand or similar material to the local topsoil, free from debris and compacted to a thickness not less than that of the surrounding natural surface.

8.2.9 Keyed kerbing

Where keyed kerbing is specified on approved drawings, excavation of the base shall be by an approved method. The primed road surface beyond the line of the face of kerb shall not be disturbed.

Provision shall be made in the base key for extension of the expansion joint through the complete kerb section.

8.3 Footpaths and Shared Paths

8.3.1 Backfill / subgrade material

Trenches shall be backfilled with clean sand or the excavated materials provided that the excavated materials are free draining and clear of any contamination including asbestos.

Layers shall be compacted to a minimum of 95% MMDD. Particular attention shall be applied to the final 200 mm ensuring that it is adequately watered, free from clay or other substandard material and thoroughly compacted and shaped to provide a dense uniform surface. When granular materials are used for trench backfill, the material shall be placed in layers with a maximum depth of 300 mm and compacted for the full width of the trench.

The minimum density requirement for trench backfill under footpaths or shared paths is 95% of MMDD. Density may be confirmed using a Perth Sand Penetrometer (PSP), for clean Perth sands compaction shall continue until a minimum of 9 blows per 300mm layer is achieved.

For other materials, the density testing requirement must be confirmed by a NATA accredited laboratory.

Where the Person elects or where PSP testing is not suitable, compaction can be determined by density testing and this shall override the requirements of achieving specific penetrometer results. The minimum density requirements are 95% of MMDD and shall be determined in layers of not more than 300 mm.

No backfill material shall be placed more than 1.0 m in depth until that layer has been tested and confirmed that sufficient compaction has been achieved.

The following quantity of testing shall be performed as a minimum:

Table 8-4: Required minimum quantity of compaction testing for trench backfilling on footpaths

At each position, testing shall be undertaken on both edges and in the centre of the trench. To avoid damage, centre testing should not progress past 300mm above the service.

Length of trench	Positioning	Quantity per layer
< 5m	Each end	6
5m to <10m	Each end and centre	9
10m to <20m	Each end and two evenly spaced cross sections	12
≥ 20m	Each end and at 5m intervals	≥15

8.3.2 General requirements

Any pits within the surface shall be suitable for light vehicle traffic and shall finish flush and level with the surrounding surface to within 0 mm to + 5 mm. Surface reinstatement shall be cut back to edges so as to minimise longitudinal joints. The reinstatement shall match the existing materials in colour and texture and all grades shall be replicated so as to fully restore functionality for pedestrians and drainage.

When works involve the replacement of footpaths at road pedestrian crossings, irrespective of the pre-existing formation, a ramp compliant with the needs of wheelchairs and mobility scooters shall be provided. Ramps shall be constructed in accordance with the Local Government's standard drawing or in the absence of such, in accordance with *Main Roads WA Standard Drawing 9831-5649-3*. Where tactile pavers existed prior to the works, these shall be replaced in accordance with *Main Roads WA Drawing Number 200931-0089-5.Materials.*

Footpath construction will generally be either concrete, asphalt or block paving. All reinstatement shall be in accordance with the specifications in Appendix E, or as specified by the Local Government.

All test results shall be supplied to the Local Government upon request.

8.4 Crossovers

A crossover is defined as a constructed crossing giving access from a public thoroughfare to private land or a private thoroughfare serving the land.

For planned works, property owners and residents should be consulted at least 14 days prior to work commencing. For emergency and unplanned works, the owner and residents should be consulted as soon as practically possible.

Disruptions to property access should be avoided and thrust boring alternatives should always be considered first. If disruption to access is unavoidable then this should be minimised and affected users of the crossing shall be consulted at the earliest opportunity. If necessary, interim access arrangements shall be provided by deploying temporary reinstatement, bridging devices or by constructing alternative access. The positioning of pits and covers in the crossover should be

avoided. If unavoidable then they shall be designed to an acceptable standard to accommodate the anticipated loading.

All residential crossover reinstatement shall be completed at the direction of the Local Government and the *"Guidelines and Specifications for Residential Crossovers (WALGA)"*. Industrial crossovers shall be reinstated at the direction of the Local Government. Longitudinal and horizontal grades and boundary levels shall be preserved and only altered at the direction of the Local Government. Drainage functionality shall be maintained.

If the crossing is constructed from customised materials then the Person shall negotiate reinstatement specifications with the owner. Unsightly part patching is not acceptable and the surfacing material shall be cut back to an extent that achieves an acceptable and agreed aesthetic and engineering outcome.

All work shall be performed in accordance with an approved TMP with due consideration to the safety of pedestrians.

8.5 Protection of Stormwater

8.5.1 Pre and post works requirements

Surveys are required to determine the condition of existing enclosed stormwater drains at the pre and post-construction stages when a trench is running parallel to an existing pipe and is excavated under the following conditions:

1. Is within 0.5m of the pipe edge or,
2. within a distance from the pipe edge equal to the diameter of the existing stormwater pipe; and
3. is to be excavated to a level deeper than half the pipe diameter or 0.3 m above pipe invert.

Should the pipe be fouled by debris, silt or tree roots such that a survey cannot be undertaken, the Person shall advise the Local Government which shall arrange for the cleaning of the pipe to allow the survey to be performed. Cleaning of the pipe by the Local Government shall not unreasonably delay the works.

The Person shall submit to the Local Government a copy of the report and a video display of the pre and post-construction closed circuit television camera (CCTV) inspections. Should any changes in alignment, structural integrity or join opening be observed as a result of the Persons activities, the Person shall propose a remedial plan for Local Government approval.

Where a service is to be placed in an open trench and crosses under a Local Government drain, the method of pipe support shall be submitted to the Local Government prior to works commencing. The pipe shall be inspected both prior to and after the service installation when the trench is backfilled to the underside of the pipe. Backfill shall be CLSM or CSS to the invert of the pipe. Any damage observed to the Local Government's pipe shall be repaired to the satisfaction of the Local Government. A pipe video inspection shall be performed 6 months after completion of the works. Should any changes in alignment, structural integrity or join opening be observed as a result of the Person's activities, the Person shall propose a remedial plan for Local Government approval.

8.5.2 Trenchless technology

Where trenchless technology is used and is to pass over or under or within 0.5 m parallel to a Local Government pipe, the installation shall be treated as a trench parallel to the pipe and the same conditions applied as stipulated in 8.5.1.

If during a subsequent video inspection, the installed service is found to be inside the stormwater pipe, it shall be removed from the pipe and the pipe repaired as per section 8.5.3.

8.5.3 Pipeline restoration

Where a pipe is damaged, the affected pipe length shall be removed and replaced to the satisfaction of the Local Government. The Local Government shall be invited to witness all stages of work and shall be notified to inspect the pipe and approve the restoration before backfilling.

8.5.4 Pipes and precast components

All pipes and precast components incorporated in the restoration works shall be in good condition and free of cracks, chips and deformities. Any items damaged by the Contractor shall be rejected, removed from the site and replaced with new materials.

8.5.5 Pollution control – drainage gullies and pits

The Person is responsible for submitting the method of pollution control in their CMP for Local Government approval (e.g. construct bunds and direct spills or wash water away from the drain).

8.5.6 Dewatering

Trenches should be kept free of standing water. The method shall be at the discretion of the Person and may be well- point dewatering or open pumping. In wet conditions where groundwater is above the base of the trench, bedding material should be crushed rock material a minimum of 150 mm thick.

A dewatering licence shall be obtained unless:

- the development is within the water table (non-artesian) aquifer; and
- water is taken from the well solely for the purpose of removing underground water to facilitate construction or other activity (that is, dewatering); and
- the water is taken at a pump rate not exceeding 10 litres per second over a period of less than 30 consecutive days; and
- the volume of water taken over the period does not exceed 25,000 kilolitres.

Irrespective of whether a licence is required, disposal of dewatering water shall be to the requirements of the *Department of Water and Environmental Regulation Water quality protection note 13: November 2012 - Dewatering of soils at construction sites*.

8.6 Verges, Parks and Reserves

8.6.1 General considerations

Verges are defined as all areas between the road edge and the road reserve boundary excluding footpaths and crossovers. The conditions in this Section shall also apply to Local Government managed parks and reserves. There may be various established components on these areas including lawns, gardens, trees, fences and reticulation. Any disturbance of any of these components shall be reinstated to pre-construction condition however, the Person shall consult with the Local Government to determine if established treatments are acceptable in accordance with the Local Government's treatment policies. The Person shall consult with the adjacent property owner and the Local Government to establish reinstatement requirements before commencing work.

The verge is generally the alignment that is used to locate utility services and the Person is responsible to take all reasonable measures to locate and identify all services in the vicinity of the works and to comply with the requirements of the relevant service authorities.

Verges, parks and reserves, especially in regional areas, may contain natural vegetation and the Person shall comply with all requirements relating to the disturbance of natural vegetation. The Person is responsible to reinstate all work to an aesthetic and functional state that is equivalent to or better than the pre-construction state and the disturbed area shall be restored so that it blends into the surrounding undisturbed verge. All contaminated top soil shall be removed and replaced with an approved alternative.

Verges, parks and reserves may be subject to vehicle or pedestrian traffic and all planning requirements as specified in Section 7 shall apply.

8.6.2 Backfill / subgrade material

Trenches shall be backfilled with clean sand or the excavated materials provided that the excavated materials are free draining and clear of any contamination including asbestos.

Backfill materials shall be placed in layers with a maximum depth of 300 mm and compacted for the full width of the trench. Layers shall be compacted to a minimum of 95% MMDD. Compaction requirements shall be confirmed using a PSP or density testing and records shall be kept and provided to the Local Government upon request.

If a trench is within 1.0 m of a road carriageway then the requirements of 8.1.1.1 shall apply.

8.6.3 Turfed areas

This applies to grassed areas that are maintained. The underlying layers of topsoil previously stockpiled shall be replaced, raked smooth and lightly compacted. If necessary, the area shall be rotary hoed to break up lumps. The previously stripped and stacked turf shall then be re-laid and lightly compacted and well-watered. The Person and the Local Government shall agree on a maintenance management plan during the defects liability period. In the event of the turf dying or deteriorating within the12 month's defects liability period, the Person shall replace the turf using new turf of the same species obtained from a reputable commercial nursery.

The stockpiled topsoil of grassed/lawn areas (unable to be turfed) shall be re-spread, raked smooth and watered. If necessary, it shall be rotary hoed to break up lumps and lightly top-dressed with a suitable sand to create a surface equal in appearance to the surrounding area.

Reinstatement of synthetic turf is generally the responsibility of the relevant property owner but some Local Governments do not allow synthetic turf and the Person shall discuss the appropriate action with the Local Government.

All rocks or larger bits of spoil (larger than 30 mm diameter) are to be removed and disposed of offsite.

8.6.4 Non-turfed areas

Ungrassed or sparsely grassed surfaces shall be reinstated using the stockpiled topsoil and raked to a smooth level finish to match the appearance of the undisturbed surround. The areas shall be top dressed lightly with suitable sand and raked as necessary to remove all ruts and depressions.

All rocks or larger bits of spoil (larger than 30 mm diameter) to be removed and disposed of offsite.

8.6.5 Landscaped areas

The Person shall seek direction from the Local Government before reinstating landscaped areas. Treatments can range from a native garden to a vegetable garden, rockeries and synthetic grass. Some elements may not comply with the Local Governments verge policy in which case the Person shall follow the directive of the Local Government. The Person shall make every effort to preserve landscaped areas and materials so that reinstatement to the prior condition can be achieved.

8.6.6 Shrubs, trees and plants

The Person shall seek direction from the relevant Local Government regarding trees and shrubs requiring removal or trimming prior to work commencing. No street trees are to be pruned or removed without this advice and the approval of the Local Government.

Trees, shrubs and plants that are damaged or removed shall be replaced according to the direction of the Local Government and the property owner. Restoration of Local Government trees, shrubs and plants shall be subject to 12 months defects liability period.

The surface is to be restored using the stockpiled topsoil for the top 200 mm compacted to a density of the surrounding soil. The areas shall be mulched as necessary to match surroundings or previous condition.

8.6.7 Reticulation

The Person shall be responsible for restoring all reticulation removed or damaged as part of their works. The property owner or Local Government shall be consulted and notified of the planned works to ensure that an alternative watering regime is in place prior to the disruption of the reticulation system. The Person will be responsible for providing this interim arrangement until the watering systems are reinstated to the satisfaction of the owner. The Person shall perform a final reticulation test.

8.6.8 Street tree protection

Before commencing any work, the Person shall establish the Local Government conditions for the identification and protection of street trees and any other requirements for works in the vicinity of identified trees.

Local Governments place a high value on their tree population and any excavation work within the Tree Protection Zone shall be conducted in accordance with *Australian Standard 4970-2009 – Protection of trees on development sites*. This also applies to the protection of tree roots during thrust boring and trenching operations.

8.6.9 Naturally Occurring Vegetation, Flora and Fauna

The Person is solely responsible to obtain all the required permissions for the disturbance or otherwise of any naturally occurring vegetation, flora or fauna including Native Title clearances and vegetation clearing permits. The Person is required to ascertain and obtain all the required permissions for his activities and any permit issued by a Local Government does not in any way release the Person from these requirements.

8.7 Structures

All structures such as fences and walls shall be restored to the previous condition or better and according to direction from the Local Government. Aesthetic and engineering function shall be restored appropriately in accordance with the relevant Australian Standards. Some affected structures may be on private property or be unapproved and the Person shall consult the Local Government and the property owner before commencing work. The Person shall install temporary works to maintain structural function during the works.

8.7.1 Street furniture

The Person is responsible to obtain permission from the relevant owner regarding all affected street furniture, services and infrastructure. The Person shall be responsible for all street furniture and service relocations and associated costs. Reinstatement of all street furniture shall comply with disability access requirements.

8.7.2 Bus stop infrastructure

Reinstatement of bus stop infrastructure shall be executed with due regard to the *"Partnership Agreement between WALGA and the Public Transport Authority – Defining the Roles and Responsibilities for the Planning, Installation and Maintenance of Bus Stop Infrastructure: 2018–2022/23"*. Core bus stop infrastructure is the responsibility of the PTA and ancillary bus stop infrastructure is the responsibility of the Local Government. The relevant party shall be consulted as soon as possible for approval of all works affecting such infrastructure. The relevant party will issue instruction regarding the management of disruptions, reinstatement specifications and upgrading requirements that may be triggered to comply with Disability Standards.

8.7.3 Retaining walls

Reinstatement of all retaining structures shall be to the original design standard or better and works shall be certified by a registered structural engineer before hand over to the land owner or managing authority.

8.7.4 Utility pits and covers

No work is to commence before service authorities have been notified and services have been located. The Person is responsible for all service relocations, reinstatements and associated costs. The Person is responsible to obtain all the necessary approvals, permits and specifications that may be required by affected utilities.

Inspection openings shall be adjusted to the level of the finished footpath. The Person shall be responsible for any damage done to public utility services, inspection openings, etc. sustained as a result of the works.

All pits covers shall be designed for light vehicle (5T) loading or unless otherwise specified by the Local Government. The positioning of pits and covers in crossovers or in the trafficked wheelpath should be avoided. If unavoidable then they shall be designed to an acceptable standard to accommodate the anticipated loading.

8.7.5 Street Lighting

Street lights may be under the management of the relevant electricity distributor (Western Power, Horizon Power) or Local Government. Where works will impact on the lighting column or cabling, approval shall be received from the asset owner. If existing or relocated street lighting poles are within the scope of the project, the luminaires are to be fitted with new lamps and cleaned. Any modification to the lighting requires the entire asset(s) to be checked for compliance with the current standards at the time of design. Where works will require temporary disconnection of street lighting, any need for temporary lighting shall be agreed with the relevant road authority, prior to works commencing.

8.8 Private Property

In general, reinstatement on private property should be considered the same as within the road reserve.

9 Inspections, Acceptance, Faults and Failures

Acceptance of all works shall be in accordance with the relevant Local Government. The Person shall allow the Local Government representative access to the site at any time. As soon as possible after completion of the work, the Person shall arrange a handover inspection with the Local Government. The Person shall provide the Local Government with all relevant information including test results, inspection videos and engineering verifications upon request.

Any defects or faults identified during the handover inspection shall be repaired within 10 working days or as otherwise agreed. A 12 months defects liability period shall apply unless otherwise agreed by the Local Government. If any defects manifest during the defects liability period, the Person shall be responsible to repair as soon as possible. If the defect is a hazard to vehicle or pedestrian traffic then the Person shall take immediate action to repair or install temporary measures to ensure that the safety of pedestrians and vehicles. The Person shall be responsible for any damage to property or injury to persons occurring as a result of defects in the liability period.

Appendix A (reference section 8.1 Roads)

Trench backfill with controlled low-strength material

Controlled Low-Strength Material (CLSM) is a cementitious fill that is in a flowable state at the time of placement and has limited compressive strength to facilitate subsequent excavation.

Where backfill may have to be excavated at a later date, the strength of CLSM shall be limited. Strengths up to 2 MPa at 28 days can generally be excavated using normal construction equipment.

As CLSM is a highly fluid material, consideration shall be given to the lateral pressure exerted during placement; lightweight pipes etc. may need to be anchored to prevent flotation.

The trench should be filled to slightly above the bottom of the pavement. This allows for bleed water in the mix, which will rise to the surface, and for some plastic settlements to occur.

If it is not practical to place the pavement immediately, the trench may be filled flush with the pavement surface and the CLSM temporarily used as a wearing surface. The CLSM can be later removed to the required depth and the pavement material placed.

Where the CLSM is used as a temporary wearing surface under traffic, the pavement shall be reinstated within 48 hours. The Person shall monitor the site and ensure any potholes or erosion of 25 mm or more is repaired immediately. In areas of pedestrian traffic, the stabilised sand may be left as a wearing surface for up to 4 days, but the Person shall monitor the surface and repair any trip hazards greater than 10 mm immediately.

Where it is necessary to carry out pavement restoration within 24 hours, mixes giving 28 day strengths of at least 1.5 MPa to 2 MPa should be used. CLSM backfill should be protected from any foot or vehicular traffic until it has hardened.

The Person shall supply test certificates from accredited pre-mixed concrete suppliers demonstrating compliance with the following criteria:

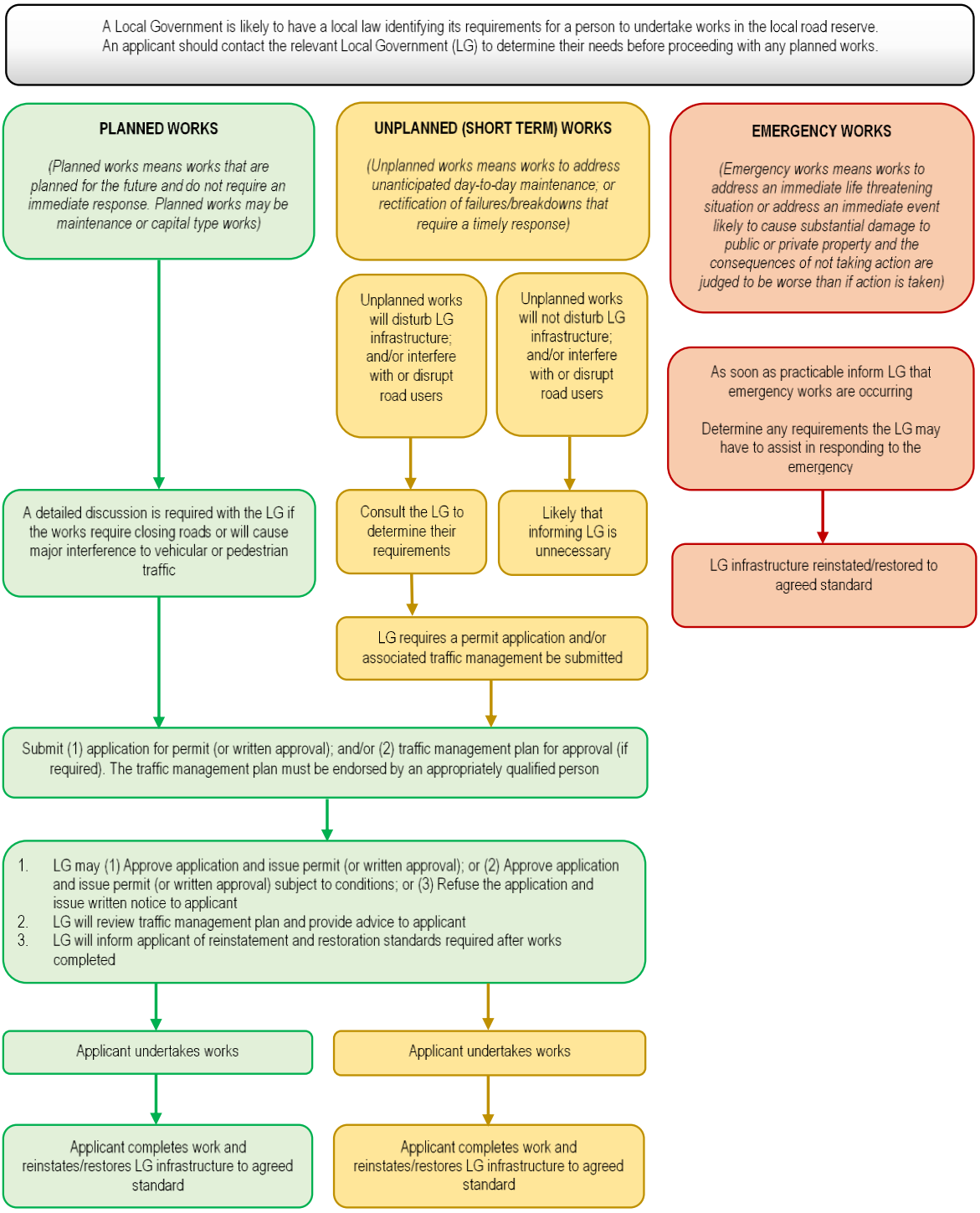
- slump ≥ 200 mm
- minimum 28 day compressive strength = 1.5 MPa
- maximum 28 day compressive strength = 2.0 MPa

Site mixed CLSM shall not be permitted under any road or path unless an approved design and confirmation with 3 NATA accredited test certificates on 3 separate batches is supplied prior to works commencing, and at least 1 test per days' work is sampled and tested by an independent NATA accredited laboratory and results forwarded to the Local Government within 30 days of testing.

Should the test fail to meet the specified 28 day compressive strength, the Local Government may, at its discretion, require the removal and replacement of the CLSM.

Appendix B (reference section 7.1 Application)

Process of advising Local Government of works in the road reserve



Appendix C (reference section 7 Planning the Works)

Construction Management Plans for Works within Road Reserves

Local Government requires careful management of excavation, demolition and building works within its municipal boundaries. To achieve this, the Local Government may require the Person to prepare a Construction Management Plan (CMP) that takes into account all relevant aspects of work activities within the road reserve.

The need for a CMP depends on the nature of work, the likelihood of disruptions, impact on local amenity, dangers or risks involved, traffic management or any other relevant issues required to be addressed to comply with Local Government requirements. A CMP shall be submitted to the Local Government 4 weeks in advance, fully addressing each new stage of construction or work activities.

The CMP shall address in detail a range of health (noise, dust, vibration, lighting, pollution, etc.), safety, traffic management and amenity issues relating to the construction site and adjoining community. It shall also consider broader obligations including recycling, waste management and environmental initiatives.

Elements of the Planning works required by Local Government

The Person shall identify the specific requirements for each site to ensure that the proposed works are clearly presented to the affected community members and road users, and that the works will be undertaken in a safe and effective manner. The CMP Elements are:

- **Element 1:** Community Engagement, Public Safety, Amenity and Site Security
- **Element 2:** Operating Hours, Noise and Vibration Controls
- **Element 3:** Air and Dust Management
- **Element 4:** Stormwater and Sediment Control
- **Element 5:** Waste and Materials Re-use
- **Element 6:** Traffic Management
- **Element 7:** Environmental Considerations

Local Government Powers

The Local Government has the authority to ask for a CMP which shall be submitted 4 weeks prior to work commencement on site.

The Local Government may require a security deposit to be provided in relation to a CMP. In the event of non-compliance with the approved CMP, the Local Government reserves the right to draw from the deposit to undertake rectification works.

Appendix D (reference section 8.1.2 Pavement reinstatement)

Pavement reinstatement requirements

Road Hierarchy	Subgrade Condition	Subbase	Basecourse	Primer seal	Wearing Course	Thickness of Asphalt	Comments
Access Road	Sandy/silty soil with CBR>=10	Limestone 150mm	Crushed rock, gravel or ferricrete basecourse material. Reclaimed concrete road base may be considered. Minimum thickness -100mm	Two coat emulsion 10/5 @ 1.5 l/m^2 residual bitumen	Dense Graded Asphalt AC7 (50 blow) or AC10 (50 blow)	30mm	For clayey soil with CBR value <=10, pavement design is required
Local Distributor	As above	Limestone 150mm	As above	As above	SMA 7 (50 blows) or AC 10 (Class 320 75 blows)	30mm	As above
District Distributor B	As above	Limestone 200mm	As above Minimum thickness 150mm	As above	As above but AC 14	40mm	As above
District Distributor A	As above	Limestone 200mm	As above Minimum thickness 150mm	As above	As above but AC 14	Min of 40mm	As above
Regional Distributor	As above	Suitable local available material subject to LG approval	Suitable local available material subject to LG approval	As above for asphalt wearing course	AC 14 or Double-Double seal	40mm for DGA	Pavement thickness dependent on materials and traffic and subject to pavement design.

Note:

1. *For District Distributors in areas of heavy traffic, if thick lift asphalt is the basecourse replacement option, then the basecourse shall be a minimum of 80 mm thick AC20 and the wearing course shall be minimum 40mm AC14/SMA14 or equivalent.*
2. *The above requirements are not to be used for any roads under the control of Main Roads WA.*
3. *Materials to comply with the following specifications:*

   IPWEA / AAPA Technical Specification for Supply and Laying of Asphalt Road Surfacing
   WALGA Specification 1 - Granular Pavement Materials or Main Roads WA Specification 501: Pavements
   WALGA Specification 2 – Sprayed Bituminous Surfacing
   IPWEA/WALGA Specification for the Supply of Recycled Road Base

Appendix E (reference section 8.3 Footpaths and Shared Paths)

Specifications for Footpaths and Shared Paths

Concrete footpaths and shared paths

a) **Compaction** – The subgrade shall be compacted to a minimum of 95% Maximum Dry Density (MMDD). Compliance to be in accordance with Local Government direction.

b) **Concrete** – All concrete used shall develop a compressive strength of 25 MPa at 28 days. The concrete to be used shall be composed of a mixture of sand, cement, aggregate and water to give strength specified with a maximum slump of 80 mm. Concrete and its placement shall conform to AS 1379 (1991) and AS 3600 (1988) respectively.

c) **Reinforcement** – Steel reinforcement may be required in the construction of footpaths in industrial areas or where there are higher levels of projected traffic and load.

d) **Placing concrete** – The base shall be thoroughly and evenly moistened, but not saturated, prior to placing concrete. All stones or other deleterious materials shall be removed from the base prior to pouring concrete. Concrete shall be evenly placed to the depth specified and shovelled into position continuously and spaded, especially at all edges, to give maximum density. No concrete shall extend on the road surface. No break in operation shall be permitted from time of placing concrete to finishing.

e) **Finishing** – Surface finish shall be obtained by screeding to the correct levels and finished with a transverse brooming tool to provide a non-slip dense surface, free of any depressions, float marks, irregularities, honeycomb sections or slurry likely to cause excessive surface wear. Edges shall be smoothed using a 100 mm wide edging tool.

f) **Jointing** – On shared paths use lockjoints. Expansion joints shall be full depth joints and filled with bitumen-impregnated canite or similar approved material and butyl mastic sealer. Expansion joints should be located at:

   i. The lot boundary and both sides of a path where there is a path and also at the back of the kerb section adjoining the crossing.

   ii. Where it adjoins a rigid structure or any public utility structure.

   iii. The ends of the existing kerbing where kerbing has been removed.

   iv. Lockjoints shall be placed at 4m intervals with expansion joints at 20m intervals.

   Contraction joints shall be made with an approved jointing tool with 2.0 m maximum spacing either laterally or longitudinally.

The extent of concrete paving reinstatement shall fully extend to existing adjoining joints e.g. contraction joints, shrinkage control joints or pattern lines. Surface texture shall be restored and any surface highlighting shall match the existing surrounding surfaces. The design of the pit lids shall conform to the requirements agreed between the Local Government and the asset owner.

Concrete shall be laid at the design slump for that mix. Admixtures may be used to increase flowability, but uncontrolled addition of water to increase flowability on site shall not be permitted.

Block paving

a) **Base Material** – Base course material shall be in compliance with the *WALGA Specification 1 – Granular Pavement Materials (Type 1.2, 2.2 or 3.2)* or at the direction of Local Government.

b) **Base Course** – Base course is to have a total consolidated thickness of not less than 100 mm for residential applications. Material to be spread, rolled, water-bound and corrected as necessary to shape, grade, etc.

c) **Compaction** – The base course shall be compacted to 98% of the MMDD. The subgrade shall be compacted to a minimum of 95% MMDD. Compaction control shall be at the direction of Local Government.

The block pavement shall be compacted and brought to level by not less than three passes of the vibrating plate compactor. Plywood of 12 mm thickness shall be used either attached to the base of the compactor or laid on the blocks as a cushion to prevent damage to the surface. Compaction control shall be at the direction of Local Government.

d) **Bedding layer** – The bedding layer shall have a pre-compacted depth of 20 mm to 40 mm, such that the final compacted thickness is within a tolerance of 25 mm ± 10 mm. The bedding layer shall be well-graded concreting sand, free of deleterious soluble salts and other contaminants. The sand should be of uniform moisture content and is to be spread over the compacted base course and screeded in a loose condition.

e) **Paving Blocks** – The paving units shall be either clay or concrete, 60–76 mm thick complying with AS4455 and AS4456.

f) **Laying** – The paving blocks shall be laid onto the loose bedding sand with a gap of approximately 2-3 mm between adjacent blocks Part blocks shall be neatly cut to size with a hydraulic guillotine, bolster or saw.

g) **Joint filling** – The sand used for joint filling should be finer than the bedding layer. 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.

h) **Edge restraint** – Edge restraint shall be provided to withstand vehicle impact and prevent lateral movement of the paving bricks. Edge restraint can be provided by placing at least 100 mm wide (preferably 250 mm wide) and 100 mm deep minimum cast in-situ concrete strip or precast concrete kerb along all unrestrained edges. The use of sand/cement mortar is not recommended as an edge restraint.

Asphalt

a) **Base Material** – Base course material shall be in compliance with the *WALGA Specification 1 – Granular Pavement Materials (Type 1.2, 2.2 or 3.2)* or at the direction of Local Government.

b) **Base Course** – Base course is to have a total consolidated thickness of not less than 100 mm. Material to be spread, rolled, water-bound and corrected as necessary to shape, grade, etc. The thickness shall be increased to 150 mm if the asphalt is to be paver laid.

c) **Compaction** – The base course shall be shaped and compacted to 98% of the maximum dry density. The subgrade shall be compacted to a minimum of 95% MMDD. Compaction control shall be at the direction of Local Government.

d) **Asphalt** – Black asphalt shall be type RAC10 with 50 Marshall Blow, red asphalt shall be type AC10 Laterite with 50 Marshall Blow in accordance with IPWEA/AAPA specification for supply and laying of asphalt road surfacing.

e) **Laying** – Asphalt work should not be done in cold, windy or wet conditions as thin layers of asphalt (30 mm or less) cool rapidly in these situations and will not be compacted adequately. The finishing work shall be undertaken while the material is hot, to produce a fine, dense, smooth surface, free of surface voids.

f) **Edging** – Edge restraints shall be reinstated to match existing.

Table E-1: Schedule of requirements for footpaths

Schedule of Requirements		
CONCRETE		
Item	**Residential**	**Industrial**
Thickness	100mm	150mm thick. F72 reinforcing mesh shall be provided 50mm above base of slab.
Concrete Strength Capacity @ 28 days	25 MPa / 80mm slump	25 MPa / 80mm slump
BLOCK PAVED		
Item	**Residential**	**Industrial**
Thickness of Blocks	60mm min	80mm min
Sand Bedding	25mm ± 5mm	25mm ± 5mm
Basecourse (crushed stone or gravel)	100mm	150mm
OR	150mm	
Basecourse – Limestone		200mm
ASPHALT		
Item	**Residential**	**Industrial**
Asphalt	25mm	30mm
Basecourse (crushed stone or gravel)	100mm	150mm
OR		
Asphalt	40mm	40mm
Basecourse - Limestone	150mm	200mm

Note: Specified thicknesses assume adequate subgrade support. If weak subgrades are present then alternative pavement design measures will be required at the direction of the Local Government.