



DESIGN GUIDELINES

**FOR SUBDIVISIONAL DEVELOPMENTS,
URBAN AND RURAL ROAD AND DRAINAGE
CONSTRUCTION, AND
TRAFFIC MANAGEMENT PROJECTS**

PREPARED BY: BUILT & NATURAL ENVIRONMENT SUSTAINABILITY DIVISION

Edited to incorporate changes adopted by Council at the Ordinary Council Meeting 07 April 2014.

VERSION 3.23 - 07 April 2014

INTRODUCTION

The Design Guidelines for Subdivisional Developments, Urban and Rural Road and Drainage Construction and Traffic Management Projects, hereinafter called the Design Guidelines, are intended as a reference to designers to guide and assist in the preparation of best practice designs for civil engineering infrastructure to be constructed in Latrobe City Council.

The Design Guidelines provide a set of Standards to be used by developers, consultants and designers in the planning of new infrastructure and for the rehabilitation of existing infrastructure. These standards are a minimum and alternatives will be considered upon application.

It is intended that the Design Guidelines will be updated on a regular basis and comment and feedback on the contents is welcomed.

The primary objectives of the Design Guidelines are:

- To provide sufficient information and direction to designers, to ensure that all issues associated with the safe and efficient movement of road traffic are addressed during the design process.
- To provide a set of guidelines for use by Latrobe City staff and by engineering consultants for the preparation of quality engineering design plans for road and drainage construction and traffic engineering projects.
- To provide a uniform set of design standards for use in planning new subdivisional developments throughout the Latrobe City.
- To provide the basis for a Specification to be used for outsourcing the design of various capital works.
- To create infrastructure assets that will last for the maximum design life.

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1. Survey & Services

1.1 EXISTING CONDITIONS SURVEY

The existing conditions survey conducted prior to design shall ensure that the following features are located, particularly where proposed works abut existing works that are the responsibility of Latrobe City Council. These features must include:

- Building/property lines, verandahs (within road reserves), fences, gates.
- Title pegs, reference marks, permanent marks, TBM's.
- Footpaths, kerb and channel, table drains, vehicle crossings, perambulator crossings, edge of pavement, edge of seal, edge of formation, shoulders, centre of bitumen/formation/pavement, line of crown, line and lane markings.
- Stormwater pits and pipes including invert levels of existing pits and invert levels of inlet and outlet pipes, pipe sizes.
- Culverts, end-walls, wing walls, property inlets, house drains, outfall structures, watercourses, dams, ponds, lakes, high and low water marks (shore lines).
- tops and toes of banks, changes of grade, batters.
- trees, shrubs, other significant vegetation.
- road furniture, signs, guide posts, bollards, letterboxes, guard rails.
- buildings, bridges, retaining walls, bus shelters, bike racks, seats.
- service poles, guys, pits, covers, manholes, hydrants, valves, conduits, cable.
- railway lines and fixtures.

1.2 DATUMS

All survey shall be tied to Australian Height Datum (AHD) levels and should be tied to Map Grid Australia (MGA) co-ordinates or such other co-ordinates as approved by Latrobe City Council. Latrobe City's Co-ordinator Infrastructure Design may be able to provide AHD levels and MGA co-ordinates upon request.

1.3 SURVEY REFERENCE POINTS

All survey marks used as reference points for existing conditions surveys shall be listed on the plans including a description of each mark, its number, reduced level and co-ordinates.

1.4 SURVEY PRESENTATION

All projects involving feature survey only shall be presented to Latrobe City Council in both hard copy and electronic form, compatible with Latrobe City Council's existing information systems.

A digital version of final survey plans for record purposes shall be submitted on CD or by E-mail. The digital files shall be of a format capable of being loaded into current Council software without loss of data. Current software for this purpose is Trimble's "Terra-model" and Listech's "LisCad Lite".

Plans shall be presented on Latrobe City Council's standard Title Block, available from Latrobe City Council in Auto-cad and Terra-Model Formats.

Drawings should be produced in scales as follows:

1:250 or 1:500
1:1000 or 1:500 for rural roads.

1.5 PROVING OF SERVICES

The surveyor is responsible for obtaining from all service authorities information regarding the location of the authorities' underground assets within the scope of works. The surveyor shall verify the accuracy of the service information on site.

All underground assets likely to be affected by proposed drainage or other construction works are to be exposed to accurately locate and depth the service to avoid possible damage or conflict with the works.

Where necessary the surveyor shall arrange with the service authorities to peg/locate services onsite.

Backfill for trench reinstatement following service deepthing shall be compacted to 95% of the standard in road reserves and easements.

2 Design Process

2.1 DESIGN FOR MUNICIPAL WORKS

2.1.1 URBAN ROAD REHABILITATION WORKS

In order to undertake design for the rehabilitation of existing urban roads and associated assets, a specific process of community consultation is required. This process was adopted by Latrobe City Council in August 2009 and is further detailed in Appendix E. All urban road rehabilitation projects are required to follow the process outlined in Appendix E.

The designer shall ensure that the extent of the rehabilitation works includes all the items detailed in Appendix F.

2.1.2 DESIGN FOR OTHER MUNICIPAL WORKS

For projects designed by Latrobe City Council staff, the designer shall comply with the procedures set out in Appendix A.

For external contract work the Designer shall conform to the Specification for the design work as advertised. This will include attendance at specified meetings to ensure the design is progressing satisfactorily, throughout all stages of the process. Refer to Appendix B for approval stages.

2.2 NEW SUBDIVISIONAL DEVELOPMENTS

Owners and their consultants should note the following sections relating to the stages of the process for new subdivisional developments.

All new access and/or through roads, drainage and ancillary works within new subdivision developments shall generally be provided at the full cost to the developer in accordance with the standards set out in these guidelines. In certain cases developments may be subject to Development Contributions. These issues will need to be addressed with Latrobe City Council's Planning Department early on in the planning process.

Developments that set out allotments abutting unmade or partially constructed roads will be required to upgrade that road to a standard not less than the criteria set out in these guidelines.

A contribution from the Developer will be required for this work and will generally be based on the following criteria:

- Road Function
- Benefit to developer
- Benefit to Latrobe City Council
- Estimated volume of traffic using road – before and after the development.
- Road and pedestrian safety issues and amenity of surrounding area.
- Relevant Latrobe City Council policies.

In developments involving a Latrobe City Council contribution, a decision regarding the timing of construction would be made by Latrobe City Council having regard to Latrobe City's budgetary program.

2.2.1 PLANNING APPROVAL PROCESS

The subdivision of land for residential development requires the issue of a Planning Permit by the Responsible Authority. Permits to subdivide may or may not contain requirements to undertake works.

As part of the Planning Permit process, Latrobe City Council's Planning Division refer all planning permit applications to subdivide to a number of Statutory Authorities and to a number of Latrobe City Council's other divisions.

With regard to design/construction requirements, owners and consultants are encouraged to discuss new subdivision developments with the relevant Latrobe City Council officers prior to making formal Planning Permit applications. Preliminary advice and informal discussion of subdivision works requirements is available for those wanting to determine viability or to pre-plan new developments.

2.2.2 CERTIFICATION OF SUBDIVISION PLANS

Subdivision plans submitted for certification shall show easements for drainage purposes to the satisfaction of Latrobe City Council and any other responsible authority.

It is recommended that for each subdivision, the Owner's surveyors and engineering consultants together discuss the requirements of the subdivision to ensure the co-ordination of the Certified Plan and the engineering plans.

Each engineering plan will be checked to ensure that works are located within appropriate easements, and that block dimensions and roads accord with the certified plan.

2.2.3 ENGINEERING PLAN & SPECIFICATION

Engineering plans including specifications shall be prepared by qualified professionals in accordance with these Design Guidelines and submitted to Latrobe City Council for approval **PRIOR TO THE COMMENCEMENT OF WORKS**.

The designer is to certify that the design is in accordance with these guidelines, and will be responsible for any design errors or omissions. The designer's certification shall take the form shown in Appendix G and be submitted with the engineering plans.

The design certification is an integral part of the engineering plans and as such the plans will not be approved until the certification has been received.

Approval of the engineering plan will be in writing.

2.2.4 WORKS NOT TO COMMENCE

It is a requirement of the Subdivision Act that works must not commence until:

- The subdivision plan has been certified,
- The engineering plan has been approved, and
- Any agreement required under the Planning Approval has been entered into.

2.2.5 CONSTRUCTION REQUIREMENTS

Construction shall not commence until all control measures detailed in the approved Environment Construction Management plan are in place.

It is a requirement of the Subdivision Act that all works must comply with:

- The certified plan; and
- The approved engineering plan; and
- The standards specified in the planning scheme or the permit.

In order for Latrobe City Council to be satisfied that the works comply with the approved Engineering Plan, Latrobe City Council's supervisor must inspect and approve the works at the nominated "Hold Points". These hold points are listed in Appendix D.

2.2.6 STATEMENT OF COMPLIANCE

A Statement of Compliance may be applied for at any time after:

- Engineering plans have been approved, and
- All fees and charges paid, and
- All conditions of the Planning Approval for the subdivision have been complied with, and
- All works shown on the approved engineering plans have been accepted for care and maintenance by Latrobe City Council.

A request for consent to the issue of a Statement of Compliance may be considered when the works are practically complete. Security to the value of all outstanding works including maintenance and defects liability, plus 10 percent has been lodged with Latrobe City Council.

The preferred form for a security is a bank guarantee, without any expiry date.

Outstanding works for which a security has been lodged shall be completed within 12 months from the date the works were practically complete. Where outstanding works have not been completed within the required timeframe, Latrobe City Council may take recourse to use the lodged security to undertake the completion of the works.

It is important to note that all works required by Council under the planning approval and which are to become the responsibility of Latrobe City Council, shall remain in the sole care and management of the Owner until such time as Latrobe City Council accepts responsibility for the works.

2.2.7 PRACTICAL COMPLETION

The owner's engineering consultant will advise Latrobe City Council's Manager Infrastructure Development when the works are complete and request the issue of a Certificate of Practical Completion.

Prior to the issue of a Certificate of Practical Completion,

- the Council's supervisor and the Owner's representative shall jointly inspect and confirm that the works are complete,
- the Contractor's nominated representative shall lodge a Statement of Construction Certification with Latrobe City Council, regarding any works not inspected (this shall take the form shown in Appendix G), and
- the final digital and hard copy versions of the Engineering Plans shall have been lodged with Latrobe City Council.

The Manager Infrastructure Development will issue a Certificate of Practical Completion for the works stating the date upon which the 12 month maintenance period commenced.

2.2.8 ACCEPTANCE OF WORKS

Following the issue of a Certificate of Practical Completion for the subdivision works, the owner is responsible for the rectification of any defects appearing within the completed works for a period of 12 months.

If after the completion of the works, repairs are required due to:

- Any defect in any materials used in connection with the works' or
- The manner in which the works were performed.

The Owner must rectify the works to the satisfaction of Latrobe City Council.

In accordance with the Subdivision Act, the applicant is responsible for the maintenance of the completed works in good condition and repair until the expiry of the maintenance period.

Prior to the completion of the 12 month maintenance period, Latrobe City Council's supervisor and the Owner's representative shall jointly inspect the works.

At the completion of the 12 month maintenance period and the completion of any required remedial works, the Manager Infrastructure Development will issue an Acceptance of Works certificate for the works accepting responsibility for the future care and maintenance of the works.

3 General Design Requirements

3.1 GENERAL DESIGN REQUIREMENTS

This section applies to the design of all infrastructure on behalf of Latrobe City Council, or which in due course will be taken over by Latrobe City Council for care and management.

Designers must comply with the following standards and publications:

- Australian Standard AS1158 – Roadway Lighting
- Australian Standard AS2890 Parking Facilities (Parts 1 to 5)
- Australian Standard AS1742 – Manual of Uniform Traffic Control Devices (parts 1 to 13)
- Austroads Design Vehicles and Turning Path Templates
- Austroads Guide to Road Design
- Austroads Guide to Road Safety
- Austroads Guide to Traffic Management
- Austroads Pavement Design
- Austroads Rural Road Design – Guidelines to the Geometric Design of Rural Roads (2003)
- Country Fire Authority’s “Planning Conditions and Guidelines for Subdivisions”
- Environment Protection Authority publication no. 275 – “Construction Techniques For Sediment Pollution Control”
- Latrobe City Bicycle Plan
- Latrobe City Municipal Fire Prevention Plan.
- Latrobe City Roadside Management Plan
- Latrobe City’s “A Strategy for Biodiversity and Native Vegetation”, October 2002
- Latrobe City’s “Environmental Management Guidelines for Staff and Contractors- Native Vegetation on Rural Road Reserves”, May 2002
- Latrobe City’s Standard Drawings
- Latrobe City’s Standard Specifications
- Department of Transport – Public Transport Guidelines for Land Use and Development
- Soil Conservation Authority’s “Guidelines for Minimising Soil Erosion and Sedimentation from Construction Sites in Victoria”
- The Institution of Engineers, Australia “Australian Rainfall and Runoff”

- VicRoads Road Design Guidelines
- VicRoads Road Design Manual
- VicRoads Traffic Engineering Manual, Volume 1 and 2
- VicRoads Trucks on Roads Design Guide
- Victorian Department of Infrastructure's Res-code
- Code of Practice for Co-ordination of Street-works, Victoria
- Commonwealth of Australia – Disability Standards for Accessible Public Transport

Designers must also be familiar with the following Acts and Regulations:

- Disability Discrimination Act,
- Instrument for delegation of Major Traffic Control Item approval powers,
- Local Government Act,
- Road Safety Road Rules Regulations,
- Road Safety (Traffic Management) Regulations,
- Road Management Act,
- Subdivision Act.

3.2 ROAD PAVEMENT DESIGN

The depths of flexible pavements, in all cases, are to be determined in accordance with AustRoads guidelines for pavement design and based on a design life of 30 years minimum for all roads except industrial roads which shall be 50 years minimum. Subgrade CBR and other geotechnical tests are required to verify the suitability of the subgrade to support the proposed pavement depths. A minimum soaked CBR of 5.0 is required.

Other pavement surfaces such as interlocking segmental concrete paving or reinforced concrete paving may be acceptable subject to Latrobe City Council approval and to compliance with appropriate industry standards for such materials. Colour schemes, layouts etc. are to be approved by Latrobe City Council.

The minimum pavement thicknesses acceptable to Latrobe City Council are shown in the table below:

Road Classification	Treatment
Access Lane, Access Place, Access Street, in residential and rural living areas	Sub Base – 200 mm thick Class 3 crushed rock Base – 100 mm thick Class 2 crushed rock
Collector/Connector Street Level 1 or Collector/Connector Street Level 2 in residential and rural living areas	Sub Base – 300 mm thick Class 3 crushed rock Base – 150 mm thick Class 2 crushed rock
Commercial Street	Sub Base – 300 mm thick Class 3 crushed rock Base – 150 mm thick Class 2 crushed rock
Industrial Street or Industrial Court Bowl	Sub Base – 350 mm thick Class 3 crushed rock Base – 200 mm thick Class 2 crushed rock
Roundabouts or intersections with traffic lights in residential areas or rural living areas	200 mm compacted depth of 3% by weight cement treated 20 mm Class 3 crushed rock 120 mm compacted depth of 20 mm Type SI hot mix asphalt and 30 mm thick wearing surface
Roundabouts or intersections with traffic lights in industrial and commercial areas	200 mm compacted depth of 3% by weight cement treated 20 mm Class 3 crushed rock 150 mm compacted depth of 20 mm Type SI hot mix asphalt and 40 mm thick wearing surface

Note:

1. Refer clause 4.8 for details of wearing surface requirements.
2. Subgrades with a CBR <5 must be stabilised insitu with lime and/or cement at a minimum depth of 200 mm to achieve a minimum CBR of 5.
3. Subgrades in areas such as Churchill and Hazelwood North where there are expansive clays are required to be stabilised insitu at a minimum depth of 200 mm and a lime distribution of 3% by weight.

3.3 HORIZONTAL ALIGNMENT

Refer to Section 2.4 of Vic Roads Design Guidelines Part 2, for criteria involving horizontal alignment. It will be essential that designers prepare horizontal alignments to provide for designated speed controls and target speed controls, particularly in residential areas.

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3.4 VERTICAL ALIGNMENT

Designs for grades and vertical curves are generally to conform to the criteria set out in Part 2 of the VicRoads Road Design Guidelines.

3.4.1 Maximum Grades

Desirable maximum grades are set out below, reproduced from figure 2.5.5(a) of Part 2 of the Road Design Guidelines.

ROAD TYPE	TOPOGRAP		
	Flat	Rolling	Mountainous
FREEWAYS AND DUAL CARRIAGEWAY ARTERIAL ROADS	3% - 4%	4% - 5%	6% - 8%
SINGLE CARRIAGEWAY ARTERIAL ROADS	4% - 5%	5% - 6%	8% - 9%
COLLECTOR ROADS		6% - 7%	9% - 10%
STREETS LOW VOLUME ROADS		7% - 9%	10%
DRIVEWAYS (private) (commercial)		15% 8%	

Notes:

1. Circumstances where the maximum grades listed could be too high include:
 - at the point with zero cross-fall within superelevation development sections, water flows longitudinally along the road and depths can increase to the point where aquaplaning occurs. Flow depths should be checked where grades exceed 5 per cent.
 - In areas subject to frost, ice or snow, grades should be kept as low as possible. The desirable maximum grade in these conditions is 3 per cent and the maximum 6 per cent.
2. In steep country, the use of grades steeper than 10% may be unavoidable on roads other than freeways.
3. Maximum grades at intersections are covered in VicRoads Road Design Guidelines clause 2.5.6.3

Special consideration must be given to the design of drains on roads where grades exceed 5% to ensure there are adequate scour control methods put into place.

3.4.2 Minimum Grades

Drainage is the main consideration where minimum grades are involved. In rural areas a minimum grade of 1:200 (0.5%) is desirable to provide for drainage of table and median drains. Where this cannot be achieved in very flat terrain, special consideration shall be given to cross falls of the pavement and grading of table drains to ensure the pavement boxing is above the water table. In urban areas or where kerbs are provided the absolute minimum grade is 1 in 300 (0.33%) for a maximum length of 50m, with a desirable minimum of 1 in 200 (0.5%).

Refer to Section 2.5.7 of Part 2 of the VicRoads Design Guidelines for criteria involving the design of vertical curves. Special consideration shall be given to drainage where vertical curves are used on relatively flat grades.

3.5 SIGHT DISTANCE

The designer shall check and provide for the following sight distances along roadways having regard to the applicable design speed:

- Car stopping Sight Distance
- Truck Stopping Sight Distance
- Overtaking Sight Distance
- Manoeuvre Sight Distance

At intersections the following sight distances on all approach roads are to be checked and shall comply with requirements as set down in Section 2.3 of VicRoads Road Design Guidelines Part 2:

- Approach Sight Distance
- Safe Intersection Sight Distance
- Truck Stopping Sight Distance
- Tail Light Stopping Sight Distance

3.6 INTERSECTION DESIGN

For the purposes of these guidelines it is assumed that the type of intersection to be designed has clearly been decided upon as part of an earlier investigation and planning process, including any necessary land acquisitions.

Designers must provide for the safe and efficient movement of traffic and also provide for the safety of pedestrians and cyclists.

A strong emphasis must be placed on the correct number and placement of road markings and signage and also pay special attention to the overall landscape/amenity of the intersection.

The following references are to be used in conjunction with the VicRoads Traffic Engineering Manual Vol. 1 – Traffic Management.

- VicRoads Traffic Engineering Manual Vol. 2, Signs and Markings.
- Austroads Guide to Road Design
- Austroads Guide to Road Safety
- AustRoads Guide to Traffic Management
- Australian Standard 1742 Manual of Uniform Traffic – Control Devices, Part 2 Traffic – Control devices for General Use and Part 14 Traffic Signals.
- VicRoads – Trucks on Roads – Design Guide

Regardless of the type of intersection being designed the designer must have regard to:

- Volume and type of traffic using the intersection with a realistic allowance for increases in traffic volumes over the estimated life of the intersection.
- Safe intersection sight distance.
- Design Turning Templates for various classes of vehicles at appropriate design speeds.
- Adequate sight distances within roundabouts.
- Adequate drainage.
- Appropriate lane widths.
- Design speed of the intersection – ensure that vehicles are physically prevented from traversing intersections faster than the recommended safe speed.
- Kerb types
- Road camber (cross-falls) and super elevation – to ensure that heavy vehicles may negotiate all turns without danger of overturning.
- Street Lighting

Each intersection and associated linking roadways must be designed to adequately cater, for all turning movements for the expected types of vehicles and more specifically must be based around a “Design Vehicle” and a “Check Vehicle” as defined in Section 3 of the “Trucks on Roads – Design Guide”.

Designers are required to be familiar with legal requirements set down in the “Trucks on Roads – Design Guide”.

3.7 CROSS-FALLS

Cross-fall on road pavements shall be 3%. The minimum fall on nature strips should be 50 mm from the front of footpath to the back of kerb and channel. The cross-fall on footpaths shall be 2.5%.

3.8 PERMANENT SURVEY MARKS

Standard permanent survey marks are to be placed at maximum spacings of 300 m in urban areas (1 km in rural areas) and at other locations as determined by the Manager Infrastructure Development. A Permanent Mark sketch plan as approved under the Survey Co-ordination Act shall be completed and registered with Land Victoria. Such registration shall be deemed not to have taken place until notarised advice has been forwarded to Latrobe City Council.

3.9 ROAD FURNITURE

Provide guide post delineation, street name signs, Stop or Give Way signs, and all other necessary road traffic signs and road markings in accordance with VicRoads Traffic Engineering Manual Volumes 1 & 2, Australian Standard AS 1742 and Latrobe City Council standards.

Guard fence shall be provided as and where required in accordance with the warrants listed in VicRoads' Road Design Manual.

3.10 ENVIRONMENTAL CONSTRUCTION MANAGEMENT

An Environmental Construction Management Plan must be submitted for approval at the design stage. The Plan should address issues such as silt traps, litter traps, cleanliness of site during construction and maintenance periods, erosion control, disposal of waste material, dust control, bitumen spraying, noise control and spillage of solids and liquids.

4 Urban Road Design

4.1 CLASSIFICATION OF URBAN ROADS

Urban roads managed by Latrobe City Council are defined by the following functional classifications in accordance with Council's adopted road hierarchy:

i. Access Lanes

A side or rear lane principally providing vehicle and pedestrian access to parking for lots with frontage to another street. Includes CBD lanes. Traffic volumes generally up to 200 vehicles per day.

ii. Access Place

A minor street whose primary function is to provide local residential property access with shared traffic, pedestrian and recreation use of the road pavement. The maximum length of an access place is 100 m. Does not provide for any through traffic. Traffic volumes generally up to 200 vehicles per day.

iii. Minor Access Street

A street providing local residential access where traffic is subservient to local amenity, vehicle speeds and volumes are low and pedestrian and bicycle movements are facilitated. Serves no external through traffic function. Traffic volumes generally up to 500 vehicles per day.

iv. Major Access Street

A street providing local residential access where traffic is subservient to local amenity. Traffic volumes are permitted to a higher level and speed limit is set to the default urban limit of 50 km/hr. Serves no external through traffic function. Traffic volumes generally up to 2,000 vehicles per day.

v. Collector Road

Collects traffic from the access places and access streets and connects to an Arterial road or another Collector road. Should not provide an attractive alternate route for through traffic on Arterial roads. Services traffic generated only within the Local Traffic Area. Speed limit is generally at least 60 km/hr. Traffic volumes generally up to 6,000 vehicles per day.

vi. Link Road-

Where the road is not designated as a primary arterial (C road), but the main function is to provide for through movements by external traffic and the requirement for access to adjacent property is also important.

It is very important in limiting any future traffic management problems that streets should be designed to meet their function and carry the volumes and limit vehicle speeds as specified in table 4.1 below.

Table 4.1 Classification of Urban Roads

CLASSIFICATION	No of dwellings served	Vehicles Per Day - up to	Target speed ¹ Km/h	Design speed ² Km/h
Access Lane		200	15	na
Access Place	<=13 max. length of 100 m	200	15	na
Minor Access Street	<50	500	30	na
Major Access Street	<200	2000	40	na
Collector Road		6000	na	Speed limit of road
Link Road		10,000	na	Speed limit of road

1. Target speed is defined as the average speed of vehicles at the location within the street segment where vehicles travel at their highest speed. Each street segment being defined by the location at each end of an appropriate slow point to control vehicle speeds.
2. Design speed means the speed used for the design of each element of a road.

4.2 ROAD WIDTHS & PARKING

The design features of each type of street, the width of road reserve and road pavement, nature-strips, kerbing and landscaping should convey the road's function, encourage appropriate driver behaviour and discourage speeding. Table 4.2 shows the recommended street widths and parking provisions for the various classes of urban road.

Designers are reminded that special consideration must be given to situations where schools, shops, sports and entertainment venues are involved where specific designs will need to be prepared to provide for on street parking and traffic control for expected peak flows. This will necessarily affect the width of road pavements.

If it can be demonstrated that recommended widths and footpath requirements should be varied to suit a particular application due consideration will be given to the proposal submitted by the designer/developer.

Table 4.2 Street widths and parking

Street Type	Carriageway width ¹	Parking provision within street reserve	Min verge width (includes footpath) See General Note 2	Minimum Road Reserve Width See General Notes 5 & 6
Access Lane (second road frontage)	5.5 m See General Note 6	Yes (one side) Appropriately signed	None	As determined by turning movements.
Access Place	7.3 m	Yes (both sides)	3.5 m each side	16.0 m
Access Street (Minor)	7.3 m	Yes (both sides)	4.0 m min each side	16.0 m
Access Street (Major)	7.3 m ²	Yes (both sides)	4.5 m min each side	18.0 m
Collector Road	11.0 m	Yes (both sides)	6.0 m min each side	24.0 m

Footnotes:

1. Carriageway width is measured from kerb invert to invert, width is to be increased by 0.5 m if a barrier kerb is used.
2. Roads to be narrowed to 5.0 metres at intersections.

General Notes:

- Note 1 Higher traffic volumes and intended use/s of carriageway may require greater Carriageway widths.
- Note 2 The developers must ensure that verge widths are sufficient to accommodate services that are required to be located.
- Note 4 Verge widths may be reduced to 3 m in the following situations:
- Court bowls less than 100 m in length.
 - Where access gates are set back from the property boundary by 3.0 m.
- Note 5 The minimum width of road reserve cannot be calculated by adding the minimum distances of the components within the road reserve.
- Note 6 Designers and developers need to ensure that the road reserve width adopted complies with the requirements of the following documents and Authority requirements:
- Department of Transport – Public Transport Guidelines.
 - Various walkability and bicycle strategies.
 - CFA may require the minimum Carriageway width to be 7.3 metres in certain areas unless parking is restricted to one side.

4.3 KERBS & PATHS

Kerbing and path requirements for each class of road are shown in table 4.3. Details of each kerb type are provided in Latrobe City Council's standard drawings LCC 101 and LCC 103.

Table 4.3 Street kerbs, footpath and bicycle path provision:

Street Type	Kerbing ¹	Footpath ²	Bicycle Path
Access Lane		Not required	Not required
Access Place	LM, LSM or SM	Not required if less than 100 m long	Not required
Minor Access Street	LM, LSM or SM	Both sides. ⁴	Not required
Major Access Street	LSM or SM	Both sides.	Not required
Collector Road	SM	Both sides.	2.5 m wide off-road or 2x1.5 m on-road. ³

1. LM = Latrobe City modified mountable kerbing, LSM = Latrobe City modified semi mountable kerbing, and SM = Semi mountable kerbing.
2. All footpaths are to be 1.5 m wide unless approved otherwise.
3. Bicycle Paths required in accordance with adopted Strategies.
4. Footpath may be provided on one side if there is no development abutting one side of the street; topography or vegetation precludes provision of a footpath; and adequate arrangements are made for postal delivery.

There may be situations where the use of a barrier type kerb or fully mountable kerb (refer LCC 101) is more appropriate and use of such kerbs may be permitted, subject to approval. Examples for barrier kerb usage include where a footpath is located immediately behind the kerb, in shopping areas or where on-street parking should be clearly defined and encroachment of parked vehicles beyond the kerb line is not acceptable. Note that if barrier kerbs are used, road pavement width is to be increased by 0.5 m.

4.4 FOOTPATHS

All new footpaths shall be a minimum depth of 125 mm and constructed of 25 MPa concrete reinforced with F72 mesh. The base course for footpaths shall be 50 mm compacted crushed rock or approved gravel base. All footpaths shall be 1.5 m wide unless otherwise directed.

Latrobe City Council's Standard Drawings LCC 401 and 402 refer. Note that perambulator crossings in the vicinity of shopping areas shall be constructed with tactile ground surface indicators in accordance with VicRoads standard drawing SD 2031.

Footpaths to be constructed in reserves shall be a minimum depth of 100 mm, reinforced with F72 mesh and shall be constructed to a minimum width of 2.5 m.

4.5 VEHICLE CROSSINGS

The construction of a vehicle crossing infill is not required in new residential subdivisional areas and kerb laybacks for vehicle crossings shall only be provided where a standard semi mountable or a barrier kerb is used. The crossing in-fills shall be provided by each property owner at such later time as vehicle access is required to the property.

Where vehicle crossings are to be constructed, the crossing shall be in accordance with Council's standard drawings LCC 307.

Where crossings are proposed to be located within 10 m of an intersection, the designer must have further discussion with Latrobe City Council, for determination. Crossings shall not be located over drainage side entry pits, opposite drainage easements or over any other service pits without prior written approval from the relevant authority.

The Designer shall check the profile of each crossing to ensure that clearance is provided for a design vehicle ie. that vehicles do not scrape on the road or vehicle crossing. The design vehicle shall comply with the requirements of AS2890.1 Parking Facilities - Part 1: Off-Street Car Parking.

4.6 TRAFFIC SPEEDS & TRAFFIC MANAGEMENT DEVICES

Generally new subdivision streets shall be designed to limit expected vehicle speed values to the target speed or less - refer to Table 4.1. Vehicle speeds shall be controlled by means of street alignment and local area traffic management (LATM) devices.

Where LATM devices are required to control target traffic speeds, designers are required to comply with the provisions of Vic Roads Traffic Engineering Manual Vol. 1 – Traffic Management. Devices defined as Major Traffic Control Devices shall require written approval from the relevant authority prior to approval of the final design by Latrobe City Council.

Proposals for speed limits other than the general default speed limit shall be referred to VicRoads for written approval prior to approval of the final design by Latrobe City Council.

4.7 COURT-BOWLS & KERB RETURNS

Council at its meeting of 2 April 2001 resolved that all courts bowls be constructed with a minimum diameter of 20 m (to face of kerb).

The radii of kerb returns at intersections shall be a minimum of 10 m to face of kerb, unless otherwise approved by the Manager Infrastructure Development. Designers are also referred to section 3.6 "Intersection Design" regarding the general requirements for the design of intersection layouts.

4.8 WEARING SURFACE

The details of the bituminous wearing surface are shown below:

Road Classification	Treatment
Access Lane, Access Place, Access Street, Collector/Connector Street Level 1 or Collector/Connector Street Level 2 in residential areas	Size 7 mm emulsion primer-seal 30 mm thick Size 10 mm Type H hot mix asphalt overlay*
Access Lane, Access Place, Access Street, Collector/Connector Street Level 1 or Collector/Connector Street Level 2 in rural living areas	Size 10 mm primer-seal Size 7 mm final seal applied 12 months after the primer-seal.
Commercial Street	Size 10 mm emulsion primer-seal 30 mm thick Size 10 mm Type H hot mix asphalt overlay
Industrial Street or Industrial Court Bowl	Size 10 mm emulsion primer-seal 40 mm thick Size 10 mm Type SMAN stone mastic asphalt overlay
Roundabouts or intersections with traffic lights in residential areas or rural living areas	30 mm thick 10 mm Type H hot mix asphalt overlay**
Roundabouts or intersections with traffic lights in industrial and commercial areas	40 mm thick 14 mm Type HP hot mix asphalt overlay**

Note:

Refer clause 3.2 for minimum pavement thicknesses.

* For pavement rehabilitations works the asphalt wearing surface must be applied twelve months after the application of the emulsion primer-seal or primer-seal.

** The pavement must consist of a deep lift asphalt base with a cement bound sub-base.

4.9 DRAINAGE

Refer also to Section 7 for general drainage design requirements.

Each allotment is to be provided with a pipe drainage outlet at the legal point of discharge and the outlet shall be connected to a pipe drain. A property outlet may only be connected to the kerb using an approved kerb adaptor where there is no suitable underground pipe and either a standard semi mountable or a barrier kerb profile is to be constructed. Where there is to be one-way cross-fall in a street, property drainage connections on the high side of the street shall be connected direct to an underground stormwater pipe. Property inlets shall be constructed in accordance with Latrobe City Council's standard drawing LCC 209.

Easement drains are to be provided within allotments and/or reserves to pick up stormwater from those areas that cannot be drained to a street drain or kerb.

Cut-off drains are required to protect developments from runoff from adjacent areas, such as undeveloped rural land.

Where the runoff from a 1 in 100 year ARI storm event is in excess of the design capacity of the underground stormwater pipe drainage system, overland surcharge routes shall be provided. Appropriate easements will need to be provided where such surcharge routes traverse any allotment and covenants placed on allotment titles to prevent the construction of any restriction to the flow of the storm surcharge.

Appropriate drainage easements are to be set aside to the satisfaction of Latrobe City Council.

Litter traps and silt traps are to be provided where appropriate. All drainage from new developments shall be connected to an approved outfall drainage system via an underground pipe drain.

4.10 NATURE-STRIPS – RESIDENTIAL AREAS

Nature-strips are required to be topsoiled and grassed in accordance with Latrobe City Council's Landscape Standards and trees are to be provided in accordance with City requirements. The minimum depth of topsoil is to be 100 mm.

Latrobe City Council offers and encourages a service to developers to supply, plant and maintain street trees for a specific fee. Further advice is to be obtained from Latrobe City Council's Parks Officer.

Standard drawings LCC 701, LCC 702, LCC 713 and LCC 714 and Latrobe City Council's Urban Design Standards-Street Tree Chapter apply.

4.11 RESERVES

All reserves within the development shall be landscaped in accordance with plans to be approved by Latrobe City Council. 2.5 m wide concrete paths, 100 mm thick, reinforced with F72 mesh, are to be provided where it is necessary to link proposed and existing pedestrian routes.

Reserves shall be uniformly graded, topsoiled and grassed prior to hand over to Council. Reserves shall be drained with well graded grassed, open swale drains connected to underground pipe drains at appropriate locations and, more particularly, to prevent stormwater run-off from entering residential blocks.

Public lighting to P5 Standard (Australian Standard AS 1158) is to be provided along the route of the footpath, with all cabling to be underground. Latrobe City Council has designated standard poles for specific areas throughout Latrobe City Council. These standards must be observed.

4.12 STREET LIGHTING

Street lighting shall be provided for all new urban roads and in reserves where a footpath has been constructed linking other areas. Lighting shall be designed in accordance with Australian Standard AS1158 – Roadway Lighting, the requirements of Latrobe City Council's provider of street lighting (currently SP AusNet) and Latrobe City Council's requirements. The design for street lighting should be as efficient as possible and efforts made to reduce wasted energy.

5 Rural Road Design

5.1 CLASSIFICATION OF RURAL ROADS

Rural roads are classified in accordance with Council's adopted road hierarchy and are defined as set out below:

(Council are currently in the process of adopting a road hierarchy for all its rural areas. The road classes shown in table 5.1 below are those currently proposed. When adopted by Council, Definitions for each class will be inserted into the Guidelines.)

5.2 RURAL ROAD CROSS SECTIONS

Table 5.1 shows the recommended geometric design cross sections of the various classes of rural roads. The data is based on Part 3 of the Vic Roads Road Design Guidelines and on previous design standards within Latrobe City.

Also refer to "Environmental Management Guidelines for Staff and Contractors- Native Vegetation on Rural Road Reserves", Latrobe City, May 2002, and

"A Strategy for Biodiversity and Native Vegetation" Latrobe City, October 2002.

TABLE 5.1 – RURAL ROADS

ROAD CLASS	LANE WIDTH (m)	SHOULDER WIDTH (m)	SEALED SHOULDER (m)	TOTAL SEAL (m)	PAVEMENT WIDTH (m)	ROAD RESERVE WIDTH (m)
1. Rural Access	5.5	0.5	0.0	5.5	6.5	15.0
2. Rural Collector Road	2 x 3.0	1.0	0.5	7.0	8.0	20.0
3. Rural Link	2 x 3.5	2.0	1.5	10.0	11.0	20.0

5.3 WEARING SURFACE

The base course is to be sealed with a size 10 bituminous primer seal coat and sprayed with a size 7 final seal applied 12 months after the primer seal. At roundabouts or intersections with traffic lights the wearing surface shall consist of 30 mm thick 10 mm type H hot mix asphalt overlay. The pavement must consist of a deep lift asphalt base with a cement bound sub-base.

5.4 VEHICLE CROSSINGS

A standard rural type vehicle crossing is to be provided to each allotment. Special care shall be given to ensure the location of the crossings comply with sight distance requirements - refer to Section 3.4.

The applicable standard drawing is LCC 306.

The Designer shall check the profile of each driveway to ensure that clearance is provided for a design vehicle ie. that vehicles do not scrape on the road or vehicle crossing. The design vehicle shall comply with the requirements of AS2890.1 Parking Facilities - Part 1: Off-Street Car Parking Figure D1.

5.5 DRAINAGE PROVISION

Provide table drains and culverts as necessary to ensure the road reserve is drained to appropriate outfalls. Provide catch pits and scour control measures on batters and inverts to ensure open channels are not subjected to erosion. Provide silt traps and litter traps where appropriate.

For subdivisional developments provide all necessary drainage easements for outfalls from road culverts.

Refer also to Section 7 for general drainage design requirements.

5.6 LINE-MARKING

Marked centre lines and edge lines are required on all Rural Link and Rural Collector roads but not for Rural Access roads.

6. Other Roads

6.1 INDUSTRIAL DEVELOPMENTS

The minimum pavement width for roads servicing new industrial development shall be 12.0 m between line of kerbs. The kerb type shall be semi-mountable, 600 mm wide in accordance with Standard Drawing LCC101.

The pavement shall be designed in accordance with clause 3.2 and the wearing surface requirements are detailed in clause 4.8.

Heavy-duty reinforced concrete crossings shall be provided to each allotment. The crossings are to be designed to provide for the largest “design vehicle” expected to enter the allotment.

Special consideration must be given to intersection designs to provide for the safe movement of 25 m semi-trailers and B-Doubles.

6.2 SERVICE ROADS

Service Roads adjacent to industrial, residential or commercial developments will require individual design having regard to:

- VicRoads requirements,
- Adjacent use,
- Parking,
- One way or two way traffic,
- Intersection treatments,
- Widths of lanes, and
- The general requirements of these guidelines.

7. Drainage

7.1 DRAINAGE DESIGN

Drainage design shall be in accordance with “Australian Rainfall and Runoff”. Reference shall also be made to VicRoads “Road Design Guidelines – Part 7 Drainage” and the Soil Conservation Authority’s – “Guidelines for Minimising Soil Erosion and Sedimentation from Construction Sites in Victoria”. Detailed drainage computations are required to be submitted for each project or proposed development.

Designs must include the provision of cutoff drains to prevent runoff entering a subdivision from an external catchment. Allowance must also be made for drainage surcharge routes for runoff from storms with an ARI of 100 years. Surcharge routes are to take runoff safely away from developments such as residences or offices.

Designs shall include the provision of silt traps and litter traps where appropriate. Wetlands should be also considered where applicable.

7.2 RECURRENCE INTERVAL

The following average recurrence intervals (ARI) shall be adopted:

- Five (5) years for residential development.
- Ten (10) years for industrial or where surcharge would seriously affect private property.
- Ten (10) years for commercial centres of 10 shops or less.
- Ten (10) years for rural road culverts.
- Twenty (20) years for drains in commercial areas with more than 10 shops.
- Fifty (50) years for major rural culverts.

Provision shall also be made to ensure that any overland surcharge resulting from a storm having a 100 year recurrence interval is able to pass through the subdivision along streets and reserves. This is to ensure that there is no likelihood of dwellings being flooded by a storm of this magnitude.

Depth of overland flow shall be limited to 200 mm and the depth velocity product shall be limited to 0.36.

The finished surface level of all allotments shall be a minimum of 300 mm above the 100 year ARI level.

7.3 CO-EFFICIENT OF RUNOFF

The following minimum co-efficients of runoff shall be adopted:

Residential areas (low density)	0.45
Residential areas (medium density)	0.60
Commercial zones	0.90
Industrial zones	0.80
Residential Road Reserves	0.75
Parks and Gardens	0.25
Paved areas	0.90

Low density residential areas shall be those areas designated as LDRZ in the Latrobe Planning Scheme and medium density residential areas shall be those designated as R1Z in the planning scheme.

In all cases the co-efficient of runoff shall be checked against “Australian Rainfall and Runoff”.

For areas of special use, such as schools, community centres, sporting developments etc., an investigation is to be carried out to determine the likely percentage of impervious area to determine an appropriate co-efficient.

7.4 TIME OF CONCENTRATION

The following initial times of concentration shall be adopted:

From building to property boundary	7 minutes
Street water to side entry pit	6 minutes

For shop abutting street alignment, 3 minutes to street drainage.

Special consideration will be necessary for other buildings such as factories.

7.5 DESIGN VELOCITIES

The minimum design velocity for pipe flows shall be:

- Pipe running half full or greater - 0.75 m per second.
- Pipe less than half full - 1.00 m per second.

The maximum design velocity for pipe flows shall be:

- 6 m per second.

7.6 PIPE SIZE, CLASS & TYPE

All steel reinforced concrete pipes (SRC) shall comply with Australian Standard AS4058. All UPVC pipes shall comply with Australian Standard AS1254.

Latrobe City Council prohibits the use of Fibre Reinforced Concrete (FRC) pipes for stormwater purposes.

All SRC pipes shall have rubber ring joints. If the pipeline is located near trees which are known to have aggressive root systems, then rubber rings containing a root inhibitor need to be specified.

UPVC pipes (Class 12) up to 225 mm diameter may be used. Joints shall be solvent welded or rubber rings.

The minimum diameter of a pipe for use in collecting property drainage is 150 mm.

The minimum diameter of pipe used to collect run off from streets or roads is 300 mm.

Class of pipe shall be selected in accordance with the Concrete Pipe Association of Australasia publication "Concrete Pipe Installation and Selection".

Pipes up to and including 600 mm dia. for use in road reserves shall have rubber ring joints. Pipes over 600 mm dia. may have interlocking joints with sand-bands where special circumstances, in the opinion of the Manager Infrastructure Development, this use is required.

All pipes in the Churchill township require rubber ring joints due to the nature of the soil.

7.7 MINIMUM COVER OVER PIPES

In easements	0.40 m
In road reserves	0.75 m

The minimum cover requirements listed above allow for Telecom, water and gas mains and conduits to be installed over stormwater drains. Whenever large service mains are required, additional cover should be provided particularly at crossings.

Wherever an external area contributes to the system, the drain shall be designed at a depth and capacity sufficient to serve the total upstream area as if fully developed.

Any exceptions to the minimum cover requirements are to be discussed with the Manager Infrastructure Development before proceeding into detailed design. Higher strength pipes may then be considered.

7.8 PIT SPACING & LOCATION

Generally side entry pits should be spaced so that the length of flow in channels does not exceed 100 m where grades are less than 6% and 60 m spacing for grades in excess of 6%. Channel flow widths should not exceed 1.2 m.

Channel flow approaching an intersection is to be collected before the tangent point except where it can be demonstrated that adequate capacity is available in the kerb and channel to carry water around the return.

Double side entry pits should be used where approach grades to intersections are in excess of 6% and at low points in roads where surcharge would seriously affect private property.

In all cases design consideration shall be given to pit location and pit inlet capacities, to ensure flows are not directed onto private property.

7.9 DRAINAGE STRUCTURE DESIGN

Drainage structures shall comply with Council's standard details for such structures – where modification to details or special structures are required, details shall be submitted with the construction plans. Where a change in pipe direction occurs at a pit, the pit shall be located with its downstream face (not its centre) at the intersection of the pipe centrelines. Acute intersection angles between drainage lines at pits shall not be permitted.

Generally the minimum fall to be provided through pits shall be 30mm, however, in all circumstances where changes in direction, a number of pipes entering one pit, large inlet and outlet velocity differences or grate or kerb inlets occur, losses shall be considered and provided for.

Losses to be allowed for shall be calculated on the basis of:

$$\frac{K V_o^2}{2g}$$

Where V_o is the outlet velocity = $\frac{Q_{\text{outlet}}}{A_{\text{outlet}}}$

And K is the head co-efficient.

Values for K for the various pit configurations are given in the latest version of the VicRoads "Road Design Manual".

7.10 MAIN DRAINS

Pipes of 900 mm dia. or greater are to be designed as main drains and as such large direction changes through standard pits will not be permitted. Consideration shall be given to the use of special manholes and/or bends at all changes of direction.

Design criteria for main outfall drains shall be determined after discussion with the Manager Infrastructure Development.

7.11 ANCHOR BLOCKS

Anchor blocks are required between pits at 10 m intervals where the grade is 1 in 7 or steeper. Refer to Latrobe City Council's Standard Drawing LCC 204.

7.12 BACKFILL

All pipes installed under road pavement, concrete paving or kerb and channel must be backfilled with compacted Class 2 crushed rock. All other trenches in the road reserve must be backfilled with compacted Class 3 crushed rock or with compacted select excavated material as approved.

8. Drawing Presentation

8.1 GENERAL

Final design drawings shall be submitted in both hard copy and digital form, compatible with Council's existing information systems.

Digital version of final approved plans for Council record purposes shall be submitted on CD or by Email. The digital files shall be of a format capable of being loaded into current Council software without loss of data. Current software for this purpose is Trimble's "Terra-model" and Autodesk's "AutoCAD".

Hard copy of final approved plans for Council record purposes shall be submitted on Australian Standard (AS 1100.101) A3 sized sheets.

Plans shall be presented on the Council's standard Title Block. (Available from Latrobe City Council in Auto-cad and Terra-Model Formats).

Drawings should be produced in scales as follows:

Plan	1:250 or 1:500 (1:1000 or 1:500 for rural roads)		
Longitudinal Section Horizontal	1:250	or	1:500 or 1:1000
	1:50 or 1:100		Vertical
Cross Sections Horizontal	1:100		
	1:50 or 1:100		Vertical
Drainage Longitudinal Section Horizontal	1:250	or	1:500 or 1:1000
	1:25 or 1:50 or 1:100		Vertical
Intersection Details	1:100 or 1:250		

Where large scales are necessary Australian Standard preferred scales should be adopted.

8.2 PLAN

It is important to note that in some projects, it will be necessary to produce more than one plan. This is particularly the case for projects such as intersection designs and CBD landscape works. The Manager Infrastructure Development must be consulted to determine the level of information to be shown on each plan.

The plan shall clearly show:

- All existing features, including existing road and drainage construction, trees, fences, structures, etc.
- Property details including boundaries (Lot number, dimensions, P.S. number, street numbers, etc, and easements).
- All pavements and ancillary works that are to be constructed.
- Design centre lines with chainages at intervals generally ranging from 10 m to 20 m to suite local conditions such as terrain and curvature. Chainages of pits, tangent points, property boundaries, low points and culverts shall also be shown.
- Utility Services:
 - Telstra pits, service poles, overhead cables and underground cables;
 - TXU Network service poles, pole stays, pits, overhead cables, underground cables and underground property connections;
 - Gippsland Water water mains, valve covers, fire plugs, sewer pit covers, sewer mains and property sewer connections; and
 - Origin Energy gas mains.
- Intersection contours at 0.1 metre intervals.
- Service conduit positions.
- Stormwater drainage pipe dimensions and invert levels, sub-surface drains, property drain connections, drainage structures, pit covers, dimension of pits and pit invert levels, end-walls and pit schedule.
- Offsets to drainage lines.
- Extent and limits of proposed works including connections to existing construction.
- Design line of kerb or edges of seal/formation and horizontal alignment.
- Street lighting layout and underground and/or overhead power supply.
- Set out co-ordinates and levels.
- Signage, line marking, major traffic control signage – full details of type, location and quality of signs are to be shown. (Permanent and temporary.)
- Footpaths, vehicle and path crossings.
- Location of all survey stations, PSM's and TBM's and reduced levels.
- Kerb radii as measured to line of kerb.
- Extent of cut and fill on adjoining properties showing existing contours and design contours.

- Existing surface levels at the corners of all lots and at significant changes of grade within the allotment or alternatively contour information.
- Special details drawn to a larger scale.
- Flood levels – when applicable.
- Provide design table for all curves indicating design velocity, E, I, R, T, S and CA.
- Landscape features including seats, bollards, banner poles, paving, plantations and other structures.
- Street trees including diameter of tree.
- Location of all native roadside vegetation affected by road rehabilitation works.

8.3 LONGITUDINAL SECTIONS

Longitudinal sections shall contain the following information:

8.3.1 Urban Street Designs

- Centre line chainages.
- Existing surface levels at street alignments, including existing vehicle crossing levels.
- Existing surface levels along proposed back of kerb.
- Design centreline level.
- Design back of footpath levels (or finished street alignment level when there is no footpath).
- Design back of kerb levels at every 20 m on uniform grades and at 10 m (max.) on vertical curves and also at low points, tangent points, SC's, pits, high points, boning points and changes of grade.
- Location and level of existing services traversing the road.
- Length of vertical curves and IP's.
- Grading of kerbs on straights, curves and around court bowls.
- Kerb levels at ¼ points and TP's on curves at intersections.

8.3.2 Rural Road Designs

- Existing surface levels along proposed centre line of road.
- Design centre line levels at every 20 m on uniform grades and at 10 m (max.) on vertical curves and also at low points, tangent points, SC's, pits, high points, boning points and changes of grade.
- Locations and level of existing culverts and services.
- For flat grades, or where a table drain varies from the road grade, provide a separate grading for the table drain.

8.3.3 Stormwater Drains (Pipe Drains, Open Drains - lined and unlined)

- Centre line running chainage.
- Existing surface levels along the centre line of the proposed drain.
- Finished surface levels including top of pit levels.
- Design invert levels and grade of the proposed drain.
- Location of pits and pit numbers/types.
- Pit schedule, detailing type and internal dimensions of all pits and pit numbers.
- Locations and depth of all services which the designed drain crosses.
- Pipe type, size and jointing method.
- Pipe design velocity, actual discharge and pipe capacity.
- Plot of hydraulic grade line.
- Location and details of special backfill in trenches.
- Location of the pipe (i.e. street name, reserve, lot number).
- Typical cross section of open drains.
- Drainage structures.

8.4 CROSS SECTIONS

Cross sections to be generally provided every 20 m on uniform grades, 10 m on vertical curves and at specific locations in between where it is necessary to show special features. Cross sections must be shown at low points, high points, tangent points, boning points and at SC and CS points on horizontal curves.

Note: A typical cross section shall be drawn for all projects to show the profile and dimensions of the finished section, pavement depth and type, details of footpath, kerb details, location of sub-surface drains, table drains and conduits for services, cut and fill batter slopes and ground water levels, where known, and location of guide posts and signs.

Cross sections must be checked to provide for the Australian Standard design vehicle to ensure vehicles have unrestricted access to each allotment.

8.4.1 Urban Street Designs

Information to be shown:

- Plot of existing surface levels across road reserve:
 - at centreline of the road pavement including any crown that does not coincide with the centreline;
 - at lip and top of kerb levels on kerb and kerb and channel;
 - at front and back of footpaths;
 - at building line and/or fence line; and
 - at other changes in cross section profile.
- Design levels of footpath, kerbs and pavement profile.
- Position and design level of crown of road.
- Profile of proposed road pavement.
- Location and level of existing services if required.
- Chainage of cross-section.
- Extent of cut and fill batters.
- Design cross-falls.

8.4.2 Rural Areas

- Plot of existing surface levels across the road reserve:
 - at centreline of the through traffic lanes including any crown that does not coincide with the centreline;
 - at edge of seal;
 - at edge of shoulder;
 - at edge of verge;
 - at invert of table drain;
 - at toe and top of batter;
 - at building line and/or fence line;
 - at other changes in profile.
- Design levels of centre line, edges of seal, shoulders, verges and table drain.
- Profile of proposed road pavement and shoulders.
- Extent of batters and drains.
- Property lines, fences and other structures that may be located within the road reserve.
- Plot of existing or proposed drainage culvert at the relevant cross-section.
- Design cross falls.

8.5 CROSS SECTION INTERVALS

Intervals to be shown at:

- 20 metres on straights;
- 10 metres on sharp horizontal curves;
- 5 metres on sag vertical curves;
- 10 metres on crest vertical curves;
- 5 metres on kerb returns at court bowls; and
- 2 metres on kerb returns at intersections.

8.6 INTERSECTION AND COURT BOWL DETAILS

For intersection treatments, it will be usual practice to show existing and design contours, set out points, radii and outline of proposed works and existing features on one plan and detailed presentation of all proposed works and existing features on another plan.

Information to be shown:

- Appropriate existing and proposed features.
- Kerbs, vehicle crossings, pedestrian crossing and footpaths.
- Design contours of road pavement at 0.1 m intervals.
- Chainages along line of kerb.
- Levels at TP's, along crown of road and crown high point in Court bowl and at $\frac{1}{4}$ points around kerb returns.
- Radii of all curves on line of kerb.
- Curve details including set out points.
- Location of stormwater drains, pits and drainage structures.
- Signage details and street furniture.

9. Other Requirements

9.1 PREPARATION OF THE SCHEDULE OF QUANTITIES

The Designer shall provide a schedule of quantities for the construction works. The schedule of quantities shall include an item number, a description of each item and the quantity of the item. A sample of a Tender Form Schedule 1A is available to assist the Designer in preparing the schedule of quantities. The Designer will be required to submit schedule of quantities in a similar format.

The Designer shall take due care in calculating the quantities. It is expected that the Designer shall calculate the quantities to an accuracy of $\pm 5\%$. The Designer shall avoid listing an item quantity as an item, and where practicable an item unit shall be number, length, area or volume.

The Designer shall obtain the Manager Infrastructure Development's approval for the quantities. The Designer shall provide the Manager Infrastructure Development with a hard copy and a copy on disk in Microsoft Word format, of the schedule of quantities.

9.2 ENGINEERING ADVICE

During the period that others are undertaking the construction works, the Designer may be required to provide engineering advice to the Manager Infrastructure Development or Latrobe City Council's road rehabilitation designer at the direction of the Manager Infrastructure Development, within 24 hours of the request. The Designer may be required to provide advice to clarify details or ambiguities in the construction drawings, and to correct errors, oversights or omissions in the construction drawings.

In the event that it is necessary to amend the design, the Designer will be required to carry out all necessary design rework, within the timeframes specified by the Manager Infrastructure Development. All amendments to the design shall be undertaken to the approval of the Manager Infrastructure Development.

9.3 GENERAL CONSTRUCTION MATTERS

The following must be attended to during the construction phase:

- An Environmental Construction Management Plan for the construction phase must be submitted with the design for approval at the design stage. Litter, silt and other debris must not be allowed to enter the underground drainage network. The plan must include provision for such issues as silt and litter traps, cleanliness of the site, erosion control, disposal of waste, dust control, bitumen spraying, construction noise and spillage of solids and liquids.

- Council will give notification to Work-Safe Victoria of the construction of any subdivision works or road or bridge works with an estimated value in excess of \$100,000. This follows receipt of a written request from Work-Safe Victoria for such notice.
- Council's supervisor must be contacted when construction hold points are reached. Construction hold points are listed in Appendix D. Work shall not continue until approval is given. Where works continue without being inspected by the Council supervisor, the Contractor's nominated representative shall lodge a Statement of Construction Certification with Latrobe City Council prior to the issue of a Certificate of Practical Completion, regarding the works not inspected. This shall take the form shown in Appendix G.
- The contractor shall protect all works at all times, existing and new, from damage by others. Council will not be responsible for any damage, unless caused by Council.
- All work shall be undertaken by experienced tradesman, including work carried out by subcontractors, and to a high quality of workmanship. Unsatisfactory work will not be accepted by Council.
- Documented proof of the quality of materials such as concrete, crushed rock and bituminous products must be available upon request, or within a reasonable timeframe.
- Following practical completion, works will be placed on a 12 month minimum defects liability period before final completion and acceptance by Council.
- Prior to acceptance by Council, all roads, kerbs, footpaths, pits and pipes must be cleaned.
- It should be noted that irrespective of when a Statement of Compliance for Subdivisional works may have been issued, any roads, drains, footpath, kerb and other similar infrastructure created as a result of a subdivision remain in the sole care, management and responsibility of the Owner until such time as final completion is achieved and the works are accepted by Council.

9.4 FEES

Refer to Appendix C for details of fees applicable to engineering plans, supervision of works and checking of plans for subdivisions.

9.5 APPROVALS

The Designer shall regularly consult with the Manager Infrastructure Development during the design process and obtain approval for design concepts. In the event that the Designer is not able to achieve the design requirements during the design process, he shall immediately notify the Manager Infrastructure Development. The Designer shall obtain direction from the Manager Infrastructure Development to vary the design requirements prior to proceeding further with the design works. The Designer shall obtain final approval for the design drawings from the Manager Infrastructure Development prior to commencing the preparation of the construction drawings. The Designer shall provide the Manager Infrastructure Development with a copy of all design drawings.

The Manager Infrastructure Development may accept recommendations from the Designer to vary the design criteria for the project.

APPENDIX A

DESIGNS BY LATROBE CITY STAFF

Note that for the design of residential street rehabilitation works, the design process must also be undertaken in accordance with the steps outlined in Appendix E.

- Consult with the Program Manager and Manager Infrastructure development to be aware of all the relevant facts as to why the design is required, whether there are any special circumstances to consider, and what is expected from the completed design.
- A Design Brief will be issued to the Designer providing basic details of the project.

Complete an on-site inspection and note any possible on-site restrictions (eg services) which may affect the proposed design.

Liaise with the Surveyors to ensure that all details required for the base plan will be picked up to the satisfaction of the Designer. The Designer to provide written information to the Surveyors specifying the full extent of the works to be surveyed.

Liaise with the Surveyors to determine station co-ordinates used in the survey (MGA), traverse adopted PSM's, TBM's and AHD levels adopted for each and the location where new PSM's may be required.

Be aware that projects on a Declared Road will require VicRoads approval prior to the final design being accepted.

Projects funded by VicRoads (eg. Better Roads Program) on local roads also require approval by VicRoads.

Consult with the Manager Infrastructure Development and the Program Manager when the design has reached the first draft stage and when the design is nearing completion.

Major Traffic Control Items to have VicRoads or formal delegated approval from the General Manager Built and Natural Environment Sustainability before design is finalised.

When required, pavement and sub-grade investigations may need to be performed and the Designer will need to provide recommendations for pavement treatment based on the quality of the existing sub-grade with a particular emphasis on CBR's and ground water problems.

On completion of the design, the Designer, Program Manager and Manager Infrastructure Development shall meet to ensure the design complies with the original intent of the design brief and is ready for tendering.

The Designer shall obtain the Manager Infrastructure Development's approval for the construction drawings prior to commencing the preparation of the schedule of quantities.

APPENDIX B

DESIGNS FOR LATROBE CITY COUNCIL BY CONSULTANTS APPROVAL STAGES

Note that for the design of residential street rehabilitation works, the design process must also be undertaken in accordance with the steps outlined in Appendix E.

- Completion of Survey Plan of existing features. Submit copy to the Manager Infrastructure Development for comment.
- Preparation of preliminary concept design plans showing overall layout and trial gradings. Consultation with the Manager Infrastructure Development or his representative to obtain approval in principle of the work to date. This is to be confirmed in writing by Latrobe City Council. This stage may require more than one consultation.
- Proceed to the detailed design stage. Present “near finished” plans to the Manager Infrastructure Development or his representative and arrange for a meeting to discuss fine tuning and final presentation of design. Meeting outcome is to be confirmed in writing by Latrobe City Council.
- Submit completed designs in accordance with Section 8 of these Guidelines. Provide a signed statement of Design Certification of the form shown in Appendix G. The designs shall be deemed not complete until this certification has been provided to Latrobe City Council.
- Prepare and submit a schedule of quantities for the works.
- Council to confirm acceptance of the works and arrange for final payment and complete a performance review of the Consultant’s work for future reference.

APPENDIX C

C.1 FEES & CHARGES FOR SUBDIVISIONAL DEVELOPMENTS

All Fees and Charges are due and payable prior to the issue of a Statement of Compliance.

The following fees are based on the Subdivision (Permit and Certification Fees) Regulation 1989.

- In the event that Council prepares engineering plans, the prescribed fee for the purposes of section 15 (6) of the Subdivision Act 1988 is:
 - 3.5 per cent of the estimated cost of constructing the works proposed on the engineering plan.
- For inspections and approval of the construction works by Latrobe City Council, the prescribed fee for the purposes of section 17 (2) (b) of the subdivision Act 1988 is:
 - per cent of the cost of constructing those works which are subject to supervision.
- For plan checking and approval of engineering plans, the prescribed maximum fee for the purposes of section 43 (2) (a) (iv), of the Subdivision Act 1988 is:
 - 0.75 per cent of the estimated cost of constructing the works proposed on the engineering plan.

C.2 DRAINAGE HEAD-WORKS CHARGES

Drainage head-works charges are due on urban subdivisions in all parts of the municipality and are based on the area of land being subdivided, inclusive of all roads included in the subdivision but excluding reserves.

The current drainage head-works charges are:

- Urban residential development - \$5,887 per hectare.
- Industrial & Commercial areas - \$7,988 per hectare.

APPENDIX D

HOLD POINTS FOR SUBDIVISION CONSTRUCTION INSPECTIONS

1. SITE ESTABLISHMENT

No native or significant vegetation may be removed or disturbed until a plan has been approved by the Superintendent.

2. DRAINAGE, PIPES AND CULVERTS

All drainage pipe lines and joints must be inspected and approved by the Superintendent before any backfilling is placed in position. Backfill must be compacted as specified.

Subsoil drains – Trenches and pipes must be inspected by the Superintendent before the screenings are placed.

Property connections – all pipes, inspection openings and connections to pipe drains must be inspected before any backfilling may occur.

3. CONCRETE

No concrete shall be placed before the formwork, reinforcement and bedding, in place, have been inspected by the Superintendent

4. CONCRETE KERB AND CHANNELING

Concrete shall not be placed until the bedding and string line, when in position, have been inspected and approved by the Superintendent.

5. CONCRETE PAVING

Concrete shall not be placed until the bedding and form work, when in position, have been inspected and approved by the Superintendent.

6. CONCRETE VEHICLE CROSSINGS

No concrete shall be poured before the formwork, reinforcement and bedding are in place and inspected and approved by the Superintendent.

7. PAVEMENT

The subgrade, sub-base and base course of the road pavement shall be tested and approved by the Superintendent before the placing of further courses or sealing is permitted.

Subgrade - Subgrade shall be cut to level, cross-fall and grades as designed and compacted and stabilised if necessary. Subgrade shall be proof rolled in the presence of the Superintendent with a smooth wheel roller, or grader, weighing at least 12 tonne mass with an intensity of contact pressure on the rear wheels of not less than 6 tonne per metre, without visible deformation.

Pavement Layers - All pavement layers shall be compacted so that they are capable of withstanding test rolling without visible deformation, with a smooth wheel roller, or grader, of approximately 12 tonne mass with a load intensity on the rear wheels of not less than 6 tonne per metre of width; or alternatively with a pneumatic tyred roller loaded to not less than 4.5 tonne per tyre, and tyres inflated to 700 kPa.

Prior to sealing, a final proof roll is required in the presence of the Superintendent.

8. PAINTED PAVEMENT MARKINGS

Line marking and painting shall not commence until the Superintendent has inspected the set out and given approval to proceed.

9. TIMING OF INSPECTIONS

Wherever possible a minimum of 24 hour notice is required for all hold point and other inspections.

APPENDIX E

RESIDENTIAL STREET REHABILITATION GUIDELINES

E.1 INTRODUCTION

- These Guidelines have been prepared to assist in the delivery of rehabilitation projects within Latrobe City Council of Latrobe.
- In particular, these guidelines provide a framework for encouraging participation from the local community for those streets where there is an opportunity to 'change' the street environment

E.2 BASIS OF GUIDELINES

- A Council adopted functional road hierarchy of residential streets within the municipality should form the basis of these guidelines.
- The functional road hierarchy would identify the 'role' of individual streets in the road network and accordingly enable 'options' for rehabilitation to be considered based on the function and physical distinctions of the existing street environment.
- On this basis a network of streets with physical distinctions between traffic routes and residential streets can be established within the municipality.

E.3 KEY OBJECTIVES

- To rehabilitate residential streets based on the functional road hierarchy for residential streets to enhance the local street environment.
- To encourage participation from the local community to assist in achieving appropriate design outcomes for the rehabilitation of residential streets.
- To deliver the rehabilitation of residential streets in a cost effective and sustainable manner.
- To improve Council's road infrastructure and minimize routine and periodic maintenance costs.
- To establish a process of continuous improvement by reviewing the design consultation process and outcomes.

E.4 APPROACH

- The approach needs to be 'Integrated' (i.e. the whole picture needs to be looked at) and recognizes the function of all residential streets.
- Council's Development Approvals Committee needs to be involved in the street tree selection.
- The starting point needs to recognize that the 'basic' need is to provide for the rehabilitation of residential streets in a cost effective manner.
- *From this 'basic' need, a process is required to be established that provides for an appropriate design treatment to be prepared which considers:-*
 - Street function under the Road Hierarchy
 - Existing infrastructure within the street environment;
 - Practical application of construction techniques to minimize reconstruction and maintenance costs; and
 - Stakeholder and community participation through a staged consultation process with Latrobe City Council

E.5 BACKGROUND AND OUTCOMES

- Set the scene for a collaboration of various disciplines to improve residential street amenity and safety within the Latrobe City area.
- Encourage participation by the residents/owners and service providers in achieving change in community perceptions of their street. Residential streets can be a safe and pleasant place to walk, ride or drive through.
- Involvement of Latrobe City Council to contribute to the consultation and review process.
- Through discussion and refinement of ideas produce standard cross sections for street rehabilitation design for each road classification.
- Provide various design options. This will be generic, rather than specific, due to the range of site conditions i.e. street reservation, pavement widths, crossovers, drainage, traffic calming devices, topography and sight lines, existing trees etc, which all have to be worked around.
- Exploration of the use of materials to contribute to the guideline options. Particularly materials and surfaces that have not been used yet.
- Build a degree of flexibility so that, within reason, design principles can be reviewed, adjusted and upgraded with new ideas. Provide notation for and against items that don't work so well, or require improvement before use again.
- Establish a consultative approach for City contact with residents at an early stage. Address community ideas on balance of other factors such as engineering, design and budget. Avoid school holiday periods for consultative stages.

- Explore other funding sources and means of installing new ideas, this may be through sponsorship, promotion of a new material, technique or funding through streetscape and government funding programs.
- Maintain cost effectiveness of the design, consultation and importantly the final constructed product on the ground.
- Provide cost effective maintenance and a balance of capital cost and on-going maintenance.
- Conduct a review, say at six monthly intervals, of the process' success and resident's responses to particular street treatments.

E.6 EXISTING RESIDENTIAL STREETS (TRADITIONAL)

- Residential street reserves vary between 15 and 20 m between building lines (common street reserves widths are 15 m and 20 m).
- A variety of pavement widths exist in the Latrobe City ranging from 5 m to 12 m Nature-strip widths vary, although 3.5 m widths are common.
- Footpath widths are most commonly 1.2 to 1.5 m in width.
- Street light and power poles are located on nature-strips (offset from building line varies).
- Alignments of streets are mostly straight with few if any variations to the pavement widths or property alignments.
- Many residential streets have mature trees along their length.

E.7 RES-CODE PROVISIONS IN THE PLANNING SCHEME

- The Res-Code provision outlined in Clause 56 of the Latrobe Planning Scheme specifies the minimum requirements for 'residential subdivision' within the municipality.
- The relevance of the Res-Code provisions is such that in particular pavement widths are generally reduced compared with existing streets (i.e. access place 3.5 – 5.0 m compared with a traditional court of 7.0 m).
- Adopt Res-code unless it can be demonstrated that a particular situation warrants something else.

E.8 FUNCTIONAL ROAD HIERARCHY OF RESIDENTIAL STREETS

- The functional road hierarchy of residential street would indicate the 'function' of the individual street based on the following types of streets:

VICROADS CONTROLLED

M Road – (duplicated motorways/freeways) provide primary road links that sustain economic and regional development. They connect Melbourne with other capital cities and major provincial centres, and they link major centres of production and manufacturing with Victoria's export terminals.

A Road - serves same role as 'M' roads but carry less traffic. These roads have a single carriageway.

B Road – provides the primary link between major regions not served by 'A' roads, and highly significant tourism Regions. They have strategic significance for Victoria.

C Road – provides the more important links between other centres of population, and between these centres and the primary transport network. Formerly called Main Roads.

COUNCIL CONTROLLED

Secondary Arterial Road – where the road is not designated as a primary arterial (C road), but the main function is to provide for through movements by external traffic and the requirement for access to adjacent property is also important.

Collector Road - collects traffic from the access places and access streets and connects to an Arterial road or another Collector road. Should not provide an attractive alternate route for through traffic on Arterial roads. Services traffic generated only within the Local Traffic Area. Speed limit is generally at least 60 km/h. Traffic volume generally up to 6,000 per day.

Major Access Street - a street providing local residential access where traffic is subservient to local amenity. Traffic volumes are permitted to a higher level and speed limit is set to the default urban limit of 50 km/h. Serves no external through traffic function. Traffic volumes generally up to 2,000 vehicles per day.

Minor Access Street - a street providing local residential access where traffic is subservient to local amenity, vehicle speeds and volumes are low, and bicycle movements are facilitated. Serves no external through traffic function. Traffic volumes generally up to 500 vehicles per day.

Access Place - a minor street whose primary function is to provide local residential property access with shared traffic, pedestrian and recreational use of the road pavement. The maximum length of an access place/court is 100 m. Does not provide for any through traffic. Traffic volumes generally up to 200 vehicles per day.

Access Lane - a side or rear lane principally providing vehicle and pedestrian access to parking for lots with frontage to another street. Includes CBD lanes. Traffic volume generally up to 200 vehicles per day.

E.9 CONSULTATION PROCESS – SPECIFIC STREETS

(a) Background Information

Information to support consultation and design process.

It should not be assumed residents can understand plans and to assist the consultation process the following supporting information should be provided at each street's consultation process:

- Examples of relevant streetscape works, preferably within Latrobe City Council of Latrobe. This can be in the form of various mediums, i.e. photographs, videos, coloured plans and cross-sections.
- Ultimately with more streets completed to a high standard, advise residents where they can view examples.

(b) Initial Contact and Timelines

The various concepts should be approved by a Councillor Briefing prior to the entire program commencement. This should also include information on tree species in accordance with Council's street tree charter.

When funding is allocated and street priorities listed, residents of each street listed for rehabilitation should be advised by Council of the intentions to reconstruct the road. This advice should outline the opportunities to redesign (if appropriate) that the reconstruction process provides. It is important to provide information to all residents and provide consultative meetings in each street so that the design process and final constructed outcome receives ownership by the residents and the broader community.

The initial contact by letter from Council should provide an overview of the consultation, design and implementation processes. A brief statement of the process and time frame should be prepared and distributed to all residents. A timeframe for the consultation design and implementation of streets is to be provided for complex streets. This is likely to be set between 18 months to 24 months. Straight forward streets could be set at a 10-12 month process.

Mail out all relevant information to all residents and owners

In streets where schools, shops and community facilities are provided it is important that a representative of each facility or service is kept informed.

(c) First meeting

All residents / owners to be invited to this meeting. The meeting should be held at the nearest public hall.

The local Ward Councillor should chair the meeting. It is important residents of each street are guided within a framework of what is realistically achievable.

Council officers should provide one very basic concept for the street. This then sets general layout parameters without deviating in directions that raise expectations of residents or are unachievable.

(d) Design Development Process

As a result of the first consultation meeting a specific concept plan for the street is developed. The plan is circulated by mail to all residents and property owners. Comment is invited along with attendance at the second street meeting.

(e) Second meeting

A presentation to residents and owners of the particular street is held to discuss the concept. In streets where opportunities allow for a range of solutions, more than one concept plan should be presented and time given for residents to vote on the concept of their choice. Representation at the meeting by the local Ward Councillor should be encouraged.

(f) Review

A period of resident review and comment should be allowed prior to the Design Team assessing comments and changes of the concept to finalise the plan and commence Engineering design documentation.

(g) Council approval/sign-off

Following assessment of residents' comments, the Design Team will develop a concept plan that reflects the outcomes of the consultation process and Council's objectives. Plan presented by the Design Team Representative to Council for adoption.

(h) Advise residents of final outcome

Write to all residents/owners of the final proposed design and state that Council has approved the concept. Provide an estimate of time when the works will be undertaken.

E.10 DESIGN PROCESS COUNCIL'S DESIGN TEAM

Council's Design Team should involve appropriate engineering staff, including the construction supervisor, and Parks Officer. The Team should, where appropriate also call on the expertise of Council's Urban Designer.

The Design Team prepares the design options made available at the initial resident consultation. They also present concepts and makes presentations to Councillors and Committee members. The Design Team has responsibility for organising the design program, the consultation process and the design process.

STEP 1. ANALYSIS AND ASSESSMENT BY COUNCILS DESIGN TEAM.

Determine street classification from Functional Road Hierarchy of Residential Streets. Consider the role of the street and assess the following:

- What is the existing traffic function that the street provides in the road network (i.e. collector road, local access, schools, shops, community facilities etc.);
- Is that road function appropriate? (i.e. access only, through traffic function);
- Does the road function need to be modified? (i.e. narrow, wider, parking etc.) If so, what are the impacts on adjacent streets;
- Bus routes;
- Street lighting- particularly where large trees are present;
- Frequency of accidents and location;
- Car parking demands;
- Disabled access and safety (DDA requirements);
- Property access;
- Assessment of level grades between existing profile footpath/crossovers;
- Street layout and easement dimensions;
- Traffic survey results - speed;
- Pedestrian paths, nature strips;
- Cyclist routes;
- Sight lines;
- Infrastructure, present and existing damage, impediments;
- Service relocations, in particular the timing, cost and where or not it can actually be relocated;
- Tree species and retention value, attempt to retain trees if possible (Council advice is that there are significant numbers of existing unsuitable street trees); and
- Drainage scheme to work in with precinct drainage strategy. Review elevations and longitudinal sections. Develop potential pollutant traps to collect litter and cleanse storm water runoff.

STEP 2. OBJECTIVES PLAN (PRELIMINARY OPTIONS)

From the design options provide general objectives and a framework plan to present to the residents of each particular street, well in advance of design work. Plan presented to Councillor Briefing for in-principle approval. The plan should provide the basic parameters as realistic targets and solutions yet remain flexible enough to allow residents input into the alignment, parking provisions, special access conditions (turning circles) and particular zones where traffic calming and speed reduction are of paramount importance.

STEP 3. REVIEW PERIOD BY RESIDENTS

Request residents should be given a 2 week period for review and comment, (avoid school holiday periods). Residents/owners are invited to provide written submissions. Telephone/verbal comments welcome.

STEP 4. INTERNAL REVIEW OF OBJECTIVES PLAN AND RESIDENT'S COMMENTS (COUNCIL OFFICER)

Following the feedback from residents is a period of review of comments made and commencement of the design development process.

STEP 5. DESIGN CONCEPT

Refinement of the objectives plan to a concept plan or design development plan.

STEP 6. REVIEW PERIOD BY RESIDENTS

The design development plan is to be circulated to all property owners and tenants in the street, inviting comment on the design. A second meeting to discuss the design development plan is conducted with the residents to obtain their opinions and consider improvements.

STEP 7. COUNCIL APPROVAL OF CONCEPT AND DESIGN DEVELOPMENT

Following review and any inclusion of residents ideas to the design development the plans are presented to Council and Committee for adoption and sign off.

Advise residents/owners in writing of the final outcome.

STEP 8. FINAL DESIGN

On Council's adoption of the plans the Design Team prepares the final engineering plans, cross sections and contract documentation

STEP 9. CONSTRUCTION STAGE

Monitor the success and cost of new techniques at the construction stage. Discuss with the contractors any improvements or modifications to techniques that would improve outcomes.

STEP 10. POST CONSTRUCTION STAGE

Generally monitor the success of the project by the Design Team. Note improvements that can be made to achieve the best possible solutions, both in the consultation process, dissemination of information and design outcomes.

STEP 11. REVIEW – COUNCIL’S DESIGN TEAM

The Design Team conduct a half day review period every 12 months to assess the outcomes of particularly new techniques and new materials used. Update the design guidelines and design options accordingly.

STEP 12. RESIDENT AND DESIGN REVIEW

Every two years conduct a review with resident representatives, particularly of recently completed streets that have incorporated new layout ideas.

APPENDIX F

EXTENT OF ROAD REHABILITATION WORKS

The design of the road rehabilitation works shall provide for the following:

F.1 SITE PREPARATION WORKS

- the removal of street trees in accordance with the recommendations of Latrobe City Council's Arborist and as approved by the Council's Development Approvals Committee;
- the removal and reinstatement of native vegetation in accordance with Planning Permit conditions;
- demolition of obsolete drainage structures;
- the alteration of water mains, gas mains, sewers, underground electrical cables, electrical poles and telephone cables etc;
- the alteration of Telstra pit covers, electrical pit covers, sewer pit covers, water main valve covers, fire plug covers and Permanent Survey Marker covers etc;

F.2 EARTHWORKS

- excavation of the road pavement to subgrade profile;
- insitu lime stabilisation of the road subgrade at a depth of 200 mm and a lime distribution rate of 10 kg/m²;
- reinstatement of nature strips;

F.3 DRAINAGE PIPES

- the replacement of underground stormwater drains as indicated on the site plan;
- the construction of underground stormwater drains as indicated on the site plan;
- the replacement of property drainage connections;
- the installation of 100 mm diameter PVC flexible subsurface drains or 300 mm deep geo-composite fin drains including flush risers;

F.4 DRAINAGE STRUCTURES

- the replacement of drainage pits as indicated on the site plan;
- the construction of drainage pits as indicated on the site plan;
- the replacement of stormwater drainage pit covers and lintels;
- the modification of drainage structures as indicated on the site plan

F.5 CONCRETE KERB & CHANNEL

- the replacement of kerb and channel with SM2 or SM3 kerb and channel including the placement of 200mm deep class 2 fine crushed rock bedding as per Standard Drawing No: LCC102.

F.6 CONCRETE VEHICLE CROSSINGS & FOOTPATH

- the replacement of vehicle crossings as per Standard Drawing No: LCC307;
- the replacement of footpath and footpath crossings as per Standard Drawing Nos: LCC401 and LCC402;
- the extent of replacement work will be determined by Latrobe City Council.

F.7 PAVEMENT

- insitu cement stabilisation of the existing road pavement at a depth of 200 mm and a cement distribution rate of 12 kg/m²; OR
- placement of pavement consisting of 200 mm compacted thickness of class 3 fine crushed rock sub base and 100 mm compacted thickness of class 2 fine crushed rock base course;

F.8 BITUMINOUS WEARING SURFACE

- application of 7 mm emulsion primer seal;
- laying of 30 mm thick 10 mm type N hot mix asphalt;

F.9 LINE MARKING & SIGNS

- installation of line marking as indicated on the site plan;
- reinstatement of existing line marking;
- installation of signs as indicated on the site plan;
- reinstatement of fire plug markers

F.10 SERVICES – PROVISIONAL ITEM

The Designer shall obtain an estimate of the cost to alter any services from the relevant service authority.

The Designer shall notify the Manager Infrastructure Development of any utility services that will conflict with the road rehabilitation works and the estimated cost to alter the services. The Designer shall obtain approval from the Manager Infrastructure Development for the proposed alteration of the utility services, prior to proceeding further with the design works.

F.11 SET OUT OF WORKS

The Designer shall arrange the set out a reference line for the road rehabilitation works to prove the accuracy of the design and survey.

The reference line shall be set out on the centre line of the road with 9.5 mm diameter by 225 mm long rose head decking spikes driven into the road pavement. The reference marks shall be highlighted with yellow paint and the chainage indicated adjacent the reference marker with yellow paint.

The reference markers shall be levelled with a dumpy level. The reference mark levels shall be included on the longitudinal sections.

APPENDIX G

CONSULTANT CERTIFICATIONS

G.1 DESIGN CERTIFICATION

The statement of certification required for design works shall be submitted to Latrobe City Council on the relevant company letterhead in the following form:

“As the Engineering Consultancy’s nominated representative responsible for the design and preparation of the engineering plans for the works detailed on drawing number (*drawing no. and revision*), dated (*date*),

I certify that I have checked these designs and drawings and that they are in accordance with Latrobe City’s Design Guidelines, Specifications and Standard Drawings and with any variations to such as have been approved in writing by Latrobe City Council.

Name: (*name*)

Signature: (*signature*)

Date: (*date*)

“

G.2 CONSTRUCTION CERTIFICATION

Where a statement of certification is required for construction works, it shall be submitted to Latrobe City Council on the relevant company letterhead in the following form:

“As the nominated representative responsible for the construction of the works associated with the *(provide details of project, stage, planning approval no., drawing no., revision, drawing date, etc. as required to identify project)*, I certify that:

(Include or delete the following as appropriate)

1. The works have been constructed in accordance with:
 - The approved engineering plans,
 - The approved design,
 - Latrobe City’s Design Guidelines, Construction Specifications and Standard Drawings or such variations as approved by Latrobe City Council in writing,
 - Relevant Australian Standards,
 - The approved Environmental Construction Plan for the project,
 - The approved Traffic Management Plan, and
 - Conditions and requirements pertaining to any relevant planning approval.
2. Corrective action taken for non-conforming work has been documented and accepted by Latrobe City Council.
3. All required notifications were given to Latrobe City Council, property owners and service authorities.
4. Alterations of services were carried out in accordance with the requirements of the responsible authorities.
5. All repairs, restorations or reinstatements to public or private property have been completed to the satisfaction of the relevant owners.
6. There are no further statements or claims in regard to the above works to be lodged with Latrobe City Council.

Name: *(name)*

Signature: *(signature)*

Company: *(company name)*

Date: *(date)*

“

End of Document