

NOTICE OF MEETING

Pursuant to the provisions of section 88 (1) of the
Local Government Act 1999

Infrastructure and Environment Committee of the



will be held by

electronic means

on

Wednesday 4 August 2021 at 7.15pm

A handwritten signature in black ink, appearing to read "James Miller".

James Miller

CHIEF EXECUTIVE OFFICER

In light of the ongoing COVID-19 public health emergency, and pursuant to section 302B of the Local Government Act 1999 and the Electronic Participation in Council Meetings Notice (No 1) 2020, **public access to all Council and Committee meetings will be facilitated via live stream on Council's YouTube channel.**

On the day of the meeting, a direct link to the live stream will be displayed on the homepage of Council's website www.apc.sa.gov.au

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Nil

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8 QUESTIONS ON NOTICE

Nil

9 QUESTIONS WITHOUT NOTICE

10 MOTIONS ON NOTICE

Nil

11 MOTIONS WITHOUT NOTICE

12 URGENT BUSINESS

13 CONFIDENTIAL ITEMS
Nil

14 NEXT MEETING
To be advised

13 CLOSURE

2. Confirmation of Minutes**Wednesday 4 August 2021**

- 2.1 “that the minutes of the Infrastructure and Environment Committee meeting held on Tuesday 15 June 2021 (MB Folios 63 to 70, inclusive), be accepted as read and confirmed.”

MINUTES

of the

Infrastructure and Environment Committee

of the



Pursuant to the provisions of section 88 (1) of the
Local Government Act 1999

HELD IN

**Council Chamber
Redbanks Road
Mallala**

on

Tuesday 15 June 2021 at 6.00pm

The Chairperson formally declared the meeting open at 6.00pm.

1. ATTENDANCE

1.1 Present:

Mr Richard Dodson	Chairperson	
Mr Howard Lacy	Independent Member	
Mayor Mark Wasley	Mayor	
Councillor John Lush	Mallala/Dublin Ward	
Councillor Terry-Anne Keen	Mallala/Dublin Ward	
Councillor Kay Boon	Two Wells Ward	
Councillor Margherita Panella	Lewiston Ward	<i>By audio-visual link</i>
Councillor Brian Parker	Lewiston Ward	<i>By audio-visual link</i>

Also in Attendance:

General Manager – Infrastructure and Environment	Mr Thomas Jones
Acting General Manager – Governance and Executive Office	Ms Alyssa Denicola
General Manager – Finance and Business – <i>By audio-visual link</i>	Mr Rajith Udugampola
General Manager – Development and Community – <i>By audio-visual link</i>	Mr Darren Starr
Asset Engineer	Mr Michael Ravno
Administration and Executive Support Officer/Minute Taker	Ms Stacie Shrubsole
Information Technology Support Officer – <i>By audio-visual link</i>	Mr Sean Murphy

1.2 Apologies

Councillor Frank Maiolo	Two Wells Ward
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2. CONFIRMATION OF MINUTES

2.1 Infrastructure and Environment Committee Meeting – 15 March 2021

Committee Resolution

Moved Councillor Boon Seconded Councillor Keen 2021/ 005

“that the minutes of the Infrastructure and Environment Committee meeting held on Monday 15 March 2021 (MB Folios 58 to 62, inclusive), be accepted as read and confirmed.”

CARRIED

3. BUSINESS ARISING

Nil

4. DECLARATION OF MEMBERS' INTERESTS (material, actual, perceived)

Nil

5. ADJOURNED ITEMS

Nil

6. REPORTS FOR INFORMATION

6.1 Committee Resolutions

Committee Resolution

Moved Councillor Boon Seconded Mayor Wasley 2021/ 006

“that the Infrastructure and Environment Committee, having considered Item 6.1 – *Committee Resolutions*, dated 15 June 2021, receives and notes the report.”

CARRIED

6.2 Middle Beach Boat Ramp Investigations

Committee Resolution

Moved Mayor Wasley Seconded Councillor Keen 2021/ 007

“that the Infrastructure and Environment Committee, having considered Item 6.2 – *Middle Beach Boat Ramp Investigations*, dated 15 June 2021, receives and notes the report.”

CARRIED

6.3 Two Wells Township Community Wastewater Management System

Committee Resolution

Moved Councillor Boon Seconded Mayor Wasley 2021/ 008

“that the Infrastructure and Environment Committee, having considered Item 6.3 – *Two Wells Community Wastewater Management System Project*, dated 15 June 2021, receives and notes the report.”

CARRIED

6.4 Lewiston Localised Stormwater Improvement Investigations

Committee Resolution

Moved Councillor Keen Seconded Councillor Boon 2021/ 009

“that the Infrastructure and Environment Committee, having considered Item 6.4 – *Lewiston Localised Stormwater Improvement Investigations*, dated 15 June 2021, receives and notes the report.”

CARRIED

6.5 Undergrounding of Power – Two Wells Main Street

Committee Resolution

Moved Councillor Boon Seconded Mr Lacy 2021/ 010

“that the Infrastructure and Environment Committee, having considered Item 6.5 – *Undergrounding of Power - Two Wells*, dated 15 June 2021, receives and notes the report.”

CARRIED

6.6 Mallala Road Roundabout

Committee Resolution

Moved Mayor Wasley Seconded Councillor Lush 2021/ 011

“that the Infrastructure and Environment Committee, having considered Item 6.6 – *Mallala Road Roundabout*, dated 15 June 2021, receives and notes the report.”

CARRIED

7. REPORTS FOR DECISION

7.1 Thompson Beach, Seasonal Closure of Beach to Vehicles

Committee Resolution

Moved Councillor Keen Seconded Councillor Boon 2021/ 012

“that the Infrastructure and Environment Committee, having considered Item 7.1 – *Thompson Beach, Seasonal Closure of Beach to Vehicles*, dated 15 June 2021, receives and notes the report and in doing so, recommends to Council that it instruct the Chief Executive Officer to bring back a report with options to restrict vehicle access to Thompson Beach.”

Councillor Parker disconnected from the meeting at 6.51pm.

CARRIED

- 7.2 Heritage list 33ha of Council Owned Land North of Thompson Beach Settlement
Councillor Parker reconnected to the meeting at 6.53pm.

Committee Resolution

Moved Councillor Boon Seconded Councillor Panella 2021/ 013

“that the Infrastructure and Environment Committee, having considered Item 7.2 – *Heritage list 33ha of Council Owned Land North of Thompson Beach Settlement*, dated 15 June 2021, receives and notes the report and in doing so recommends to Council that it apply to Heritage list a portion of Assessment Number 29108/34348/34348 Title ID CT5372/262, CT5346/891, CT5346/890 identified in Attachment 1 under the Native Vegetation Heritage Agreement Program.”

CARRIED

- 7.3 Policy Introduction – Light Fleet, Plant and Heavy Vehicles Replacement Policy

Committee Resolution

Moved Councillor Lush Seconded Councillor Parker 2021/ 014

“that Council, having considered Item 7.3 – *Policy Introduction – Light Fleet, Plant and Heavy Vehicles Replacement Policy*, dated 15 June 2021, receives and notes the report and in doing so recommends to Council that it adopts the proposed Light Fleet, Plant and Heavy Vehicles Replacement Policy as presented at Attachment 1 to this Report.”

CARRIED

- 7.4 Mallala Community Wastewater Management Scheme – Review of Charges

The Chairperson declared an interest in Item 7.4 – *Mallala Community Wastewater Scheme – Review of Charges*, on the basis that his employer, Light Regional Council, provides a CWMS maintenance service to Adelaide Plains Council and indicated that he would not influence the Committee’s discussion.

Committee Resolution

Moved Mr Lacy Seconded Mayor Wasley 2021/ 015

“that the Infrastructure and Environment Committee, having considered Item 7.4 – *Mallala Community Wastewater Management Scheme – Review of Charges*, dated 15 June 2021, receives and notes the report in doing so recommends that the Chief Executive Officer brings back report in to the financial costing structure of the Mallala Community Wastewater Scheme.”

CARRIED

- 7.5 Green Organics Service in Coastal Communities

Committee Resolution

Moved Mayor Wasley Seconded Councillor Boon 2021/ 016

“that the Infrastructure and Environment Committee, having considered Item 7.5 – *Green Organics Service in Coastal Communities*, dated 15 June 2021, receives and notes the report, and in doing so recommends to Council that, in light of findings presented in this report, it instruct the Chief Executive Officer to bring back a further report to the Infrastructure and Environment Committee in relation to a potential community waste education process.”

CARRIED

7.6 Liberty Stages 5-8 – Road Naming

The Chairperson sought leave of the meeting to suspend meeting procedures pursuant to Regulation 20(1) of the Local Government (Procedures at Meetings) Regulations 2013 for a period of time sufficient to facilitate informal discussions in relation to potential road names. Leave was granted.

The meeting was suspended at 7.36pm.

Councillor Panella disconnected from the meeting at 7.41pm.

The meeting resumed at 7.50pm.

Committee Resolution

Moved Councillor Lush

Seconded

Councillor Boon

2021/ 017

“that the Infrastructure and Environment Committee, having considered Item 7.6 – *Liberty Stages 5-8 – Road Naming*, dated 15 June 2021, receives and notes the report and in doing so, recommends to Council that it assigns the following road names to the Stages 5-8 of the Liberty land division:

1. Reid Road
2. Wilder Lane
3. Mill Avenue
4. Friedman Grove
5. Kelly Street
6. Washington Boulevard
7. Hancock Avenue
8. Goldstein Street
9. Coolidge Grove.”

CARRIED

8. QUESTIONS ON NOTICE

Nil

9. QUESTIONS WITHOUT NOTICE

Not recorded in Minutes in accordance with Regulation 9(5) of the *Local Government (Procedures at Meetings) Regulations 2013*.

10. MOTIONS ON NOTICE

Nil

11. MOTIONS WITHOUT NOTICE

Nil

Councillor Panella reconnected to the meeting at 7.52pm.

12. URGENT BUSINESS

Nil

13. CONFIDENTIAL ITEMS

13.1 Gracewood, Mallala – Developer Negotiations

Committee Resolution

Moved Councillor Keen Seconded Councillor Boon **2021/ 018**

“that:

1. Pursuant to section 90(2) of the *Local Government Act 1999*, the Infrastructure and Environment Committee orders that all members of the public, except Acting General Manager – Governance and Executive Office, General Manager – Development and Community, General Manager – Infrastructure and Environment, General Manager – Finance and Business, Asset Engineer, Administration and Executive Support Officer/Minute Taker and IT Support Officer be excluded from attendance at the meeting of the Council for Agenda Item 13.1 *Gracewood, Mallala – Developer Negotiations*;
2. The Infrastructure and Environment Committee is satisfied that, pursuant to section 90(3)(b)(i) of the Local Government Act 1999 Item 13.1 – *Gracewood, Mallala – Developer Negotiations* concerns commercial information the disclosure of which could reasonably be expected to confer a commercial advantage on a person with whom the council is conducting business, or to prejudice the commercial position of Council, being information relating to ongoing negotiations in relation to Gracewood, Mallala; and
3. The Infrastructure and Environment Committee is satisfied that the principle that Council meetings should be conducted in a place open to the public has been outweighed by the need to keep the information, matter and discussion confidential.”

CARRIED

Councillor Boon left the meeting at 7.53pm.

General Manager – Infrastructure and Environment provided a verbal update, and answered questions, in relation to Item 13.1 – *Gracewood, Mallala – Developer Negotiations*.

Councillor Boon returned to the meeting at 7.55pm.

13.1 Committee Resolution

Moved Councillor Keen Seconded Councillor Lush **2021/ 019**

“that the Infrastructure and Environment Committee, having considered Item 13.1 – *Gracewood, Mallala – Developer Negotiations*, dated 15 June 2021, receives and notes the report.”

CARRIED

14. NEXT MEETING

To be confirmed


15. CLOSURE

There being no further business, the Chairperson declared the meeting closed at 8.08pm.

Confirmed as a true record.

Chairperson:.....

Date: ____/____/____

 Adelaide Plains Council	6.1	Committee Resolutions
	Department: Report Author:	Infrastructure and Environment General Manager – Infrastructure and Environment
Date: 4 August 2021	Document No:	D21/33438

OVERVIEW

The purpose of this report is to provide an update in relation to the status of Committee resolutions currently being actioned, for Members' information and monitoring.

Attachment 1 provides a list of *ongoing* Committee Resolutions from February 2020, Resolutions that have been completed since the last Committee Meeting and *all* Committee Resolutions from the 15 June 2021 meeting.

RECOMMENDATION

"that the Infrastructure and Environment Committee, having considered Item 6.1 – *Committee Resolutions*, dated 4 August 2021, receives and notes the report."

Attachments

1. Resolution Register

References

Legislation

Local Government Act 1999

Other


N/A

Infrastructure & Environment Committee - Resolutions from 15 March 2021

Meeting Date	Item Number	Title	Resolution Description	Resolution Number	Status/ Comments ('Deferred, Ongoing, Agenda, Completed')
15-Jun-21	2.1	Confirmation of Minutes	"that the minutes of the Infrastructure and Environment Committee meeting held on Monday 14 December 2020 (MB Folios 54 to 57, inclusive), be accepted as read and confirmed."	2021/001	complete
15-Jun-21	6.1	Committee Resolutions	"that the Infrastructure and Environment Committee, having considered Item 6.1 – Committee Resolutions, dated 15 March 2021, receives and notes the report."	2021/002	complete
15-Jun-21	7.1	Committee Resolutions	"that the Committee, having considered Item 7.1 – Draft 2021-2025 – 4 Year Capital Program, dated 15 March 2021, receives and notes the report and in doing so recommends to Council that it adopt the draft 2021-2025, 4 Year Capital Renewal Program as presented at Attachment 1 to this Report."	2021/003	complete

Infrastructure & Environment Committee - Ongoing Resolutions

Meeting Date	Item Number	Title	Resolution Description	Resolution Number	Status/Comments ('Deferred, Ongoing, Agenda, Completed')
10-Feb-20	8.4	Community Empowerment Model for Facility Management	“that the Infrastructure and Environment Committee, having considered Item 8.4 – Community Empowerment Model for Facility Management, dated 10 February 2020, receives and notes this report and recommends that Management carry out further costings and consultation to better assess the likelihood of success in implementing a Community Empowerment model for facility management.”	2020/011	Ongoing
03-Sep-20	7.5	Guideline Introduction - Verge Landscaping and Maintenance	“that the Infrastructure and Environment Committee, having considered Item 7.5 – Guideline Introduction – Verge Landscaping and Maintenance, dated 3 September 2020, receives and notes the report and in doing so recommends to Council that it adopts the proposed Verge Landscaping and Maintenance Guidelines as presented at Attachment 1 to this Report subject to minor amendments as discussed.”	2020/026	Completed. Council adopted the procedure at its Ordinary Meeting on 28 January 2021.
03-Sep-20	7.6	Liberty Landscaping	“that the Infrastructure and Environment Committee, having considered Item 7.6 – Liberty Landscaping, dated 3 September 2020, receives and notes the report, and in doing so, recommends to Council that it: 1. Adopts the Liberty Central Reserve landscape plans and the outcomes of the open space assessment as presented in Attachment 1 and Attachment 2 of this Report; and 2. Instructs the Chief Executive Officer to negotiate with The Hickinbotham Group on extended maintenance periods being greater than two financial years for the Liberty Central Reserve and greater than five financial years for the “Entry Statement” Water Body Reserve, to reduce the financial impact on Council.”	2020/027	Completed. Council adopted the Liberty Central Reserve Landscape Plans and Outcomes of Open Space Assessment at its Ordinary Meeting on 28 September 2020. Management have negotiated the maintenance periods with the developer .
03-Sep-20	13.2	Mallala CWMS Augmentation	“that the Infrastructure and Environment Committee, having considered Item 13.2 – Mallala CWMS Augmentation, dated 3 September 2020, receives and notes the report and in doing so recommends to Council that it instruct the Chief Executive Officer to continue to negotiate with the developer with a view to having the Gracewood development connect into the existing Mallala CWMS, subject to the parties entering into a suitable legal instrument to ensure that Council’s financial risks are mitigated.”	2020/034	Negotiations Ongoing. Note: Council, at its Ordinary Meeting on 26 October 2020, revoked the confidentiality order (Council Resolution 2020/358) and, accordingly, staff report, Attachment 1, Attachment 2 and Attachment 3 pertaining to Item 13.2 - Mallala CWMS Augmentation are now publicly available
14-Dec-20	7.1	Wheller Road Land Division	“that the Committee having considered Item 7.1 – Wheller Road Land Division, dated 14 December 2020, receives and notes the report and in doing so recommends to Council that it instructs the Chief Executive Officer to continue to pursue an Infrastructure Agreement with the developer to detail the required infrastructure upgrades, being: - upgrade to the existing portion of Wheller Road - 10m wide pavement with a 7.5m 14/7 two-coat spray seal and drainage swales on both sides of the road with 100% of cost borne by developer.”	2020/038	Completed (Rescinded)

	7.1	Draft Infrastructure Asset Management Strategy, and Plans
	Department: Report Author:	Infrastructure and Environment General Manager Infrastructure and Environment
Date: 4 August 2021	Document Ref:	D21/23552

EXECUTIVE SUMMARY

- The purpose of this report is for the Infrastructure and Environment Committee (the Committee) to consider and provide recommendations to Council in relation to the draft Infrastructure Asset Management Strategy and Plans presented as Attachments 1 and 2 to this Report.
- The Infrastructure and Asset Management Plan Categories are;
 - Transport
 - Buildings
 - Open Space
 - Stormwater
 - Community Wastewater Management System (CWMS)
- Following the resolution of Council in December 2020 to recommence work on the review of Infrastructure and Asset Management Plan post adoption of the Strategic Plan 2020-2024, Management have undertaken a substantial review of the Infrastructure Asset Management Plans. A workshop was held on 17 May 2021 with the documentation presented at this workshop utilised to develop the attached Infrastructure Asset Management Plans.
- It is recommended that the Committee considers the draft Infrastructure Asset Management Strategy and Plans and recommends to Council that it releases the suite of documents (Strategy, and Plans) for public consultation subject to any amendments that the Committee considers necessary.

RECOMMENDATION

“that Council, having considered Item 7.1 – *Draft Infrastructure Asset Management Strategy, and Plans*, dated 4 August 2021, receives and notes the report and in doing so, recommends to Council that it release the draft Infrastructure Asset Management Strategy and Plans for public consultation in according with Council’s Public Consultation policy.”

BUDGET IMPACT

Estimated Cost:	\$500
Future ongoing operating costs:	\$Nil
Is this Budgeted?	Yes

RISK ASSESSMENT

Adelaide Plains Council is responsible for the operation, maintenance, renewal of an extensive range of physical assets with a replacement value of **\$158 million**, without regular reviews of Councils Infrastructure Asset Management Strategy, Policy and Plans Council is at risk of not being aware of the long term or future expenditure to maintain its suite of assets and thus heightening the risk of the premature degrading of those assets.

Attachments

1. Draft Infrastructure Asset Management Strategy
2. Draft Infrastructure Asset Management Plans

DETAILED REPORT

Purpose

The purpose of this report is for the Infrastructure and Environment Committee (the Committee) to consider and provide recommendations to Council in relation to draft Infrastructure and Asset Management Strategy, and Plans, presented as **Attachments 1 and 2** to this Report.

Background/History

Council, at its Ordinary Meeting on 14 December 2020, resolved as follows:-

14.6 *Recommence Review of Infrastructure and Asset Management Plan*

Moved Councillor Lush Seconded Councillor Parker 2020 447

“that Council, having considered Item 14.6 – Recommendation Review of Infrastructure and Asset Management Plan, dated 14 December 2020, receives and notes the report and in doing so instructs the Chief Executive Officer to recommence work on the review of Infrastructure and Asset Management Plan post adoption of the Strategic Plan 2020-2024.”

CARRIED

Councils are required to develop and adopt Infrastructure Asset Management Plans relating to the management and development of infrastructure and major assets covering a period of at least ten (10) years. Council have the following asset management plan:

- Transport
- Buildings
- Open Space
- Stormwater
- Community Wastewater Management System (CWMS)

The plans for Transport, Buildings, Open Space, Stormwater and Community Wastewater Management System (CWMS) were adopted in 2017. The plans have been developed to satisfy the following key objectives:

- To communicate funding required to support current levels of service and future demand across the asset portfolios.
- To develop linkages with other Council strategic plans.
- To endorse an improvement plan that includes a more definitive link with Councils long term financial plan.

Discussion

Following the resolution of Council in December 2020 to recommence work on the review of Infrastructure and Asset Management Plan post adoption of the Strategic Plan 2020-2024, Management have undertaken a substantial review of the Infrastructure Asset Management Plans. A workshop was held on 17 May 2021 with the documentation presented at this workshop utilised to develop the attached Infrastructure Asset Management Plans.

Management have been capturing realistic and accurate data in the field ensuring that Council has a very good understanding of what asset it has responsibility for and most importantly how the asset is functioning for the community. The data also captured the condition of assets to assist in making clear decisions on when to renew or maintain the assets. The asset software Conquest is dedicated to store the raw data captured, and has the capability of producing current, future, and historical reporting that analyses and predicts future expenditure.

Transport, Building, Open Space, Stormwater and Community Wastewater Management System Plans recognise asset consumption and ascertain likely future asset maintenance and renewal needs and the need for new additional assets to meet future community service expectations.

With the review of the Transport, Building, Open Space, Stormwater and Community Wastewater Management System asset management plan complete, it is proposed that the plans be released for public consultation in line with Council's Public Consultation Policy.

A report will be presented back to Council following the consultation period with details on submissions received and any proposed amendments as a result of any submissions, with the intent to formally adopt the new plans.

Conclusion

The Council has a significant portfolio of assets under its care and control. These assets form an integral part of providing services to the community and sound asset management is a key to the financial sustainability of the Council. Council has an obligation to ensure that current assets are managed efficiently and effectively. The management of assets cannot be done in isolation and needs to consider financial, social and environmental factors in decision making.

It is recommended that the Committee considers the draft Infrastructure Asset Management Strategy and Plans and recommends to Council that it releases the suite of documents for public consultation, subject to any amendments that the Committee considers necessary.

References

Legislation

Local Government Act 1999

Council Policies/Plans

Strategic Plan 2021-2024

Long Term Financial Plan



STRATEGIC ASSET MANAGEMENT PLAN

Document Control	Strategic Asset Management Plan
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Document ID :

Rev No	Date	Revision Details	Author	Reviewer	Approver
V1	July 2021	For Review	IAC	GMIE	
V1	July 2021	For Review	IAC	EMT	
V1	August 2021	For Review	IAC	I&E Committee	

DRAFT

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EXECUTIVE SUMMARY

Context

Adelaide Plains Council is responsible for the acquisition, operation, maintenance, renewal and disposal of an extensive range of physical assets with a replacement value of **\$158,612,221.38 million**.

These assets include land, buildings, parks, recreation areas, roads, footpaths, stormwater drainage system, community wastewater management system and associated operating assets and provide service essential to our community's quality of life.

This Strategic Asset Management Plan (SAMP) takes the organisational objectives in our Strategic Plan, develops the asset management objectives, principles, framework and strategies required to achieve our organisational objectives. The plan summarises activities and expenditure projections from individual asset management plans to achieve the asset management objectives.

What does it Cost?

Operating Outlays (excluding depreciation)

The projected operating outlays necessary to provide the services covered by this SAMP includes operation and maintenance of existing assets over the 10 year planning period is **\$2,686,862 million** on average per year.

Capital Outlays

The projected required capital outlays including renewal/replacement and new/upgrade of existing assets and acquisition of new assets over the 10 year planning period is **\$4,452,335 million** on average per year.

We have balanced the projected expenditures in the SAMP with financial outlays in the Long-Term Financial Plan (LTFP), this will involve.

- community consultation on desirable and affordable levels of service
- balancing service performance, risk and cost in a trade-off of projects and initiatives
- considering the impact of trade-offs and accepting the service and risk consequences

What we will do

Our aim is to provide the services needed by the community in a financial sustainable manner. Achieving financial sustainability requires balancing service levels and performance with cost and risk.

It may not be possible to meet all expectations for services within current financial resources. We will continue to engage with our community to ensure that needed services are provided at appropriate levels of service at an affordable cost while managing risks.

What we have deferred

We endeavour to provide all services at the desired service levels or provide new services. Major initiatives and projects that are deferred for the next 10 years under long-term financial plan funding levels are:

- None Identified

Managing the Risks

There are risks associated with providing the service and not being able to complete all identified initiatives and projects. We have identified major risks as:

- None Known
- We will endeavour to manage these risks within available funding by:
- Undertaking necessary asset repairs and maintenance to councils assets

Confidence Levels

This SAMP is based on high level of confidence information.

The Next Steps

The actions resulting from this asset management plan are:

- implement the improvement plan in Section 4.1
- improve consultation methods to increase awareness of service performance, risk and cost pressures we are facing
- investigate actions to extend the life of assets without affecting performance and risk
- review asset renewal and replacement options to reduce service delivery lifecycle costs.

2. ASSET MANAGEMENT STRATEGY

2.1 Asset Management System

Asset management enables an organisation to realise value from assets in the achievement of organisational objectives, while balancing financial, environmental and social costs, risk, quality of service and performance related to assets.

An asset management system is a set of interrelated and interacting elements of an organisation to establish the asset management policy and asset management objectives, and the processes, needed to achieve those objectives. An asset management system is more than 'management information system' software. The asset management system provides a means for:

- coordinating contributions from and interactions between functional units within an organisation; and
- consistent application of the asset management processes to achieve uniform outcomes and objectives.

The asset management system includes:

- The asset management policy
- The asset management objectives
- The strategic asset management plan
- The asset management plans, which are implemented in
 - operational planning and control
 - supporting activities
 - control activities
 - other relevant processes.

The asset management system fits within the organisation's strategic planning and delivery process as shown in Figure 1.

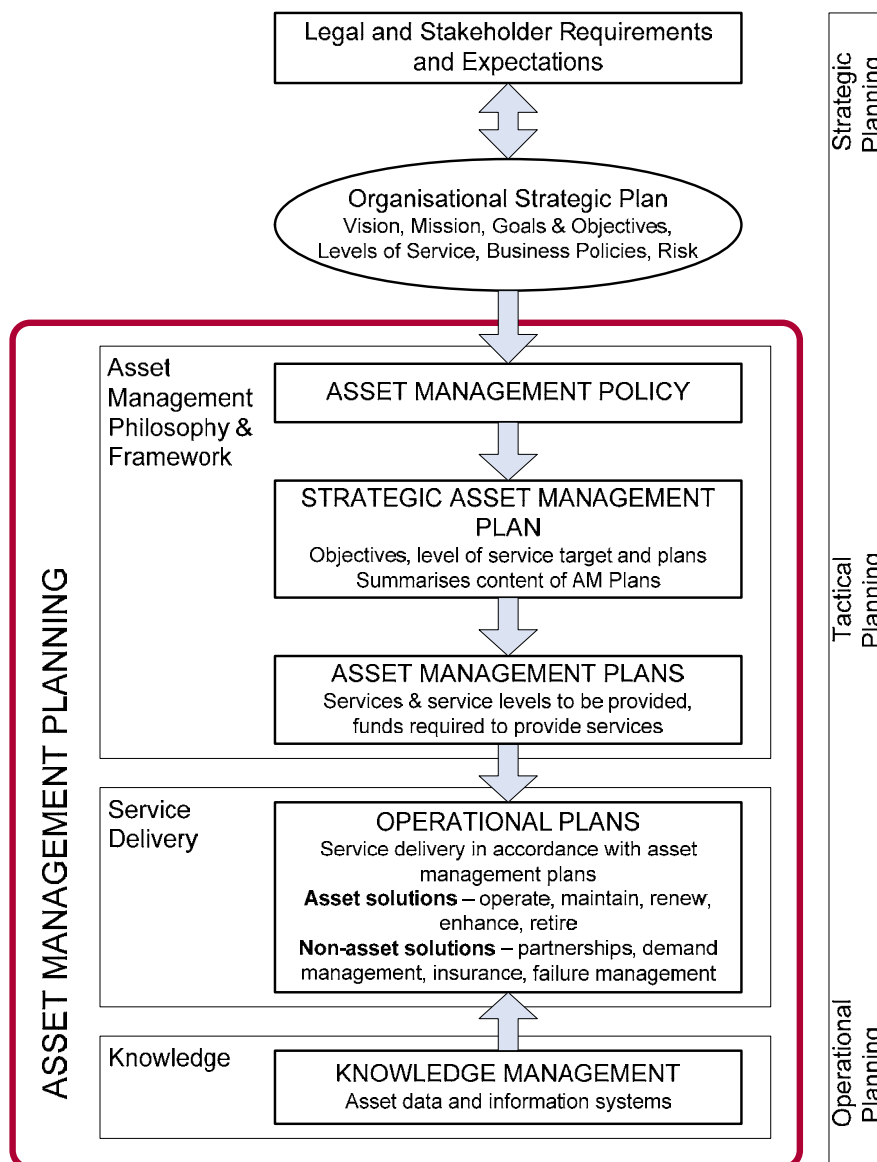


Figure 1: Strategic Asset Management Plan fit in Planning Process

2.1.1 Asset Management Policy

The asset management policy sets out the principles by which the organisation intends applying asset management to achieve its organisational objectives. Organisational objectives are the results the organisation plans to achieve, as documented in its Strategic Plan. Our adopted asset management policy is available from Adelaide Plains Council website.

2.1.2 Strategic Asset Management Plan

This strategic asset management plan is to document the relationship between the organisational objectives set out in the Strategic Plan 2020-2024 and the asset management (or service) objectives and define the strategic framework required to achieve the asset management objectives.

The asset management objectives must be aligned with the organisation's strategic objectives set out in its strategic plan. This strategic asset management plan encompasses the following key themes:

- Envable Lifestyle
- Emerging Economy
- Remarkable Landscapes
- Proactive Leadership

2.1.3 Asset Management Plans

Supporting the strategic asset management plan and asset management plans for major service/asset categories. The asset management plans document the activities to be implemented and resources to be applied to meet the asset management objectives. The strategic asset management plan summarises the key issues from following asset management plans:

- Transport
- Buildings and Land
- Stormwater
- Community Wastewater Management System (CWMS)
- Open Space

The Strategic Asset Management Plan is part of the organisation's strategic and annual planning and reporting cycle as shown in Table 2.1.

Table 2.1: Strategic Asset Management Plan within the Planning and Reporting Cycle

	Plan	Planning Cycle	Performance Reporting	Reporting Method
Community Planning	Strategic Plan	4 years	Community Objectives Indicators	Annual Report
Strategic Planning	10 year Long-Term Financial Plan	4 years	Financial Indicators	Annual Report
	Strategic Asset Management Plan Asset Management Plans		Asset Management Objectives	
Operational Planning	4 year Operational Plan	4 years	Operational Objectives incorporated into Annual Plan	Annual Report
Annual Planning & Budget	Annual Plan & Budget	Annual	Annual Objectives Budget Objectives	Reports to Council
	Departmental Work Plans		Work Plan Objectives	Reports to Council, Environment & Infrastructure Committee, Finance Audit Committee
	Individual Work Plans		Work Plan Objectives	Performance Reviews

2.2 What Assets do we have?

We manage a lot of assets to provide services to our community. The assets provide the foundation for the community to carry out its everyday activities, while contributing to overall quality of life.

Table 2.2: Assets covered by this Plan

Asset Class/Category	Details
Transport	Sealed Roads 181,728 Length (m) Sheeted Roads 541,218 Length (m) Bridges No. 4 Footpaths Sealed 19,186 Length (m) Footpaths Unsealed 61 Length (m) Pram Ramps No. 184 Kerb & Watertable 63,778 Length (m)
Stormwater	Pipes Box Culverts Headwalls Junction Boxes Pump Stations Gross Pollutant Traps
Open Space	Landscaping Sites No. 12 Site Improvements No. 226 Structures No. 45
Buildings and Land	Buildings No. 45 Buildings Components No. 19 Land Parcels No. 162 Easements No. 16
Community Wastewater Management System	Pump Stations No. 9 Air Valve No. 15 Tanks No. 10 Domestic Pumps/Sumps No. 20 Gravity Pipes No. 74 Irrigation No. 31

2.3 Our Assets and their management

2.3.1 Asset Values

The infrastructure assets covered by this strategic asset management plan are shown in Table 2.3.1. These assets are used to provide services to the community.

Table 2.3.1: Assets covered by this Plan

Asset Class/Category	Gross Replacement Cost
Transport	\$105,618,397.00
Stormwater	\$11,517,680.00
Open Space	\$6,421,682.44
Buildings & Land	\$28,478,471.94
Community Wastewater Community System	\$6,575,990.00
TOTAL	\$158,612,221.38

2.3.2 Asset Management Indicators

An asset management objective is to provide the services that the community needs at the optimum lifecycle cost in a financially sustainable manner. Figure 2 shows the projected operation, maintenance, new, renewal expenditure balanced with financial outlays in the 10 year long-term financial plan. Also figure 3 shows the projected total expenditure – Life of Plan 10 Years.

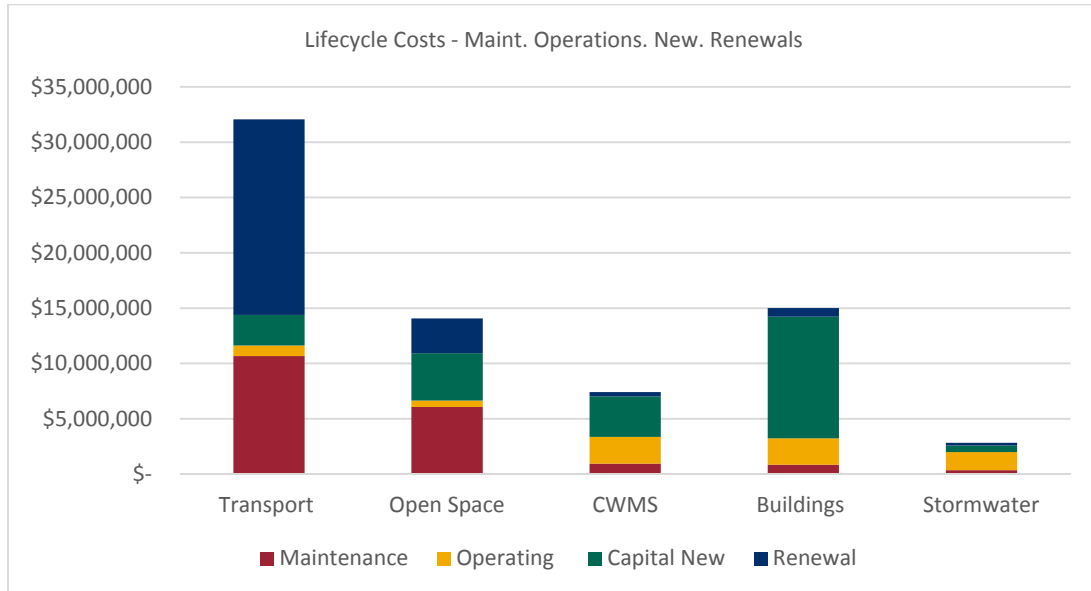


Figure 2: Projected Maintenance, Operations and Capital Expenditure

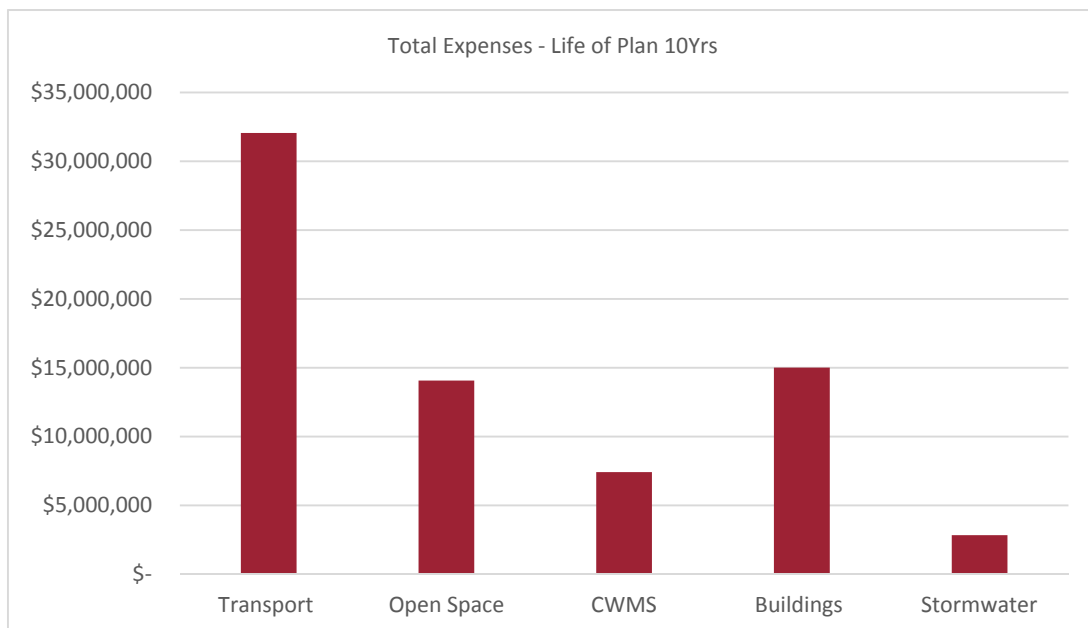


Figure 3: Projected Total Expenditures - Life of Plan, 10 Years

The purpose of this strategic asset management plan is to develop the strategies to achieve the asset management objectives through balancing of asset service performance, cost and risk.

2.3.3 Opportunities and Risks

We have identified opportunities relevant to the services included in this strategic asset management plan including:

- Strategic Overview & Management of Infrastructure Assets
- Service Standards and Levels

Relevant risks to the strategic asset management plan in the future are:

- Decline in Service Levels
- Decline Operational Service Standards
- Influx of Gifted Assets

Infrastructure risk management plans for these and other relevant risks are summarised with risk management activities and resource requirements incorporated in the relevant asset management plans.

2.4 Where do we want to be?

2.4.1 Community Expectations

We have identified community expectations for service levels to be generally consistent with current levels of service. We engage with the community through community engagement processes to ensure that informed decisions are made on future levels of service and costs and that service and risk consequences are known and accepted by stakeholders.

2.4.2 Organisational Objectives

The organisation objectives are developed in the Strategic Plan 2020-2024 under Vision, shown below.

Vision

Productive: A leading supplier of primary produce to local, national and international markets. Proximity to markets and natural growing conditions provide competitive advantages for primary producers on the Adelaide Plains that has seen our economy emerge as a key contributor to the region's prosperity.

- **Diverse:** A more diverse community with access to a greater mix of local opportunities. Increased employment, services and education attracts and retains a diverse community that chooses to live, learn and work in the region.
- **Location:** A lifestyle location connected to the Barossa, Coast and Adelaide. Adelaide Plains is a quiet community that offers residents time and space with convenient access to the benefits of Greater Adelaide, the coast and the Barossa region.
- **Welcoming:** A proud, spirited and generous community. This is a place that everyone belongs, where community connection and care is strong and someone is always available to help when a neighbour is in need.
- **Ambition:** Advancing infrastructure and technology to foster a competitive local economy. Modern practice, research and innovation, and efficient access to export centres and local markets builds an economic environment and reputation that rivals the State's major primary productions regions. With employment opportunities diversifying and new housing products in abundance, Adelaide Plains will become the place of choice for the Northern Adelaide Plains.
- **Leadership:** A decisive and proactive Council. Our Elected Members share a vision of prosperity founded on courage, robust deliberation, transparency and forward thinking and investing.
- **Attractive:** A Place of choice for businesses, residents and visitors. Our townships are inviting, well cared for, filled with character and provide a range of services, facilities and accommodation that caters for all people and our landscapes, events and infrastructure provide memorable experiences.

Strategies

ENVIABLE LIFESTYLE

Strategic Response

Arrest the departure of younger population through affordable housing, access to diverse employment opportunities, regional university pathways and retail/recreation. Support retention of older community members through compact living with ease of access to improved retail and services in townships. Add to the vibrancy of towns through events, volunteering opportunities and community initiative funds or service support.

Strategies

1. Manage growth to sustain and activate our townships;
2. Provide, support and acquire facilities, assets, services and programs that build community capacity, health and connection; and
3. Advocate for increased health, education, aged care and youth services, welfare and emergency facilities and services.

EMERGING LANDSCAPES

Strategic Response

Facilitate growth of the business sector through strategic advocacy, partnerships and service improvements that generate local procurement and employment opportunities, provide certainty for investment and enhance the appeal and visitor experience delivered by Council's key tourism strengths and opportunities.

Strategies

1. Support the growth of primary industries and the introduction of value-add employment generators;
2. Facilitate greater access to local opportunities from public and private investment; and
3. Reinforce Adelaide Plains Council as a place of choice for business, residents and visitors.

REMARKABLE LANDSCAPES

Strategic Response

Advocate for Government investment in the Gawler River Catchment, liaise with and support agencies responsible for adverse event mitigation and response, maintain a mix of waste management services and increase community education and lever volunteering opportunities and multiple State agency agendas to target the enhancement of coastal visitor experiences.

Strategies

1. Protect and enhance our coastal and riverine landscapes, native vegetation and heritage;
2. Mitigate the impacts of adverse natural events on the community;
3. Improve resource recovery and carbon and waste management.

PROACTIVE LEADERSHIP

Strategic Response

Proactive engagement in new and existing regional partnerships, pursuit of funding and exploration of new revenue opportunities will create value for the region and rate payers. Early engagement in reform will support opportunities for continuous improvement. Setting a strategic financial agenda with regard to sustainability ratios will open up investment opportunities for the delivery of Council's strategic plan, and a continued emphasis on engagement and consultation will raise awareness, understanding and participation by an increasingly active community regarding Council's intent and progress.

Strategies

1. Actively seek funding and partnerships to deliver Council initiatives;
2. Actively engage with and inform our communities;
3. Strategic and sustainable financial management; and
4. Proactively engage in Local Government Reform and continuous improvement.

2.5 Asset Management Vision

To ensure the long-term financial sustainability of the organisation, it is essential to balance the community's expectations for services with their ability to pay for the infrastructure assets used to provide the services. Maintenance of service levels for infrastructure services requires appropriate investment over the whole of the asset life cycle. To assist in achieving this balance, we aspire to:

Develop and maintain asset management governance, skills, process, systems and data in order to provide the level of service the community need at present and in the future, in the most cost-effective and fit for purpose manner.

In line with the vision, the objectives of the strategic asset management plan are to:

- ensure that our infrastructure services are provided in an economically optimal way, with the appropriate level of service to residents, visitors and the environment determined by reference to our financial sustainability;
- safeguard our assets including physical assets and employees by implementing appropriate asset management strategies and appropriate financial resources for those assets;
- adopt the long term financial plan as the basis for all service and budget funding decisions;
- meet legislative requirements for all our operations;
- ensure resources and operational capabilities are identified and responsibility for asset management is allocated;
- ensure operational and service delivery risks are adequately managed;
- continually improve our asset, risk and financial management and service delivery performance;
- provide high level oversight of financial and asset management responsibilities through Audit Committee reporting to Council on development and implementation of the Strategic Asset Management Plan, Asset Management Plans and Long Term Financial Plan.

2.6. How will we get there?

The strategic asset management plan proposes strategies to enable the organisational objectives and asset management policies to be achieved.

Table 2.6: Asset Management Strategies

No	Strategy	Desired Outcome
1	Incorporate Year 1 of long term financial plan revenue and expenditure projections into annual budgets.	Long term financial planning drives budget deliberations and the long term implications of all services are considered in annual budget deliberations.
2	Report our financial position at fair value in accordance with Australian Accounting Standards, financial sustainability and performance against organisational objectives in Annual Reports.	Financial sustainability information is available for Council and the community.
3	Develop and maintain a long term financial plan covering 10 years incorporating asset management plan expenditure projections with a sustainable funding position outcome.	Sustainable funding model to provide our services.
4	Develop and annually review asset management plans and strategic asset management plan covering at least 10 years for all major asset classes.	Identification of level of services needed by the community and required funding to optimise 'whole of life' costs.
5	Review and update asset management plans, strategic asset management plan and long term financial plans after adoption of annual budgets. Communicate any consequence of funding decisions on service levels and service risks.	We and the community are aware of changes to service levels and costs arising from budget decisions.
6	Develop and maintain a risk register of operational and service delivery risks showing current risk levels, risk management treatments and report regularly to Council on current high level risks.	Risk management of operational and service delivery risks is an integral part of governance.
7	Ensure Council decisions are made from accurate and current information in asset registers, on service level performance and costs and 'whole of life' costs.	Improved decision making and greater value for money.
8	Report on our resources and operational capability to deliver the services needed by the community in the annual report.	Services delivery is matched to available resources and operational capabilities.
9	Ensure responsibilities for asset management are identified and incorporated into staff position descriptions.	Responsibility for asset management is defined.
10	Implement an improvement plan to realise 'core' maturity for the financial and asset management competencies within 2 years.	Improved financial and asset management capacity within the organisation.

2.7 Asset Management Improvement Plan

The tasks required achieving a 'core' financial and asset management maturity are shown in priority order in the asset management improvement plan in Section 4.1.

2.8 Consequences if actions are not completed

There are consequences for the Council if the improvement actions are not completed. These include:

- Inability to achieve strategic and organisational objectives;
- Inability to achieve financial sustainability for the organisation's operations;
- Current risks to infrastructure service delivery are likely to eventuate and response actions may not be appropriately managed;
- We may not be able to accommodate and/or manage changes in demand for infrastructure services.

3. OPERATIONS AND MAINTENANCE

3.1 Routine Operation and Maintenance Plan

Operation include regular activities to provide services such as public health, safety and amenity, i.e. cleaning, utility services, street sweeping, grass mowing and street lighting.

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again.

3.1.1 Operation and Maintenance Plan

Operation activities affect service levels including quality and function, such as cleanliness, appearance, etc., through street sweeping and grass mowing frequency, intensity and spacing of street lights and cleaning frequency and opening hours of building and other facilities.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating, e.g. road patching but excluding rehabilitation or renewal.

Maintenance expenditure levels are considered to be adequate to meet projected service levels. Where maintenance expenditure levels are such that will result in a lesser level of service, the service consequences and service risks have been identified and service consequences highlighted in the respective AM Plan and service risks considered in the Infrastructure Risk Management Plan.

3.1.2 Operation and Maintenance Strategies

We will operate and maintain assets to provide the defined level of service to approved budgets in the most cost-efficient manner. The operation and maintenance activities include:

- Scheduling operations activities to deliver the defined level of service in the most efficient manner;
- Undertaking maintenance activities through a planned maintenance system to reduce maintenance costs and improve maintenance outcomes. Undertake cost-benefit analysis to determine the most cost-effective split between planned and unplanned maintenance activities (50-70% planned desirable as measured by cost);
- Maintain a current infrastructure risk register for assets and present service risks associated with providing services from infrastructure assets and reporting Very High and High risks and residual risks after treatment to management and Council;
- Review current and required skills base and implement workforce training and development to meet required operation and maintenance needs;
- Review asset utilisation to identify underutilised assets and appropriate remedies, and over utilised assets and customer demand management options;
- Maintain a current hierarchy of critical assets and required operation and maintenance activities;
- Develop and regularly review appropriate emergency response capability;
- Review management of operation and maintenance activities to ensure we are obtaining best value for resources used.

4. PLAN IMPROVEMENT AND MONITORING

4.1 Improvement Plan

The asset management improvement tasks identified from an asset management maturity assessment and preparation of this strategic asset management plan are shown in Table 4.1.

Table 4.1: Improvement Plans

Transport

Task	Tasks	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Review service levels	Council Administration	As required
3	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
4	Level 2 Bridge Assessment	Council Administration	2020/21FY 2021/22FY
5	Develop footpath/pram ramps strategic plan	Council Administration	2021/22FY 2022/23FY
6	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

Stormwater

Task	Task	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Continue the development of stormwater implementation plans for each town as a follow-on from the stormwater management plans	Council Administration	As per revaluation requirements
3	Review service levels	Council Administration	As required
4	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
5	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

Open Space

Task	Task	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Continue the development of open space implementation plans	Council Administration	As per asset condition assessment
3	Review service levels	Council Administration	As required

4	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
5	Develop Open Space & Recreation Strategy	Council Administration	FY2022/23
6	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

Community Wastewater Management System (CWMS)

Task	Task	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Continue CWMS scheduled and programmed maintenance requirements	Council Administration/ CWMS Officer	Ongoing
3	Review service levels	Council Administration	As required
4	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
5	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

Buildings & Land

Task	Task	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Continue the development of buildings implementation plans	Council Administration/ Buildings Officer	As per asset condition assessment
3	Review service levels	Council Administration	As required
4	Review parcels of land for need and requirement	Council Administration	As required
5	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
6	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

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Strategic Plan 2020-2024

Asset Management Policy

Annual Plan and Budget

Long Term Financial Plan

Asset Management Plans

- Transport
- Open Space
- Buildings and Land
- Stormwater
- Community Wastewater System (CWMS)

ASSET MANAGEMENT PLAN

Transport

Document Control		Asset Management Plan			
Document ID :					
Rev No	Date	Revision Details	Author	Reviewer	Approver
V1.11	June/July 2021	Develop Transport Infrastructure Asset Management Plan	IAC		
V1.11	July 2021	For Review	IAC	GMEI EMT	GMEI EMT

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1.0 Introduction

1.1 Background

The Adelaide Plains Council has worked on the development of this Asset Plan based on the asset register as at June 2020.

The transport network comprises:

- Sealed Roads
- Unsealed Roads
- Kerbs and Watertables
- Pram Ramps
- Footpaths
- Bridges
- Car Parks
- Traffic Control

The infrastructure assets included in this plan have a total replacement value of \$105,618,397 at 2020 valuation.

This plan outlines the requirements for the Council to continue to plan and deliver on the demands to maintain its road infrastructure to prescribed service levels and the expenditure demand and proposed budget is presented below.

The renewal expenditure presented has been established through on-site inspections to verify asset information, delivering a significant 4 year rolling works program with targeted expenditure provided over a 10 year period.

Some adjustments to the works program generated from the asset register have been made to even out the annual expenditure requirements by deferring or bringing forward certain road segments for treatment to assist works expediency.

Council plans to provide transport asset services for the following:

Operation, maintenance and renewal of sealed roads, unsealed roads, kerbs and watertables, footpaths, bridges and pram ramps, car parks and traffic controls to meet service levels set by Council in annual budgets.

Council is committed to maintaining and renewing the existing transport assets to required service level standards. Additionally, Council will continue planning to upgrade transport assets, however commitment to internal funding and external funding is yet to be determined and accordingly is not included in the expenditure profile and will form part of the annual budgeting process.

Adelaide Plains Council own and manage an extensive rural sheeted road network and a smaller rural sealed network throughout the council area. Council also own and manage a township road network across numerous towns with mainly sealed and some sheeted road surfaces.

Council's rural and township unsealed road surfaces Categories 1, 2, 3-A, 3-B and 3-C sheeted surfaces are treated as capital expenditure. Category 4-A formed natural roads are funded entirely under maintenance.

Asset groups included within the transport infrastructure group include sealed road, unsealed roads, kerbing, channel & spoon drains, footpaths, pram ramps, bridges, car parks and traffic control.

This Asset Management Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the planning period.

The Asset Management Plan is to be read with Asset Management Policy and Asset Management Strategy, where developed, along with other key planning documents:

- Strategic Plan
- Annual Business Plan
- Long Term Financial Plan

The Adelaide Plains Council contains approximately 142km of rural sealed roads, 39km of township sealed roads, 541km of sheeted roads and 235km natural formed roads. Also within the IAMP, four Bridges, 19.2km of footpaths, 184 Pram Ramps and 63.7km of kerb, channel and spoon drains. Only sealed and sheeted roads are treated as capital expenditure, natural formed roads are funded under maintenance.

This Transport Infrastructure Asset Management Plan provides for Councils road network and has been developed using an asset register which was digitised using historical plans and field collection during 2020. The register was valued as at 30 June 2020 and has been updated with 2021/2022 capital works to the value of \$2,357,850.

Asset	Quantity	Renewal Value	Total Value
Sealed Roads	181,728 Length (m) 1,407,552 m ²	\$71,466,451	\$71,466,451
Sheeted Roads	541,218 Length (m) 3,839,977 m ²	\$18,489,371	\$18,489,371
Bridges	4 No.	\$4,935,627	\$4,935,627
Sealed Footpaths Block Paving, Concrete, Hotmix, Spray Seal	19,186 Length (m)	\$3,182,193	\$3,182,193
Unsealed Footpaths Rubble Walkway/Shared Path	61 Length (m)		
Pram Ramps	184 No.	\$270,480	\$270,480
Kerb and Watertable	63,778 Length (m)	\$7,274,275	\$7,274,275
Total			\$105,618,397

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 1.1.1

Table 1.1.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Residents and Ratepayers	<ul style="list-style-type: none"> ▪ Ultimate beneficiaries of the AMP process ▪ Feedback collected throughout the year ▪ Annual satisfaction survey undertaken
Insurers	<ul style="list-style-type: none"> ▪ Local Government Mutual Liability Scheme
Lessees	<ul style="list-style-type: none"> ▪ Leases operating who provide feedback on services, and have a range of maintenance responsibilities.

Key Stakeholder	Role in Asset Management Plan
State & Federal Government	<ul style="list-style-type: none"> Responsible for awarding grants to Council
Department for Infrastructure and Transport (DiT)	<ul style="list-style-type: none"> Liaison with DiT, discuss future Works Programs
Visitor / Tourists	<ul style="list-style-type: none"> Regular satisfaction surveys undertaken, and feedback collected
Council	<ul style="list-style-type: none"> To act as custodians of community assets To set Asset Management Policy and vision Allocate resources to meet Council objectives in providing services while managing risks
Executive Management Team	<ul style="list-style-type: none"> Responsible for the development, management and review of an Asset Management Strategy, associated plans, practices and reporting on the status and effectiveness of Council's asset management To monitor and review the performance of employees in achieving the asset management strategy, plans and practices To ensure sufficient resources are applied to manage the assets to legislative requirements; and Accountable for the management of assets within their areas of responsibility
Asset Manager and Staff	<ul style="list-style-type: none"> To lead the development of the Asset Management Plans To develop and implement maintenance, renewal and capital works programs in accordance with the Asset Management Policy, Strategy, Plans, as well as budget allocations Develop Specific Management Plans (upgrade, renewal, maintenance, operations, disposal) To deliver levels of service to agreed risk and cost standards and expectations To report asset related risk and damage To establish and monitor asset compliance and risk inspection regimes To manage asset condition assessments To provide technical expertise to the Executive Management Team

1.2 Goals and Objectives of Asset Ownership

Our goal for managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,

- Identifying, assessing and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

- Levels of service – specifies the services and levels of service to be provided,
- Risk Management,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 ¹
- ISO 55000²

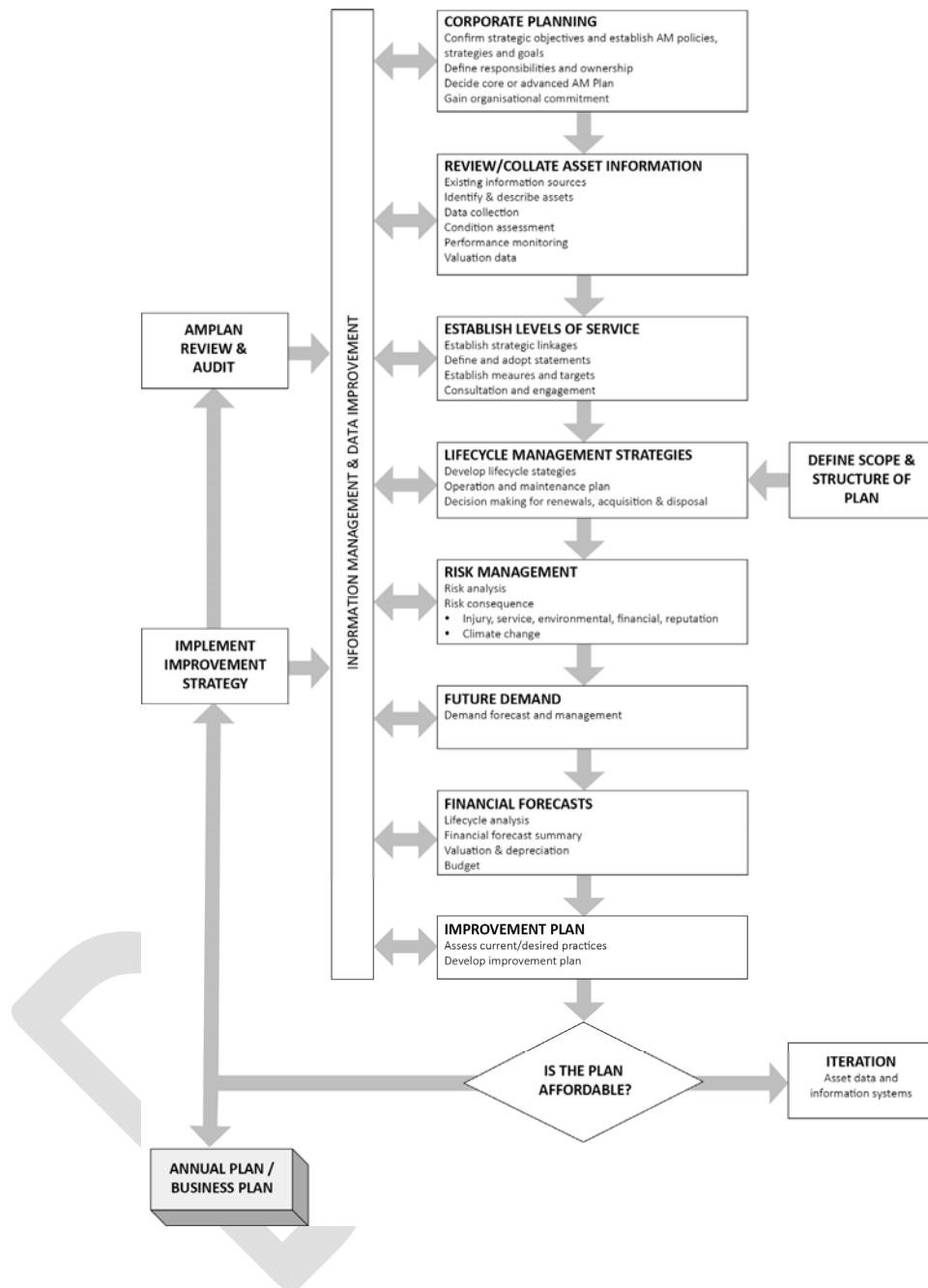
A road map for preparing an AM Plan is shown below.

¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² ISO 55000 Overview, principles and terminology

Road Map for preparing an Asset Management Plan

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



2.0 LEVELS OF SERVICE

Current and Desired Levels of Service

Levels of Service define the asset performance targets, in relation to reliability, quantity, quality, responsiveness, safety, capacity, environmental impacts, comfort, cost/affordability and legislative compliance. One of the key objectives in developing IAMP has been to match the level of service provided by Adelaide Plains Council to the expectations of the users (i.e. the community) within available resources.

This requires a clear understanding of the user needs, expectations and preferences. To achieve and sustain acceptable standards of service for Council's asset network requires an annual commitment of funds. These funds provide for regular and responsive maintenance and for timely renewal or replacement of the asset. The provision of adequate financial resources ensures that the Infrastructure Assets network are appropriately managed and preserved. Funding below requirement impacts directly on community development and if prolonged will result in the need for "catch up" expenditure imposed on ratepayers in the future. Additionally, deferred renewal results in increased and escalating reactive maintenance as aged assets deteriorate at increasing rates. No authority can deliver everything all the time. In fact, in line with good practice and affordable service delivery, it may not be practical or cost effective to deliver the same level of service across the entire asset portfolio.

Some of Councils IAMP provides different maintenance interventions, inspection frequencies and response times for each asset classification. In accordance with the International Infrastructure Management Manual, Council acknowledges that the primary purpose of an asset hierarchy is to ensure that appropriate management, engineering standards and planning practices are applied to the asset based on its function. It also enables more efficient use of limited resources by allocating funding to those assets that are in greater need and the costs are better justified. The community generally expect that Council will provide an effective method for its asset management which meets the required Australian and State legislative regulations.

Council has defined service levels in two terms and provides the level of key performance measure, level of service objective, performance measure process, current level of service and desired level of service.

Community Levels of Service

Community Levels of Service relate to the service outcomes that the community wants in terms of reliability, responsiveness, amenity, safety and cost.

Community levels of service measures used in the asset management plan are:

- Quality: How good is the service?
- Function: Does the service meet users' needs?
- Responsiveness: How quickly are problems attended to and resolved?
- Capacity/Utilisation: Is the service over or under used?
- Safety: Does the service achieve appropriate levels of public and environmental safety?

Table 2.1.1 Community Levels of Service

Key Performance Measure	Level of Service Objective	Performance Measure Process	Current Level of Service	Desired Level of Service
CUSTOMER (COMMUNITY) LEVEL OF SERVICE				
Quality	All weather access for all sealed and gravel resheeted roads	Council maintains a conditions-based road register and rolling 4 year renewal plan to manage reseals and resheeting	Plan and budgets match to deliver required levels of service	Plan and budgets match to deliver required levels of service
	Footpaths provide safe access for higher pedestrian areas	Number customer complaints	Establish annual reporting and number of complaint's trending down	Establish annual reporting and number of complaint's trending down
	Smooth and safe transition from road across the bridge structure	Develop a plan and budget allocation	Undertake when resheeting unsealed roads	Meet planned targets
	Roads will be progressively upgraded from unsealed to sealed where justified and in-line with Councils road matrix and budget.	Developed roads matrix	Need and budget allocation for approval	Meets targets – require budget allocation for approval
Function/Capacity /Utilisation	Roads suitable for road user needs	Road use are categorised based on utilisation and are fit for purpose	Road categories are defined and reviewed	Road categories are defined and reviewed
Safety	Provide safe and suitable roads free from hazards	Number of accidents reported and customer service requests	Reduce accidents and request caused by road conditions	Reduce accidents and request caused by road conditions

Technical Levels of Service

Technical Levels of Service support the community service levels and are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities that the Council undertakes to best achieve the desired community outcomes

Table 2.1.2 Technical Levels of Service

Key Performance Measure	Level of Service Objective	Performance Measure Process	Current Level of Service	Desired Level of Service
TECHNICAL LEVEL OF SERVICE				
Operations	Efficiently utilise assets which will consume resources such as human resources, energy and materials	Resource/Expertise/Capacity System/Process	Tonkin Consulting – software conquest	Information is reliable for decision making i.e. roads based software
Maintenance	Retain assets in a suitable condition to meet it original service potential in line expected life	Routine Maintenance performed as set out in road categories Perform reactive maintenance as required	Based on categories Demand is met when required	Based on categories Demand is met when required
Renewal	Replace existing assets with assets of equivalent capacity or performance capability	Asset Renewal is planned and occurs in line with established standards and timeframes	Annual works program is delivered	Annual works program is delivered
New/Upgrade	Upgrades are cost effective, meet end user's needs, are affordable and are in line with council policies and road matrix	Developed roads matrix. Roads will be progressively upgraded from unsealed to sealed where justified and in-line with councils road matrix and budget	Need and budget allocation for approval	Meets targets – require budget allocation for approval

Table 2.1.3 Sheeted Road Design Elements

Street Type	Unsealed Category 1 Collector Rd	Unsealed Category 2 Collector Rd	Unsealed Category 3-A Local Rd	Unsealed Category 3-B Local Rd	Unsealed Category 3-C Local Rd	Unsealed Category 4-A Natural Formed Rd
Road Width	9m	8m	7m	6m	6m	Variable
Road Usage	High Use	Medium to High Use	Medium Use	Medium to Low Use	Low Use	Very Low Use
Sheeting Thickness (Compacted)	150mm	100mm	100mm	100mm	100mm	NA
Cross fall	6%	6%	6%	6%	6%	Minimum
Material	40mm crushed rock	40mm crushed rock	40mm crushed rock	40mm crushed rock	40mm crushed rock	NA
Maintenance Patrol Grading	Graded when required. Minimum of 3 grades per year	Graded when required. Minimum of 3 grades per year	Graded when required. Minimum of 2 grades per year	Graded when required. Minimum of 2 grades per year	Graded when required. Minimum of 2 grades per year	0 or 1 grade per year
Patching	Patching when required to maintain safety	Patching when required to maintain safety	Patching when required to maintain safety	Patching when required to maintain safety	Patching when required to maintain safety	Regulatory and warning signs replaced as required
Stormwater	Side drains and culverts cleaned as required	Side drains and culverts cleaned as required	Side drains and culverts cleaned as required	Side drains and culverts cleaned as required	Side drains and culverts cleaned as required	Side drains and culverts cleaned as required
Signage	Regulatory and warning signs replaced as required	Regulatory and warning signs replaced as required	Regulatory and warning signs replaced as required	Regulatory and warning signs replaced as required	Regulatory and warning signs replaced as required	Regulatory and warning signs replaced as required

Table 2.1.4 Sealed Road Residential & Rural Road Design Elements

Street Type	Access Road (Residential)	Local Road (Residential)	Collector Road (Residential)	Rural Road
Reference Document	Drawing No. 18-1983-001 June 2019 DWG No. D1	Drawing No. 18-1983-002 June 2019 DWG No. D2	Drawing No. 18-1983-003 June 2019 DWG No. D3	Drawing No. 18-1983-004 July 2021 DWG No. D0
Reserve Width	13.5m	15m	Min 20m	Min 20m
Road Clear Zone	1.5m	1.5m	1.5m	1.5m
Traffic Catchment (max)	10 lots	200 lots	N/A	N/A
Traffic volume	15-40 vpd	40-800 vpd	800 + vpd	500 + vpd
Design speed	30 km/h	50 km/h (max)	50 km/h (max)	100 km/h (max)
Carriageway Width (minimum) Lanes – moving Parking	6m Two Lane 1	7.6m Two Lane 2 or 1	11.0m-13.4m (with cycle lanes) Two Lane 2 (indented bays accepted)	9.2m (bitumen seal width 7.2m min) Two Lane
Constructed footpaths (with a one side path – preference is to be located on low side and above common services trench)	One side – width 1.5m	One side - width 1.5m	Both sides – width 1.8m to 2.5m at bus stops, seating and sheltered areas to be provided.	NA
Cycle provision	On carriageway	On carriageway	Shared path on verge or cycle lane on carriageway.	NA
Grade Desirable	2.5%-3%	2.5%-3%	2.5%-3%	3%
Public Transport	NA	NA	Indented bus stops, seating and sheltered area.	NA
Individual Lot access	Yes	Yes	Yes	Yes
Sight distance (general) Reference Standards and Codes	As per AUSTROADS, AS2890, AS1428 Aust Model Code & Services in Streets Code	As per AUSTROADS, AS2890, AS1428 Aust Model Code & Services in Streets Code	As per AUSTROADS, AS2890, AS1428 Aust Model Code & Services in Streets Code	As per AUSTROADS, AS2890, AS1428 Aust Model Code & Services in Streets Code
Drainage	Underground drainage network where practical	Underground drainage network where practical	Underground drainage network where practical	Underground drainage network where practical

Potholes Maintenance	Pothole repair as required to maintain safety	Pothole repair as required to maintain safety	Pothole repair as required to maintain safety	Pothole repair as required to maintain safety
Heavy Patch Maintenance	Heavy patch as required to maintain safety	Heavy patch as required to maintain safety	Heavy patch as required to maintain safety	Heavy patch as required to maintain safety
Linemarking Maintenance	Linemarking in accordance with Australian Standards	Linemarking in accordance with Australian Standards	Linemarking in accordance with Australian Standards	Linemarking in accordance with Australian Standards
Kerb & Watertables Maintenance	Kerb watertables cleaned twice per year minimum	Kerb watertables cleaned twice per year minimum	Kerb watertables cleaned twice per year minimum	Kerb watertables cleaned twice per year minimum
Kerb & Watertables Maintenance	Kerb watertables and kerbs repaired as required	Kerb watertables and kerbs repaired as required	Kerb watertables and kerbs repaired as required	Kerb watertables and kerbs repaired as required
Weed Spraying Maintenance	Weed spraying and slashing as required (property owners encouraged to maintain road verges adjacent to their properties). Any landscaping, paving or tree planting requires Council approval.	Weed spraying and slashing as required (property owners encouraged to maintain road verges adjacent to their properties). Any landscaping, paving or tree planting requires Council approval.	Weed spraying and slashing as required (property owners encouraged to maintain road verges adjacent to their properties). Any landscaping, paving or tree planting requires Council approval.	Weed spraying and slashing as required (property owners encouraged to maintain road verges adjacent to their properties). Any landscaping, paving or tree planting requires Council approval.
Regulatory	Regulatory, warning and advisory signs maintained to Australian Standards. Street name signage.	Regulatory, warning and advisory signs maintained to Australian Standards. Street name signage.	Regulatory, warning and advisory signs maintained to Australian Standards. Street name signage.	Regulatory, warning and advisory signs maintained to Australian Standards. Street name signage.

Construction, Renewal and Maintenance Standards for Roads

SEALED ROADS

This plan has been developed based on assumptions related to the construction and renewal standards set out in the following sections for the seal and unsealed road network. Council owns and maintains a sealed road network totalling approximately 181.7km in length, this made up of rural roads 142.4km and townships 39.3km.

The Sealed road network is classified as follows:

- High Use – Rural & Township
- Standard Use – Rural & Township
- Intersections – Rural & Township
- Land Divisions - Township
- On-Road Car Parks - Township

For sealed surfaces the type of seal, whether it be Hotmix or spray seal, the speed environment (high use, standard use, intersection, land division or on-road car parks), performance (standard or nonstandard) and underlying pavement (<300mm pre 2004 or >300mm post 2004) are the predominate factors affecting useful life. Performance (standard or non-standard) has been determined by two factors, the history of last date of sealing stored within Conquest and condition scores (including photographs) collected during field inspections. Standard surfaces are expected to have limited preparation work when resurfaced, while non-standard show higher levels of cracking and deformation requirements and other preparation works. The area of sealed road surface is determined from road segment lengths and measured seal width.

Rural spray seal surfaces have been further classified based on their construction date, namely pre 2004 and post 2004. The spray seal surfaces applied pre 2004 have proven to last longer than those applied post 2004 and as such the pre 2004 surfaces have a longer useful life.

Table 2.1.5 provides a breakdown of the various sealed surface types in the network.

Table 2.1.5 Sealed Surfaces Network

Surface Type	Length (m)	Surface Area (m2)	Approximate % of Sealed Road Network (Area)
TOWNSHIP SEALED			
Hotmix Bitumen (Standard Use)	1,758	14,662	1%
Hotmix Bitumen (Land Division)	9,010	69,736	5%
Hotmix Bitumen (Intersection)	29	286	<1%
Hotmix Bitumen (On-Road Car Park)	1,490	6,301	<1%
Spray Seal (High Use)	5,068	60,326	4%
Spray Seal (Standard Use)	21,510	171,392	12%
Spray Seal (Land Division)	430	3,869	<1%
<i>Sub Total</i>	<i>39,293</i>	<i>326,572</i>	<i>23%</i>
RURAL SEALED			
Hotmix Bitumen (Standard Use)	841	7,220	1%
Hotmix Bitumen (Intersection)	1,024	8,187	1%
Spray Seal (High Use pre 2004)	21,535	159,068	11%

Spray Seal (High Use post 2004)	79,335	613,843	44%
Spray Seal (Standard Use pre 2004)	10,544	75,128	5%
Spray Seal (Standard Use post 2004)	29,156	217,535	15%
<i>Sub Total</i>	<i>142,435</i>	<i>1,080,980</i>	<i>77%</i>
TOTAL Sealed Surfaces	181,728	1,407,552	100%

Township Sealed Roads - Service Level Standards

Construction Method	
Seal Width:	<p>Standard Access Road: 6.0m width, however, dependant on location & available road reserve width, consideration to incorporate on-street parking, lighting, nature strips/verges and footpaths. Consideration also given to incorporate bike lanes.</p> <p>Local Street: 7.6m width, however, dependant on location & available road reserve width, consideration to incorporate on-street parking, lighting, nature strips/verges and footpaths. Consideration also given to incorporate bike lanes.</p> <p>Standard Collector Road: 11.0 – 13.4m width, however, dependant on location & available road reserve width, consideration to incorporate on-street parking, lighting, nature strips/verges and footpaths. Consideration also given to incorporate bike lanes.</p>
Seal Types:	Spray seal 2 coat seal or hotmix bitumen seal.
Pavement Width:	Same as seal width.
Pavement Depth:	Details subject to geotechnical investigations report, traffic volumes and class.
Renewal Method	
Reseal:	<p>Single coat spray seal (spray seal 7 or 10mm) with an ongoing reseal plan of 2 coat/1 coat/2 coat. Two coat is 10/5 or 14/7mm aggregate size.</p> <p>Roads with high deformation and cracking have been identified as non-standard based on the condition assessment at inspection.</p>
Pavement:	Township roads, rework existing pavement, may need to import 150mm QG, moisture at OMC, compact and prime surface (AMCO) prior to placing bitumen. <u>Note:</u> Details subject to geotechnical investigations report, traffic volumes and class of vehicles.
Formation:	Details subject to geotechnical investigations report, traffic volumes and class of vehicles.
Seal Life:	20 to 25 years for the upper seal layer depending on usage and 60 to 75 years for the longer life seal layer.

Pavement Life:	60 to 80 years for the pavement depending on usage.
Maintenance Method	
Maintenance:	Preventative edge patching, pothole repairs, crack sealing and pavement repairs. Side drains cleaned and in good working order. Ensure that no surface water lays or ponds on the sealed surface.

Rural Sealed Roads - Service Level Standard

Figure 1 shows a typical construction cross section to illustrate standard for new construction. It is noted that this is not always achievable due to native vegetation clearance restrictions and undulating terrain.

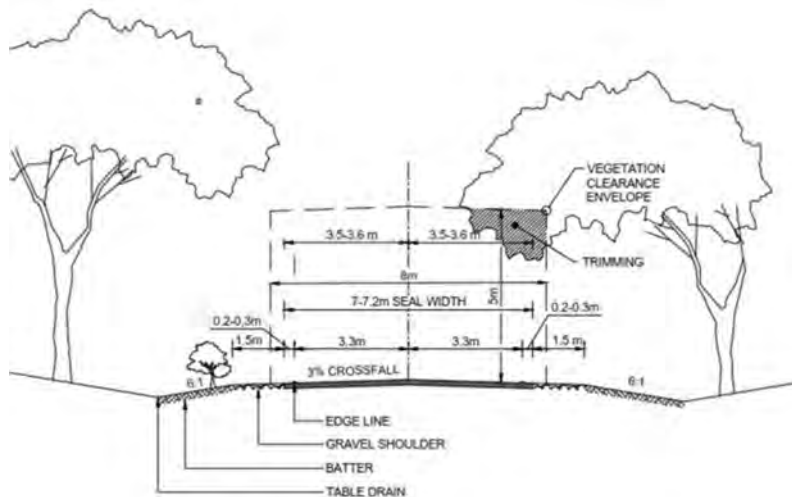


Figure 1 Rural Sealed Road Construction Cross Section

Construction Method	
Seal Width:	9.2m Refer to Figure 1
Seal Types:	14 / 7 mm Double Bitumen Seal
Pavement Width:	10.2m Refer to Figure 1
Pavement Depth:	Details subject to geotechnical investigations report, traffic volumes and class.
Renewal Method	
Reseal:	Single coat spray seal (spray seal 7 or 10mm) with an ongoing reseal plan of 2 coat/1 coat/2 coat. Two coat 10/5 or 14/7mm aggregate size. Roads with high deformation and cracking have been identified as non-standard based on the condition assessment at inspection.
Pavement:	Rework existing pavement if material is suitable, may need to import PM2/20 QG for sub base, base course 175mm PM1/20 QG, moisture at OMC, compact and prime surface (AMCO)

	prior to placing bitumen. <u>Note:</u> Details subject to geotechnical investigations report, traffic volumes and class of vehicles.
Formation:	Details subject to geotechnical investigations report, traffic volumes and class of vehicles.
Seal Life:	Varies on category
Maintenance Method	
Maintenance:	Road maintenance for seal roads is managed to maintain service levels within the network. Maintenance works are undertaken as per planned maintenance schedules and in reaction to justified public complaints and any defects identified by staff. Works consist of filling potholes, edge repairs, dig outs and crack sealing. A budget has been set based on historical spending and on the assumption the seal program will be funded to ensure roads do not deteriorate beyond a reasonable intervention level. Budgets will be set to maintain vegetation clearance envelope.

UNSEALED ROADS

Council owns and maintains an unsealed sheeted road network totalling approximately 541.2km in length, this made up of rural roads 530.1km and townships 11.1km. The unsealed road network has been segmented and digitised in the Council's GIS system. Unsealed Roads within the Adelaide Plains Council serve the community in a wide range of ways from farm gate access, single and multiple residential dwelling access to tourism and freight access and routes for transportation goods like grain, fruit, vegetables, stock and hay. They play a critical role in supporting the local economy and rural communities.

The development on the road categorises has been undertaken in an initial attempt to allow Council to apply different renewal and construction standards across the road network in an affordable way, rather than having one standard for all unsealed roads. Unsealed sheeted roads have been categorised as follows:

Sheeted Surface

The sheeted road network is classified according to its usage and are grouped as follows:

- Category 1
- Category 2
- Category 3-A
- Category 3-B
- Category 3-C
- Category 4-B

Surface Type	Length (m)
Township Sheeted	
Category 1	338
Category 3-A	6,712
Category 3-B	4,056
<i>Sub Total</i>	<i>11,106</i>
Rural Sheeted	
Category 1	105,497
Category 2	104,627
Category 3-A	59,197
Category 3-B	229,697

Category 3-C (Long Haul)	31,094
<i>Sub Total</i>	<i>530,112</i>
TOTAL Sheeted Surfaces	541,218

In addition to the above categories sheeted roads been further classified based on their distance from Councils quarry site located on Carslake Road. Roads were separated into two groups <15km and >=15km, the average distance from the first group was 9km and classified as Short Haul with the second group 19km and classified Long Haul. The haulage classification is reflected in the current replacement costs for sheeted surfaces, it does not have any impact on useful life. The useful life has been defined based on the response traffic loading for the defined road category. Table 2.1.6 provides a breakdown of the various categories in the network.

Table 2.1.6 Sheeted Surfaces Network

Surface Type	Length (m)	Surface Area (m2)	Approximate % of Sheeted Road Network (Area)
TOWNSHIP SHEETED			
Category 1 (Short Haul)	338	3,041	<1%
Category 3-A (Long Haul)	926	6,483	<1%
Category 3-A (Short Haul)	5,786	40,504	1%
Category 3-B (Long Haul)	2,377	14,261	<1%
Category 3-B (Short Haul)	1,679	10,075	<1%
<i>Sub Total</i>	<i>11,106</i>	<i>74,364</i>	<i>2%</i>
RURAL SHEETED			
Category 1 (Long Haul)	27,133	244,193	6%
Category 1 (Short Haul)	78,364	705,280	18%
Category 2 (Long Haul)	30,879	247,031	6%
Category 2 (Short Haul)	73,748	589,985	15%
Category 3-A (Long Haul)	28,389	198,726	5%
Category 3-A (Short Haul)	30,808	215,656	6%
Category 3-B (Long Haul)	78,607	471,640	12%
Category 3-B (Short Haul)	151,090	906,541	24%
Category 3-C (Long Haul)	11,308	67,847	2%
Category 3-C (Short Haul)	19,786	118,714	3%
<i>Sub Total</i>	<i>530,112</i>	<i>3,765,612</i>	<i>98%</i>
TOTAL Sheeted Surfaces	541,218	3,839,977	100%

Natural Formed Roads

Natural formed roads require no road base material to provide a surface. Hence there are no recurring capital works costs, there is however regular maintenance costs.

Township & Rural Sheeted Roads - Service Level Standards

Construction Method	
Sheeted Width:	Category 1: 9m Category 2: 8m Category 3-A: 7m Category 3-B: 6m Category 3-C: 6m Category 4-B: Form existing natural surface
Sheeted Depth:	Category 1: 150 PM2/40QG Category 2: 100mm PM2/40QG Category 3-A: 100mm PM2/40QG Category 3-B: 100mm PM2/40QG Category 3-C: 100mm PM2/40QG Category 4-A: NA
Formation Width:	Varies to suit road reserve width
Renewal Method	
Resheet:	Supply, place and compact quarry gravel to restore the sheeted wearing surface including minor reshaping of existing formation and reinstatement of cut-out drains.
Formation:	6% cross fall
Maintenance, Patrol Grading:	Category 1 Graded when required. Minimum of 3 grades per year. Category 2 Graded when required. Minimum of 3 grades per year. Category 3-A Graded when required. Minimum of 2 grades per year. Category 3-B Graded when required. Minimum of 2 grades per year. Category 3-C Graded when required. Minimum of 2 grades per year. Category 4-A 0 or 1 grade per year
Heavy Patching – As Required	Category 1 Category 2 Category 3-A Category 3-B Category 3-C as required
Potholing – As Required	
Regulatory and warning signs replaced – As Required	

KERB AND WATERTABLE

Adelaide Plains Council is responsible for maintaining the kerb, channel and spoon drains on Council roads as well as Department for Infrastructure and Transport roads, this contains approximately 64km of kerb and watertable assets contained within the townships.

Kerb and Watertable Type	Length (m)	Approximate % of Network (length)
Kerb and Watertable	25,917	41%
Mountable Kerb and Watertable	32,382	51%
Barrier/Plinth Kerb	742	1%
Median Kerb	1,016	2%
Spoon Drain	3,722	6%
TOTAL Kerb and Watertable	63,778	100%

BRIDGES

The condition data shown in Section 4.3 Asset Condition, Figure 6 Summary Bridges Condition Profile Condition 1-5 indicates the condition of the bridges. Council is currently undertaking a Level 2 Assessment of the bridges within the register.

Bridge – Location	Bridge No.	Replacement Value
Wasleys Bridge (State Heritage) Light River	BRG1	\$2,542,130
Old Port Wakefield Road Salt Creek	BRG2	\$451,023
Old Port Wakefield Road Gawler River	BRG3	\$1,153,184
Bakers Road Ford Gawler River	BRG4	\$789,290.30
TOTAL Bridges	4	\$4,935,627.30

3.0 FUTURE DEMAND

3.1 Demand Forecasts

The demand on Council that would result in change to the way the road assets are maintained, renewed or upgraded in the future is more generally related to ongoing growing expectations from the community to have some roads changed to a higher category.

Factors affecting demand include changes in demographics, customer preferences & expectations and economic factors, etc. Demand factor trends and impacts on service delivery are summarised in Table 3.1.1.

Table 3.1.1 Demand Factors, Projections and Impact on Services

Demand Driver	Present Position	Projection	Impact of Services
Sealing some higher use unsealed roads and town roads	105km length, category 1 roads	Develop priority approach to seal high use roads in accordance with the Legatus 2030 Regional Transport Plan for regionally significant roads which attracts 50% funding. Develop priority approach for any potential township seal upgrades where justified.	Potential increase in sealed network.
Consider the extent of all-weather rural roads	00km of rural formed graded roads that are not all weather.	Develop priority approach to provide all weather access roads.	Potential increase in the rural sheeted network.
Multiple all weather access roads to rural residential properties	Single all weather access to residential properties.	Increase in requests for providing alternative all weather access to some residential properties.	Potential increase in sheeted road network.

3.2 Demand Impact and Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Council will determine the ability of the existing assets to manage increased usage for new and housing developments as well as demand for wider agricultural vehicular movements. Developers may be required to provide additional infrastructure for the existing network and upgrade where necessary to ensure adequate transportation. Further opportunities will be developed in future revisions of this asset management plan. Opportunities identified to date for demand management are shown in Table 3.1.2.

Table 3.1.2 Demand Management Plan

Service Activity	Demand Management Plan
Change in services	Further analysis of providing the service at current and target service levels.
	Managing existing assets through planned maintenance, renewal and upgrade.
	Providing new assets to meet demand.
	Communicate service levels to the community measured against current funding capacity.
	Disposal of assets determined surplus to requirements.
	Council growth to meet existing and new legislative demands.
Rural and township sealed roads	Review higher use roads and town unsealed roads. Establish traffic counts and establish criteria for assessing the merit of sealing any more unsealed roads. Review Roads Matrix

4.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Council plans to manage and operate the assets at the agreed levels of service (Refer to Section 2) while managing life cycle costs.

4.1 Background Data

Adelaide Plains Council Transport assets are in both rural areas and townships within the Council and the assets covered by this asset management plan. The transport assets consumption is measured by condition at time of inspection. The condition at time of inspection is used to calculate the estimated condition at time of valuation for each asset.

The renewal of surface assets is determined through use of a modelling program called the Road Surface Manager (RSM). The renewal of surface assets is determined by age, condition rating, visual inspections, risks and ongoing maintenance. The treatment selected for a road surface is determined by the condition at inspection, the treatments include preventative resealing (sealed roads) and resheeting (unsealed sheeted roads), if roads fall into poor condition then rehabilitation is considered and then reconstruction, the cost of the treatments increases as it they include pavement (sealed roads) or lower base (unsealed sheeted roads) works.

4.2 Asset Capacity and Performance

Council's services are generally provided to meet design standards where these are available. Locations where deficiencies in service performance are known are detailed in Table 4.2.1

Table 4.2.1: Known Service Performance Deficiencies

Assets	Service Deficiency
All Weather Access	Farming community unable to access paddocks during period of wet weather.
Rural Freight Routes	Known rural freight routes which are unsealed roads and do not perform well under heavy freight traffic.
Rural Road Drainage	Insufficient or in effective cut out and cut off drainage in certain locations in the network.
Change in Services	Further analysis of providing the service at current and target service levels.
Rural and Town Sealed Roads	Review higher use roads and town unsealed roads. Establish traffic counts and establish criteria for assessing the merit of sealing any more unsealed roads. Review of Roads Matrix
Bridges	Level 2 assessments and ongoing inspections.

The above service deficiencies were identified and are being considered and prioritised. Refer to above Demand Management Plan.

4.3 Asset Condition

Condition is currently monitored via field collection of roads, bridges, footpaths, pram ramps, kerbs and watertables at the time of asset revaluation.

Condition is measured using a 1 – 5 grading system³ as detailed in Table 4.3.1. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system may be used at a more specific level, however, for reporting in the AM plan results are translated to a 1 – 5 grading scale for ease of communication. Illustration showing the overall asset condition Figure 7.

³ IPWEA, 2015, IIMM, Sec 2.5.4, p 2 | 80.

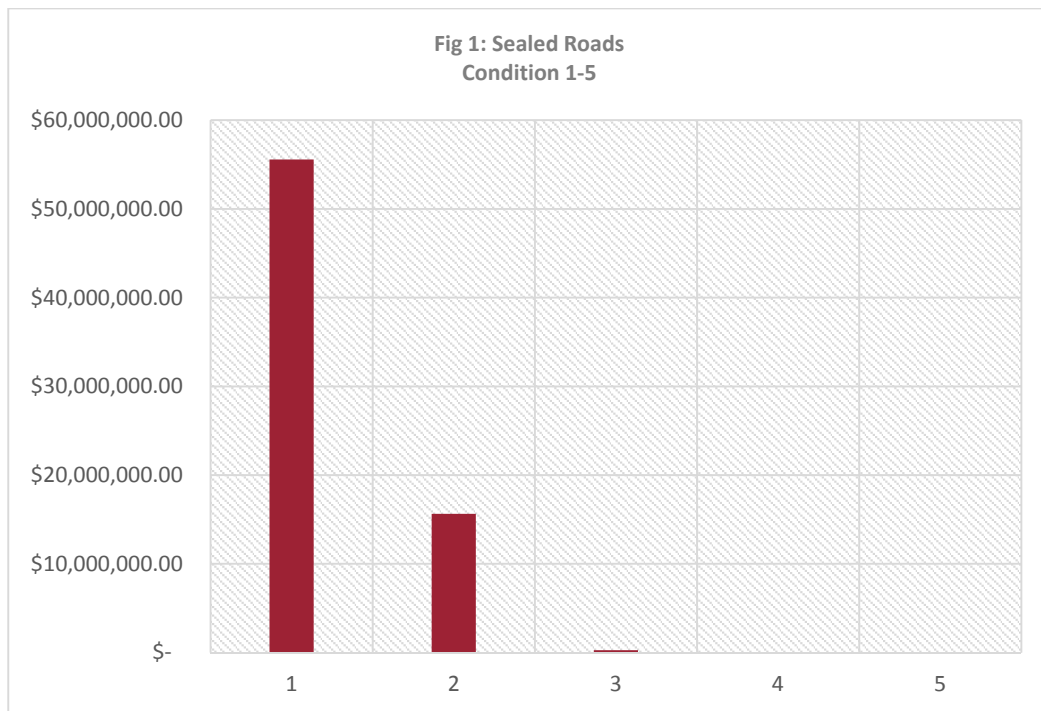


Figure 1 Summary of Sealed Roads Condition Profile 1-5

As shown in Figure 1, approximately 99% of the rural and township road seal and pavement assets have a condition less than 2 with the remaining 1% at condition 3.

The sealed road network is being generally funded maintained through preventative treatments however, in some cases additional funds are required for the rehabilitation of pavement related defects identified in the conditions assessment. The plan is aimed to prevent pavement reconstruction through appropriate sealed road surface management.

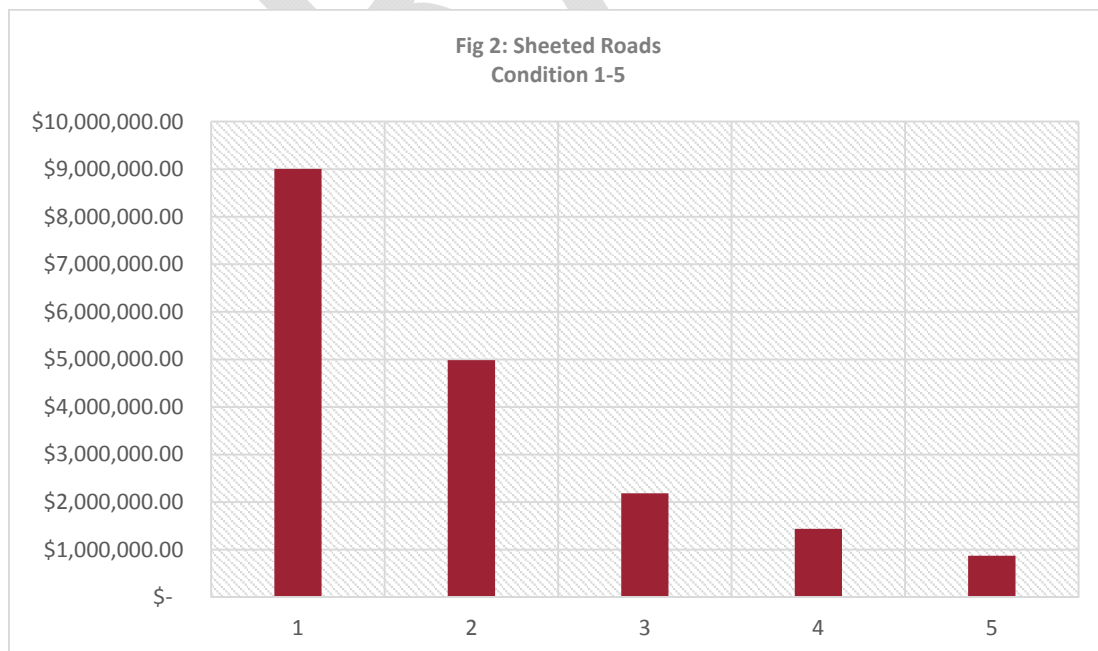


Figure 2 Summary Unsealed Sheeted Roads Condition Profile 1-5

As shown in Figure 2, approximately 75.6% of the rural and township road unsealed sheeted assets have a condition less than 2 with 11.8% at condition 3 the remaining 12.6% at condition 4 & 5.

Unsealed sheeted road network is being generally maintained through preventive treatments. The plan aims to prevent lower base reconstruction through appropriate sheeted road surface management.

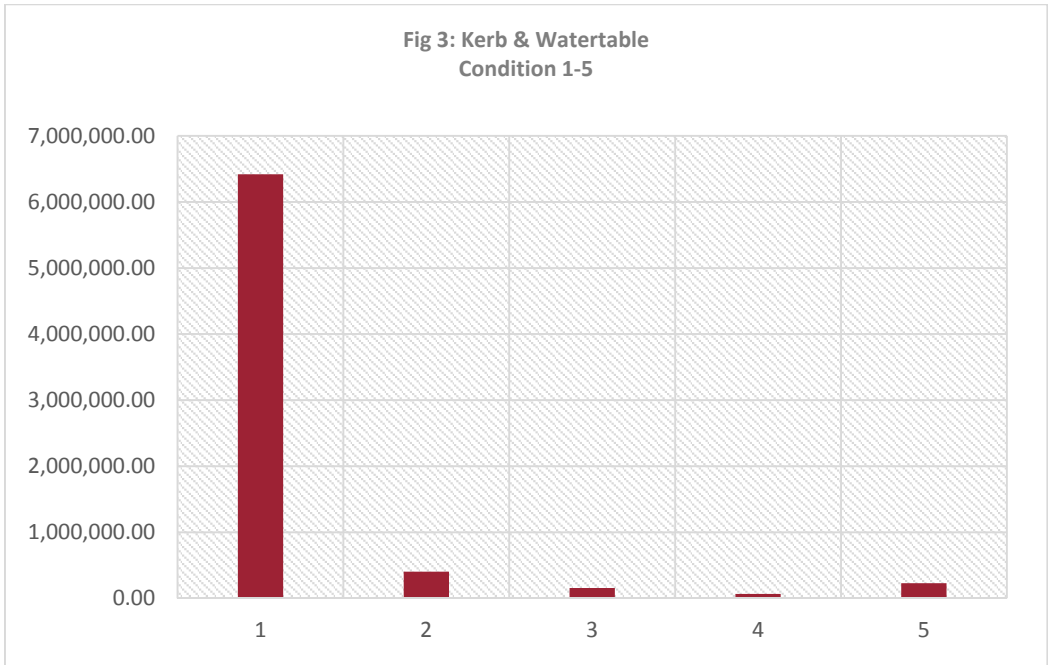


Figure 3 Summary Kerb and Watertable Condition Profile 1-5

As shown in Figure 3, approximately 93.7% of the kerb and watertable have a condition between 1 and 2, 2.1% at condition 3, remaining 4.2% at condition 4 & 5.

As part of the condition assessment lengths of kerb to be replaced through proactive treatments have also been included in the plan to correct issues affecting kerb performance and ensure kerb and watertable can reach their prescribed end of life and still maintain appropriate level of service.

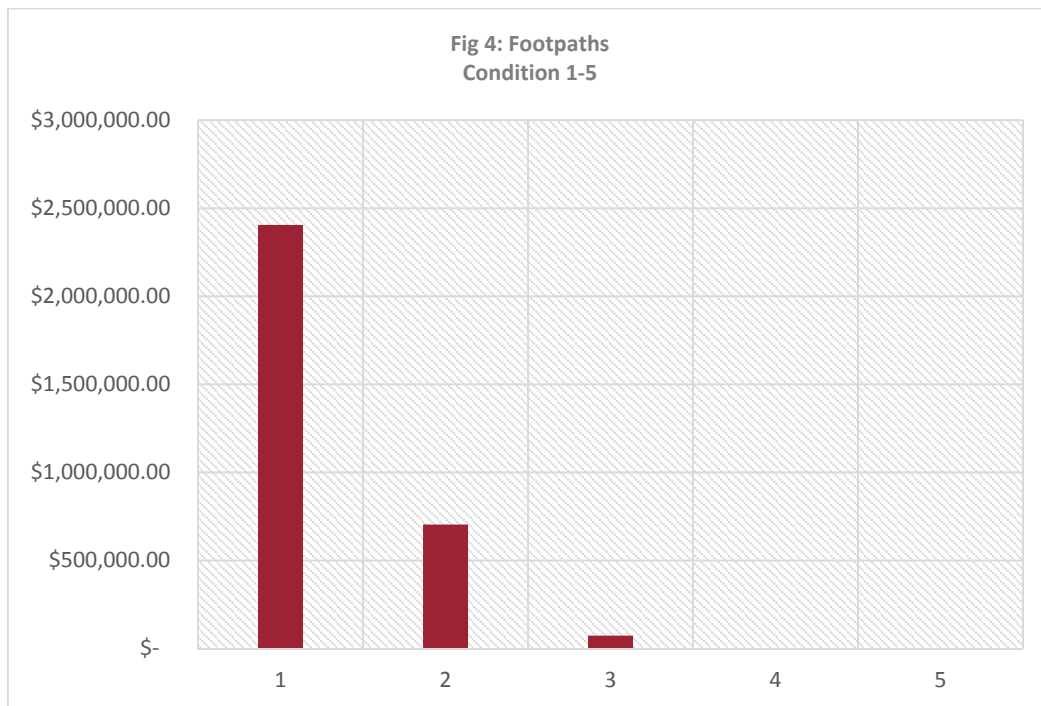


Figure 4 Summary Footpaths Profile Condition 1-5

As shown in Figure 4, approximately 97.7% of the footpath assets have a condition less than 2 with the remaining 2.3% at condition 3.

Review the full footpath network to develop a long term upgrade and renewal strategy to improve connectivity and identify high use footpaths for each town. The remaining asphalt and spray sealed footpaths will be replaced with concrete or block paving type footpath, this represents 3.3% value of the total footpath network.

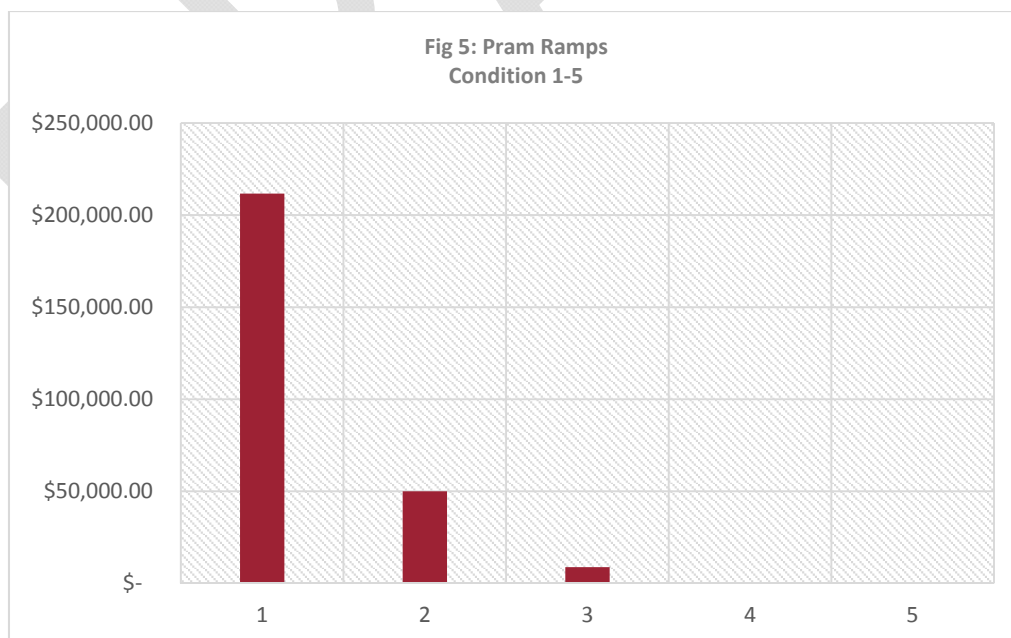


Figure 5 Summary Pram Ramps Profile Condition 1-5

As shown in Figure 5, approximately 96.9% of the pram ramp assets have a condition less than 2 with the remaining 3.1% at condition 3.

Review the pram ramp locations in conjunction with the footpath network, develop a long term upgrade and renewal strategy to improve connectivity and identify high use footpaths, pram ramps for each town.

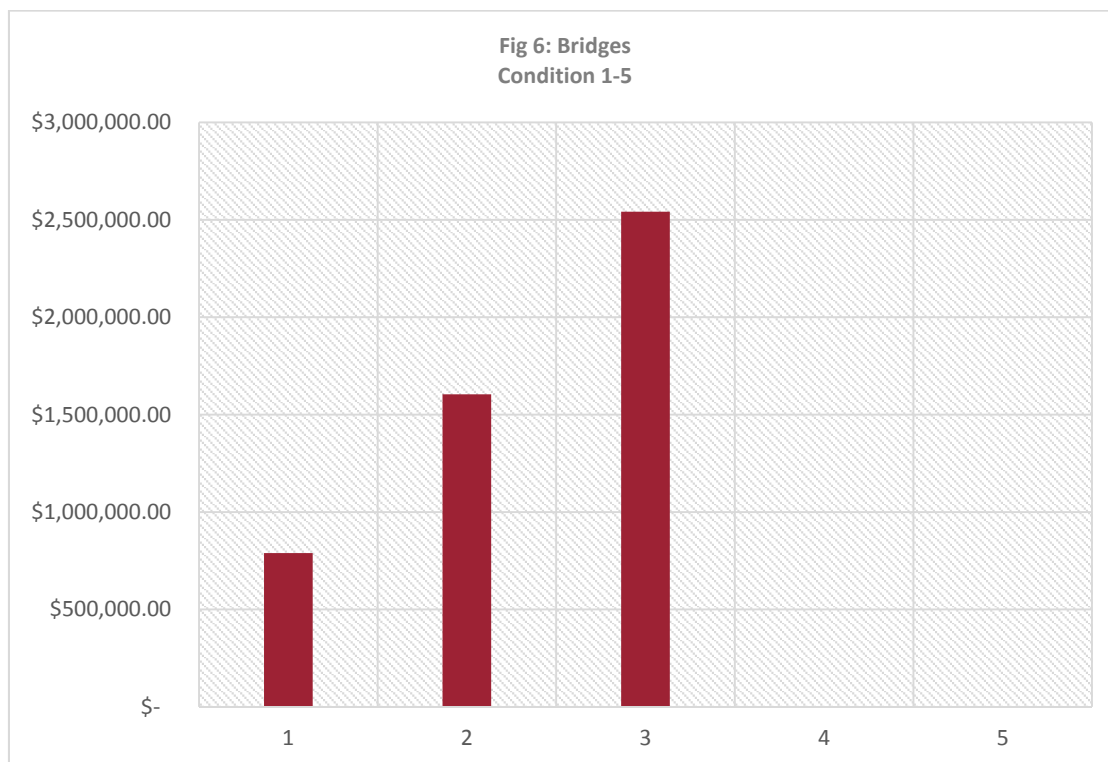


Figure 6 Summary Bridges Condition Profile Condition 1-5

The condition of bridges represents the consumption of asset life as a whole asset when last inspected. The condition data shown in Figure 6 indicates that approximately 48.5% of the bridges have a condition of 1 and 2, the remaining 51.5% at condition 3.

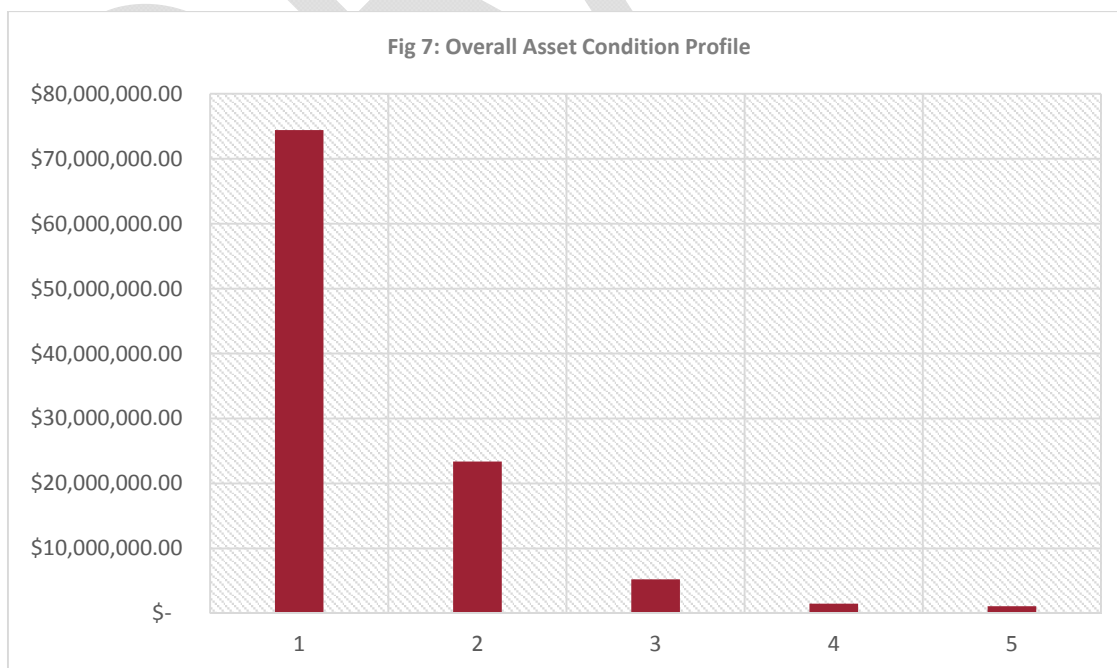


Figure 7 Overall Asset Condition Profile

Table 4.3.1: Condition Grading System

Condition Grading	Description of Condition
1	Very Good: free of defects, only planned and/or routine maintenance required
2	Good: minor defects, increasing maintenance required plus planned maintenance
3	Fair: defects requiring regular and/or significant maintenance to reinstate service
4	Poor: significant defects, higher order cost intervention likely
5	Very Poor: physically unsound and/or beyond rehabilitation, immediate action required

The overall condition score and subsequent consumption of the building assets has been estimated based on a combination of available data such as age and the standard useful life of the asset.

Table 4.3.2: Asset Standard Useful Lives

Roads Surface Type – Sealed	Standard Useful Life
Township Sealed Upper/Short Life/Single Layer	
Hotmix Bitumen Standard Use Single Layer (Standard Performance)	64 years
Hotmix Bitumen Land Division Single Layer (Standard Performance)	64 years
Hotmix Bitumen Land Division Single Layer 75mm (Standard Performance)	64 years
Hotmix Intersection Single Layer (Standard Performance)	25 years
Hotmix Bitumen On-Road Car Park Single Layer	25 years
Spray Seal High Use Upper (Standard Performance)	20 years
Spray Seal Standard Use Upper (Standard Performance)	25 years
Spray Seal Standard Use Upper (Non-Standard Performance)	25 years
Spray Seal Land Division Upper	25 years
Township Sealed Lower/Long Life Layer	
Spray Seal High Use Lower (Standard Performance)	40 years
Spray Seal Standard Use Lower (<300mm Pavement Standard Performance)	80 years
Spray Seal Standard Use Lower (>300mm Pavement Standard Performance)	64 years
Spray Seal Land Division Surface	64 years
Rural Sealed Upper/Short Life/Single Layer	
Hotmix Bitumen Standard Use Short Life (Standard Performance)	25 years
Hotmix Bitumen Intersection Single Layer (Standard Performance)	25 years
Spray Seal High Use Upper (pre 2004 Standard)	20 years

Performance)	
Spray Seal High Use Upper (post 2004 Standard Performance)	15 years
Spray Seal High Use Upper (post 2004 Non-Standard Performance)	15 years
Spray Seal Standard Use Upper (pre 2004 Standard Performance)	20 years
Spray Seal Standard Use Upper (post 2004 Standard Performance)	15 years
Spray Seal Standard Use Upper (post 2004 Non-Standard Performance)	15 years
Rural Sealed Lower/Long Life	
Hotmix Bitumen Standard Use Long Life (Standard Performance)	75 years
Spray Seal High Use Lower (pre 2004 Standard Performance)	40 years
Spray Seal High Use Lower (post 2004 Standard Performance)	30 years
Spray Seal Standard Use Lower (pre 2004 Standard Performance)	40 years
Spray Seal Standard Use Lower (post 2004 Standard Performance)	30 years

Roads Surface Type – Unsealed	Standard Useful Life
Township Sheeted Surface	
Township (Cat 1) Sheeted (Long Haul)	20 years
Township (Cat 1) Sheeted (Short Haul)	20 years
Township (Cat 2) Sheeted (Long Haul)	24 years
Township (Cat 2) Sheeted (Short Haul)	24 years
Township (Cat 3-A) Sheeted (Long Haul)	28 years
Township (Cat 3-A) Sheeted (Short Haul)	28 years
Township (Cat 3-B) Sheeted (Long Haul)	28 years
Township (Cat 3-B) Sheeted (Short Haul)	28 years
Rural Sheeted Surface	
Rural (Cat 1) Sheeted (Long Haul)	15 years
Rural (Cat 1) Sheeted (Short Haul)	15 years
Rural (Cat 2) Sheeted (Long Haul)	20 years
Rural (Cat 2) Sheeted (Short Haul)	20 years
Rural (Cat 3-A) Sheeted (Long Haul)	28 years
Rural (Cat 3-A) Sheeted (Short Haul)	28 years
Rural (Cat 3-B) Sheeted (Long Haul)	28 years
Rural (Cat 3-B) Sheeted (Short Haul)	28 years
Rural (Cat 3-C) Sheeted (Long Haul)	35 years
Rural (Cat 3-C) Sheeted (Short Haul)	35 years

Footpath Type	Standard Useful Life
Block Paved Footpath	50 years
Concrete Aggregate Footpath	50 years
Rubble Walkway/Shared Path	15 years
Pram Ramps	80 years

Kerb, Channel, Spoon Drains	Standard Useful Life
Spoon Drains	70 years
Kerb & Channel <300mm Pavement	160 years
Kerb & Channel >300mm Pavement	128 years

Sealed Roads

Township Spray Seal

Township spray sealed roads are identified as either standard use, high use or land division roads and performance (standard or non-standard). Township spray sealed surfaces have been separated into two components for upper and lower surface layers.

Township Hotmix Bitumen

Township hotmix bitumen surfaces are identified as standard use, intersection, land division or on-road carpark surfaces and performance (standard or non-standard).

Rural Spray Seal

Rural spray seal road surfaces have been identified as standard or high use, pre 2004 or post 2004 and performance (standard or non-standard). Rural spray seal surfaces have been separated into two components for upper and lower surface layers.

Rural Hotmix Bitumen

Rural hotmix bitumen intersection surface has been valued as a single component.

Unsealed Roads

Supply, haulage of material from pit (short haul 9km & long haul 15km) and placement of new sheeting material (150mm depth for Category 1 Roads, 100mm depth for Category 2 and 3 Roads).

4.4 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection, and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs and cleaning.

The trend in operations and maintenance budgets are shown in Tables 4.4.1 and 4.4.2

Table 4.4.1: Maintenance Budget Trends

Year	Maintenance Budget \$
2019 - 2020	\$1,023,000 (Actual)
2020 - 2021	\$1,050,000 (Budget)
2021 - 2022	\$1,050,00 (Budget)

Table 4.4.2: Operations Budget Trends

Year	Operations Budget \$
2019 - 2020	\$000 (Actual)
2020 - 2021	\$000 (Budget)
2021 - 2022	\$000 (Budget)

Maintenance budget levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

4.5 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 4.5.1. Asset useful lives were last reviewed on 30 June 2020.

Table 4.5.1: Useful Lives of Assets

Roads Surface Type – Sealed	Standard Useful Life
Township Sealed Upper/Short Life/Single Layer	
Hotmix Bitumen Standard Use Single Layer (Standard Performance)	64 years
Hotmix Bitumen Land Division Single Layer (Standard Performance)	64 years
Hotmix Bitumen Land Division Single Layer 75mm (Standard Performance)	64 years
Hotmix Intersection Single Layer (Standard Performance)	25 years
Hotmix Bitumen On-Road Car Park Single Layer	25 years
Spray Seal High Use Upper (Standard Performance)	20 years
Spray Seal Standard Use Upper (Standard Performance)	25 years

Spray Seal Standard Use Upper (Non-Standard Performance)	25 years
Spray Seal Land Division Upper	25 years
Township Sealed Lower/Long Life Layer	
Spray Seal High Use Lower (Standard Performance)	40 years
Spray Seal Standard Use Lower (<300mm Pavement Standard Performance)	80 years
Spray Seal Standard Use Lower (>300mm Pavement Standard Performance)	64 years
Spray Seal Land Division Surface	64 years
Rural Sealed Upper/Short Life/Single Layer	
Hotmix Bitumen Standard Use Short Life (Standard Performance)	25 years
Hotmix Bitumen Intersection Single Layer (Standard Performance)	25 years
Spray Seal High Use Upper (pre 2004 Standard Performance)	20 years
Spray Seal High Use Upper (post 2004 Standard Performance)	15 years
Spray Seal High Use Upper (post 2004 Non-Standard Performance)	15 years
Spray Seal Standard Use Upper (pre 2004 Standard Performance)	20 years
Spray Seal Standard Use Upper (post 2004 Standard Performance)	15 years
Spray Seal Standard Use Upper (post 2004 Non-Standard Performance)	15 years
Rural Sealed Lower/Long Life	
Hotmix Bitumen Standard Use Long Life (Standard Performance)	75 years
Spray Seal High Use Lower (pre 2004 Standard Performance)	40 years
Spray Seal High Use Lower (post 2004 Standard Performance)	30 years
Spray Seal Standard Use Lower (pre 2004 Standard Performance)	40 years
Spray Seal Standard Use Lower (post 2004 Standard Performance)	30 years

Roads Surface Type – Unsealed	Standard Useful Life
Township Sheeted Surface	
Township (Cat 1) Sheeted (Long Haul)	20 years
Township (Cat 1) Sheeted (Short Haul)	20 years
Township (Cat 2) Sheeted (Long Haul)	24 years
Township (Cat 2) Sheeted (Short Haul)	24 years
Township (Cat 3-A) Sheeted (Long Haul)	28 years

Township (Cat 3-A) Sheeted (Short Haul)	28 years
Township (Cat 3-B) Sheeted (Long Haul)	28 years
Township (Cat 3-B) Sheeted (Short Haul)	28 years
Rural Sheeted Surface	
Rural (Cat 1) Sheeted (Long Haul)	15 years
Rural (Cat 1) Sheeted (Short Haul)	15 years
Rural (Cat 2) Sheeted (Long Haul)	20 years
Rural (Cat 2) Sheeted (Short Haul)	20 years
Rural (Cat 3-A) Sheeted (Long Haul)	28 years
Rural (Cat 3-A) Sheeted (Short Haul)	28 years
Rural (Cat 3-B) Sheeted (Long Haul)	28 years
Rural (Cat 3-B) Sheeted (Short Haul)	28 years
Rural (Cat 3-C) Sheeted (Long Haul)	35 years
Rural (Cat 3-C) Sheeted (Short Haul)	35 years

Footpath Type	Standard Useful Life
Block Paved Footpath	50 years
Concrete Aggregate Footpath	50 years
Rubble Walkway/Shared Path	15 years
Pram Ramps	80 years

Kerb, Channel, Spoon Drains	Standard Useful Life
Spoon Drains	70 years
Kerb & Channel <300mm Pavement	160 years
Kerb & Channel >300mm Pavement	128 years

The estimates for renewals in this AM Plan were based on Method 2.

4.4.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground).⁴

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.⁵

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 4.5.2

Table 4.5.2: Renewal Priority Ranking Criteria

⁴ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

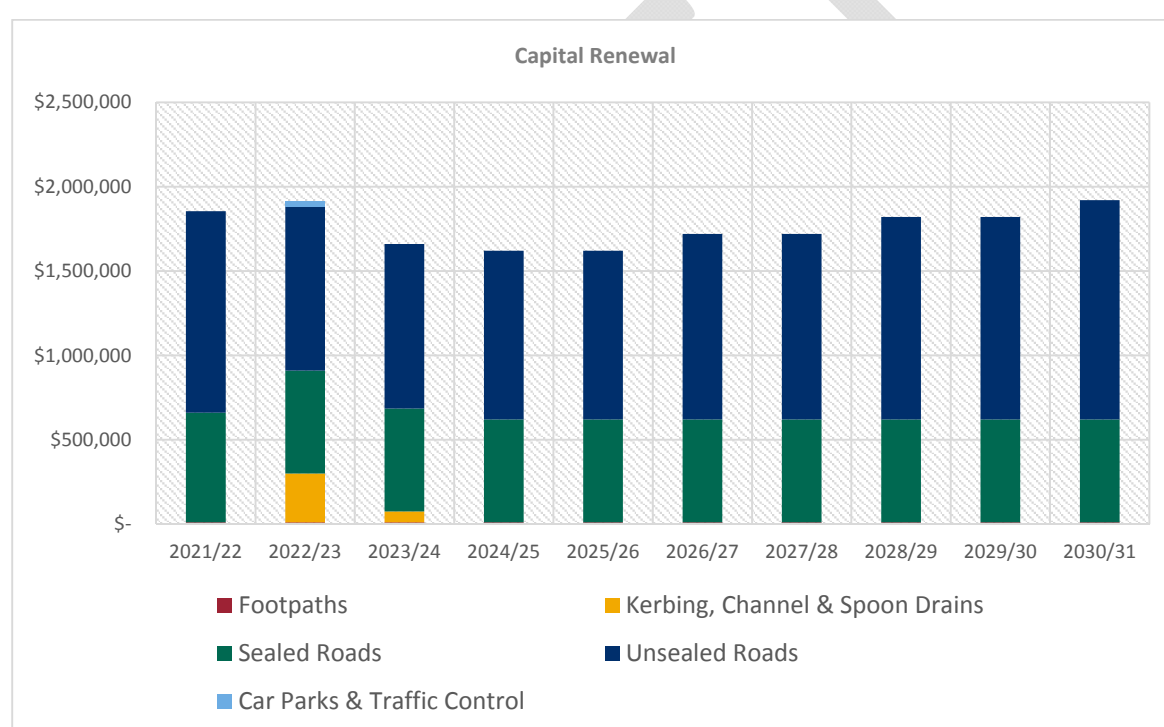
⁵ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Criteria	Weighting
Asset Condition Rating 4 or 5	20
Risks – Residual risk high or extreme	20
Safety and Compliance	60
Total	100%

4.5 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 4.5.1. A detailed summary of the forecast renewal costs is shown in Appendix D.

Figure 4.5.1 Forecast Renewal Costs



All figure values are shown in current day dollars.

4.6 Acquisition Plan

Acquisition reflects are new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated, gifted to Council.

4.6.1 Selection criteria

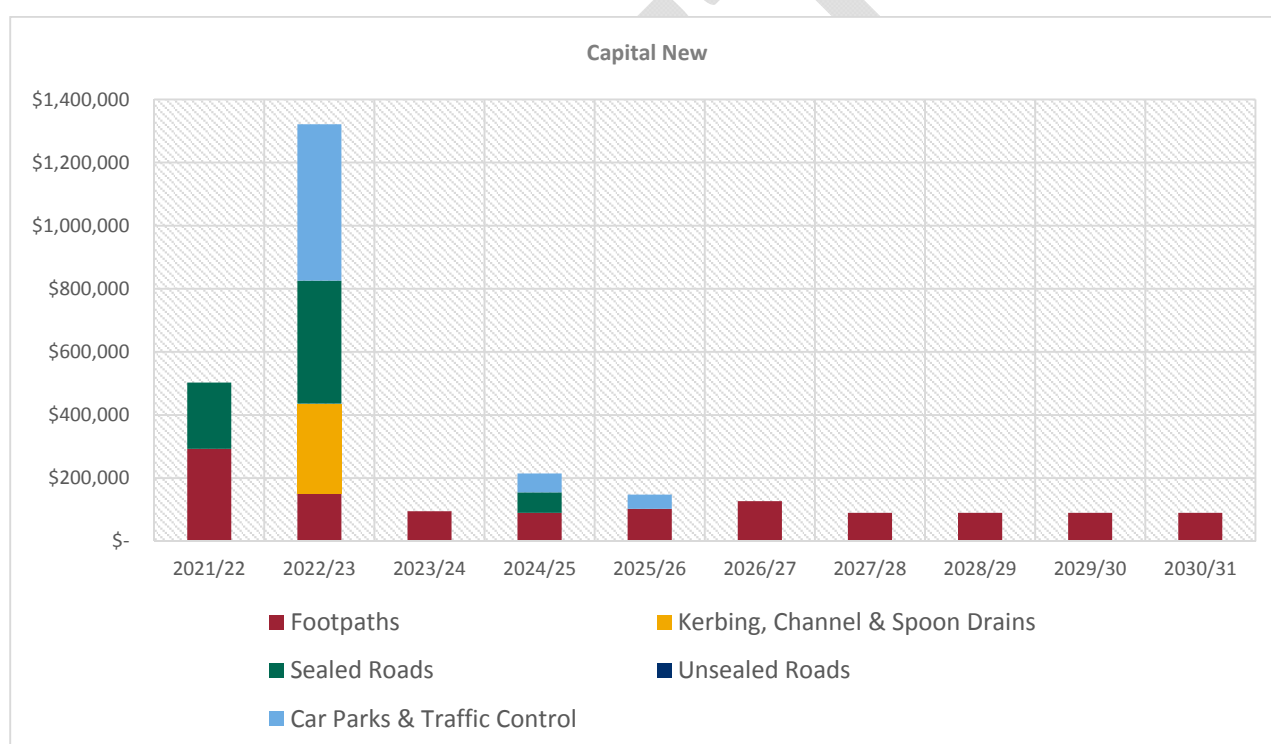
Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Entities needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed in Table 4.6.1.1

Table 4.6.1.1: Acquired Assets Priority Ranking Criteria

Criteria	Weighting
Safety and Compliance	20
Risks – Residual risk high or extreme	20
Demand	60
Total	100%

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised / summarized in Figure 4.6.1.2 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

Figure 4.6.1.2: Acquisition New (Constructed) Summary

All figure values are shown in current day dollars.

4.7 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 4.7.1. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 4.7.1. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

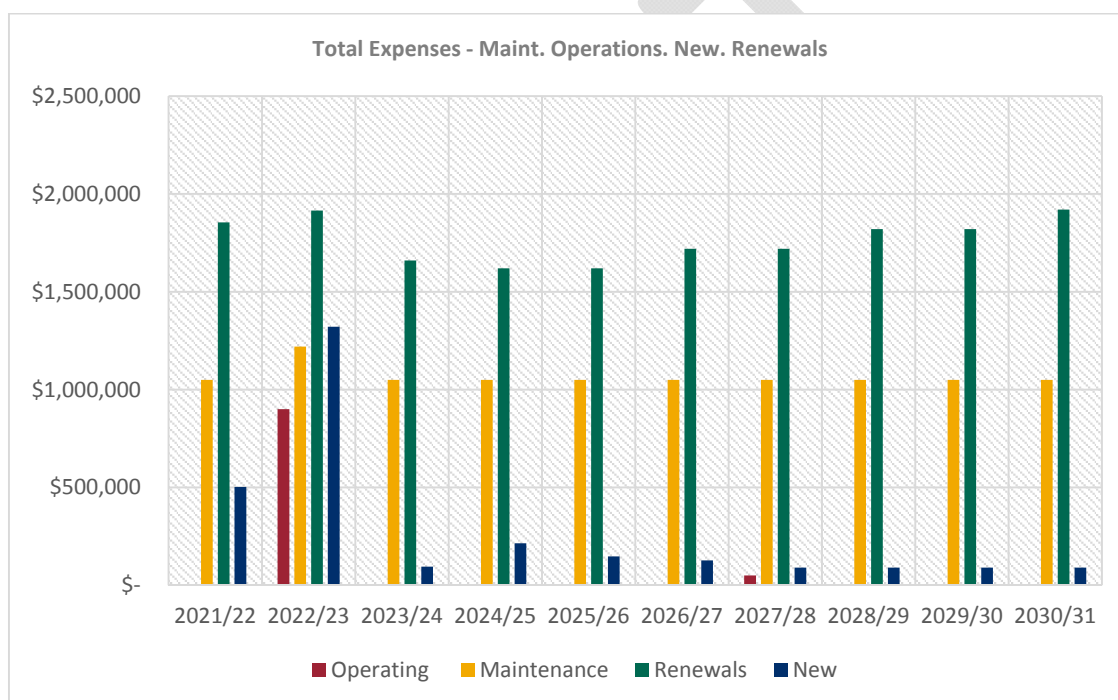
Table 4.7.1: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
None Known	NA	NA	NA	NA
None Known	NA	NA	NA	NA

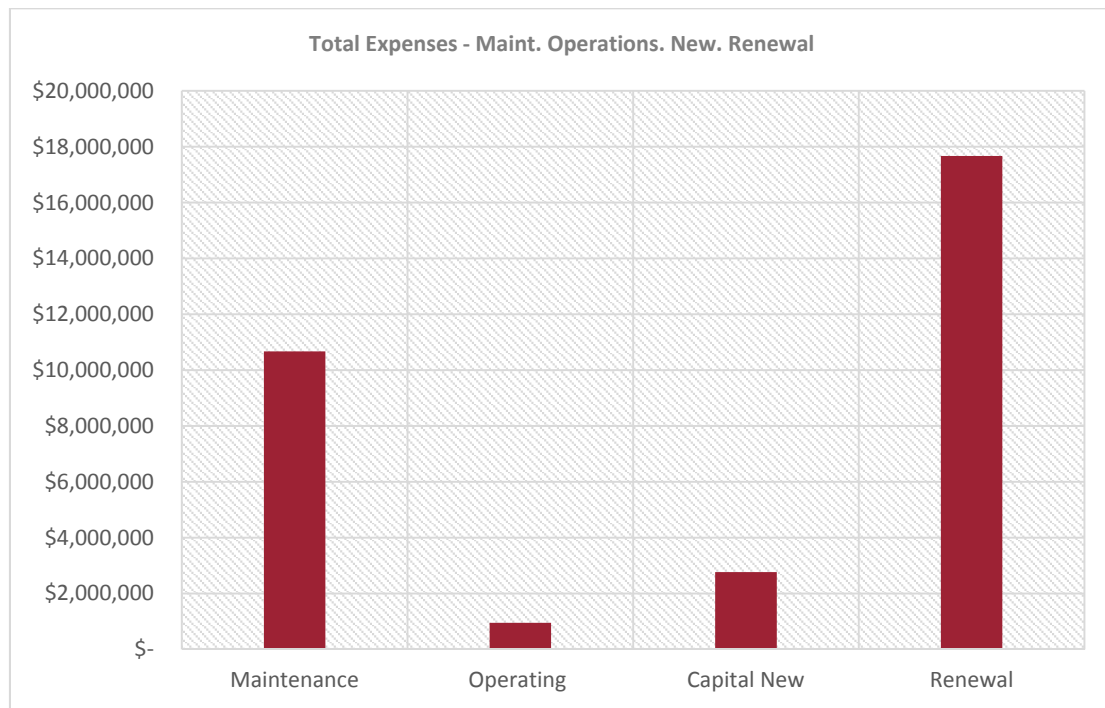
4.8

Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 4.8.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

Figure 4.8.1: Lifecycle Summary

All figure values are shown in current day dollars.



All figure values are shown in current day dollars.

5.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’⁶.

An assessment of risks⁷ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

5.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 5.1.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 5.1.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Bridges	Deterioration/Degradation, Load Carrying Capacity Exceeded by Vehicles	Causing High Consequence - Bridge damage, collapse & closure.
Sealed & Sheeted Roads	Stormwater Flooding	Damage to road surface, traffic not being able to use.

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

5.2 Risk Assessment

The risk management process used is shown in Figure 5.2.1 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

⁶ ISO 31000:2009, p 2

⁷ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

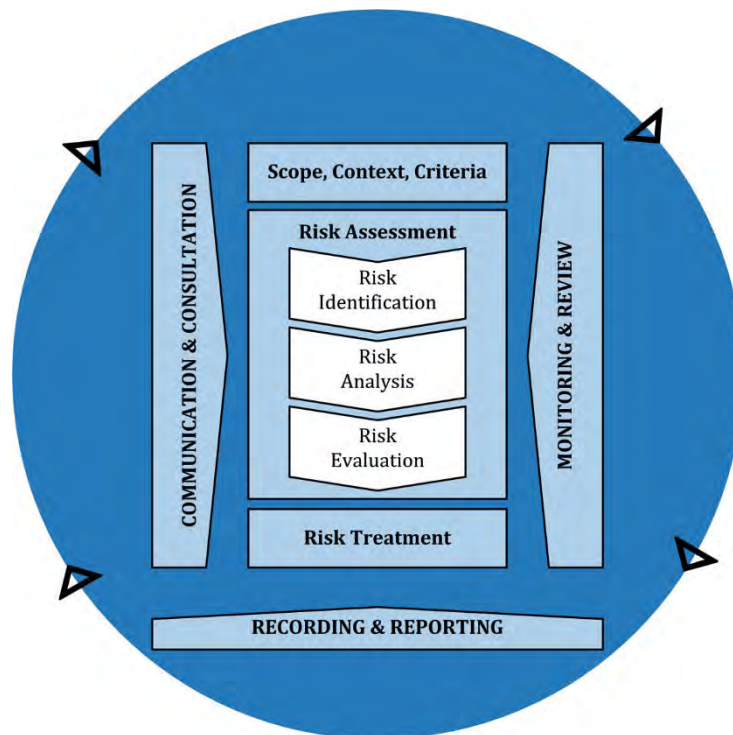


Fig 5.2.1 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks⁸ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 5.2.2. It is essential that these critical risks and costs are reported to the Executive Management Team.

⁸ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

Table 5.2.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Sealed & Sheeted Roads	Flooding Damage	High	Early identification of damage, lodge claim to disaster fund, seek state and/or federal funds for improvements	Medium	Recurrent budget requirements for maintenance
Bridges	Bridge Collapse	Very High	Undertake Level 2 Assessments & conduct regular inspections. Carry out identified repairs and maintenance with urgency, report findings immediately to supervisor	High	Unknown costs, require financial year budget for approved works
Footpaths and Pram Ramps	Pedestrian Falls and Trips	High	Upgrade footpaths and provide for pram ramps at strategic sites	Medium	Unknown costs, require financial year budget for approved works
Footpaths	Pedestrian Trips and Falls	High	Upgrade existing hotmix and sealed footpaths with block paving or concrete type. Undertake regular inspections	Low	Unknown costs, require financial year budget for approved works

Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented.

5.3 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale⁹ in accordance with Table 5.3.1.

Table 5.3.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$

⁹ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

Confidence Grade	Description
B. High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C. Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D. Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E. Very Low	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 5.3.2.

Table 5.3.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Very High	Council trends available, Refer to Council Strategic Plan 2020-2024
Growth projections	Very High	Council trends available, refer to Council Strategic Plan 2020-2024
Acquisition forecast	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
Operation forecast	High	Extrapolated from previous years
Maintenance forecast	High	Extrapolated from previous years
Renewal forecast - Asset values	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
- Asset useful lives	Very High	Reviewed in accordance via revaluation schedule
- Condition modelling	Very High	Reviewed in accordance via revaluation schedule and condition ratings
Disposal forecast	N/A	N/A

The estimated confidence level for and reliability of data used in this AM Plan is considered to be Very High.

6.0 PLAN IMPROVEMENT AND MONITORING

6.1 Status of Asset Management Practices¹⁰

6.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is Authority.

6.1.2 Asset management data sources

This AM Plan also utilises asset management data. The source of the data is Conquest.

6.2 Improvement Plan

It is important that council recognise areas of their AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AM Plan is shown in Table 6.2.1.

Table 6.2.1: Improvement Plan

Task	Tasks	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Review service levels	Council Administration	As required
3	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
4	Level 2 Bridge Assessment	Council Administration	2020/21FY 2021/22FY
5	Develop footpath/pram ramps strategic plan	Council Administration	2021/22FY 2022/23FY
6	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

6.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of 4 years and is due for complete revision and updating within 2 years of each council election.

6.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan,

¹⁰ ISO 55000 Refers to this as the Asset Management System

- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 110%).

DRAFT

7.0 REFERENCES

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- ISO, 2014, ISO 55000:2014, Overview, principles and terminology
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- Adelaide Plains Council Strategic Plan 2020 - 2024
- Adelaide Plains Council Annual Plan and Budget
- Adelaide Plains Council Roads Priority Matrix
- Adelaide Plains Council Asset Valuation & Methodology Report
- Adelaide Plains Council Layout Drawings – D0 to D21

8.0 APPENDICES

Appendix A Acquisition Forecast (New)

FOOTPATHS

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Footpath Capital New											
Joseph Street - Chivell Street to Elizabeth Street (101m)	22,350	0	0	0	0	0	0	0	0	0	22,350
Butler Street - Irish Street to End of Seal	88,500	0	0	0	0	0	0	0	0	0	88,500
Elizabeth Street (Mallala) - Joseph St to Mary St	41,200	0	0	0	0	0	0	0	0	0	41,200
Mary Street - Chivell St to Elizabeth St	24,000	0	0	0	0	0	0	0	0	0	24,000
Second Street (Dublin) - Sixth St to Seventh St	28,200	0	0	0	0	0	0	0	0	0	28,200
Donaldson Street - Elizabeth St to Wilson Rd	58,000	0	0	0	0	0	0	0	0	0	58,000
Elizabeth Street - William St to Donaldson Rd	30,600	0	0	0	0	0	0	0	0	0	30,600
Cameron Terrace - Dublin Rd to Feltwell Rd	0	37,000	0	0	0	0	0	0	0	0	37,000

Railway Avenue - Balaklave Rd to Lindsay St	0	17,000	0	0	0	0	0	0	0	0	17,000
South Terrace (Dublin) - Old Port Wakefield Rd to Seventh St	0	40,000	0	0	0	0	0	0	0	0	40,000
Carmel St - Balaklave Rd to End of Seal	0	25,000	0	0	0	0	0	0	0	0	25,000
Calagora St - Lisieux Street to Carmel St	0	32,000	0	0	0	0	0	0	0	0	32,000
Jenkin Crt - Butler Rd to End	0	0	25,000	0	0	0	0	0	0	0	25,000
Irish Street - Butler Stret to Redbanks Rd	0	0	23,000	0	0	0	0	0	0	0	23,000
Calala Crt - Old Port Wakefield Rd to End	0	0	47,000	0	0	0	0	0	0	0	47,000
Seventh Street - Third Street to Second Street (156m)	0	0	0	0	13,000	0	0	0	0	0	13,000
Seventh Street - Fourth Street to Third Street (142m)	0	0	0	0	0	12,000	0	0	0	0	12,000
Seventh Street - Fifth Street to Fourth Street (145m)	0	0	0	0	0	12,000	0	0	0	0	12,000
Third Street (Dublin) - Sixth Street to Seventh Street (151m)	0	0	0	0	0	13,000	0	0	0	0	13,000
Future Program Allocation	0	0	0	90,000	90,000	90,000	90,000	90,000	90,000	90,000	630,000
	292,850	151,000	95,000	90,000	103,000	127,000	90,000	90,000	90,000	90,000	1,218,850
TOTAL FOOTPATH NEW	292,850	151,000	95,000	90,000	103,000	127,000	90,000	90,000	90,000	90,000	1,218,850

KERBING, CHANNEL & WATERTABLES

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Kerbing Capital New											
South Terrace (Dublin) - Old Port Wakefield Road to Sixth Street (468m)	0	165,000	0	0	0	0	0	0	0	0	165,000
South Terrace (Dublin) - Sixth Street to Seventh Street (332m)	0	120,000	0	0	0	0	0	0	0	0	120,000
	0	285,000	0	0	0	0	0	0	0	0	285,000
TOTAL KERBING NEW	0	285,000	0	0	0	0	0	0	0	0	285,000

SEALED ROADS PROGRAM

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Intersection Upgrade - Hill Street (Dublin Road and Balaklava Road)	100,000	0	0	0	0	0	0	0	0	0	100,000
Intersection Upgrade - Dawkins Road and Williams Road	0	100,000	0	0	0	0	0	0	0	0	100,000
Hickinbotham Subdivision Infrastructure - Cycle/Walking Path	0	125,000	0	0	0	0	0	0	0	0	125,000
Redbanks Road - Mallala - Two Wells Road to Irish Street	0	165,000	0	0	0	0	0	0	0	0	165,000
Germantown Road - Gawler Road to Temby Road	110,000	0	0	0	0	0	0	0	0	0	110,000

Balaklava Rd - Mallala - Lisieux St, Town Centre - Shoulder Hotmix	0	0	0	65,000	0	0	0	0	0	0	65,000
List of New Roads for Construction and Sealing - From updated Road Matrix	0	0	0	0	0	0	0	0	0	0	0
	210,000	390,000	0	65,000	0	0	0	0	0	0	665,000
TOTAL SEAL NEW	210,000	390,000	0	65,000	0	0	0	0	0	0	665,000

UNSEALED ROADS PROGRAM

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0
TOTAL UNSEALED NEW	0	0	0	0	0	0	0	0	0	0	0

CAR PARKS & TRAFFIC CONTROL

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Two Wells Mainstreet - Pedestrian Refuges/Crossing	0	195,000	0	0	0	0	0	0	0	0	195,000
Two Wells Mainstreet - Eastern End Car Parking and WSUD	0	300,000	0	0	0	0	0	0	0	0	300,000

Ruskin Road, Thompson Beach Car Parking	0	0	0	60,000	0	0	0	0	0	0	60,000
Coastal Carpark Formalise, Adelaide International Bird Sanctuary (AIBS)	0	0	0	0	45,000	0	0	0	0	0	45,000
	0	495,000	0	60,000	45,000	0	0	0	0	0	600,000
TOTAL CAR PARKS & TRAFFIC CONTROL NEW	0	495,000	0	60,000	45,000	0	0	0	0	0	600,000

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Appendix B Operation Forecast

CAR PARKS & TRAFFIC CONTROL

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Car Parks & Traffic Control Operating											
Two Wells, Mainstreet - Underground Powerlines (Seek PLEC Funding, 66% of Total Cost Contribution)	0	900,000	0	0	0	0	0	0	0	0	900,000
	0	900,000	0	0	0	0	0	0	0	0	900,000
TOTAL CAR PARKS & TRAFFIC CONTROL OPERATING	0	900,000	0	0	0	0	0	0	0	0	900,000

BRIDGES

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Bridges Operating											
Level 2 Assessments	0	0	0	0	0	0	50,000	0	0	0	50,000
	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	50,000	0	0	0	50,000
TOTAL BRIDGES OPERATING	0	0	0	0	0	0	50,000	0	0	0	50,000

Appendix C Maintenance Forecast

All Transport Asset Categories, Excluding Bridges – Bridges See Below and Operations Section

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Total Maintenance - Transport											
Maintenance - Unsealed & Sealed Rds, Footpaths, Kerb & Channel, Spoon Drains, Car Parks, Traffic Control	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	10,500,000
	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	10,500,000
TOTAL MAINTENANCE	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	1,050,000	10,500,000

BRIDGES

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Bridges Maintenance											
Repairs/Maintenance Assessment Report Includes Salt Creek Culvert – Report April 2012, Mace Engineering Services	0	170,000	0	0	0	0	0	0	0	0	170,000
	0	0	0	0	0	0	0	0	0	0	0
	0	170,000	0	0	0	0	0	0	0	0	170,000
TOTAL BRIDGES MAINTENANCE	0	170,000	0	0	0	0	0	0	0	0	170,000

Appendix D Renewal Forecast Summary

FOOTPATHS

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Pram Ramp Renewal, Meet DDA Compliant Requirements	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000
	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000
TOTAL FOOTPATH RENEWAL	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	100,000

KERBING, CHANNEL & WATERTABLES

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Southern Side - Kerb and Watertable - Redbanks Road (005) from Mallala - Two Wells Road to Irish Street	0	115,000	0	0	0	0	0	0	0	0	115,000
Northern Side - Kerb and Watertable - Balaklava Road (010) from Lisieux Street to Carmel Street	0	75,000	0	0	0	0	0	0	0	0	75,000
Northern Side - Kerb and Watertable - Balaklava Road (015) from Carmel Street to Aerodrome Road	0	100,000	0	0	0	0	0	0	0	0	100,000
Kerb and Watertable - Windmill Road (005) from Gawler Road to End	0	0	65,000	0	0	0	0	0	0	0	65,000
	0	290,000	65,000	0	0	0	0	0	0	0	355,000
TOTAL KERBING, CHANNEL & DRAINS RENEWAL	0	290,000	65,000	0	0	0	0	0	0	0	355,000

SEALED ROADS PROGRAM

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Dawkins Road (Judd Road to Boundary Road) and Hayman Road (Williams to Boundary)	650,000	0	0	0	0	0	0	0	0	0	650,000
Future program	0	610,000	610,000	610,000	610,000	610,000	610,000	610,000	610,000	610,000	5,490,000
	650,000	610,000	610,000	610,000	610,000	610,000	610,000	610,000	610,000	610,000	6,140,000
TOTAL SEALED ROADS RENEWAL	650,000	610,000	610,000	610,000	610,000	610,000	610,000	610,000	610,000	610,000	6,140,000

UNSEALED ROADS PROGRAM

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Reheeting 2021-2022	1,195,000	0	0	0	0	0	0	0	0	0	1,195,000
Future Resheeting Program	0	975,000	975,000	1,000,000	1,000,000	1,100,000	1,100,000	1,200,000	1,200,000	1,300,000	9,850,000
	1,195,000	975,000	975,000	1,000,000	1,000,000	1,100,000	1,100,000	1,200,000	1,200,000	1,300,000	11,045,000
TOTAL UNSEALED ROADS RENEWAL	1,195,000	975,000	975,000	1,000,000	1,000,000	1,100,000	1,100,000	1,200,000	1,200,000	1,300,000	11,045,000

CAR PARKS & TRAFFIC CONTROL

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Longview Road	0	30,000	0	0	0	0	0	0	0	0	30,000
	0	30,000	0	0	0	0	0	0	0	0	30,000
TOTAL CAR PARKS & TRAFFIC CONTROL	0	30,000	0	0	0	0	0	0	0	0	30,000

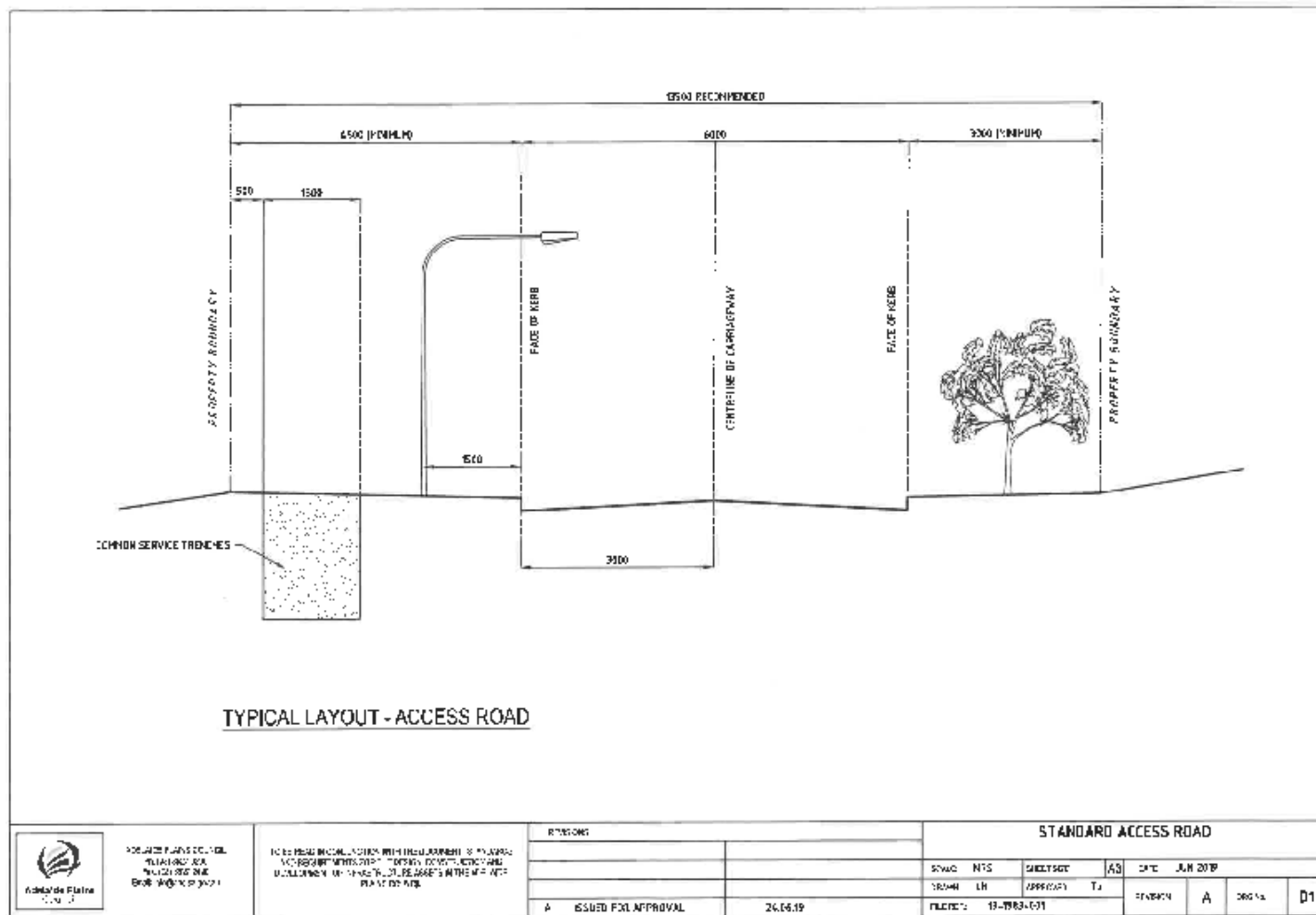
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Appendix E DRG D0 to D21

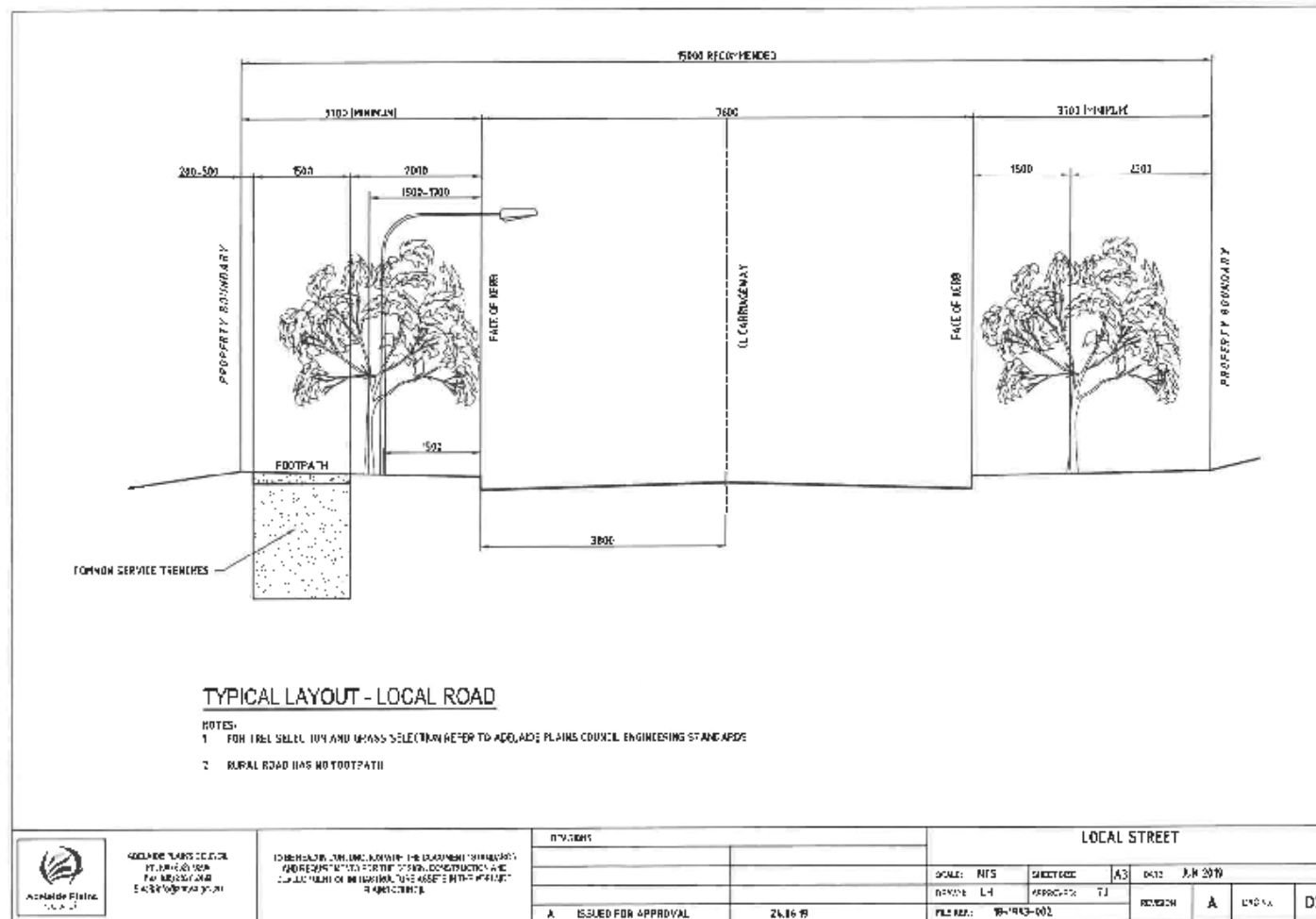
D0 – Rural Road Construction, Bitumen Sealing

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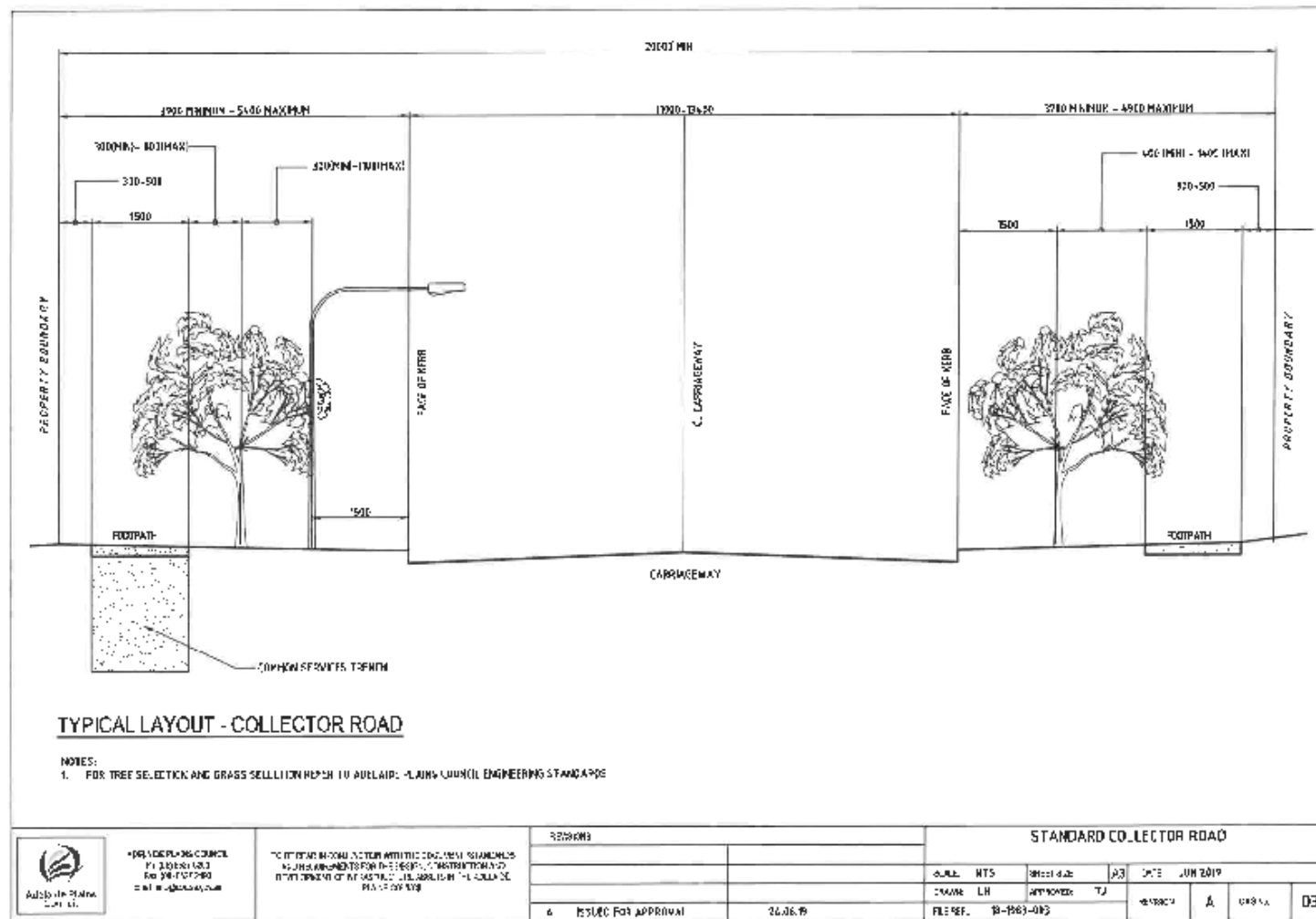
D1 – Residential Access Sealed Road, Carriageway Width 6m



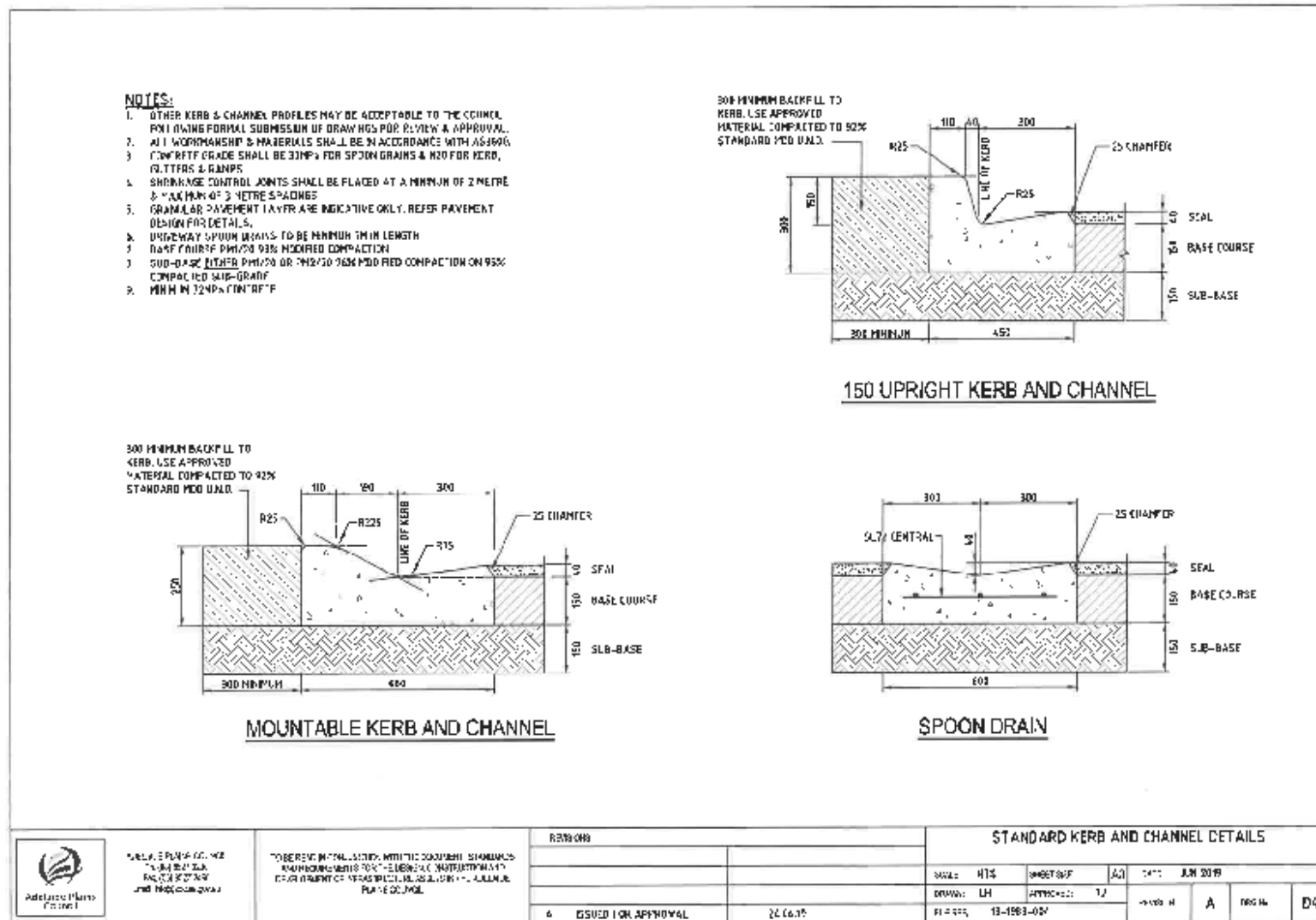
D2 – Residential Local Sealed Road, Carriageway Width 7.6m



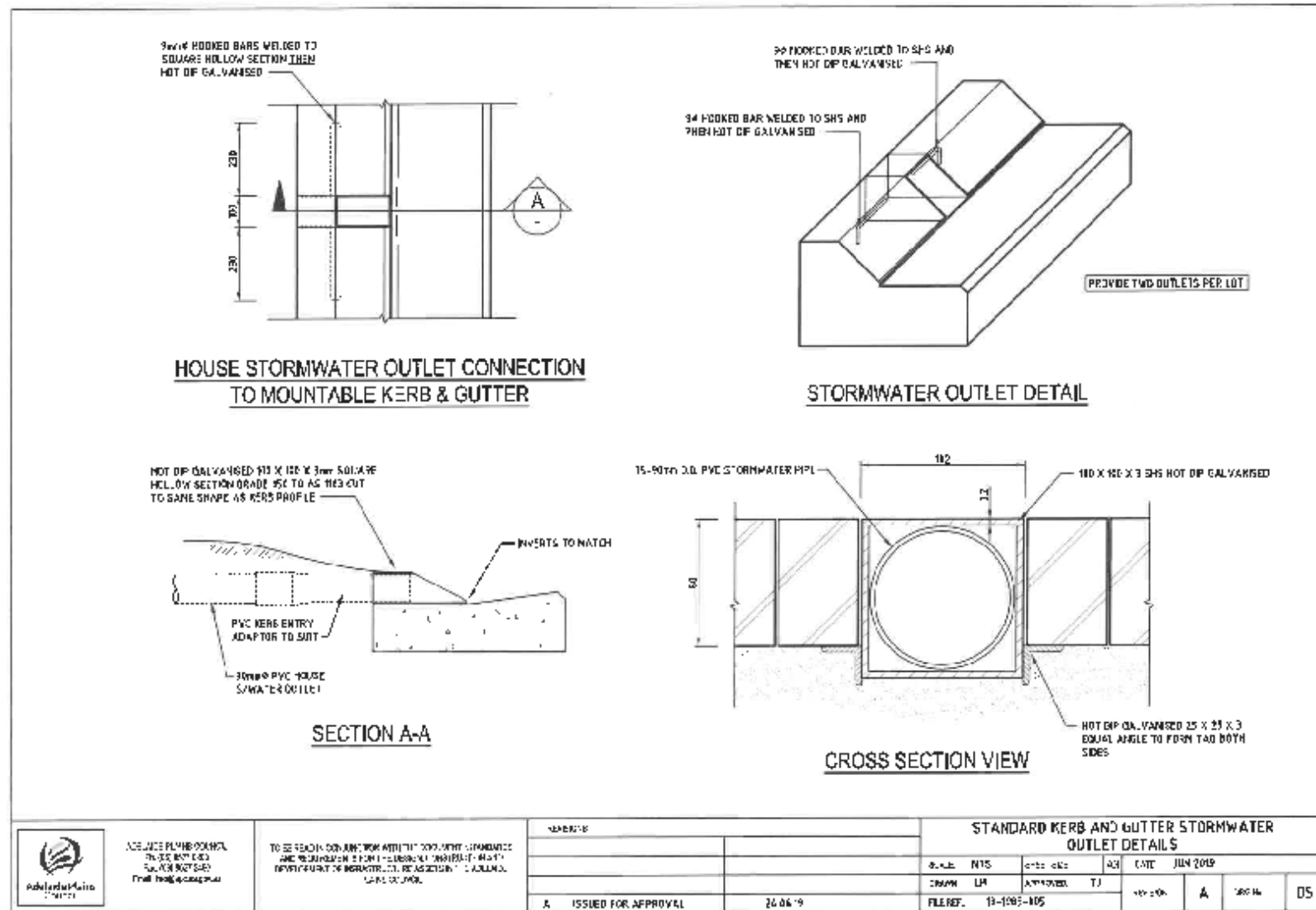
D3 – Residential Collector Sealed Road, Carriageway Width 11.0 - 13.4m



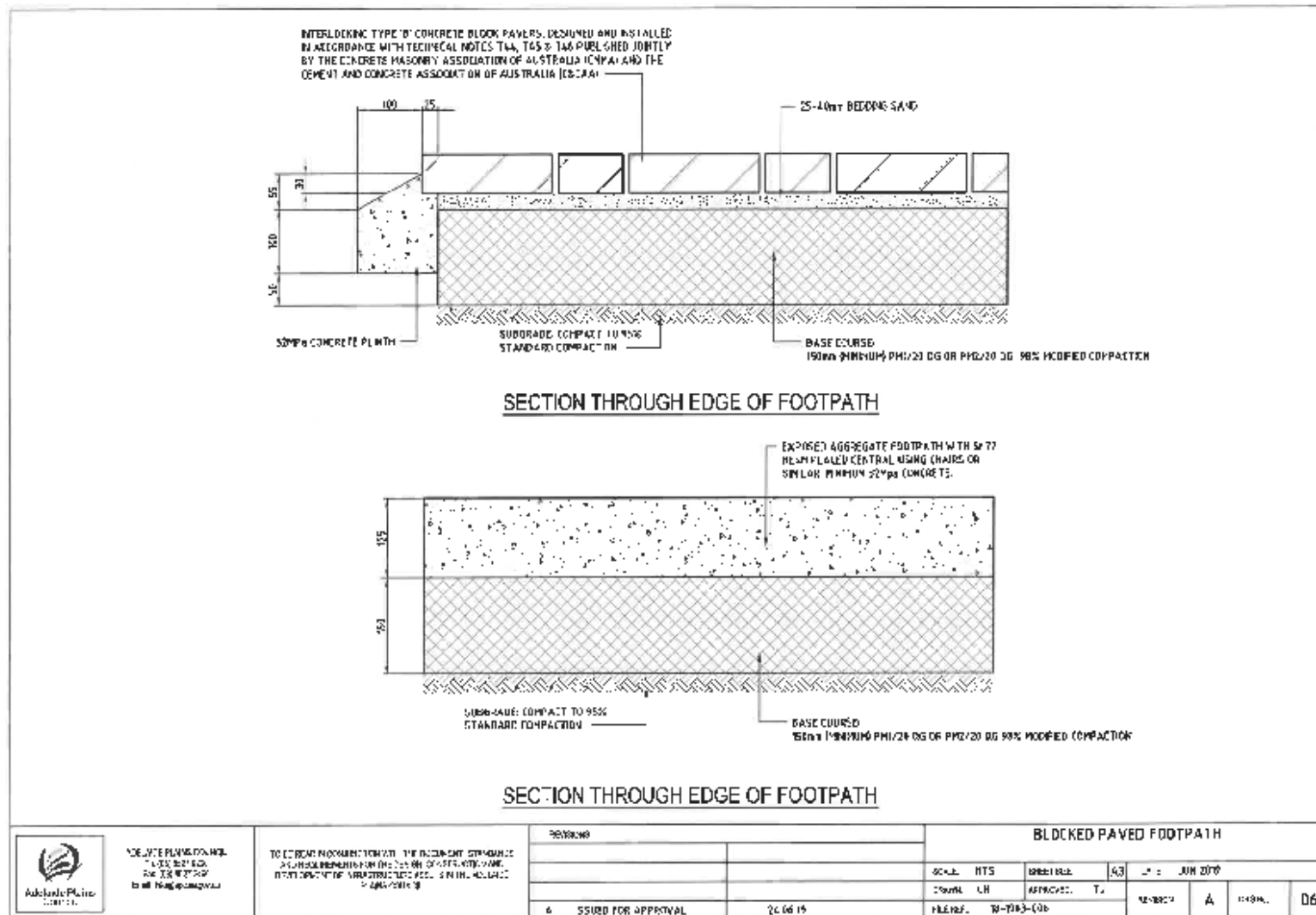
D4 – Mountable Kerb & Channel, 150mm Upright Kerb & Channel, Spoon Drain Details



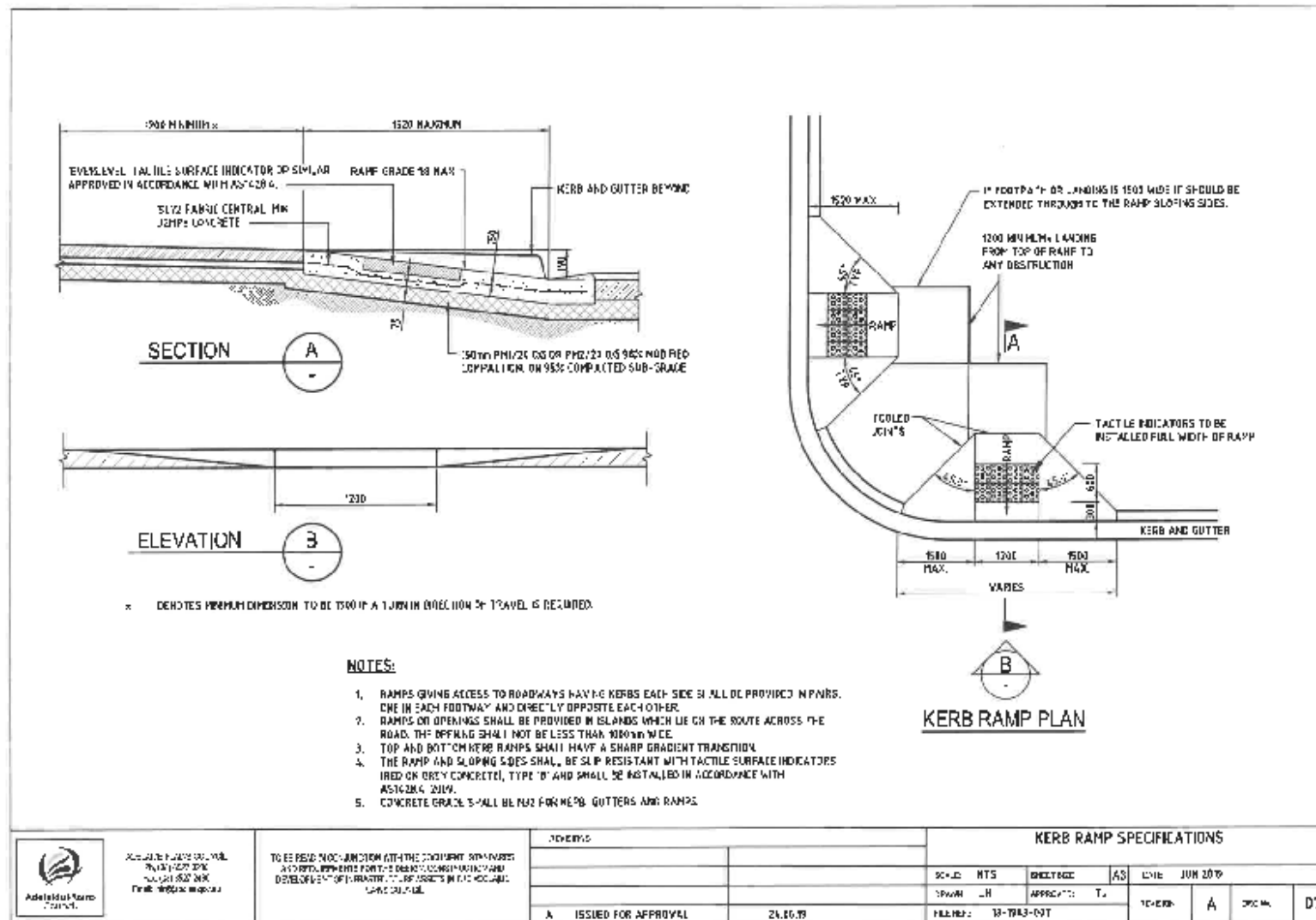
D5 – Kerb & Channel Stormwater Outlet Details



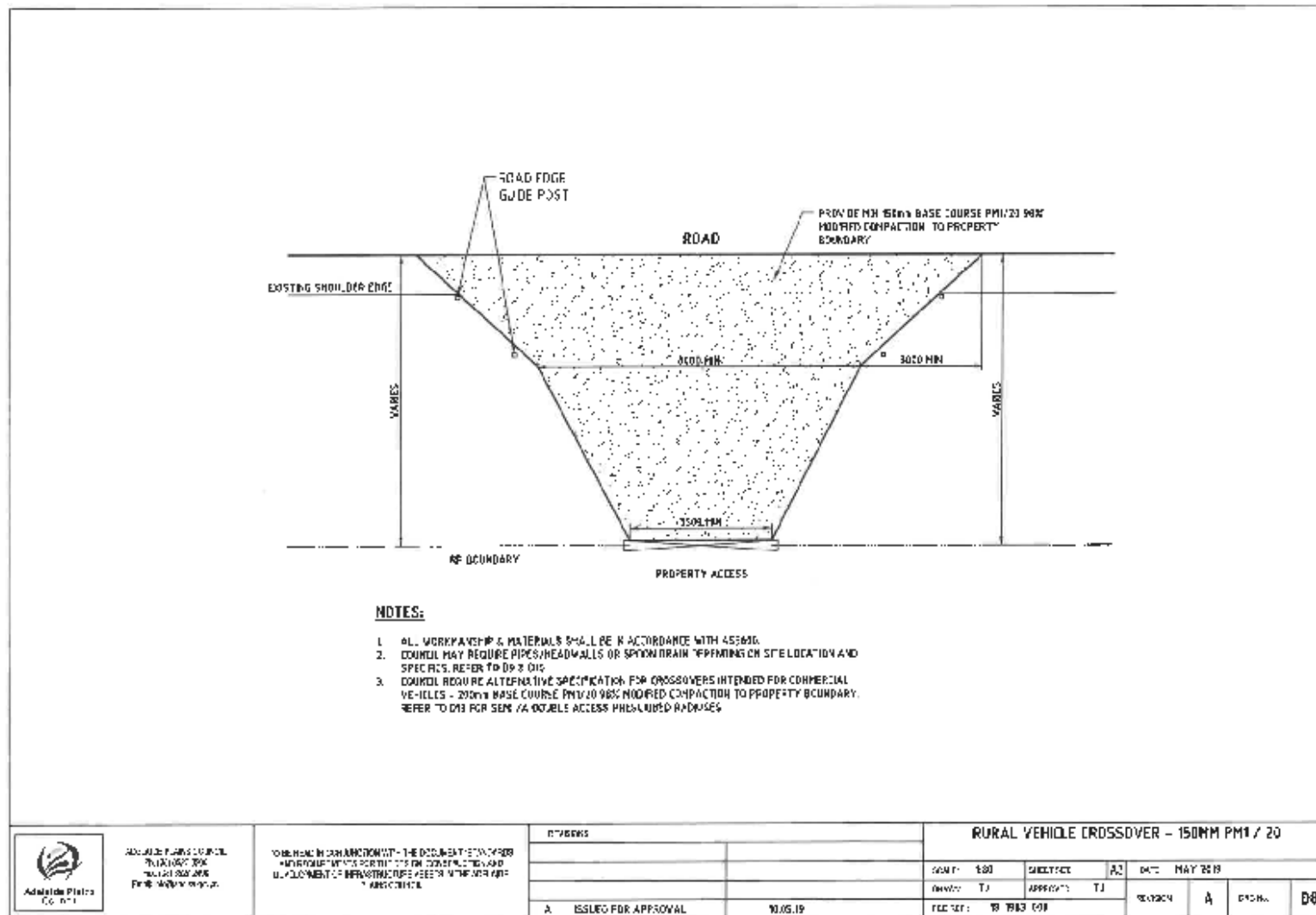
D6 – Blocked Paved Footpath



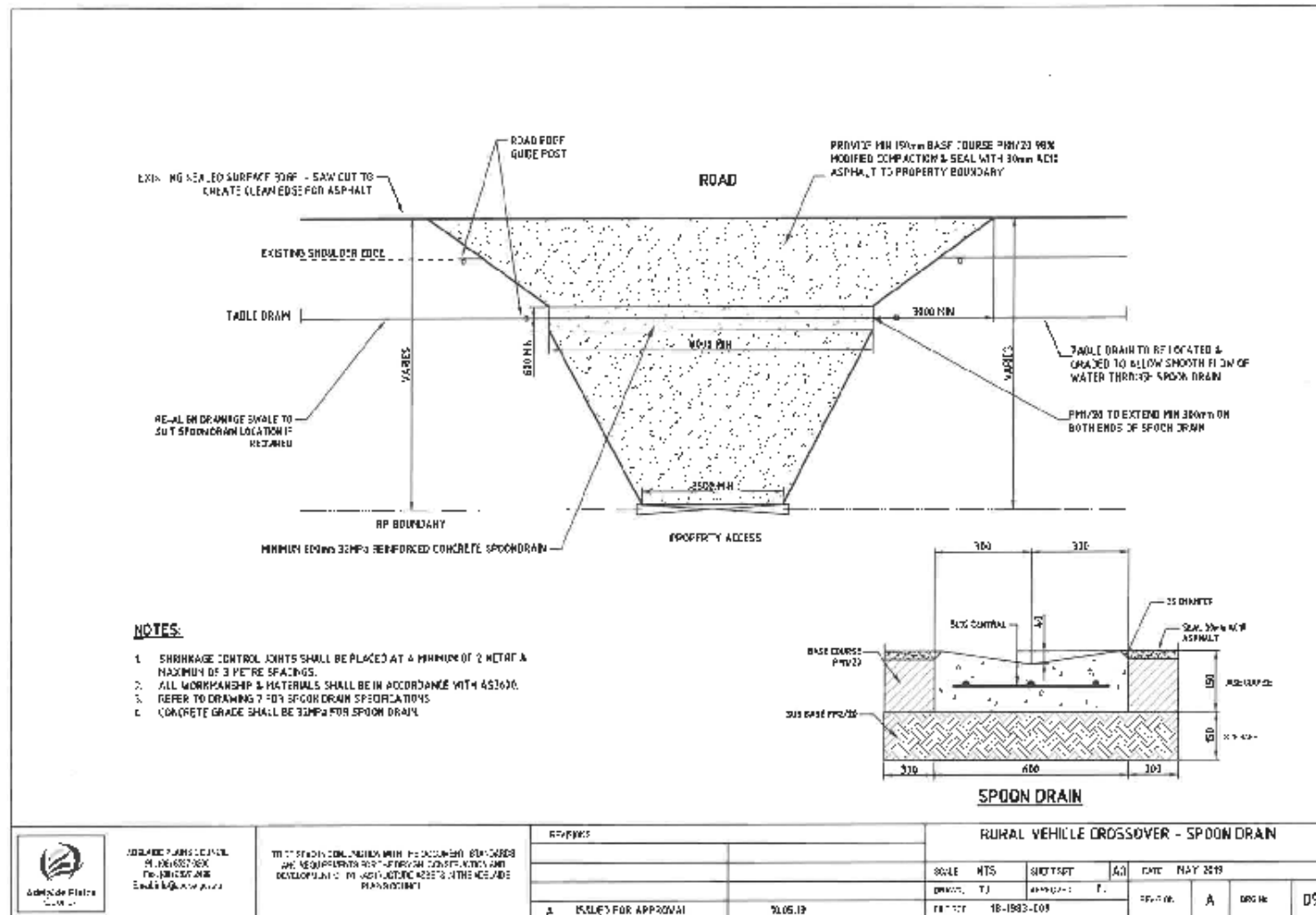
D7 – Kerb Ramp Specifications



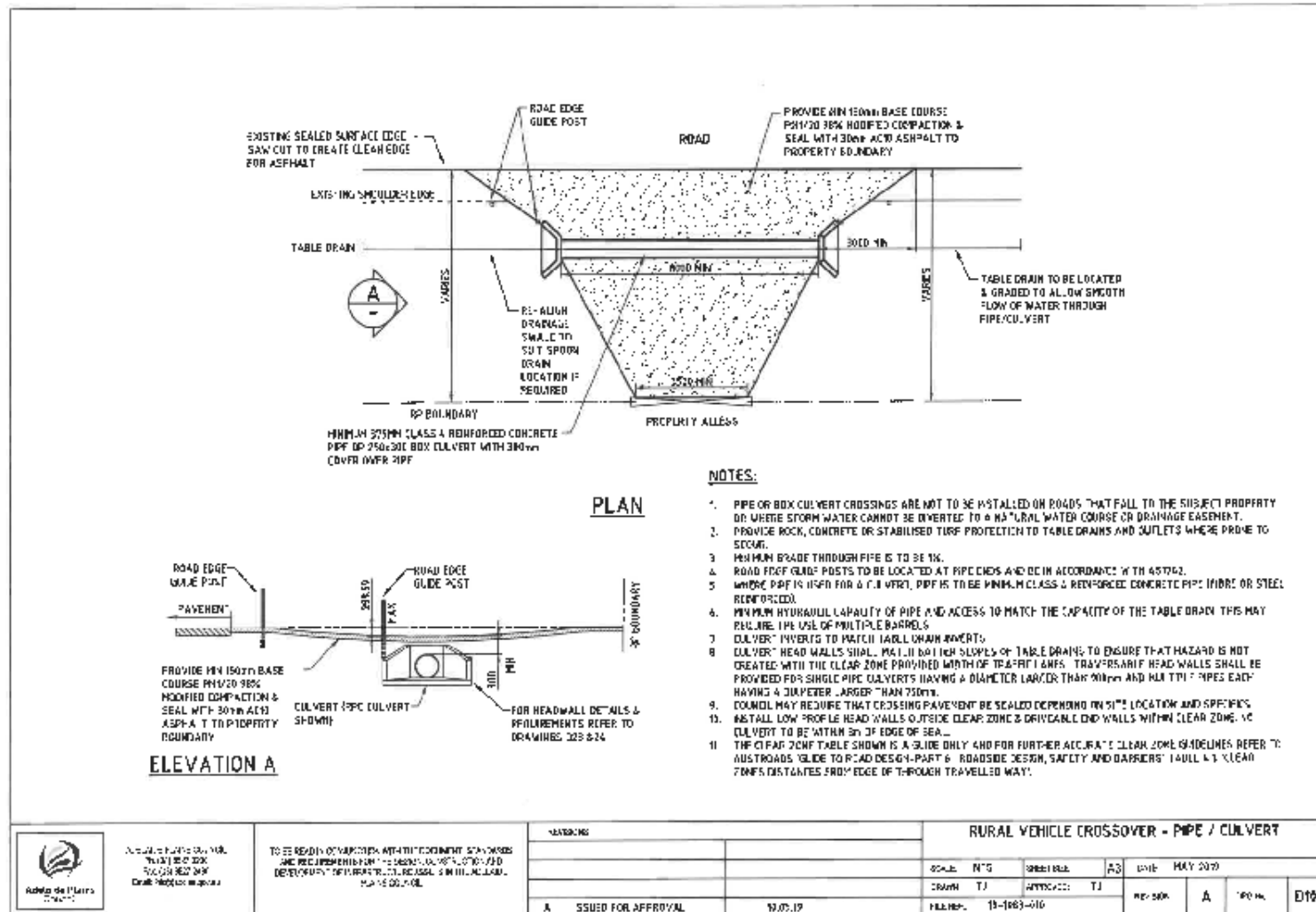
D8 – Rural Vehicle Crossover – 150mm PM1/20QG



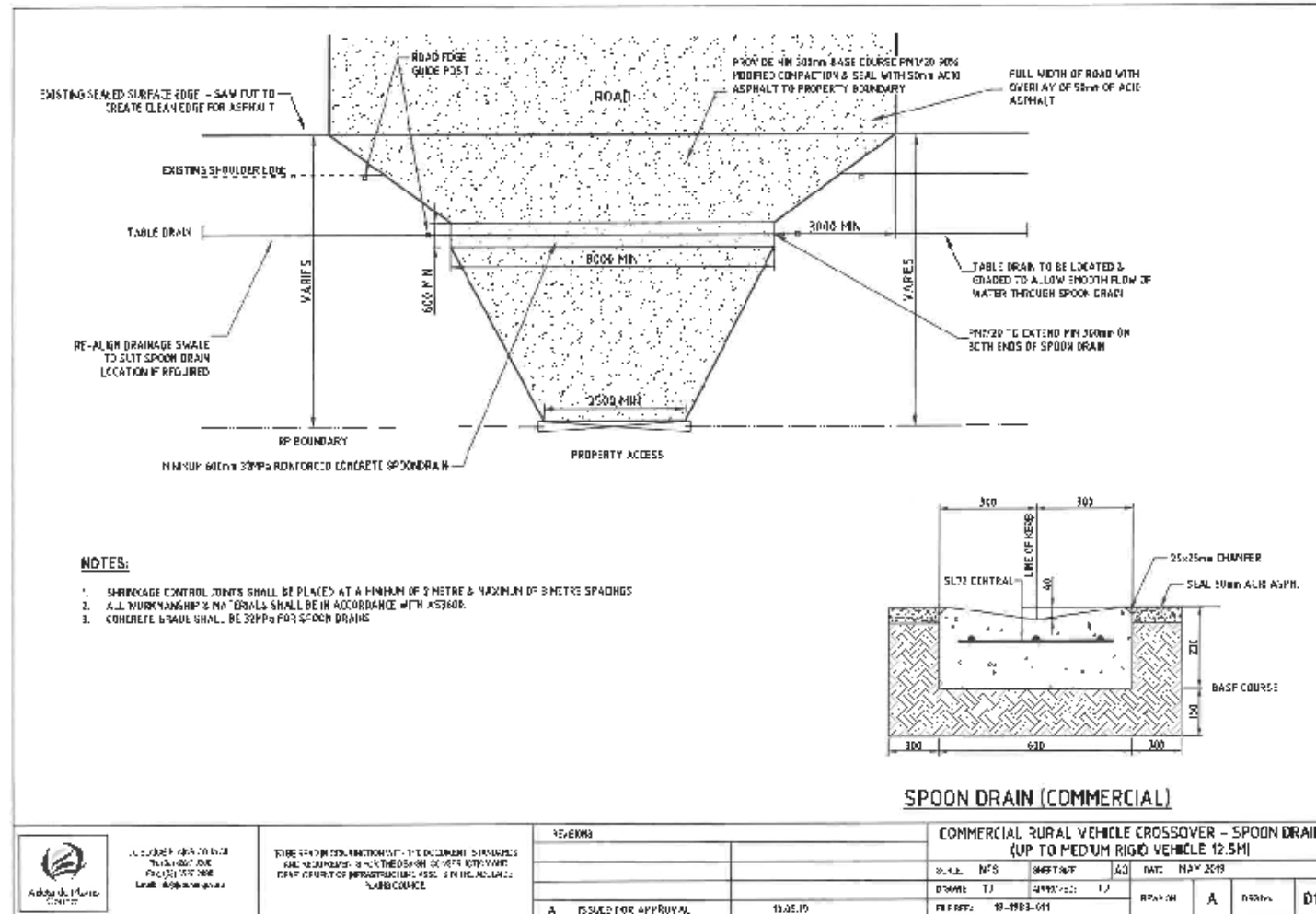
D9 – Rural Vehicle Crossover – Spoon Drain



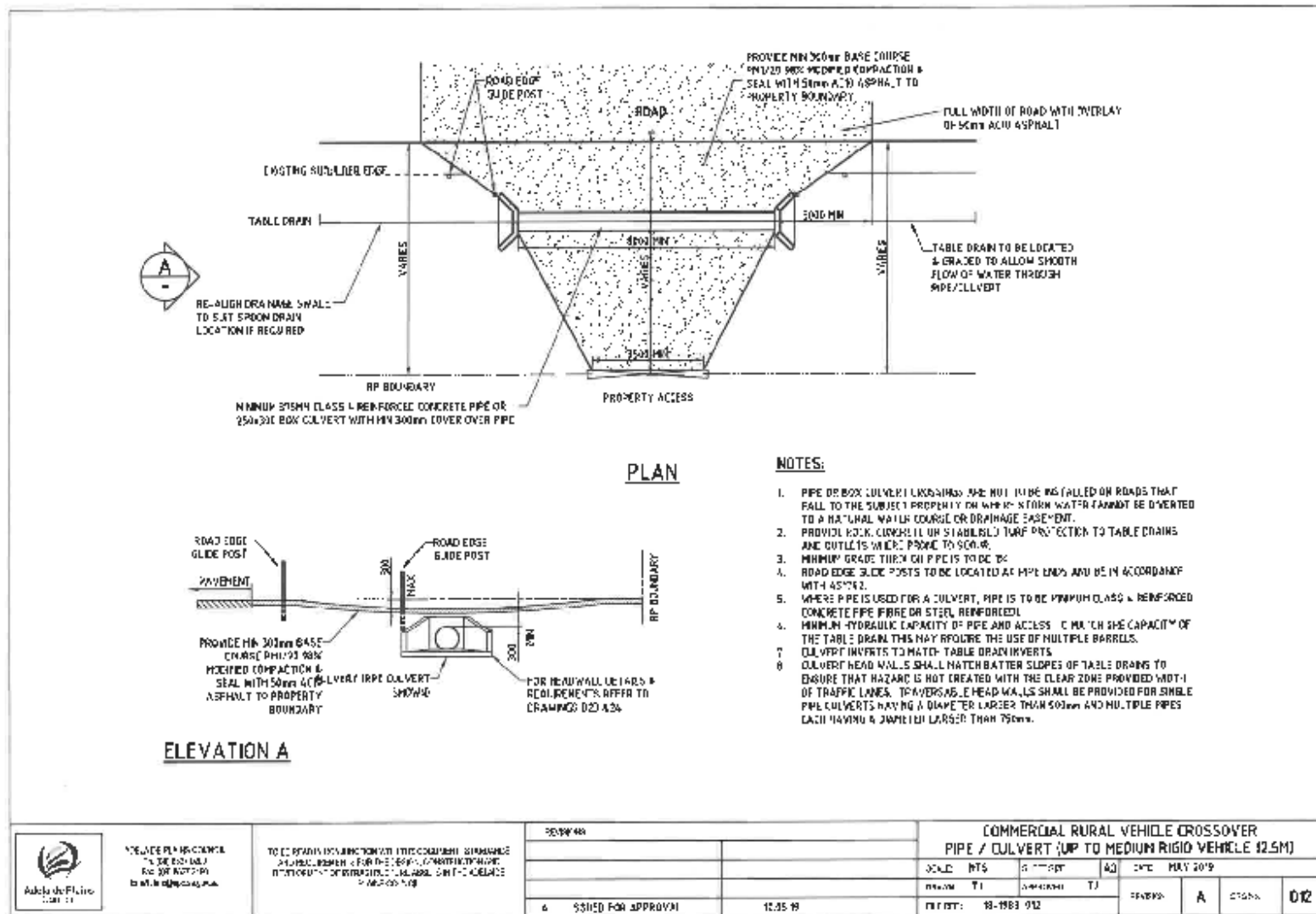
D10 – Rural Vehicle Crossover – Pipe / Culvert



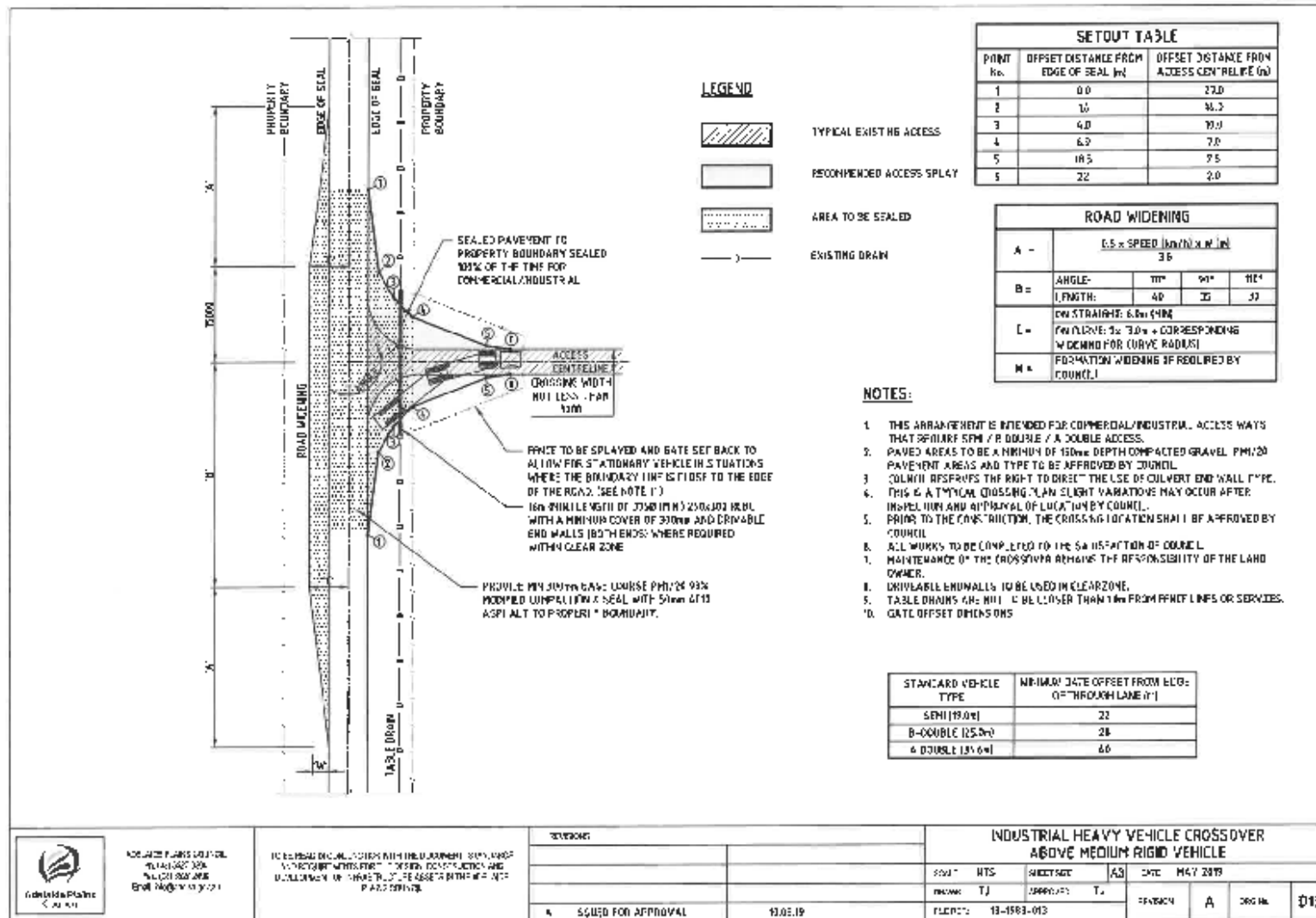
D11 – Commercial Rural Vehicle Crossover – Spoon Drain (Up To Medium Rigid Vehicle 12.5M)



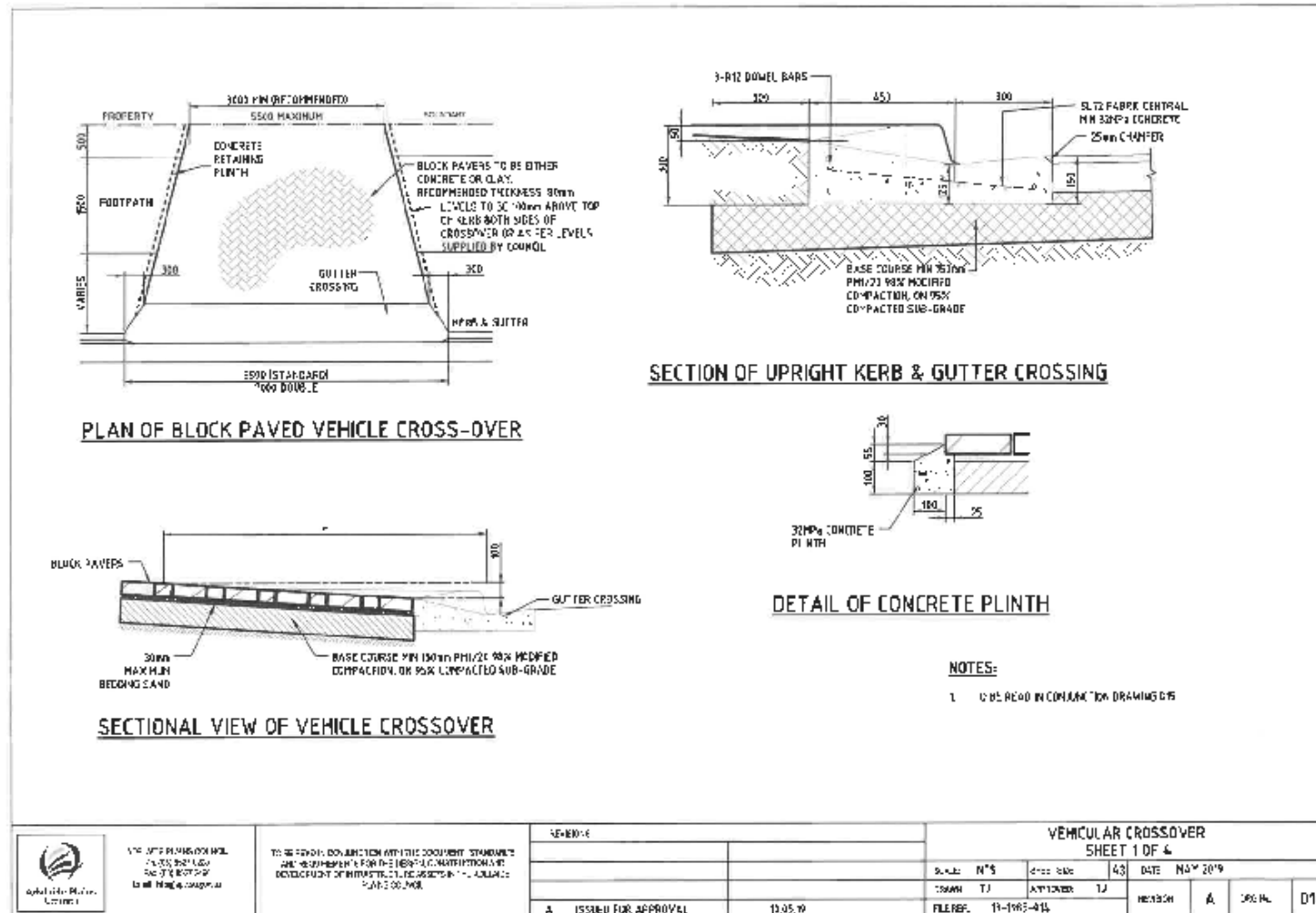
D12 – Commercial Rural Vehicle Crossover – Pipe / Culvert (Up To Medium Rigid Vehicle 12.5M)



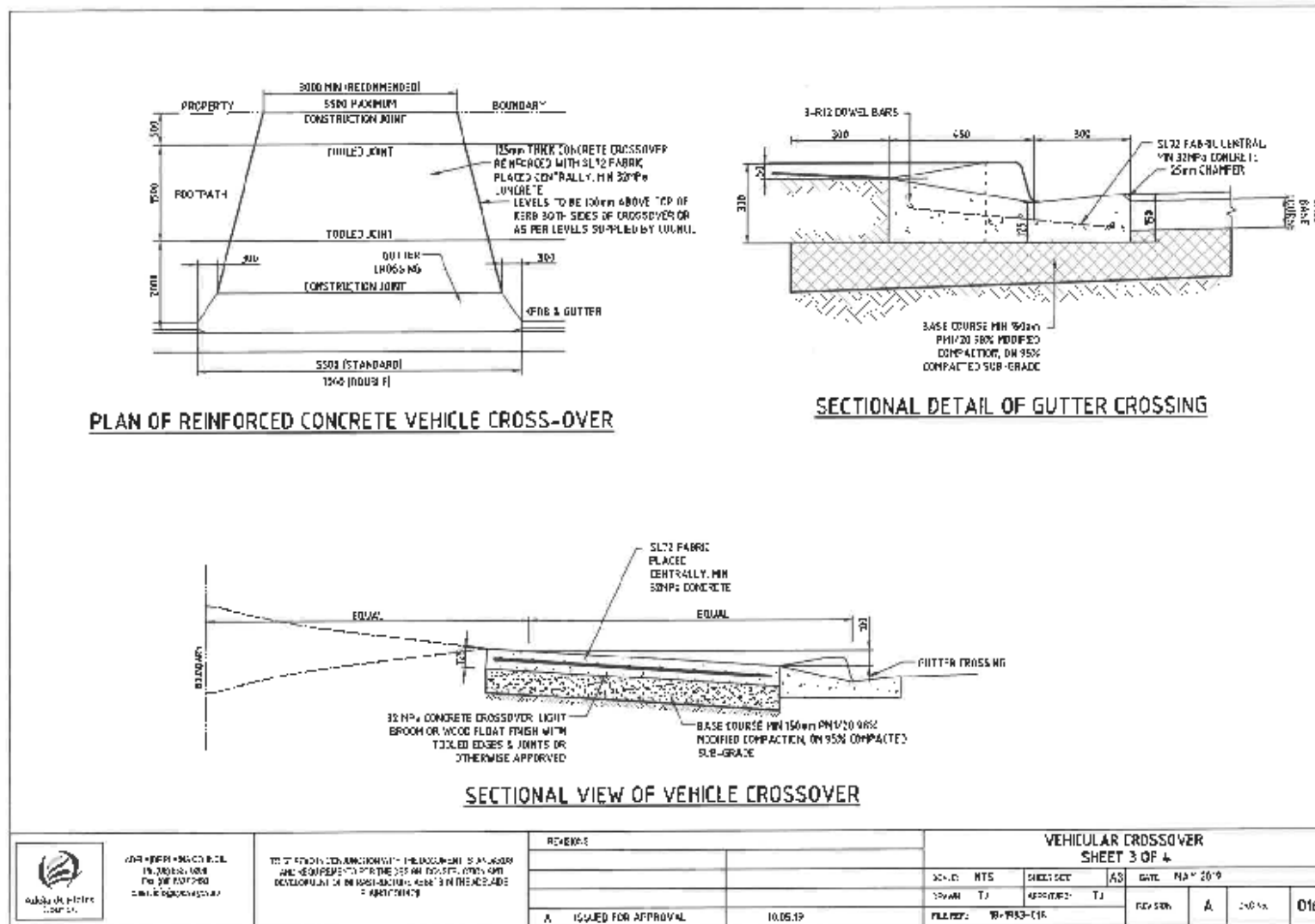
D13 – Industrial Heavy Vehicle Crossover Above Medium Rigid Vehicle



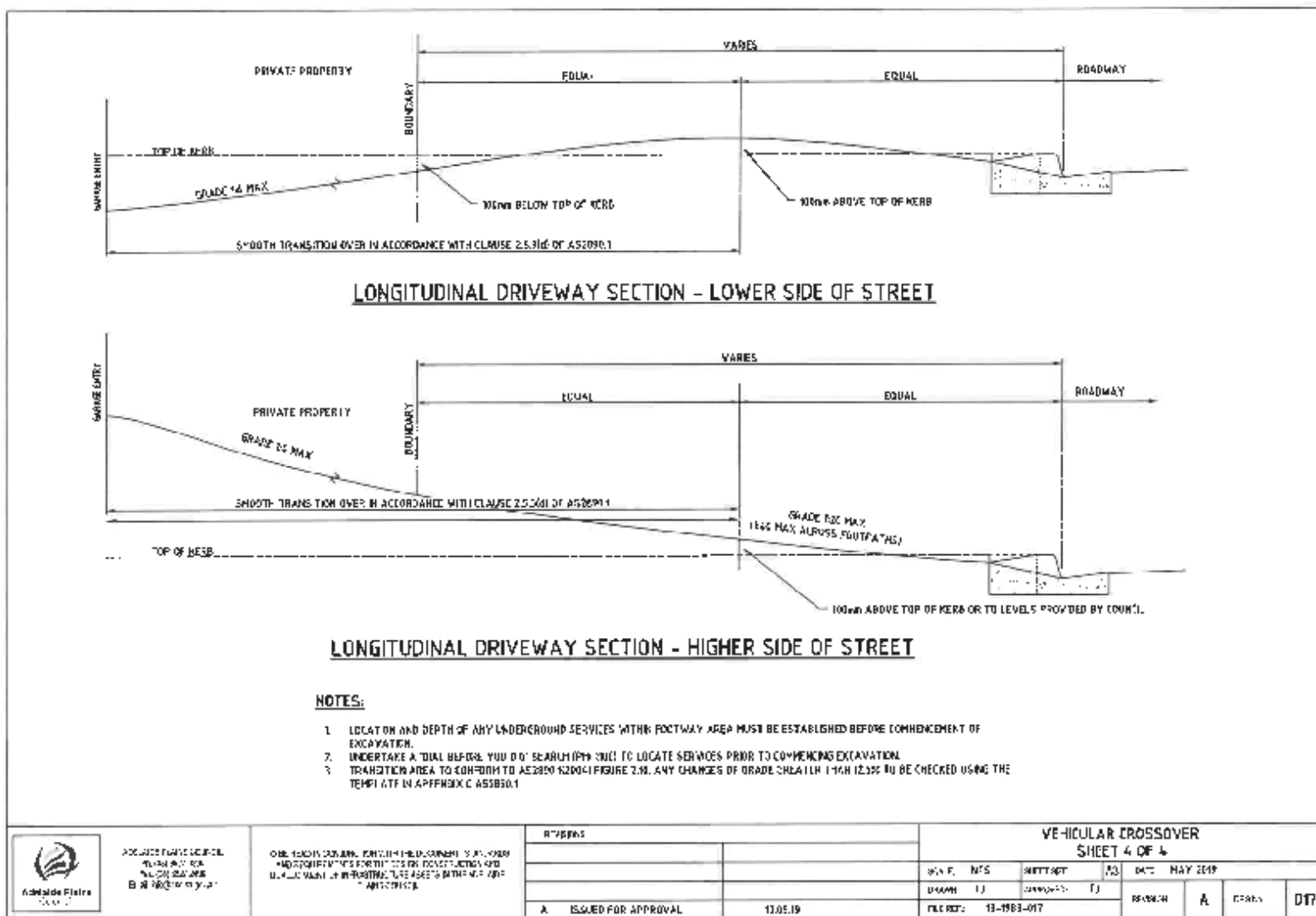
D14 – Vehicular Crossover, Sheet 1 of 4



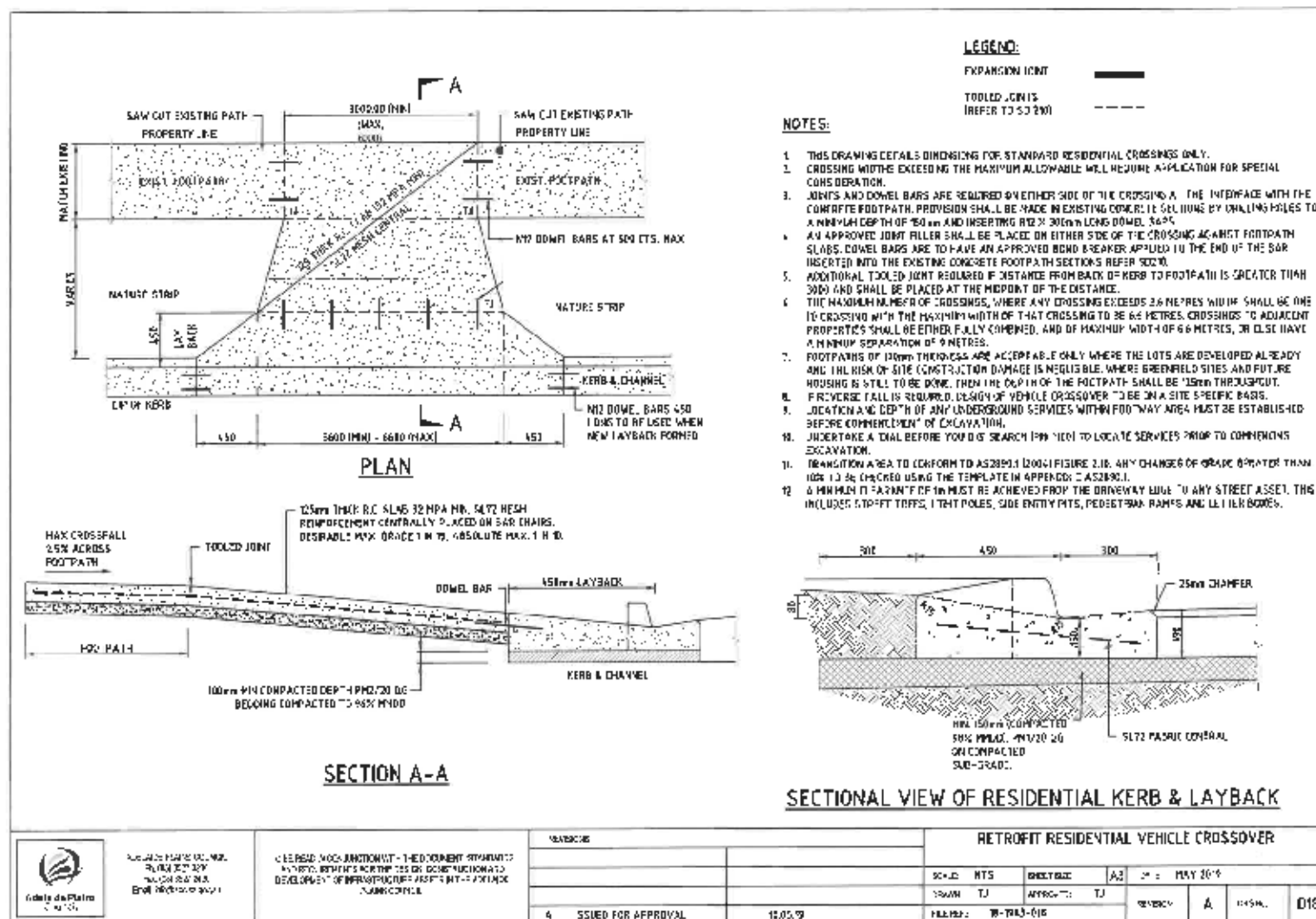
The figure contains two technical drawings. The left drawing, titled 'BLOCK PAVED ENTRANCEWAY DETAILS', shows a plan view of a road entrance. It includes a 'BOUNDARY' line, a 'FOOTPATH' (1.50m wide), and a 'MATCH TO MODPA IN CROSSFALL'. A '3000 M.H. (RECOMMENDED)' manhole is shown with a '5500 MAXIMUM' depth. A '300' wide section is also indicated. The right drawing, titled 'SECTION (HIGHSIDE OF STREET)', shows a cross-section of the road. It includes a '1500 FOOTPATH', a 'WIDTH & SLOPE VARIES (1:20 MAX)', and a 'GUTTER CROSSING'. The road structure consists of a 'BASE COURSE M.H. (50mm PM/50 98% MODIFIED COMPACTION) ON 98% COMPACTED SUB-GRADE' and a '30mm MAXIMUM BEDDING SAND ON 98% COMPACTED SLB-GRADE'. A note indicates 'INTERLOCKING OR PAVERS RECOMMENDED THICKNESS 80mm'. A '300' wide section is also indicated.



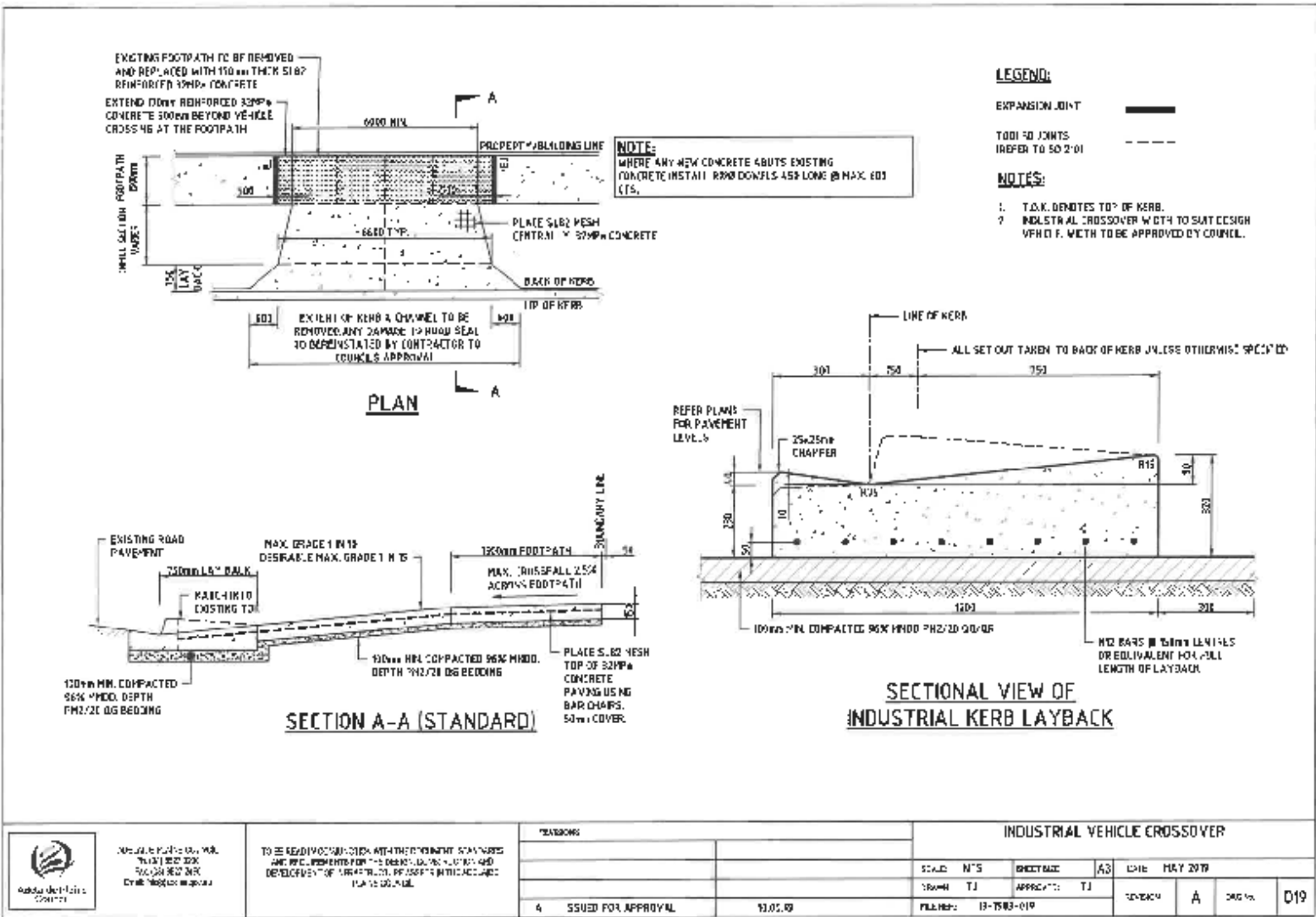
D17 – Vehicular Crossover, Sheet 4 of 4



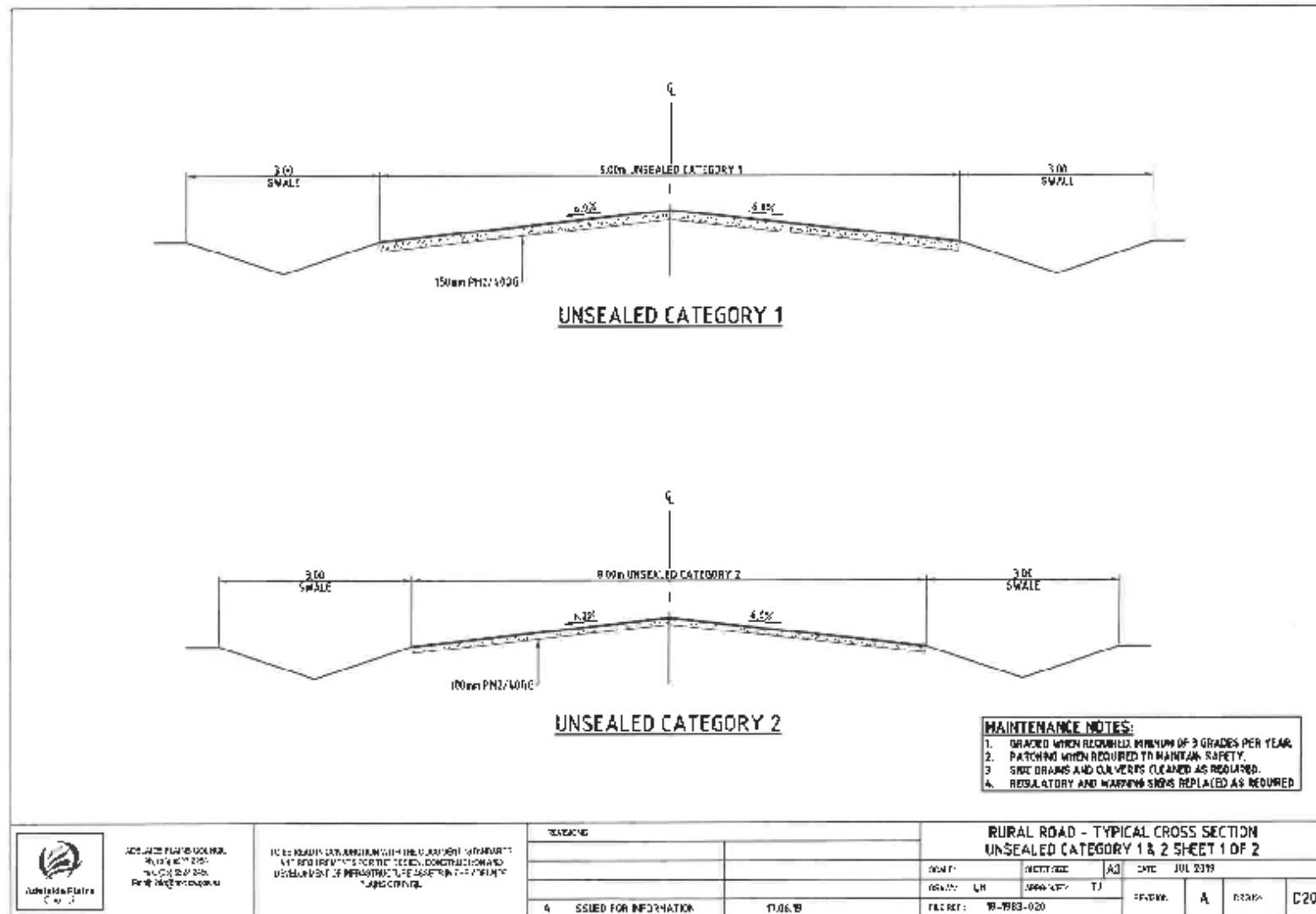
D18 – Retrofit Residential Vehicle Crossover



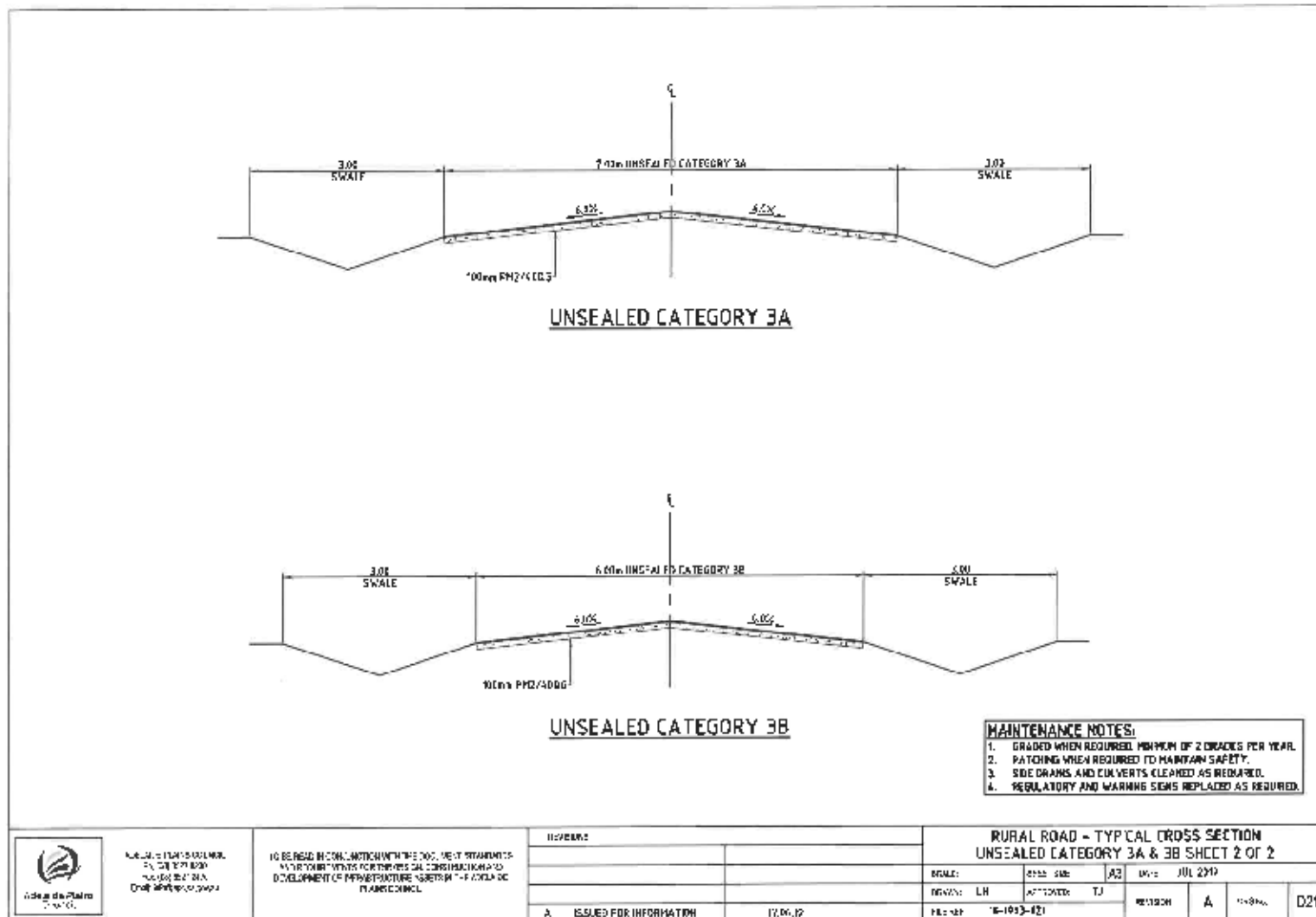
D19 – Industrial Vehicle Crossover



D20 – Rural Road, Unsealed Category 1 & 2



D21 – Rural Road, Unsealed Category 3A & 3B

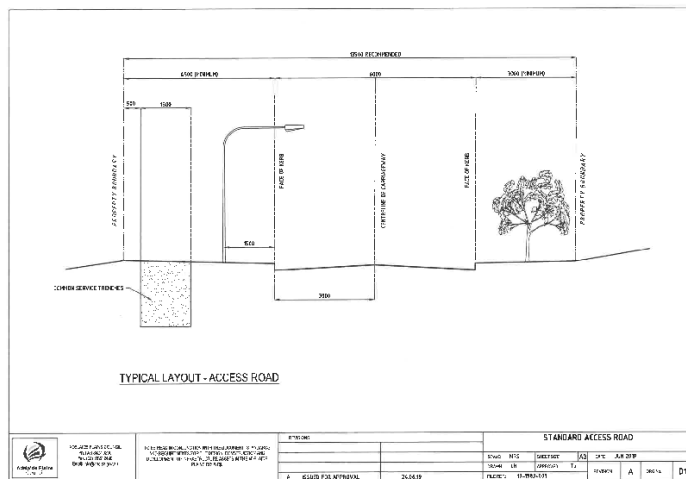


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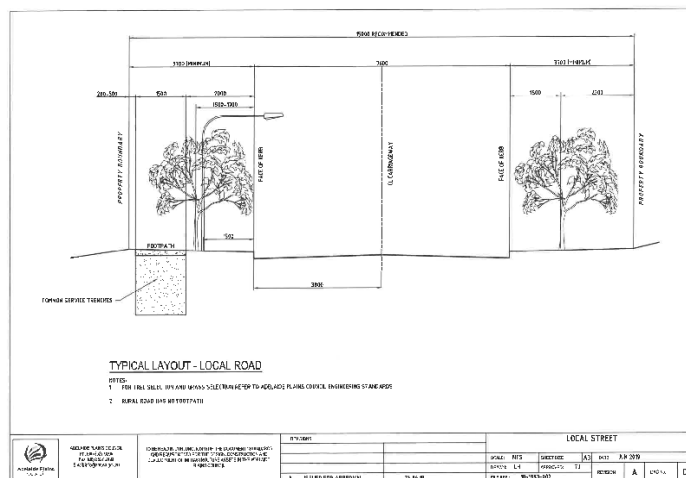
Appendix F Descriptions - Sealed Road Designs & Unsealed Road Categories

D0		<p>Newly Constructed Rural Sealed Road Carriageway 9.2m – (Bitumen Seal 7.2m min)</p> 
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D1
6m wide



D2
7.6m wide



D3

11.0 - 13.4m wide

TYPICAL LAYOUT - COLLECTOR ROAD

NOTES:
1. FOR THIS SECTION, GRASS BELLS (CONCRETE) IS REQUIRED - (LAWNS) ARE NOT REQUIRED (STANDARD)

STANDARD COLLECTOR ROAD	
ROAD WIDTH	11.0 - 13.4m
ROAD TYPE	Collector Road
ROAD GRADE	1:100
ROAD SURFACE	Asphalt
ROAD TYPE	Collector Road
ROAD GRADE	1:100
ROAD SURFACE	Asphalt

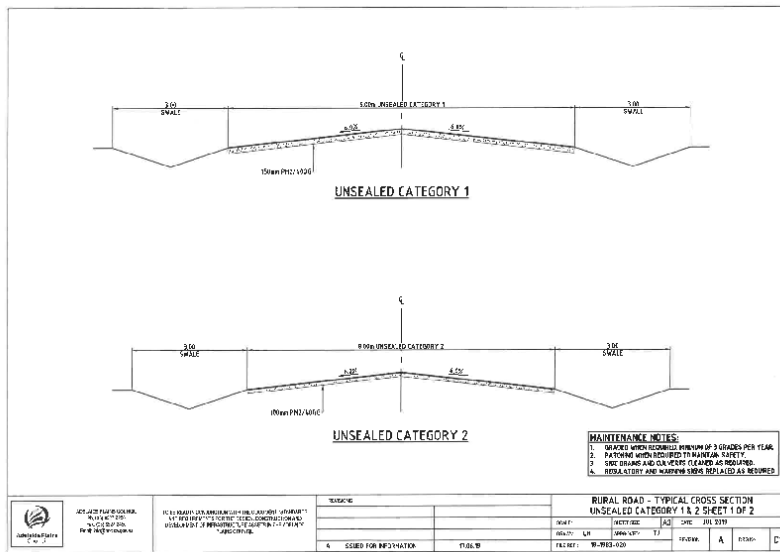
D20

Cat 1
9m wide

Cat 2

Typical Category 1 Road
Rural Sheeted Road – Good Condition

8m
wide



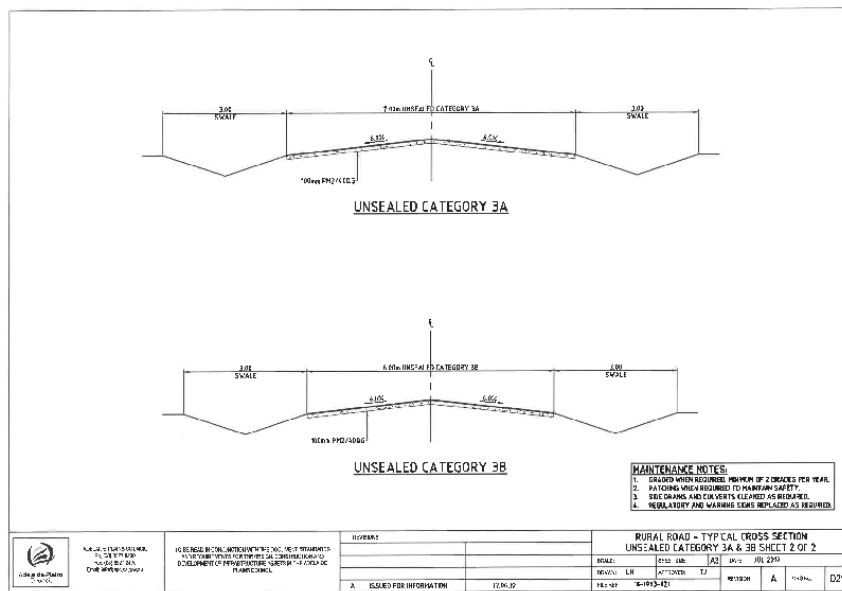
Typical Category 2 Road
Rural Sheeted Road



Cat
3-A
7m
wide

Cat
3-B
6m
wide

Cat
3-C
6m
wide



Typical Category 3-A Road
Rural Sheeted Road Showing Signs of Wear and Developing of Patches



<p>Cat 4-A</p> <p>various widths</p>	<p>No Design Required</p>	<p>Natural Formed Road</p> 
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ASSET MANAGEMENT PLAN

Buildings & Land

Document Control		Asset Management Plan			
Document ID :					
Rev No	Date	Revision Details	Author	Reviewer	Approver
V1.11	June 2021	Develop Buildings & Land Infrastructure Asset Management Plan	IAC		
V1.11	July 2021	For Review	IAC	GMEI EMT	EMT

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1.0 Introduction

1.1 Background

This Asset Management Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the planning period.

The Asset Management Plan is to be read with Asset Management Policy and Asset Management Strategy, where developed, along with other key planning documents:

- Strategic Plan
- Annual Business Plan
- Long Term Financial Plan

Council own and manage 45 different buildings, 16 easements and 162 parcels of land. The building assets were split into complex and non-complex with the complex buildings collected at a detailed component level consisting of:

- Buildings
- Fit-outs
- Buildings Componentry (electrical, plumbing, roofing)
- Site Improvements
- Sub and Super Structures
- Land

Councils land, building assets are valued at either Level 2 (market value) or Level 3 (current replacement costs).

This Building Infrastructure Asset Management Plan provides for Councils building and land network and has been developed using an asset register which was digitised using historical plans and field collection during 2020. The register was valued as at 30 June 2020 and has been updated with 2021/2022 capital works to the value of \$80,000.

The infrastructure assets included in this plan have a total replacement value of \$28,478,471.94

Asset	Quantity	Renewal Value	Total Value
Buildings	45	\$2,771,072.00	\$2,771,072.00
Buildings Componentry, Electrical	19	\$1,163,552.60	\$1,163,552.60
Buildings Componentry, Plumbing	19	\$1,057,797.44	\$1,057,797.44
Buildings Componentry, Roof	19	\$692,990.76	\$692,990.76
Fit-Outs Buildings	19	\$3,421,705.48	\$3,421,705.48
Sub Structures	19	\$841,383.09	\$841,383.09
Super Structures	19	\$5,004,570.57	\$5,004,570.57
Land	162	\$13,285,000	\$13,285,000
Easements	16	\$240,400.00	\$240,400.00
Total			\$28,478,471.94

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 1.1.1

Table 1.1.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Residents and Ratepayers	<ul style="list-style-type: none"> ■ Ultimate beneficiaries of the AMP process ■ Feedback collected throughout the year ■ Annual satisfaction survey undertaken
Insurers	<ul style="list-style-type: none"> ■ Local Government Mutual Liability Scheme
Lessees	<ul style="list-style-type: none"> ■ Leases operating who provide feedback on services, and have a range of maintenance responsibilities
State & Federal Government	<ul style="list-style-type: none"> ■ Responsible for awarding grants to Council and sporting groups
Visitor / Tourists	<ul style="list-style-type: none"> ■ Regular satisfaction surveys undertaken, and feedback collected
Council	<ul style="list-style-type: none"> ■ To act as custodians of community assets ■ To set Asset Management Policy and vision ■ Allocate resources to meet Council objectives in providing services while managing risks
Executive Management Team	<ul style="list-style-type: none"> ■ Responsible for the development, management and review of an Asset Management Strategy, associated plans, practices and reporting on the status and effectiveness of Council's asset management ■ To monitor and review the performance of employees in achieving the asset management strategy, plans and practices ■ To ensure sufficient resources are applied to manage the assets to legislative requirements; and ■ Accountable for the management of assets within their areas of responsibility
Asset Manager and Staff	<ul style="list-style-type: none"> ■ To lead the development of the Asset Management Plans ■ To develop and implement maintenance, renewal and capital works programs in accordance with the Asset Management Policy, Strategy, Plans, as well as budget allocations ■ Develop Specific Management Plans (upgrade, renewal, maintenance, operations, disposal) ■ To deliver levels of service to agreed risk and cost standards and expectations ■ To report asset related risk and damage ■ To establish and monitor asset compliance and risk inspection regimes ■ To manage asset condition assessments ■ To provide technical expertise to the Executive Management Team

1.2 Goals and Objectives of Asset Ownership

Our goal for managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

- Levels of service – specifies the services and levels of service to be provided,
- Risk Management,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 ¹
- ISO 55000²

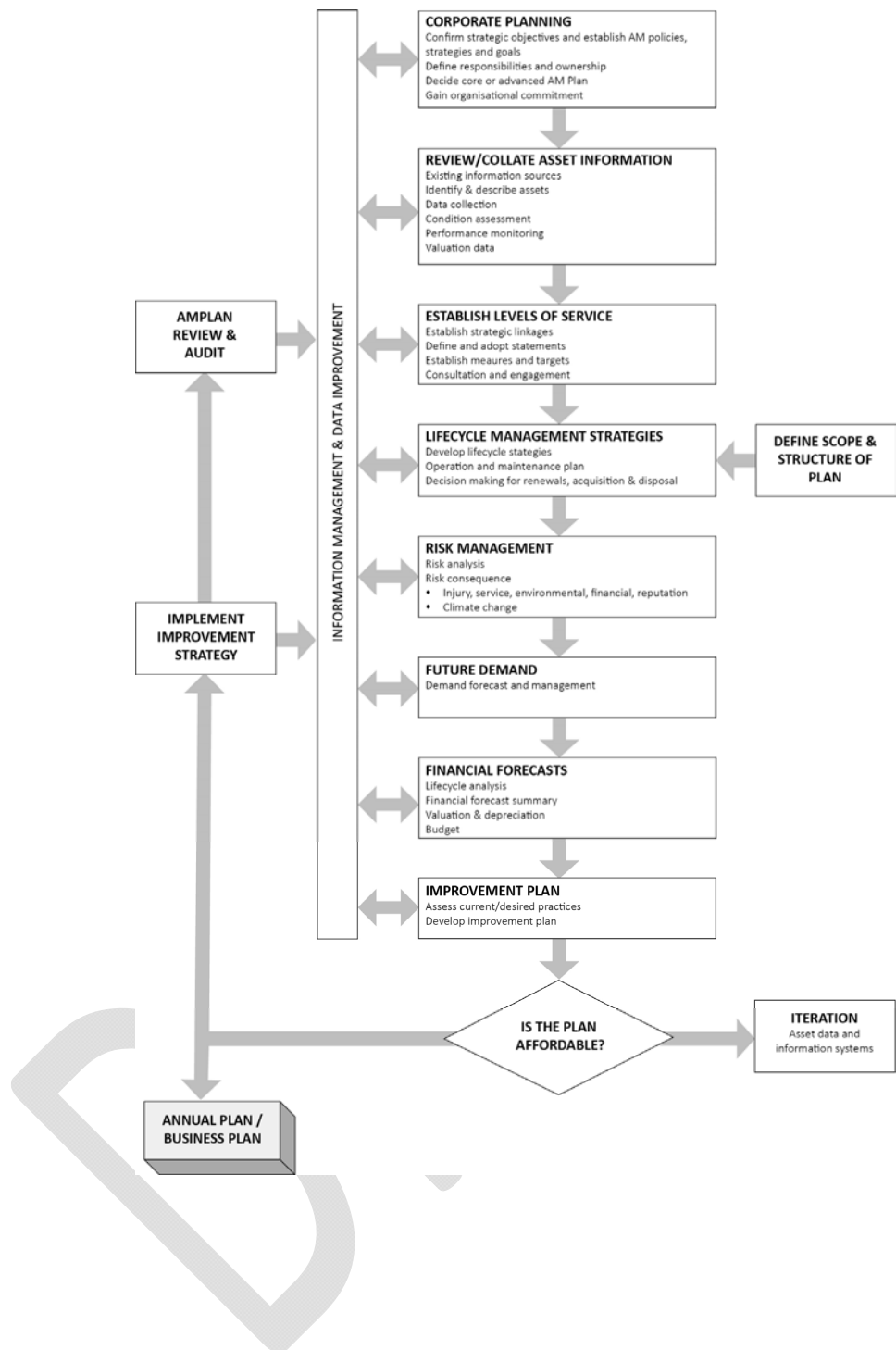
A road map for preparing an AM Plan is shown below.

Road Map for preparing an Asset Management Plan

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11

¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² ISO 55000 Overview, principles and terminology



2.0 LEVELS OF SERVICE

The community generally expect that Council will have the necessary infrastructure and operation and maintenance practices in place to manage Councils Buildings and Land.

Levels of service relate to outcomes the customer receives in terms of quality, quantity, responsiveness and performance as provided by the asset, they area developed in line with Councils strategic and corporate goals and legislative requirements.

Community Levels of Service relates to the service outcomes that the community wants in terms of quality, quantity, responsiveness, amenity, safety and financing.

Table 2.1.1 Community Levels of Service

Key Performance Measure	Level of Service Objective	Performance Measure Process	Current Level of Service	Desired Level of Service
CUSTOMER (COMMUNITY) LEVEL OF SERVICE				
Quality	Fit for purpose and suitable for public use in today's legislative environment considering local community demands while being mindful of heritage aspects	Engagement with community associations Customer feedback and customer service requests Management/consultant reports Building inspection	Report from user group and management committees 70% of buildings and improvements meet quality service level Ongoing Ongoing	Continuing to meet community expectations 100% of buildings and improvements meet quality service level Compliance/growth requirements Compliance/growth requirements
Function	Ensure buildings are functional for their current use	Engagement with community associations Management/consultant reports	Report from user group and management committees Ongoing	Continuing to meet community expectations Compliance/growth requirements
Capacity / Utilisation)	Ensure buildings capacity is tailored to meet current and future trends in utilisation	Engagement with community associations Management/consultant reports	Buildings and structure are currently utilised in accordance with community expectation. Potential for greater utilisation exist Ongoing	Buildings and structure are utilised in accordance with community expectation and buildings are fully utilised. 100% utilisation Compliance/growth requirements

Safety	Ensure buildings are compliant and minimise risk to the community	Customer requests	Current managing requests in a timely manner	Managing requests in a timely manner
		Incident reports and near misses	Incident reports managed in a timely way	Continue to manage incident reports in a timely way and encourage reporting by users
		Building inspection	Proactive building inspections on a prescribed frequency i.e. fire control inspections	Proactive building inspections on a prescribed frequency

Technical Levels of Service support the community service levels and are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities that the Council undertakes to best achieve the desired community outcomes.

Table 2.1.2 Technical Levels of Service

TECHNICAL LEVEL OF SERVICE				
Operations	Building interiors are clean and hygienic consistent with their use	Ensuring clean and hygienic facilities meeting community expectations	All contracts in place Customer requests received are minimal	All contracts in place Customer requests are minimal
Maintenance	Proactive maintenance carried out to ensure buildings continue to fulfil function	Method of maintenance Number of customer requests	Some proactive maintenance but the majority is reactive 50 recorded customer requests per year	Minimise reactive maintenance and plan for proactive maintenance 10 recorded customer requests per year
Compliance	Buildings are compliant with all legislated safety requirements and risk to employee and community safety is mitigated to an acceptable level	Buildings inspection process	Compliance contracts and checks in place Buildings inspection process underway	Improved compliance contracts and checks in place Annual building inspections coordinated and actioned

Renewal	Assets are renewed at an optimal time in their life-cycle	<p>Meet Councils requirements of the Strategic Plan 2020-2024</p> <p>10 year renewal plan defined and approved by Council, covered off in the IAMP and incorporated into the LTFP and annual budgeting</p>	Developed through the Buildings Infrastructure Asset Management Plan	<p>Meet requirements</p> <p>Improved 10 year plan based on detail condition inspection</p>
Upgrade	All required upgrades for compliance, safety and functionality are planned and implemented	<p>Meet Councils requirements of the Strategic Plan 2020-2024</p> <p>10 year renewal plan defined and approved by Council, covered off in the IAMP and incorporated into the LTFP and annual budgeting</p>	Developed through the Buildings Infrastructure Asset Management Plan.	<p>Meet requirements</p> <p>Improved 10 year plan based on detail condition inspection</p>

3.0 FUTURE DEMAND

3.1 Demand Forecasts

Council's building and infrastructure supports its role as a service provider, together with the provision of spaces for community activities and recreation. During the life of this plan Council will conduct a review of the buildings and land assets in consultation with the community to determine the appropriate asset distribution and classification to meet current and future demands.

Factors affecting demand include changes in demographics, customer preferences & expectations and economic factors, etc. Demand factor trends and impacts on service delivery are summarised in Table 3.1.1.

Table 3.1.1 Demand Factors, Projections and Impact on Services

Demand Driver	Present Position	Projection	Impact of Services
Demographics	<p>Planned to accommodate for 19,358 by 2050.</p> <p>Since 2001, Council has had a greater proportion of the mature family demographic) people aged 5-17 years and 35 to 59 years) than Greater Adelaide.</p> <p>Between 2001 and 2016 the proportion of people aged between 60 and 84 years increased from 23.0% to 35.3%, and increase of 843 persons.</p> <p>(source, APC Strategic Plan 2020-2024)</p>	<p>Reliable forecasts suggest Adelaide Plans Council will have a high proportion of families and a growing proportion of population aged over 60 years at 2041. (source, APC Strategic Plan 2020-2024)</p>	<p>Changing nature of services delivered from facilities.</p> <p>Mobility considerations.</p> <p>Need to maintain facilities utilised by the younger population and families to support growth e.g. playgrounds and sports clubs.</p>
DDA compliance	<p>Accessibility to buildings is important for all users.</p>	<p>When upgrading of buildings to ensure Council meets DDA requirements and Council continues to monitor any changes to legislation.</p>	<p>Additional upgrade, renewal and maintenance costs to be allocated.</p>
Community Programmes and Hall Hire	<p>Building Facilities have several regular hirers.</p>	<p>Regular Hirer numbers to be maintained.</p>	<p>No impact better asset utilisation.</p>
Environmental impacts	<p>Buildings are constructed to withstand today's known environmental conditions and to meet today's environmental standards.</p>	<p>Greater requirements related to constructing buildings that are environmentally sustainable.</p>	<p>Higher costs associated with constructing buildings that are environmentally sustainable i.e. water retention/recycling, solar energy etc.</p>
Request for Sporting clubroom upgrades	<p>Annual assessment by Council staff using a matrix which determines the recreation/community</p>	<p>Clubs over time will approach Council requesting facilities.</p>	<p>Insufficient funds to improve every clubroom immediately.</p>

	benefits & building requirements of each Clubroom.	Council to develop an Open Space and Recreation Strategy 2022-23.	
Community facilities	Ancillary facilities such as public toilets and shelters are located at regional and district open space.	Increased public expectation for additional ancillary facilities at local and neighbourhood reserves. Council to develop an Open Space and Recreation Strategy 2022-23.	Requiring whole of Life cost assessment.

3.2 Demand Impact and Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Council will determine the ability of the existing systems to manage increased requirements. Opportunities identified to date for demand management are shown in Table 3.1.2.

Further opportunities will be developed in future revisions of this asset management plan.

Table 3.1.2 Demand Management Plan

Service Activity	Demand Management Plan
Change in services	Further analysis of providing the service at current and target service levels.
	Managing existing assets through planned maintenance, renewal and upgrade.
	Providing new assets to meet demand.
	Communicate service levels to the community measured against current funding capacity.
	Disposal of assets determined surplus to requirements.
	Council growth to meet existing and new legislative demands.

4.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Council plans to manage and operate the assets at the agreed levels of service (Refer to Section 2) while managing life cycle costs.

4.1 Background Data

Adelaide Plains Council's Buildings and Land assets are located throughout several towns in the Council area.

- Buildings
- Fit-outs
- Buildings Componentry (electrical, plumbing, roofing)
- Sub and Super Structures
- Land

4.2 Asset Capacity and Performance

Council's services are generally provided to meet design standards where these are available. Locations where deficiencies in service performance are known are detailed in Table 4.2.1

Table 4.2.1: Known Service Performance Deficiencies

Assets	Service Deficiency
Future Demand	Providing new assets to meet demand.
Review of Asset Base	Disposal of assets determined surplus to requirements.
Office Space Requirements	Council growth to meet existing and new legislative demands.

The above service deficiencies were identified and are being considered and prioritised. Refer to above Demand Management Plan.

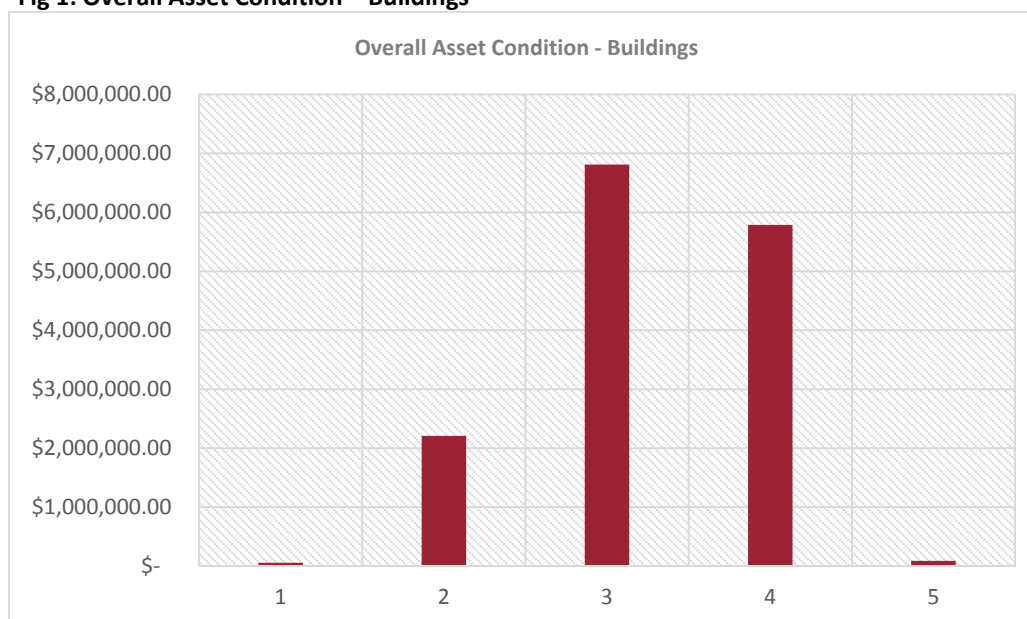
4.3 Asset Condition

Condition is currently monitored via field collection of buildings and land at the time of asset revaluation.

Condition is measured using a 1 – 5 grading system³ as detailed in Table 4.3.1. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system may be used at a more specific level, however, for reporting in the AM plan results are translated to a 1 – 5 grading scale for ease of communication. Illustration showing the overall asset condition Figure 1.

³ IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Fig 1: Overall Asset Condition – Buildings



As shown in Figure 1, approximately 15.2% of the building assets have a condition less than 2 with 45.5% at condition 3 the remaining 39.3% at condition 4 & 5.

Councils building network is being maintained through preventive treatments.

Table 4.3.1: Condition Grading System

Condition Grading	Description of Condition
1	Very Good: free of defects, only planned and/or routine maintenance required
2	Good: minor defects, increasing maintenance required plus planned maintenance
3	Fair: defects requiring regular and/or significant maintenance to reinstate service
4	Poor: significant defects, higher order cost intervention likely
5	Very Poor: physically unsound and/or beyond rehabilitation, immediate action required

The overall condition score and subsequent consumption of the building assets has been estimated based on a combination of available data such as age and the standard useful life of the asset.

Table 4.3.2: Asset Standard Useful Lives

Asset	Standard Useful Life
Building Various Types and Locations	50 – 100 years
Building - No Components	15 – 50 years
Building Electrical Component	32 - 80 years
Building Fit Out Component	20 – 50 years
Building Plumbing Component	32 – 80 years
Building Roof Component	32 – 80 years

Building Sub Structure Component	40 - 100 years
Building Super Structure Component	40 – 100 years

4.4 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection, and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs and cleaning.

The trend in operations and maintenance budgets are shown in Tables 4.4.1 and 4.4.2

Table 4.4.1: Maintenance Budget Trends

Year	Maintenance Budget \$
2019 - 2020	\$66,150 (Actual)
2020 - 2021	\$70,000 (Budget)
2021 - 2022	\$85,000 (Budget)

Table 4.4.2: Operations Budget Trends

Year	Operations Budget \$
2019 - 2020	\$221,500 (Actual)
2020 - 2021	\$231,228 (Budget)
2021 - 2022	\$238,489 (Budget)

Maintenance budget levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

4.5 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 4.5.1. Asset useful lives were last reviewed on 30 June 2020.

Table 4.5.1: Useful Lives of Assets

Asset	Standard Useful Life
Building Various Types and Locations	50 – 100 years
Building - No Components	15 – 50 years
Building Electrical Component	32 - 80 years
Building Fit Out Component	20 – 50 years
Building Plumbing Component	32 – 80 years
Building Roof Component	32 – 80 years
Building Sub Structure Component	40 - 100 years
Building Super Structure Component	40 – 100 years

The estimates for renewals in this AM Plan were based on Method 2.

4.4.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground).⁴

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.⁵

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 4.5.2

Table 4.5.2: Renewal Priority Ranking Criteria

⁴ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

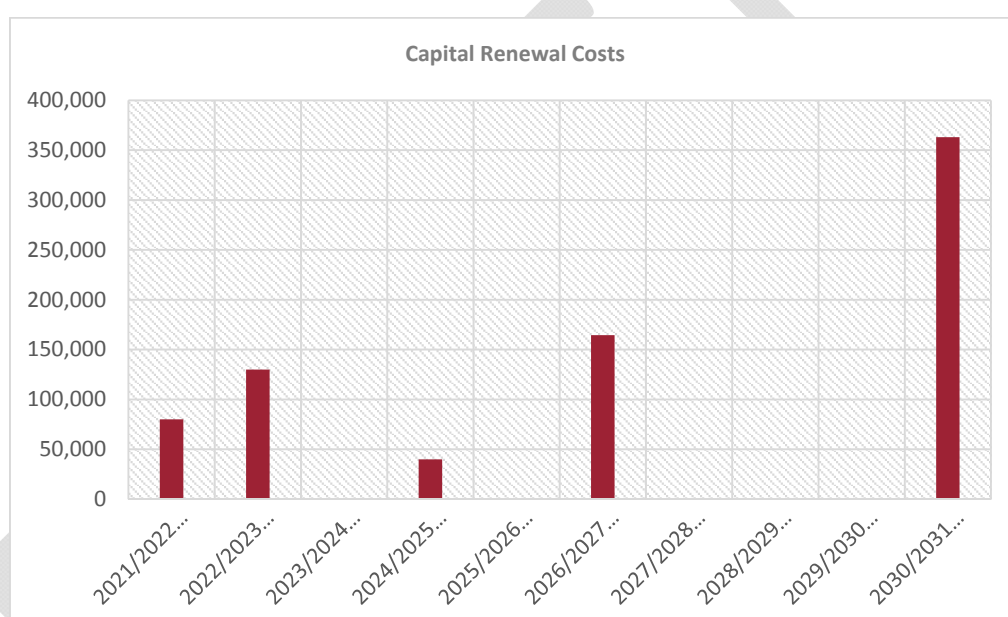
⁵ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Criteria	Weighting
Asset Condition Rating 4 or 5	60
Risks – Residual risk high or extreme	20
Safety and Compliance	20
Total	100%

4.5 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 4.5.1. A detailed summary of the forecast renewal costs is shown in Appendix D.

Figure 4.5.1 Forecast Renewal Costs



All figure values are shown in current day dollars.

4.6 Acquisition Plan

Acquisition reflects are new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated, gifted to Council.

4.6.1 Selection criteria

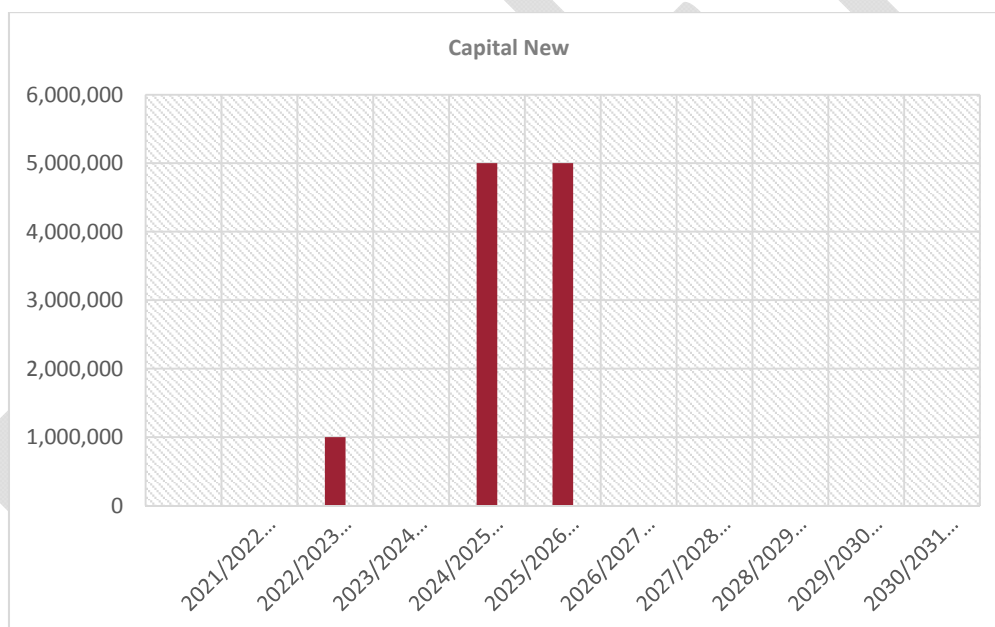
Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Entities needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed in Table 4.6.1.1

Table 4.6.1.1: Acquired Assets Priority Ranking Criteria

Criteria	Weighting
Safety and Compliance	30
Risks – Residual risk high or extreme	30
Demand	40
Total	100%

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised / summarized in Figure 4.6.1.2 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

Figure 4.6.1.2: Acquisition New (Constructed) Summary

All figure values are shown in current day dollars.

4.7 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 4.7.1. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 4.7.1. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

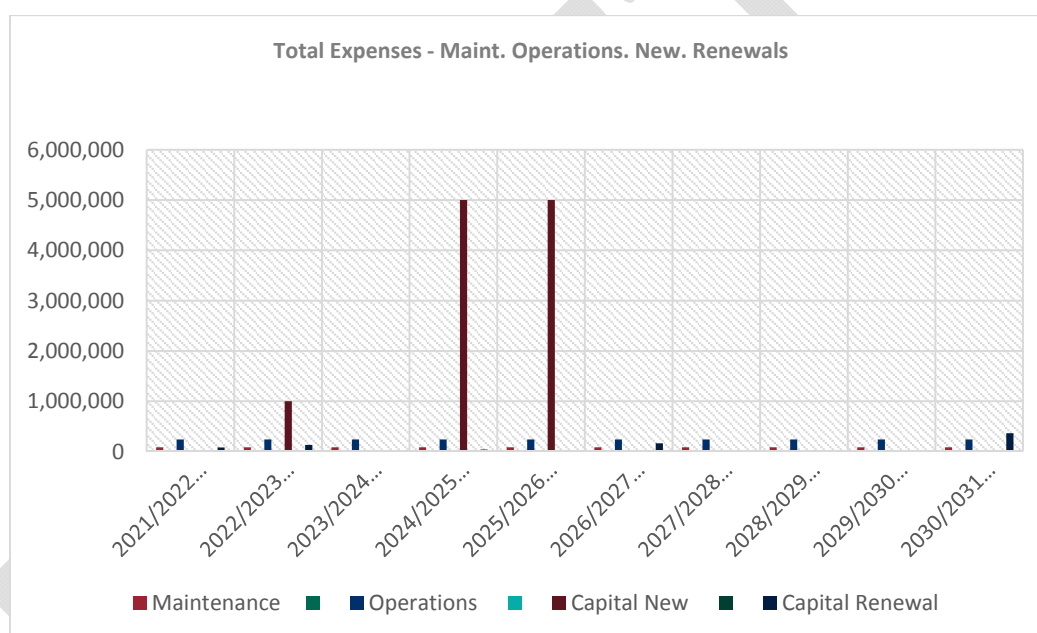
Table 4.7.1: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
None Known	NA	NA	NA	NA
None Known	NA	NA	NA	NA

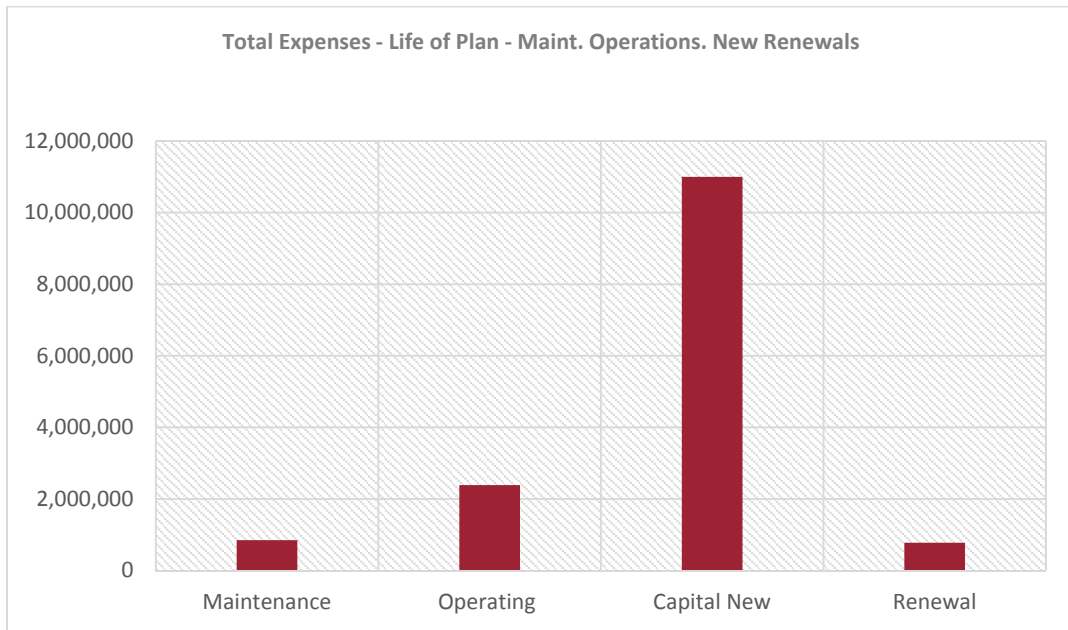
4.8

Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 4.8.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

Figure 4.8.1: Lifecycle Summary

All figure values are shown in current day dollars.



All figure values are shown in current day dollars.

5.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’⁶.

An assessment of risks⁷ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

5.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 5.1.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 5.1.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Buildings	Termite Damage	Significant repair or replacement of asset.
Buildings	Lack of General Up Keep and Maintenance (Property Deterioration)	Poor structural condition. Impact, not fit for purpose.

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

5.2 Risk Assessment

The risk management process used is shown in Figure 5.2.1 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

⁶ ISO 31000:2009, p 2

⁷ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

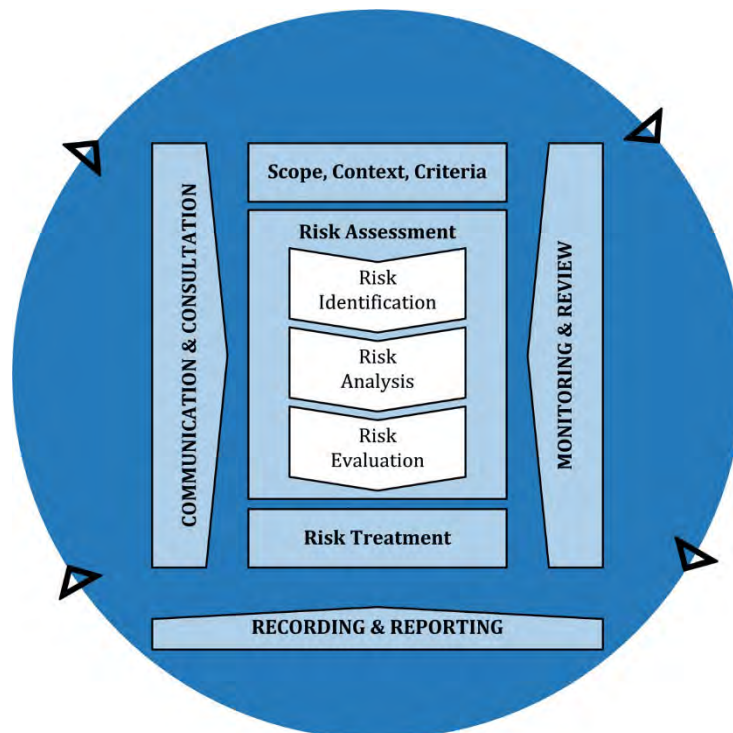


Fig 5.2.1 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks⁸ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 5.2.2. It is essential that these critical risks and costs are reported to the Executive Management Team.

⁸ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

Table 5.2.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Compliance	Future inspections to be carried out to ensure building compliance i.e. fire safety, disabled access, and roof access along with smoke detection and emergency lighting.	High	Undertake regular building inspections.	High	Recurrent budget requirements for maintenance inspections.
Building damage/destruction	Natural disaster. Vandalism. Pest and vermin. Lack of security. Inappropriate use.	Medium	Insurances. Pest control in place. Safety and fire inspections. Liaison with emergency services.	Medium	Recurrent budget for risk management controls.
Buildings structural failure	Insufficient maintenance and inspections. Aged structure.	High	Some maintenance checks and inspections.	High	Ongoing budget requirements.

Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented.

5.3 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale⁹ in accordance with Table 5.3.1.

Table 5.3.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B. High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C. Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or

⁹ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

Confidence Grade	Description
	B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D. Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E. Very Low	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 5.3.2.

Table 5.3.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Very High	Council trends available, Refer to Council Strategic Plan 2020-2024
Growth projections	Very High	Council trends available, refer to Council Strategic Plan 2020-2024
Acquisition forecast	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
Operation forecast	High	Extrapolated from previous years
Maintenance forecast	High	Extrapolated from previous years
Renewal forecast - Asset values	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
- Asset useful lives	Very High	Reviewed in accordance via revaluation schedule
- Condition modelling	Very High	Reviewed in accordance via revaluation schedule and condition ratings
Disposal forecast	N/A	N/A

The estimated confidence level for and reliability of data used in this AM Plan is considered to be Very High.

6.0 PLAN IMPROVEMENT AND MONITORING

6.1 Status of Asset Management Practices¹⁰

6.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is Authority.

6.1.2 Asset management data sources

This AM Plan also utilises asset management data. The source of the data is Conquest.

6.2 Improvement Plan

It is important that council recognise areas of their AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AM Plan is shown in Table 6.2.1.

Table 6.2.1: Improvement Plan

Task	Task	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Continue the development of buildings implementation plans	Council Administration/ Buildings Officer	As per asset condition assessment
3	Review service levels	Council Administration	As required
4	Review parcels of land for need and requirement	Council Administration	As required
5	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
6	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

6.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of 4 years and is due for complete revision and updating within 2 years of each council election.

6.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan,

¹⁰ ISO 55000 Refers to this as the Asset Management System

- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 110%).

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7.0 REFERENCES

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- ISO, 2014, ISO 55000:2014, Overview, principles and terminology
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- Adelaide Plains Council Strategic Plan 2020 - 2024
- Adelaide Plains Council Annual Plan and Budget

8.0 APPENDICES

Appendix A Acquisition Forecast (New)

	2021/20 22 \$	2022/20 23 \$	2023/20 24 \$	2024/20 25 \$	2025/20 26 \$	2026/20 27 \$	2027/20 28 \$	2028/20 29 \$	2029/20 30 \$	2030/20 31 \$	Total
FINANCIAL YEAR:											
Building Capital New											
Temp Accommodation allocation only	0	300,000	0	0	0	0	0	0	0	0	300,000
Office Accommodation Review Outcome - Preliminaries, Design, Consultation, Prudential Report	0	700,000	0	0	0	0	0	0	0	0	700,000
Office Accommodation Review Outcome (not sure of FY & cost, approval subject to Council resolution) allocation only	0	0	0	5,000,000	5,000,000	0	0	0	0	0	10,000,000
	0	1,000,000	0	5,000,000	5,000,000	0	0	0	0	0	11,000,000
TOTAL BUILDING NEW	0	1,000,000	0	5,000,000	5,000,000	0	0	0	0	0	11,000,000

Appendix B Operation Forecast

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Building Operating											
Water, Security, Power, Cleaning, Insurance	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	2,384,890
	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	2,384,890
TOTAL BUILDING OPERATING	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	238,489	2,384,890

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Appendix C Maintenance Forecast

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Building Maintenance											
General Maintenance Requirements - Recurrent Cost	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	850,000
	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	850,000
TOTAL BUILDING MAINTENANCE	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	85,000	850,000

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Appendix D Renewal Forecast Summary

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Buildings Capital Renewal											
Mallala Oval - RSL – Fit out	0	0	0	0	0	160,000	0	0	0	0	160,000
Dublin Institute/Hall - Toilets	80,000	0	0	0	0	0	0	0	0	0	80,000
Two Wells Library - Electrical	0	0	0	0	0	0	0	0	0	93,000	93,000
Mallala Institute/ CWA - Fit out	0	0	0	0	0	0	0	0	0	270,000	270,000
Lewiston Wetlands Playground - Toilet Block	0	130,000	0	0	0	0	0	0	0	0	130,000
Mallala Office - Security System Upgrade (pending office accommodation outcome)	0	0	0	20,000	0	0	0	0	0	0	20,000
Two Wells Office - Security System Upgrade (pending office accommodation outcome)	0	0	0	20,000	0	0	0	0	0	0	20,000
Mallala Institute/CWA - Storage Shed	0	0	0	0	0	4,500	0	0	0	0	4,500
	80,000	130,000	0	40,000	0	164,500	0	0	0	363,000	777,500
TOTAL BUILDINGS RENEWAL	80,000	130,000	0	40,000	0	164,500	0	0	0	363,000	777,500



ASSET MANAGEMENT PLAN

Open Space

Document Control		Asset Management Plan			
Document ID :					
Rev No	Date	Revision Details	Author	Reviewer	Approver
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1.0 Introduction

1.1 Background

This Asset Management Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the planning period.

The Asset Management Plan is to be read with Asset Management Policy and Asset Management Strategy, where developed, along with other key planning documents:

- Strategic Plan
- Annual Business Plan
- Long Term Financial Plan

The Adelaide Plains Council has about 283 open space assets, incorporating parks and reserves, play equipment, sports lighting, shade sails, seating, retaining walls, drinking fountains, barbeques, shelters and cemeteries. The total value of Adelaide Plains Council Open Space portfolio is \$6,421,682.44 million. These range in condition and quality based on several factors including age and quality, its suitability to the physical environment (e.g. coastal or inland), usage, and asset maintenance program.

This Open Space Infrastructure Asset Management Plan provides for Councils Open Space network and has been developed using an asset register which was digitised using historical plans and field collection. The register was valued as at 30 June 2020 and has been updated with 2021/2022 capital works to the value of \$405,000.

The infrastructure assets included in this plan have a total replacement value of \$6,421,682.44 million.

Asset	Quantity	Renewal Value	Total Value
Landscaping Componentry i.e. Irrigation, Wetlands	12	\$702,889.57	\$702,889.57
Site Improvements, Componentry i.e. Netball/Tennis Courts, Seating, Lighting, BBQs, Play Equipment, Fencing etc..	226	\$4,828,598.60	\$4,828,598.60
Structures Componentry i.e. Shade Shelters, Shade Sails, Pergolas	45	\$890,194.27	\$890,194.27
Total			\$6,421,682.44

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 1.1.1

Table 1.1.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Residents and Ratepayers	<ul style="list-style-type: none">▪ Ultimate beneficiaries of the AMP process▪ Feedback collected throughout the year▪ Annual satisfaction survey undertaken
Insurers	<ul style="list-style-type: none">▪ Local Government Mutual Liability Scheme

Key Stakeholder	Role in Asset Management Plan
Lessees	<ul style="list-style-type: none"> Leases operating who provide feedback on services, and have a range of maintenance responsibilities
State & Federal Government	<ul style="list-style-type: none"> Responsible for awarding grants to Council and sporting groups
Visitor / Tourists	<ul style="list-style-type: none"> Regular satisfaction surveys undertaken, and feedback collected
Council	<ul style="list-style-type: none"> To act as custodians of community assets To set Asset Management Policy and vision Allocate resources to meet Council objectives in providing services while managing risks
Executive Management Team	<ul style="list-style-type: none"> Responsible for the development, management and review of an Asset Management Strategy, associated plans, practices and reporting on the status and effectiveness of Council's asset management To monitor and review the performance of employees in achieving the asset management strategy, plans and practices To ensure sufficient resources are applied to manage the assets to legislative requirements; and Accountable for the management of assets within their areas of responsibility
Asset Manager and Staff	<ul style="list-style-type: none"> To lead the development of the Asset Management Plans To develop and implement maintenance, renewal and capital works programs in accordance with the Asset Management Policy, Strategy, Plans, as well as budget allocations Develop Specific Management Plans (upgrade, renewal, maintenance, operations, disposal) To deliver levels of service to agreed risk and cost standards and expectations To report asset related risk and damage To establish and monitor asset compliance and risk inspection regimes To manage asset condition assessments To provide technical expertise to the Executive Management Team

1.2 Goals and Objectives of Asset Ownership

Our goal for managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,

- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

- Levels of service – specifies the services and levels of service to be provided,
- Risk Management,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 ¹
- ISO 55000²

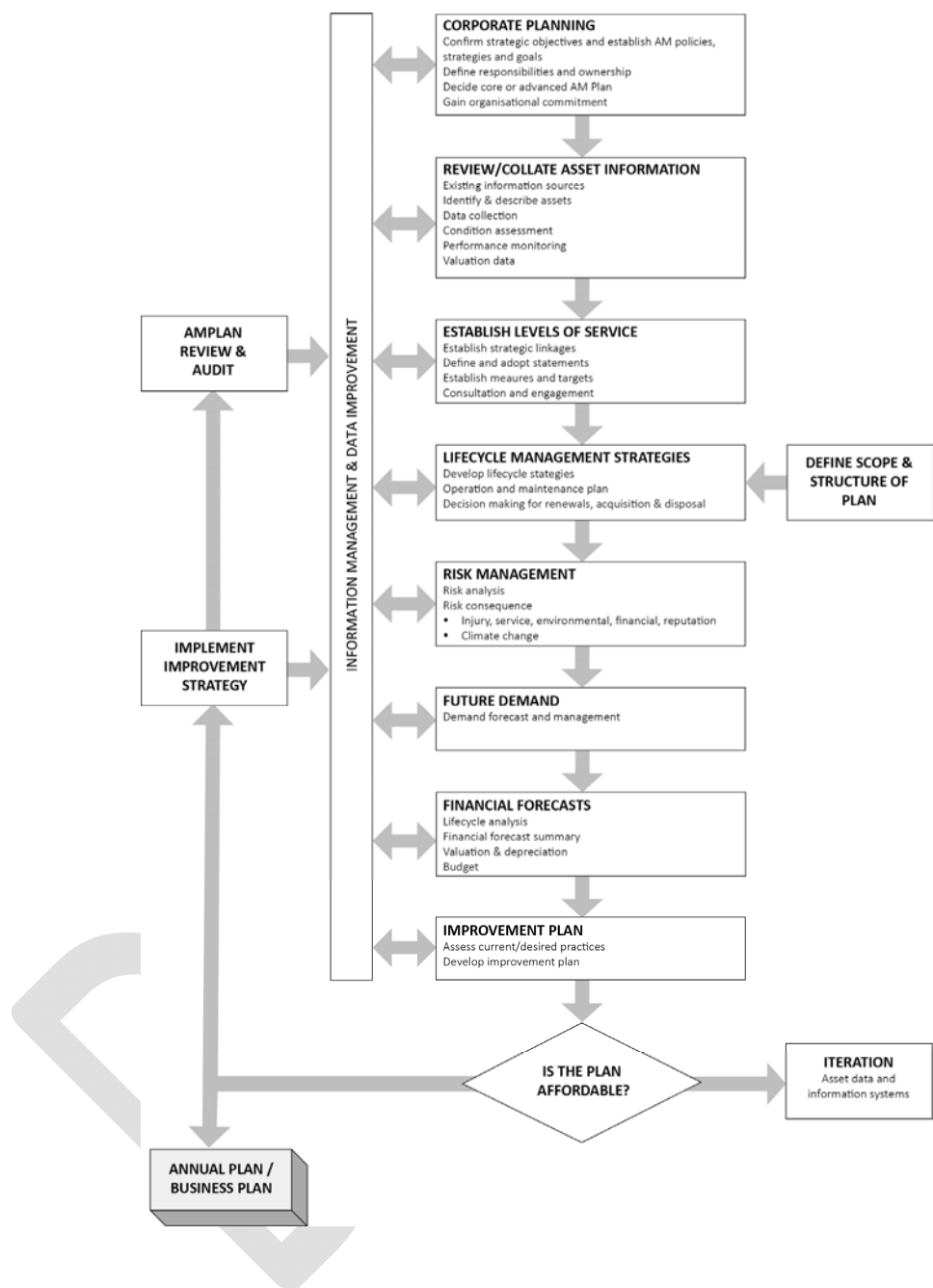
A road map for preparing an AM Plan is shown below.

Road Map for preparing an Asset Management Plan

¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² ISO 55000 Overview, principles and terminology

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



2.0 LEVELS OF SERVICE

The community generally expect that Council will have the necessary infrastructure and operation and maintenance practices in place to manage Councils Open Space assets.

Levels of service relate to outcomes the customer receives in terms of quality, quantity, responsiveness and performance as provided by the asset, they are developed in line with Councils strategic and corporate goals and legislative requirements. Level of service delivery are summarised in Table 2.1.1 Community Levels of Service, Table 2.1.2 Technical Levels of Service and Table 2.1.3 Operational Standards Levels of Service.

Community Levels of Service relates to the service outcomes that the community wants in terms of quality, quantity, responsiveness, amenity, safety and financing.

Table 2.1.1 Community Levels of Service

Key Performance Measure	Level of Service Objective	Performance Measure Process	Current Level of Service	Desired Level of Service
CUSTOMER (COMMUNITY) LEVEL OF SERVICE				
Quality	Open Space assets are damage free and clean	Community survey FY2021/22 Number of customer requests	Not known at this time 50 recorded customer requests per year	7 or above – community satisfaction survey result 10 recorded customer requests per year
Function	Provide opportunities for sports, recreation and enjoyment	Community survey FY2021/22	Not known at this time	7 or above – community satisfaction survey result
Capacity	Assets designed to cater for current and future demand Community participation	Review of usage data and need Community survey FY2021/22	Building capacity is being assessed in the lead up to major renewal or new projects Not known at this time	Building capacity is being assessed in the lead up to major renewal or new projects 7 or above – community satisfaction survey result
Safety	Facilities and free from hazards and accessible to all groups Provide safe suitable facilities free from hazards	Number of incidents/injury reports Average number of safety defects per asset. Legislative compliance	1 recorded customer requests per year Report findings and action requirements	0 recorded customer requests per year Report findings and action requirements within budget allocation

			within budget allocation	
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Technical Levels of Service support the community service levels and are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities that the Council undertakes to best achieve the desired community outcomes.

Table 2.1.2 Technical Levels of Service

Key Performance Measure	Level of Service Objective	Performance Measure Process	Current Level of Service	Desired Level of Service
TECHNICAL LEVEL OF SERVICE				
Condition	Ensuring the physical state of the open space assets are in a serviceable condition	Ongoing maintenance or capital renewal of assets	Report findings and action requirements within budget allocation	Report findings and action requirements within budget allocation
Capacity	Assets have the capacity to meet community demand	Community survey FY2021/22 Develop an Open Space Recreation Strategy with community engagement and input	Not known at this time Future budget allocation provided FY2022/23. Referenced in Open Space Infrastructure Asset Management Plan	7 or above – community satisfaction survey result Implement outcomes from the Open Space Recreation Strategy
Safety	Open Space assets are safe and free of hazards	Legislative compliance for play equipment, asbestos, lead meeting EPA standards	Report findings and action requirements within budget allocation	Report findings and action requirements within budget allocation
Accessibility	Facilities are accessible to all	Compliance with Disability Discrimination Act (DDA), upgrading assets to meet standards	100%	100%

Table 2.1.3 Operational Standards Levels of Service

Descriptor	Class-A	Class-B	Class-C	Class-D	Class-E
Water	Lawns during summer	Summer lawn areas as required	Limited or no lawn irrigation	No lawn irrigation	No Lawn irrigation
	Trees and shrubs as required, drip irrigation to be installed where possible	Trees and shrubs as required, drip irrigation to be installed where possible	Hand water new revegetation areas	Hand water new revegetation areas	Hand water new revegetation areas, first summer only
	Read meters MONTHLY to monitor water use to adhere to water budgets	Read meters MONTHLY to monitor water use to adhere to water budgets	Check meter readings every 6 Months, unless turf irrigated then Monthly	Check meter readings every January and July if present	No water meters
Irrigation Systems	Repair sprinklers, valves and pipes as required	Repair sprinklers, valves and pipes as required	No/limited sprinklers systems, check taps/valves if present	No irrigation systems	No irrigation systems
	Sprinkler checks monthly Nov-Feb	Sprinkler checks monthly Nov-Feb	No/limited sprinklers	No sprinklers	No sprinklers
Mowing	Grass height between 80-100mm covering 30% of turf area	Grass height between 80-100mm covering 30 - 50% of turf area	Seasonally dependent especially on reserves with waterways and drains. Grass height between 100mm - 150mm covering >50% Reserve	Seasonally dependent particularly on reserves with waterways and drains. Grass height at ≥ 150 mm covering >50% of Reserve	Seasonal mowing for firebreaks, grass height >150mm
Note 1: Mowing may be deferred if a community event is scheduled, this is to reduce the impact on the turfs health. Note 2: Slashing may be deferred for Class D & E reserves to allow native grasses to seed.					
Edging	Every 2-4 weeks or as required	Every Month	No edging, unless sloping sites	No edging	No edging
Brush Cutting	Around signage, furniture, structures every 1-2 weeks	Around signage, furniture, structures, path edges every 2-4 weeks	Around signs, furniture, path edges, drain heads every 4 weeks	Around signs, path edges and drain heads every 2 months or as season requires	Around revegetation sites, drain heads & fence lines-seasonal requires

Poisoning	Around garden bed edges, base of trees, footpaths	Lawn edges, garden bed edges, base of trees, footpath surfaces, path edges	Bi-monthly around reserves, fence lines, obstacles, trees, walkways, steps; pest plants as required	Pest plants as required, path edges	Control environmental weeds and spray around new seedlings/revegetation sites
	Check fortnightly - seasonally dependent	Check monthly - seasonally dependent	Spray around new seedlings/revegetation sites	Spray around new seedlings/revegetation sites	Vertebrate pest control when necessary
Pruning / Spraying	Trees and shrubs as required to maintain tidy appearance and for plant health	Trees and shrubs as required	Prune damaged or hazardous branches	Prune damaged or hazardous branches	Pruning only for safety or vehicle access or fire hazard reduction
	Roses in winter and spent flowers as required	Roses in winter and remove flowers as they fade			
Hand Weed	Roses and garden beds where spraying not appropriate - check weekly	Roses and garden beds where spraying not appropriate - check every 2 weeks	No garden beds, spray where possible, some hand weeding of seedlings as required	No garden beds, spray where possible, some hand weeding of seedlings as required	Some hand weeding of seedlings as required
Dig, Plant, Maintain	Annual beds	Annual beds			Not applicable
Plant	Replacements as necessary and for improvements	Replacements as necessary and for improvements	Revegetation and screen plantings in winter	Trees/shrubs - screening and resident request	Trees/shrubs as per environmental and biodiversity planning and programmes
Fertilise	Turf/lawns Autumn and Spring	Lawns in Spring	No/limited fertilising	No fertilising	No fertilising
Top Dress	Lawns/turf to ensure even surfaces throughout	Top dress high traffic or damaged areas as necessary	Uneven surfaces for public safety & mower safety as required	Roll rough or stony areas that are mown	No top dressing
Maintain Assets and Play Equipment	Playground equipment in safe condition (Weekly Monitoring Inspections)	Playground equipment in safe condition (Weekly Monitoring Inspections)	Playground Equipment in a safe condition (Fortnightly Monitoring Inspections)		
	Furniture (seats, tables, bins, barbecues)	Furniture (seats, tables, bins, barbecues)			

	Structures (e.g. shelters, rotundas, toilets/change rooms)	Structures (e.g. shelters, rotundas, toilets/change rooms)	Few or no structures to maintain	Little or no structures to maintain	Little or no structures to maintain
	Monthly inspection of all pathways, footbridges and walking trails in safe to easily accessible state	Monthly inspection of all pathways, footbridges and walking trails in safe to easily accessible state	Safe walkways by repairs to footpaths, walkways, steps, post and rail fences & hand rails as required	Check and maintain walkways/footpaths	Check and maintain walkways/fence lines
Hand Litter Pick Up	Daily to twice weekly (June, July, August)	Daily (Dec, Jan, Feb) - Weekly (May, June, July)	Check Monthly	Pick up as required	Pick up as required
Vandalism/ Repairs	Inspect & access within 24hrs Mon to Fri, carry out ASAP depending on damage/vandalism & required materials	Inspect & access within 24hrs Mon to Fri, carry out ASAP depending on damage/vandalism & required materials	Inspect & Access within 48hrs Mon to Fri, carry out ASAP depending on damage/vandalism & required materials	For safety if required or programmed	For safety if required or programmed

Note: Refer to Appendix E - Reserves & Parks Operational Maintenance Classifications

3.0 FUTURE DEMAND

3.1 Demand Forecasts

Council's open space infrastructure supports its role as a service provider, together with the provision of spaces for community activities and recreation. During the life of this plan Council will conduct a review of its open space assets in consultation with the community to determine the appropriate asset distribution and classification to meet current and future demands.

Factors affecting demand include changes in demographics, customer preferences and expectations and economic factors, etc. Demand factor trends and impacts on service delivery are summarised in Table 3.1.1.

Table 3.1.1 Demand Factors, Projections and Impact on Services

Demand Driver	Present Position	Projection	Impact of Services
Demographics	<p>Planned to accommodate for 19,358 by 2050.</p> <p>Since 2001, Council has had a greater proportion of the mature family demographic) people aged 5-17 years and 35 to 59 years) than Grater Adelaide.</p> <p>Between 2001 and 2016 the proportion of people aged between 60 and 84 years increased from 23.0% to 35.3%, and increase of 843 persons.</p> <p>(source, APC Strategic Plan 2020-2024)</p>	<p>Reliable forecasts suggest Adelaide Plans Council will have a high proportion of families and a growing proportion of population aged over 60 years at 2041. (source, APC Strategic Plan 2020-2024)</p>	<p>Changing nature of services delivered from facilities.</p> <p>Mobility considerations.</p> <p>Need to maintain facilities utilised by the younger population and families to support growth e.g. playgrounds.</p>
DDA compliance	<p>Accessibility to open space assets is important for all users.</p>	<p>When upgrading of open space assets to ensure Council meets DDA requirements and Council continues to monitor any changes to legislation.</p>	<p>Additional upgrade, renewal and maintenance costs to be allocated.</p>
Climate/environmental changes	<p>Exponential severe weather events to continue based on current trends.</p>	<p>Assets not reaching their stated useful lives due to lack of consideration of climate change.</p>	<p>Higher costs associated with construction methods that are environmentally sustainable.</p>
Community facilities	<p>Open Space assets such as seating and playgrounds are located in appropriate areas.</p>	<p>Increased public expectation for additional open space facilities.</p>	<p>Requiring whole of Life cost assessment.</p>

		Develop an Open Space and Recreation Strategy 2022-23	
Technology change	Trends showing smart cities/townships creating services through smart technology.	Operating and maintenance costs can be reduced with the application of smart technology. Reduced water, power and waste consumption with all be a direct benefit to the environment.	Level of service improvements for parks, reserves will impact our maintenance and renewal programs.

3.2 Demand Impact and Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Council will determine the ability of the existing systems to manage increased requirements. Opportunities identified to date for demand management are shown in Table 3.1.2.

Further opportunities will be developed in future revisions of this asset management plan.

Table 3.1.2 Demand Management Plan

Service Activity	Demand Management Plan
Change in services	Further analysis of providing the service at current and target service levels.
	Managing existing assets through planned maintenance, renewal and upgrade.
	Providing new assets to meet demand.
	Communicate service levels to the community measured against current funding capacity.
	Greater budget allocation to cater for developers gifted assets i.e. lawned/grassed areas in parks and verges, playground/equipment, trees, seating and bin enclosures.
	Develop Open Space Recreation Strategy and Action Plan FY2022/23

4.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Council plans to manage and operate the assets at the agreed levels of service (Refer to Section 2) while managing life cycle costs.

4.1 Background Data

Adelaide Plains Council's Open Space assets are located throughout several towns in the Council area.

- Structures
- Landscaping
- Site Improvements

4.2 Asset Capacity and Performance

Council's services are generally provided to meet design standards where these are available. Locations where deficiencies in service performance are known are detailed in Table 4.2.1

Table 4.2.1: Known Service Performance Deficiencies

Assets	Service Deficiency
Future Demand	Providing new assets to meet community demand.
Developers	Increase in quantity of assets requiring ongoing maintenance and renewal. Greater budget allocation to cater for developers gifted assets i.e. lawned/grassed areas in parks and verges, playground/equipment, trees, seating and bin enclosures.
Change in Services	Develop an Open Space Recreation Strategy and Action Plan 2022/23 financial year.

The above service deficiencies were identified and are being considered and prioritised. Refer to above Demand Management Plan.

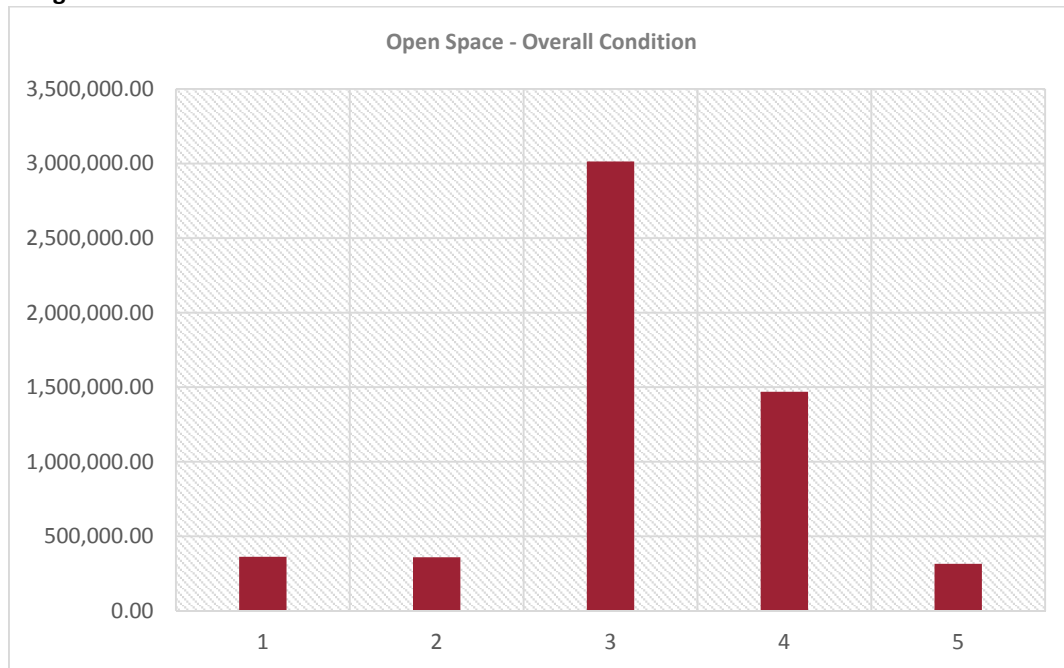
4.3 Asset Condition

Condition is currently monitored via field collection of open space at the time of asset revaluation.

Condition is measured using a 1 – 5 grading system³ as detailed in Table 4.3.1. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system may be used at a more specific level, however, for reporting in the AM plan results are translated to a 1 – 5 grading scale for ease of communication. Illustration showing the overall asset condition Figure 1.

³ IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Fig 1: Asset Condition – Overall



As shown in Figure 1, approximately 13.0% of the open space overall assets have a condition less than 2 with 54.6% at condition 3 the remaining 32.4% at condition 4 & 5.

Councils open space network is being maintained through preventive treatments.

Table 4.3.1: Condition Grading System

Condition Grading	Description of Condition
1	Very Good: free of defects, only planned and/or routine maintenance required
2	Good: minor defects, increasing maintenance required plus planned maintenance
3	Fair: defects requiring regular and/or significant maintenance to reinstate service
4	Poor: significant defects, higher order cost intervention likely
5	Very Poor: physically unsound and/or beyond rehabilitation, immediate action required

The overall condition score and subsequent consumption of the open space assets has been estimated based on a combination of available data such as age and the standard useful life of the asset.

Table 4.3.2: Asset Standard Useful Lives

Asset	Standard Useful Life
Landscaping - Oval Irrigation, Play Equipment, BBQs	10 years
Water Tanks, Bench Seating	15 years
Bollards, Boom Gates, Pergola	20 years
Sports Lighting, Block Paving, Gates, Hotmix Paving, Concrete Kerbing	25 years

Fencing, Flag Poles	30 years
Skate Ramp, Paving Masonry	40 years
Brick Shelter	50 years
Historic Wells Reserve	60 years
Statue on Base, Steel ANZAC Memorial, Plaques, War Tank	80 years
Stone Walls, Granite	100 years

4.4 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection, and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs and cleaning.

The trend in operations and maintenance budgets are shown in Tables 4.4.1

Table 4.4.1: Maintenance/Operations Budget Trends

Year		Reserves	Parks & Garden	Ovals	Playgrounds	Total
2019 - 2020	\$ (Actual)	136,228	117,939	70,429	25,840	350,436
2020 - 2021	\$ (Actual)	298,972	155,513	66,887	9,314	530,686
2021 - 2022	\$ (Budget)	253,331	268,839	75,641	9,588	607,399

Maintenance budget levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

4.5 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 4.5.1. Asset useful lives were last reviewed on 30 June 2020.

Table 4.5.1: Useful Lives of Assets

Asset	Standard Useful Life
-------	----------------------

Landscaping - Oval Irrigation, Play Equipment, BBQs	10 years
Water Tanks, Bench Seating	15 years
Bollards, Boom Gates, Pergola	20 years
Sports Lighting, Block Paving, Gates, Hotmix Paving, Concrete Kerbing	25 years
Fencing, Flag Poles	30 years
Skate Ramp, Paving Masonry	40 years
Brick Shelter	50 years
Historic Wells Reserve	60 years
Statue on Base, Steel ANZAC Memorial, Plaques, Army Tank	80 years
Stone Walls, Granite	100 years

The estimates for renewals in this AM Plan were based on Method 2.

4.4.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground).⁴

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.⁵

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 4.5.2

Table 4.5.2: Renewal Priority Ranking Criteria

⁴ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

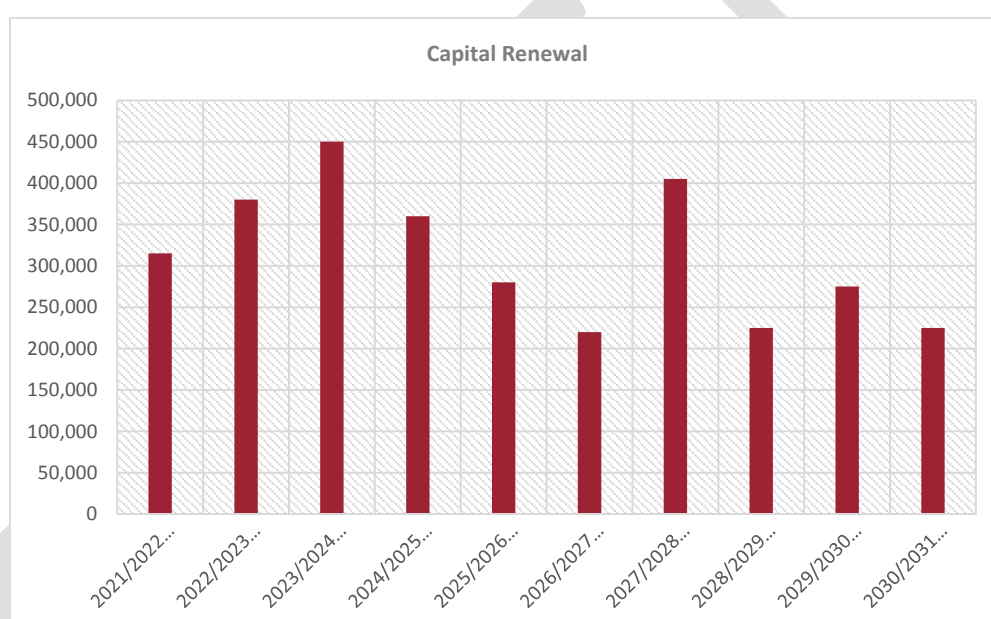
⁵ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Criteria	Weighting
Asset Condition Rating 4 or 5	60
Risks – Residual risk high or extreme	20
Safety and Compliance	20
Total	100%

4.5 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 4.5.1. A detailed summary of the forecast renewal costs is shown in Appendix D.

Figure 4.5.1 Forecast Renewal Costs



All figure values are shown in current day dollars.

4.6 Acquisition Plan

Acquisition reflects are new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated, gifted to Council.

4.6.1 Selection criteria

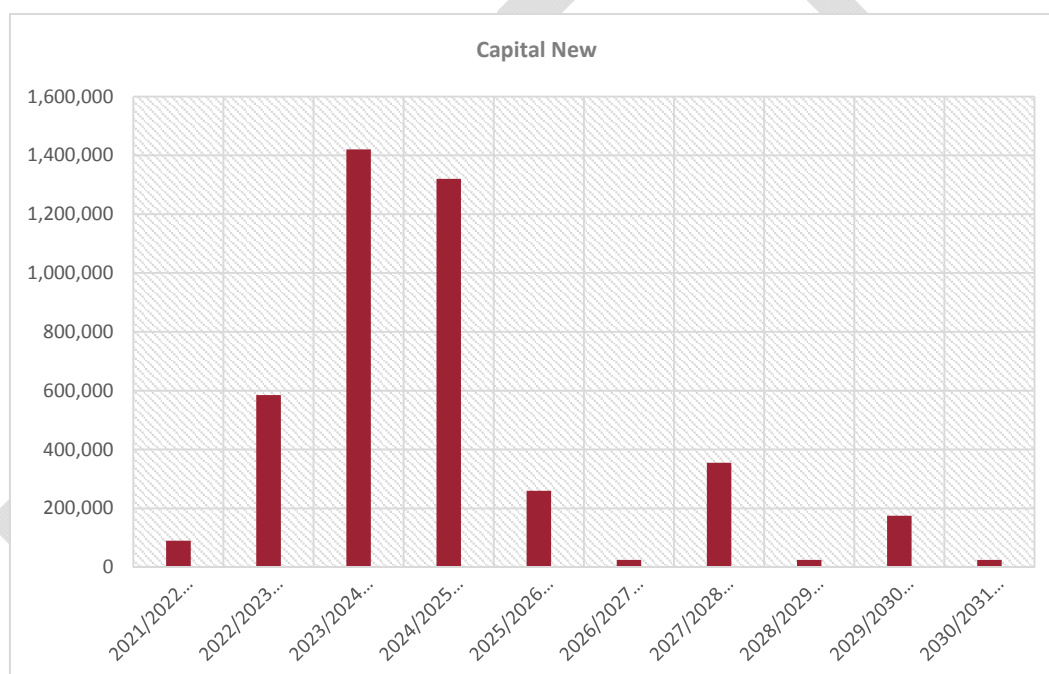
Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Entities needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed in Table 4.6.1.1

Table 4.6.1.1: Acquired Assets Priority Ranking Criteria

Criteria	Weighting
Safety and Compliance	30
Risks – Residual risk high or extreme	30
Demand	40
Total	100%

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised / summarized in Figure 4.6.1.2 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

Figure 4.6.1.2: Acquisition New (Constructed) Summary

All figure values are shown in current day dollars.

4.7 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 4.7.1. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 4.7.1. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

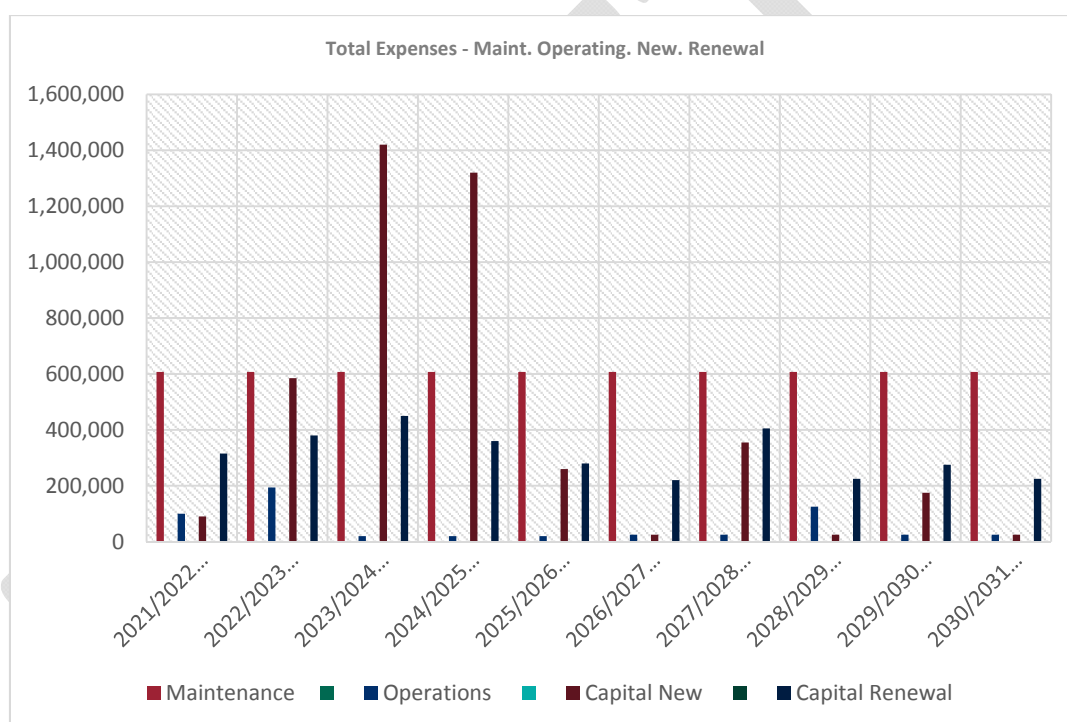
Table 4.7.1: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
None Known	NA	NA	NA	NA
None Known	NA	NA	NA	NA

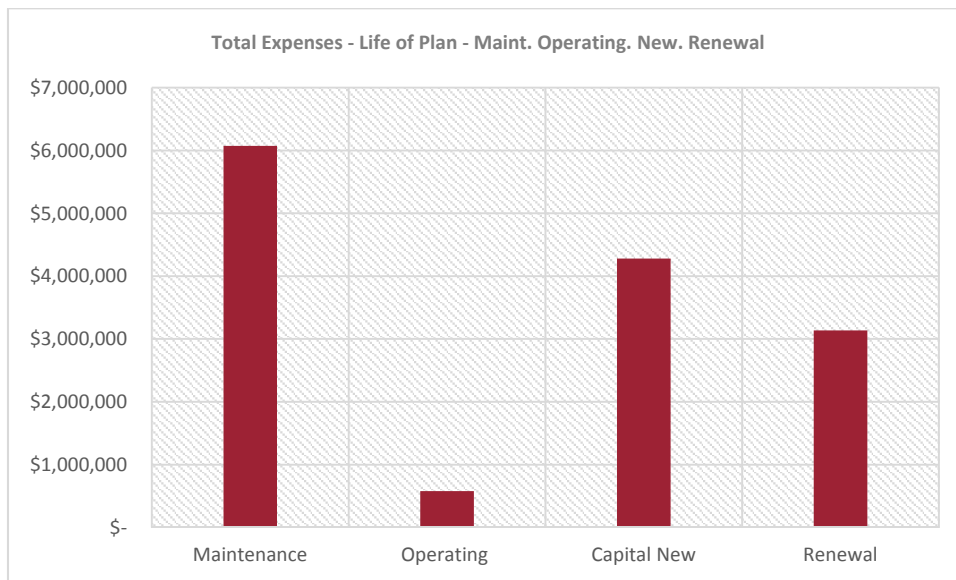
4.8

Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 4.8.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

Figure 4.8.1: Lifecycle Summary

All figure values are shown in current day dollars.



All figure values are shown in current day dollars.

5.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’⁶.

An assessment of risks⁷ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

5.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 5.1.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 5.1.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Play Equipment	Damage – Wear and Tear	Significant repairs or replacement of asset.
Structures	Lack of General Maintenance	Poor structural condition. Impact, not fit for purpose.

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

5.2 Risk Assessment

The risk management process used is shown in Figure 5.2.1 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

⁶ ISO 31000:2009, p 2

⁷ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

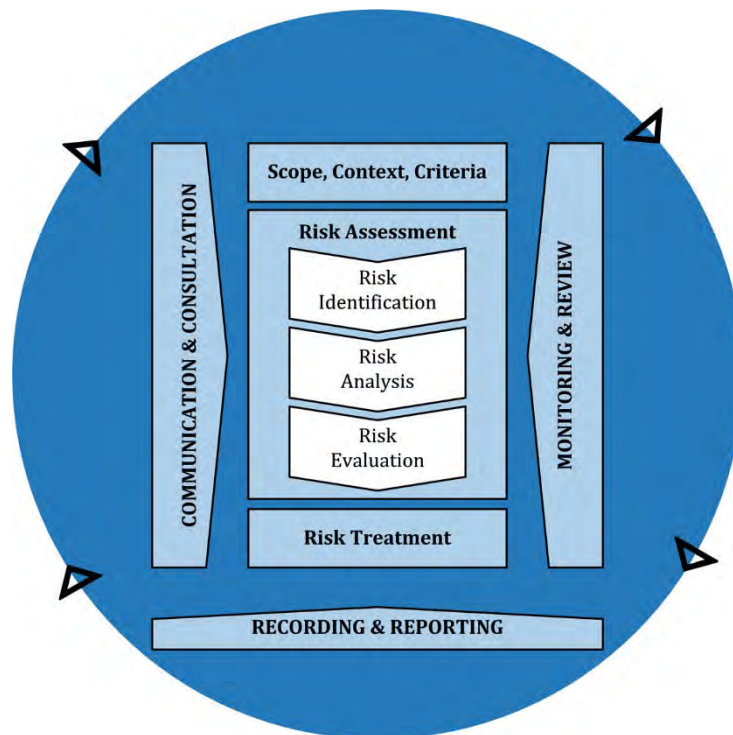


Fig 5.2.1 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks⁸ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 5.2.2. It is essential that these critical risks and costs are reported to the Executive Management Team.

⁸ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

Table 5.2.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Play Equipment (compliance)	Asset failure, not conforming to Australian Standards	High	Undertake regular play equipment inspections, frequency as per Australian Standards	Low	Recurrent budget requirements for ongoing inspections.
Structures - structural failure	Insufficient maintenance and inspections. Aged structure.	High	Undertake regular site inspections, document findings/conditions.	Low	Ongoing budget requirements.

Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented.

5.3 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale⁹ in accordance with Table 5.3.1.

Table 5.3.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B. High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C. Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D. Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E. Very Low	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 5.3.2.

⁹ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

Table 5.3.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Very High	Council trends available, Refer to Council Strategic Plan 2020-2024
Growth projections	Very High	Council trends available, refer to Council Strategic Plan 2020-2024
Acquisition forecast	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
Operation forecast	High	Extrapolated from previous years
Maintenance forecast	High	Extrapolated from previous years
Renewal forecast		
- Asset values	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
- Asset useful lives	Very High	Reviewed in accordance via revaluation schedule
- Condition modelling	Very High	Reviewed in accordance via revaluation schedule and condition ratings
Disposal forecast	N/A	N/A

The estimated confidence level for and reliability of data used in this AM Plan is considered to be Very High.

6.0 PLAN IMPROVEMENT AND MONITORING

6.1 Status of Asset Management Practices¹⁰

6.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is Authority.

6.1.2 Asset management data sources

This AM Plan also utilises asset management data. The source of the data is Conquest.

6.2 Improvement Plan

It is important that council recognise areas of their AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AM Plan is shown in Table 6.2.1.

Table 6.2.1: Improvement Plan

Task	Task	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Continue the development of open space implementation plans	Council Administration	As per asset condition assessment
3	Review service levels	Council Administration	As required
4	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
5	Develop Open Space & Recreation Strategy	Council Administration	FY2022/23
6	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

6.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of 4 years and is due for complete revision and updating within 2 years of each council election.

6.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan,

¹⁰ ISO 55000 Refers to this as the Asset Management System

- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 110%).

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7.0 REFERENCES

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- ISO, 2014, ISO 55000:2014, Overview, principles and terminology
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- Adelaide Plains Council Strategic Plan 2020 - 2024
- Adelaide Plains Council Annual Plan and Budget

8.0 APPENDICES

Appendix A Acquisition Forecast (New)

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Street & Reserves/Parks Furniture Program	0	20,000	20,000	20,000	20,000	25,000	25,000	25,000	25,000	25,000	205,000
Streetscape and WSUD	0	50,000	50,000	50,000	0	0	0	0	0	0	150,000
Donaldson Road, Close Make Parkland/Rec Type Area	0	5,000	10,000	50,000	0	0	0	0	0	0	65,000
Parham Short Stay - Shelter/camp kitchen, upgrade surface, fencing renewal, landscaping and signage	0	0	200,000	0	0	0	0	0	0	0	200,000
Wetland Trails, Lewiston - seating, paths, signage	0	0	0	50,000	0	0	0	0	0	0	50,000
Bakers Wetland - seating, paths, signage	0	0	0	0	50,000	0	0	0	0	0	50,000
Hams Park, Stage 2, Relocate	0	0	0	0	40,000	0	0	0	0	0	40,000
Middle Beach - Foreshore upgrade	0	0	0	300,000	0	0	0	0	0	0	300,000
Open Space & Recreation Strategy Outcomes (Allocation)	0	0	50,000	0	50,000		50,000	0	50,000	0	200,000
Trail Strategy Outcomes (Allocation)	0	0	100,000	0	100,000		100,000	0	100,000	0	400,000
Parham Playground Landscaping, Shade, Furniture, Parking & Paths (Levee)	0	0	0	0	0	0	180,000	0	0	0	180,000
Council Boundary Signs - Allocation	0	60,000	0	0	0	0	0	0	0	0	60,000
Township Entrance Signs - Allocation	0	0	140,000	0	0	0	0	0	0	0	140,000

Parham Playground - Shade Shelter	60,000	0	0	0	0	0	0	0	0	0	60,000
Parham Playground - New Element	15,000	0	0	0	0	0	0	0	0	0	15,000
Mallala Playground - New Element	15,000	0	0	0	0	0	0	0	0	0	15,000
Stage 1 - Hart Reserve Development - Implementation (master planned 2020/21)	0	400,000	0	0	0	0	0	0	0	0	400,000
Stage 2 - Hart Reserve Development - Implementation (master planned 2020/21)	0	0	200,000	0	0	0	0	0	0	0	200,000
Stage 2 - Two Wells/Mallala Ovals - Implementation	0	0	500,000	0	0	0	0	0	0	0	500,000
Stage 2A - Two Wells/Mallala Ovals - Implementation	0	0	0	500,000	0	0	0	0	0	0	500,000
Stage 3 - Two Wells Oval - Additions, Support to Area (Possible New Sport Facilities)	0	0	0	350,000	0	0	0	0	0	0	350,000
Stage 1 - Police Block - Shelter, Skate Park, Masterplan/Concepts	0	50,000	0	0	0	0	0	0	0	0	50,000
Stage 2 - Police Block - Shelter, Skate Park, Masterplan/Concepts	0	0	150,000	0	0	0	0	0	0	0	150,000
	0	0	0	0	0	0	0	0	0	0	0
	90,000	585,000	1,420,000	1,320,000	260,000	25,000	355,000	25,000	175,000	25,000	4,280,000
TOTAL OPEN SPACE NEW	90,000	585,000	1,420,000	1,320,000	260,000	25,000	355,000	25,000	175,000	25,000	4,280,000

Appendix B Operation Forecast

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Roadside Vegetation Management Plan	0	100,000	0	0	0	0	0	50,000	0	0	150,000
Open Space & Recreation Strategy	0	60,000	0	0	0	0	0	50,000	0	0	110,000
Street/Verge Tree Planting	0	20,000	20,000	20,000	20,000	25,000	25,000	25,000	25,000	25,000	205,000
Implement, Eden and Liberty Recycled Water	0	4,000	0	0	0	0	0	0	0	0	4,000
Parham Campground - Formalise Land	0	5,000	0	0	0	0	0	0	0	0	5,000
Parham - Old Playground Block (Sell or Develop Site)	0	5,000	0	0	0		0	0	0	0	5,000
Stage 1 - Two Wells/Mallala Ovals - (Masterplan, Design/Costing/Consultation) includes car park, lighting, cricket nets etc.. (seeking grant \$100k to match APC budgeted funds)	0	100,000	0	0	0	0	0	0	0	0	100,000
	0	0	0	0	0	0	0	0	0	0	0
	0	294,000	20,000	20,000	20,000	25,000	25,000	125,000	25,000	25,000	579,000
TOTAL OPEN SPACE OPERATING	0	294,000	20,000	20,000	20,000	25,000	25,000	125,000	25,000	25,000	579,000

Appendix C Maintenance Forecast

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Open Space Maintenance											
	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	6,073,990
	0	0	0	0	0	0	0	0	0	0	0
	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	6,073,990
TOTAL OPEN SPACE MAINTENANCE	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	607,399	6,073,990

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Appendix D Renewal Forecast Summary

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Open Space Capital Renewal											
Street & Reserves/Parks Furniture Program	20,000	20,000	20,000	20,000	20,000	20,000	25,000	25,000	25,000	25,000	220,000
Open Space & Recreation Strategy Outcomes (Allocation)	0	0	50,000	0	50,000	0	50,000	0	50,000	0	200,000
Wetland Trails - Lewiston Shelter	0	0	0	10,000	0	0	0	0	0	0	10,000
Bakers Wetland - Shelter	0	0	0	0	10,000	0	0	0	0	0	10,000
Two Wells Oval - Irrigation System	95,000	0	0	0	0	0	0	0	0	0	95,000
Two Wells Oval Entrance	70,000	0	0	0	0	0	0	0	0	0	70,000
Dublin Lions Park	70,000	0	0	0	0	0	0	0	0	0	70,000
Lewiston Reserve, Fencing	10,000	0	0	0	0	0	0	0	0	0	10,000
Reserve & Street Furniture (various locations)	15,000	0	0	0	0	0	0	0	0	0	15,000
Signage - Wayfinding & Information (various locations)	35,000	0	0	0	0	0	0	0	0	0	35,000
Two Wells Mainstreet Playground Upgrade	0	0	180,000	0	0	0	0	0	0	0	180,000
Lewiston Playground Upgrade	0	0	0	130,000	0	0	0	0	0	0	130,000
Dublin Playground Upgrade	0	130,000	0	0	0	0	0	0	0	0	130,000

Parham Playground Upgrade	0	0	0	0	0	0	130,000	0	0	0	130,000
Parham Camp Ground - Fencing	0	30,000	0	0	0	0	0	0	0	0	30,000
Future Site Improvements Renewal	0	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	1,800,000
	0	0	0	0	0	0	0	0	0	0	0
	315,000	380,000	450,000	360,000	280,000	220,000	405,000	225,000	275,000	225,000	3,135,000
TOTAL OPEN SPACE RENEWAL	315,000	380,000	450,000	360,000	280,000	220,000	405,000	225,000	275,000	225,000	3,135,000

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Appendix E Reserves & Parks Operational Maintenance Classifications

Adelaide Plains Council Reserves & Parks Operational Maintenance Classifications

CLASS-A RESERVES & PARKS

Name	Location
Lewiston Playground	Lewiston
Lewiston Dog Off Leash	Lewiston
Two Wells Memorial	Two Wells
Two Wells Playground	Two Wells
Two Wells Village Green	Two Wells
Two Wells Sporting Complex	Two Wells
Two Wells Service Centre	Two Wells
Two Wells Main Street Gardens	Two Wells
East Reserve	Mallala
Mallala Office	Mallala
Mallala Playground	Mallala
Mallala Sporting Complex	Mallala
Dublin Lions Park	Dublin
Dublin Sporting Complex	Dublin

CLASS-B RESERVES & PARKS

Name	Location
Petticoat Lane	Two Wells
Historic Wells & Path	Two Wells
Dunstan Units	Mallala
Mallala Monument	Mallala
Mallala Hub	Mallala
Mallala Chamber	Mallala
Dublin Main Street	Dublin
Schlodder Shelter	Dublin
Dublin Playground	Dublin
Port Parham Playground	Port Parham
Two Wells Cemetery	Two Wells
Feltwell Cemetery	Mallala

CLASS-C RESERVES & PARKS

Name	Location
Gameau Reserve	Two Wells
Hart Reserve	Two Wells
Dog Obedience	Two Wells
Dog Off-Leash Two Wells	Two Wells
Police Block	Mallala
Campground	Port Parham
Thompson Beach Foreshore Shelters	Thompson Beach
Grace Plains Cemetery	Grace Plains
Shannon Cemetery	Calomba
Dublin Cemetery	Dublin
Barabba Cemetery	Barabba

CLASS-D RESERVES & PARKS

Name	Location
Donaldson Road Reserve	Two Wells
Gameau Dam	Two Wells
Rockies Reserve	Barabba
Lewiston Wetlands	Lewiston
Camel Reserve	Lewiston
Fletcher Reserve	Lewiston
Aunger Ponds	Lewiston
Hams Park	Lewiston
Pony Track	Lewiston
Equus Reserve	Lewiston
Old Playground Block	Port Parham

CLASS-E RESERVES & PARKS

Name	Location
Harniman Reserve	Lewiston
Connel Vale Reserve	Lewiston
Humzy Reserve	Lewiston
Bakers Wetland	Lewiston
Greens Reserve	Lewiston

Cannizzaro Reserve	Lewiston
Hancock Reserve	Lewiston
Bethesda Road Reserve	Lewiston
Hayman Reserve	Lewiston
Clysdale Reserves	Lewiston
Dragonfly Reserve	Lewiston
Gilks Reserve	Lewiston
Canala Ct Reserve	Two Wells
Rodeo Grounds	Two Wells
Avon Road Reserve	Dublin
Dublin Parklands	Dublin
Barabba Reserve	Barabba
Redbanks Reserve - Germantown Rd	Redbanks
Coleman road- Old Dump	Mallala
Limerock Road Old Dump	Lower Light
Rowe Road Ford Reserve	Lower Light
Blue Bonnet Reserve	Lower Light
Deviation Road Reserves	Lewiston
Various Closed Road Reserves	District

ASSET MANAGEMENT PLAN

Stormwater

Document Control		Asset Management Plan			
Document ID :					
Rev No	Date	Revision Details	Author	Reviewer	Approver
V1.11	May 2021	Develop Stormwater Infrastructure Asset Management Plan	IAC		
V1.11	July 2021	For Review	IAC	GMEI EMT	EMT

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1.0 Introduction

1.1 Background

This AM Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the planning period.

The AM Plan is to be read with the 2017 Two Wells Stormwater Management planning document. This should include the Asset Management Policy and Asset Management Strategy, where developed, along with other key planning documents:

- Strategic Plan
- Annual Business Plan
- Long Term Financial Plan

Council own and manage stormwater assets within the Council this includes: pipes, box culverts, pits, junction boxes, headwalls, gross pollutant traps and pump stations.

Stormwater assets located within road reserves owned by The Department for Infrastructure and Transport (DiT) that drain stormwater from both the DiT road and the Council drainage area.

This Stormwater Infrastructure Asset Management Plan provides for Councils stormwater drainage network and has been developed using an asset register which was digitised using historical plans and field collection during 2020. The register was valued as at 30 June 2020 and has been updated with 2021/2022 capital works to the value of \$000.

The infrastructure assets included in this plan have a total replacement value of \$11,517,680

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 1.1.1

Table 1.1.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Residents and Ratepayers	<ul style="list-style-type: none">■ Ultimate beneficiaries of the AMP process■ Feedback collected throughout the year■ Annual satisfaction survey undertaken
Visitor / Tourists	<ul style="list-style-type: none">■ Regular satisfaction surveys undertaken, and feedback collected
Insurers	<ul style="list-style-type: none">■ Local Government Mutual Liability Scheme
Council	<ul style="list-style-type: none">■ To act as custodians of community assets■ To set Asset Management Policy and vision■ Allocate resources to meet Council objectives in providing services while managing risks
Executive Management Team	<ul style="list-style-type: none">■ Responsible for the development, management and review of an Asset Management Strategy, associated plans, practices and reporting on the status and effectiveness of Council's asset management■ To monitor and review the performance of employees in achieving the asset management strategy, plans and practices

Key Stakeholder	Role in Asset Management Plan
	<ul style="list-style-type: none"> ■ To ensure sufficient resources are applied to manage the assets to legislative requirements; and ■ Accountable for the management of assets within their areas of responsibility
Asset Manager and Staff	<ul style="list-style-type: none"> ■ To lead the development of the Asset Management Plans ■ To develop and implement maintenance, renewal and capital works programs in accordance with the Asset Management Policy, Strategy, Plans, as well as budget allocations ■ Develop Specific Management Plans (upgrade, renewal, maintenance, operations, disposal) ■ To deliver levels of service to agreed risk and cost standards and expectations ■ To report asset related risk and damage ■ To establish and monitor asset compliance and risk inspection regimes ■ To manage asset condition assessments ■ To provide technical expertise to the Executive Management Team

1.2 Goals and Objectives of Asset Ownership

Our goal for managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

- Levels of service – specifies the services and levels of service to be provided,
- Risk Management,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

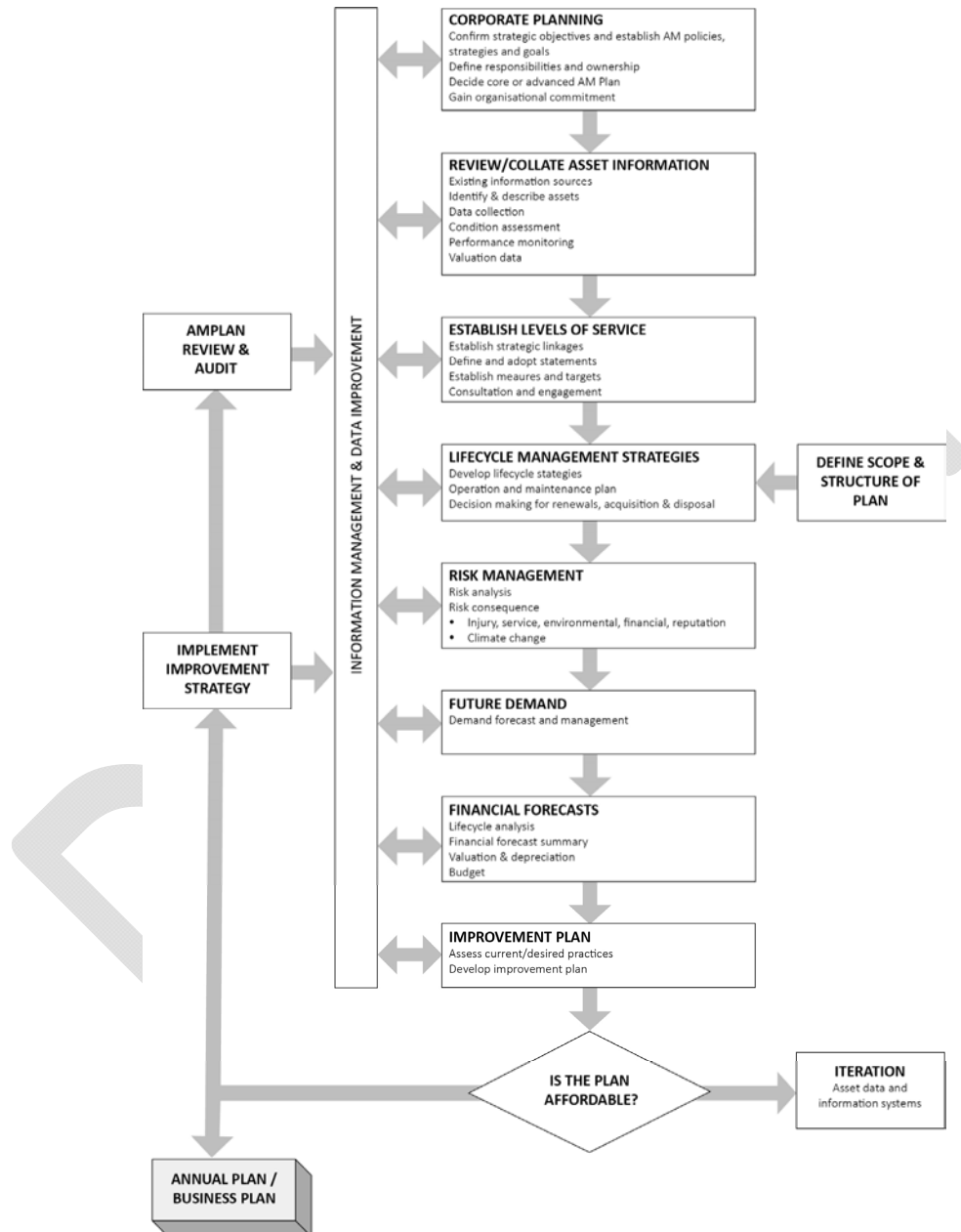
Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 ¹
- ISO 55000²

A road map for preparing an AM Plan is shown below.

Road Map for preparing an Asset Management Plan

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² ISO 55000 Overview, principles and terminology

2.0 LEVELS OF SERVICE

The community generally expect that Council will have the necessary infrastructure and operation and maintenance practices in place to control the stormwater in such a way that the tolerance to minor and major flooding is balanced against the cost to install and maintain a drainage system network.

Council has defined service levels in two terms and provides the level of service objective, performance measure process and service target in Table 2.1.1 and Table 2.1.2

Community Levels of Service relates to the service outcomes that the community wants in terms of reliability, responsiveness, amenity, safety and financing.

Table 2.1.1 Community Levels of Service

Key Performance Measure	Level of Service Objective	Performance Measure Process	Current Level of Service	Desired Level of Service
CUSTOMER (COMMUNITY) LEVEL OF SERVICE				
Quality	Stormwater network is generally unobstructed	Regular cleaning of stormwater pits and street sweeper activities	Proactive planned works undertaking of regular checking and cleaning of assets	Continue work practice - Proactive planned works undertaking of regular checking and cleaning of assets
Function/Capacity /Performance	Stormwater functions/capacity to required level (i.e. no flash flooding in events less than a 5Yr Annual Recurrence Intervals (ARI), protection of dwellings	When undertaking asset renewal and/or new works, consideration to future Annual Recurrence Intervals (ARI), events	Road and general stormwater levels, designs are considered during the design phase	Road and general stormwater levels, designs are considered during the design phase for projects Mallala Stormwater Flood Plain Management Plan & Stormwater Urban Master Plan to be developed 2022/24 AWE completed Two Wells stormwater review
Responsiveness	Reactive to services with determined response time	Time taken to respond to customer requests during and after office hours	Contact details are available on councils website, weather warning advice issued, APC resources are prepared to respond	Contact details are available on councils website, weather warning advice issued, APC resources are prepared to respond

Technical Levels of Service support the community service levels and are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities that the Council undertakes to best achieve the desired community outcomes.

Table 2.1.2 Technical Levels of Service

TECHNICAL LEVEL OF SERVICE				
Condition	Physical state of stormwater assets is in serviceable condition	When undertaking asset renewal and/or new works, to consider future ARI events	Road and general stormwater levels, designs are considered during the design phase	Report findings and action requirements within budget allocation
Capacity	Assets have the capacity to meet community demand	When undertaking asset renewal and/or new works, to consider future ARI events	Road and general stormwater levels, designs are considered during the design phase	Report findings and action requirements within budget allocation may need future capital budget to undertake works
Safety	Stormwater assets are safe and free of hazards	Number of incidents/injury reports	0 recorded customer requests per year	0 recorded customer requests per year
Amenity	Maintain visual amenity of stormwater infrastructure	Maintain, clear debris and weeds from pit entry points	Weed spaying and debris clearing to suit seasonal conditions	Weed spraying and debris clearing as programmed

3.0 FUTURE DEMAND

3.1 Demand Forecasts

Factors affecting demand include population change, changes in demographics, seasonal factors, consumer preferences and expectations, economic factors, agricultural practices, environmental awareness etc. Demand factor trends and impacts on service delivery are summarised in Table 3.1.1.

Table 3.1.1 Demand Factors, Projections and Impact on Services

Demand Driver	Present Position	Projection	Impact of Services
Growth in stormwater drainage area due to new development areas	Limited capacity of underground stormwater network creates reliance on surface flow within the road carriageway.	Minor developments could impact on existing downstream properties.	Potential risk of creating flooding issues by approving development without understanding impact on performance of existing drainage system and upgrading capacity of the system to cope with development.
Flood protection	Flood plain areas.	Risk of flooding to property from runoff from large areas.	Emergency response and public awareness of risks and a need to identify priority capital works from finalised and adopted stormwater management plans.

3.2 Demand Impact and Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Council will determine the ability of the existing systems to manage increased requirements. Opportunities identified to date for demand management are shown in Table 3.1.2. Further opportunities will be developed in future revisions of this asset management plan.

Table 3.1.2 Demand Management Plan

Service Activity	Demand Management Plan
Stormwater drainage	Identify known local problem areas.
	Local area drainage modelling and develop upgrade concepts and costs for approval.
	Develop construction drawings and undertaken works.
	Evaluation of impact of new allotments on existing infrastructure.
	Planning to incorporate any identified growth over asset life.
	Develop Mallala Stormwater Flood Plain Management Plan and Stormwater Urban Management Plan to be developed 2022/24.
	Incorporate in future iterations of the Asset Management Plan as requirements are known per township stormwater implementation plans.

4.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Council plans to manage and operate the assets at the agreed levels of service (Refer to Section 2) while managing life cycle costs.

4.1 Background Data

Adelaide Plains Council's stormwater assets are located throughout several towns in the Council area.

- Stormwater Drains Assets
 - Pipes
 - Box Culverts
 - Headwalls
 - Junction Boxes
 - Pump Stations
 - Gross Pollutant Traps

4.2 Asset Capacity and Performance

Council's services are generally provided to meet design standards where these are available. Locations where deficiencies in service performance are known are detailed in Table 4.2.1

Table 4.2.1: Known Service Performance Deficiencies

Assets	Service Deficiency
Underground Pipe/Pit System	Identify known local problem areas.
Stormwater General - Mallala	Develop Mallala Stormwater Flood Plain Management Plan and Stormwater Urban Management Plan to be developed 2022 - 24.
Stormwater, Two Wells – AWE Stormwater Management Plan	Review and undertake necessary actions from the Two Wells Stormwater Management Plan.

The above service deficiencies were identified and are being considered and prioritised. Refer to above Demand Management Plan.

4.3 Asset Condition

Condition is currently monitored via field collection of stormwater at the time of asset revaluation.

Condition is measured using a 1 – 5 grading system³ as detailed in Table 4.3.1. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system may be used at a more specific level, however, for reporting in the AM plan results are translated to a 1 – 5 grading scale for ease of communication.

³ IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Table 4.3.1: Condition Grading System

Condition Grading	Description of Condition
1	Very Good: free of defects, only planned and/or routine maintenance required
2	Good: minor defects, increasing maintenance required plus planned maintenance
3	Fair: defects requiring regular and/or significant maintenance to reinstate service
4	Poor: significant defects, higher order cost intervention likely
5	Very Poor: physically unsound and/or beyond rehabilitation, immediate action required

The overall condition score and subsequent consumption of the stormwater assets has been estimated based on a combination of available data such as age and the standard useful life of the asset.

Table 4.3.2: Asset Standard Useful Lives

Asset	Standard Useful Life
Pipes (Concrete)	100 years
Pipes (PVC Underground)	70 years
Box Culverts	100 years
Pump Stations – Electrical & Concrete Structure	50 years
Station Pumps	15 years
Side Entry Pits, Junction Boxes, Grated Inlet Pits	80 years
Headwalls	80 years
Gross Pollutant Traps	80 years

4.4 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection, and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs and cleaning.

The trend in maintenance budgets are shown in Table 4.4.1

Table 4.4.1: Maintenance Budget Trends

Year	Maintenance Budget \$
2019 - 2020	\$35,000 (Actual)
2020 - 2021	\$31,000 (Budget)
2021 - 2022	\$36,000 (Budget)

Maintenance budget levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

4.5 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 4.5.1. Asset useful lives were last reviewed on 30 June 2020.

Table 4.5.1: Useful Lives of Assets

Asset	Standard Useful Life
Pipes (Concrete)	100 years
Pipes (PVC Underground)	70 years
Box Culverts	100 years
Pump Stations – Electrical & Concrete Structure	50 years
Station Pumps	15 years
Side Entry Pits, Junction Boxes, Grated Inlet Pits	80 years
Headwalls	80 years
Gross Pollutant Traps	80 years

The estimates for renewals in this AM Plan were based on Method 2.

4.4.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground).⁴

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.⁵

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 4.5.1

Table 4.5.1: Renewal Priority Ranking Criteria

Criteria	Weighting
Asset Condition Rating 4 or 5	20
Risks – Residual risk high or extreme	30
Stormwater Management Plan Actions	50
Total	100%

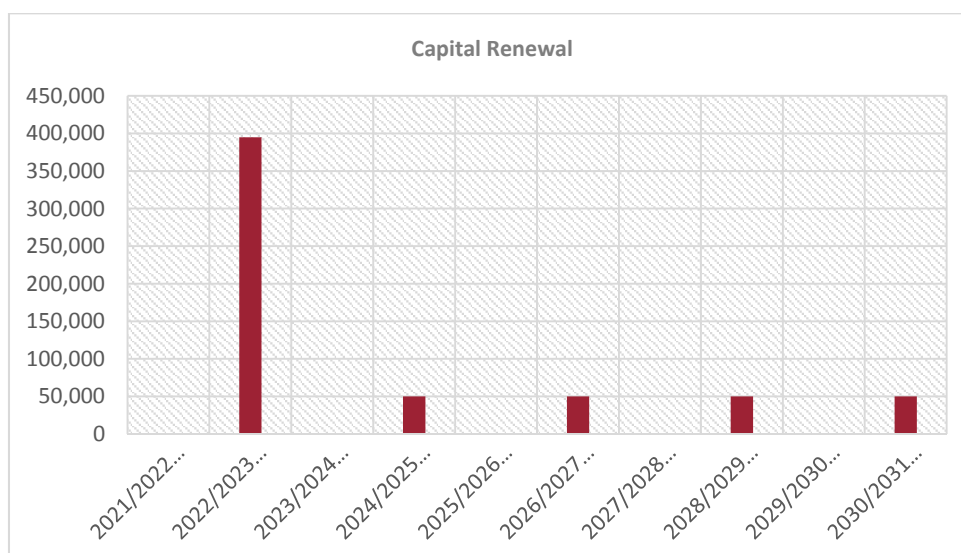
4.5 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 4.5.2. A detailed summary of the forecast renewal costs is shown in Appendix D.

Figure 4.5.2 Forecast Renewal Costs

⁴ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

⁵ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.



All figure values are shown in current day dollars.

4.6 Acquisition Plan

Acquisition reflects are new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated, gifted to Council.

4.6.1 Selection criteria

Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Entities needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed in Table 4.6.1.1

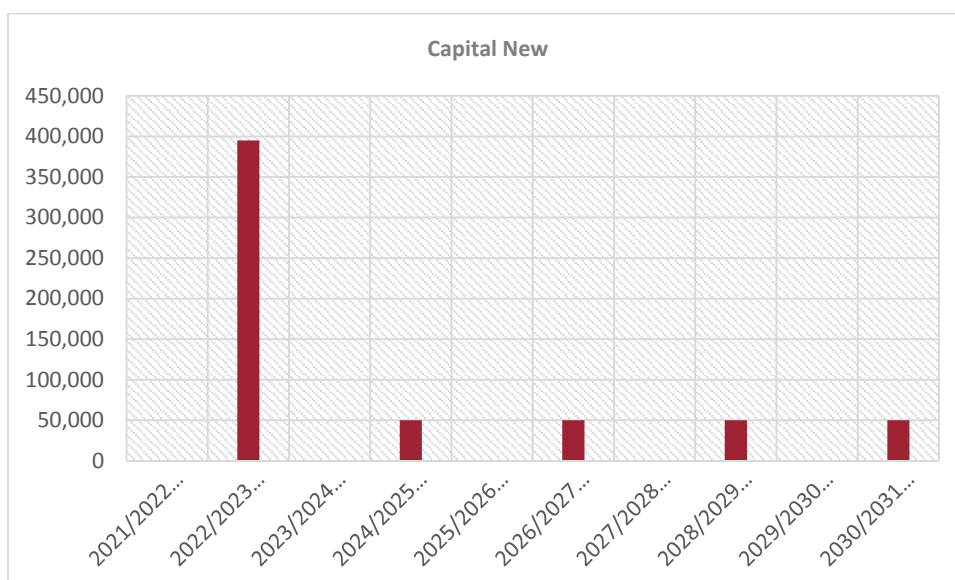
Table 4.6.1.1: Acquired Assets Priority Ranking Criteria

Criteria	Weighting
Gifted by Developers	60
Risks – Residual risk high or extreme	20
Stormwater Management Plan Actions	20
Total	100%

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised / summarized in Figure 4.6.1.2 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

Figure 4.6.1.2: Acquisition New (Constructed) Summary



All figure values are shown in current day dollars.

4.7 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 4.7.1. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 4.7.1. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

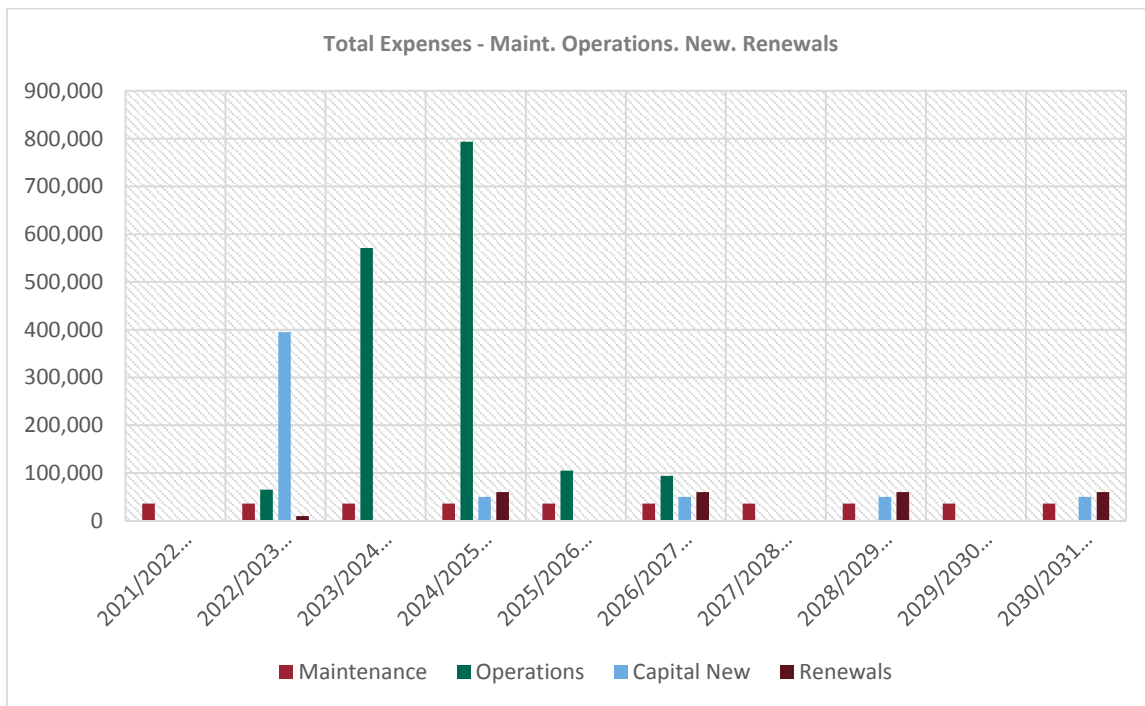
Table 4.7.1: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
None Known	NA	NA	NA	NA
None Known	NA	NA	NA	NA

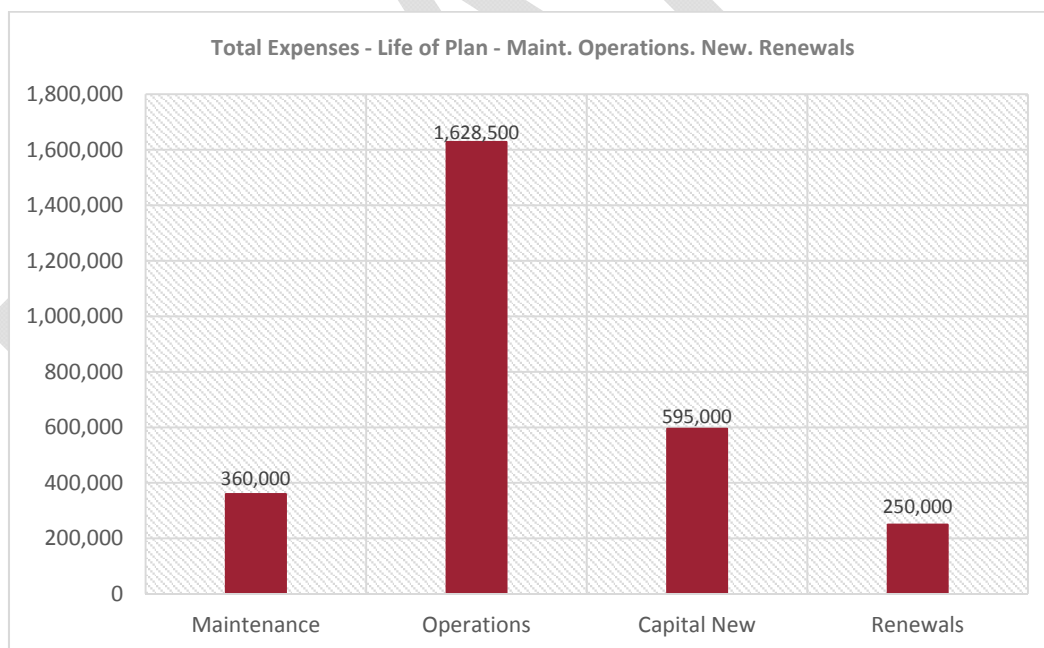
4.8 Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 5.7.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

Figure 5.7.1: Lifecycle Summary



All figure values are shown in current day dollars.



All figure values are shown in current day dollars.

5.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’⁶.

An assessment of risks⁷ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

5.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 5.1.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 5.1.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Stormwater	Lack of Stormwater Capacity	Flooding of Properties
Stormwater	Climate Change	Stormwater outlets lower than sea level

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

5.2 Risk Assessment

The risk management process used is shown in Figure 5.2.1 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

⁶ ISO 31000:2009, p 2

⁷ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

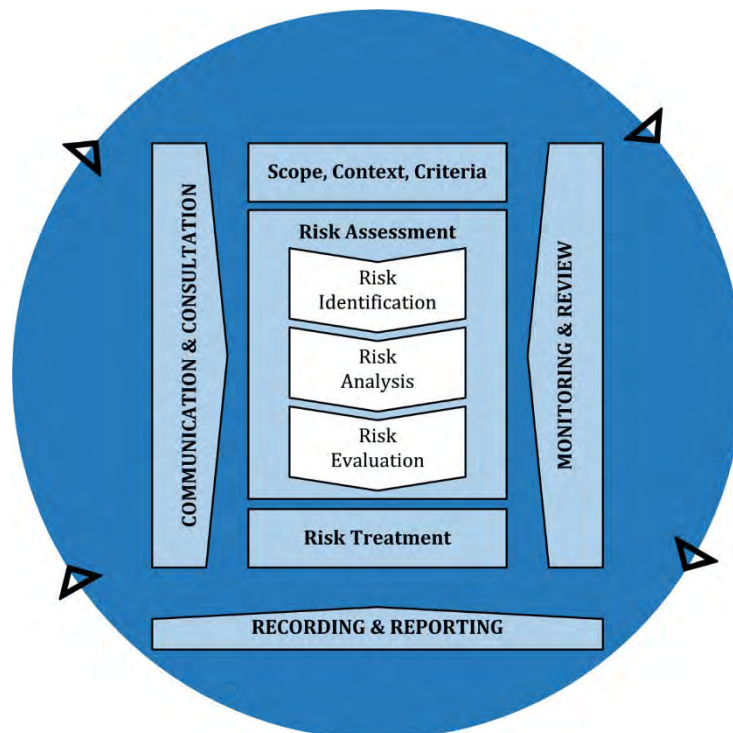


Fig 5.2.1 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks⁸ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 5.2.2. It is essential that these critical risks and costs are reported to the Executive Management Team.

⁸ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

Table 5.2.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Climate Change	Rising sea levels and changes to weather patterns will impact on the capacity of the existing stormwater system and an increase in flood prone areas from more frequent extreme tidal and storm events.	VH	Two Wells AWE Stormwater Management Plan and Coastal Adaptation Study are considered and actioned	M	Continue to monitor, update Coastal Adaptation Study undertake Mallala Stormwater Management Plan

Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented.

5.3 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale⁹ in accordance with Table 5.3.1.

Table 5.3.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B. High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C. Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D. Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E. Very Low	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 5.3.2.

⁹ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

Table 5.3.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Very High	Council trends available, Refer to Council Strategic Plan 2020-2024
Growth projections	Very High	Council trends available, refer to Council Strategic Plan 2020-2024
Acquisition forecast	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
Operation forecast	High	Extrapolated from previous years
Maintenance forecast	High	Extrapolated from previous years
Renewal forecast - Asset values	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
- Asset useful lives	Very High	Reviewed in accordance via revaluation schedule
- Condition modelling	Very High	Reviewed in accordance via revaluation schedule and condition ratings
Disposal forecast	N/A	N/A

The estimated confidence level for and reliability of data used in this AM Plan is considered to be Very High.

6.0 PLAN IMPROVEMENT AND MONITORING

6.1 Status of Asset Management Practices¹⁰

6.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is Authority.

6.1.2 Asset management data sources

This AM Plan also utilises asset management data. The source of the data is Conquest.

6.2 Improvement Plan

It is important that council recognise areas of their AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AM Plan is shown in Table 6.2.1.

Table 6.2.1: Improvement Plan

Task	Task	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Continue the development of stormwater implementation plans for each town as a follow-on from the stormwater management plans	Council Administration	As per revaluation requirements
3	Review service levels	Council Administration	As required
4	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
5	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

6.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of 4 years and is due for complete revision and updating within 2 years of each council election.

6.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,

¹⁰ ISO 55000 Refers to this as the Asset Management System

- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 110%).

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- Adelaide Plains Council Strategic Plan 2020 - 2024
- Adelaide Plains Council Annual Plan and Budget
- AWE Stormwater Management Plan - Two Wells Township

8.0 APPENDICES

Appendix A Acquisition Forecast (New)

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Stormwater Capital New											
Redbanks Road (005) from Mallala - Two Wells Road to Irish Street	0	100,000	0	0	0	0	0	0	0	0	100,000
Dublin Stormwater Capture Project - Stage 1	0	170,000	0	0	0	0	0	0	0	0	170,000
Dublin Stormwater Capture Project - Stage 2	0	110,000	0	0	0	0	0	0	0	0	110,000
Mallala Stormwater Urban Management Plan Outcomes	0	0	0	50,000		50,000		50,000	0	50,000	200,000
Middle Beach - Tidal Drainage System	0	15,000	0	0	0	0	0	0	0	0	15,000
	0	395,000	0	50,000	0	50,000	0	50,000	0	50,000	595,000
TOTAL STORMWATER NEW	0	395,000	0	50,000	0	50,000	0	50,000	0	50,000	595,000

Appendix B Operation Forecast

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Stormwater Operating											
Mallala Stormwater Flood Plain Management Plan (report)	0	65,000	0	0	0	0	0	0	0	0	65,000
Mallala Stormwater Urban Management Plan (report)	0	0	55,000	0	0	0	0	0	0	0	55,000
Levee, Hickinbotham - Component D - Flood Management Timing Plan	0	0	500,000	0	0	0	0	0	0	0	500,000
Levee, Hickinbotham - Component A1 - Area 2 Flood Management Timing Plan	0	0	16,000	0	0	0	0	0	0	0	16,000
Levee, Hickinbotham - Component C - Area 6 Flood Management Timing Plan	0	0	0	716,500	0	0	0	0	0	0	716,500
Levee, Hickinbotham - Component A2 - Area 3 Flood Management Timing Plan	0	0	0	7,000	0	0	0	0	0	0	7,000
Levee, Hickinbotham - Component A3 - Area 4 Flood Management Timing Plan	0	0	0	70,000	0	0	0	0	0	0	70,000
Levee, Hickinbotham - Component A4 - Area 5 Flood Management Timing Plan	0	0	0	0	105,000	0	0	0	0	0	105,000
Levee, Hickinbotham - Component A5 - Area 6 Flood Management Timing Plan	0	0	0	0	0	94,000	0	0	0	0	94,000
	0	65,000	571,000	793,500	105,000	94,000	0	0	0	0	1,628,500
TOTAL STORMWATER OPERATING	0	65,000	571,000	793,500	105,000	94,000	0	0	0	0	1,628,500

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Appendix C Maintenance Forecast

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Stormwater Maintenance											
General Maintenance Requirements - Recurrent Costs	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	360,000
TOTAL STORMWATER MAINTENANCE	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	36,000	360,000

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Appendix D Renewal Forecast Summary

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
Stormwater Capital Renewal											
Mallala Stormwater Urban Management Plan Outcomes	0	0	0	50,000	0	50,000	0	50,000	0	50,000	200,000
Allocation - Pump Station, Pump Replacements (*Refer Below)	0	10,000	0	10,000	0	10,000	0	10,000	0	10,000	50,000
*Tangari Estate Pump											
*Fourth Street, Dublin											
*Fifth Street, Dublin											
*St George Boulevard, Lewiston											
	0	10,000	0	60,000	0	60,000	0	60,000	0	60,000	250,000
TOTAL STORMWATER RENEWAL	0	10,000	0	60,000	0	60,000	0	60,000	0	60,000	250,000

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ASSET MANAGEMENT PLAN

Community Wastewater Management System

(CWMS)

Document Control		Asset Management Plan			
Document ID :					
Rev No	Date	Revision Details	Author	Reviewer	Approver
V1.11	June 2021	Develop Community Wastewater Management System (CWMS) Infrastructure Asset Management Plan	IAC		
V1.11	July 2021	For Review	IAC	GMEI EMT	EMT

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1.0 Introduction

1.1 Background

The goal and purpose of this Community Wastewater Management System (CWMS) Asset Management Plan is to improve Council's long-term strategic management of its CWMS assets in order to cater for the community's desired levels of service in the future, in accordance with Council's key strategic documents and demonstrate reasonable management in the context of Council's available financial and human resources.

The CWMS Plan is maintained and managed in accordance with all regulatory requirements under the South Australian Water Act 2012, the Essential Services Commission of South Australia (ESCOSA) the Office of the Technical Regulator (OTR) and Local government Act 1999.

Council will continue to develop service levels and asset renewal projects to ensure needs for the community are delivered. These service levels have been set in accordance with user needs, regulations, industry practice and legislative codes of practice.

The Asset Management Plan is to be read with Asset Management Policy and Asset Management Strategy, where developed, along with other key planning documents:

- Strategic Plan
- Annual Business Plan
- Long Term Financial Plan

The basic function of a CWMS network is to convey household and commercial wastewater from sinks, bathrooms and toilets (everything that goes down the drain) to a point of disposal being a lagoon and/or treatment plant, prior to disposing of the wastewater.

This infrastructure asset management plan covers the following infrastructure assets owned by the Adelaide Plains Council:

- Pump stations (9) and associated assets (including mechanical, civil and electrical assets)
- Gravity Drainage Network
- Pumping Stations
- Rising Mains Network
- Wastewater Treatment Plants
- Lagoons
- Reuse Systems

This CWMS Infrastructure Asset Management Plan provides for Council's Community Wastewater Management System network and has been developed using an asset register which was digitised using historical plans and field collection during 2020. The register was valued as at 30 June 2020 and has been updated with 2021/2022 capital works to the value of \$80,000.

The infrastructure assets included in this plan have a total replacement value of \$6,575,990

Asset	Quantity	Renewal Value	Total Value
Pump Stations	9	\$205,291	\$205,291
Air Valve/Scour Valve	15	45,066	\$45,066
CWMS Tanks	10	\$108,369	\$108,369
Domestic Pumps/Sumps	20	\$393,393	\$393,393
Gravity Pipes	74	\$1,414,146	\$1,414,146
Irrigation	31	\$544,286	\$544,286

Pump Chambers	5	\$142,817	\$142,817
Maintenance Holes	69	\$114, 969	\$114,969
Various CWMS Infrastructure Assets	Items	\$5,020,385	\$5,020,385
Total			\$6,575,990

Key stakeholders in the preparation and implementation of this AM Plan are shown in Table 1.1.1

Table 1.1.1: Key Stakeholders in the AM Plan

Key Stakeholder	Role in Asset Management Plan
Residents and Ratepayers	<ul style="list-style-type: none"> ■ Ultimate beneficiaries of the AMP process ■ Feedback collected throughout the year ■ Annual satisfaction survey undertaken
Insurers	<ul style="list-style-type: none"> ■ Local Government Mutual Liability Scheme
Lessees	<ul style="list-style-type: none"> ■ Leases operating who provide feedback on services, and have a range of maintenance responsibilities
State Government	<ul style="list-style-type: none"> ■ SA Health Authority ■ Environment Protection Authority ■ Essential Services Commission of South Australia (ESCOSA) - Office of the Technical Regulator (OTR)
Visitor / Tourists	<ul style="list-style-type: none"> ■ Regular satisfaction surveys undertaken, and feedback collected
Council	<ul style="list-style-type: none"> ■ To act as custodians of community assets ■ To set Asset Management Policy and vision ■ Allocate resources to meet Council objectives in providing services while managing risks
Executive Management Team	<ul style="list-style-type: none"> ■ Responsible for the development, management and review of an Asset Management Strategy, associated plans, practices and reporting on the status and effectiveness of Council's asset management ■ To monitor and review the performance of employees in achieving the asset management strategy, plans and practices ■ To ensure sufficient resources are applied to manage the assets to legislative requirements; and ■ Accountable for the management of assets within their areas of responsibility
Asset Manager and Staff	<ul style="list-style-type: none"> ■ To lead the development of the Asset Management Plans ■ To develop and implement maintenance, renewal and capital works programs in accordance with the Asset Management Policy, Strategy, Plans, as well as budget allocations ■ Develop Specific Management Plans (upgrade, renewal, maintenance, operations, disposal)

Key Stakeholder	Role in Asset Management Plan
	<ul style="list-style-type: none"> ■ To deliver levels of service to agreed risk and cost standards and expectations ■ To report asset related risk and damage ■ To establish and monitor asset compliance and risk inspection regimes ■ To manage asset condition assessments ■ To provide technical expertise to the Executive Management Team

1.2 Goals and Objectives of Asset Ownership

Our goal for managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

- Levels of service – specifies the services and levels of service to be provided,
- Risk Management,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 ¹
- ISO 55000²

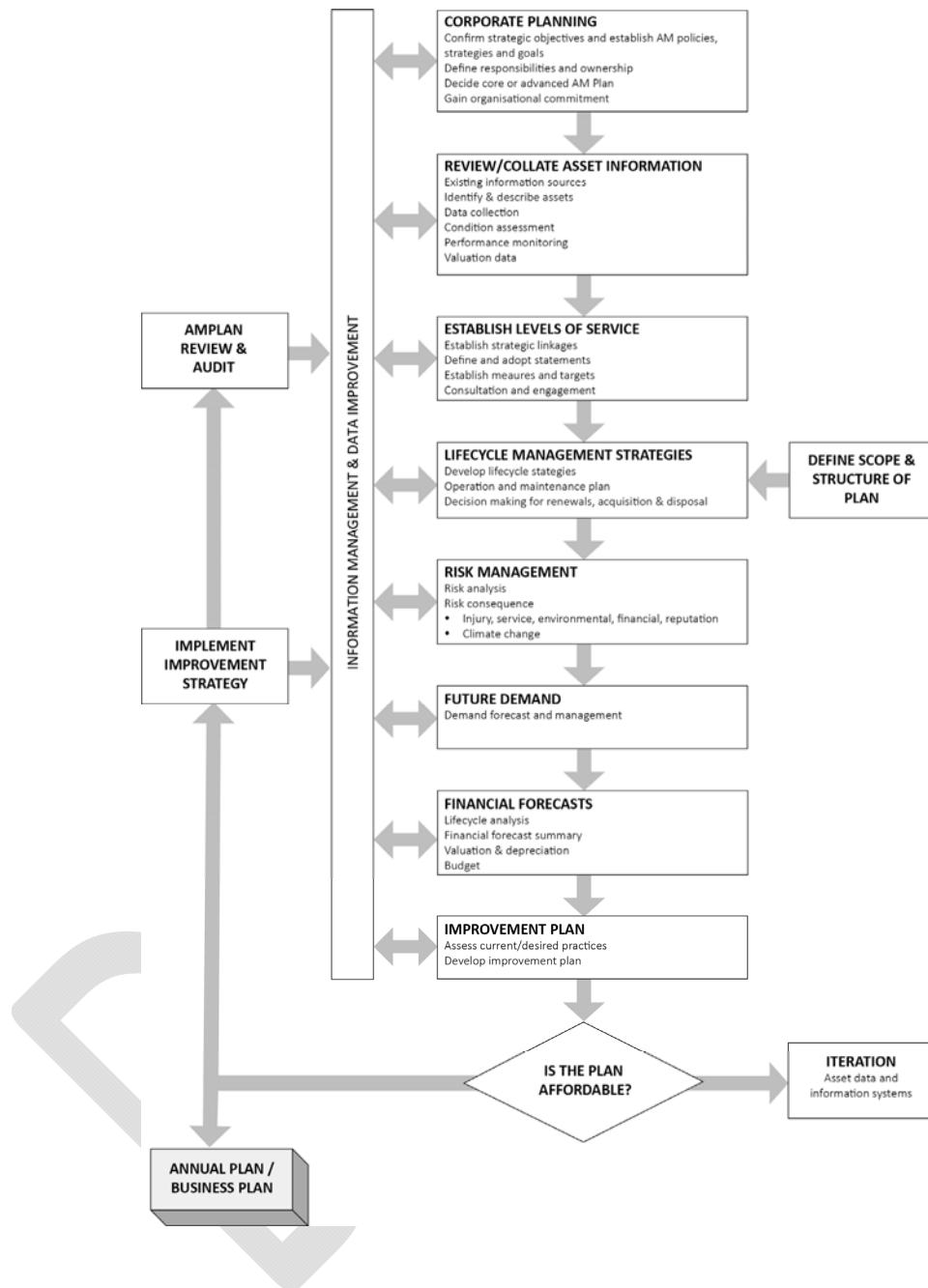
A road map for preparing an AM Plan is shown below.

Road Map for preparing an Asset Management Plan

¹ Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

² ISO 55000 Overview, principles and terminology

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



2.0 LEVELS OF SERVICE

The community generally expect that Council will have the necessary infrastructure and operation and maintenance practices in place to manage Councils Community Wastewater Management System.

Levels of service relate to outcomes the customer receives in terms of quality, quantity, responsiveness and performance as provided by the asset, they area developed in line with Councils strategic and corporate goals and legislative requirements.

Community Levels of Service relates to the service outcomes that the community wants in terms of quality, quantity, responsiveness, amenity, safety and financing.

Table 2.1.1 Community Levels of Service

Key Performance Measure	Level of Service Objective	Performance Measure Process	Current Level of Service	Desired Level of Service
CUSTOMER (COMMUNITY) LEVEL OF SERVICE				
Quality	Well maintained and suitable wastewater collection and disposal system	Number of customer requests relating to CWMS maintenance	Acceptable compliance to SA Health and EPA requirements	Continuing to meet the service delivery needs of the community
Function	Meet SA Health Department & EPA standards	Compliance to approval conditions compliance to approval conditions	All uncontrolled releases from the network stopped within 4 hours of being reported	Continuing to meet community expectations
Responsiveness	Response time to customer requests & time taken to complete requests	> 90% of all requests adequately responded to and dealt with within 4 hours of being notified (excluding parts supply)	Acceptable compliance to SA Health and EPA requirements	Continuing to meet capacity requirements
Safety	Low level of risk to personal and environmental health	Overflows within the pipe network, treatment plant and/or at pump stations	Acceptable Compliance to SA Health and EPA requirements	Continuing to provide a low risk service to the community

Technical Levels of Service support the community service levels and are operational or technical measures of performance. These technical measures relate to the allocation of resources to service activities that the Council undertakes to best achieve the desired community outcomes.

Table 2.1.2 Technical Levels of Service

TECHNICAL LEVEL OF SERVICE				
Operations Cost Effectiveness	Provide cost effective Community Wastewater Management System to meet Department of Health and EPA guidelines	Monitor energy usage	Energy usage maintained to current or below current levels	Review periodically - energy usage
Maintenance	Periodic visual assessment and servicing of access points	Routine removal and inspection of access lids	Ongoing inspections and flushing at intervals of not more than 12 months	Access to all reported blockages available within the 4 hour timeframe
	Periodic visual assessment to determine condition and function of drains	CCTV inspection (when required) and drain flushing	As per contract with Light Regional Council	Ongoing inspections and flushing at intervals of not more than 12 months
Condition	Network assets in good condition to ensure Community Wastewater Management System has appropriate design capacity	Continuous monitoring of pump stations operating hours	No pump station to operate for more than 12 hours per day as per SA Health guidelines	No pump station to operate for more than 12 hours per day as per SA Health guidelines
Renewal	Renewal of existing assets at an optimum time in their lifecycle	CCTV inspection and drain flushing	100% of network inspected at intervals of not more than 6 years	100% of network inspected at intervals of not more than 6 years
	Planned works that requires replacement identified as part of periodic inspection	Planned renewal works	As and where required as identified and planned from periodic visual inspection	As and where required as identified and planned from periodic visual inspection.
New/Upgrade	Targeted capital works if capacity or Work Health and Safety issue	Planned capital works	As and where required as identified and planned from periodic visual inspection	Developer liaison

Function	Odour control from Wastewater Treatment Plant lagoon storage	Periodic monitoring level of odour near Wastewater Treatment Plant lagoon & storage	No reported incidents, monitor	Monitor
	Septic Tank Cleaning (Middle Beach)	Septic Tank Cleaning Program (Middle Beach)	100% of Septic Tanks cleaned on a 4 yearly cycle (Middle Beach)	Action 100% of Septic Tanks cleaned on a 4 yearly cycle (Middle Beach)
Safety	Planned renewal if Work Health and Safety component Treated water quality	Planned renewal works	As and where required as identified and planned from periodic visual inspection	As and where required as identified and planned from periodic visual inspection
		Compliance to reclaimed water guidelines	Number of samples taken meet Department of Health and EPA guidelines	Number of samples taken meet Department of Health and EPA guidelines

In addition to these, Council's Licence Agreement conditions in terms of operating the CWMS System require that APC contractor provide a monthly monitoring program to ensure that the water quality meets the Health Department and EPA Requirements.

A detailed analysis of the water quality monitoring program and sampling requirements are stored in Council's Electronic Document Management System.

3.0 FUTURE DEMAND

3.1 Demand Forecasts

Drivers affecting demand include population change, changes in demographics, seasonal factors, consumer preferences and expectations, technological changes, economic factors, agricultural practices and environmental awareness. The impact of these trends are regularly examined and demand management strategies are recommended as a technique to modify demand without compromising customer expectation. The Population Projections by Local Government Area predicts the Estimated Resident Population will increase as follows:

There is predicted to be stronger growth in Two Wells, Mallala and Dublin Townships, with a probable population of up to 19,358 people within the Adelaide Plains Council by 2050.

In forecasting on the future integration of land use and Community Wastewater Management System (CWMS) planning, the following are being reviewed:

- Opportunities for provision of reuse water to Council open space and recreation parks.
- Land use effluent disposal demand
- Effluent reuse
- Irrigation
- Urban Boundary Growth

Factors affecting demand include changes in demographics, customer preferences & expectations and economic factors, etc. Demand factor trends and impacts on service delivery are summarised in Table 3.1.1

Table 3.1.1 Demand Factors, Projections and Impact on Services

Present Position	Demand Forecast	Demand Impact (Projection)	Impact on Services
Population increase	Planned to accommodate for 19,358 by 2050. (source, APC Strategic Plan 2020-2024)	Increased demand and use of CWMS assets will affect the useful life of the assets which will increase the maintenance and renewal program.	A review needs to be undertaken to confidently determine capacity currently exists to accommodate potential future demand from zoned residential land.
Population	2016 Census (ABS) 8,801 Average growth rate of 5.5% per year between 2011-2016. (source, APC Strategic Plan 2020-2024)	It is projected to grow by 10,557 persons to a population of 19,358 by 2050 at 1.2% per annum. (source, APC Strategic Plan 2020-2024)	
Demographics	Population Growth - It is projected to grow by 10,557 persons to a population of 19,358 by 2050 at 1.2% per annum. (source, APC Strategic Plan 2020-2024)	Future growth rate will depend on timing of rezoning and servicing of additional land located in existing townships not connected to be investigated.	Potential impact from new land developments.

3.2 Demand Impact and Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Council will determine the ability of the existing systems to manage increased requirements. Opportunities identified to date for demand management are shown in Table 3.1.2.

Further opportunities will be developed in future revisions of this asset management plan.

Table 3.1.2 Demand Management Plan

Service Activity	Demand Management Plan
Wastewater Collection	Investigate Capacity assessment of each pump station.
	Evaluation of impact of new allotments on existing infrastructure.
	Assess Developer contributions per Council policy.
	Negotiated developer system augmentations where required.
Wastewater Treatment, Storage and Reuse	Review capacity assessment of wastewater harvesting facilities.
	Capacity assessment of wastewater treatment processes, transfer and storage of treated wastewater.
	Evaluation of impact of new irrigation areas.
	Plan to incorporate any identified growth of treated effluent demand for irrigation.
Trade Waste Discharge	Increased stormwater inflow into the wastewater network.
	These impacts will be minimised by applying strict water quality discharge limits on all trade waste connections to the system.
Stormwater inflow	Focused flow monitoring of system and smoke testing targeted areas.
	Public education plays a significant role in the minimisation of rainwater inflow into the wastewater network. Increasing community awareness on the effects of the excessive inflow rates will help in reducing the number of faulty private drains and illegal stormwater connections.

The new assets required to meet growth will be acquired free of cost from the land developments and constructed/acquired by Council.

4.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Council plans to manage and operate the assets at the agreed levels of service (Refer to Section 2) while managing life cycle costs.

4.1 Background Data

Adelaide Plains Council's Community Wastewater Management System (CWMS) assets are located throughout the Adelaide Plains Council.

- Pump stations (9) and associated assets (including mechanical, civil and electrical assets)
- Gravity Drainage Network
- Pumping Stations
- Rising Mains Network
- Wastewater Treatment Plants
- Lagoons
- Reuse Systems

4.2 Asset Capacity and Performance

Council's services are generally provided to meet design standards where these are available. Locations where deficiencies in service performance are known are detailed in Table 4.2.1

Table 4.2.1: Known Service Performance Deficiencies

Assets	Service Deficiency
Future Demand	Providing new assets to meet demand.
Wastewater Treatment, Storage and Reuse	Plan to incorporate any identified growth of treated effluent demand for irrigation use.

The above service deficiencies were identified and are being considered and prioritised. Refer to above Demand Management Plan.

4.3 Asset Condition

Condition is currently monitored via field collection of CWMS at the time of asset revaluation.

Condition is measured using a 1 – 5 grading system³ as detailed in Table 4.3.1. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system may be used at a more specific level, however, for reporting in the AM plan results are translated to a 1 – 5 grading scale for ease of communication.

³ IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Table 4.3.1: Condition Grading System

Condition Grading	Description of Condition
1	Very Good: free of defects, only planned and/or routine maintenance required
2	Good: minor defects, increasing maintenance required plus planned maintenance
3	Fair: defects requiring regular and/or significant maintenance to reinstate service
4	Poor: significant defects, higher order cost intervention likely
5	Very Poor: physically unsound and/or beyond rehabilitation, immediate action required

The overall condition score and subsequent consumption of the CWMS assets has been estimated based on a combination of available data such as age and the standard useful life of the asset.

Table 4.3.2: Asset Standard Useful Lives

Asset	Standard Useful Life
Inspection, Maintenance Points and Holes	70 years
Return, Air & Scour Valves	30 years
Property Connection Pipe – 100 & 150mm	75 years
Gravity Pipes	60 years
Rising Mains	60 years
Irrigation & Pressure Pipes	60 years
Pump Chambers	50 years
Pump Stations	15 years
Pump Station Controller (Electrical)	30 years
Treatment Lagoon Lining	30 years
Irrigation Pumps	15 years

4.4 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning, street sweeping, asset inspection, and utility costs.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance activities include pipe repairs and cleaning.

The trend in operations and maintenance budgets are shown in Tables 4.4.1 and 4.4.2

Table 4.4.1: Maintenance Budget Trends

Year	Maintenance Budget \$
2019 - 2020	\$74,815 (Actual)
2020 - 2021	\$86,431 (Budget)
2021 - 2022	\$95,872 (Budget)

Table 4.4.2: Operations Budget Trends

Year	Operations Budget \$
2019 - 2020	\$182,221 (Actual)
2020 - 2021	\$161,003 (Budget)
2021 - 2022	\$196,632 (Budget)

Maintenance budget levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

4.5 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from one of two approaches in the Lifecycle Model.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), or
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 4.5.1. Asset useful lives were last reviewed on 30 June 2020.

Table 4.5.1: Useful Lives of Assets

Asset	Standard Useful Life
Inspection, Maintenance Points and Holes	70 years
Return, Air & Scour Valves	30 years
Property Connection Pipe – 100 & 150mm	75 years
Gravity Pipes	60 years
Rising Mains	60 years
Irrigation & Pressure Pipes	60 years
Pump Chambers	50 years
Pump Stations	15 years
Pump Station Controller (Electrical)	30 years
Treatment Lagoon Lining	30 years
Irrigation Pumps	15 years

The estimates for renewals in this AM Plan were based on Method 2.

4.4.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or

- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a playground).⁴

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.⁵

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 4.5.2

Table 4.5.2: Renewal Priority Ranking Criteria

Criteria	Weighting
End of Useful Life	20
Risks – Residual risk high or extreme	30
Safety and Compliance	50
Total	100%

4.5 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 4.5.1. A detailed summary of the forecast renewal costs is shown in Appendix D.

Figure 4.5.1 Forecast Renewal Costs



⁴ IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

⁵ Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

All figure values are shown in current day dollars.

4.6 Acquisition Plan

Acquisition reflects are new assets that did not previously exist or works which will upgrade or improve an existing asset beyond its existing capacity. They may result from growth, demand, social or environmental needs. Assets may also be donated, gifted to Council.

4.6.1 Selection criteria

Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential upgrade and new works should be reviewed to verify that they are essential to the Entities needs. Proposed upgrade and new work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. The priority ranking criteria is detailed in Table 4.6.1.1

Table 4.6.1.1: Acquired (New) Assets Priority Ranking Criteria

Criteria	Weighting
Safety and Compliance	20
Risks – Residual risk high or extreme	20
Demand	60
Total	100%

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised / summarized in Figure 4.6.1.2 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

Figure 4.6.1.2: Acquisition New (Constructed) Summary



All figure values are shown in current day dollars.

4.7 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 4.7.1. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 4.7.1. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

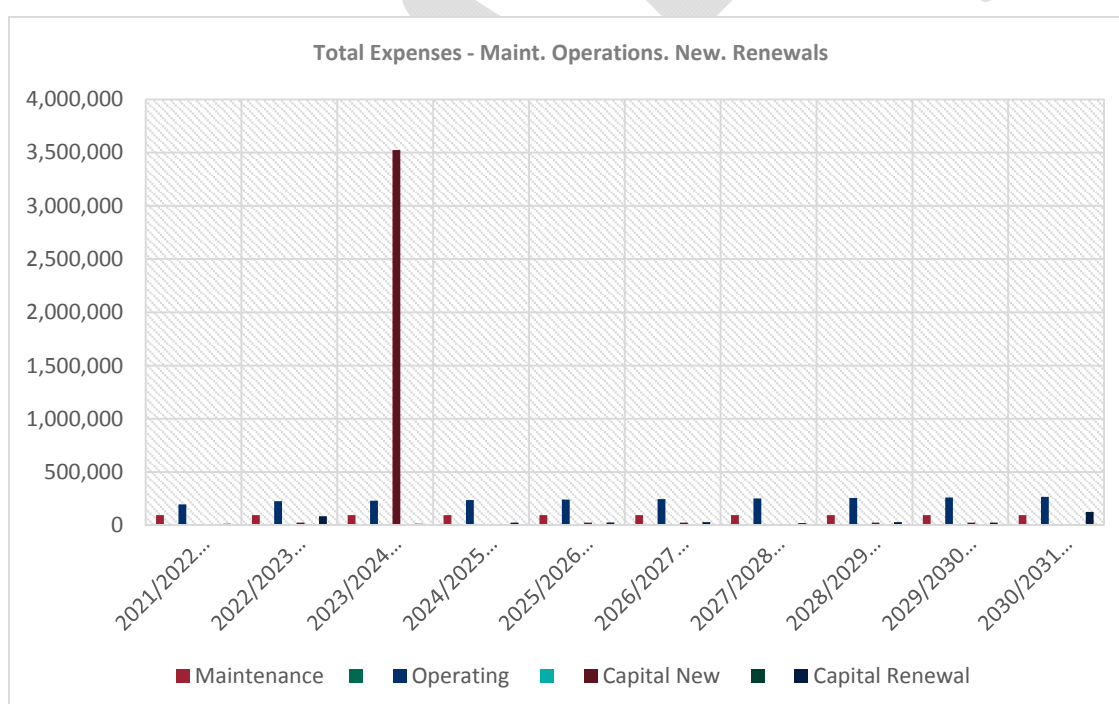
Table 4.7.1: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
None Known	NA	NA	NA	NA
None Known	NA	NA	NA	NA

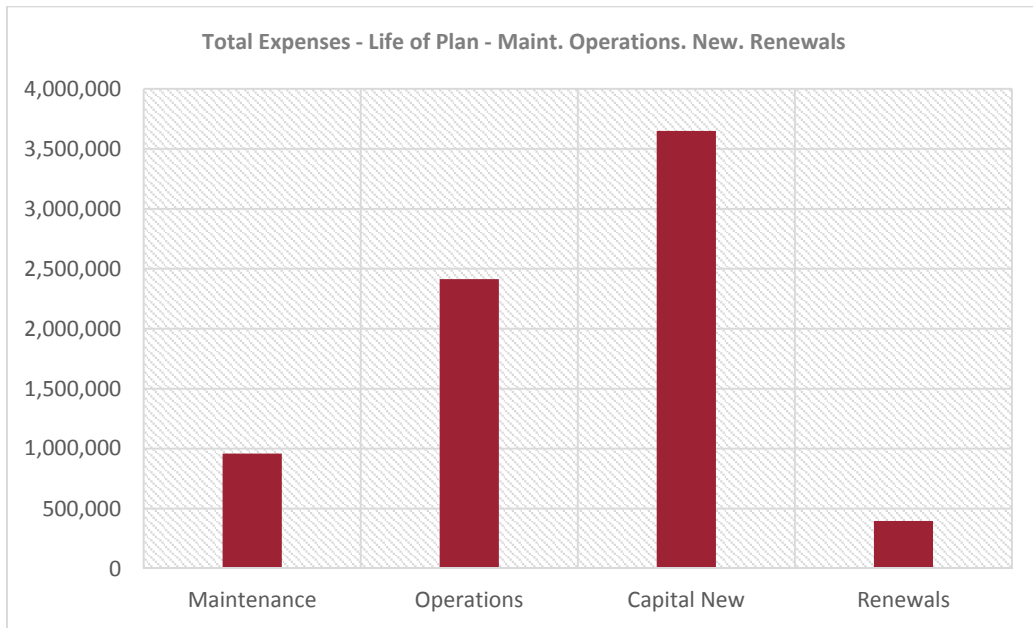
4.8 Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 4.8.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

Figure 4.8.1: Lifecycle Summary



All figure values are shown in current day dollars.



All figure values are shown in current day dollars.

5.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’⁶.

An assessment of risks⁷ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

5.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 5.1.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 5.1.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Pump Stations	Breakdowns	Possible Overflows
Treatment Lagoons	Over Topping	Possible Overflows

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

5.2 Risk Assessment

The risk management process used is shown in Figure 5.2.1 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

⁶ ISO 31000:2009, p 2

⁷ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

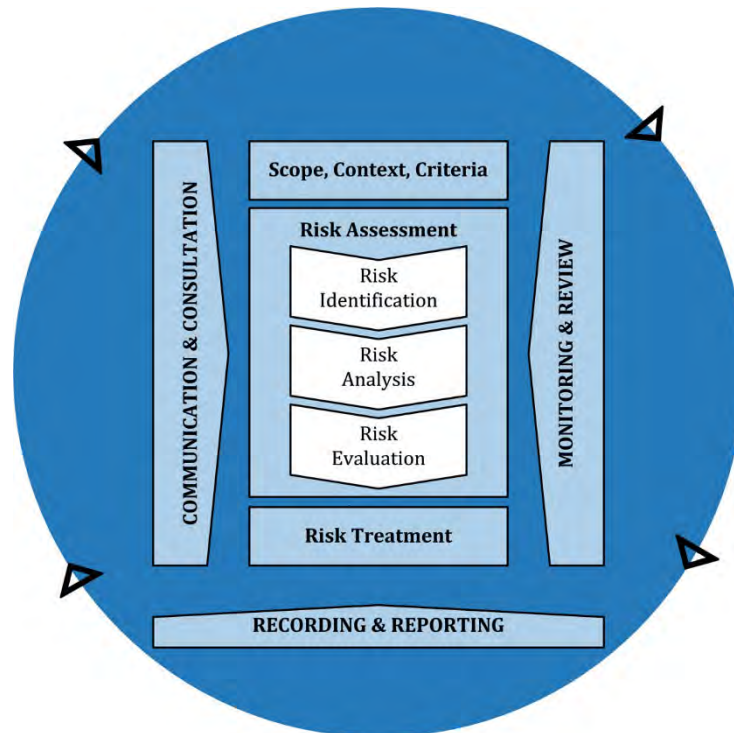


Fig 5.2.1 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks⁸ associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 5.2.2. It is essential that these critical risks and costs are reported to the Executive Management Team.

⁸ REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

Table 5.2.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Treatment Plant	Discharge to environment from inadequacy capacity	High	Upgrade plant capacity/emergency flow storages.	L	Investigate costs.
Effluent Lines	Blockage	High	Program regular flushing of lines and inspections.	Low	Currently performed – service agreement with RL Council.
Pump Stations	Blockage	High	Program regular flushing of lines and inspections.	Low	Currently performed – service agreement with RL Council.
Pump Stations	Pump Failure	High	Upgrade telemetry monitoring, emergency response plan, determine requirements for emergency generator, emergency portable pump.	High	Investigate, APC own a mobile diesel generator.
Effluent Lines	Infrastructure damaged by excavation	High	Add GIS CWMS data to Dial Before You Dig service.	Low	Investigate cost.
Effluent Lines	Deterioration of existing lines	High	Systematic cleaning and inspection of drain and replace or repair when required.	High	Known at time before replacement occurs.

Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented.

5.3 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale⁹ in accordance with Table 5.3.1.

⁹ IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

Table 5.3.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B. High	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C. Medium	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D. Low	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E. Very Low	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 5.3.2.

Table 5.3.2: Data Confidence Assessment for Data used in AM Plan

Data	Confidence Assessment	Comment
Demand drivers	Very High	Council trends available, Refer to Council Strategic Plan 2020-2024
Growth projections	Very High	Council trends available, refer to Council Strategic Plan 2020-2024
Acquisition forecast	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
Operation forecast	High	Extrapolated from previous years
Maintenance forecast	High	Extrapolated from previous years
Renewal forecast - Asset values	Very High	Council trends available, refer to Council Strategic Plan 2020-2024. Align to LFTP – Capital Works Program
- Asset useful lives	Very High	Reviewed in accordance via revaluation schedule
- Condition modelling	Very High	Reviewed in accordance via revaluation schedule and condition ratings
Disposal forecast	N/A	N/A

The estimated confidence level for and reliability of data used in this AM Plan is considered to be Very High.

6.0 PLAN IMPROVEMENT AND MONITORING

6.1 Status of Asset Management Practices¹⁰

6.1.1 Accounting and financial data sources

This AM Plan utilises accounting and financial data. The source of the data is Authority.

6.1.2 Asset management data sources

This AM Plan also utilises asset management data. The source of the data is Conquest.

6.2 Improvement Plan

It is important that council recognise areas of their AM Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AM Plan is shown in Table 6.2.1.

Table 6.2.1: Improvement Plan

Task	Task	Responsibility	Timeline
1	Annually review 10 year capital works program, renewals and new	Council Administration	October/November each year
2	Continue CWMS scheduled and programmed maintenance requirements	Council Administration/CWMS Officer	Ongoing
3	Review service levels	Council Administration	As required
4	Long Term Financial Plan and Asset Management Plan align	Council Administration	As required
5	Review & Document Asset Management Plan Risks	Council Administration	Ongoing

6.3 Monitoring and Review Procedures

This AM Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AM Plan will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, acquisition and asset disposal costs and planned budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AM Plan has a maximum life of 4 years and is due for complete revision and updating within 2 years of each council election.

6.4 Performance Measures

The effectiveness of this AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this AM Plan are incorporated into the long-term financial plan,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures consider the 'global' works program trends provided by the AM Plan,

¹⁰ ISO 55000 Refers to this as the Asset Management System

- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 90 – 110%).

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7.0 REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
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- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
- IPWEA, 2020 'International Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2018, Practice Note 12.1, 'Climate Change Impacts on the Useful Life of Assets', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2012, Practice Note 6 Long-Term Financial Planning, Institute of Public Works Engineering Australasia, Sydney, <https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn6>
- IPWEA, 2014, Practice Note 8 – Levels of Service & Community Engagement, Institute of Public Works Engineering Australasia, Sydney, <https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn8>
- ISO, 2014, ISO 55000:2014, Overview, principles and terminology
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- Adelaide Plains Council Strategic Plan 2020 - 2024
- Adelaide Plains Council Annual Plan and Budget
- Maintenance Contract with Regional Light Council

8.0 APPENDICES

Appendix A Acquisition Forecast (New)

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
CWMS Capital New											
Two Wells - New Community Waste Management System	0	0	3,500,000	0	0	0	0	0	0	0	3,500,000
Two Wells - Eden and Liberty Estates, Recycled Water Reuse (reserves & parks)	0	25,000	25,000	0	25,000	25,000	0	25,000	25,000	0	150,000
	0	25,000	3,525,000	0	25,000	25,000	0	25,000	25,000	0	3,650,000
TOTAL CWMS NEW	0	25,000	3,525,000	0	25,000	25,000	0	25,000	25,000	0	3,650,000

Appendix B Operation Forecast

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
CWMS Operating											
Materials, Power, Water, Dep & Insurance etc..	196,352	196,352	196,352	196,352	196,352	196,352	196,352	196,352	196,352	196,352	1,963,520
Two Wells - Liberty and Eden Estates, Recycled Water Costs (parks & reserves) - Allocation	0	30,000	35,000	40,000	45,000	50,000	55,000	60,000	65,000	70,000	450,000
	196,352	226,352	231,352	236,352	241,352	246,352	251,352	256,352	261,352	266,352	2,413,520
TOTAL CWMS OPERATING	196,352	226,352	231,352	236,352	241,352	246,352	251,352	256,352	261,352	266,352	2,413,520


Appendix C Maintenance Forecast

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
CWMS Maintenance											
External Service Maintenance Contract Provider (RL Council)	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	600,000
Contractors Repairs	22,040	22,040	22,040	22,040	22,040	22,040	22,040	22,040	22,040	22,040	220,400
Internal Maintenance Staff	13,832	13,832	13,832	13,832	13,832	13,832	13,832	13,832	13,832	13,832	138,320
	95,872	95,872	95,872	95,872	95,872	95,872	95,872	95,872	95,872	95,872	958,720
TOTAL CWMS MAINTENANCE	95,872	95,872	95,872	95,872	95,872	95,872	95,872	95,872	95,872	95,872	958,720

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Appendix D Renewal Forecast Summary

FINANCIAL YEAR:	2021/2022 \$	2022/2023 \$	2023/2024 \$	2024/2025 \$	2025/2026 \$	2026/2027 \$	2027/2028 \$	2028/2029 \$	2029/2030 \$	2030/2031 \$	Total
CWMS Capital Renewal											
Mallala - Replacement of Property Pumps	15,000	15,000	15,000	15,000	20,000	20,000	20,000	20,000	25,000	25,000	190,000
Middle Beach - CWMS Shed	0	0	0	0	7,000	0	0	0	0	0	7,000
Middle Beach - Irrigation Pump	0	0	0	0	0	0	0	0	0	40,000	40,000
Middle Beach - Allocation	0	10,000	0	10,000	0	10,000	0	10,000	0	10,000	50,000
Mallala Treatment Plant (Chamber Protection Coating)	0	60,000	0	0	0	0	0	0	0	0	60,000
Two Wells - Allocation	0	0	0	0	0	0	0	0	0	50,000	50,000
	15,000	85,000	15,000	25,000	27,000	30,000	20,000	30,000	25,000	125,000	397,000
TOTAL CWMS RENEWAL	15,000	85,000	15,000	25,000	27,000	30,000	20,000	30,000	25,000	125,000	397,000

 Adelaide Plains Council	7.2	Policy Review – Asset Management Policy
	Department: Report Author:	Infrastructure and Environment General Manager Infrastructure and Environment
Date: 4 August 2021	Document Ref:	D21/32042

EXECUTIVE SUMMARY

- The purpose of this report is for Infrastructure and Environment Committee to review Council's current Asset Management Policy (**the Current Policy**)
- The Current Policy was last reviewed in September 2020.
- Council should regularly review its policies to ensure that they remain relevant and inline with current legislation and best practice.
- As part of the holistic Asset Management review the policy has been reviewed with Management proposing only minor amendments.
- The Current Policy reviewed by the Management is presented at **Attachment 1** to this report.

RECOMMENDATION

“that Infrastructure and Environment Committee, having considered Item 7.2 – Policy Review – Asset Management Policy dated 4 August 2021, receives and notes the report and in doing so, recommends to Council that it adopts the revised Asset Management Policy as presented in Attachment 1 to this report subject to following changes

.....
”

BUDGET IMPACT

Estimated Cost:	Nil
Future ongoing operating costs:	Nil
Is this Budgeted?	Not Applicable

RISK ASSESSMENT

The Asset Management Policy establishes a framework of broad principles relating to the management of Council's assets to strategically manage assets to meet the long term needs of the Community.

Asset management practices impact directly on the core business of Council and responsible asset management is required to achieve Council's strategic direction. A strategic approach to asset management will ensure that Council delivers the highest appropriate level of service and will assist in ensuring a consistent, fair and transparent approach regarding Council's asset management.

Attachments

1. Asset Management Policy reviewed in August 2021

DETAILED REPORT

Purpose

The purpose of this report is for infrastructure and Environment Committee to review Council's Asset Management Policy which provides a framework of broad principles relating to the management of Council's assets strategically to meet the long term needs of the Community.

Background/History

The Current Policy was adopted by Council in September 2020.

Council should regularly review its policies to ensure they remain relevant and inline with current legislation and best practise. As part of the holistic Asset Management review the policy has been reviewed with Management proposing only minor amendments.

Discussion

Attachment 1 provides Asset Management Policy recently reviewed by the Council management review.

Conclusion

With a focus on ensuring Council Members and staff understand their obligations with regard to Asset Management strategic directions and objectives, Council management is satisfied that current policy provides clear direction and guidelines on Council's assets management.


References

Legislation

Local Government Act 1991

Council Policies/Plans

Infrastructure and Asset Management Plans

	Asset Management Policy	
	Version Adoption by Council: 28 September 2020 Resolution Number: 2020/314 Current Version: V13	
	Administered by: General Manager – Infrastructure and Environment	Last Review Date: 2021 ¹⁰ Next Review Date: 2023 ³²
DOCUMENT NO: D20/40631	Strategic Plan 2020/2024: Enviably Lifestyle and Proactive Leadership Strategic Outcome 4.3: Great Places and	

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1. Objective

This Policy has been developed to establish a framework of broad principles relating to the management of Council's assets to strategically manage assets to meet the long term needs of the Community.

Asset management practices impact directly on the core business of Council and responsible asset management is required to achieve Council's strategic direction. A strategic approach to asset management will ensure that Council delivers the highest appropriate level of service and will assist in ensuring a consistent, fair and transparent approach regarding Council's asset management.

2. Scope

This policy applies to all Council activities; it provides the overall framework to guide the sustainable management of Council's asset portfolio as a platform for service delivery and guidelines for implementing consistent asset management processes throughout the Council.

3. Definitions

Asset - property, plant and equipment including infrastructure and other assets (such as furniture and fittings) with benefits expected to last more than twelve (12) months;

Asset Management - the combination of management, financial, economic, and engineering and other practices applied to physical assets with the objective of providing the required service level in the most cost effective manner;

Levels of Service - service levels are a combination of functional criteria related to quality, quantity, reliability, responsiveness, environmental acceptability and cost, derived in consultation with clients, and used to measure an asset's performance;

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1

Lifecycle Cost - the total cost of an asset throughout its life including planning, design, construction, acquisition, operation, maintenance, and rehabilitation and disposal costs;

New Asset - the construction/purchase/~~of~~gifted of an asset that is not currently part of Council's asset base;

Renewal - works required to upgrade, refurbish or replace existing assets with assets of equivalent capacity or performance capability.

4. Policy Statement

This Policy aims to ensure that adequate provision is made for the long-term replacement or renewal of assets by:

- ensuring that Council's services and infrastructure are provided in a sustainable and serviceable manner, with the appropriate levels of service to the community and environment;
- safeguarding Council's physical assets, including human resources, through the implementation of effective asset management strategies and the allocation of financial resources;
- creating an environment of awareness where Council employees take an integral part in the overall management of Council's assets;
- meeting legislative requirements for asset management;
- ensuring adequate resources are maintained and responsibility assigned for asset management; and
- demonstrating open, transparent and responsible asset management practices that align with best practice and Council's strategic direction.

5. Specific Provisions / Responsibilities

5.1 Background

Council is committed to implementing a systematic asset management framework, applying best practice principles across all areas of Council, ensuring that assets are planned, created, operated, maintained and renewed in accordance with Council's priorities for service delivery and legislative requirements.

Council's assets include:

- Buildings and Land Reserves;
- Community Land;
- Community Wastewater Management Systemsschemes (CWMS);
- Storm-water and associated infrastructure; ~~and~~
- Transport and associated Infrastructure;
- Open Space.

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A strategic approach to asset management will ensure Council delivers the highest appropriate level of service through its assets providing a positive impact on:

- the community, elected members and staff;
- Council's financial management;
- the ability of Council to deliver the expected level of service and infrastructure;
- the political environment in which Council operates; and
- Council legislative requirements.

5.2 Principles

5.2.1 A consistent Asset Management Strategy, inclusive of relevant legislative requirements, together with political, social and economic considerations must be taken in to account in the development of Council's asset management practices.

5.2.2 Asset management principles will be integrated within existing financial, planning and operational practices, this will include an inspection schedule ensuring agreed service levels are maintained and to identify asset renewal priorities.

5.2.3 Asset renewals, required to meet agreed service levels, and identified in the Asset Management Plans and Long Term Financial Plans will be fully funded in the annual budget estimates. Service levels defined in Asset Management Plans will be fully funded in the annual budget estimates. Asset renewal plans will be prioritised and implemented progressively based on agreed service levels and the effectiveness of the current assets to provide that level of service.

5.2.4 Systematic and cyclic reviews will be applied to all asset classes ensuring that assets are managed, valued and depreciated in accordance with appropriate best practice and applicable Australian Standards.

5.2.5 Future life cycle costs will be assessed and reported with all decisions relating to new services and assets, and the upgrading of existing services and assets. Future service levels will be determined in consultation with the community and in accordance with Council's Public Consultation Policy.

5.5 Responsibility

The following key roles and responsibilities are identified in the management of this Policy:

5.5.1 Council

- to act as custodians of community assets; and
- to ensure sufficient resources are applied to manage the assets to legislative requirements.

5.5.2 Chief Executive Officer

- to monitor and review the performance of employees in achieving the requirements

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- of Council's Asset Management Strategy and associated plans; and
- to ensure sufficient resources are applied to manage the assets to legislative requirements.

5.5.3 Executive Management Team

- responsible for the development, management and review of an Asset Management Strategy, associated plans, practices and reporting on the status and effectiveness of Council's asset management;
- to monitor and review the performance of employees in achieving the asset management strategy, plans and practices;
- to ensure sufficient resources are applied to manage the assets to legislative requirements; and
- accountable for the management of assets within their areas of responsibility.

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6. Related Documents

Fixed Assets Accounting Policy

[Asset Management Strategy](#)

~~Infrastructure and Asset Management Plans-~~

~~Code of Conduct for Council Members~~

Long Term Financial Plan

Residents Contributions to Road Sealing Policy

Strategic Plan ~~2017-2020~~ [2020-2024](#)

Public Consultation Policy

[Disposal of Land & Assets Policy](#)

[Procurement Policy](#)

[Light Fleet, Plant and Heavy Vehicles Replacement Policy](#)

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7. Records Management

All documents relating to this Policy will be registered in Council's Record Management System and remain confidential where identified.

8. Document Review

This Policy will be reviewed periodically to ensure legislative compliance and that it continues to meet the requirements of Council its activities and programs.

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9. References

Local Government Act 1999

10. Further Information


Members of the public may inspect this Policy free of charge on Council's website at www.apc.sa.gov.au or at Council's Principal Office at:

2a Wasleys Rd, Mallala SA 5502

On payment of a fee, a copy of this policy may be obtained.

Any queries in relation to this Policy must be in writing and directed to the General Manager Infrastructure and Environment.

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 Adelaide Plains Council	7.3	Wasleys Bridge Remediation Options
	Department: Report Author:	Infrastructure and Environment General Manager Infrastructure and Environment
Date: 4 August 2021	Document Ref:	D21/30360

EXECUTIVE SUMMARY

- The purpose of this report is for Infrastructure and Environment Committee (the Committee) to consider, and make recommendations to Council in relation to Wasleys Bridge current condition and remediation options.
- Wasleys Bridge is located on Wasleys Road, over the River Light at Redbanks, approximately five kilometres east of Mallala. The bridge is State Heritage listed, designed in 1913 and constructed soon after and is therefore just over 108 years old. The structure is a single span steel arch with a reinforced concrete deck. The span is 30.5 metres with a kerb to kerb width of 6.4 metres. The abutments and wingwalls each end are reinforced concrete.
- On the 22 of April 2013, Council endorsed the lowering of the load limit on Wasleys Bridge to 12 tonne. Since this time numerous Council and consultant reports have been undertaken with a chronological order of events presented as **Attachment 1** to this Report.
- The Bridge has further declined significantly in condition since the Independent structural report was presented to Council in December 2016 with the current condition presented as **Attachment 2** to this Report.
- Following the resolution of Council in August 2019, Management submitted and was successful in securing grant funding in 2020 through Round 5, Department of Infrastructure, Regional Development and Cities, Bridge Renewal Program and received \$107,500, matched by Councils contribution, totalling \$215,000 to undertake structural repairs during financial year 2021/22.
- Subsequent to the successful Bridge Renewal Program funding a select tender process was undertaken to ascertain level of interest, to seek costs and to engage suitably experienced, qualified and accredited bridge contractors to undertake the structural repairs and maintenance to Wasleys Bridge. The Tender Evaluation Panel met on several occasions to evaluate the received tenders.
- In parallel to the tender process a load limit capacity assessment was undertaken. The bridge assessment and load rating was based on clause 9 of Australian Standard AS 5100.7:2017 (Bridge Design – Part 7: Bridge Assessment), assessed for its current load limit capacity 12 tonne with the outcome presented as **Attachment 3** to this Report.
- The Committee has several options that it may wish to consider;
 - Option 1 – Undertake structural repairs and maintenance. – **Medium risk.**
 - Option 2 – Undertake a portion of structural repairs and maintenance. – **High risk.**

- Option 3 – Close the bridge. – **Low risk.**
- Option 4 – Construct a new bridge. – **Low risk.**
- Option 5 - Do nothing. – **Extreme risk.**
- It is for the Committee to now consider Options 1-5, and make recommendations to Council accordingly.

RECOMMENDATION 1

“that Infrastructure and Environment Committee, having considered Item 7.3 – *Wasleys Bridge Remediation Options*, dated 4 August 2021, receives and notes the report and in doing so recommends to Council that Council:

- 1. Acknowledge the Tonkin Consulting Report - Wasleys Bridge Assessment, Load Capacity Assessment presented as Attachment 1 to this Report which strongly recommends the lowering of the Wasleys Bridge load limit from 12 tonne to 6.5 tonne.**
- 2. In acknowledging 1 above, Wasleys Road Bridge be lowered in tonnage capacity to 6.5 tonne.”**

RECOMMENDATION 2

“that Infrastructure and Environment Committee, having considered Item 7.3 – *Wasleys Bridge Remediation Options*, dated 4 August 2021, recommends to Council that.....”

- Committee members are drawn to options 1-5 appearing on pages 6-8 of this report.**

BUDGET IMPACT

Estimated Cost:	Identified in options 1-5 appearing on pages 6-8 of this report.
Future ongoing operating costs:	Identified in options 1-5 appearing on pages 6-8 of this report.
Future ongoing operating costs	\$50,000 (External assessments - Level 2)
Is this Budgeted?	No

RISK ASSESSMENT

The following risks have been assessed in line with Council’s Risk Management Policy and Procedure.

Financial - The cost of not undertaking the required Bridge repairs and maintenance works, costs are likely to escalate as the Bridge deteriorates further. This risk can be addressed through the Long Term Financial Plan. This risk is assessed as **high**.

Infrastructure and Assets - If Council does not undertake and proceed with the Bridge repairs and maintenance the asset will further decline in disrepair to a point that a Bridge replacement will be likely or higher renewal costs. This risk is assessed as **extreme**.

Environmental - There is potential for significant human and environmental concerns as the Bridge steel work contains leaded paint, this has been quantified by undertaking certified testing. Human and the environment is regarded as highly important, this will be managed by the contractor in accordance with the Environmental Protection Authority (EPA) standards and procedures. These risks will be managed through the development of an Environmental Management Plan (EMP) which has been addressed through Councils tender process. This risk is assessed as **high**.

Public Safety – It is possible that structural failure could occur where load limits of a bridge are not appropriately sign posted advising 6.5 tonne load capacity. It is known T44 (44 tonne semi-trailer) vehicles are using the asset. Structural failure could lead to death, permanent disability, or long-term hospital admission. This risk is assessed as **extreme**.

Attachments

1. Chronological Order of Events
2. Photographic Identity - Wasleys Bridge Condition
3. Tonkin Consulting - Wasleys Bridge Assessment, Load Capacity Assessment

DETAILED REPORT

Purpose

The purpose of this report is for Infrastructure and Environment Committee (the Committee) to consider, and make recommendations to Council in relation to Wasleys Bridge current condition and remediation options.

Background/History

Wasleys Bridge is located on Wasleys Road, over the River Light at Redbank's, approximately five kilometres east of Mallala. The bridge is State Heritage listed, designed in 1913 and constructed soon after and is therefore just over 108 years old. The structure is a single span steel arch with a reinforced concrete deck. The span is 30.5 metres with a kerb to kerb width of 6.4 metres. The abutments and wingwalls each end are reinforced concrete.

On the 22 of April 2013, Council endorsed the lowering of the load limit on Wasleys Bridge to 12 tonne. Since this time numerous Council and consultant reports have been undertaken with a chronological order of events presented as **Attachment 1** to this Report.

The Bridge has further declined significantly in condition since the Independent structural report was presented to Council in December 2016 with the current condition presented as **Attachment 2** to this Report.

Council, at its Ordinary Meeting on 26 August 2019, resolved as follows:-

14.6 Wasley Road Bridge - Maintenance

Moved Councillor Keen Seconded Councillor Maiolo 2019/ 360

“that Council, having considered Item 14.6 – Wasleys Road Bridge - Maintenance, dated 26 August 2019, receives and notes the report and in doing so:-

- 1. Endorses the Wasleys Road Bridge for grant funding through Round 5 – Department of Infrastructure, Regional Development and Cities – Bridges Renewal Program;***
- 2. Endorses that Council's contribution for Wasleys Road Bridge be supported in a budget revision subject to an offer from external funding source; and***
- 3. Defer consultation in relation to either closure or reduced load limit/local traffic only on Wasleys Road Bridge until Round Five - Department of Infrastructure, Regional Development and Cities – Bridges Renewal Program outcome is received.”***

CARRIED UNANIMOUSLY

Following the above resolution of Council in August 2019, Management submitted and was successful in securing grant funding in 2020 through Round 5, Department of Infrastructure, Regional Development and Cities, Bridge Renewal Program and received \$107,500, matched by Councils contribution, totalling \$215,000 to undertake structural repairs during financial year 2021/22.

It is prudent to note that the Bridge Renewal Program criteria for eligibility was focused on structural improvements, with the majority of works outlined in the options below being maintenance in nature and therefore not eligible under the Bridge Renewal Program.

Discussion

Subsequent to the successful Bridge Renewal Program funding a select tender process was undertaken to ascertain level of interest, to seek costs and to engage suitably experienced, qualified and accredited bridge contractors to undertake the structural repairs and maintenance to Wasleys Bridge. The Tender Evaluation Panel met on several occasions to evaluate the received tenders.

In relation to the tender, a response is required no later than mid- August to allow the contractor sufficient lead time to procure material and schedule works to deliver by the expiry date for the Bridge Renewal Program funding (December 2021).

In parallel to the tender process a load limit capacity assessment was undertaken. The bridge assessment and load rating was based on clause 9 of Australian Standard AS 5100.7:2017 (Bridge Design – Part 7: Bridge Assessment), assessed for its current load limit capacity 12 tonne with the outcome presented as **Attachment 3** to this Report.

The initial structural capacity assessment undertaken in 2011 was based on section sizes concrete thickness and reinforcement as nominated on the drawings. This provided bridge capacity based on all elements being in as a new condition. Clearly the original elements of the bridge are not in as new condition as they are in the order of 108 years old and have experienced some deterioration over that period.

A brief overview of the load limit capacity assessment outcomes are outlined below

The current condition of the bridge shows that:

- There are losses of concrete cover and slab reinforcement deterioration.
- General loss of original steel beam corrosion protection and establishment of surface rust scale visible.
- In the outer arch girders, the steel plates that forms the sections are fully deteriorated and cannot be considered working with the section.

- The maintenance recommendations that were included in the 2011 report prepared by KBR were not carried out to date.

The initial results from the structural assessment indicates that the bridge has marginal capacity to continue to operate. A load limit of 6.5 tonne should be applied immediately and maintenance implemented to prevent further deterioration of the structure.

Provide physical constraint or at a minimum additional/renewed signage to prevent traffic crossing the bridge from both directions concurrently.

Council should determine an appropriate future strategy for this bridge and its required design;

- Capacity. Actions could include;
- Undertake a detailed condition assessment if a full refurbishment is considered or if the 6.5 tonne limit is satisfactory for future service. This will include invasive inspections and various tests to determine residual material thickness and strength for both the concrete and the steel.
- Establish budget and time frame for replacement.
- Design and construct Replacement Bridge.

Options & Risk Implications

The Committee has several options that it may wish to consider;

- Option 1 – Undertake structural repairs and maintenance.
- Option 2 – Undertake a portion of structural repairs and maintenance.
- Option 3 – Close the bridge.
- Option 4 – Construct a new bridge.
- Option 5 - Do nothing.

Option	Council \$ Contribution	Risk Level
1	\$859,570	Medium
2	\$197,500	High
3	\$35,000	Low
4	\$4,392,500	Low
5	\$000	Extreme

Below are further details in relation to options 1-5;

Option 1

Undertake structural repairs and maintenance. - Proceed as recommended, and previously resolved by Council (Resolution No. 2019/360), to undertake structural repairs and maintenance to Wasleys Bridge. The maintenance costs are much higher than anticipated and were an unbudgeted item.

In relation to resolution 2019/360, point 3 “***..Defer consultation in relation to either closure or reduced load limit/local traffic only on Wasleys Road Bridge until Round Five - Department of Infrastructure, Regional Development and Cities – Bridges Renewal Program outcome is received.***”

The load limit capacity assessment undertaken and presented as **Attachment 3** to this Report provides new information about the bridge’s current condition and load carrying capacity. The report strongly advises to lower the load limit to 6.5 tonne, and undertake structural repairs, maintenance and place physical constraints to manage traffic. A traffic treatment (physical barrier) will ensure that one vehicle transverses the bridge at any given time to manage the 6.5 tonne load limit capacity. Noting the bridge repairs and maintenance will not provide greater strength to the bridge super structure or substructure, repairs and maintenance will assist by extending the life of the asset.

Costs:

\$107,500	Income - Bridge Renewal Program, Round 5
\$107,500	Council 50% Contribution, Budget 2021/22
\$752,070	Additional Council Contribution
\$967,070	Total Cost (Ex GST)

Risk Profile: Option 1 actioned, risk is assessed as **medium**

Option 2

Undertake a portion of structural repairs and maintenance – Proceed with a small part of the structural repairs and maintenance, this decision requires discussion with the preferred tenderer as mobilisation, set up and demobilisation is a cost, the remaining costs to undertake actual repairs and maintenance works is unknown. Lower load limit capacity to 6.5 tonne, place physical constraints to manage traffic. Physical constraint will ensure that one vehicle transverses the bridge at any given time to manage the 6.5 tonne load limit capacity.

Costs:

\$107,500	Income - Bridge Renewal Program, Round 5
\$107,500	Council 50% Contribution, Budget 2021/22
\$ 90,000	Additional Council Contribution (reduce load limit, physical constraints, citb levy, road closure, invasive checks & testing, project management & contingency)
\$305,000	Total Cost (Ex GST) to be confirm.

Risk Profile: Option 2 actioned, risk is assessed as **high**

Option 3

Close the bridge – Close the road and bridge to vehicular traffic, no action required for bridge structural repairs and maintenance, no need to lower load capacity or to install physical constraints. Given the nearby alternative routes available this option is to close the bridge to vehicular traffic. Council could

undertake a comprehensive consultation process to gain a better understanding of Wasleys Road Bridge utilisation.

Costs:

\$000	Income - Bridge Renewal Program, Round 5 (Return Funding)
\$1,000	Consultation, Public Notification
\$34,000	Council Cost - Roads (Opening and Closing) Act 1991 (fencing, barriers, signage, survey, documentation, project management)
\$35,000	Total Cost (Ex GST)

Risk Profile: Option 3 actioned, risk is assessed as *low*

Option 4

Construct a new bridge – Construct a new bridge adjacent to the existing structure, within the same road reserve corridor. Cost estimate: detailed design, documentation and construction, plus quality control, see below \$4.5M.

Costs:

\$107,500	Income - Bridge Renewal Program, Round 5
\$107,500	Council 50% Contribution, Budget 2021/22
\$4,285,000	Additional Council Contribution (detailed design, documentation, construction, project management & contingency, statutory approvals, survey, geotechnical investigations, road realignment, traffic control devices and quality control)
\$4,500,000	Total Cost (Ex GST)

Risk Profile: Option 4 actioned, risk is assessed as *low*

Option 5

Do nothing - Not undertaking bridge structural repairs and maintenance, or lower load limit capacity to 6.5 tonne. The bridge will further deteriorate to a point that it won't be 'fit for purpose,' therefore will need to close to all vehicular traffic. Noting, Wasleys Bridge is a State Heritage listed asset, demolition approval is unlikely.

Costs:

\$000	Income - \$107,500 Bridge Renewal Program, Round 5 (Return Funding)
\$000	Council Contribution
\$000	Total Cost (Ex GST)

Risk Profile: Option 5 actioned, risk is assessed as *extreme*

Conclusion

It is for the Committee to now consider Options 1-5, and make recommendations to Council accordingly.

References

Legislation

Statutory:

Roads (Opening and Closing) Act 1991

Local Government Act 1999

Department for Environment & Water – SA State Heritage

South Australian Heritage Register (12977, date listed 21/10/1993)

Standards:

Australian Standard AS 5100.7:2017

AS/NZS ISO31000:2009 Risk Management Principles and Guidelines

Council Policies/Plans

Risk Management Policy

Risk Management Procedure

Procurement Policy

Work Health & Safety Policy



Public Consultation Policy




Chronological Order of Events




No.	Date	Provider/Title	Action/Outcome
1	27 February 2007	Department for Transport, Energy and Infrastructure	Inspection Report
2	29 July 2011	KBR	Investigations Report
3	22 April 2013	Ordinary Council Meeting Agenda Item 13.1 – Wasleys Bridge Load Limit	Resolution No. 2013/150 "That Council, having considered Item 13.1 Wasleys Bridge Load Limit dated 22 of April 2013, endorses the lowering of the load limit on Wasleys Bridge to 12 tonne and that Light Regional Council be advised of Council's decision".
4	2 May 2013	SA Government Gazette	Load Limit Notification - 12 tonne
5	3 August 2016	Mace Engineering Services Pty Ltd	Future Options for Bridge Structure Report
6	19 December 2016	Ordinary Council Meeting Agenda Item 17.4 Independent Structural Report – Recommendations for Wasleys Bridge Maintenance	Resolution No. 2016/391 "That Council, having considered Item 17.4 – Independent Structural Report - Recommendations for Wasleys Bridge Maintenance, dated 19 December 2016," receive and note this report". Resolution No. N/A Adjourned - Refer Motion 2016/392 Below "That Council, having considered Item 17.4 – Independent Structural Report - Recommendations for Wasleys Bridge Maintenance, dated 19 December 2016," endorse option four in the Mace Engineering report and allocate budget for \$25,000 for the recommendation of stage one in 2017-2018 budget for maintenance repairs Wasleys Bridge". Resolution No. 2016/392 "That the motion be adjourned until discussions have been had with Light Regional Council confirming the ownership status of the Wasleys Road bridge."
7	16 January 2017	Ordinary Council Meeting Agenda Item 4.1 Independent Structural Report – Recommendations for Wasleys Bridge Maintenance	Resolution No. 2017/003 "That Council, having considered Item 17.4 – Independent Structural Report - Recommendations for Wasleys Bridge Maintenance, dated 19 December 2016, undertake consultation in



			relation to either closure or reduced load limit/local traffic only on Wasleys Bridge and that management bring a subsequent report back to Council for consideration.”
8	17 December 2018	Ordinary Meeting, Agenda Item 18.4 Funding Options – Wasleys Road Bridge	<p>Resolution No. 2018/551</p> <p>“In relation to the Independent Structural Report Recommendations for Wasleys Bridge Maintenance I move that the CEO be authorised to investigate funding options under the state and federal funded Bridges Renewal Programme or other such funding arrangement.”</p>
9	25 February 2019	Council Report, Agenda Item 15.4 Wasleys Bridge – Funding Options	<p>Resolution No. 2019/078</p> <p>“That Council, having considered Item 15.4 – Funding Options – Wasleys Road Bridge, dated 25 February 2019, receives and notes the report.”</p> <p>Resolution No. 2019/079</p> <p>“That the Chief Executive Officer prepare a case for maximum funding in Round 5 of the federal funded Bridges Renewal Program, in relation to the maintenance and repair of Wasleys Road Bridge.”</p>
10	26 August 2019	Council Report, Agenda Item 14.6 Wasleys Road Bridge – Maintenance	<p>Resolution No. 2019/360</p> <p>Endorses the Wasleys Road Bridge for grant funding through Round 5 – Department of Infrastructure, Regional Development and Cities – Bridges Renewal Program;</p> <p>Endorses that Council’s contribution for Wasleys Road Bridge be supported in a budget revision subject to an offer from external funding source; and</p> <p>Defer consultation in relation to either closure or reduced load limit/local traffic only on Wasleys Road Bridge until Round Five - Department of Infrastructure, Regional Development and Cities – Bridges Renewal Program outcome is received.”</p>
11	February 2021	Mace Engineering Services Pty Ltd	Report Technical Specification
12	10 June 2021	Tenderer	Tender No: T15-2020/21, closed 10/06/21




13	6 July 2021	Development Application No. 21007649	Approval Granted - State Heritage Listed Bridge, DEW – Heritage SA provided advisory comments.
14	9 July 2021	Tonkin Consulting	Load Capacity Assessment Report


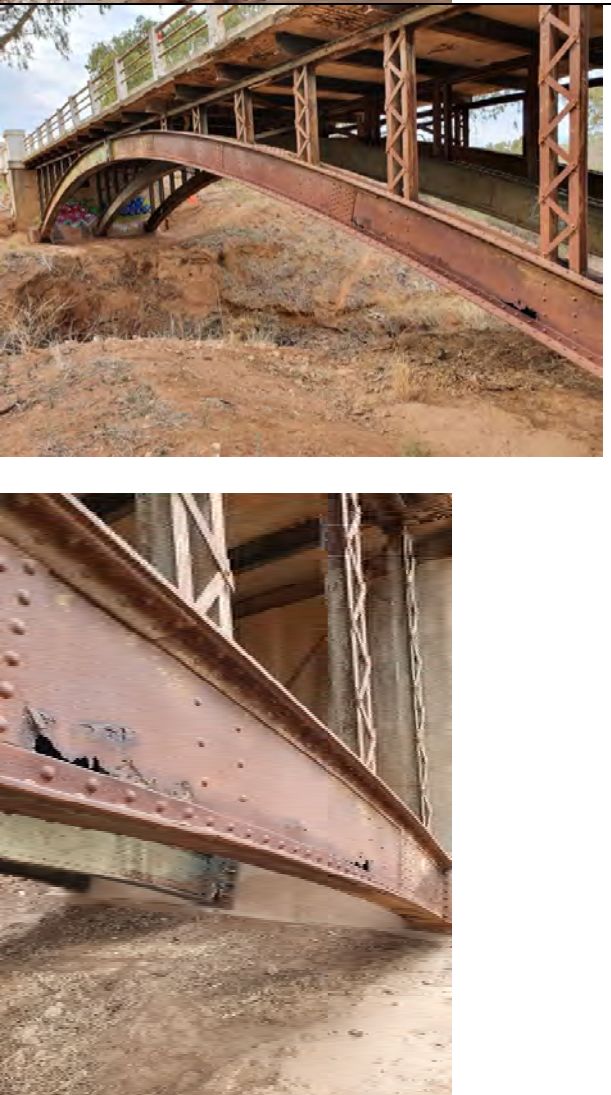
Photo No.	Location/Description	Photograph
1	Abutment wall cracking, shown consistent for all four bridge abutment walls.	
2	Abutment wall cracking, shown consistent for all four bridge abutment walls.	



3	Abutment wall cracking, shown consistent for all four bridge abutment walls.	
4	Abutment wall cracking, shown consistent for all four bridge abutment walls.	
5	Damage to concrete kerb as shown, consistent for all four bridge abutment walls.	




6	Damage to concrete kerb as shown, consistent for all four bridge abutment walls.	
7	Damage to concrete kerb as shown, consistent for all four bridge abutment walls.	
8	Road Surface - transverse pavement cracking, bridge deck joints (4 of).	




9	Concrete barrier posts 26 in total, spalling and cracking.	
10	Concrete barrier posts 26 in total, spalling and cracking.	




11	Concrete barrier posts 26 in total, spalling and cracking.	
12	Concrete barrier posts 26 in total, spalling and cracking.	
13	<p>Bottom rail (one) bent outwards, straighten or replace.</p> <p>Location between 2nd and 3rd post from Mallala end on downstream.</p>	

<p>14</p>	<p>Bottom rails (two) bent outwards, straighten or replace.</p> <p>Location between 2nd and 3rd post from Wasleys end on upstream.</p>	
<p>15</p>	<p>View of steel girder, Wasleys end, downstream.</p> <p>Severe rusting to girder.</p>	

16	Typical view of inside of girders showing a build-up of debris and laminar corrosion to the inside face of the web plates.	
17	Typical view of inside of girders showing a build-up of debris and laminar corrosion to the inside face of the web plates.	

18	Centre steel girder.	
20	<p>Concrete Deck – spalling of concrete to the underside of the deck at Wasleys end.</p> <p>Spalling covers a varying degree of area on the underside of deck.</p>	
21	<p>Concrete Deck – spalling of concrete to the underside of the deck at Wasleys end.</p> <p>Spalling covers a varying degree of area on the underside of deck.</p>	

22	<p>Concrete Deck – spalling of concrete to the underside of the deck at Wasleys end.</p> <p>Spalling covers a varying degree of area on the underside of deck.</p>	
23	<p>Abutment cracking underside, Wasleys end.</p>	
24	<p>Steel work - cross girders and supports.</p>	

25	Steel work – girders, cross girders and supports.	
26	Wasleys end, concrete deck edge broken.	
27	Steelwork – support arms from girder to cross girders.	

Wasleys Bridge Assessment

Load Capacity Assessment

Adelaide Plains Council

9 July 2021
Ref: 211073R001A



Document History and Status

Rev	Description	Author	Reviewed	Approved	Date
A	For Review	ZA	PSC	TT	09 July 2021

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Project: Wasleys Bridge Assessment | Assessment Report
Client: Adelaide Plains Council
Ref: 211073R001A

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Appendices

Appendix A – Historical Drawings of the Bridge
Appendix B – Traffic Reports
Appendix C - Structural Calculations

1 Introduction

1.1 Brief

In response to Adelaide Plains Council's request to undertake load capacity assessment of Wasleys Bridge, Tonkin was engaged in accordance with proposal (Ref. 211073PL001A). The bridge was inspected by Patrick Callaghan and Zak Alma on 09/06/2021. The load capacity assessment will be based on the visual inspection of the bridge and the available drawings and report that were previously prepared for the bridge.

A detailed review has been carried out of the historical drawings of the bridge along with a previous report prepared in 2011 (prepared by KBR).

It is assumed that the bridge was constructed in accordance with the historical drawings.

The Tonkin engineers visited and inspected the bridge on 09/06/2021. The bridge was built in 1913 and consists of concrete deck slab resting on steel beams spaced at 1.70m centres. The steel beams are supported by steel columns that are then supported on three steel arches that are in turn supported at the bridge ends. The span of these arches is 30.48m.

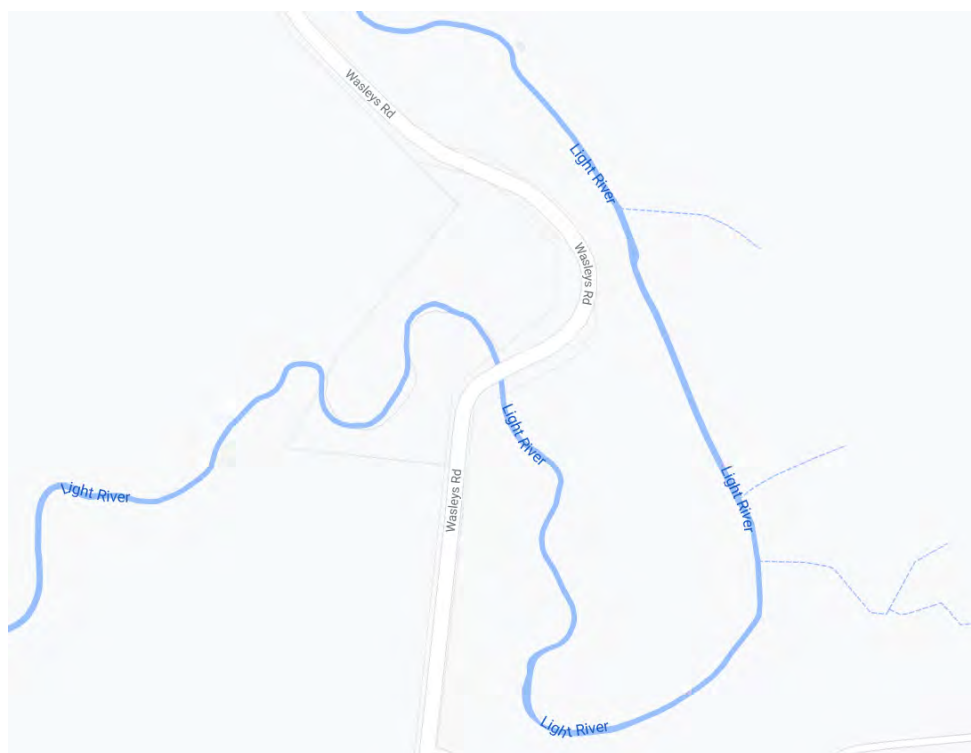


Figure 1 Bridge Location

2 Bridge Assessment

2.1 Bridge Description

The available bridge drawings are dated 1913 and show the same layout as the current bridge except for the bridge barrier which was changed from timber to concrete posts with guard rails (refer to the drawings in Appendix-A).

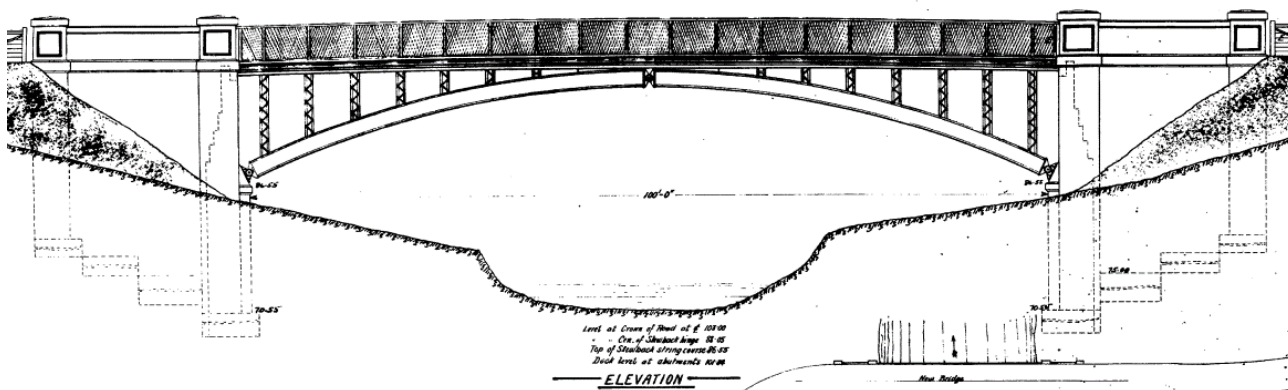


Figure 2 Bridge Elevation as Shown in 1913 Drawings

The bridge currently consists of an approximate 150mm thick reinforced concrete deck slab supported on 10"x5"x30 lb/ft steel girders with 1701 mm spacing. The girders are simply supported on steel columns built up of 2/6"x3"x12.4 lb sections that are supported by arched beam. The arched beam is built up of 2/5"x 1/2" top plates, 2x2/3 1/2"x 1/2" EA top and bottom, 2/2' web plates 3/8" thick., 2/16"x 3/8" bottom plates.

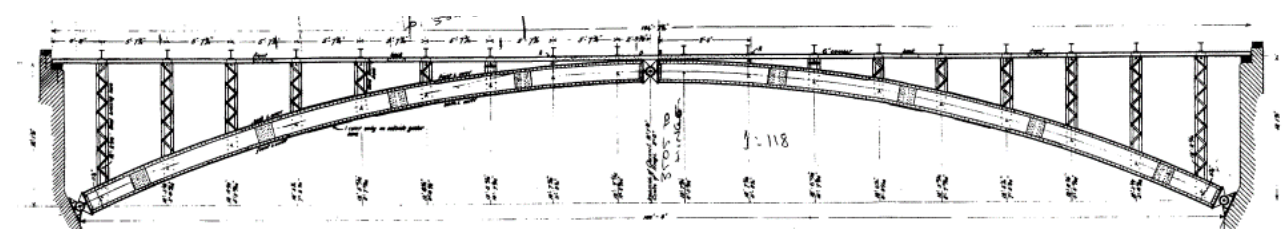


Figure 3 Bridge Section Showing the Steel Structure Elements

The bridge arch span is 30.48m, simply supported on both sides with a hinge in the middle.

The deck slab width is approximately 7.40m, and the guardrail is steel pipe rail supported on the top of concrete posts.

The asphalt wearing course layer has deteriorated and needs maintenance.

It was confirmed by Council's representative, that the repair and maintenance recommendations of 2011 report have not been carried out to date.

2.2 Assessment Methodology:

The bridge assessment and load rating are based on clause 9 of Australian Standard AS 5100.7:2017 (Bridge Design – Part7: Bridge Assessment) and the 2011 report prepared by KBR.

2.2.1 Material Properties:

The yield strength of the reinforcement bars is assumed to be 450 Mpa (Mesh 1914 to 1995 Table A1, Appendix A – AS5100.7-2017).

The yield strength of the steel sections is assumed to be 210 MPa.

The concrete grade is 20MPa.

The above properties are the same material properties used in 2011 report.

2.2.2 Structure Description:

The bridge is 32m long by 7.40m wide and consists of a 150 mm thick reinforced concrete deck slab, resting on steel cross girders (10"x 5"x30 lb/ft) at 1.72m centres. The concrete slab is spanning over 19 spans.

The cross girders are supported by verticals double channels (6"x3"x12.4 lb/ft BSC) and horizontal longitudinal double channels (5"x2½"x10.22 lb/ft BSC). The cross girders spans are maximum 3.05 (two spans each).

The vertical channels are supported by three arch girders (one central and two side girders)

No clear details for the footings on the bridge sides are available in the drawings. Hence, with the absence of information about the concrete footings and walls and the fact that the bridge is more than 100 years old, could not be assessed in this report.

2.2.3 Bridge Current Condition:

Patrick Callaghan and Zak Alma of Tonkin visited the site and verified that the maintenance recommendations detailed in KBR report 2011 which marked a timeline for the required maintenance as 2-3 years from the report date, have not been carried out to date. The Council is seeking a review and update of these recommendations as it is in the process of obtaining contractor quotes to undertake the maintenance work for the bridge.

The following are some of the observations from the site inspection:

Table 2.1 Bridge Current Condition

Description	Photo
<p>1</p> <ul style="list-style-type: none"> • Deterioration of the asphalt wearing surface above the bridge's deck. • Guard Rails are corroded and not in accordance or compliant with the modern standard. 	
<p>2</p> <ul style="list-style-type: none"> • Concrete spalling and corroded reinforcement bars were observed at different locations on the underside of the concrete deck. • Cracks are seen in one of the abutments. • Graffiti on concrete and steel bridge components. • Corroded components of bridge steel structure (Connection of arch beam to the abutment wall) 	  

Description	Photo
<p>3</p> <ul style="list-style-type: none"> Corroded arch beam (downstream side beam) the web plate of the built up section is fully corroded and have holes as shown. 	
<p>4</p> <ul style="list-style-type: none"> The top of the arch beam is open and allows water and debris to be collected in the beam section and by time cause the section corrosion. 	
<ul style="list-style-type: none"> The vertical channels supported on the central grid are not tied together with plates as the side girders verticals. 	
<ul style="list-style-type: none"> Movements at the connection between the bridge deck and the abutments. 	

2.2.4 Theoretical Capacity of the Bridge:

The original design drawings of the bridge do not show any indication of the loads or vehicle used in design of the bridge. Given the year of construction a 15T truck is a likely design vehicle. The 2011 report prepared by KBR, concluded that the bridge was adequate for a single lane loaded with 12T vehicles (This approach is a deviation from current Australian Standard AS 5100).

This assumption (of a single traffic lane) is a significant departure from the design principles incorporated within AS 5100. The validity of this assumption is challenged for a number of reasons, being:

- While bridge traffic volumes are low there is no physical constraint to prevent traffic crossing the bridge from both directions concurrently.
- Kerb to kerb clear distance is 6.28m which will allow for opposing traffic to pass.
- While from site observation it is clear that users generally travel down the centre of the bridge, there are no traffic management features to control this behaviour.

The bridge will be assessed for a single lane, but a physical constraint should be installed to prevent traffic from both directions concurrently and provide validity to this assumption.

The structural assessment undertaken within this report is based on the following assumptions:

- Structural layout and dimension based on original drawings.
- Material strengths as listed in section 2.2.1 of this report.
- Bridge operates as a single lane bridge.
- No earthquake load assessment.
- No lateral stream flow load case.
- Capacity of abutments assumed to be adequate.
- The barriers should be a regular performance level barrier based on the traffic report (refer appendix B and C and by inspecting the existing barriers, they do not have sufficient resistance to that performance level or even the low performance level.
- Impact of differential settlement and thermal affects have not been reviewed.
- The concrete footings of the bridge were not assessed since no information was available about them.
- The bridge arch beams are simply supported on the abutment walls with a hinge in the centre of each girder.

Assessment vehicle loads used in this report:

- SM1600 (AS5100.2-2017)
- 4 wheels x 100kN (each vehicle).

Load capacity is assessed based on proportioning the sections capacities and the applied load.

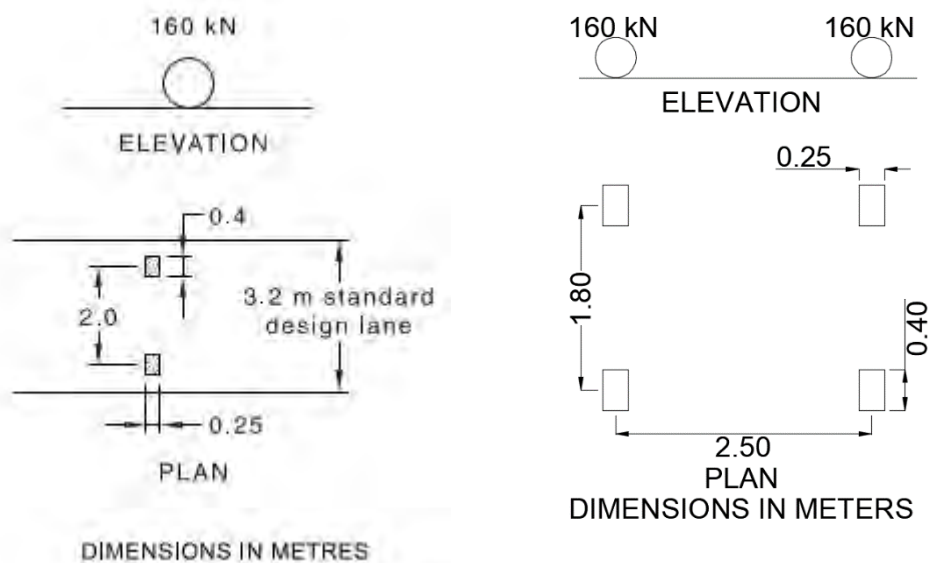


Figure 4 - A160 Axle Load (AS5100.2-20.17) & 4 Wheels x 100kN (Not Standard)

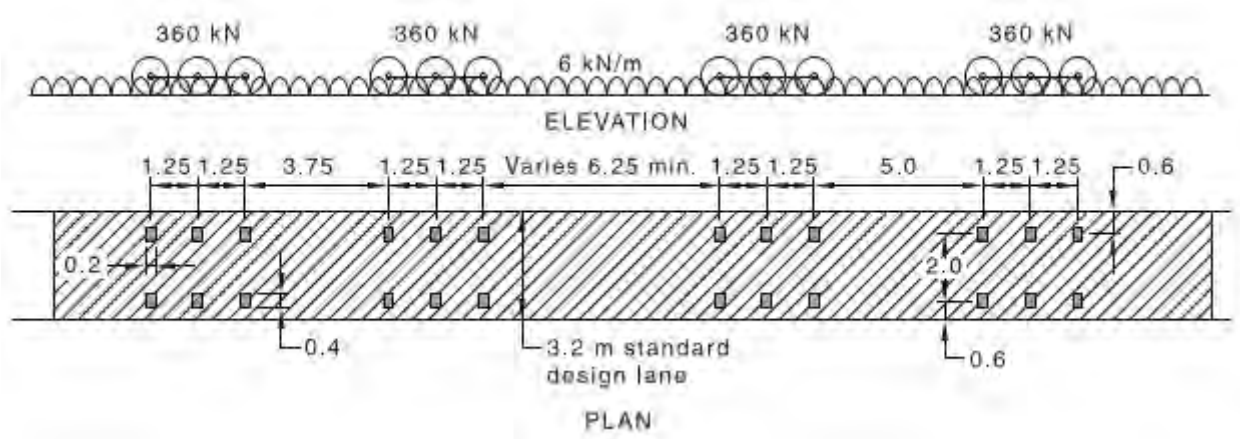


Figure 5 – M1600 (AS5100.2-2017)

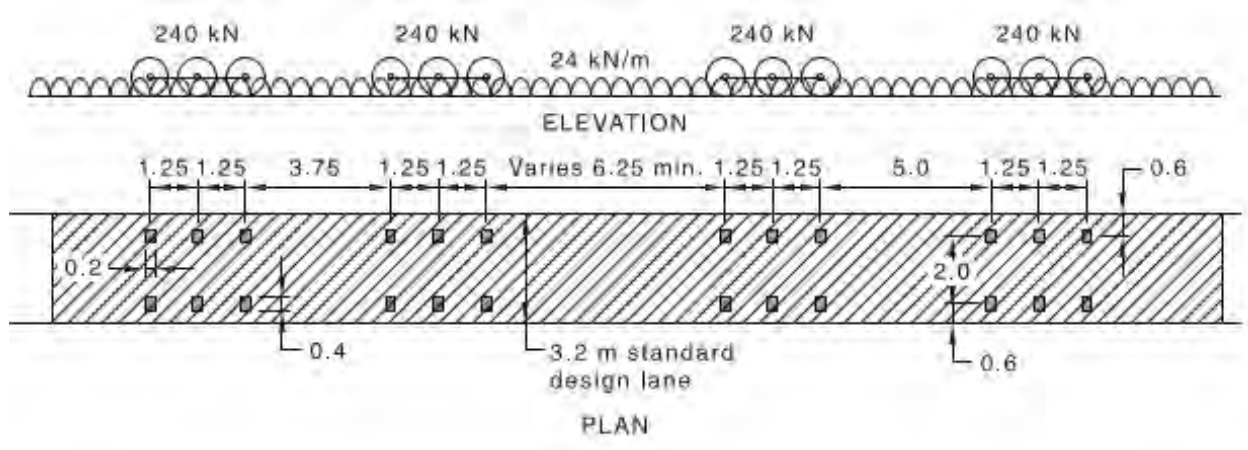


Figure 6 – S1600 (AS5100.2-20.17)

2.2.5 Load Rating:

Assessment of the existing bridge has been undertaken in accordance Australian Standard AS 5100.7-2017 and the investigation report prepared by KBR in 2011.

The standard promotes the concept of a load rating factor for the bridge to determine a suitable operational management strategy that can be adopted.

The load rating factor is determined by calculating the residual structural capacity of the bridge (or more particularly principal bridge element) after subtracting the load effects from factored permanent load (Dead Load) and factored superimposed dead loads (such as pavement material). The residual or available capacity is then divided by the traffic load effect of the nominated rating vehicle.

The load rating factor (LRF) is defined then as

$$\text{LRF} = \text{Available bridge capacity for vehicle loads} / \text{factored traffic load effect of nominated rating vehicle}$$

A LRF value of 1.0 means the bridge has an acceptable factor of safety against failure for the nominated rating vehicle. An acceptable factor of safety is achieved under the bridge code by applying a load factor of 1.8 to the actual traffic load of the nominated vehicle.

As a reference point, the member capacity tables below include an assessment for the steel girders based on traffic loads (SM 1600) that would be applied if the bridge was being designed under the current bridge code.

Differential settlement and thermal effects have not been considered as they are not expected to induce significant additional stress in this bridge.

Load ratings were determined for all critical structural members and the smallest value was adopted for the load rating of the bridge as a whole.

The initial structural capacity assessment is based on section sizes, concrete thickness and reinforcement as nominated on the drawings. This provides bridge capacity based on all elements being in as a new condition.

Clearly the original elements of the bridge are not in as new condition as they are in the order of 100 years old and have experienced some deterioration over that period. This deterioration will reflect in a reduction in member capacity and hence load carrying capacity.

The degree of deterioration varies from element to element and is not uniform across the structure. A detailed assessment of the condition of each element has not been undertaken for this report.

2.2.6 Load Capacity Results:

Based on Australian Standard AS5100.7 the main bridge elements have been assessed by applying the nominated vehicle load (plus dead load) and determining the resultant load rating factor.

2.2.6.1 Deck Slab – Load Rating Factor

As New Condition	W80 / A160 (AS5100.2-2017)	M1600/S1600 (Max) (AS5100.2-2017)	4 Wheels x 100kN (Not Standard)
Moment (kN.m)	75.78	59.63	93.45
LRF	0.5 < 1	0.63 < 1	0.41 < 1

For Load Rating Factor LRF = 1, the maximum wheel load on the concrete deck slab is 37kN, refer to Appendix C.

2.2.6.2 Steel Girders – Load Rating Factor

As New Condition	W80 / A160 (AS5100.2-2017)	M1600/S1600 (Max) (AS5100.2-2017)	4 Wheels x 100kN (Not Standard)
Moment (kN.m)	120.08	110.27	174.7
LRF	0.64 < 1	0.7 < 1	0.44 < 1
Shear (kN)	270.4	209.04	351.52
LRF	0.58 < 1	0.76 < 1	0.22 < 1

For Load Rating Factor LRF = 1, the maximum wheel load on the steel cross beams is 43.3kN, refer to Appendix C.

2.2.6.3 Vertical Channels – Load Rating Factor

As New Condition	SM1600 (AS5100.2-2017)	4 Wheels x 100kN (Not Standard)
Axial Load (kN)	491.6	640.32
LRF	0.26 < 1	0.2 < 1

For Load Rating Factor LRF = 1, the maximum vehicle load on the vertical channels is 65 kN, refer to Appendix C.

2.2.6.4 Arch Girders – Load Rating Factor

The central arch girder is assessed with the full theoretical capacity of the section as shown in KBR report 2011. But the outer girders are considered without the web plates since these plates are fully corroded.

The vehicle load used in assessing the arch girders (central and outer girders) is 400 kN weight besides proportional forces from SM1600 (AS5100.2-2017).

For the central girder the sections were safe to carry the load, hence the central arch girder members are not the critical members to determine the bridge capacity.

While the reduced sections for the outer girders show that for Load Rating Factor LRF = 1, the maximum vehicle load on the vertical channels is 106 kN, refer to Appendix C

Reduced Section	SM1600 (AS5100.2-2017)	4 Wheels x 100kN (Not Standard)
Axial Load (kN) – Outer Girder	2253.5	2929.5
LRF – Outer Girder	0.52	0.4 < 1

As can be seen the vehicle load under the current AS1500 is significantly higher than the suggested maximum loads that can be taken by the bridge components.

The load rating factor (LRF) calculations shows that this structure require a load limit to avoid overstressing.

3 Discussion & Recommendations

The original bridge was constructed in 1913 which makes it over 100 years old, and even with the maintenance work that was done or recommended to rehabilitate the bridge over these years, the bridge is not in the same condition as when it was constructed. In addition, the assessment of the members sections and materials theoretically will not reflect their current condition status after all these years.

From site observations it appears that there is a traffic control signage to limit the operation of the bridge as single lane bridge, but as advised by the Council representative, the drivers are not adhering to these signs because the clear width between barriers is in the order of 6.28m and can be used as 2-lane bridge.

The current condition of the bridge shows that:

- There are losses of concrete cover and slab reinforcement deterioration.
- General loss of original steel beam corrosion protection and establishment of surface rust scale visible.
- In the outer arch girders, the steel plates that forms the sections are fully deteriorated and can not be considered working with the section.
- The maintenance recommendations that were included in the 2011 report prepared by KBR were not carried out to date.

The summary of the structural calculations shows the capacity of the different components of the bridge.

The target Load Rating Factor (LRT) is 1.0 or greater.

It should be noted that this result is very sensitive to the estimated condition of the individual members and assessment has ignored secondary load effects from shrinkage, creep, differential settlement and temperature changes, which will result further reduction in the LRF values.

Therefore, it is recommended that a traffic load limit of 6.5T vehicle load to be applied to the bridge and Council should plan for future replacement.

To retain this section of roadway within in operation in the medium term. The following actions are recommended:

1. Immediately apply a load limit of 6.5T.
2. Repair works to commence immediately based on "Bridge Repair Manual – Appendix D to Road Structures Inspection Manual" issued by DIT:
 - SR01 Major Repairs to Spalling Concrete.
 - SR05 Epoxy Pressure Injection of Cracks
 - SR14 Repair of Corroded Girder Webs
3. Provide physical constraint, or at a minimum additional/renewed signage, to prevent traffic crossing the bridge from both directions concurrently.

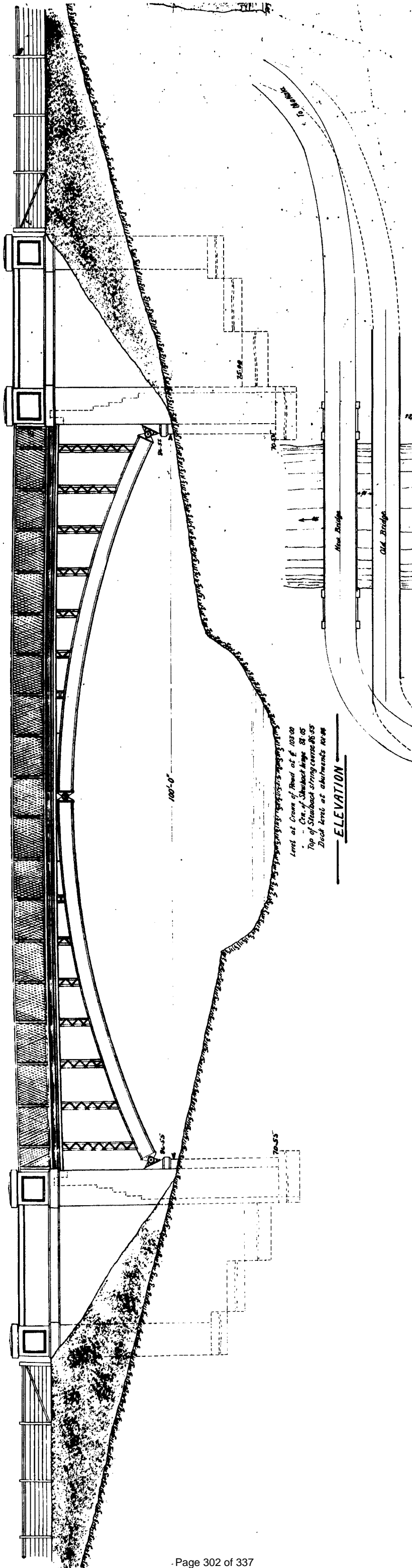
Council should then determine an appropriate future strategy for this bridge and its required design capacity. Actions could include;

- Undertake a detailed condition assessment if a full refurbishment is considered or if the 6.5T limit is satisfactory for future service.
This will include invasive inspections and various tests to determine residual material thickness and strength for both the concrete and the steel.
- Establish budget and time frame for replacement.
- Design and construct replacement bridge.

The initial results from the structural assessment indicates that the bridge has marginal capacity to continue to operate. A load limit of 6.5T should be applied immediately and maintenance implemented to prevent further deterioration of the structure.

The existing barriers provide delineation of the edge of the bridge, however offer no containment of errant vehicles using the bridge. The detail and structural capacity of the existing deck slab is inadequate to support a crash barrier that would comply with AS 5100.

Appendix A – Historical Drawings of the Bridge



4 August 2021

ROADS AND BRIDGES DEPT. S.A.

REDBANKS BRIDGE

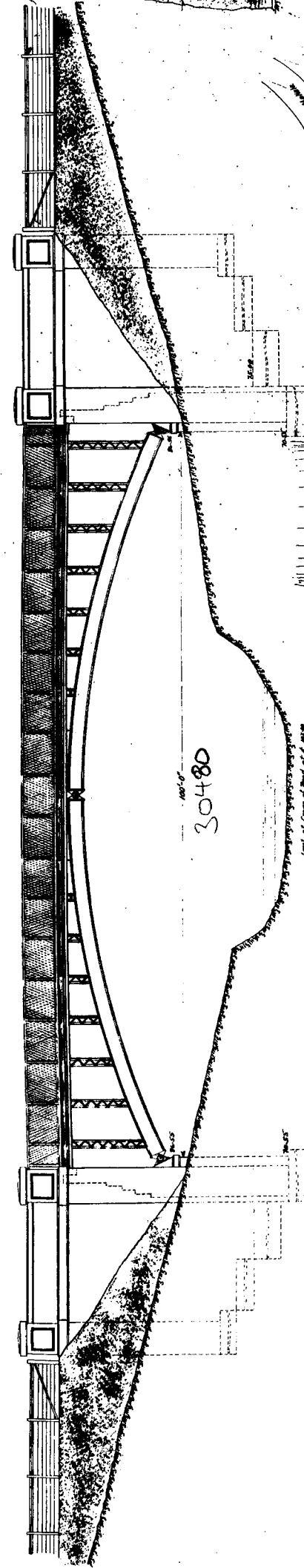
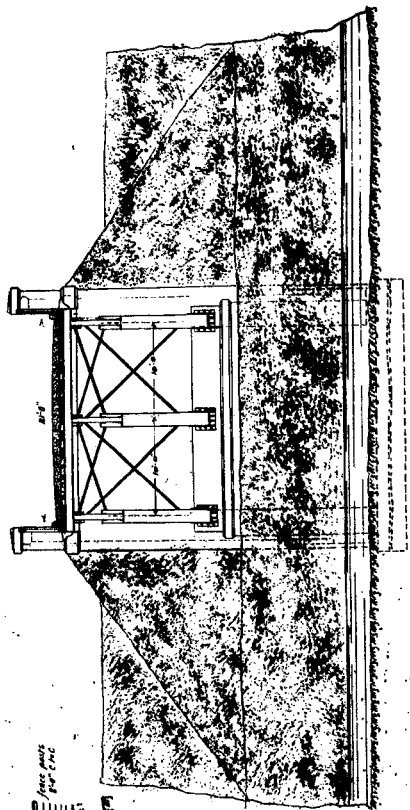
GENERAL DRAWING

Scale 1/8" = 1' Feet

DRAWING N°:

N°297

This is Drawing N°1, referred to in Contract N°170
Contractor: Samuel, Dwyer
Date: 16/12/12
Scale: 1/8" = 1' Feet

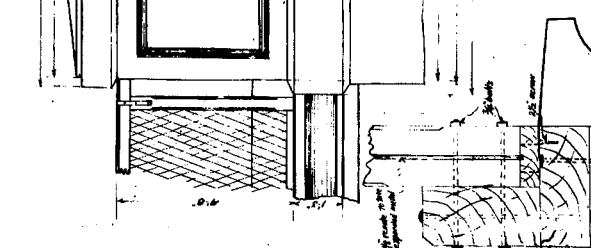
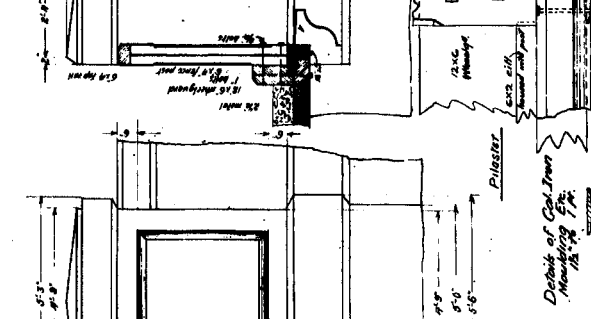
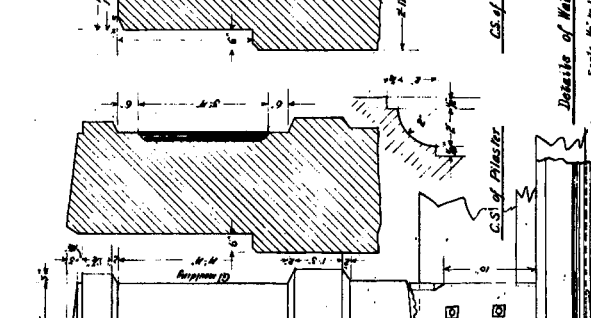
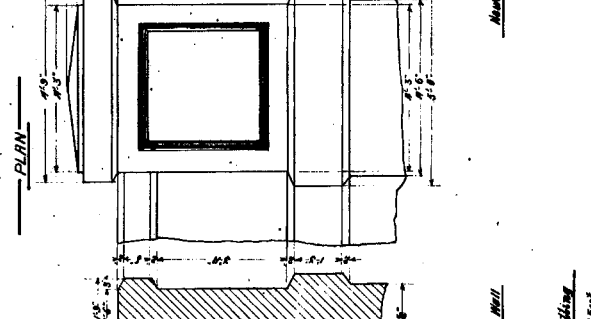
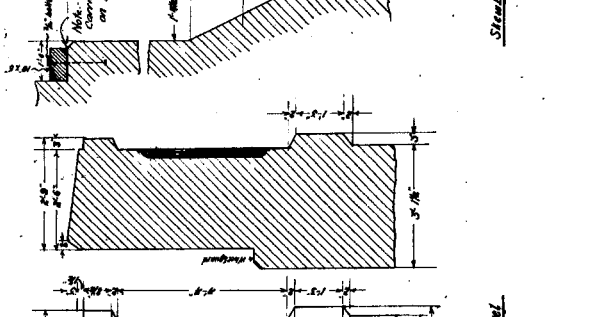
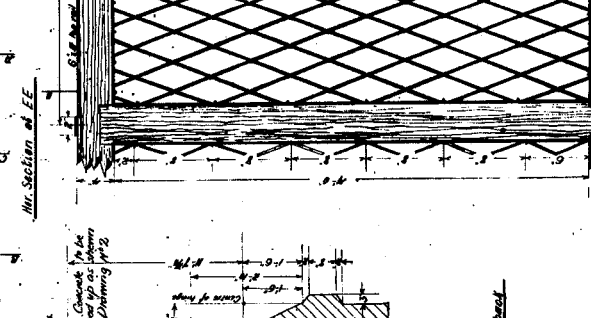
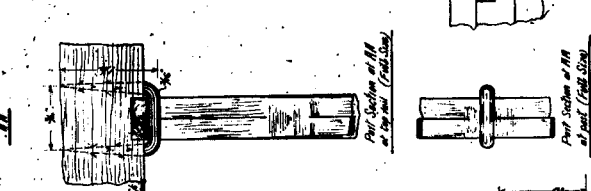
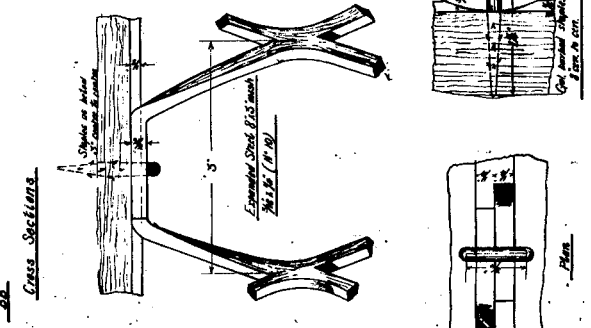
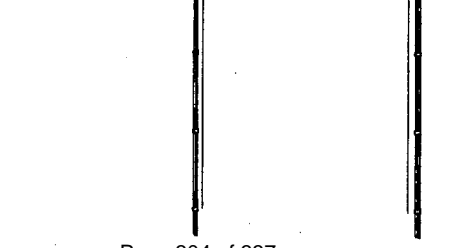
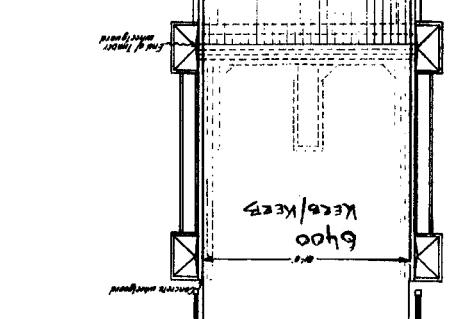
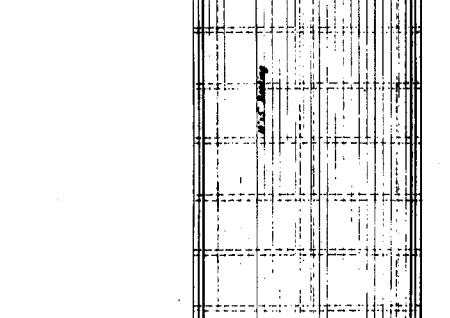
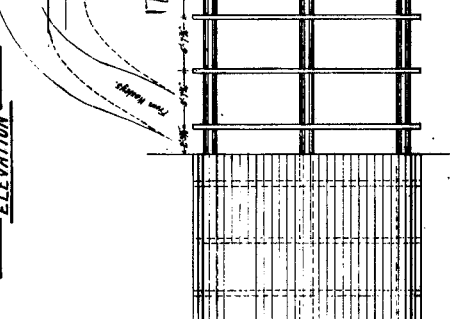
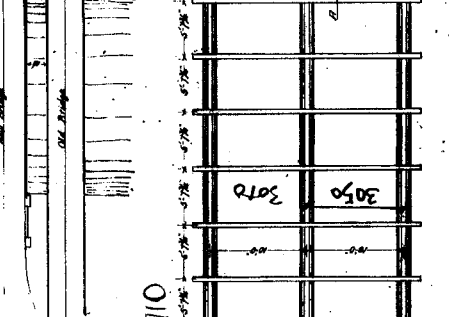
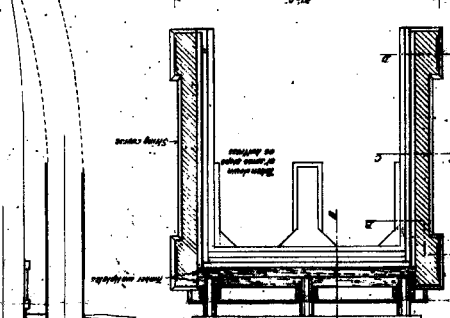
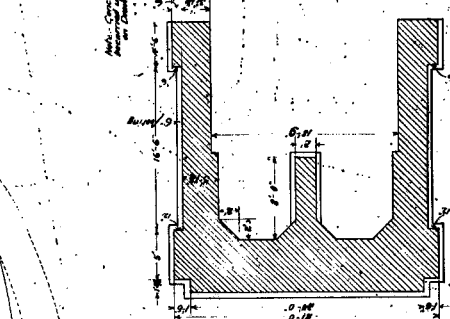
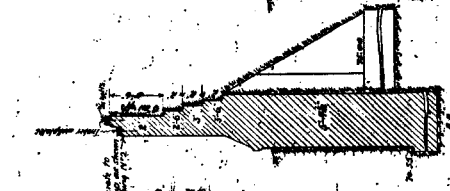
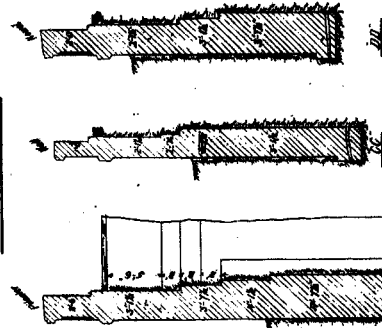


30480

Level at Crown of Road at 6.000
Crown of Road at 6.000
Top of Standard string course at 6.000
Level at 6.000

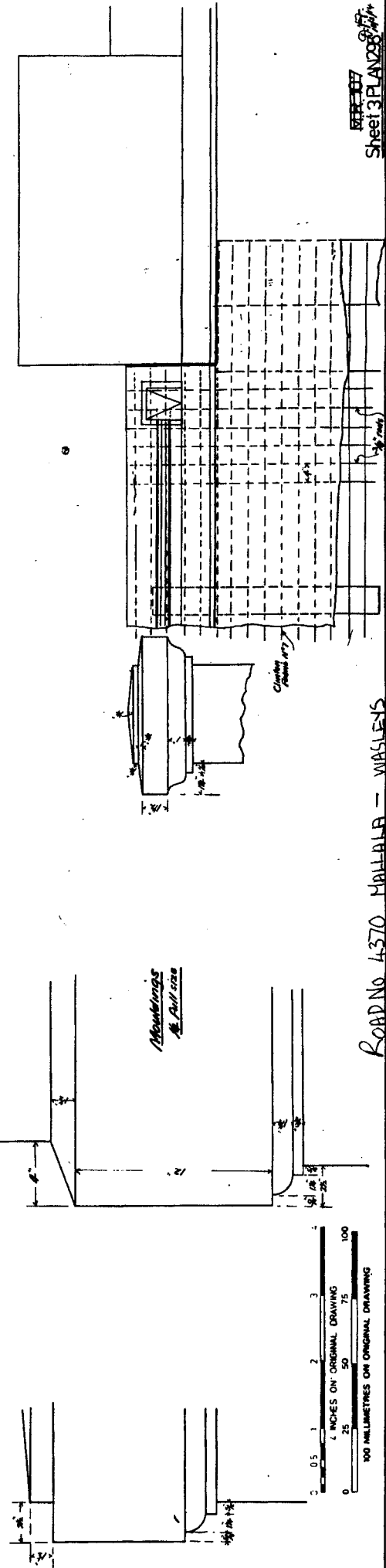
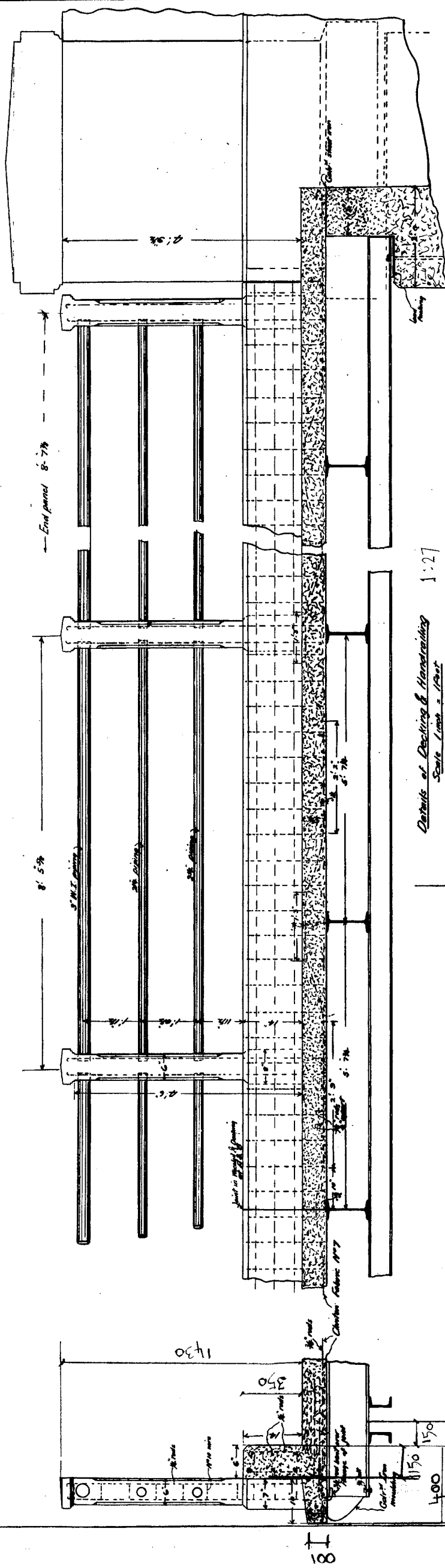
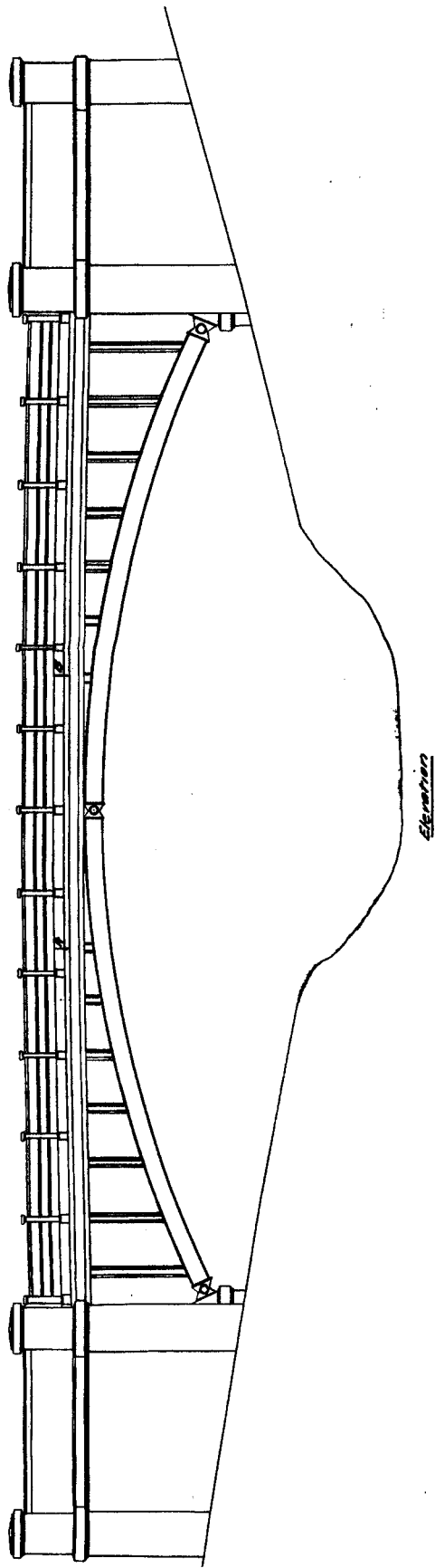
ELEVATION

CROSS SECTION



0 0.5 1 2 3 4
INCHES ON ORIGINAL DRAWING
0 25 50 75 100
100 MILLIMETRES ON ORIGINAL DRAWING

DEPARTMENT OF SOUTH AUSTRALIA



Appendix B – Traffic Reports

Traffic Summary

Location - Wasleys Road, Wasleys Road - Collins Road to Start Bridge - ID-912

Survey Period - 0:00 Friday, 27 March 2015 to 0:00 Tuesday, 14 April 2015 (18 days of data)

Volume						
	Total	Weekday	Weekend	ADT	AWDT	AWET
Combined	1103	741	362	61	62	60
West	568	388	180	32	32	30
East	535	353	182	30	29	30
Days	18	12	6	18	12	6

Speed				
	All Days	Weekdays	Weekend	
Mean speed	60.3	59.2	62.5	km/h
Median speed	60.8	60.5	61.2	km/h
85% speed	72.7	72.7	73.1	km/h

PSL = 0 km/h

Class				
Class (<i>AustRoads94</i>) Scheme shown on Page 2	All Days	%	Weekdays	Weekend
1 - SV	926	84.0%	618	308
2 - SVT	89	8.1%	57	32
3 - TB2	38	3.4%	30	8
4 - TB3	26	2.4%	18	8
5 - T4	6	0.5%	5	1
6 - ART3	3	0.3%	0	3
7 - ART4	4	0.4%	4	0
8 - ART5	7	0.6%	6	1
9 - ART6	4	0.4%	3	1
10 - BD	0	0.0%	0	0
11 - DRT	0	0.0%	0	0
12 - TRT	0	0.0%	0	0













Average Daily Volume							
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
West	97	63	52	67	109	98	82
East	103	71	46	56	77	94	88
Combined	200	134	98	123	186	192	170
AM Pk West	2	6	3	4	4	3	2
PM Pk West	4	3	4	4	4	4	4
AM Pk East	2	7	3	3	2	3	4
PM Pk East	6	4	2	4	3	4	4
Days	3	2	2	2	3	3	3

Report created 15:07 Monday, 22 June 2015 using MTE version 4.0.6.0

AustRoads94

Austroads94 replaced NAASRA in Australia in 1994. It is an improved system using information from the spacings of the first three axles, the total number of axles and the number of axle groups. There are 13 classes.

- **Units:** Metric (m)
- **Car class:** 1
- **Unclassifiable vehicle class:** 13

Axles	Groups	Description	Class		Parameters	Dominant Vehicle	Aggregate
2	1 or 2	Short - Sedan, Wagon, 4WD, Utility, Light Van	SV	1	$d(1) \geq 1.7\text{m}$, $d(1) \leq 3.2\text{m}$ & axles=2		1 (Light)
3, 4 or 5	3	Short Towing - Trailer, Caravan, Boat, etc.	SVT	2	groups=3, $d(1) \geq 2.1\text{m}$, $d(1) \leq 3.2\text{m}$, $d(2) \geq 2.1\text{m}$ & axles=3,4,5		
2	2	Two axle truck or Bus	TB2	3	$d(1) > 3.2\text{m}$ & axles=2		2 (Medium)
3	2	Three axle truck or Bus	TB3	4	axles=3 & groups=2		
>3	2	Four axle truck	T4	5	axles>3 & groups=2		
3	3	Three axle articulated vehicle or Rigid vehicle and trailer	ART3	6	$d(1) > 3.2\text{m}$, axles=3 & groups=3		3 (Heavy)
4	>2	Four axle articulated vehicle or Rigid vehicle and trailer	ART4	7	$d(2) < 2.1\text{m}$ or $d(1) < 2.1\text{m}$ or $d(1) > 3.2\text{m}$ & axles = 4 & groups>2		
5	>2	Five axle articulated vehicle or Rigid vehicle and trailer	ART5	8	$d(2) < 2.1\text{m}$ or $d(1) < 2.1\text{m}$ or $d(1) > 3.2\text{m}$ & axles=5 & groups>2		
≥ 6	>2	Six (or more) axle articulated vehicle or Rigid vehicle and trailer	ART6	9	axles=6 & groups>2 or axles>6 & groups=3		
>6	4	B-Double B-Double or Heavy truck and trailer	BD	10	groups=4 & axles>6		
>6	5 or 6	Double road train or Heavy truck and two trailers	DRT	11	groups=5 or 6 & axles>6		
>6	>6	Triple road train or Heavy truck and three trailers	TRT	12	groups>6 & axles>6		

Traffic Summary

Location - Wasleys Road, Wasleys Road - Collins Road to Start Bridge - ID-912

Survey Period - 0:00 Thursday, June 17, 2021 to 0:00 Wednesday, July 07, 2021 (20 days of data)

Volume						
	Total	Weekday	Weekend	ADT	AWDT	AWET
Combined	650	537	113	33	38	19
South	360	277	83	18	20	14
North	290	260	30	15	19	5
Days	20	14	6	20	14	6

Speed				
	All Days	Weekdays	Weekend	
Mean speed	60.1	61.7	52.9	km/h
Median speed	58.3	59.8	48.2	km/h
85% speed	77.4	77.4	74.2	km/h

PSL = 0 km/h

Class				
Class (<i>AustRoads94</i>) Scheme shown on Page 2	All Days	%	Weekdays	Weekend
1 - SV	428	65.8%	347	81
2 - SVT	35	5.4%	25	10
3 - TB2	160	24.6%	140	20
4 - TB3	7	1.1%	6	1
5 - T4	0	0.0%	0	0
6 - ART3	5	0.8%	4	1
7 - ART4	11	1.7%	11	0
8 - ART5	1	0.2%	1	0
9 - ART6	1	0.2%	1	0
10 - BD	2	0.3%	2	0
11 - DRT	0	0.0%	0	0
12 - TRT	0	0.0%	0	0

Average Daily Volume							
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
South	49	59	44	61	64	42	41
North	44	40	35	69	72	14	16
Combined	93	99	79	130	136	56	57
AM Pk South	2	1	4	2	2	3	2
PM Pk South	2	2	3	2	3	2	2
AM Pk North	2	2	3	2	3	1	0
PM Pk North	1	2	2	4	2	1	1













Days	3	3	2	3	3	3	3
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Report created 13:45 Wednesday, July 07, 2021 using MTE version 4.0.6.0

AustRoads94

Austroads94 replaced NAASRA in Australia in 1994. It is an improved system using information from the spacings of the first three axles, the total number of axles and the number of axle groups. There are 13 classes.

- **Units:** Metric (m)
- **Car class:** 1
- **Unclassifiable vehicle class:** 13

Axles	Groups	Description	Class		Parameters	Dominant Vehicle	Aggregate
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3, 4 or 5	3	Short Towing - Trailer, Caravan, Boat, etc.	SVT	2	groups=3, $d(1) \geq 2.1\text{m}$, $d(1) \leq 3.2\text{m}$, $d(2) \geq 2.1\text{m}$ & axles=3,4,5		
2	2	Two axle truck or Bus	TB2	3	$d(1) > 3.2\text{m}$ & axles=2		2 (Medium)
3	2	Three axle truck or Bus	TB3	4	axles=3 & groups=2		
>3	2	Four axle truck	T4	5	axles>3 & groups=2		
3	3	Three axle articulated vehicle or Rigid vehicle and trailer	ART3	6	$d(1) > 3.2\text{m}$, axles=3 & groups=3		3 (Heavy)
4	>2	Four axle articulated vehicle or Rigid vehicle and trailer	ART4	7	$d(2) < 2.1\text{m}$ or $d(1) < 2.1\text{m}$ or $d(1) > 3.2\text{m}$ & axles = 4 & groups>2		
5	>2	Five axle articulated vehicle or Rigid vehicle and trailer	ART5	8	$d(2) < 2.1\text{m}$ or $d(1) < 2.1\text{m}$ or $d(1) > 3.2\text{m}$ & axles=5 & groups>2		
>=6	>2	Six (or more) axle articulated vehicle or Rigid vehicle and trailer	ART6	9	axles=6 & groups>2 or axles>6 & groups=3		
>6	4	B-Double B-Double or Heavy truck and trailer	BD	10	groups=4 & axles>6		
>6	5 or 6	Double road train or Heavy truck and two trailers	DRT	11	groups=5 or 6 & axles>6		
>6	>6	Triple road train or Heavy truck and three trailers	TRT	12	groups>6 & axles>6		

Appendix C - Structural Calculations

Project Wasleys Bridge - Load Capacity Assessment.

Job number 211073

Taken by

Date 21/6/2021 Page 1 of

Location

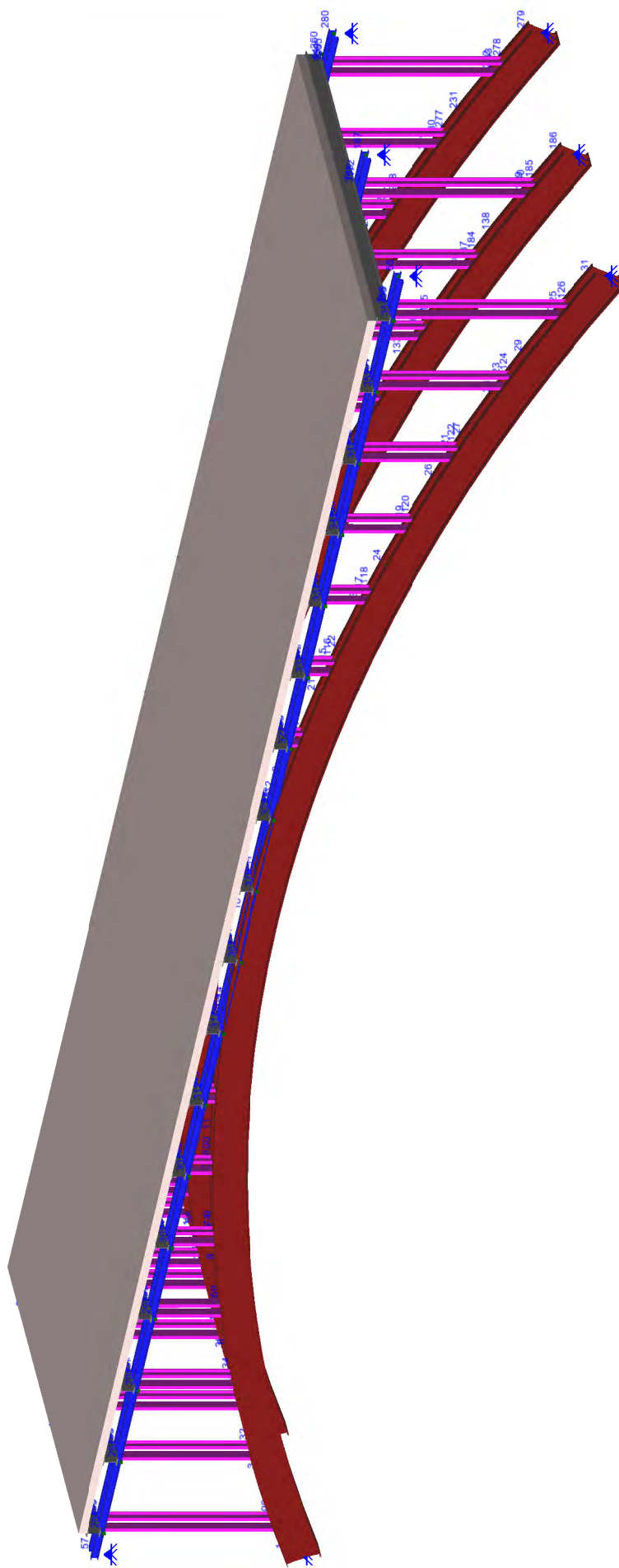
Present

☐ Phone ☐ Meeting ☐ Site visit ☐ Other

Calculation ZA Checked

Assessment of Bridge Structure Calculations:

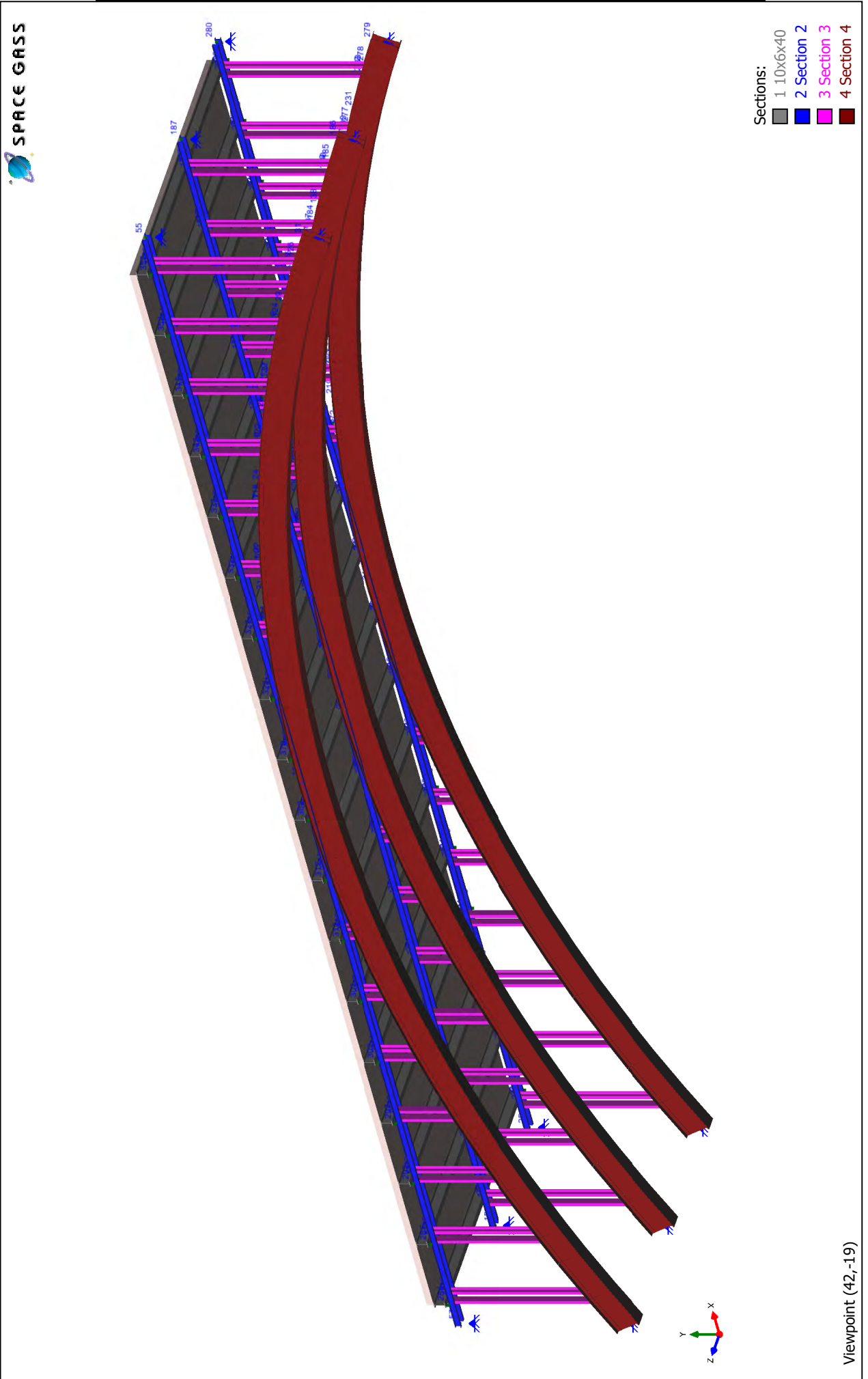
- Assessment of concrete deck slab.
- Assessment of Cross Girders.
- Assessment of vertical channels
- Assessment of arch girders



Sections:

- 1 10x6x40
- 2 Section 2
- 3 Section 3
- 4 Section 4

Viewpoint (44,15)



Assessment of concrete deck Slab.

Structure type: concrete deck

Cross girders spacing 1720 mm

Number of girders 18 girders.

Overall deck width 7450 mm

Deck slab thickness 150 mm

Slab main reinforcement $3/8 \approx 9.5 \text{ mm}$ @ 100 cts (KBR)

Assumed reinforcement cover 30 mm

Assumed concrete strength 20 MPa

Reinforcement strength 450 MPa (Mesh No 7, Table A1, App. A)

Concrete density 25 kN/m^3

Asphalt density 21.2 kN/m^3 (Table A1 - AS1170.1)

Average asphalt thickness 100 mm (Assumed)

Slab dead Loads 1) Self weight $0.15 \times 25 = 3.75 \text{ kN/m}^2$

2) 100 mm asphalt $0.1 \times 21.2 = 2.12 \text{ kN/m}^2$

Slab live Loads

calculations will consider SM1600 Load Refer

AS5100.2-2017



Load case 1
 1 (SW) Dead Load

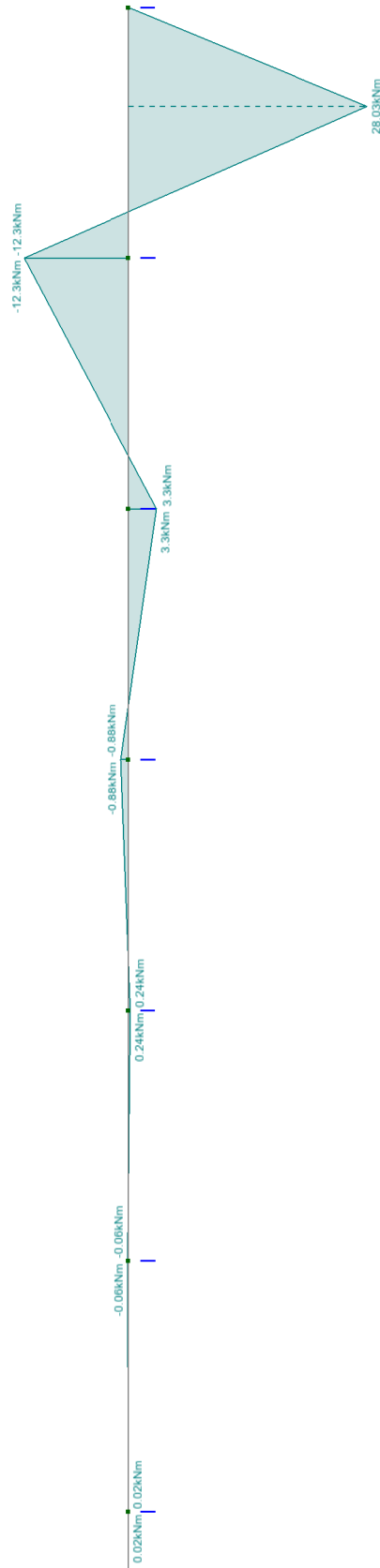


Sections:
 1 Slab 150x1000

Viewpoint (0,0), Moments



Load case 133
 133 Scenario 1 (Pos 32)



Sections:
 1 Slab 150x1000

Viewpoint (0,0), Moments

Project Wasleys Bridge - Load Capacity Assessment

Job number 211073

Taken by

Date 21/6/2021 Page 3 of

Location

Present

☐ Phone ☐ Meeting ☐ Site visit ☐ Other

Calculation ZA

Checked

Load Factors

Dead Load (1.2)

Superimposed dead load (1.4)

Live Load (1.8)

Dynamic Load Allowance (0.4)

Loads:

Dead load $0.15 \times 25 = 3.75 \text{ kN/m}^2$

Superimposed dead load $0.1 \times 21.2 = 2.12 \text{ kN/m}^2$

Live load 80 kN wheel load

$M_D = 2.3 \text{ kN.m/m}$

$M_{SD} = 0.66 \text{ kN.m/m}$

$M_L = 28.03 \text{ kN.m}$

Moment resisting width for one way slab supporting concentrated load CL 9.6 AS 5100.5-2017

$b_{eff} = \text{load width} + 2.4a [1.0 - (a/L_n)]$

$a = \frac{1.702}{2} = 0.851 \text{ m}$

$L_n = 1.702 \text{ m}$

$b_{eff} = 1.42 \text{ m}$ say 1.4m.

Concrete strip 150mm thick x 1400mm wide

$3/8 \text{ } \phi 100 \text{ (Mesh No 7)}$

$\Rightarrow \phi M_{uo} = 37.9 \text{ kN.m/strip}$ (Refer to calculation sheet)

Section Properties:

Width $B = 1100$ mm
Depth $D = 150$ mm

Gross Area $A_g = 210000$ mm²
Second Moment of Area $I_g = 3.94E+08$ mm⁴
Section Modulus $Z = 5.25E+06$ mm³

Concrete :

$f_{cu} = 20$ MPa-CL 3.1.1.1
 $f_{ck} = 2.68$ MPa-CL 3.1.1.1
Density $\rho_c = 24$ kN/m³-CL 3.1.1.1 (24 kN/m³ normal-weight concrete)
Cracking Moment $M_{cr} = 14.1$ kNm
 $E_c = 24000$ MPa-CL 3.1.1.1

Shrinkage

Exposed perimeter of slab $u_e = 2800$ mm top & bottom
Hypothetical thickness $t_h = 150$ mm $2A_g/u_e$
Final autogenous shrinkage strain $\epsilon_{ca}^* = (0.06f_{cu}^* - 1) \times 50 \times 10^{-6}$
Autogenous shrinkage strain $\epsilon_{ca} = 0.00001$
Final drying basic shrinkage strain $\epsilon_{cs,db} = 0.001$
 $a_1 = 1.367$ For $t = 10950$ days (30 years)
 $k_1 = 1.35$ Environment Temp $k_2 = 0.6$
Basic drying shrinkage strain $\epsilon_{cs,db} = 0.00084$
Drying Shrinkage Strain $\epsilon_{cs,d} = 0.000680$
Design shrinkage strain $\epsilon_{sh} = 0.000690 = 690 \times 10^{-6}$ (autogenous shrinkage + drying shrinkage)
Note: ϵ_{sh} has a range of $\pm 30\%$, Table 3.1.7.2 provides typical shrinkage

Reinforcement :

$F_{yk} = 350$ MPa TR 3.2.1
 $E_s = 200000$ MPa CL 3.2.2
Modular ratio $n = 8.3$

Top Cover TC 30 mm
Bot Cover BC 30 mm
Intense Compaction Yes
Exposure Classification A
Minimum Cover = Not Suitable mm Warning Insufficient Cover

Layer	Class	Size	Area	NO.	A_s mm ²	d_s mm
1	N	N16	200	0	0	38
2	N	N16	200	0	0	0
3	N	N16	200	0	0	0
4	L	3/8"	71	14	994	15.755
Total Req =					994	mm ²
Area Steel in tensile half =					994	mm ²

Percentage Reinforcement = 0.47% Can use to check shrinkage and thermal

Ultimate Positive Bending Capacity :

Applied Ultimate Moment $M^* = 37.9$ kNm

Rectangular Stress Block Parameters $\gamma = 0.85$
 $\alpha_2 = 0.85$

Neutral axis depth $d_{na} = 22.1$ mm
Concrete centroid $d_c = 9.4$ mm
Adjust neutral axis so sum of forces = 0

Layer	Distance	E_s	σ_s (Mpa)	Force (kN)	A_{st}	A_{sc}	Force x Distance
Concrete	-12.7			-447.3			5687
Steel 1	16	0.0022	431	0.0	0.0	0.0	0
Steel 2		0.0030	450	0.0	0	0	0
Steel 3		0.0030	450	0.0	0	0	0
Steel 4	93	0.0126	450	447.3	994	0	41654
O.K.				0.0	994.0	0.0	47341

kNmm

$d_{eq} = 115.2$ mm
 $d_o = 115.235$ mm
 $K_{uo} = 0.192$ O.K.

Capacity reduction factor $0.6 \leq \phi = (1.19 - 13K_{uo}/12) \leq 0.8$ $\phi = 0.8$ Table 2.3.2(b)

Positive Bending Capacity

$M_{uo} = 47.3$ kN.m	(sum of forces x distance)
$\phi M_{uo} = 37.9$ kN.m	O.K.

$1.2M_{uo} = 16.9$ KN.m Less than M_{uo} OK
OR $A_{st, min} = 326.0$ mm² $A_{st} = 994$ mm² OK (in statically indeterminate structures)

Project Wasleys Bridge - Load Capacity Assessment

Job number 211073

Taken by

Date 21/6/2021 Page of

Location

Present

☐ Phone ☐ Meeting ☐ Site visit ☐ Other

Calculation ZA Checked

$$M_{ULT/D}^* = 1.2 \times 2.3 \times 1.4 = 3.86 \text{ kN.m / strip (1.4m wide)}$$

$$M_{ULT/SD}^* = 1.4 \times 0.66 \times 1.4 = 1.29 \text{ kN.m / Strip (1.4m wide)}$$

$$M_{ULT/LL}^* = 28.03 \times 1.4 \times 1.8 = 70.64 \text{ kN.m / strip}$$

$$M^* = 3.86 + 1.29 + 70.64 = 75.78 > \phi M_{uo}$$

For safe deck slab $\phi M_{uo} \geq M^*$

$$\Rightarrow 37.9 \geq 3.86 + 1.29 + (M_{LL} \times 1.4 \times 1.8)$$

$$\Rightarrow 12.99 \geq M_{LL}$$

$$\Rightarrow \text{wheel load} < \frac{12.99}{28.03} \times 80 = 37.1 \text{ kN (3.7 T)}$$

For M1600/S1600 (Max.)

$$M_{ULT/LL}^* = 21.62 \times 1.4 \times 1.8 = 54.48 \text{ kN.m} \Rightarrow M^* = 59.63 \text{ kN.m}$$

For non-standard 4wheel, x 100kN

$$M_{ULT/LL}^* = 35.04 \times 1.4 \times 1.8 = 88.3 \text{ kN.m} \Rightarrow M^* = 93.45 \text{ kN.m}$$

Assessment of Steel Cross Girders:

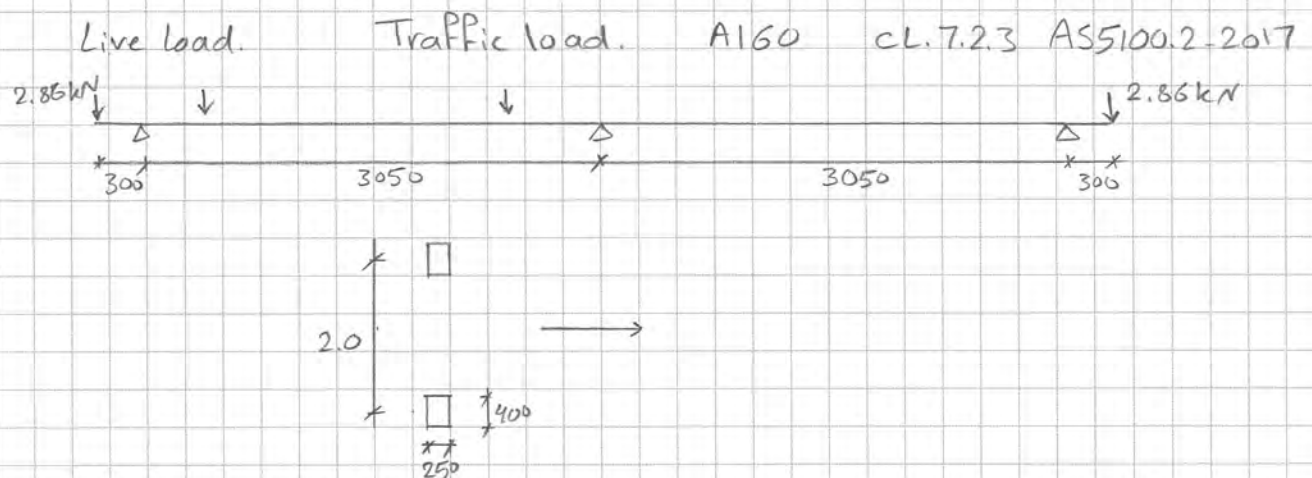
Size 10" x 5" x 30 lb RSJ @ 1720 cts (254 x 127 x 45 kg/m)

Span 3050 mm

Loads:

- Dead load
- 1) section self weight 0.45 kN/m
 - 2) concrete slab $3.75 \times 1.72 = 6.45$ kN/m
 - 3) Guard rail & kerb $(0.33 + 1.33) \times 1.72 = 2.86$ kN (each end)

Superimposed dead load 100mm asphalt $2.12 \times 1.72 = 3.65$ kN/m



$$M_D^+ = 4.1 \text{ kN.m}$$

$$M_D^- = 7.6 \text{ kN.m}$$

$$V_D = 12.83 \text{ kN}$$

$$M_{SD}^+ = 2.32 \text{ kN.m}$$

$$M_{SD}^- = 4.16 \text{ kN.m}$$

$$V_{SD} = 6.88 \text{ kN}$$

$$M_{LL}^+ = 43.85 \text{ kN.m}$$

$$M_{LL}^- = 41.72 \text{ kN.m}$$

$$V_{LL} = 97.36 \text{ kN}$$

$$M_{\max}^* = 1.2 \times 7.6 + 1.4 \times 4.16 + 1.4 \times 1.8 \times 41.72 = 120.08 \text{ kN.m}$$

$$V_{\max}^* = 270.4 \text{ kN}$$

Project Wasleys Bridge - Load Capacity Assessment

Job number 211073

Taken by

Date 21/6/2021 Page of

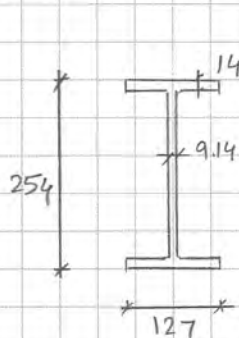
Location

Present

☐ Phone ☐ Meeting ☐ Site visit ☐ Other

Calculation ZA Checked

Capacity calculations for 10"x5"x30lb RSJ



10"x5"x30lb

$$b_f = 5" = 127 \text{ mm}$$

$$d = 10" = 254 \text{ mm}$$

$$w_t = 30 \text{ lb/ft} = 44.6 \text{ kg/m}$$

$$t_w = 0.36 \text{ in} = 9.14 \text{ mm}$$

$$t_f = 0.552 \text{ in} = 14 \text{ mm}$$

$$F_y = 210 \text{ MPa}$$

$$\phi M_{sx} = 102.82 \text{ kN.m}$$

$$\phi M_{bx} = 76.9 \text{ kN.m} \quad (\text{Refer to calculation sheet})$$

$$\phi V_v = 0.9 \times 0.36 F_y A_e$$

$$= 0.9 \times 0.36 \times 210 \times (254 \times 9.14) \times 10^{-3} = 157.96 \text{ kN}$$

$$\left. \begin{array}{l} \phi M_b < M_{max}^* \\ \phi V_v < V^* \end{array} \right\}$$

For safe cross beam

$$\phi M_b \geq M^*$$

$$\phi V_v \geq V^*$$

M 1) Axle load

$$76.9 \geq 1.2 \times 7.6 + 1.4 \times 4.16 + 1.4 \times 1.8 M_{LL}$$

$$M_{LL} < 24.6 \quad (\text{Factor of wheel load})$$

$$\text{Axle load} < \frac{24.6 \times 160}{43.85} = 89.76 \text{ kN}$$

Project Wasleys Bridge - Load Capacity Assessment Job number 211073

Taken by

Date 21/6/2021 Page of

Location

Present

☐ Phone ☐ Meeting ☐ Site visit ☐ Other

Calculation ZA Checked

$$V \quad 2) \text{ Axle load } 157.96 \geq 1.2 \times 12.83 + 1.4 \times 6.88 + 1.4 \times 1.8 \times V_{LL}$$

$$V_{LL} < 52.75 \text{ kN (Factor of wheel load)}$$

$$\text{Axle load} < \frac{52.75}{97.36} \times 160 = 86.69 \text{ kN}$$

\Rightarrow For cross beam, maximum wheel load 43.3 kN

For M1600/S1600 (Max.)

$$M_{UL+LL}^* = 37.83 \times 1.4 \times 1.8 = 95.33 \text{ kNm} \Rightarrow M^* = 110.27 \text{ kNm}$$

$$V_{UL+LL}^* = 73.02 \times 1.4 \times 1.8 = 184.01 \text{ kN} \Rightarrow V^* = 209.04 \text{ kN}$$

For non-Standard 4 wheel $\times 100 \text{ kN}$

$$M_{UL+LL}^* = 63.4 \times 1.4 \times 1.8 = 159.77 \text{ kNm} \Rightarrow M^* = 174.7 \text{ kNm}$$

$$V_{UL+LL}^* = 129.56 \times 1.4 \times 1.8 = 326.5 \text{ kN} \Rightarrow V^* = 351.52$$

Job: Wasleys Bridge-Load Capacity Assessment
Job No. 211073
SECTION: Cross beams
Designer ZA
Date 29/06/2021

Section 10"x5"x30lb

Depth of Section d	Flange		Web Thickn tw	Depth between Flanges dw	Gross Section Area Ag	About X-axis				
	Width bf	Thickness tf				Ix mm ⁴	Zx mm ³	Sx mm ³	rx mm	Zex mm ³
254	127	14.0208	9.144	225.9584	5627.447	60122974	473409.24	544033.7	103.36286	544033.7
ly mm ⁴	About Y-axis			Torsion constant J	Warping constant Iw	Yield Stress		Form factor Kf	Compactness about x-axis C.N.S	fymin MPa
	Zy mm ³	Sy mm ³	ty mm			Flange fyf MPa	Web fyw MPa			
4.80E+06	7.56E+04	1.18E+05	29.2141707	2.95E+05	6.89E+10	210	210	0.95	C	210
										0

Young modulus of elasticity Es = 200000 MPa

Shear modulus of elasticity Gs = 80000 MPa

2) Design Action Effects

Mux* = 1 KN.m Nuc* = 0 KN Nut* = 0 KN Muy* = 0 KN.m

3) Flexural Capacity

3-1) Section Capacity

Msx = 114.25 KN.m	OK
Msy = 23.83 KN.m	OK

φMsx = 102.82 KN.m	OK
φMsy = 21.44 KN.m	OK

3-2) Member Capacity

Effective length of the design segment Lef = 3050 mm
Reference buckling moment Moa = $\text{SQRT}\{\pi^2 E I_y / L_e^2 [GJ + \pi^2 E I_w / L_e^2]\}$ 1.97E+08 N.m
Slenderness reduction factor αs = 0.6 [SQRT (Ms/Moa)² + 3] - Ms/Moa 0.748
Enter moment modification factor αm = 1

Member capacity in bending φMbx = 76.9 KN.m OK

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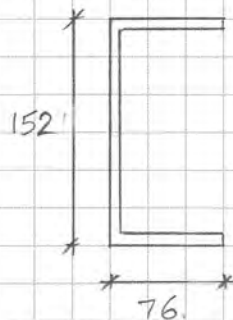
Calculation ZA

Checked

Assessment of Vertical Channels

size 6" x 3" x 12.4 lb BSC

Maximum height 3.5m



$d = 152 \text{ mm}$

$b_f = 76 \text{ mm}$

$t_w = 6.35 \text{ mm}$

$t_f = 9.65 \text{ mm}$

Mass 19 kg/m

Area $A = 2354.8 \text{ mm}^2$

$r_x = 60.96$

$r_y = 22.35 \text{ mm}$

$$\phi N_s = \phi A_n F_y$$

$$= 0.9 \times 2354.8 \times 210 \times 10^3 = 445.06 \text{ kN}$$

$$k_F = 1$$

$$a_c = \frac{\xi}{2} \left\{ 1 - \sqrt{1 - \left(\frac{90}{\xi \lambda} \right)^2} \right\} \leq 1.0$$

$$\xi = \frac{\left[\left(\frac{\lambda}{90} \right)^2 + 1 + \eta \right]}{2 \left(\frac{\lambda}{90} \right)^2}$$

$$\eta = 0.00326 (\lambda - 13.5) \geq 0$$

$$\lambda = \lambda_n + a_a \cdot a_b$$

$$\lambda_n = \left(\frac{L_e}{r} \right) \sqrt{\frac{k_F F_y}{250}} = \frac{3500}{22.35} \sqrt{\frac{1 \times 210}{250}} = 143.5$$

$$a_a = \frac{2100 (\lambda_n - 13.5)}{(\lambda_n^2 - 15.3 \lambda_n + 2050)} = 13.35$$

$$a_b = +0.5$$

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Calculation

Checked

$$\lambda = \lambda_n + a_n \cdot a_b$$

$$= 143.5 + 13.35 \times 0.5 = 150.175$$

$$\eta = 0.00326 (\lambda - 13.5)$$

$$= 0.00326 (150.175 - 13.5) = 0.446 > 0$$

$$\xi = \frac{\left[\left(\frac{150.175}{90} \right)^2 + 1 + 0.446 \right]}{2 \left(\frac{150.175}{90} \right)^2} = 0.76$$

$$a_c = 0.76 \left\{ 1 - \sqrt{1 - \left(\frac{90}{0.76 \times 150.175} \right)^2} \right\}$$

$$= 0.293$$

$$\phi N_c = \phi a_c N_s$$

$$= 0.293 \times 445.06 \text{ kN} = 130.47 \text{ kN (each channel)}$$

Note: during site visit, it was noticed that the central girder vertical channels were not connected together like the side girders, since the central girder channels will take the maximum load, the applied load calculations will be for individual channels on the central girder, max height 3.5 m

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Calculation ZA

Checked

Channels loads

$$N_{c,D} = 25.424 \text{ kN}$$

$$N_{c,SD} = 0.95 \text{ kN}$$

$$N_{c,LL} = 241.464$$

Model loaded with by

$$4 \text{ wheels} \times 100 \text{ kN} = 400 \text{ kN}$$

$$N_c^* = 1.2 \times 25.424 + 1.4 \times 0.95 + 1.4 \times 1.8 \times 241.464$$

$$= 640.32 \gg 130.47$$

Wheel load

$$130.47 \text{ kN} \gg 1.2 \times 25.424 + 1.4 \times 0.95 + 1.4 \times 1.8 \times N_{c,LL}$$

$$N_{c,LL} < 39.14 \text{ kN} \quad (\text{Factor of load})$$

$$\text{vehicle load} < \frac{39.14}{241.464} \times 400 = 64.8 \text{ kN}$$

Say vehicle load 6.5 T

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Calculation ZA Checked

Assessment of Arch Girders

- Based on the site inspection, the central Girder will be assessed with the same status as assessed in KBR report, while the side girders will be assessed for current status where the web plates are not considered in the design.

Central Girder Forces (From Space Gass Model)

$$M_D = 11.90 \text{ kN.m}, \quad N_D = 510.66 \text{ kN}, \quad V_D = 20.94 \text{ kN}$$

$$M_{SD} = 0.41 \text{ kN.m}, \quad N_S = 16.5 \text{ kN}, \quad V_{SD} = 0.7 \text{ kN}$$

$$M_{LL} = 219.163 \text{ kN.m}, \quad N_{LL} = 598.6 \text{ kN}, \quad V_{LL} = 186.99$$

Outer Girder Forces (From SpaceGass Model)

$$M_D = 13.54 \text{ kN.m}, \quad N_D = 428.28 \text{ kN}, \quad V_D = 16.32 \text{ kN}$$

$$M_{SD} = 0.54 \text{ kN.m}, \quad N_{SD} = 11.07 \text{ kN}, \quad V_{SD} = 0.47 \text{ kN}$$

$$M_{LL} = 197.45 \text{ kN.m}, \quad N_{LL} = 544 \text{ kN}, \quad V_{LL} = 94 \text{ kN}$$

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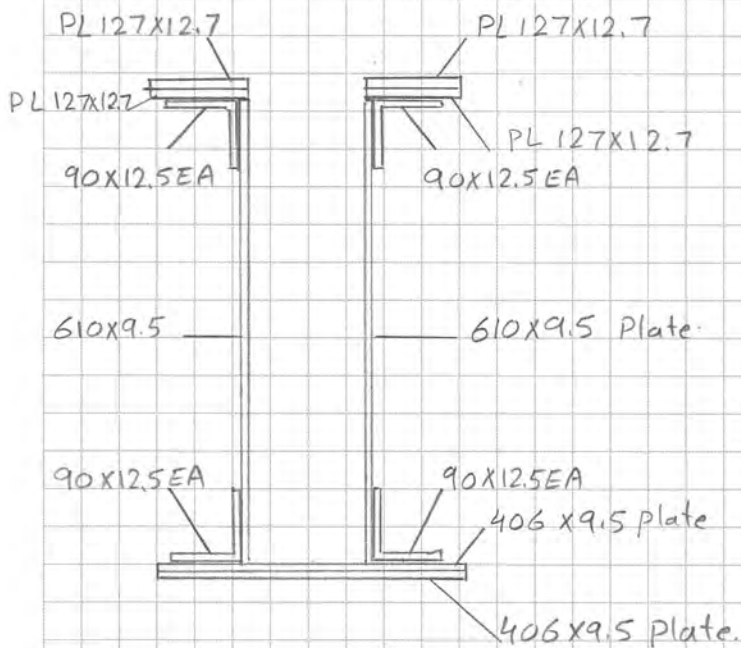
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Calculation ZA Checked

Central Girder Properties & Capacity

(Original sizes for girder components)



Note: sizes as per KBR report 2011

Section properties: (Spacegass Shape builder)

$$A = 34130.6$$

$$y_c = 308.26 \quad x_c = 0$$

$$I_x = 2422.67 \times 10^6 \text{ mm}^4$$

$$r_x = 266.425 \text{ mm}$$

$$I_y = 428.282 \times 10^6 \text{ mm}^4$$

$$r_y = 112.02 \text{ mm}$$

$$J = 2222729$$

$$Z_y = 2109.765 \times 10^3 \text{ mm}^3$$

$$Z_{xt} = 7096.206 \times 10^3 \text{ mm}^3$$

$$Z_{xc} = 7740.272 \times 10^3 \text{ mm}^3$$

Central Girder capacity:

Effective length for girder is the distance between bracing:

$$l_e = 4 \times 1.72 = 6.88$$

$$\phi N_s = \phi k_p \cdot A_n \cdot F_y$$

$$= 0.9 \times 1 \times 34130.6 \times 210 \times 10^{-3} = 6450.7 \text{ kN}$$

$$\phi N_c = a_c \cdot \phi k_p \cdot A_n \cdot F_y$$

$$a_b = +0.5$$

$$\lambda_n = \frac{l_e}{r} \sqrt{\frac{k_p \cdot F_y}{250}} = \frac{6880}{112.02} \sqrt{\frac{1 \times 210}{250}} = 56.29$$

$$a_a = \frac{2100(\lambda_n - 13.5)}{\lambda_n^2 - 15.3\lambda_n + 2050} = 20.62$$

$$\lambda = \lambda_n + a_a \cdot a_b = 66.6$$

$$\eta = 0.00326(\lambda - 13.5) = 0.17370$$

$$\xi = \frac{\left[\left(\frac{\lambda}{\lambda_0}\right)^2 + 1 + \eta\right]}{2\left(\frac{\lambda}{\lambda_0}\right)^2} = 1.57$$

$$a_c = 1.57 \left(1 - \sqrt{1 - \left(\frac{\lambda_0}{1.57 \times 66.6}\right)^2}\right) = 0.771$$

$$\phi N_c = 0.9 \times 0.771 \times 34130.6 \times 210 \times 10^{-3} = 4973.5 \text{ kN}$$

$$M_s = Z \cdot F_y = 7096.206 \times 10^3 \times 210 \times 10^{-6} = 1490.2 \text{ kN.m}$$

$$M_o = \sqrt{\left(\frac{\pi^2 EI_z}{L^2}\right) \sqrt{GJ + \left(\frac{\pi^2 EI_w}{L^2}\right)}} \quad I_w = 38.5 \times 10^{12} \text{ mm}^6$$

$$= \sqrt{\frac{\pi^2 \times 2 \times 10^5 \times 428.2 \times 10^8}{(6880)^2} \sqrt{(8 \times 10^4 \times 2222729) + \frac{\pi^2 \times 2 \times 10^5 \times 38.5 \times 10^{12}}{(6880)^2}}} \times 10^{-6}$$

$$= 5638.16 \text{ kN.m}$$

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Calculation ZA Checked

$$a_s = 0.6 \left[\sqrt{\left(\frac{M_s}{M_o} \right)^2 + 3} - \frac{M_s}{M_o} \right]$$

$$= 0.6 \left[\sqrt{\left(\frac{1490.2}{5638.16} \right)^2 + 3} - \frac{1490.2}{5638.16} \right] = 0.89$$

$$a_m = 1$$

$$\phi M_{bx} = a_m a_s \phi M_{sx} = 1 \times 0.89 \times 0.9 \times 1490.2 = 1193.65 \text{ kN.m}$$

$$M^* = 1.2 \times 11.9 + 1.4 \times 0.41 + 1.4 \times 1.8 \times 219.163$$

$$= 567.14 \text{ kN.m} < \phi M_{bx} \quad \text{Moment not critical}$$

$$N_c^* = 1.2 \times 510.66 + 1.4 \times 16.5 + 1.4 \times 1.8 \times 598.6$$

$$= 2144.36 < \phi N_c$$

$$\phi M_{rx} = \phi M_{sx} \left(1 - \frac{N^*}{\phi N_s} \right)$$

$$= 0.9 \times 1490.2 \left(1 - \frac{2144.36}{6450.7} \right) = 895.34 \text{ kN.m} > M^*$$

Central girder is not critical in this assessment.

Outer Girder Properties & Capacity

Web plates are not considered in the calculations

Top & bottom parts of the section are combined by vertical channel & resisting tension and compression of the applied couple besides the axial force from the model.

effective length is the spacing between vertical channels groups (max 1.72m)

$$l_e = 1.72 \text{ m}$$

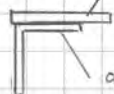
2X 127X12.7 plate

90X12.5 EA



2X 127X12.7 plate

90X12.5 EA



$$A = 10639.1 \text{ mm}^2$$

$$I_x = 190.393273 \times 10^6 \text{ mm}^4$$

$$I_y = 7.4705 \times 10^6 \text{ mm}^4$$

$$r_x = 26.5 \text{ mm}$$

$$r_y = 133.775 \text{ mm}$$

$$\lambda_n = \frac{l_e}{r} \sqrt{\frac{k_r P_y}{250}}$$

$$= \frac{1720}{26.5} \sqrt{\frac{1 \times 210}{250}} = 59.48$$

$$a_b = 0.5 \Rightarrow a_c = 0.746$$

$$\phi N_c = 0.9 \times 1 \times 10639.1 \times 0.746 \times 210 \times 10^{-3} = 1500 \text{ kN}$$

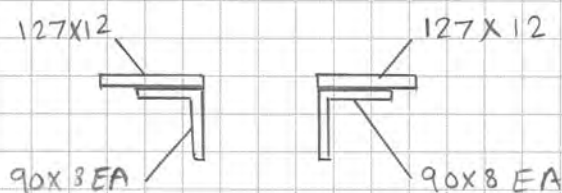
$$N_c^* = 1.2 \times \left(428.28 + \frac{13.54}{0.5} \right) + 1.4 \left(11.07 + \frac{0.54}{0.5} \right) + 1.4 \times 1.8 \left(544 + \frac{197.45}{0.5} \right) = 2929.5 \text{ kN}$$

$$LRF \geq 1 \Rightarrow N_{c,LL} < \left\{ 1500 - \left[1.2(428.28 + 13.54/0.5) + 1.4(11.07 + 0.54/0.5) \right] \right\} / (1.4 \times 1.8)$$

$$N_{c,LL} < 397.44 \text{ kN}$$

$$\Rightarrow \text{Vehicle load} < \frac{397.44}{544 + \frac{197.45}{0.5}} \times 400 = 169.3 \text{ kN}$$

For reduced section's thicknesses (Outer girders)



$$A = 8848 \text{ mm}^2$$

$$I_x = 162.835 \times 10^6 \text{ mm}^4$$

$$I_y = 5.085 \times 10^6 \text{ mm}^4$$

$$r_x = 23.97 \text{ mm}$$

$$r_y = 135.66 \text{ mm}$$

$$\lambda_n = \frac{1720}{23.97} \sqrt{\frac{1 \times 210}{250}} = 65.48$$

$$a_b = +0.5 \Rightarrow a_c = 0.713$$

$$\phi N_c = 0.9 \times 1 \times 0.713 \times 8848 \times 210 \times 10^{-3} = 1192.33 \text{ kN}$$

$$N_c^* = 2929.5 \text{ kN}$$

$$LRF \geq 1 \Rightarrow N_{c,LL} < \left\{ 1192.33 - \left[1.2(428.28 + 13.54/0.5) + 1.4(11.07 + 0.54/0.5) \right] \right\} / (1.4 \times 1.8)$$

$$N_{c,LL} < 249.56 \text{ kN}$$

$$\Rightarrow \text{Vehicle load} = 106.32 \text{ kN}$$

Bridge Barriers (Based on report #17-2015)

- Determination of Barriers Performance Level

Ref: Traffic summary Report #17-2015

AS 5100.1-2017 - Appendix A

Average 61 vehicle every day / 18 days

Maximum 67 vehicle a day

considering AADT \approx 61 vehicle/day

Ref AS 5100.1-2017 - Appendix A

Adjusted AADT = $RT \times GD \times CU \times US \times AADT$ CL.A4.2.6

Table A1 $\Rightarrow RT = 2$ (one way)

Figure A2 $\Rightarrow GD = 1$ Assume (0% \rightarrow -2%)

Figure A3 $\Rightarrow CU = 3$ Radius $< 100m$

Figure A4 $\Rightarrow US = 1$ height $< 3.5m$

\Rightarrow Adjusted AADT = $2 \times 1 \times 3 \times 1 \times 61 = 366$

Speed $\approx 60 km/h$

10% commercial vehicle,

\Rightarrow Figure A5 - Regular Level

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Calculation ZA

Checked

Bridge Barriers (Based on report #60 2021)

- Determination of Barrier performance level

Average 33 vehicle every day / 20 days

Maximum 68 vehicle a day

Considering AADT \approx 33 vehicle/day

Ref AS 5100.1-2017 - Appendix A

Table A1 \Rightarrow RT = 2 (One way)

Figure A2 \Rightarrow GD = 1 Assume (0% \rightarrow 2%)

Figure A3 \Rightarrow CU = 3 Radius $<$ 100m

Figure A4 \Rightarrow US = 1 height $<$ 3.5m

\Rightarrow Adjusted AADT = $2 \times 1 \times 3 \times 1 \times 33 = 198$

Speed \approx 60 km/h

10% Commercial vehicles

\Rightarrow Figure A5 (Regular Level)