



# INFRASTRUCTURE DESIGN MANUAL

## ATTACHMENT A ISSUE ASSESSMENT SHEETS

## Issue No 1. General Comments on the Infrastructure Design Manual

### Comments Received

#### Terraco

*The manual is unnecessarily complex in many areas, and requires additional consideration and refinement prior to the manual being adopted.*

*It also has a number of requirements which contradict accepted standards, particularly clause 56 of Planning Schemes. We would submit it is inappropriate to adopt a design manual which clearly contradicts the Planning Scheme. The manual should be amended to agree with Clause 56, or the Planning Scheme should be amended to reflect Council's preferred road classification standards.*

#### PlanRight

*Overall the manual seems to be in a good state. The level of detail is about right, spelling out items particular to the relevant councils without regurgitating the associated Australian Standards etc.*

*The checklists included seem comprehensive without being laboriously long and may well supersede our own (trial will determine this).*

*One areas of concern is in the structure of the design phases for submittal of plans. Our thoughts are that Approval in Principle should be overall layouts and design concepts. Once these are approved, detailed design may then proceed without the risk of having to scrap everything due to a basic layout problem. The level of detail asked for at the 'Approval in Principle' stage in the manual however is far beyond this and requires a fair amount of detailed design.*

*What scope is there for council staff to insist upon standards/details not listed or covered within this manual? If something is listed within the manual are we able to assume council cannot insist on changes?*

#### VicRoads

*Suggest that Infrastructure Design Manual be renamed 'Infrastructure Design Manual – Municipal Roads & Subdividable Land'.*

#### Moira Shire

*The document may need a simple method for tracking changes that have been made between successive versions. The easiest method might be the one used in the Building Code of Australia where there is a margin down the edge of the page where a notation can be made depending upon which version was responsible for the change. This can also aid on providing a summary of changes made with any new version.*

*This might also be useful if an increasing number of councils coming on board wish to increase the variation with the standard text. The method adopted in the BCA for handling State variations might be a useful means for handling these differences as well.*

#### Tomkinson

*Would you please advise if the document is to be incorporated into the Planning Scheme and whether or not a panel hearing will be held if we still object to some items following your response.*

*Whilst we applaud Councils commitment to instigate the Infrastructure Design Manual, we are concerned that once the manual is adopted Council will become too rigid in their application of the document with no opportunity to seek common sense solutions when the need arises from time to time.*

*As consultants our job is to provide more liveable precincts for residents but with the affordability of housing becoming an increasing issue within all municipalities, many of our concerns relate directly to items which increase overall development costs, whilst not necessarily providing a better product for the end user.*

*As the manual stands and reads there is a significant increase of consultancy work required which would be in the order of a 20% increase and even beyond 50% increase in some cases. Consideration to this must be a major priority when addressing our concerns.*

### Working Group Assessment

It is acknowledged that one of the objectives of the Infrastructure Design Manual is to provide a system by which Councils can determine and implement infrastructure standards that reflect and address local needs or desires. These are considered to be consistent with the objectives of Clause 56 of the Planning Scheme. The disputes about discrepancies between Clause 56 and the Infrastructure Design Manual arise when people only compare the minimum standards but neglect to consider full the objectives of the Clauses. The Planning Scheme does not require that minimum standards be provided, but more importantly that the **objectives** of the Planning Scheme be met. Clause 56, Residential Subdivision states as follows:

*“Purpose*

*To implement the State Planning Policy Framework and the Local Planning Policy Framework, including the Municipal Strategic Statement and local planning policies”*

In other words where local policies exist and are recognised in the planning scheme then these can require higher than the minimum standards specified in the planning scheme.

The Infrastructure Design Manual does contain a lot of detail about the design work to be undertaken and at what stage of design it is required to be presented to Councils. In general there should not be a significant change from what work would be undertaken now in best practice.

Where there are higher standards than the ‘minimum’ standards required these are acknowledged throughout the Manual through reference to ‘principles’ with explanation about why there is a difference.

### Proposed Actions

- 1) Add comment regarding precedence of documents comments, eg. the Manual requirements take precedence over standard drawings.

## Issue No 2. Comments on the Section 1

### Comments Received

#### VicRoads

*At the end of 5<sup>th</sup> dot point insert "on Municipal Roads and Private Land"*

#### Internal Staff Comments

*Does the introduction need to be re-written to accommodate other Councils that may come on board?*

*There is a need to outline the precedence of documents comments, for example the requirements of the Infrastructure Design Manual take precedence over standard drawings.*

*There is need to consider how future amendments will be identified and communicated.*

### Working Group Assessment

The introduction as currently written is appropriate to reflect the objectives of the Manual and the background to its development. It is recommended that any Council who subscribe in the future can be acknowledged by adding comment to the current introduction.

It is assumed that VicRoads comment is partly to differentiate between the infrastructure standards documented with the Infrastructure Design Manual and those standards that VicRoads adopt for their roads, some of which are also impacted upon by developers and municipals works. It needs to be remembered however that standards for roads is only one of many areas covered by the manual, so alternative wording may be more appropriate.

### Proposed Actions

- 1) Leave introduction as currently drafted, and add list of subscribing Councils as they come on board.
- 2) Amend fifth dot point in introduction to read:  
*To clearly document Council's requirements for the design and development of infrastructure;*

**Issue No 3. Infrastructure Design Manual Section 2**

**Comments Received**

Moira Shire

*Add 'Moira Shire – Infrastructure Planning' to definition of Councils Engineering Department*

**Working Group Comment**

It is appropriate to amend as per Moira's comment. Others may be also be added if they come on board.

**Proposed Actions**

- 1) Agree to amend Section 2 of the Manual to add Moira.

**Issue No 4. Infrastructure Design Manual Section 3.1**

**Comments Received**

VicRoads

*Under fourth paragraph insert after Council staff "and where appropriate, referral authorities such as VicRoads."*

**Working Group Comment**

VicRoads comment is reasonable.

**Proposed Actions**

- 1) Amend as per VicRoads comment.

## Issue No 5. Infrastructure Design Manual Section 3.2

### Relevant Excerpt from the Infrastructure Design Manual

The following are the relevant excerpts from the Infrastructure Design Manual

*Developments may involve the construction of engineering works, or may potentially impact upon existing Council assets such as roads and/or drainage systems. In these instances, the Applicant should also include the following information, as a minimum, to enable engineering review to take place.*

- *Plans of existing site conditions showing:
  - ~ Existing surface contours (generally at 100 mm intervals) and clear identification of both natural and constructed drainage flowpaths;*
- *Conceptual layout of the proposed development;
  - ~ Street lighting details;*
- *Proposed Water Sensitive Urban Design (WSUD) treatments and MUSIC analysis;*

### Comments Received

#### ALDE

*Should instead just specify “at an interval sufficient to clearly identify natural and constructed flow paths. 100mm is completely unnecessary for all but the flattest sites. In many cases existing topographic maps will provide enough detail to show flowpaths and drainage areas.*

*There is no difference between the large and small developments. For example a 2 lot subdivision with a requirements for a small drainage extension and provision of services should require significantly less detail than a 200 lot development. Perhaps there should be a simpler checklist for small jobs.*

#### Singleton Bahen Stansfield

*The level of detail is normally submitted at the design stage and would be unnecessary for the majority of applications.*

#### Tominkson

*100 mm contours are unnecessary in Bendigo unless in flat areas such as Huntly, Epsom etc.*

*Street lighting detail may be cost dependent and these details have generally not been provided at this time.*

*MUSIC analysis for WSUD should not be necessary at this preliminary stage.*

#### Styles

*The implied requirement for 100 mm contours at the planning application stage is considered excessive and will place a substantial cost burden on the developer at the very outset of any venture. Whilst in some rare instances 100 mm contours might be generally necessary generally they are not, except in very flat terrain.*

#### Brian Bartlett

*Preliminary Design plans – the Manual requires natural surface and finished surface contours at 50mm intervals on lotfill plans. This is considered excessive intervals for the Bendigo area.*

### Working Group Comment

It is acknowledged that 100 mm contour intervals are not as appropriate in undulating or hilly terrain such as around Bendigo or southern parts of the Shire of Campaspe. However topographical maps may not be appropriate either unless in very hilly areas for concept level discussions. It would be considered more appropriate to develop a table of ‘average site grades’ versus ‘contour interval’. It may also be appropriate to look at whether the proposed intervals would work on quite small sites, which may be better addressed through nominating a grid interval for spot levels or minimum number of contour intervals. Amendment to the contour intervals would not negate the need to

identify natural and constructed drainage flowpaths, and it may be appropriate to address very small and relatively flat sites using arrows showing flow direction.

With respect to the difference between large and small developments, there should be no difference in the planning or design process, it is the level of detail and extent of works that will vary. It is preferable to follow a consistent process and if there are items that are not relevant or applicable then they can be recorded as such.

The level of detail nominated in the Manual is aimed at ensuring that the proposed development has considered all fundamental features of the land and critical issues. The Manual does not ask for detailed design at the time of permit application, however there still needs to be sufficient amount of *preliminary* design undertaken to demonstrate that the proposal is workable. Too often the very simplistic applications received by Councils have made assessment difficult and have led to fundamental changes to development layouts. When these are having to be negotiated after permits are issued and plans endorsed, it is very frustrating for all parties and often leads to a perception of Council changing its mind. The aim is to have better prepared applications that allow proper assessment by Council Officers and referral agencies to ensure that permits are issued with appropriate conditions and with confidence in the success of the development. This attitude is reinforced by Clause 56 of the Planning Scheme.

With respect to the reference to street lighting detail, the intention is that the style is nominated but not details such as location.

With respect to the request for MUSIC analysis it is a requirement of Clause 56.07-4 of the Planning Scheme that developments are designed to meet the current best practice performance objectives for stormwater quality as contained in the Urban Stormwater – Best Practice Environmental Management Guidelines (Victorian Stormwater Committee 1999) as amended. In addition to this, DSE provides Practice Notes to guide consultants in the preparation of permit applications. The VPP Practice Note *‘Using the integrated water management provision of Clause 56 – Residential Subdivision’* recognises that the location of urban run-off systems can influence the layout of a residential subdivision and should be submitted as part of the design response and nominates MUSIC analysis as part of that design response. Therefore the requirement for WSUD treatment and MUSIC analysis is consistent with Clause 56 requirements and does not require amendment.

### **Proposed Actions**

- 1) Amend Section 3.2 requirements in relation to the nominated contour interval and develop a table of ‘average site grades’ versus ‘contour interval’ and that small sites need a minimum number of spot levels and arrows of flow direction.
- 2) Amend Section 3.2 to clarify that ‘street lighting detail’ relates to style and not specific locations.



**Issue No 6. Infrastructure Design Manual Section 3.5**

**Excerpt from the Section 3.5 of the Manual Development Contribution**

*Development Contributions shall be generally controlled by the use of Section 173 agreements, planning permit conditions and/or Development Contributions Plans. Development contributions may be required for roadworks, drainage, public open space, traffic management works, community development or other works that benefit the Developer and/or others. The City of Greater Shepparton has developed procedures for the management of Development Contributions within its municipality. This document "Undertaking Works & Payment of Development Contributions" can be found on the City of Greater Shepparton's web-site.*

*Any contribution from Council shall be made in accordance with Council's relevant policies, copies of which are available on Council's web-sites. Because such works will be 'Capital Works' or new assets, Councils must make provision within their approved budgets. Accordingly Developers must submit plans and documents detailing any request for a contribution prior to January each year. In all instances the allocation of Council funding cannot be guaranteed for the following financial year. Supporting documents shall include plans, specifications and a detailed Engineer's Estimate. The estimate should detail the contribution of all benefiting parties and the date or trigger for the amount expected from Council.*

**Comments Received**

Brian Bartlett

*Drainage Levy principles applied by Council need to be clearly outlined. Little or no mention is made of drainage levies in this manual.*

ALDE

*There is no mention of drainage levies, principals for funding GPTs, main drains, outfall works etc from levies.*

*The timing of applications for funds would in many cases be unworkable. Application of drainage levies towards outfall works including construction of GPTs etc should be able to be made at the time of payment of levies for example. Drainage levies would be reduced by the cost of the main drainage works.*

Singleton Bahen Stansfield

*Council receives a considerable amount of funding from developer levies including drainage levies. The reserve of funds should be made more readily available rather than the developer shouldering Council costs for 12 months or more. In some instance, Council contribution can be offset by developer levies at the time of the works.*

**Working Group Comment**

Drainage levies are usually quite specific to the individual Council in the way that they are calculated, applied and spent. Therefore it will not be possible to document easily within the Manual. It is however reasonable to make mention of them to acknowledge that Councils sometimes use these as a form of Developer Contribution. It is proposed to state in the Manual that where Councils have policies in relation to drainage levies and/or headworks charges, these will be documented in Council's separate policies, and that other arrangements may need to be in place where adequate drainage infrastructure is not available.

Singleton Bahen Stansfield comment is an issue that Councils may consider when reviewing their policies or when developing specific Development Contribution Plans, but is not an issue to be addressed via the Manual at this time.

Often pre-development agreements are used to assist the planning and implementation of shared infrastructure and should be noted in the Manual. Because this needs to be fixed to the land, it is best to use a Section 173 Agreement.

**Proposed Action**

- 1) Amend section 3.5 to include comment in the Manual noting that where Councils have policies in relation to drainage levies and/or headworks charges, these will be documented in Council's separate policies, and that other arrangements may need to be in place where adequate drainage infrastructure is not available.
- 2) Amend Section 3.5 to add 'pre-development agreements or other arrangement' before section 173 agreements in first line.

## Issue No 7. Infrastructure Design Manual Sections 4.2

### Excerpts from the Manual describing the general requirements for Outline Development Plans

#### Section 4.2 excerpt

*Outline Development Plans should be submitted for review with a written response to the provisions in ResCode, and guidelines contained within this manual.*

#### Section 4.2 excerpt

*Unless agreed otherwise, any submission and review of an Outline Development Plan shall require a meeting with Council's planning and engineering staff. Relevant service authorities should be invited to attend this meeting. The Developer's Representative shall be responsible for co-ordinating the meeting.*

### Comments Received

#### Chris Smith & Associates

*Sections 4.2 and 4.3 make numerous references to ResCode and various subclauses of Clause 56. We note that development also includes industrial, commercial and other developments as well as rural subdivisions, which are not the subject to the provisions of Clause 56. We suggest the Manual be amended to include (as appropriate) or similar after any reference to ResCode or Clause 56 and the reference is made to the appropriate development guidelines (e.g. the Greater Shepparton Industrial Development Guidelines) where they exist.*

#### VicRoads

*First paragraph, extend first sentence after meeting "and where appropriate, VicRoads and DSE".*

### Working Group Comment

It is sensible to clarify that ResCode or Clause 56 of the Victorian Planning Provisions relates to residential developments. It is also desirable to clarify the precedence of documents (refer to Issue No 1) to avoid confusion. The Infrastructure Design Manual takes precedence over previous documents where they relate to infrastructure standards, however there are elements of other documents that refer to subdivision layouts and design issues rather than infrastructure standards, such as the Greater Shepparton Industrial Guidelines. Previous Council documents will need to be reviewed and amended over time to delete reference to standards now covered in the Infrastructure Design Manual.

It is more appropriate to add the VicRoads comment to the second sentence.

### Proposed Action

- 1) Amend Section 4.2 of the Manual to clarify that Clause 56 provision apply to residential development and that the Manual takes precedence over previous Council documents in relation to infrastructure standards.
- 2) Amend Section 4.2 to add reference to meeting with VicRoads and DSE.

**Issue No 8. Infrastructure Design Manual Section 4.3**

**Excerpts from the Manual describing the specific requirements for Outline Development Plans**

Section 4.3 excerpt

*Engineering design requirements for an Outline Development Plan proposal are as follows:*

- *Subdivision developments must be designed to meet the provisions of the Clause 56 of the planning scheme, except where varied by this Manual.*
- *Cul-de-sacs shall be shown with court bowl ends. Hammerhead or 'T' heads are not permitted.*
- *Road reserve widths must be adequate for the intended road type, and should comply with Section 12.3.2 of this manual. The Outline Development Plan should include a typical cross-section of differing road types, detailing the intended function of the road, e.g. bike lanes, drainage, landscaping.*
- *Proposed street names shall conform to the Street Naming Guidelines.*

Note that Section 4.3 is quite extensive but only those parts directly relevant to the submitter's comments are listed above.

**Comments Received**

VicRoads

*Second hollow dot point 'motilities' suspect misspelt mobilities*

*Make a third dot point after the second as "identification of public transport requirements".*

*Fifth existing dot point, we question use of the term ARTERIAL as RMA refers to arterials as Declared Roads under responsibility of VicRoads. Is it better to refer to Municipal Arterials as Major Roads or something similar?*

*In existing 10<sup>th</sup> dot point after radius insert "and sightlines"*

Brian Bartlett

*States that no 'hammerhead' or 'T' heads. Properly constructed 'T' heads that allow for a 3 point turn of a garage truck should be allowable. A court bowl only needs one car parked in it to require a multi-point turn of a garbage truck only.*

*'T' heads not built to a reasonable standard in the past have given this access method a bad name. 'T' heads at least 18m across work fine for a 3 point turn. I agree garbage trucks should not have to fully back down a court but a 3 point turn should be acceptable and is difficult to avoid even with a court bowl.*

*The Manual states surface flow paths should not be directed through property easement, but though drainage easements? I assume that this is meant to be drainage reserves.*

Chris Smith & Associates

*1st dot point: At sections 3.2 and 4.3 the Manual states that the application documents for developments which include the construction of engineering works should include plans of existing site conditions showing, among other things, existing surface contours and natural and constructed drainage flow paths. We note that that a vast majority of developable land within the Greater Shepparton and Campaspe municipalities are very flat and have long since been cleared of all natural features to facilitate agricultural activities. Accordingly, in the past there has been no need to show existing surface levels contours on our ODP's. Will there now be a requirement to undertake a full feature survey and level survey at this early stage of the development process?*

*Third dot point: Proposed surface level contours would require some fairly extensive design time to produce at a time when Council's opinion on the estate is unknown. How do you propose that both existing contours and proposed contours be shown clearly on the same plan? Would direction of flow arrows be sufficient to indicate proposed overland flow paths.*

*15<sup>th</sup> dot point: Cul-de-sacs shall be shown with court bowl ends. Hammerhead or T heads are not permitted. Does this apply to nooks? Where there is insufficient area of land available to provide a court bowl with a turning circle, a short nook provides a shared driveway style design enables access to two or three allotments. Garbage pads are*

then provided on the through road at the intersections of the nooks so that garbage trucks do not have enter the nook. Refer examples provided.

#### ALDE

*This is not consistent with Clause 56 of the Planning Scheme. The reference to the Coroner's finding in the Principle section is misleading. The case referred to involved a truck backing a considerable distance down a street because it couldn't turn at all. It did not involved a 3-point turn.*

*3-point turns are often required in court bowls, for example when one or more vehicles are parked in the bowl area. Provision of circular bowls rather than other shapes at the ends of cul-de-sacs does not ensure that reverse movements will not occur. In some infill sites, provision of round court bowl areas may not be suitable or even possible, whereas alternative treatments may work. Proper engineering consideration may be given to the design of cul-de-sac ends, rather than a prescriptive require for round bowls only.*

*This is a lot of detail required for road x-section etc. for an ODP.*

#### Tomkinson

*The level of information seems to be more in keeping with that which is supplied at the detailed design stage. Some of the information would not be available without undertaking detailed design which should not be necessary at this early stage.*

*How has the park area of 0.75 Ha been determined?*

#### Styles

*T head courts when designed correctly can be a very useful design concept and facilitate the more economical development of available land. To eliminate this concept from the designers' repertoire will unnecessarily limit development.*

*The inclusion of typical x-sections at the ODP stage can be difficult, particularly at the ODP stage can be difficult, particularly in steep country where a detail consideration of all aspects may dictate a very different x-section than initially envisaged.*

*The amount of drainage detail required at the ODP stage is excessive and unnecessary cost burden to the developer. Most of the requirements are detail design requirements. A generalised and to some extent flexible layout plan together with catchment area should be all that is required.*

### **Working Group Comment**

Chris Smith & Associates recommendation to clarify that ResCode or Clause 56 of the VPP relates to residential developments is reasonable. It is also desirable to clarify the precedence of documents (refer to Issue No 1) to avoid confusion e.g. the Greater Shepparton Industrial Development Guidelines may have requirements that are in conflict with the IDM. It is the opinion of the working group that the Infrastructure Design Manual takes precedence over previous documents where they relate to infrastructure standards, however there are elements of other documents that refer to subdivision layouts and design issues rather than infrastructure standards. Previous Council documents will need to be reviewed and amended over time to delete reference to standards now covered in the Infrastructure Design Manual.

With respect to provision existing surface contours and natural and constructed drainage flow paths on ODP submissions, refer to comments under Issue No 5. It is not true to say that in the past there has been no need to show existing surface levels contours on ODP's. It is the experience of the Councils that the omission of this information has sometimes resulted in limited assessment and subsequent rework. The level of survey required will depend on the supporting material available. For example in irrigated areas, there is often historic data available and only confirmation of key features would be required. Therefore the level of survey required will be site-specific. At the end of the day, sufficient detail needs to be provided to enable proper assessment of the proposal and to avoid the risk of rework for consultants and developers. This is further supported by discussions under Issue No 5 about the level of detail appropriate for proper planning and assessment of development.

The Manual discusses under 'Appendix N Notes on Engineering Principles' the reasons behind why cul-de-sacs shall be shown with court bowl ends. In relation to the examples of 'nooks' provided by Chris Smith & Associates, they are considered to be in essence driveways and property accesses and not a desirable part of the road reserve

or council assets. They should therefore be located on common property with a drainage pit at the common property / road reserve boundary. This will need further clarification in the Manual.

It is not the experience of Councils that elimination of T-Head courts limits development. In fact it has been demonstrated that in many cases there is negligible financial impact to the development or lot yield. Further to this Councils often receive criticism and complaint from their residents about these types of cul-de-sacs and have expressed a preference for court bowls. It is also noted that previous versions of Clause 56 of the Planning Scheme obviously promoted t-head cul-de-sacs, while the revised provisions that came into effect in October 2006 no longer refer to this arrangement, but instead under Standard C17 discusses the need for designs to minimise the provision of cul-de-sacs and to provide for service and emergency vehicles to safely turn at the end of a dead-end street. Councils believe that this is best addressed by the provision of court bowls of sufficient dimension to allow safe turning in a forward direction. Councils have also been contacted by waste collection contractors with concerns about this issue. It may be that a lack of appropriate turning facility at the end of dead-end streets may in the future lead to Councils not being able to provide waste collection services in these streets at great inconvenience to residents.

With respect to the difficulty of achieving a full court bowl in infill developments, it is acknowledged that this may not always be achievable. In these instances written approval may be granted for site-specific alternatives, however the approval would be conditional upon provision of alternative waste collection areas and may other have implications in terms of road design and construction.

The minimum park area of 0.75 Ha results from general Council experience and is about the size of park that provides for a good mix of recreational uses.

Brian Bartlett's comments regarding surface flow paths being directed through 'drainage reserves' is correct.

It is unclear why Singleton Bahen Stansfield and Styles commented that there is a lot of detail required in relation to road cross-sections. The Manual requires that typical cross-sections of differing road types, detailing the intended function of the road, e.g. bike lanes, drainage, landscaping be provided. Detailed design is not required at this stage but agreement on the function of the roads is considered important and is supported by Clause 56.06-7 Standard C20 which requires that a street detail plan show the street hierarchy and typical cross-sections for all streets. An example within the Manual may clarify this issue.

The issue of drainage detail has been discussed under Issue No. 3 of this report.

With respect to the use of the term arterial in the Manual, this is consistent with Clause 56 of the Planning Scheme. On the basis that Clause 56 acknowledges that these road require specific design, this reference should not cause any issues of concern.

### **Proposed Action**

- 1) Amend the Sections 4.2 and 4.3 of the Manual to clarify that Clause 56 provision apply to residential development and that the Manual takes precedence over previous Council documents in relation to infrastructure standards.
- 2) Amend relevant sections of the Manual in relation to surface contours as proposed in Issue No 3 of this report.
- 3) Amend Section 4.3 to include "identification of public transport requirements";
- 4) Correct spelling of mobilities as per VicRoads comment.
- 5) Amend existing 10<sup>th</sup> dot point to insert "and sightlines".
- 6) Amend Section 4.3 to state that surface flow paths must be directed through **drainage reserves**.

## Issue No 9. Infrastructure Design Manual Section 5.3

### Relevant Excerpt from the Infrastructure Design Manual

*The detailed checklists appended to this manual provide designers with documentation to demonstrate that the requirements of the Council have been satisfied. Designers are required to sign off the relevant checklists, to verify that the specified criteria have been met.*

*For Developers, these checklists form an integral part of each submission of documentation, and provide the basis for fast-tracking approvals. Councils, to check authenticity, will randomly undertake audits of submitted checklists. Consultants providing reliable checklists will be ranked accordingly and attract less auditing. Others may experience delays in the approval process due to increased rates of auditing.*

*Where Developer's submissions are accompanied by completed checklists, Council's engineering department will not spend time checking quality or minor documentation details, and will therefore be able to review documentation in a significantly shorter time.*

*Where Developer's submissions are not accompanied by completed checklists, or where auditing has shown that previous checklists have not been reliably completed, Council's engineering department will be required to review the submission in greater detail. This may include a check design details and quality of documentation against the checklists. As a result, responses or approvals of submitted documents shall not be able to be fast-tracked.*

### Comments Received

#### ALDE

*The time frame for approval of engineering plans under the Subdivision Act is 28 days. Therefore, the total time that council should take to approve all 3 stages (Approval in Principal, Preliminary Design Submission and final Design Submission) should be 28 days maximum, regardless of whether completed checklists are submitted with the plans. It is worth noting that Council intends to charge a Plan Checking Fee, but only intends to randomly audit checklists.*

#### Singleton Bahen Stansfield

*No definite timeframes for the checking and review of plans by Council is stated, only plans submitted with checklists will be "fast tracked". We are concerned that the time taken by Council to process additional information prescribed in the manual will significantly lengthen the approval process, despite Council's stated objective of ensuring expediency for developers.*

### Working Group Assessment

Councils will undertake random audits not random plan checking, which Councils will still undertake plan checking for design intent, compliance with conditions and functionality. In the past Councils have had to undertake a greater level of detailed plan checking than is reasonable, even on work prepared under quality assurance systems. Even when amendments are requested, Councils have found documents returned without anyone checking that the amendments have been completed. Thus Councils Officers are not processing additional information prescribed in the manual, as it is the better checked by consultants before submission and presented in a consistent manner with sufficient detail to allow Council Officers to focus on the critical design elements, and will provide opportunity for improved turnaround times.

### Proposed Actions

No amendment proposed.

**Issue No 10. Infrastructure Design Manual Section 5.4**

**Relevant Excerpt from the Infrastructure Design Manual**

*It is not the responsibility of the Council to design, construct, or supervise the construction of roads and drainage infrastructure for private land development. It is the responsibility of the Developer to engage suitably qualified and experienced personnel who will carry out these functions to the satisfaction of the Council.*

*The Developer shall ensure that these persons:*

*Possess a professional indemnity insurance policy that covers design, construction and supervision and includes a provision for a maximum possible claim;*

*Do not have a pecuniary interest with either the Developer, or in the due completion of the works, and in particular that any such person is not responsible for the supervision and control of labour and material inputs into the development; and*

*Are acceptable to Council, being as a minimum, eligible for membership to the Institute of Engineers Australia, and having a minimum of 5 years experience in the relevant engineering field.*

**Comments Received**

Brian Bartlett

*The manual states that the developer shall ensure that these persons do not have a pecuniary interest with either the developer or in the due completion of the works and in particular that any such person is not responsible for the supervision and control of the labour and material input into the development.*

*It is a restriction of trade on an engineer to not permit him to design and project manage / supervise the construction of roads and drainage infrastructure for private land development that he may have a financial interest in. I do agree however that the engineer should not be acting as the contractor / constructor for works he is project managing / supervising.*

*The design / project manage process of a development is taken through a thorough checking control process by Council. Council accepts a 3.25% of works value fee for plan checking and supervision fee to ensure this checking is carried out through the development process.*

*A list of required inspections to be carried out by the Council is stated in the draft Appendix F representing thirteen No. minimum hold points. In addition, the maintenance on constructed works is to be extended to 12 months.*

*The checking process by council is thorough to ensure that at the end of the 12 month period the Council asset at handover is to a proper standard to meet the required Council standards and objectives. It is not possible for an engineer to reduce the standards through such a process for his own financial gain. The Building Control commission allow a registered builder to build a spec home for the builder's profit. There are thorough checks through the process to ensure adequate standards are complied with.*

**Working Group Assessment**

The purpose of the clauses in Section 5.4 is to avoid a situation where the person responsible for ensuring implementation of an approved design to agreed standards, has financial gain from completion of works with minimal labour, materials and costs. As per the submitter's comments above an engineer should not be acting as the contractor / constructor for works he is project managing / supervising. If a project is running into difficulties relating to costs or progress, it is problematic to expect someone who also has a direct financial interest to objectively balance what are usually competing interests. Checking and hold point inspections undertaken will indeed assist the process, but it is much cleaner to simply ensure that someone independent from the financial interest of the development is part of the process.

This requirement does not negate the opportunity for an engineer to design and project manage works on a private land development. Indeed this is common practice in development, and can continue to be so under these requirements.

**Proposed Actions**

No amendment proposed.



## Issue No 11. Infrastructure Design Manual Section 5.5

### Relevant Excerpt from the Infrastructure Design Manual

*A pre-design site inspection is expected to be undertaken prior to any detailed design work commencing.*

*For Designers undertaking works on behalf of Council or Developers a pre-design site inspection should be held with a representative from the Council's Engineering department to discuss specific issues and requirements for the site and surrounds.*

### Comments Received

#### Tomkinson

*A pre-design site inspection should not be necessary for every development and the manual should be amended accordingly. In most cases the design engineer will arrange for a meeting at functional design stage to discuss any issues. This proposal has the potential to increase the design phase by approximately 8 weeks.*

### Working Group Assessment

It is unclear how a pre-design inspection can incur an 8 week delay.

It is difficult to adequately plan and design civil infrastructure works without having the benefit of at least one early site inspection. It is the experience of Councils that consultants who try to avoid the time and cost of an early inspection often end up with poor design outcomes, design rework, delays in approvals due to the need for rework and even frustrating negotiation with Council officers. This is often the case with consultants from outside of the region in which the works are planned. None of these things save their client money in the long run and are better off avoided if possible.

Often a consultant visits the site as part of preparing a fee submission and this may satisfy the request for a pre-design inspection. The Infrastructure Design Manual doesn't specify that a separate visit be undertaken. The important thing is that the designer has at least taken the opportunity to assess site features and the surrounding environment, and can design accordingly. For these reasons, the Manual states that a visit **should** be undertaken. If a consultant chooses not to undertake a pre-design inspection they take the risk of rework. However, Council Officers should not be asked to compromise on infrastructure standards during the approval process because some site-specific issue was missed.

Council officers often have useful local knowledge or know of planned infrastructure works in the vicinity of the site that can impact upon designs. Often Council Officers undertake their own inspections when future works are known to determine appropriate conditions. It is generally for these reasons that the Manual offers to have a joint inspection. It is not mandatory and there will be sites, such as low-risk two lot infill developments, that do not get any significant gain from joint inspections.

### Proposed Actions

- 1) Amend the first sentence of Section 5.5 of the Manual to add 'unless approved otherwise in writing'.
- 2) Amend the second paragraph to clarify that the joint inspection is an invitation by Councils, not mandatory.

**Issue No 12. Infrastructure Design Manual Section 5.8**

**Relevant Excerpt from the Infrastructure Design Manual**

*Engineering plans and documentation shall be submitted at three separate stages during the design process, in accordance with the following sections.*

**Comments Received**

Tomkinson

*We do not see that it is necessary for a three stage design documentation process. An approval in principle and final documentation should be adequate for the majority of projects.*

**Working Group Comment**

If done correctly the three stage process is simply:

- 1) Review and agree to functional layout;
- 2) Review and agree to the details; and
- 3) Rubber stamp the final product.

This is essentially what occurs now and it doesn't seem sensible to try to delete one of these steps.

It has long been common practice in engineering to review projects at 25% completed design, 90% completed design and final design stage. What the Manual attempts to provide is a formal structure to this process and to clarify what information Councils need to see at these stages.

This approach is not expected to result in any longer period of design or approval than is current practice and more importantly has the potential to provide improved turnaround times because the requirements of consultants are well documented from the start and the information to be provided will be shown consistently and clearly.

The working group discussed comments by VicRoads regarding the following sub-sections of 5.8 and it is proposed to refer to the three stages hereafter as :

- i) Functional Layout Design
- ii) Detailed Design; and
- iii) Final Design

**Proposed Actions**

No amendment proposed.

**Issue No 13. Infrastructure Design Manual Section 5.8.1**

**Excerpt from the Manual detailing submission for Approval in Principle :**

*Preliminary engineering plans are to be submitted to Council's engineering department for review. The submission must note key engineering assumptions specific to the proposed development. This submission can occur before or after an application for planning permit is made.*

*The approval in principle submissions shall be prepared on the basis of this manual in accordance with general engineering principles, the planning permit conditions and all other information collated from the site. The Design Engineer shall initially provide adequate data on the proposed roads, drainage and parking for the development to enable approval in principle to be issued by the Council.*

Road Design : *The submission shall include one hardcopy set (A3 plans) of road layout and parking plans showing:*

- i. Layout of roads and allotments with nominated carriageway widths (between invert of kerbs) and nominated road reserve widths;*
- ii. Layout of road hierarchy and estimated traffic volumes;*
- iii. Typical road reserve cross-sections;*
- iv. Conceptual layout of proposed intersections internal and external to the development;*
- v. Carparking layout plan as per this manual. Where requirements are not detailed herein the parking proposal shall comply with ResCode;*
- vi. Vehicle turning movement plan (refer Section 12.3.9); and*
- vii. Details of any staging of the development and impact on the road network.*

Drainage Design : *The submission shall include one hardcopy set (A3 plans) of the overall drainage strategy showing:*

- i. Total catchment area, nominated sub-catchment areas and co-efficient of runoff for each sub-catchment;*
- ii. Layout of proposed drainage systems with approximate sizes;*
- iii. Natural surface contour lines to the AHD;*
- iv. 1 in 100 year ARI flood levels where applicable;*
- v. Preliminary design contour lines to AHD;*
- vi. Nominated overland flow path for 1 in 100 year ARI storm events;*
- vii. Nominated drainage discharge point and any treatment concepts;*
- viii. Existing drainage services and proposed connection points to both existing and future developments; and*
- ix. Details of any staging of the development and impact on the drainage network.*

**Comments Received**

ALDE

*There is no differentiation between the large and small developments. For example a 2 lot subdivision with a requirements for a small drainage extension and provision of services should require significantly less detail than a 200 lot development. Perhaps there should be a simpler checklist for small jobs.*

*The amount of detail required seems excessive for approval of the in principle design. Vehicle turning plans, sub catchment areas, runoff coefficients, approximate pipe sizes are all detailed design issues. To go to this degree of at the "in principle" stage is absurd. Design contours may be appropriate if significant reshaping is proposed, but for most developments would be unnecessary, and would require the design to be fully completed in order to generate them.*

**Working Group Assessment**

The consistent planning and design process has been discussed under Issue No's 5, 7 and 8 of this report. The working group considers that the process for both small and large developments should be the same, and that it is the only the level of detail that changes. All issues should be acknowledged following the same process, however for smaller developments it may be that some issues are not applicable. It is better to note these for the record that simply stay silent on the matter, as then it is unclear whether something was not relevant or simply not considered.

As to the level of detail required for this stage of approval, it is ineffectual to approve functional layouts without supporting documentation demonstrating that the proposal is both appropriate and achievable.

In the case of roads, the level of detail proposed is considered the minimum required to ensure appropriate review and approval can take place. For example, how could a typical road reserve be considered without knowing how much traffic it is expected to carry or what public transport function it needs to accommodate? Similarly, a functional layout for drainage couldn't be considered without understanding of the catchment, types of land use and critical issues such as retardation, outfall and treatment proposals. It is important to have confidence in the approximate sizing of drainage systems to ensure that project expectations are realistic. Obviously detailed design needs to be completed before actual sizes can be determined, but sufficient preliminary design should be undertaken to establish likely sizes of basins, open drains, treatment areas etc as these can have significant impact on projects, particularly land development. Too often in the past, insufficient detail has been provided in early stages of design, and as a result the size and number of allotments has had to be significantly reviewed with serious financial implications. There are some elements of the drainage system such as underground pipe systems that are not as critical at this stage, and can be deferred to the detailed design stage.

For development projects that have gone through preparation of an Outline Development Plan in accordance with Section 4 of the Manual, or whose planning permit submission complied with Section 3.2 of the Manual, the majority of information required to satisfy Section 5.8.1 will already be on file. For those projects that have not gone through those processes, including non-development work undertaken by Councils (either internally or externally designed) it is good practice to review functional layout designs at this stage to ensure that the 'big picture' issues are sound before proceeding to detailed design.

The working group also considers that VicRoads comments under Section 5.8.2 are more appropriate under Section 5.8.1 and propose to amend this approval stage to be referred to as "Functional Layout Approval"

### **Proposed Actions**

- 1) Amend Section 5.8.1 item (ii) under Drainage Design to clarify that this does not apply to pipe sizes.
- 2) Amend Section 5.8.1 to be called 'Functional Layout Approval' instead of 'Approval in Principle' and carry change throughout the document.

**Issue No 14. Infrastructure Design Manual Section 5.8.2**

**Excerpt from the Manual describing Preliminary Design Submission**

*Once approval in principle has been received, design work should be carried through to a near-to-complete stage. This work should then be submitted to Council's engineering department for review of the design and documentation. It is intended that submission as preliminary design shall negate the need to produce excessive numbers of copies should further amendment be needed. Preliminary design approval may be granted subject to minor amendments. Should significant amendments be required, documents shall be required to be resubmitted for preliminary design approval.*

*Preliminary design documentation shall be prepared on the basis of this manual in accordance with general engineering principles, the planning permit conditions and all other information collated from the site, service authorities and the like.*

*Two (2) hardcopy sets and one (1) electronic copy of draft plans and specifications are to be submitted to Council for comment, prior to lodging final design plans and specifications for approval. Completed checklists as found in Appendix D 'Checklists and Forms for developer's Representatives shall accompany this submission.*

*Documentation shall be prepared in accordance Appendix E 'Information to be Shown on Plans', and will include a master services plan. The master services plan shall show the overall layout of all services within the limit of works and shall include both existing and proposed services. The purpose of the plan is to enable clashes of services to be clearly identified and to demonstrate that appropriate clearances are achieved. Individual cables are not required for electrical, telecommunication and similar services, but may instead be shown as a single line representing the alignment of trenches. The location of street lights, sub stations, pump stations, etc shall be shown on the master services plan, as shall major landscaping features.*

**Comments Received**

Singleton Bahen Stansfield

*The submission of pavement design computations and CBR results from a laboratory have not been proved necessary for each and every project involving road construction in Bendigo. We submit that this requirement is appropriate to the Shire of Campaspe and Greater Shepparton only and the need for design computations and CBR results be assessed on a case by case basis in Bendigo, rather than as a matter of course.*

ALDE

*Producing a Services masterplan can be problematic. Usually at this stage of the design process some service authority designs are not complete. Power and Telstra design are not completed until the road and drainage design and plans are complete. The location of street lights in particular would never be known at this stage. A plan showing preliminary, proposed offset, and which side of the road services are required could be produced, but the same information could be provided in simple service offset table, listing road name, service and kerb offsets. Alternatively, typical cross sections for each street showing proposed service offsets could be provided.*

*Even after the design for power and Telstra have been produced, there is a danger of transposing information incorrectly to an overall services masterplan. There is also a quality control issue of ensuring that any design changes made by the power designer or Telstra are updated on the services masterplan if it is included in the design drawings.*

Planright (also section 12.7.2)

*Is a pavement design required for minor works? (e.g.: road widening for short lengths) if so geotech investigation could become more expensive than putting in a conservative pavement depth. Could a minimum pavement be suggested for this style of works?*

Brian Bartlett

*Manual asks for CBR/pavement designs yet on p47 states minimum pavement depth of 250mm. Present City of Bendigo standards of 200 mm + seal / 30 mm asphalt for residential has worked well and I cannot see the reason to increase, except if poor subgrade is encountered.*

Tomkinson

*Are two sets of preliminary plans necessary? Some but not all of this information is generally included on the layout plan and is unavailable until the final design has been completed.*

*CBR testing has not been required in Bendigo due to the stable nature of the soils. A 200 mm FCR depth is generally sufficient in most areas. In suspect areas lab soaked CBR's may be necessary to determine pavement depth.*

*Is an estimate of the works required at the final design stage? Bendigo has always had a policy of being provided with supervision/checking fee at a later point when the successful contractor has been appointed in order to get the correct fee and eliminate the need for additional paperwork to either provide more fees or reimbursement.*

#### VicRoads

*Suggest renaming the Preliminary Design Submission as Functional Layout Design Submission. Functional Layout terminology is consistently used by local government and VicRoads. Why introduce a new term? If adopted this suggestion will need to change frequently throughout the document and attachments.*

*After 5.8.2 and also after 5.8.3 insert "coordinate with VicRoads where appropriate".*

### **Working Group Comment**

Firstly, the working group believes that some of the issues raised in the submissions above will be cleared up by renaming this section 'Detailed Design Approval' instead of 'Preliminary Design Approval'. The term preliminary was used to note that this was not the final approval, but appears to have caused confusion. If it is thought of as the time at which detailed design is reviewed, then many of the comments will be addressed.

In response to comments by Tomkinsons, Brian Bartlett and Singleton Bahen Stansfield, it is agreed that there are areas of Bendigo where subgrade is generally sound and nominal pavements can be adopted with confidence. There will still be some Greater Bendigo areas, and certainly the majority of the Shire of Campaspe and Greater Shepparton municipality that have relatively poor subgrade. These areas will need proper subgrade assessment and pavement design is more important. The working groups proposed to prepare plans for areas of Bendigo that do not require CBR assessment or pavement design. The remainder of the clause relating to CBR in this section can remain as it is written, although pavement design can be waived by written agreement.

In relation to Planright's query regarding pavement design for small areas of roadworks, a request in writing could be made for waiving of pavement design on small areas such as road widening. Perhaps in these instances it is more appropriate to provide a record of the existing pavement material and match this.

It is not true to say that the location of street lights will never be known at this stage. For many years consultants working in the Shire of Campaspe have provided details of electrical design including light locations on plans at the detailed design stage. This has not been a problem and ensures that road designs aren't approved, and then require later changes due to other service design issues eg. Clashes between light pole bases and drainage pits, or clear zone issues. The working group does not consider plans to be at a fully detailed stage if this level of information is still outstanding.

Many consultants have been producing master services plans for a number of years now and do not appear to have difficulty in gaining or presenting the required information. It is a very useful tool for demonstrating the multiple assets on one plan without authorities having to manually transpose information. It allows clashes and clearances to be shown at the approval stage, and highlights to contractors the proximity of services that they may not otherwise be aware of. The level of detail is not required to be the same as for the individual service plans, for eg. electrical information only need to show trench alignments and light locations. Because most of the information is in one CAD system, or can be referenced without unreasonable work, it is considered that the benefits to authorities and contractors outweigh the work to produce the plan.

With respect to the number of plans to be provided at this stage of approval, it was intended to keep one for council records and return one set marked up for amendment by the Design Engineer, as stated in the final paragraph of section 5.8.2. It is agreed that only one hardcopy set will be requested, as councils often advise the Design Engineer of required changes by letter, not marked up plans. If only one hardcopy set of plans is to be provided, then they should be provided in an unbound state to assist with scanning and copying as required. Specifications should be provided as a bound document, and all electronic documents should be provided in a format compatible with the relevant councils systems. If consultants wish to have a marked up set of plans returned then they can choose to provide a second set.

It is agreed that the provision of an estimate can be deferred, but must be provided prior to any request for statement of compliance.

**Proposed Actions**

- 1) Amend all references to preliminary design to be 'Detailed Design' and carry out throughout the document;
- 2) City of Greater Bendigo to prepare plan showing areas where CBR testing of subgrade and pavement design are not required;
- 3) Amend Section 5.8.2. to incorporate reference to City of Greater Bendigo CBR / pavement plan;
- 4) Amend Section 5.8.2 to require only one unbound hardcopy of plans for Detailed Design Approval;
- 5) Delete requirement for estimate from Section 5.8.2 of the Manual;

**Issue No 15. Infrastructure Design Manual Section 5.8.3**

**Excerpts from the Manual detailing Final Design Submission**

*On completion of the final design plans and specifications, the design engineer shall provide three (3) hardcopies and one (1) electronic copy of these to the Council's engineering department with a covering letter certifying that these fully comply with the guidelines of this manual, except for approved variations. An additional set of hardcopy plans shall be provided if landscaping is to be incorporated into the development.*

*Final design approval should be received prior to construction commencement. Tendering of works prior to receipt of final design approval shall be undertaken solely at the Developer's risk.*

**Comments Received**

Chris Smith & Associates

*We query the need for 3 hardcopies to be forwarded to Council on the completion of the final design, in an effort to conserve paper we suggest that one copy be forwarded to Council until the time of endorsement.*

VicRoads

*After 5.8.2 and also after 5.8.3 insert "coordinate with VicRoads where appropriate".*

*After your last paragraph insert "The issue of a planning permit and Final Design approvals does not constitute consent to undertake works within existing road reserves under the management responsibility of Council or VicRoads".*

**Working Group Assessment**

The working group agrees that the requirement for plans can be reduced to two sets instead of three, with only one approved set being returned to the consultant.

VicRoads comment is worthy of incorporation into the Manual.

**Proposed Actions**

- 1) Amend Section 5.8.3 to require only two copies of plans for Final Design Approval.
- 2) Amend Section 5.8.3 to add VicRoads comment.



## Issue No 16. Infrastructure Design Manual Section 6.1

### Excerpts from the Manual detailing Documentation Objectives

*The objectives of these documentation requirements are as follows:*

- *To provide consistency in the presentation of design information;*
- *To eliminate duplication of data entry into various record systems;*
- *To provide an 'as constructed' record of Councils' assets;*

### Comments Received

#### VicRoads

*Additional 4<sup>th</sup> dot point suggested; "To provide documentation of installation dates of any Major Traffic Control Items to Council".*

### Working Group Assessment

The documentation requirements relate to infrastructure designs that may take place quite some time prior to any construction. In fact in both development and non-development works there have been whole designs completed that have not even proceeded to construction. The VicRoads comment regarding installation dates is therefore not something to be addressed in this section of the manual. It may be better to add to the Statement of Compliance checklist a requirement to confirm installation dates of Major Traffic Control items. Non-development roadworks are invariably undertaken by VicRoads, Councils or their contractors, in which case there are other processes that capture this data.

### Proposed Actions

- 1) Add requirement for installation dates of Major Traffic control items to Statement of Compliance checklists.

**Issue No 17. Infrastructure Design Manual Section 6.2**

**Comments Received**

VicRoads

*Under Section 6.2 insert "The engineering Department of each Council requires the installation dates of any approved Major Traffic Control Item to enable advice to be forwarded to VicRoads within 30 Calendar days of enacting the VicRoads delegation".*

**Working Group Assessment**

This is not the appropriate section as per comments in Issue No. 16. Propose to amend checklists as per notes under Issue No. 16, and can also put reference such as VicRoads suggested clause into Section 7.5 as part of request for final inspection.

**Proposed Actions**

- 1) Add VicRoads suggested clause to Section 7.5 of the Manual.

## Issue No 18. Infrastructure Design Manual Section 6.3.2

### Excerpts from the Manual detailing Final Design Submission

*When requesting preliminary design approval or final design approval, or providing as constructed information, plans shall be submitted on A1 sheets with the following scales:*

<i>Layout Plans</i>	<i>1:500</i>
<i>Longitudinal Sections</i>	<i>Horiz 1:500 Vert 1:50</i>
<i>Intersection Plans</i>	<i>1:200 or 1:100</i>
<i>Details</i>	<i>1:10 or 1:25</i>

### Comments Received

#### ALDE

*A1 plans are difficult to use to use in the field. Contractors prefer plans in A3 booklet form, as they are easier to use, and are less prone to being damaged, pages being lost etc. A3 plan sets are also easier to control for a quality assurance point of view (maintaining controlled copy status and keeping updated with any amendments). When subdivision road and drainage plans are produced in A1 size to satisfy with the requirements of some Councils, the final construction sets are almost always reduced copies, at A3 size. Reduction can sometimes make some of the detail difficult to read. If the originals plans are produced in the size and scale required the problems associated with reduction are removed. It is often helpful to provide A1 plans of the layout showing overall areas to assist the checking process, but they are unnecessary for final construction drawings as long as suitable overall layout or 'key' plans are included in the final drawings. Council should note VicRoads use A3 plans for most of their projects, including major urban roadworks.*

*The scale of various types of drawings should be dependent on the amount of detail to be shown rather than arbitrarily fixed for all projects. For example, longitudinal sections are usually quite clear at 1:1000/1:100 unless the alignment is unusually complex. Layout plans for rural residential subdivisions can often be drawn at 1:1000 rather than 1:500. Intersection details can often be shown at 1:250, but do sometimes need a greater scale to show the required details.*

*The scales shown in the manual should be indicative rather than prescriptive. There should be a note or statement to the effect that the drawings should be drawn at appropriate scales to clearly show the required information, and that the scales shown in the manual are indicative. Choice of sheet size should be left to the consultant who produces the plans*

### Working Group Assessment

The scales and plan sizes nominated were in fact established with the potential reduction of plots in mind. Thus a 1:500 plan for Council approval at A1 size will scale down to 1:1000 on A3 for other uses, without the need for redrafting anything. Consultants and Constructors may choose to use A1 in the field, but Councils maintain a preference for A1 for clarity of information when checking and for final records.

### Proposed Actions

No amendment proposed.

**Issue No 19. Infrastructure Design Manual Section 6.3.3**

**Excerpt from the Infrastructure Design Manual**

*Datum*

*All levels shall be to Australian Height Datum (AHD). Plans shall nominate a minimum of two (2) permanent survey marks (PSM's) and their respective numbers/identification, and any temporary benchmarks (TBM's) relevant to the works.*

**Comments Received**

ALDE

*AHD is not always available or necessary for rural jobs.*

*Although generally good practice, it is not always practical or necessary to connect to more than one PSM.*

Tomkinson.

*AHD is generally not available or required in rural areas.*

Styles

*AHD datums should not be necessary for rural work but preferred only.*

**Working Group Assessment**

With the use of GPS more common than ever, AHD is not unreasonable.

Two PSM's are preferred for checking and in case one is lost in the future. This does happen. The Manual can be amended to acknowledge that if two PSMs are not available, then it can be reduced to only one by agreement.

**Proposed Action**

- 1) Amend Section 6.3.3 of the Manual to acknowledge that exceptions may be requested in writing, prior to survey commencing, where it can be shown that two PSMs are not achievable.

**Issue No 20. Infrastructure Design Manual Section 6.3.5**

**Comments Received**

*Moira Shire*

*Add the City of Greater Shepparton **and Moira Shire** do not allocate drawings numbers.*

**Working Group Assessment**

Agree with request.

**Proposed Action**

- 1) Amend Section 6.3.5 to incorporate Moira Shire as requested.

**Issue No 21. Infrastructure Design Manual Section 7.4**

**Excerpts from the Manual detailing Construction Supervision for Developments**

*As described in Section 5.4, all subdivision road and drainage construction supervision shall be undertaken by the Construction Engineer appointed by the Developer. Neither the Manager of Council's engineering department, nor any member of that department, is responsible for carrying out the functions of the 'Superintendent' as defined in the General Conditions of Contract – AS 2124 or AS 4000. The Construction Engineer, or some other person appointed by the Developer, is required to carry out this function. The function shall not be deemed to be completed until the Developer is released from the Defects Liability Period, and correspondence during the defects liability period shall be directed to the Construction Engineer or Superintendent as nominated by the Developer.*

*A nominated Council Officer shall inspect the works at critical milestones to ensure that the works are constructed in accordance with Council requirements and the approved plan. The Construction Engineer shall be responsible for contacting the Council's engineering department to arrange for joint inspections at each hold point relating to road and drainage construction as detailed in Appendix F List of Council Inspections and shall be present at all joint inspections. It is not the role of Council to give a Contractor a direct instruction regarding the works, however as much guidance and assistance as possible will be given on site to assist the construction program.*

*Generally a minimum of 48 hours notice should be given when requesting a Council Officer to attend a construction inspection, unless noted otherwise within this Manual.*

**Comments Received**

Chris Smith & Associates

*The intention of these clauses seems to be that Council will not be responsible for supervision of the works, but will conduct inspections at nominated "hold points" in Appendix F List of Council Inspections.*

*Current construction processes with laying of pipes generally has trenches being backfilled soon after excavation to accord with OH&S regulations and safe working practices. Similarly subsoil drainage and footpath bedding are prepared in "day lots". These construction practices would require daily visits by Council for a period of some weeks to view the hold points. A workable situation would be to have the construction engineer "certify" on behalf of Council with random visits by Council officers to audit the certification process.*

PlanRight

*While the listed hold points are desirable, this may result in a large workload for council staff (and potential hold-ups for contractors). In respect to backfill or stormwater drainage, is it intended for all lengths of drain to be inspected? This would prove impractical as often drains are laid and backfilled in short lengths.*

ALDE

*It seems unnecessary for the Construction Engineer to be present for drainage pipe inspections, when Council's officer will only be ensuring that the bedding and jointing has been carried out correctly. Past experiences suggests that it is also unlikely that Council staff will ever inspect any drains except for major ones.*

*48 hours notice is not always possible. Council should be flexible in this regard.*

*We note that the manual clearly states that Councils officers will not carry out the role of the Superintendent (i.e., manage and supervise the works). Council's representatives will carry out a number of inspections, but will not supervise the works.*

*Supervision can be defined as follows:*

*Collins Compact Australian Dictionary: Supervise: 1. to direct the performance or operation of (an activity or a process). 2. to watch over (people) so as to ensure appropriate behaviour.*

*It is clear that the developer's Superintendent is responsible to supervision (which includes the management of works), and Council is very clear that they do not wish to carry out this role.*

*We suggest that Council is therefore not within its rights under the subdivision act to charge the prescribe fee for supervision, when they clearly do not supervise the works (refer Subdivision Act 1998, section 17(2)(a) & (b).)*

*We also note that this section 17(6) of the Act, states that Council may make a charge for an engineering plan it prepares. It does not state that Council may make a charge for checking plans prepared by others.*

*We would be interested to see justification for the plan checking and supervision fees which are charged by Council.*

Tomkinson.

*If Council's will not be supervising the works we expect that the 2.5% supervision fee will not be applicable.*

*If the consultant is required to provide certification of constructed works, we expect that the 2.5% supervision fee will not be applicable.*

### **Working Group Assessment**

Chris Smith & Associates suggestion regarding the inspections for backfilling of underground pipes is considered to be an appropriate arrangement. It is agreed that the Manual should be amended such that Council's checking of pipe backfill, including subsoil drainage, is a witness point so that Council is aware if works, but the contractor and work is not delayed waiting. Further to this, inspections for footpaths will be changed to witness points for City of Greater Bendigo and Moira Shire. The Shire of Campaspe and City of greater Shepparton will maintain them as hold points.

Councils are in effect undertaking the same level of inspection that they have undertaken for years and are asking the same fee for such. What the manual highlights is that we are not administering the contract or giving direction to contractors, which is important for all parties to understand. Contractual arrangements exist between the Developer and Contractor, and Council is not one of the parties to the contract. The purpose of this section is to highlight the relationships that exist to ensure that communications are appropriate. Where Councils have reviewed the engineering fees for subdivisions the actual costs incurred are commensurate with the fees received. It is not deemed to be necessary to justify these costs as part of this project.

If council officers are expected to attend within 48 hours, then it is reasonable to expect a similar level of notice.

Section 6 of the Subdivision (Permit and Certification Fees) Regulation 2000 specifies Council can charge 0.75% for plan checking, and this does not refer to plans prepared by Council.

While Council Officers do not supervise the Developer's contractor or the Developer's contracts, Councils do carry out supervision of works for compliance with the design intent, and at hold points and witness points.

### **Proposed Actions**

- 1) Amend Appendix F Council Inspections, where they relate to pipe backfill and footpaths, as per comments above.

**Issue No 22. Infrastructure Design Manual Section 7.7**

**Comments Received**

VicRoads

*under the last paragraph inset "Council's Planning Department shall seek, where appropriate, VicRoads and other referral authorities' confirmation of there being no objections to the issue of Statement of Compliance".*

**Working Group Assessment**

It is unnecessary to state this when it is part of standard statutory planning procedures, and the Infrastructure Design Manual is primarily a document about infrastructure standards and engineering design processes. It is not intended to document or duplicate other processes already in place such as town planning processes. However there is no objection to the VicRoads request and the Manual can be amended accordingly.

**Proposed Actions**

- 1) Amend Section 7.7 of the Manual to incorporate VicRoads comment above.



## Issue No 23. Infrastructure Design Manual Section 8.3

### Excerpts from the Manual detailing the Commencement of the Defects Liability Period

*The Defects Liability Period shall commence from the date of Statement of Compliance. Unless specified otherwise on the planning permit, the Defects Liability Period shall be as follows:*

- *Roads and Underground Drainage 12 months*
- *Drainage Retardation and Wetlands 12 months*
- *Landscaping 12 months*

*If a period of greater than 8 weeks has elapsed between the 'Acceptance of Works' inspection and the issue of Statement of Compliance, then Council may request that a formal handover meeting be held prior to commencement of the Defects Liability Period to review and amend any outstanding minor defects and site-specific issues.*

*The Developer shall enter into an agreement with Council regarding defects responsibilities for maintenance and correction of defects during this period. The agreement shall be signed prior to issue of Statement of Compliance. An example of a typical agreement is included in Appendix H Standard S173 Agreements.*

### Comments Received

#### Planright

*According to AS2124 & AS4000 (Clause 35) defect liability shall commence on date of practical completion (Acceptance of work). If works are OK at "Acceptance of works" meeting, why does the contractor have to wait the additional time to commence defects liability period?*

#### Tomkinson

*How does Council propose to protect the developer and contractor from damage caused by a third party during the 12 month maintenance period? It is our experience that most damage is caused by others and not from defective work during this period.*

*The section 173 agreement mentioned does not seem necessary.*

### Working Group Assessment

In the past, Councils have looked for a maintenance period from Developers. In some cases, final inspections of roads and drains were undertaken and approved and then for various reasons there were significant delays in actual Statement of Compliance being issued. One example of this is where power supply is delayed and the site sits idle for 4-5 months. In the past this has been problematic because damage can be done by contractors on the development after inspections were completed. However, because Councils are not pursuing a maintenance period, but more clearly a defects period, then PlanRight's comment is reasonable and it is agreed that the defects period may commence at the date of practical completion.

With respect to the issue of damage by others in developments, each Council has different controls in place. Some use local laws, road opening permits etc to help control these issues. Rectification of damage arising from third parties will not be pursued from the Developer and therefore Councils do not need to protect them from this. The only things Councils will require Developers to address or rectify are damage or maintenance arising directly from defective workmanship or materials. The reference to maintenance and correction in the last paragraph of section 8.3 was intended to address only that which may arise as a direct result of defective work by the developer / contractor. For example, if a pipe fails due to defective materials the developer would be expected to cover maintenance costs related to de-silting of the downstream litter trap. To ensure all parties understand this arrangement, an agreement will be required between Council and the Developer. It does not need to be a Section 173 Agreement and the manual can be amended accordingly.

### Proposed Action

- 1) Amend the last sentence of Section 8.3 to clarify maintenance and correction requirements as discussed above' and

- 2) Amend Section 8.3 to remove requirement for section 173 agreement.

**Issue No 24. Infrastructure Design Manual Section 8.5**

**Excerpts from the Manual detailing the Commencement of the Defects Liability Period**

*Defective items becoming apparent during the Defects Liability Period will be referred to the Developer's Representative for remedial action by the Developer. Failure by the Developer to comply with such instruction to rectify works shall result in forfeiture of the part or all of the bond, as required, for the Council to undertake remedial/maintenance works required by the order. Similarly if the required works are of an emergency nature, rectification works will be undertaken or arranged by the Council at the Developer's expense. The Letter of Release referred to in Section 8.6 will not be issued until payment for such repairs has been received.*

*It must be noted that during the Defects Liability Period the Developer no longer has possession of site, and an 'Occupation of a Road for Works' permit or equivalent shall be required for any works undertaken in the road reserve.*

**Comments Received**

ALDE

*It is important to note that the 12 months defects liability period is to ensure that the work is free from defects. Maintenance and damage is clearly Councils responsibility. As the manual states, the Developer no longer has possession of site. Reference to "maintenance" should be removed.*

*Any damage caused by others including builders is an issue for Council, and does not in itself indicate any defect in the works. Broken footpaths, blocked pits and drains, wheel ruts in nature strips etc are not defects and should not be treated as such. This should be made clear in this section of the manual.*

Planright

*Terminology - first mention of bond, previously it's been guarantee. Could include Bond & Guarantee in #2 – Definitions*

Styles

*The defects liability issues require extensive consideration especially in regard to what constitutes a defect, versus damage caused by third parties.*

**Working Group Assessment**

As per Working Group Assessment under Issue No. 23, it is sometimes appropriate for the Developer or contractor to have to deal with maintenance where it arises as a direct result of a defect. Therefore the reference to maintenance is valid, but should be further clarified to state that this only relates to maintenance arising from defects, not general maintenance.

It is agreed that terminology should be consistent and therefore the reference to bond should be changed to guarantee.

Defects Liability does not require extensive consideration as it is exactly what it says. Damage by third parties is not considered to be a defect.

**Proposed Actions**

- 1) Amend Section 8.5 of the Manual to delete the reference to a bond.

**Issue No 25. Infrastructure Design Manual Sections 9.2**

**Excerpts from the Manual**

Excerpt from Section 9.2

*The Developer may be required to provide new roads as part of their development and/or upgrade existing roads. The Design Engineer shall identify the impact of the development upon the existing road network and the assessment of the impact. Mitigating works shall be provided to the satisfaction of the Council.*

*A suitably qualified and experienced Traffic Engineer shall prepare the Traffic Management Strategy. Council may request information regarding the proposed consultant's experience prior to approving the Traffic Management Strategy.*

*A Traffic Management Strategy may compromise one or both of the following:*

- *Traffic Management Assessment Report that determines the road layout, road widths, functions and connectivity for all road users and/or*
- *Traffic Impact Assessment Report to determine impact on external road network and identify appropriate mitigating works.*

*Some developments that do not create new roads or intersections may still generate sufficient traffic volume or traffic movement to warrant a traffic management assessment e.g. supermarket. Such a development may also require a Traffic Impact Assessment.*

*Where a Traffic Management Assessment Report is required to be prepared as a condition of the Planning Permit, the submitted plans shall not be receive endorsement until the traffic control requirements are approved in principle by the Council's Engineering Department.*

*The provisions of this section apply to development carried out by Council.*

Excerpt from Section 9.2.1

*The need for the Traffic Management Assessment Report (TMAR) shall generally be determined at the time of issue of the planning permit, or before, and may be triggered by the following:*

- *Construction of a new road;*
- *Construction of a new intersection;*
- *Potential for further development (may need ODP to assess);*
- *Multiple Developers within a specific locality; and*
- *Large industry or retail/commercial development*

Excerpt from Section 9.2.2

*The need for the Traffic Impact Assessment Report (TIAR) shall generally be determined at the time of issue of the planning permit, or before, and may be triggered by the following:*

- *Where developments generate either :*
  - *an overall increase in traffic volumes of 10% or greater, and/or*
  - *an increase of 100 vehicles per day or greater.*

*Where VicRoads require a TIAR as well as the Council then the one report shall be prepared meeting the requirements of both organisations.*

*TIAR shall generally meet the requirements of any guidelines prepared by VicRoads for the preparation of such reports.*

**Comments Received**

ALDE

*see Issue No 26 comments*

Brian Bartlett

*Traffic management reports and road safety audits required if a new road is constructed. Considered unnecessary except for larger developments.*

Tomkinson

*This section requires further assessment. In short a traffic study would be required 90% of developments which is unnecessary. This requirement should be left to the discretion of the Council traffic engineer.*

*The same could be said for Road Safety Audits.*

Styles

*It is implied that all new roads will require a traffic management strategy prepared by an experienced traffic engineer. This will normally require the engagement of Melbourne based consultants as few accredited traffic engineers exist in rural Victoria. This requirement is considered by this office to be an unwarranted burden upon the developer especially in the case of small infill developments.*

Planright

*No problem provided council provide traffic counts of existing road network in order to determine a %age increase in traffic volumes to determine if we need a TIAR.*

**Working Group Assessment**

The Manual as written states the need is generally determined at time of permit. While this is somewhat discretionary, the list provided gives good guidance and warning as to what developments may be asked to provide these reports and thus enabling them to plan for this work. It is unlikely that infill development that is small scale will require a traffic study, however where they meet the warrants the scale of the study would of course need to be appropriate to the scale of the potential traffic issues. There are certainly experienced traffic engineers already working in regional Victoria and are frequently used by Councils and consultants alike. Sourcing these skills should therefore not represent a problem.

In relation to Planright's comments, Section 12.3.1 of the Manual already states that Councils will provide traffic counts where available, but that if additional counts are required will be at the cost of the Developer.

**Proposed Actions**

No amendment proposed.

**Issue No 26. Infrastructure Design Manual Section 10**

**Excerpts from Infrastructure design Manual**

General

*Road safety should be considered throughout all phases of road upgrade or construction. For developments within the municipality, traffic safety shall be formally considered at both design and construction stages of road development. By conducting road safety audits at the design stage before a road is built provides the most cost-effective outcomes.*

*The provisions of this section apply to development carried out by Council.*

Requirements

*Road Safety Audits shall be required for all development designs that require a Traffic Management Strategy (refer to Section 9) and shall be conducted at the detailed design stage.*

*Audits shall be conducted by a VicRoads Accredited Road Safety Auditor, other than the road designer, and shall be in carried out in accordance with the guidelines outlined in Road Safety Audit, Austroads Second Edition 2002.*

**Comments Received**

ALDE

*Any development involving any roadworks require Traffic Management Strategy.*

*Road Safety audits shall be required for all development designs that require a traffic Management Strategy.*

*This means that every development that involves any roadworks, no matter how minor, will require a complete formal road safety audit.*

*A road safety audit carried out by an audit team, comprising two or more experienced people including one senior auditor, seems an expensive and unnecessary requirements for most subdivisional development. The requirements of Section 9 and 10 are excessive for the vast majority of subdivisional developments.*

**Working Group Assessment**

As per comments under Issue No. 25, the Manual states that the need is generally determined at time of permit, and is somewhat discretionary. The incorporation of road safety audits is considered best practice for many road projects, but particularly intersection designs. Relative to the overall cost of major roadworks a road safety audit is only a relatively low cost. The most cost effective benefit is gained when the road safety audit is undertaken at the design stage, instead of waiting until construction is complete and then reviewing the safety issues.

**Proposed Actions**

No amendment proposed.

**Issue No 27. Infrastructure Design Manual Section 12.3.2**

**Excerpts from Section 12.3.2 of the Manual**

**Table 1 - Urban Road / Street Characteristics**

<b>Street Type</b>	<b>Indicative Maximum Traffic Volume</b>	<b>Carriageway Width</b>	<b>Minimum Reserve Width</b>	<b>Minimum Verge Width</b>	<b>Parking Provision within Carriageway</b>	<b>Pedestrian / Cycle Provision within Road Reserve</b>	<b>Kerbing</b>
<i>Access Lane (second road frontage)</i>	<i>300 veh/day</i>	<i>5.5m</i>	<i>As determined by turning movements</i>		<i>Yes one side</i>	<i>No footpath</i>	<i>SM2 See note 3</i>
<i>Access Place</i>	<i>300 veh/day max. (maximum length 100m)</i>	<i>6.0m</i>	<i>14.0m</i>	<i>3.5m See Note 2</i>	<i>Yes (one side)</i>	<i>Footpath both sides No separate cycle provision</i>	<i>SM2 See note 3</i>
<i>Access Street</i>	<i>1000 veh/day max</i>	<i>7.5m</i>	<i>16.0m</i>	<i>3.5m</i>	<i>Yes (both sides)</i>	<i>Footpath both sides No separate cycle provision</i>	<i>SM2 See note 3</i>
<i>Collector Street Level 1</i>	<i>3000 veh/day max</i>	<i>11.0m</i>	<i>24.0m</i>	<i>6.0m</i>	<i>Yes (both sides)</i>	<i>Shared path both sides</i>	<i>Barrier B2 Kerb outstands or splitters required at intersections and pedestrian crossing points</i>
<i>Collector Street Level 2 (alternatively called trunk collector)</i>	<i>6000 veh/day max</i>	<i>2 x 7.0m + 5.0m median</i>	<i>34.0m</i>	<i>6.0m</i>	<i>Yes (both sides)</i>	<i>Footpath both sides Shared path both sides</i>	<i>Barrier B2</i>
<i>Residential Court Bowl</i>	<i>n/a</i>	<i>10.0m radius</i>	<i>28.0m</i>	<i>3.5m See Note 2</i>	<i>n/a</i>	<i>Footpath both sides No separate cycle provision</i>	<i>SM2 See note 3</i>
<i>Commercial Street</i>	<i>n/a</i>	<i>22.0m</i>	<i>32.0m</i>	<i>5.0m</i>	<i>Yes (both sides)</i>	<i>Footpath both sides Cycle provision where directed</i>	<i>Barrier B2</i>
<i>Industrial Street</i>	<i>n/a</i>	<i>12.5m See Note 1 below</i>	<i>25.0m</i>	<i>6.0m</i>	<i>Yes (both sides)</i>	<i>n/a</i>	<i>Barrier B2</i>
<i>Industrial Court Bowl</i>	<i>n/a</i>	<i>15.0m radius</i>	<i>37.0m</i>	<i>3.5m See Note 2</i>	<i>n/a</i>	<i>n/a</i>	<i>Barrier B2</i>

**Comments Received**

Moira Shire

Add note to Table 1. Access lanes do not necessarily have to have kerb and channel on each side. They can have a concrete pavement with a central channel or can be formed in a V shape that drains to a grated pit, especially if there is no room for SM2 kerb and channel.

ALDE

The argument that "areas outside of metropolitan areas" are different and therefore require different road

*classifications, widths, etc to those specified in Clause 56 has previously been shown to be flawed. The City of Greater Bendigo's previous attempt to introduce standards which differ from Clause 56 was abandoned when the panel looking into the proposed planning scheme amendment recommended that the amendment not proceed. The manual should not contradict the planning scheme.*

*Reference to SM2 kerb and channel is misleading. City of Greater Bendigo for example uses a modified SM2 profile, which is a rollover type, which doesn't require vehicle laybacks. The standard SM2 is too severe for vehicle crossings without the provision of a driveway layback.*

*The industrial road widths have increased significantly from the standards currently in use in Bendigo. 12.5m invert to invert (currently 10.4m) 6m nature strips (currently 3m) 25m road reserve (currently 18m). The current standard works very well, and we see no reason to change it.*

#### Tomkinson

*Access place – why does the carriageway and reserve widths vary from Clause 56?*

*Access street – why does the carriageway and reserve widths vary from Clause 56?*

*Collector Street – why does the carriageway and reserve widths vary from Clause 56?*

*Residential court bowl – why has the carriageway and reserve widths been increased?*

*Industrial Street and court bowl - why has the carriageway and reserve widths been increased?*

*Why is a footpath required on both sides of the road reserve?*

#### Brian Bartlett

*Table on P33 indicates footpath to be 1.5m width both sides and also fully around court bowls. Footpath both sides of higher volume roads is agreed, but for lower trafficked roads, eg. Cul-de-sac, footpath both sides should not be required where crossing the road to the footpath one side is not hazardous. Footpath fully around a court bowl seems unnecessary and particularly expensive, given the increased width and 125 mm concrete thickness.*

*Table 1 indicates Industrial Street to be 12.5m width invert to invert, plus 6m width nature strip both sides. The present City of Greater Bendigo standard is 10.4m invert to invert and 3m and 4m width nature strip. This works well in Bendigo, with Council themselves constructing industrial roads to this standard. The additional width requirements both in road width and nature strip width is unnecessary and a waste of scarce industrial land in Bendigo.*

### **Working Group Assessment**

As per the group's comments under Issue No. 1, the residential development requirements of the Manual are not considered to be contradictory to the objectives of Clause 56 of the Planning Scheme. The discrepancies between Clause 56 and the Infrastructure Design Manual are in the interpretation of 'minimum' standards, and these are acknowledged throughout the manual through reference to 'principles' with explanation about why there is a difference. Too often Councils feel rail-roaded into adopting the absolute minimum standards of Clause 56 without full consideration being given to all aspects of Clause 56, especially the objectives of the Clauses.

The working group does not agree with ALDE's comment that areas outside of metropolitan areas are no different. It is commonly the experience of regional councils through feedback from the community and even developers that desires and expectations are quite different to those of metropolitan communities. This is in part recognised by the State Government through documents such as "Moving Forward: Making Provincial Victoria the Best Place to Live, Work and Invest". Many people live in regional areas because of the neighbourhood character of the streets that are historically found in the country. Country residents generally do not want to live in minimum width streets and often provide this feedback to Councils.

One issue of difference is that of parking in regional areas, which is not adequately addressed by the minimum requirements of Clause 56. It is ridiculous to expect residents in small country towns to have the same parking requirements as metropolitan areas which have very different public transport services. Residents in small country towns often work in towns over 50 km away with no public transport systems, and therefore use their own cars.

The size of court bowls is discussed under Issue No 8 of this report.

The comment regarding the SM2 kerb and channel profile is deemed reasonable and already noted by Note 1 to the table in the case of Campaspe. The Shire of Campaspe has for about a decade used a modified SM2 kerb similar to



Bendigo's and it has also be trialled in Shepparton successfully. Therefore it is agreed that the modified SM2 profile is to be adopted as the standard rather than the exception.

It is also agreed that access lanes can be constructed without kerb and channel if appropriately designed as a concrete pavement with a central channel, as per Moira Shire's comments.

The requirements for footpaths on both sides is specified in Clause 56 of the planning scheme, with the exception of streets that have less than five dwellings. However, this is a minimum requirement and Clause 56 note not preclude additional footpaths. In fact to comply with the objectives of access and mobility there is good argument that footpaths at all frontages are appropriate. While Clause 56 makes note of shared zones, we believe that people with disabilities are at an unreasonable risk in these environments. Because this is unreasonable, it could be deemed to be discriminatory under the Disability and Discrimination Act. This view is supported by Universal Access Workshops held within the Shire of Campaspe.

The increase in industrial carriageway and verge widths are not only related to traffic and parking lanes, but are directly linked to providing safe access to allotments. For example, the 18m reserve results in about a 11.5 metre wide gate which is unwieldy and impractical. Therefore such narrow carriageways and verges as have been constructed in the past now lead to long vehicles such as B-Doubles having to cross over the centreline of the road onto the approaching traffic lane to manoeuvre the access to the allotments. The 25 metre reserve width proposed brings the access width back to about 9.8 metres, still quite large. This also has a significant impact on the internal road width required at the entrance and can unreasonably restrict use of land within the allotment at the entrance. Providing for the safe turning movement of large vehicles is becoming more important given the higher number of B-Doubles seen on the roads.

#### **Proposed Actions**

- 1) Amend Table 1 to refer to modified SM2 for residential streets.
- 2) Amend access lane requirements to allow concrete pavements without kerb and channel as per comments above.

**Issue No 28. Infrastructure Design Manual Section 12.3.3**

**Excerpt from the Manual describing the widths and treatment of reserves (other than road reserves)**

*A landscaping plan shall be provided to the satisfaction of Council's engineering department for all proposed reserves.*

**Comments Received**

Singleton Bahen Stansfield

*This seems excessive in the case where the reserve is purely a linking walkway between roads or allotments.*

**Working Group Assessment**

Councils have found that narrow linkage reserves often cause safety concerns due to poor sight and passive surveillance, and sometimes anti-social behaviour. The width and treatment of the reserve need to be considered hand-in-hand, and it is the developer's responsibility to ensure that both these aspects are workable. It should not be left for Council to have to design and implement a treatment on reserves that have been created as part of a development.

**Proposed Actions**

No amendment proposed.

**Issue No 29. Infrastructure Design Manual Section 12.3.4**

**Comments Received**

ALDE

*See previous comments above.*

Singleton Bahen Stansfield

*In some instances it is not possible or practical to provide to provide a bowl. Providing a bowl will not ensure that cars travel in a forward direction. When cars are parked around a bowl which happens regularly, cars are forced to perform a three point turn.*

**Working Group Assessment**

Refer to comments under Issue No. 8.

**Proposed Actions**

No amendment proposed.

**Issue No 30. Infrastructure Design Manual Section 12.3.7**

**Excerpts from Infrastructure Design Manual**

*Road grades shall fall within the following limits where kerb and channel is not used:*

**Table 3 – LIMITING LONGITUDINAL GRADIENTS**

<i>Desirable minimum grade</i>	<i>0.5 %</i>
<i>Absolute minimum grade</i>	<i>0.3 %</i>
<i>Desirable maximum grade</i>	<i>10 %</i>
<i>Absolute maximum grade</i>	<i>15 %</i>

**Comments Received**

Singleton Bahen Stansfield

*Table 3 The absolute maximum grade for a longitudinal road of 15% is not always possible. Grades of 20% can be and have been used in the past*

ALDE

*15% is not always achievable. Grades of up to 20% can work over relatively short distances. The CFA requirement is that average maximum grade must not exceed 1 in 7, with a maximum of 1 in 5 for no more than 50 metres.*

**Working Group Assessment**

It should be noted that the CFA requirements are based on the 4WD vehicles, and are not necessarily appropriate for all vehicles or all roads. However the working group agrees that it would be reasonable to increase the maximum grade to 20%, with steeper grades requiring specific Council approval.

**Proposed Actions**

- 1) Amend Section 12.3.7 to make note of 20% maximum grade and that steeper grades may be granted with specific Council approval.

**Issue No 31. Infrastructure Design Manual Section 12.3.8**

**Comments Received**

*Moira Shire*

*Add the following wording to Kerb Grading:*

*Within the Shire of Campaspe, the city of Greater Shepparton and Moira Shire, kerb grades shall...*

**Working Group Assessment**

Agree with request.

**Proposed Actions**

- 1) Amend as per Moira Shire's request

**Issue No 32. Infrastructure Design Manual Section 12.3.9**

**Excerpt from the Manual regarding design for Vehicle Turning Movement**

*Vehicle turning movements are to be examined for design vehicles and check using the Austroads Vehicle Turning Templates. Road space should be provided such that the design vehicle is able to negotiate a left turn from the left lane without crossing adjacent lanes and without the need to reverse to complete the turning movement. Check vehicles may impinge upon adjacent lanes as they represent infrequent vehicles accessing local streets, such as articulated vehicles delivering building materials in new estates or furniture carrying vehicles.*

*The intersection design shall be such that 600mm clearance is applied to the total swept path of the design vehicle, and not just to the wheel path. Vehicle accesses and driveways are NOT to be used for turning movements. All roadway, right-of-ways and vehicle crossings are to be designed to accommodate a standard vehicle (car).*

*Turning movement plans shall be provided to Council with the Approval in Principle submission and shall show turning movements as nominated below.*

**Table 4 – TURNING MOVEMENT PLANS**

<b>Intersecting road types</b>	<b>Design Vehicle</b>	<b>Checking Vehicle</b>
<i>Access Streets / Access Street or Access Streets / Access Place (residential)</i>	<i>Service Vehicle <sup>(ii)</sup> (8.8m) Radius 9m</i>	<i>Single Unit Truck/Bus (12.5m) Radius 9m</i>
<i>Access Streets / Access Street or Access Streets / Access Place (industrial) <sup>(i)</sup></i>	<i>Single articulated (19m) Radius 12.5m</i>	<i>Extended single articulated (25m) Radius 12.5m</i>
<i>Collector Street / Access Street or Collector Street / Access Place (residential)</i>	<i>Service Vehicle <sup>(ii)</sup> (8.8m) Radius 9m</i>	<i>Single Unit Truck / Bus (12.5m) Radius 9m</i>
<i>Collector Street / Collector Street (residential)</i>	<i>Single Unit Truck / Bus (12.5m) Radius 12.5m</i>	<i>Single articulated (19m) Radius 12.5m</i>
<i>Collector Street / Collector Street (industrial)</i>	<i>Single articulated (19m) Radius 12.5m</i>	<i>Extended single articulated (25m) Radius 15m</i>

*a) use these for intersections with industrial land use for local/collector intersections.*

*b) service vehicle dimensions and turning should be based on fire appliance rather than a waste vehicle.*

**Comments Received**

ALDE

*The use of templates is different to Austroads guide. It is inappropriate and unnecessary to specify different requirements. Providing 600 mm clearance to the swept path is unnecessary for example. Clearance from the swept path to road furniture is required, but not for the pavement area.*

*Table 4, note(b)*

*A “service vehicle” is a standard design vehicle, with turning templates provided in the Austroads guide. It is not appropriate to differentiate between “fire appliance” and “waste vehicle”. This is confusing and misleading*

Planright

*600mm clearance to swept path can result in a significant increase in pavement over wheel paths. This can also result in more open intersections that encourage faster turning movements for cars.*

*It would make more sense for turning movements to be submitted with prelim design rather than approval in principal which only requires conceptual intersection designs.*

*Any requirement for B-Doubles in industrial areas?*

Tomkinson

*At the end of a stage which connects to a property not owned by the developer and is in accordance with an ODP, we have used driveways for the turning of vehicles. Section 12.3.9 needs to be reviewed.*

**Working Group Assessment and Consideration :**

The design and checking vehicles nominated in Table 4 of the Manual are consistent with the table in Section 8 of the "AustRoads Design Vehicles and Turning Path Templates", published February 2006. It is acknowledged that the 600 mm clearance to the swept path does differ from the guidelines in the above document, and it is agreed that this required offset can apply to the wheel path instead. The 600 mm clearance to the swept path however, need to take into account not just street furniture and signage poles, but should consider the full height profile of the above-ground infrastructure, eg. street name plates, fingerboards, tree canopies etc. Section 6.1 of the above AustRoads publication states that the Design service vehicles (8.8m0 represents domestic fire appliances and garbage vehicles. Therefore note (ii) on Table 4 is valid.

It is acknowledged that vehicle turning movements will need to be re-checked at the detailed design stage. However it is just as important to consider these requirements at the Approval in Principle stage, as it can have significant impact on overall layout, road reserve widths etc. For example, an intersection of two non-perpendicular roads may require a significant splay at the road reserves, and if not identified in the early phase of planning and design could lead to significant layout alterations affect lot sizes or numbers.

Requirements for B-doubles in industrial areas are implied in Table 4, but can be more fully presented, as per the table from Section 8 of the Austroads guidelines.

With respect to the proposal to use driveways for three point turns at temporary ends of staged roads, this issue has been discussed as part of Issues 8 and 10, and the use of driveways is not supported. Temporary turning court bowls have been used successfully for over 5 years in the Shire of Campaspe and do not appear to cause undue concern to developers.

**Proposed Actions**

- 1) Amend Section 12.3.9 such that the 600 mm offset from the swept path of a vehicle applies to aboveground structures and not the edge of pavement.

**Issue No 33. Infrastructure Design Manual Section 12.3.10**

**Comments Received**

Moira Shire

*Editorial comment - Footpath alignments shall be 300mm **maximum** offset from property boundaries in **existing** ~~new~~ development and 50mm **maximum** from property boundaries in new developments...*

Chris Smith & Associates

*Central spoon drains in the pavement are undesirable. Would fully concreted pavements with cross fall to the centre of the road with centrally graded pits permitted?*

Singleton Bahen Stansfield

*Currently the COGB standard is 1 in 8 and on some occasions we have used 1 in 7 in areas where this has been unavoidable. We have had no issues with this.*

**Working Group Assessment**

It is acknowledged that in areas of Bendigo there may be times where driveway slopes of less than 1 in 10 may be difficult to achieve. Where this is the case, approval for variation may be granted subject to detailed design demonstrating the reasonable access is achievable. Design variations are noted Section 5.7 of the Manual.

Chris Smith & Associates comments are agreed with and the Manual should be amended accordingly.

Moira shire's comments are agreed with and the Manual should be amended accordingly.

**Proposed Actions**

- 1) Amend Section 12.3.10 to note that fully concreted pavements with cross fall to the centre of the road with centrally graded pits permitted
- 2) Amend Section 12.3.10 make minor amendments as per Moira's comments.



**Issue No 34. Infrastructure Design Manual Section 12.3.11**

**Comments Received**

*Moira Shire*

*Add to item 5,*

*Within the City of Greater Shepparton **and Moira Shire** subsoil drainage shall be provided for all kerb and channel.*

**Working Group Assessment**

Agree with request.

**Proposed Actions**

- 1) Amend as per Moira Shire's request

**Issue No 35. Infrastructure Design Manual Section 12.4**

**Comments Received**

ALDE

*Generally agree with widths in table 5, however note that current Bendigo standard for minor rural roads has been 6m seal with 0.3m unsealed shoulders. The 6.2 seal with 1.5 shoulders will cause additional impact on native vegetation when construction in existing road reserves is carried out. Variations to widths in the table may be required in some circumstances.*

Tomkinson

*Rural roads – consideration should be given to 0.3m wide shoulders similar to Council Government roads due to excessive vegetation removal.*

**Working Group Assessment**

City of Greater Bendigo's current design standard is 6.2 seal width and 1.5 shoulders. Lesser widths described by ALDE were trialled by Greater Bendigo for a period and were not successful so they returned to the 6.2 + 1.5 standards. The trial was not successful for the following reasons:

- i) the minimal shoulders did not provide adequate support for the pavement;
- ii) the minimal shoulders were difficult to properly construct;
- iii) it was difficult to achieve required compaction on the narrow shoulders; and
- iv) it is difficult to maintain the minimal shoulder (ie' can't be graded as grader blade too wide).

In addition to this, the 1.5 metre shoulders provide a safety benefit which is significant on rural roads where one of the most common accident types is the 'run-off the road' types.

Minimising shoulder doesn't lessen clear zone requirements and therefore has no impact on removal of native vegetation.

**Proposed Actions**

No amendment proposed.

**Issue No 36. Infrastructure Design Manual Section 12.4.2**

**Excerpt from the Manual regarding rural road characteristics.**

**Table 5 – RURAL ROAD CHARACTERISTICS**

<b>Street Type</b>	<b>Indicative Maximum Traffic Volume</b>	<b>Minimum Reserve Width</b>	<b>Minimum Seal Width</b>	<b>Minimum Shoulder Width</b>	<b>Kerbing</b>
Rural Living Access Road	1000 veh/day max. (maximum length 1000m)	20.0m	6.2m	1.5m	nil
Rural Living Collector Road	6000 veh/day max.	25.0m	6.2m for Campaspe and Shepparton 7.0m for Bendigo.	1.5m	nil
Rural Living or Low Density Residential Court Bowls	n/a	32.0m	9.5m <sup>1</sup> 10.5m <sup>2</sup>	1.5m <sup>1</sup> 0.0 <sup>2</sup>	n/a <sup>1</sup> SM2 <sup>2</sup>
Low Density Residential Access Road	1000 veh/day max. (maximum length 1000m)	<b>Shire of Campaspe and City of Greater Shepparton</b>			
		20.0m	6.2m	1.5m	n/a
		<b>City of Greater Bendigo</b>			
		14.0m	5.5m	n/a	SM2
Low Density Residential Collector Road	6000 veh/day max.	<b>Shire of Campaspe and City of Greater Shepparton</b>			
		20.0m	6.2m	1.5m	n/a
		<b>City of Greater Bendigo</b>			
		16.0m	5.5m	n/a	SM2
Rural Access	0-50 vpd 51-150 vpd 151vpd +	20.0m	4.0m gravel 4.0m seal 6.2m seal	1.5m <sup>3</sup>	n/a

**IMPORTANT – This table must be read in conjunction with the following notes**

<sup>1</sup> these seal widths apply within the Shire of Campaspe and the City of Greater Shepparton, where waste collection vehicles are allowed to travel on the unsealed shoulders of the court bowl, on the condition that the shoulders are constructed with full depth pavement.

<sup>2</sup> these seal widths and kerbs apply within the City of Greater Bendigo where court bowls include kerbing

<sup>3</sup>. Shoulders not required for 4.0m gravel roads

**Comments Received**

Moira Shire

Add **Moira Shire** to Shire of Campaspe and the City of Greater Shepparton.

Add to Note 1:

..... within the Shire of Campaspe, the City of Greater Shepparton **and Moira Shire**, where waste collection.....

**Working Group Assessment**

Agree with request.

**Proposed Actions**

- 1) Amend as per Moira Shire's request

**Issue No 37. Infrastructure Design Manual Section 12.4.6**

**Comments Received**

Planright

*I don't recall a single instance (In the Goulburn-Murray Valleys at least) where we have been able to achieve a grade of 0.5% on open drains. Most are graded at 0.2% and many have been required to be 0.1%*

**Working Group Assessment**

Agreed that this would not be able to be achieved across much of the Shire of Campaspe and City of Greater Shepparton. It is better defined in Section 17.4, which set a minimum slope of 0.05% (1 in 2000) in Campaspe and Shepparton and 0.2% for Bendigo. It is therefore proposed to change Section 12.4.6 to reference Section 17.4 for consistency.

**Proposed Actions**

- 1) Amend Section 12.4.6 such that the minimum longitudinal gradients are as set-out in Section 17.4.

**Issue No 38. Infrastructure Design Manual Section 12.5.1**

**Comments Received**

VicRoads

*2nd last paragraph after treatment insert "requiring VicRoads or VicRoads delegated Council approval,"*

*Last paragraph replace at 70 degrees or greater with "between 70 degrees and 110 degrees."*

**Working Group Assessment**

The proposed insertion is appropriate.

**Proposed Actions**

- 1) Amend the second last paragraph under section 12.5.1 to add the words "requiring VicRoads or VicRoads delegated Council approval," as per VicRoads suggestion.
- 2) Amend the last paragraph under section 12.5.1 to replace *at 70 degrees or greater* with "between 70 degrees and 110 degrees." as per VicRoads suggestion.

**Issue No 39. Infrastructure Design Manual Section 12.5.2**

**Comments Received**

VicRoads

*at end of last paragraph add "Roundabouts are Major Traffic Control Items requiring VicRoads approval. On Municipal Roads, VicRoads has delegated such approval to Councils under a number of conditions, one such condition relates to reporting back to VicRoads."*

**Working Group Assessment**

The proposed insertion is appropriate.

**Proposed Actions**

- 1) Amend the last paragraph under section 12.5.2 to add the words, *"Roundabouts are Major Traffic Control Items requiring VicRoads approval. On Municipal Roads, VicRoads has delegated such approval to Councils under a number of conditions, one such condition relates to reporting back to VicRoads."* as per VicRoads suggestion.

**Issue No 40. Infrastructure Design Manual Section 12.5.4**

**Comments Received**

VicRoads

*In between the two paragraphs include; "Intersection spacing on State Arterials requires VicRoads approval. Access to State Arterials will be in accordance with Access Management Policies (AMP's) that may apply. Developers are encouraged to discuss access to State Arterial roads early in the Town Planning application process."*

**Working Group Assessment**

The proposed insertion is appropriate.

**Proposed Actions**

- 1) Amend Section 12.5.4 to add the paragraph, ; *"Intersection spacing on State Arterials requires VicRoads approval. Access to State Arterials will be in accordance with Access Management Policies (AMP's) that may apply. Developers are encouraged to discuss access to State Arterial roads early in the Town Planning application process."* as per VicRoads suggestion.



**Issue No 41. Infrastructure Design Manual Section 12.6**

**Comments Received**

VicRoads

*Change the title from Traffic Calming to "Traffic Calming in urban environs."*

*Also between the first two paragraphs insert "It should be noted that road humps are Major Traffic Control Items requiring special approval. Refer to Appendix ???" (suggest include Table 2.1 from TEM vol 1). May be able to also revise the note suggested under 12.5.2*

*Page 45. under dot point Control of Vehicle speeds. The last paragraph is inconsistent with 12.4.4. Could reduce this inconsistency by perhaps adding on the end of the paragraph "consistent with the likely operating speed applying to the road."*

*Page 46. 2nd Dot point. insert "MTCI requires approval -Refer to Appendix"*

*Page 42. 3rd Dot point after heading insert "(MTCI requires approval - Refer to Appendix??)"*

**Working Group Assessment**

The proposed change to the title is considered to be unnecessary. Also there are instances in regional areas where traffic calming devices such as chicanes are introduced in low density or other non-urban environments.

The suggestion to highlight that road humps are Major Traffic Control Items is worth considering, but in light of other traffic calming devices that may also be MTCI's, it would be better to insert a more generic paragraph. It is preferential to cross-reference the Traffic Engineering Manual Volume 1, rather than insert sections of that document. This avoids the need to track updates to other documents within the Manual.

The proposed clarification of the dot point under Control of Vehicles speeds will remove the inconsistency to Section 12.4.4 and should be inserted.

**Proposed Actions**

- 1) Amend Section 12.6 to add the following paragraph after the first paragraph:

*"It should be noted that some traffic calming devices, for example road humps, are Major Traffic Control Items requiring special approval. It is the Designers responsibility to obtain the necessary approvals. Designers should refer to Table 2.1 of the VicRoads Traffic Engineering Manual Volume 1".*

**Issue No 42. Infrastructure Design Manual Section 12.7**

**Comments Received**

ALDE

*We note that "SR41-A structural design guide for flexible residential street pavements" provides a simpler design process than "A guide to Structural Design of Road Pavements- 2006" and is often still used by Geotechnical engineers for the design of residential street pavements.*

*Perhaps reference to this document could be included, or the requirement could be simply to provide a road pavement design to Councils satisfaction etc.*

*It seems unreasonable to specify a minimum pavement depth of 250mm regardless of pavement design. The current standard pavement depth of 230mm in Bendigo should be retained.*

**Working Group Assessment**

It is believed that '***Into a New Age of Pavement Design : A structural design guide for flexible residential street pavements***' Special Report SR41 by Mulholland, published by AustRoads in 1989, is still consistent with the more recent design guidelines mentioned in the Manual and therefore can be incorporated as an accepted alternative.

The issue of minimum pavement depths in Bendigo is discussed under Issue No. 14 of this report.

**Proposed Actions**

- 1) Propose to amend Section 12.7 to include AustRoads publication 'Into a New Age of Pavement Design : A structural design guide for flexible residential street pavements' as an alternative pavement design document.
- 2) Amend pavement depths standards within Section 12.7 as per recommendations under Issue No. 14 of this report.

**Issue No 43. Infrastructure Design Manual Section 12.7.2**

**Comments Received**

Planright (also section 5.8.2)

*Is a pavement design required for minor works? (e.g.: road widening for short lengths) if so geotech investigation could become more expensive than putting in a conservative pavement depth. Could a minimum pavement be suggested for this style of works?*

**Working Group Assessment**

Discussed under Issue 14 of this report.

**Proposed Actions**

No amendment proposed.

**Issue No 44. Infrastructure Design Manual Section 12.7.5**

**Comments Received**

Singleton Bahen Stansfield

*Specifying minimum pavement thickness of 250mm regardless of what a pavement design specifies is impractical and is against engineering principles.*

*The flexible pavement base compaction of 98% has performed well in the past without any problems, why increase to 100%.*

Brian Bartlett

*Manual asks for CBR/pavement designs yet on p47 states minimum pavement depth of 250mm. Present City of Bendigo standards of 200 mm + seal / 30 mm asphalt for residential has worked well and I cannot see the reason to increase, except if poor subgrade is encountered.*

*The manual requires 100% modified compaction standard on pavement base, when 98% modified is present standard is considered satisfactory.*

*The manual required pavement test numbers are excessive. 3 No. in court bowls, 2 No. @ intersection, 2 No. per 50m straights. All in addition to proof rolling which in itself is the best and most thorough test.*

ALDE

*The number of tests for pavement compaction is excessive, and far exceeds the current requirements. 3 compaction tests in a court bowl and 2 per 50m along the roadway as well as proof rolling are totally unnecessary.*

Tomkinson

*Compaction Tests – the number of compaction tests is excessive. Proof rolling provides the best method of determining the compaction of a pavement. In-situ tests are required only as a confirmation that the density of the pavement meets minimum standards.*

**Working Group Assessment**

The issue of minimum pavement depths (Bartlett's comment first paragraph) in Bendigo is discussed under Issue No. 14 of this report.

The compaction standards are based upon the VicRoads Scale C standards and are deemed to be appropriate.

The compaction schedules have been reviewed and it is agreed that court bowl and straight sections can have fewer tests, but that intersections are more critical due to the turning vehicles loads. It is therefore proposed to amend the Manual to require 2 tests per court bowl, one per 50 metres where roads have kerb and channel, one per 100 metres where roads do not have kerb and channel, and 2 per intersection.

It is agreed that proof rolling is a very useful technique for assessing subgrade performance, and propose to amend such that compaction testing will only be required in areas of fill.

**Proposed Actions**

- 1) Amend Section 12.7.7 to delete the requirement for compaction testing of subgrade unless in areas of fill.
- 2) Amend Table 6 within Section 12.7.7 as follows:  
*The number of tests to be undertaken shall as specified In Table 6.*

**Table 6 Location and Number of Compaction Tests**

<b>Location</b>	<b>Urban</b>	<b>Rural</b>
<i>Court bowls</i>	<i>2 No</i>	<i>2 No</i>
<i>Intersections</i>	<i>2 No</i>	<i>2 No</i>
<i>Straights</i>	<i>2 per 50m (with kerbs)</i>	<i>1 per 100m (without kerbs)</i>

**Issue No 45. Infrastructure Design Manual Section 12.7.8**

**Excerpt from the Manual detailing requirements for soft areas in pavements**

*Where unsuitable material exists or develops during construction, it must be rectified to the satisfaction of the Council. Possible treatment methods include cement and/or lime stabilisation, replacement of the underlying material with pavement, the use of geotextiles and/or the lowering of sub-surface drainage to below the level of the area to be rectified. Rectified pavements must achieve the required levels of compaction as specified above.*

*'As Constructed' drawings or quality documentation must show the extent of all reworked soft areas and any form of treatment taken.*

**Comments Received**

ALDE

*This seems an onerous requirement and we question its value.*

Singleton Bahen Stansfield

*For what reason is this documentation needed? In the past the soft area has been reworked and proof rolled again with the Council engineer present. To further supply Council with As Constructed drawings seem unnecessary.*

Tomkinson

*Why are soft areas required as "As Constructed" drawings?*

**Working Group Assessment**

By definition As Constructed drawings are a record of the construction. It is therefore appropriate to record how things were constructed including treatment of soft area and the extent of the treatment. In the future if there is any variation in pavement behaviours it may be important to the road authorities to have a record of the construction techniques and any issues that arose during construction and the methods used to address them.

**Proposed Actions**

No amend proposed.

**Issue No 46. Infrastructure Design Manual Section 12.8**

**Comments Received**

Tomkinson

*The ResCode requirements have been determined with regard to control speed without the need for speed control devices which seems to be contrary to earlier advice in the manual.*

Vicroads

*under section 12.8 " Major Traffic Control Items require special approval, refer to Appendix???".*

**Working Group Assessment**

It is thought that Tomkinson's comment is simply a misinterpretation. This section just states that the need for traffic control devices shall be determined in accordance with VicRoads guidelines, not that they are a blanket requirement.

The insertion proposed by VicRoads is appropriate, although as discussed under previous issues it is preferable not to add an appendix but to cross-reference the VicRoads guidelines.

**Proposed Actions**

- 1) Amend Section 12.8 to add the following paragraph after the first paragraph:

*"It should be noted that Major Traffic Control Items require special approval. It is the Designer's responsibility to obtain the necessary approvals. Designers should refer to Table 2.1 of the VicRoads Traffic Engineering Manual Volume 1".*

## Issue No 47. Infrastructure Design Manual Section 12.9

### Comments Received

#### Chris Smith

*Vehicle crossings shall be constructed in accordance with the Standard Drawings. The industrial vehicle crossing Standard Drawing needs to be included.*

#### Planright

*Are vehicle crossings and laybacks required for modified semi-mountable kerb?*

*Not a new problem, but if vehicle crossings are provided and the footpaths are subsequently made thinner, who is responsible for breakage from builders?*

#### Singleton Bahen Stansfield

*The COGB uses modified SM2 kerb and channel to prevent the need vehicle laybacks and crossings.*

#### Internal staff comment

*It needs to be clear that 75mm thick footpaths are only acceptable where the lot is developed already (ie. dwelling exists) and risk of site construction damage is negligible. With greenfield sites where future housing construction is still to occur then a 125mm thick footpath is required.*

*There also needs to be clarification that of changes in grade exceeding 1 in 10 need detailed assessment for approval.*

### Working Group Assessment

The issue of modified SM2 kerb and channel has been discussed under Issue 27.

It is agreed that a standard drawing for industrial vehicular crossings should be included/developed if it is not already there.

Add the comment that ground clearance assessment needs to be provided where the change in gradient from road crossfall to vehicle crossing exceeds 1 in 10.

Internal comment – need to add that 75mm thick footpaths only okay where the lot is developed already and risk of site construction damage is negligible. Where Greenfield site and future housing construction still to be done, then 125mm thick footpath throughout.

The Manual does not state that where crossings are built, then the footpaths may be thinner, therefore PlanRight's comment is unclear. This requirement needs clarification in the Manual as per internal comment above.

### Proposed Actions

- 1) Amend Section 12.9 regarding modified kerb SM2 as per Issue No. 27.
- 2) Provide a standard drawings for industrial vehicle crossings.
- 3) Amend Section 12.9 to state that "*Footpaths of 75mm thickness are acceptable only where the lots are developed already and risk of site construction damage is negligible. Where Greenfield site and future housing construction still to be done, then 125mm thick footpath throughout*".

**Issue No 48. Infrastructure Design Manual Section 12.9.2**

**Excerpt from the Manual regarding rural vehicle crossings**

*The minimum pipe size is Ø375 in rural and rural living zones, and pipes shall be laid such that the pipe invert is 150mm lower than the invert of the table drain.*

*The minimum pipe size is Ø300 in low density residential zones where table drain batters are flat enough to allow mowing. In these instances pipes shall be laid such that the pipe invert matches the table drain invert.*

*At existing entrances with either a Ø300 or Ø375 culvert, new endwalls may be added to the existing culvert as long as the existing pipes are in good condition, are laid at the correct level, and are demonstrated to have sufficient hydraulic capacity.*

*Culverts shall be designed with the following hydraulic capacity:*

- *1 in 5 year ARI capacity before property culvert overtops;*
- *1 in 50 year ARI capacity results in overtopping of maximum depth of 300mm; and*
- *No water shall encroach on edge of shoulder on sealed roads, or edge of gravel on gravel roads.*

**Comments Received**

ALDE

*We question whether 375mm as a minimum is required, and whether the invert should be below the table drain level.*

Brian Bartlett

*The Manual requires 375mm minimum diameter for [pipes under the roads, 300mm has been accepted standard in Bendigo and is considered satisfactory.*

Planright

*When shallow swales are used, are culverts required when we can concrete the invert of the swale as this often this provides a better visual finish. This is of course provided flow depths aren't too deep.*

Tomkinson

*Rural Vehicle Crossings – The general minimum culvert diameter in the City of Greater Bendigo has been 300mm dia. Why has this minimum been increased to 375mm?*

**Working Group Assessment**

The group agreed that it is appropriate to amend these requirements referring to 375 dia culverts to allow 300dia culverts in low density developments where batters are sufficiently flat for maintenance and mowing. It is also appropriate to allow 300 dia culverts in parts of Bendigo where steeper grades reduce the risk of silting and blockage.

Planright proposal to include concrete crossings is agreed where the depth of table drain is generally less than 350mm deep and depth x velocity <0.35. Grades and changes of grades to be demonstrated to the satisfaction of the engineering department.

**Proposed Actions**

- 1) Amend Section 12.9.2 to allow 300 dia. Culverts as per discussion above.
- 2) Amend Section 12.9 to allow concrete swale crossings as per requirements above.



**Issue No 49. Infrastructure Design Manual Section 12.10**

**Comments Received**

Moira Shire

12.10.1 Shire of Campaspe and Moira Shire

**Working Group Assessment**

Agree with Moira's request

**Proposed Action**

- 1) Add Moira Shire to this paragraph as noted above.

**Issue No 50. Infrastructure Design Manual Section 12.11**

**Comments Received**

Moira Shire

Suggest add "Where a subdivision is being developed on a roadway that is not constructed, the developer shall be required to construct the road to the nearest intersection with an existing constructed roadway."

**Working Group Assessment**

This issue is able to be dealt with through planning referral processes and appropriate conditions.

**Proposed Action**

No amendment proposed.

## Issue No 51. Infrastructure Design Manual Section 13.3

### Comments Received

#### ALDE

*This seems an excessive requirement. We note that the City of Greater Bendigo has installed many metres of footpath drain over the past few years, and we are unaware of any being constructed using contrasting coloured concrete.*

*At the "approval principal" stage, the location of most pits in the footpath (Telstra and Powercor) is not known. On the rare occasion that other pits, such as drainage junction pits or sewer manholes need to be within the footpath area it is also unlikely that this will be known at the "in principal" design stage.*

#### Singleton Bahen Stansfield

*50mm probably too close as construction will knock out boundary pegs. Also doesn't leave sufficient room for power pits.*

*Are these widths (footpaths) necessary? Most of Bendigo have 1.2 or 1.4m wide footpaths.*

*(Spoon drains) This is very expensive and none of the existing spoon drains are constructed in this manner.*

*(Service pits) We often depend on Telstra and UCS for pit locations, which aren't known till after our design is complete.*

#### Planright

*Is it intended for TGSIs to be installed everywhere? (City of Shepparton have narrowed it down to CBD)*

#### Tomkinson

*Can the offset of footpaths be varied upon written request? At times existing services may dictate the final alignment of the footpath and Council's need to be flexible in this regard.*

*It seems totally unnecessary to construct a spoon drain along a reverse fall footpath in contrasting colour.*

*Generally all electricity service pits are constructed in the footpaths as there is insufficient room between the title boundary and the building line. Powercor have a minimum tolerance standard of 5mm in this regard and seems unnecessary for Council to approve as well.*

### Working Group Assessment

The paragraph detailing offsets has been addressed under Issue No 33 and is to be amended.

The revision to Clause 56 on October 2006 brought in 1.5 metres as the standard width for footpaths.

It is agreed that the coloured spoon drains are desirable but not essential and the Manual can be amended accordingly.

Detailed designs will not be complete if the locations of service pits are unknown and therefore there is no change required to the Manual.

TGSIs are not being asked to be provided at every kerb crossing, but the need is to be determined in accordance with guidelines. City of Greater Shepparton has not restricted TGSIs to just the CBD, but that all CBD crossings will require them.

### Proposed Actions

- 1) Amend footpath offsets as per recommended action under Issue No. 33.
- 2) Amend Section 13.3 to remove requirement of having coloured spoon drains.

**Issue No 52. Infrastructure Design Manual Section 15.2**

**Excerpt from the Manual regarding earthworks and lotfilling**

*Where the depth of fill is greater than 300 mm lotfilling must be compacted to 97% MMDD and trimmed and shaped to match existing site levels, except in areas nominated for soft landscaping.*

*A minimum of one compaction test per allotment shall be conducted at a distance of greater than 6 metres from the road reserve boundary. Lotfilling testing shall be included in the Contractor's Inspection and Test Plans submitted for Council's consideration.*

**Comments Received**

ALDE

*Previous requirement for lot filling has been 95% Standard MMD. An increase to 97% Modified MDD is unnecessary.*

Tomkinson

*Filling standards for lots is 95% whilst the manual requests 97%. This seems unnecessary.*

*One compaction test per allotment is excessive and we request a review of this condition.*

Brian Bartlett

*The manual states 97% MMDD present standard being 95% standard compaction for fill on lots which seems adequate.*

**Working Group Assessment and Consideration :**

The compaction requirements are based upon VicRoads Specification Table 204.131 Compaction Requirements Scale C. Given that some developments require only minimal fill, say 100mm and compaction testing is not practical it is suggested that this requirement only to fill of greater than 300mm depth.

**Proposed Actions**

- 1) Adopt VicRoads Table 204.131 Scale C for compaction standards
- 2) Amend Section 15.3 to apply only where the depth of fill is greater than 300mm.

**Issue No 53. Infrastructure Design Manual Section 15.3**

**Excerpt from the Manual earthworks and lotfilling**

*All new subdivision allotments shall be graded, cut or filled, such that a minimum grade of 1:200 is achieved along the low side of the allotment toward the drainage outlet;*

*Ideally no fill should be imported onto any development site*

**Comments Received**

Singleton Bahen Stansfield – importation of fill

*It is not practical in all instances to have no filling imported onto any development site. Good clean filling introduced to a site should not be a problem particularly if it is covered with filling from the site.*

Planright

*Minimum grade of 1:200. Is this necessary in rural residential? In flat areas this can result in extensive earthworks with fill depths up to 4-500mm over large areas for very little benefit. A nominal 200mm may be more suitable for these style developments.*

**Working Group Assessment and Consideration :**

Where fill is imported, records must be provided regarding the source of the fill. There is a further need to check EPA requirements about testing for contamination.

It is recommended that a similar procedure as per the DSE Practice Note for potentially contaminated land.

Amend minimum grades to apply in urban developments, and low density and rural living, and rural developments not applicable.

**Proposed Actions**

- 1) Amend section 15.3 to state that if fill is imported onto any development site then written records must be provided to indicate the source of the fill and to provide evidence that the soil is not contaminated as per the DSE practice note for potentially contaminated land.
- 2) Amend section 15.3 to state that the minimum grades only apply to urban sites.

**Issue No 54. Infrastructure Design Manual Section 16**

**Comments Received**

Tomkinson

The manual does not mention the issue of drainage levies for Bendigo. We request the preparation a drainage levy strategy for review.

There is little mention of what WSUD specifications are to be met.

**Working Group Assessment and Consideration :**

Drainage levy strategy is a policy issue not for the manual.

Sufficient guidelines already nominated in section 16.2

**Proposed Actions**

- 1) No amendments required.

**Issue No 55. Infrastructure Design Manual Section 16.2**

**Comments Received**

Moira Shire

*add ....within the Shire of Campaspe, the City of Greater Shepparton and **Moira Shire** shall be.....*

**Working Group Assessment**

Moira's request is agreed to.

**Proposed Action**

- 1) Amend Section 16.2 to include Moria Shire as per comment above.

**Issue No 56. Infrastructure Design Manual Section 16.4**

**Comments Received**

Moira Shire

*add ....within the Shire of Campaspe, the City of Greater Shepparton and **Moira Shire**, stormwater runoff .....*

**Working Group Assessment**

Moira's request is agreed to.

**Proposed Action**

- 1) Amend Section 16.4 to include Moria Shire as per comment above.



**Issue No 57. Infrastructure Design Manual Section 16.6**

**Excerpt from the Manual regarding average recurrence interval**

For underground drainage systems the following average recurrence intervals shall be adopted:

**Table 7 – AVERAGE RECURRENCE INTERVALS FOR MINOR DRAINAGE IN URBAN AREAS**

Drainage System	Capacity
Urban Residential Areas	1 in 5 yr ARI
Commercial centres of 10 shops or less	1 in 10 yr ARI
Industrial areas or where surcharge would seriously affect private property	1 in 10 yr ARI
Drainage through Private Industrial Property	1 in 20 yr ARI
Commercial areas	1 in 20 yr ARI

The initial time of concentration from building to property boundary shall be six (6) minutes in urban residential areas. Special consideration will be necessary for other areas.

**Comments Received**

ALDE

In some cases 1 in 2 yr ARI may be appropriate, depending in factors such as existing downstream drainage capacity. Perhaps it should say “shall generally be adopted”.

Chris Smith

The initial time of concentration shall be six (6) minutes. Generally 6 min is considered a reasonable assumption for impervious areas but would lead to a conservative drainage design if adopted for the entire site.

Singleton Bahen Stansfield

Sometimes less or more is appropriate depending upon the situation. For example a reduced recurrence interval is sensible for drainage discharging into an existing network that is under capacity.

**Working Group Assessment and Consideration :**

On site detention is required because there are many Council drains that are designed to a lesser than 1 in 5 year average recurrence interval. ALDE request is simply reducing the standard and does not provide a reasonable level of service.

1 in 5 year has been commonly adopted standard for a long time as the level of service.

The 6 minutes initial time of concentration applies to individual residential allotments and not to entire sites and therefore no change is required.

Singleton Bahen Stansfield comment is looking at the capacity of the system and not the level of service that is expected by the community. In cases where the downstream receiving pipe has a capacity less than 1 in 5 year retardation is required to ensure the correct level of service is provided.

**Proposed Actions**

No action required.

**Issue No 58. Infrastructure Design Manual Section 16.7**

**Excerpt from Manual**

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

*Table 8 – CO-EFFICIENTS OF RUNOFF*

<b>Catchment Type</b>	<b>Co-efficient of Runoff</b>
<i>Residential areas (low density)</i>	<i>0.50 See note 1 below</i>
<i>Residential areas (medium density, i.e. Units, ) (including potential unit development sites)</i>	<i>0.60 See Note 1 below</i>
<i>Commercial zones</i>	<i>0.90</i>
<i>Industrial zones</i>	<i>0.90</i>
<i>Residential road reserves</i>	<i>0.75</i>
<i>Landscaped areas</i>	<i>0.25</i>
<i>Public Open Space</i>	<i>0.35</i>
<i>Paved areas</i>	<i>0.90</i>

**Comments Received**

*Singleton Bahen Stansfield*

*Seems a bit high for low density as VicRoads suggest a value of 0.4 for 20 houses per hectare (500 square metres per lot). Similarly might be a little low for units as VicRoads suggest a value of 0.5 to 0.8 for town houses.*

**Working Group Assessment and Consideration:**

Agreed that C value for medium density residential developments should be increased. Rescode suggests C=0.8 for these developments.

Residential areas should not have the description of low density in Table 8.

City of Greater Bendigo is adopting their chart for determining coefficient of runoff's and have stated that they will provide the background to support their decision.

**Proposed Actions**

- 1) Amend Table 8 such that residential areas multi-dwelling has C=0.8 and remove referral to low density.
- 2) City of Greater Bendigo to provide details of their specific requirements for calculating coefficient of runoffs.

**Issue No 59. Infrastructure Design Manual Section 16.8**

**Excerpt from Manual**

For pipes designed to flow full and under pressure, the pipe parameters are to be based on the Colbrook – White formula. True pipe diameters are to be used in any formula.

For pipes designed to flow full and not under pressure, the pipe parameters are to be based on Manning's formula, considering:

For drainage systems within the City of Greater Bendigo a K-value of 0.15 shall be used throughout.

**Comments Received**

Brian Bartlett

*The Manual requires a k value of 0.15 for Bendigo. This to my knowledge is for PVC. Concrete spun pipes k=0.6.*

Moira Shire

*add ....within the Shire of Campaspe, the City of Greater Shepparton and **Moira Shire**, stormwater hydraulic .....*

ALDE

*It is unnecessary to specify that Manning's Formula be used for pipes designed to be flowing full but not under pressure. It is more appropriate to use the Colbrook-White Formula for all cases. Most systems will include some pipes that are under pressure, and others that are running part full. Using different formulas for different sections of the same drainage system, is unnecessary complicated, and will not affect the final design.*

*It is ridiculous to specify that "true" diameters be used in any formula. Variations between nominal and true diameters are quite small, and the effect on hydraulic calculations is minimal, particularly when considering the large degree of uncertainty involved in the estimation of the required capacities. In addition, different pipe manufacture's pipes will be used for construction when the design is being done.*

*It is unclear for which pipes a k value of 0.15 should be used in Bendigo. Appropriate K values should be used for design and are dependant on the pipe material selected.*

**Working Group Assessment and Consideration :**

A review of the two different methods supports the comment by ALDE. Colbrook-White Formula is generally accepted as more accurate and more appropriate for these types of hydraulic analysis and the Manual should be amended to specify this method.

The use of nominal diameter is considered to be acceptable when conducting hydraulic calculations of the Manual can be changed.

Bendigo have advised that their requirements for k value 0.15 are no longer relevant and this can be deleted from the Manual.

Moira's request is agreed to.

**Proposed Actions**

- 1) Amend Section 16.8 of the Manual to specify that the Colbrook-White formula is to be used for hydraulic calculations;
- 2) Amend Section 16.8 of the Manual to delete the requirement to use actual diameters;
- 3) Amend Section 16.8 of the Manual to delete the k value of 0.15 for Bendigo.
- 4) Amend Section 16.8 to include Moira Shire as per comment above.

**Issue No 60. Infrastructure Design Manual Section 16.8.2**

**Comments Received**

Moira Shire

*add ....for the Shire of Campaspe, the City of Greater Shepparton and **Moira Shire**, however.....*

**Working Group Assessment**

Moira's request is agreed to.

**Proposed Action**

- 1) Amend Section 16.8.2 to include Moria Shire as per comment above.

## Issue No 61. Infrastructure Design Manual Section 16.10.1

### Excerpt from the Manual detailing pipe size and joints

*The minimum pipe size for property connections in easements is Ø150 for PVC pipes and Ø225 for all non-PVC pipes where the pipe serves a maximum of two properties.*

*Pipes that are part of Councils' assets are to have spigot-socket rubber ring joints unless specific approval given by Council's engineering department. The City of Greater Bendigo shall approve butt-joint pipes where grades are greater than 1:200.*

*Pipes located under road pavements shall be 375 diameter or greater to minimise the risk of blockage. Elsewhere the minimum pipe size for maintenance purposes is to be 300 diameter.*

### Comments Received

#### ALDE

*This is quite a departure from the accepted practise over the past 20 or 30 years in Bendigo. Pipe sizes should be determined from hydraulic calculations, and the number of allotments should not be specified. Minimum pipe size for drains accepting runoff roadways has always been 300mm, and we see no reason to change this.*

#### Tomkinson

*Within the City of Greater Bendigo where grades tend to be much steeper, pipe sizes should be determined by drainage calculations and not the number of allotments and we request a review of this condition.*

*Minimum pipe diameters under the roads in the City of Greater Bendigo have been 300mm dia. Why has the minimum been increased to 375mm? We request a review of this condition.*

#### Singleton Bahen Stansfield

*Should be designed to suit. Four 400 sqr m properties may be served by a 150mm PVC while a single 2500 sqr m property might require a larger pipe.*

*For pipes under roads the practice has been 300mm which has proven adequate. Why the change?*

### Working Group Assessment

It is agreed that the intention of the clause is not clear enough and that this section should be amended. The issues for consideration are the risk of blockages and the number of properties that may be affected if there is a blockage.

### Proposed Actions

- 1) Amend Section 16.10.1 to replace the existing text with the following:

*"The minimum pipe size for privately owned property drainage connections in easements is Ø150 for PVC pipes and Ø225 for all non-PVC pipes.*

*Pipes that are part of Councils' assets within easements will have a minimum diameter of 225.*

*Pipes located under road pavements shall be 375 diameter or greater to minimise the risk of blockage. Elsewhere in Council's reserves, the minimum pipe size for maintenance purposes is to be 300 diameter.*

*Due to the greater grades achievable within the City of Greater Bendigo, 150 minimum diameter pipes shall be allowable within easements and 300 minimum diameter pipes shall be accepted outside of easements.*

*Pipes that are part of Councils' assets are to have spigot-socket rubber ring joints unless specific approval given by Council's engineering department. The City of Greater Bendigo shall approve butt-joint pipes where grades are greater than 1:200."*

**Issue No 62. Infrastructure Design Manual Section 16.11.2**

**Excerpt for the Manual detailing requirements for minimum drops in pit structures**

*Minimum drops at pits are required to provide sufficient slope along the pit inverts to clear debris, and to provide tolerance in setting pipe invert levels. Generally the minimum drop through pits shall be 20 mm. However, in all circumstances where changes in direction occur, a number of pipes enter the one pit, large inlet and out velocity differences or grate or kerb inlets occur, losses shall be considered and provided for.*

**Comments Received**

Chris Smith

*We do not support the introduction of this theory. It so happens that in a lot of instances where we do not have a free falling outfall condition our drainage is required to work under surcharge, hence drops through pits become immaterial and only add to increased depth of trenching. However the design practice is supported where there is a free flowing outfall and undulating terrain. Difficult to achieve in flat terrain and current practice in the Shepparton area has been to accept pits without any drop at all.*

**Working Group Assessment**

It is unlikely that a 20mm drop through pits will have a significant impact on the trenching. You would need to have 50 pits in a drainage line to increase the depth by one metre.

Because pre-cast pits are often used, and come with drops cast in a lot of the construction hassles are avoided anyway.

**Proposed Actions**

No amendment proposed.

**Issue No 63. Infrastructure Design Manual Section 16.11.5**

**Excerpt for the Manual detailing requirements for put covers**

*Pit covers shall have a clear opening of sufficient dimension and orientation to comply with OH&S and confined space entry requirements.*

*Heavy duty lids or plastic lock-down lids may be required in high risk areas such as public open spaces, recreation reserves, school areas etc. Elsewhere covers are to be installed with class rating in accordance with potential traffic loadings.*

*Trafficable gatic, or approved equivalent, load bearing covers are to be provided on all side entry pits located in exposed kerb areas, e.g. at intersections. The drainage network should be designed to locate pits away from these areas wherever possible.*

*Trafficable gatic, or approved equivalent, load bearing covers are to be provided on all pits in industrial developments.*

**Comments Received**

ALDE

*We question, what is the definition of exposed kerb areas? For example, is a side entry pit located on or near the TP of a kerb an exposed area?*

Brian Bartlett

*The Manual asks for trafficable grated load bearing covers on all side entry pits located in exposed areas eg. intersections. Seems excessive as many pits are located at tangent points at intersection and would add greatly to drainage costs. Perhaps gatic covers required if pit is located around kerb return where it has a higher chance of being loaded.*

**Working Group Assessment**

Tangent points and around kerb returns are typically where Council finds that low-grade covers are being damaged, so yes these are the areas we are referring to as 'exposed'. The additional cost at the time of development is considered minimal and the cost for replace or repair should not be left to Councils later.

**Proposed Actions**

No amendment proposed.

**Issue No 64. Infrastructure Design Manual Section 16.12**

**Excerpt from detailing litter collection pit requirements**

*Approved litter collection pits shall be provided towards the end of any drainage line that discharges to a watercourse and/or drainage basin. The pit must be located such that comfortable access by maintenance vehicles is achieved. Access shall be in a forward only direction where the pit is located in road reserves, drainage reserves or other areas with public access.*

**Comments Received**

ALDE

*Reference should be made to the cost being funded by Council from drainage levies*

Planright (also section 20.3)

*When selecting GPT's we need council's desired cleaning frequency.*

**Working Group Comment**

Draigne levies are addressed under Issue No. 6.

Specify target of 6-monthly for design purposes.

**Proposed Action**

- 1) Amend Section 16.12 to add 6-monthly cleaning as a default for design purposes.



**Issue No 65. Infrastructure Design Manual Section 16.18**

**Excerpt from Section 16.18 detailing floodway design requirements**

- 4) *Desirable maximum batter slope shall be 1 in 8; absolute maximum batter slopes shall be 1 in 5. Desirable minimum crossfall for inverts shall be 1 in 40. Minimum bed width is to be 2.5 metres.*

**Comments Received**

Singleton Bahen Stansfield

*"Minimum bed width is to be 2.5 metres"* This would make smaller steep drains have minimal depth and make it difficult for them to be recognized as drains and hence increase the chance of them being filled in.

**Working Group Assessment and Consideration :**

Floodways should be located in reserves, not private property and this risk of filling is thus minimised. The issue of safety and maintenance is deemed to be more critical and no change to this section is proposed.

**Proposed Actions**

No amendment proposed.

**Issue No 66. Infrastructure Design Manual Section 16.19**

**Excerpt from the Manual regarding drainage reserves**

*Where drainage reserves are incorporated into developments the minimum reserve width shall generally be 10 metres. Reserve widths shall accommodate a drain with sufficient capacity to cater for a 100 year ARI storm event. All-weather access tracks may be required on both sides of the drains with batter greater than 1:8 grade. Pump stations, electrical supplies, water-quality treatment infrastructure shall be sited with sufficient room for construction and maintenance vehicle turning at an appropriate location, refer to Section 18.3.8. Drainage reserves should generally be sited to abut Public Open Space areas wherever possible, but will not contribute to the provision of Public Open Space. Consideration should be given to increasing reserve width for conservation and landscaping purposes.*

*Where drainage infrastructure within the drainage reserve does not comply with standards for public access, the reserve shall be fenced to prohibit public access. A landscaping plan and fencing details shall be provided to the Council for approval. Fencing and landscaping shall be completed at the full cost of the Developer:*

**Comments Received**

ALDE

*We make the point that reserves narrower than 10m may be appropriate in some cases. We also question why drainage reserves will not contribute towards public open space. If the reserve cannot be utilised for public open space (eg a fenced retention basin) then this is reasonable. However, if the reserve serves as a walkway, or is designed as a passive open space it should definitely be included in the public open space contribution. The fact that the reserve serves a drainage function in addition to a public open space function should not affect its public open space value, unless the drainage function regularly compromises the open space use.*

*Roadways occasionally functioning as overland flow paths aren't considered not to be roads as a result of their overland flow drainage function.*

Singleton Bahen Stansfield

*Smaller drains can comfortably fit within smaller reserves. Previously 3m wide reserves have been used quite effectively.*

Brian Bartlett

*Also page 72, asks for a minimum 10m drainage reserve. This would seem excessive in many cases.*

**Working Group Assessment**

As discussed already under Issue No. 28, Councils have had safety concerns regarding narrow reserves, hence this in part leads to the requirement of reserves with sufficient width and open appearance to allow a certain amount of passive surveillance.

In addition to this there are maintenance requirements that cannot be met within narrow reserves.

In relation to public open space the locations of drainage reserves are not necessarily suitable to meet the public open space requirements. It is generally desirable to keep open space land contributions to larger more consolidate areas.

The City of Greater Bendigo has drainage areas that are active quite infrequently that may be appropriate for consideration as part of the public open space contribution. The Manual can be amended to acknowledge this.

**Proposed Actions**

- 1) Amend to state that within the City of Greater Bendigo, drainage areas that will only be used for drainage at a design interval of greater than 1 in 5 years ARI may be considered as part of the public open space contribution.

**Issue No 67. Infrastructure Design Manual Section 18.3.3**

**Comments Received**

*Internal staff comment*

*It is not always appropriate or needed to have the low flow connection, particularly where there is a significant distance between the inlet and the outlet. The Manual should be amended to address this.*

**Working Group Assessment**

This comment is agreed to, and the Manual should be changed accordingly.

**Proposed Actions**

- 1) Amend Section 18.3.3 to state that the low flow pipe 'may' be required.

**Issue No 68. Infrastructure Design Manual Section 19.3.2.1**

**Excerpt from the manual regarding**

*The following minimum information is to be supplied to Council for approval:*

- *Driveways, where these are used for on site detention, shall be bounded by kerbs of not less than 150 mm in height and 100 mm in width, and shall be cast integrally with the main slab unless otherwise approved.*

**Comments Received**

Planright

*Kerbs of not less than 150mm. Quite a lot of unit systems require only a low kerb, and putting in a substantial kerb of 150mm can create aesthetic problems. Provided freeboard is maintained to floor levels why the requirement for a minimum height?*

**Working Group Assessment and Consideration :**

The comment is agreed with but there is still a concern about the integrity of the 'kerbing'. It is agreed that the Manual can be reworded to say that where kerb is required to achieve storage it shall have min width of 100 mm and be integrally cast into driveway, and delete the reference to minimum height.

**Proposed Action**

1) Amend Section 19.3.2.1 as follows:

- *Driveways, where these are used for on site detention, shall be bounded by kerbs, these kerbs shall be of not less than 100 mm in width, and shall be cast integrally with the main slab unless otherwise approved.*

**Issue No 69. Infrastructure Design Manual Section 19.3.2.3**

**Excerpt from the Manual regarding the maintenance requirements of on-site detention systems**

***Campaspe and Shepparton***

*If on-site detention systems are going to be effective in retarding stormwater flows it is important that Council can inspect these systems to ensure that the landowner is properly maintaining their system in accordance with Council requirements.*

*To protect Council's drainage systems, a Section 173 agreement requiring the landowner to regularly maintain their on-site detention systems and requiring them to pay Council an annual inspection fee as set by Council from time to time. Council shall arrange for preparation and registration of the Section 173 Agreements, at the cost of the Developer.*

**Comments Received**

**Singleton Bahen Stansfield**

*Section S173 Agreements currently prepared and requested by Council Solicitors cost about \$1200 plus there is going to be an annual inspection fee. A more cost effective way of preparing and requesting these amendments should be investigated.*

**Moira Shire**

*add ....Shire of Campaspe, City of Greater Shepparton and **Moira Shire**.....*

**Working Group Assessment and Consideration :**

Council use on-site detention as a means of ensuring the development does not have a detrimental impact on the existing environment. The benefits of these systems is only realised when they are maintained. Therefore the maintenance of the system is as important as its construction.

At this time there are limited mechanisms available to Council that give a way of capturing this maintenance requirement, and Section 173 agreements still give Council the best opportunity to ensure that on-site detention systems are maintained. Councils should still pursue other alternative mechanisms and the requirements for Section 173 Agreements may be avoided in the future.

**Proposed Actions**

No amendment is proposed to the Manual at this time, however Councils should actively investigate alternative mechanisms for controlling maintenance of on-site detention systems.

**Issue No 70. Infrastructure Design Manual Section 20.2**

**Excerpt from the manual regarding Stormwater Treatment**

*An appropriately qualified and experienced Environmental Specialist shall be engaged by the Developer or the Developer's Representative to determine the requirements for the project.*

**Comments Received**

*Planright*

*Is an Environmental specialist required for all projects or will council specify the requirement in the planning permit?*

**Working Group Assessment**

There may be projects that do not require a detailed assessment by an environmental specialist and the manual can be reworded accordingly.

**Proposed Action**

- 1) Amend Section 20.2 to say that

*"An appropriately qualified and experienced Environmental Specialist **may need to be** engaged by the Developer or the Developer's Representative to determine the requirements for the project."*

**Issue No 71. Infrastructure Design Manual Section 20.3**

**Comments Received**

Planright (also section 16.12)

When selecting GPT's we need council's desired cleaning frequency.

**Working Group Assessment**

Discussed under Issue No. 64.

**Proposed action**

- 1) To amend as per Issue No. 64.

**Issue No 72. Infrastructure Design Manual Section 21.3**

**Comments Received**

ALDE

*We assume this is meant to read 100mm, and probably should read “existing and proposed surface levels with sufficient detail to determine the point of discharge”.*

**Working Group Assessment**

This is not a typographical error, but refers to the horizontal spacing of spot surface levels on the plan.

**Proposed Actions**

No amendment proposed.



**Issue No 73. Infrastructure Design Manual Section 22**

**Comments Received**

Planright

*Comments from contractors indicate there is very little control over silt resulting from housing construction. In staged developments, civil contractors wear the cost of cleaning up sediment originating from builders.*

**Working Group Assessment**

Recent years has seen more focus on on-site environmental controls including management of silt and erosion. Planright's comment is noted but does not require change to the Manual.

**Proposed Actions**

No amendment proposed.

Issue No 74. Infrastructure Design Manual Section 24 and Sub-Sections

Comments Received

Tomkinson

**Note that the landscaping comments received from Tomkinsons are extensive and for ease of presentation are considered as a group below:**

Section 24.1 Item 10

Identify a selection of plant species for planting in landscapes having regard to indigenous species where practical

**Is there a list of preferred species available ?**

Section 24.2

Landscape works shall not commence until the landscape plans submitted have been approved

**Does council have a recommended time for approval i.e. 2 weeks.**

Table 12 minimum provisions

**Are there indicative sizes for the different park types e.g. Local Park up to 2000 square meters, Large Park up to 5000 sqm etc.**

Table 13 Maintenance requirements

**Bendigo doesn't show mowing frequency.**

Section 24.3.2

The use of locally indigenous species close to waterways and streams.

**Is there a distance from these features that determines close?**

Section 24.3.3

Use of mulch to improve water efficiency and reduce weed competition.

**Should mention benefit of mulch in relation to salinity.**

Section 24.3.5

Plant selection - Tree selection shall be in accordance with council's street tree policy

**Suggestions on how to get this policy would be helpful, is there a different policy for each district?**

**This section also mentions precinct brochures being considered when determining tree species. A "one stop" guide encompassing all three districts and their planting requirements will be very handy.**

Section 24.3.9 Clear zones

**Pictures would clarify this item.**

Section 24.3.11 Maintenance responsibility – a defects period of 12 months shall apply & council will be responsible for the maintenance of the landscaping works.

**Shouldn't this be the developer's responsibility?**

Irrigation systems

**Can these be solar powered?**

Section 24.3.12

Referred documents

**Where are these available?**

Section 24.3.13

No landscaping other than lawn shall be permitted on nature strips

**Very strange requirement under stage 4 restrictions. Perhaps a listed of approved alternatives such as granitic sand or 20mm pebble etc. could be included.**

Section 24.3.14

soft landscaping – refers to Shepparton's 2 grass policy

**Where is this policy available from?**

Section 24.3.17

Other matters – Urban art and information boards are to be provided to encourage use of public open spaces

**Can these be located on nature strips?**

**Can landscaping architecture be included in roads or reserves?**

**Many Council's are allowing Estate/Entrance features but include a clause that they can be removed if they become maintenance issue or be removed after a set time. Would Council consider this?**

**Rather than put a blanket ban on landscaping features within the road reserve, couldn't you put a note that Council would consider proposals?**

**Councils are requiring landscaping plans for units. Given that you won't be maintaining the work is this necessary?**

ALDE

We have a number of concerns regarding this section of the manual and would like the opportunity to meet with Councils officers to discuss these issues.

Brian Bartlett

The Manual requires 100mm depth topsoil. Current being 75mm considered satisfactory. Topsoil is not in abundant supply in most of Bendigo area.

Brendan Bartlett

Landscape plans should be prepared by a suitably qualified and experienced landscape architect or landscape professional'. In the past, I have seen too many landscape plans prepared by building designers, clients themselves, or generally un-qualified people. These plans are often un-practical, un-constructible, difficult to maintain, and quite un-complementary to the surrounding landscape and the development in general. The plans are often submitted for town planning approval, without any real intention to undertake landscaping according to the plans.

A qualified and experienced landscape architect will push the agenda of sustainability, practicality, constructability, and will develop a landscape character that complements and enhances the surrounding landscape, and the municipality as a whole.

Moira Shire

Table 12 Minimum Provisions

Add Moira to Campaspe.

Table 13 Maintenance Requirements

Add Moira to Shepparton.

*Section 24.3.11*

*add the following to paragraph 1 "... of 12 months shall apply and after this time Council will be responsible"*

*Section 24.3.14*

*add the following to the end of last paragraph, "The Moira Shire will accept hydro mulch, hydro seed or equivalent over the whole area"*

**Working Group Assessment**

ALDE's request for a further meeting is noted and will be followed up by the City of Greater Bendigo directly. This may lead to later review of the landscaping sections of the Manual. These ongoing reviews have already been noted, including the minimum annual review.

In the mean time the detailed comments received below will be addressed below:

Section 24.1

Where Councils have lists of preferred species available they should be referenced in Appendix I, and/or available on the individual Council's web-sites. Council Officers may be also contacted directly if the required.

Section 24.2

The provisions of the Subdivision Act would apply.

Table 12 minimum provisions

Indicative sizes for the different park types can be found in Clause 56 of the Planning Scheme.

Table 13 Maintenance requirements

The missing mowing information is noted and Bendigo will compile for inclusion in the Manual.

Section 24.3.2

Site specific consideration would need to be undertaken, however as a rule of thumb 20 metres would be considered 'close'.

Section 24.3.3

Comment regarding the benefit of mulch in relation to salinity is noted, but no change deemed to be necessary.

Section 24.3.5

As per comment on Section 24.1 above. The one-stop brochure idea is noted.

Section 24.3.9

The suggestion of diagrams to represent clear zones is noted and may be considered further. It is also considered more appropriate to refer to this section as 'safety buffer zones'.

Section 24.3.11

The Subdivision Act allows Councils to require a 3 month maintenance period. In the majority of cases, there is negligible maintenance undertaken in this period, the than watering. It is considered a simpler process for Councils to simply waive this requirement and be responsible for all assets from the onset. On this basis Moira's request is not agreed to.

Solar powered irrigation systems may considered by individual Councils where the proposal can demonstrate robustness. Like all issues a variation from the design standards can be requested writing with supporting documentation.

Section 24.3.12

as per comment under Section 24.3.2 above.

Section 24.3.13

Variation from the design standards can be requested writing with supporting documentation. The frequency and appropriateness of any variation can be assessed as part of the Manual's future reviews and the Manual amended accordingly.

Section 24.3.14

as per comment under Section 24.3.2 above.

Section 24.3.17

Public art in the nature strip would need to demonstrate accord with clear zones etc under the Road Design Sections of the Manual. Further to this there would need to be clear agreement on ownership and maintenance. Requests would be considered on a site by site basis.

However, Estate/Entrance features primarily benefit the land developer and not the greater community therefore the requirements of Section 24.3.10 of the Manual would apply.

Landscape plans apply to all sorts of developments that Council are not responsible for maintaining. This requirement will not be changed.

**Proposed Actions**

- 1) City of Greater Bendigo shall arrange a meeting for further discussion of Section 24 requirements;
- 2) To amend Section 24 and Sub-Sections as outlined in comments above.

**Issue No 75. Infrastructure Design Manual Section 26.2.1.**

**Comments Received**

Moira

(iv) Rural areas add "Moira to Campaspe, and add as follows "Low density and Rural living"

**Working Group Assessment**

Agree with Moira's request.

**Proposed Actions**

- 1) Amend Section 26.2.1 to add Moira Shire
- 2) Amend Section 26.2.1 to add 'and' as per comment above.

**Issue No 76. Infrastructure Design Manual Section 26.2.1.4**

**Comments Received**

ALDE

The assumption that there is significant additional cost the Council for future maintenance and replacement of non-standard fittings has not been supported by any facts.

Provision of 20% payment for all non standard poles etc could only be justified if almost 1 in 5 light poles required replacement (apart from the normal replacement of lamps and photo-electric fittings which have to be carried out and paid for by Powercor anyway). We are unaware of Council ever having to replace non standard lighting. It seems completely unreasonable to charge such a large contribution towards a cost that basically does not exist.

Similarly, requiring spares to be kept "in stock" is also unreasonable. We are unaware of any poles ever having to be replaced in the 12 month period following the issue of statement of compliance. We question if Council has considered the cost and logistics of storing these spares?

**Working Group Comments**

The use of non-standard infrastructure frequently comes with an additional cost. In the case of street lighting the additional cost to Council is due to Powercor's maintenance and replacement contract requirements,. It is reasonable that the developer providing the non-standard infrastructure should contribute to this additional cost. The other issue that councils have experienced has been delays in obtaining replacement parts for non-standard items such as special globes. This helps to address this issue.

**Proposed Actions**

No amendment proposed.

**Issue No 77. Infrastructure Design Manual Section 26.2.1.4**

**Comments Received**

Moira Shire

(iii) Developer contribution: add Moira to Bendigo.

*Last dot point under “approval will be subject to” replace City of Greater Bendigo” with “Council”*

**Working Group Assessment**

Agree with Moira’s request.

**Proposed Actions**

- 1) Amend Section 26.2.1.4 to replace “City of Greater Bendigo” with “Council”.



**Issue No 78. Infrastructure Design Manual Checklists in Appendix D**

**Comments Received**

ALDE

*The design checklists are too complicated, particularly for the in principle designs.*

*For example, showing all sub-catchments, pipe sizes, pipe materials etc on an "in principle" design is not necessary. These are detailed design items. In principal design should show general layouts, overall catchments boundaries and proposed outfall points. Much of the detail required by the "in principle" checklist would require detailed design.*

Planright

*Checklist requires sub-catchment data for approval in principle. This can and does alter with detailed road design (vertical grading). When added to full turning movements for intersections it seems approval in principle is almost full design. I would have thought this submission would be to determine requirements / confirm overall layouts in order to prevent unnecessary design work, but with the level of detail being asked for this is not the case.*

Brian Bartlett

*Checklists for approval in principle ask for excessive information. Perhaps okay for larger subdivision. Maybe consider a lesser checklist for smaller scale developments.*

Brian Bartlett

*The Manual asks for a minimum requirements on all plans including:*

- ~ Signed Design Certification by a qualified Civil Engineer
- ~ Signed Checking Certification by a qualified Civil Engineer

*I assume that this means a second checking engineer. In a small consulting firm such as mine, where I am the only qualified engineer, it is not practical to ask for second engineer to carry out the checking certification.*

**Working Group Assessment**

The level of design detail to be provided at various stages has been discussed throughout this report and is primarily aimed at enabling proper assessment to be undertaken to avoid frustrating time delays due to requests for further information or rework.

In response to Brian Bartlett's comment, this does not mean that a second qualified engineer must sign, simply that someone in the organisation must have the appropriate qualification.

**Proposed Actions**

No amendment proposed.

## Issue No 79. Infrastructure Design Manual - Appendix E

### Comments Received

#### ALDE

##### **Plan requirements**

*We generally support the detail required, however some items seen unnecessary, and depending on the design software used by various consultants, may be difficult and time consuming to add to plans that are otherwise automatically produced by the design package.*

*For example, origin / destination pits for inlets and outlets are not shown automatically by most design software, and would have to be added by CAD drafting. The drainage layout including where pit inlets and outlets go is clearly indicated on layout plans and drainage longitudinal sections, and shouldn't be required on pit schedules. Pit schedules should assist the contractor to price and build the works and the origin / destination information is irrelevant.*

*Similarly, detailed information on kerb returns is generally unnecessary on road longitudinal sections, and is provided on the intersection detail plans. Design levels at 10m intervals within vertical curves is a good idea on road longitudinal sections, but 20m intervals between cross sections is usually sufficient for most jobs.*

#### Chris Smith

*Plot of each proposed top of kerb and existing surface level on title boundaries. The need for this information is supported for design in existing built up areas, but not for new greenfield sites*

*Kerb levels shown on returns at quarter points and kerb return grading into adjoining streets. We believe that this information that may have been useful in the past for set out purposes is no longer required. We note that the intersection details are to include this information also. If you see that it is important to include this information would it be OK if it was shown on the intersection details only?*

*We do not agree with the need for dimensions from title boundaries to pipe centreline to be shown on the plans as it is a function of the contractors bucket width and the clearance required behind back of kerb that will determine the pipe offset.*

#### Singleton Bahen Stansfield

Drawings show the existing and design surface levels with levels shown at pits. Surely this is sufficient?

Easier for us to allocate them while we are undertaking design. Painful to go back and change drawings after design has been finalized (and hence number of pits known) to put in pit numbers

The information is shown on the plans with the pit numbers. Surely putting it on the long sections is overkill.

#### Queries

##### Road layout plans

- ~ Kerb radii and kerb type – normally shown on intersection plans, are we duplicating information on multiple plans? Makes plans harder to read.

##### Road Cross-section plans

- ~ Existing buildings on adjacent allotments etc – Is there going to be a minimum setback distance where we have to show this or a maximum setback where we don't have to show this, i.e. if house is 10m back and we are not doing any grading into their lots or altering anything on the property. Access issues to get this information.

##### Typical Road cross Sections

- ~ Quite a lot of these details will be under the various categories or not applicable on most cross sections, is this just a rough guide for Council to see what might be in the road reserve?

### **Working Group Assessment**

A lot of the detail requested is automatically generated by the common design software used in the industry. Therefore in many cases there is no extra work and the information may be very valuable to all using the plans. It is acknowledged however that some information is desirable only, but not essential and the following requirements can be deleted from Appendix E:

- ~ Labelling of origin and destination pit number
- ~ Kerb return data if detailed contours are provided
- ~ Kerb return details may be tabulated
- ~ Traverse lines

In addition to this the requirements for levels into properties will be amended to state 'unless access cannot be gained'.

No other changes are proposed at this time, but the usefulness of the information requested and the ability to provide that information will be monitored over the next 12 months or so and reassessed with the annual review.

Drainage pit numbers will not be allocated by Council engineers.

### **Proposed Actions**

- 1) To amend the requirements within Appendix as per comments above.