



The Adelaide Park Lands Authority was established by the *Adelaide Park Lands Act 2005 (SA)* as a subsidiary of the City of Adelaide under the provisions of the *Local Government Act 1999 (SA)*.

As part of the Park Lands governance framework the Adelaide Park Lands Authority is the principle advisory body to the City of Adelaide (CoA) and the South Australian State Government (SG) on Park Lands matters.

The Authority provides guidance around the use of and improvement to the Adelaide Park Lands through the development of the Adelaide Park Lands Management Strategy 2015 – 2025, which can be found [here](#)

### Thursday 28 October 2021 Board Meeting

#### **Membership**

The Lord Mayor  
4 other members appointed by the Council  
5 members appointed by the Minister

#### **Quorum**

**6**

#### **Presiding Member**

The Right Honourable the Lord Mayor Sandy Verschoor

#### **Deputy Presiding Member**

Ms Kirsteen Mackay

#### **Board Members**

Ms Allison Bretones  
Mr Rob Brookman AM  
Ms Jessica Davies-Huynh  
Mr Stephen Forbes  
Councillor Alexander Hyde  
Ms Stephanie Johnston  
Mr Craig Wilkins  
Mr Ben Willsmore

#### **Proxy Board Members**

Councillor Arman Abrahamzadeh (for Councillor Alexander Hyde)  
Professor Emeritus Damien Mugavin (for Ms Stephanie Johnston)

Board Meeting Agenda, Thursday 28 October 2021, at 5:30 pm  
Colonel Light Room, Town Hall, King William Street, Adelaide

## Agenda

		Purpose	
<b>1.</b>	<b>Welcome and Opening</b>		
1.1	Acknowledgement of Country	To Acknowledge	Page 3
1.2	Apologies	To Note	Page 3
1.3	23/9/2021, 30/9/2021 & 14/10/2021 Minutes	To Confirm	Page 3
1.4	Business Arising	To Note	Page 3
<b>2.</b>	<b>Conflict of Interest</b>	To Note	
<b>3.</b>	<b>Presiding Member Report (verbal)</b>	To Note	
<b>4.</b>	<b>Representations (verbal)</b>	Granted as at 22/10/2021	
	Nil	To be Heard for up to 5mins	
<b>5.</b>	<b>Items requested to be considered in confidence</b>		
5.1	Exclusion of the Public	To exclude the public	Page 4
<b>6.</b>	<b>Items for the Board in confidence</b>		
6.1	Rymill Park/Murlawirrapurka - Kiosk Enhancement Proposal [s 90(3) (d)]	To discuss	Page 7
	<b>Reopen meeting to the public</b>		
<b>7.</b>	<b>Items for Board Decision</b>		
7.1	Rymill Park Lake – Renewal Options [2017/02686]	Decision to Advise CoA	Page 52
<b>8.</b>	<b>Items for Board Discussion</b>		
8.1	Associate Director Update	To inform	
8.2	Date and Insights – Urban Heat & Tree Canopy	To inform	Page 108
8.3	Adelaide Park Lands Management Strategy - Update of the Audit of Actions	To inform	Page 123
<b>9.</b>	<b>Items for Noting</b>		
9.1	Correspondence Verbal Update from Presiding Member	To Note	
<b>10.</b>	<b>Other Business &amp; Meeting Close</b>	Identified as at 22/10/2021	
	Nil	To discuss	
	<b>Next meeting – Thursday, 25 November 2021, 5.30pm</b>	To Note	

## 1. Welcome and Opening

### 1.1 Acknowledgement of Country

At the opening of the Board Meeting, the Board member presiding will state:

'Adelaide Park Lands Authority acknowledges that we are meeting on traditional Country of the Kaurna people of the Adelaide Plains and pays respect to Elders past and present. We recognise and respect their cultural heritage, beliefs and relationship with the land. We acknowledge that they are of continuing importance to the Kaurna people living today.

And we also extend that respect to other Aboriginal Language Groups and other First Nations who are present today.'

### 1.2 Apologies

Board Member - Ms Jessica Davies-Huynh (Maternity Leave 3 Months)

### 1.3 Confirmation of Minutes – 23/9/2021, 30/9/2021 & 14/10/2021

That the Minutes of the meeting of the Board of the Adelaide Park Lands Authority held on 23 September 2021 and Special meetings of the Board held on 30 September 2021 and 14 October 2021 be taken as read and be confirmed as an accurate record of proceedings.

### 1.4 Business Arising

Items with an asterisk have been actioned

Those Items identified as Complete at the September Board Meeting have been removed

Board Meeting	<u>Actions Arising</u> (Precis)	<u>Topic</u>
25 March 2021	9. Paper sought to lead discussions	CLMP targets & measures
Board Meeting 22 July 2021	<u>Actions Arising</u> (Precis)	<u>Topic</u>
	28. Draft Risk Register	Risk Management & Mitigation
	29. Workshop	Adelaide Park Lands Act 2005 (SA)
	*31. Progress for the next 6 months	Forward Agenda
Board Meeting 26 August 2021	<u>Actions Arising</u> (Precis)	<u>Topic</u>
	*32. Inclusion of world heritage narrative	Annual Community Forum
Board Meeting 23 September 2021	<u>Actions Arising</u> (Precis)	<u>Topic</u>
	33. Schedule Presentation	Torrens River / Karrawirra Parri wetlands proposal
	34. Follow up on request	Planning and Design Code
	35. Follow up on request	Draft Riverbank Masterplan
	36. Information requested ahead of review of the Park Lands Management Strategy	Leases & Licences
	*37. Provide image overlays	Riverbank Precinct Code Amendment
Board Meeting 14 October 2021	<u>Actions Arising</u> (Precis)	<u>Topic</u>
	*38. Include reference to World Heritage Nomination	Advice regarding the proposed Riverbank Precinct Code Amendment
	39. Forward Board advice to Green Adelaide	Riverbank Precinct Code Amendment & the request for Care and Control of Kate Cocks Park

Status Update for Actions Arising in Link 1 [here](#)



## Exclusion of the Public

**ITEM 5.1** 28/10/2021  
**Board Meeting**

**Requested by:**  
Clare Mockler, Chief Executive  
Officer

2018/04291  
Public

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## Purpose

It is a requirement of the *Adelaide Park Lands Act 2005 (SA)* [13 (c)] reflected in clause 4.8.19 of the *Adelaide Park Lands Charter*, that meetings of the Authority be conducted in a place open to the public except in special circumstances. These circumstances and associated considerations to exclude the public from a Board meeting are outlined in section 90 the *Local Government Act 1999 (SA)* (the Act).

Clause 4.8.21 of the *Adelaide Park Lands Charter* states the Board may order that the public be excluded from attendance at any meeting in order to enable the Board to consider in confidence any information or matter listed in section 90(3) of the Act (after taking into account any relevant consideration under that section). The exercise of this power does not exclude Board Members and/or any other person permitted by the Board to remain in the room.

The Order to Exclude for Item 6.1

1. Identifies the information and matters (**grounds**) from section 90(3) of the Act utilised to request consideration in confidence.
2. Identifies the **basis** – how the information falls within the grounds identified and why it is necessary and appropriate to act in a meeting closed to the public; and
3. In addition, identifies for the following grounds – section 90(3) (b), (d) or (j) - how information open to the public would be contrary to the **public interest**.

All Board members must keep confidential all documents and any information presented to them for consideration on a confidential basis prior to the meeting.

Exclusion of the public from this Adelaide Park Lands Authority Board meeting is sought for the consideration of the following Agenda Item:

- 6.1 Rymill Park/Murlawirrapurka - Kiosk Enhancement Proposal [section 90(3) (d) of the Act]

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## Order to Exclude for Item 6.1

### THAT THE ADELAIDE PARK LANDS AUTHORITY

1. Having taken into account the relevant considerations contained in Clause 4.8.21 of the *Adelaide Park Lands Authority Charter* and s 90(3) (d) and 90(4) & (7) of the *Local Government Act 1999 (SA)*, this meeting of the Board of the Adelaide Park Lands Authority dated 28 October 2021 resolves that it is necessary and appropriate to act in a meeting closed to the public as the consideration of Item 6.1 [Rymill Park/Murlawirrapurka - Kiosk Enhancement Proposal] listed on the Agenda in a meeting open to the public would on balance be contrary to the public interest.

#### Grounds and Basis

This Item is confidential as it contains commercial information of a confidential nature (not being a trade secret). The disclosure of information in this report could reasonably be expected to prejudice the commercial position of the person who supplied the information and confer a commercial advantage on a third party



## Public Interest

The Board is satisfied that the principle that the meeting be conducted in a place open to the public has been outweighed in the circumstances because the disclosure of this information may result in release of information prior to the finalisation of 'commercial in confidence' negotiations between the proponent and their suppliers and may materially and adversely affect the financial viability of the proponent in relation to contract negotiations which on balance would be contrary to the public interest.

2. Pursuant to Clause 4.8.21 of the *Adelaide Park Lands Authority Charter* this meeting of the Board of the Adelaide Park Lands Authority dated 28 October 2021 orders that the public (with the exception of members of Council staff who are hereby permitted to remain) be excluded from this meeting to enable the Board to consider in confidence Item 6.1 [Rymill Park/Murlawirrapurka - Kiosk Enhancement Proposal] listed in the Agenda, as the matter is of a kind referred to in s 90(3) (d) of the *Local Government Act 1999 (SA)*.

## Discussion

1. The *Adelaide Park Lands Act 2005 (SA)* requires the Authority to operate utilising Chapter 6 Part 3 of the *Local Government Act 1999 (SA)* (the Act). Chapter 6 Part 3 relates to public access to meetings and outlines the conduct to be observed by the Authority.
2. It is a requirement of the *Adelaide Park Lands Act 2005 (SA)* [13 (c)] reflected in clause 4.8.19 of the *Adelaide Park Lands Charter* (Charter), that meetings of the Authority be conducted in a place open to the public except in special circumstances. These circumstances and associated considerations to exclude the public from a Board meeting are outlined in Chapter 6, Part 3 of the Act.
3. To consider a matter in confidence, the Board through a formal resolution is required to:
  - 3.1 Identify the information and matters (grounds) from section 90(3) of the Act utilised to request consideration in confidence.
  - 3.2 Identify the basis – how the information falls within the grounds identified and why it is necessary and appropriate for the Board to act in a meeting closed to the public; and
  - 3.3 In addition identify for the following grounds – section 90(3) (b), (d) or (j) – how information open to the public would be contrary to the public interest.
4. The Charter contains the following clauses in relation to Meetings of the Board /Authority:
  - '4.8.19 Meetings of the Board must be conducted in a place open to the public.'
  - '4.8.20 All Board Members must keep confidential all documents and any information provided to them on a confidential basis for their consideration prior to a meeting of the Board, except in those circumstances prescribed by section 12 of the Park Lands Act and clause 35 of Schedule 2 to the LG Act.'  
For reference – Section 12 of the Park Lands Act and clause 35 of Schedule 2 to the LG Act read:  
12—Reports
    - (1) A member of the board of management of the Authority does not commit a breach of a duty of confidence by reporting a matter relating to the affairs of the Authority to the Minister.
    - (2) The Authority must, at the time that it furnishes its annual report to the Adelaide City Council, furnish a copy of the report to the Minister.
 35—Disclosure
    - (1) If a subsidiary discloses to a person in pursuance of this Schedule a matter in respect of which the subsidiary owes a duty of confidence, the subsidiary must give notice of the disclosure to the person to whom the duty is owed.
    - (2) A member of the board of management of a subsidiary does not commit a breach of duty by reporting a matter relating to the affairs of the subsidiary to a council or otherwise in accordance with the provisions of this Act.
  - '4.8.21 The Board may order that the public be excluded from attendance at any meeting in order to enable the Board to consider in confidence any information or matter listed in section 90(3) of the LG Act (after taking into account any relevant consideration under that section). The exercise of this power does not exclude Board Members and/or any other person permitted by the Board to remain in the room.'
  - '4.8.22 Where an order is made under sub-clause 4.8.21, a notice must be made in the minutes of the making of the order and of the grounds on which it was made.'
  - '4.8.23 Subject to sub-clause 4.8.25 a person is entitled to inspect, without payment of a fee:
    - (a) agendas and minutes of a Board Meeting;
    - (b) reports to the Board received at a meeting of the Board; and
    - (c) recommendations presented to the Board in writing and adopted by resolution of the Board.'

- '4.8.24 Subject to sub-clause 4.8.25, a person is entitled, on payment of a fee fixed by the Board, to obtain a copy of any documents available for inspection under sub-clause 4.8.23.'
- '4.8.25 Sub-clauses 4.8.23 and 4.8.24 do not apply in relation to a document or part of a document if:
- (a) the document or part of the document relates to a matter of a kind referred to in sub-clause 4.8.21; and
  - (b) the Board orders that the document or part of the document be kept confidential (provided that in so ordering the Board must specify the duration of the order or the circumstances in which it will cease to apply or a period after which it must be reviewed).'
5. In considering whether an order should be made to exclude the public, section 90(4) of the Act applies, it is irrelevant that discussion of a matter in public may:
- 5.1 cause embarrassment to the council or council committee concerned, or to members or employees of the council; or
  - 5.2 cause a loss of confidence in the council or council committee.
  - 5.3 involve discussion of a matter that is controversial within the council area; or
  - 5.4 make the council susceptible to adverse criticism
6. In considering whether an order should be made to exclude the public section 90(7) of the Act applies, the order must specify
- 6.1 the grounds on which the order was made; and
  - 6.2 the basis on which the information or matter to which the order relates falls within the ambit of each ground on which the order was made; and
  - 6.3 if relevant, the reasons that receipt, consideration or discussion of the information or matter in a meeting open to the public would be contrary to the public interest.
7. When determining whether to exclude the public from the meeting the Authority is required to consider & resolve whether it is necessary and appropriate to act in a meeting closed to the public to consider the following information in confidence.
- 7.1 Information contained in Item 6.1 – Rymill Park/Murlawirrapurka - Kiosk Enhancement Proposal:
    - 7.1.1 Is subject to an existing Authority Confidentiality Order - 25/7/2019
    - 7.1.2 Is subject to an existing Council Confidentiality Order – 30/7/2019, 6/8/2019 & 13/8/2019
    - 7.1.3 The grounds utilised to request consideration in confidence is s 90(3) (d) of the *Local Government Act 1999 (SA)*
      - (d) commercial information of a confidential nature (not being a trade secret) the disclosure of which—
        - (i) could reasonably be expected to prejudice the commercial position of the person who supplied the information, or to confer a commercial advantage on a third party; and
        - (ii) would, on balance, be contrary to the public interest;

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## Attachments

Nil

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- END OF REPORT -

## Item for the Board in Confidence

Item 6.1 – Rymill Park/Murlawirrapurka - Kiosk Enhancement Proposal

Clause 4.8.21 of the *Adelaide Park Lands Authority Charter*

Section 90(3) (d) of the *Local Government Act 1999 (SA)*

Pages 7 to 51

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## Rymill Park Lake – Renewal Options

**ITEM 7.1** 28/10/2021  
**Board Meeting**

**Author:**

Garry Herdegen, Associate  
Director, City Operations 8203  
7132

2017/02686  
Public

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### Purpose

The purpose of this report is to seek the support of the Authority for the renewal of the Rymill Park Lake with a sustainable lake (Option C). Water to fill the lake will be supplied by treated stormwater, from a series of sustainable, naturalised bio-filtration systems to be located up-stream in King Rodney Park / Ityamai-itpina (Park 15) and Victoria Park / Pakapakanthi (Park 16). This option will retain the existing ornamental lake and achieve the environmental benefits of stormwater cleansing and harvesting. This option is supported by the previous community engagement results, undertaken as part of the Rymill Park / Murlawirrapurka (Park 14) Draft Master Plan and Draft Community Land Management Plan.

It is recommended that a sustainable lake (Option C) is included as the only lake renewal proposal in the updated Master Plan and updated Community Land Management Plan, to be presented back to APLA and Council in early 2022 for endorsement.

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### Recommendation

THAT THE ADELAIDE PARK LANDS AUTHORITY ADVISES COUNCIL:

That the Adelaide Park Lands Authority:

1. Supports the renewal of the Rymill Park Lake with a sustainable lake (Option C), as detailed in Attachment A to Item 7.1 on the Agenda for the meeting of the Board of the Adelaide Park Lands Authority held on 28 October 2021.
  2. Supports the finalisation of the Rymill Park Master Plan and the Community Land Management Plan to include the sustainable lake (Option C).
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## Implications

<p>Adelaide Park Lands Management Strategy 2015-2025</p>	<p><a href="#">Adelaide Park Lands Management Strategy 2015-2025</a></p> <p>The “reimagining” of Rymill Park / Murlawirrapurka (Park 14) is identified as one of the “Big Moves” in the <a href="#">Adelaide Park Lands Management Strategy 2015-2025</a>:  <i>“as a large hub that includes a consolidated play space in closer proximity to the existing kiosk and away from the O-Bahn. Improve access and amenity surrounding the kiosk and re-configure it to address the park as well as lake, including increased seating opportunities – page 60).”</i></p> <p>Strategy 4.2 – Enhance the ecological health of Park Lands watercourses</p> <p>4.2.2 Minimise the impact of stormwater runoff on Park Lands watercourses while reducing flood risk.</p> <p>4.2.3 Improve the ecological condition of all Park Lands watercourses.</p> <p>4.2.4 Create wetlands and ephemeral stormwater detention basins to enhance the visual, recreational and biodiversity amenity of the Park Lands creeks.</p> <p>4.2.5 Re-establish self-sustaining, healthy aquatic ecosystems through revegetation with native aquatic plants and riparian revegetation in all Park Lands watercourses.</p> <p>4.2.6 Re-imagine watercourses and wetlands in the Park Lands to enhance their value to biodiversity protection and informal recreation and provide interpretation to raise public awareness of their importance to sustaining the City environment.</p> <p>4.2.7 Continue to work with the State Government and other Councils to reduce stormwater and other pollutants entering into the Torrens River catchment.</p> <p>Strategy 4.4 – Design and manage the Park Lands to be resilient to the impacts of climate change</p> <p>4.4.2 Consider future climate conditions in the selection, design and renewal of parks used for sport, recreation and events.</p> <p>4.4.5 Monitor the condition of Park Lands landscapes, vegetation, watercourses and sports grounds to assess whether management practices need to be modified due to climate change impacts.</p>
<p>APLA 2020-2025 Strategic Plan</p>	<p><a href="#">Adelaide Park Lands Authority 2020-2025 Strategic Plan</a></p> <p><a href="#">Strategic Plan Alignment – Environment</a></p> <p>2.1 Provide advice on plans, projects and policies for the Adelaide Park Lands</p> <p>2.2 Provide advice in relation to tree canopy cover, biodiversity and environmental sustainability improvements.</p>
<p>Policy</p>	<p><a href="#">Water Sensitive City Action Plan 2020-25</a></p> <p>Key Action 3.3: Investigate opportunities to integrate more natural features into Rymill Lake for improved catchment-wide water quality, recreation and nature connection outcomes.</p> <p>Key Action 3.5: Restore waterways to more natural systems and assist them to be more resilient in the face of climate change.</p> <p><a href="#">Draft Community Land Management Plan for Rymill Park / Murlawirrapurka (Park 14) (Revised September 2020 post-consultation).</a></p> <p>LAKE &amp; ISLAND: Objective: Preserve and enhance the characteristic 1960’s landscape setting and elements, through a contemporary design approach that consider current and future functions, in particular the form and scale of the lake, the island and bridges while investigating options to increase sustainability, including a vegetated wetland.</p> <p>Objective: Deliver proposals contained in a Master Plan. (pg.11)</p> <p>The water quality of the lake should be improved with consideration for its long-term aesthetic qualities as well as its environmental sustainability, capital and lifecycle costs. Explore the option of harvesting, cleaning and recycling stormwater from the city’s eastern catchment area in accordance with contemporary best practice in Water Sensitive Urban Design. This design would include native vegetation, increase biodiversity and mitigate the negative effects of pollutants entering the Torrens Lake and connecting water courses. The design will also recognise the existing connectivity with Botanic Creek and consider future options for enhancing this connection. (pg.12)</p>

	<p><u>Draft Rymill Park/Murlawirrapurka (Park 14) Draft Master Plan</u> Principle: embed environmentally sustainable principles - ensure that all design and outcomes include water and planting systems that are sensitive to the environment</p> <p>Action 1: To enhance the lake and surrounds</p> <p>1.1 Retain the existing form and footprint of the lake and island</p> <p>1.2 Improve the water quality and sustainability of the lake</p> <p>1.3 Upgrade the lake walk</p> <p>1.4 Enhance the lake environment.</p> <p><u>Water Sensitive City Action Plan 2020-25</u> Key Action 3.3: Investigate opportunities to integrate more natural features into Rymill Lake for improved catchment-wide water quality, recreation and nature connection outcomes. Key Action 3.5: Restore waterways to more natural systems and assist them to be more resilient in the face of climate change.</p> <p><u>Adelaide Park Lands Events Management Plan</u> Rymill Park is a premium event space. It is a highly used informal recreation space and festival hub in the summer months and has a number of small spaces for boutique events.</p> <p><u>Adelaide Park Lands Leasing and Licensing Policy</u> Lease negotiation of the Rymill Park Kiosk to be undertaken in accordance with the policy.</p>
Consultation	<p>Key stakeholders and the wider community were consulted as part of the Rymill Park/Murlawirrapurka (Park 14) Draft Master Plan and Community Land Management Plan community consultation in November 2019.</p> <p>Kaurna community representatives were consulted on the Draft Master Plan between 2017-2020.</p>
Resource	Not as a result of this report.
Risk / Legal / Legislative	The Rymill Park/Murlawirrapurka (Park 14) Master Plan is linked to the Draft Community Land Management Plan (CLMP) for the park. The CLMP is required under the <i>Adelaide Park Lands Act 2005 (SA)</i> and <i>Local Government Act 1999 (SA)</i> . Both documents will reference the preferred lake option.
Opportunities	<p>Opportunity to renew a valuable community asset with significant community and environmental benefits.</p> <p>Opportunity to extend ecological benefits to Botanic Creek in the Eastern Park Lands.</p> <p>Opportunity to complete the Rymill Park/Murlawirrapurka (Park 14) Master Plan and the Community Land Management Plan (CLMP).</p> <p>Opportunity to further progress one of the key 'Big Moves' of the Adelaide Park Lands Management Plan: "Re-imagine Rymill".</p> <p>Opportunity to align with Green Adelaide priorities and Regional Landscape Plan which will enable opportunities for partnerships and funding.</p>
City of Adelaide Budget Allocation	\$2.5m is allocated for Rymill Park Lake asset renewal works in 2022/23.
Life of Project, Service, Initiative or (Expectancy of) Asset	The expected life of the renewed lake is 30 years – this is what the analysis has been modelled on.
Ongoing Costs (eg maintenance cost)	The expected ongoing costs (Operational Expenditure) for the sustainable lake (Option C) is \$120,217 per annum.
Other Funding Sources	We are currently seeking external funding to support Council's allocated asset renewal funding.



## Discussion

### Background

1. In 2007, a condition audit was undertaken on the Rymill Park Lake to identify the cause of substantial water leakage. This assessment discovered significant structural issues with the lake walls and base. As recommended, a temporary liner was installed but due to state-wide water restrictions at the time, the lake was unable to be refilled with mains (potable water).
2. In response to water restrictions, a connection was made to the lake from recycled wastewater supplied via the Glenelg to Adelaide Recycled Wastewater Scheme (GARWS) serviced by the Glenelg to Adelaide Pipeline (GAP) in 2009.
3. These temporary solutions addressed the high cost of water to maintain lake levels and allowed time to consider the longer-term vision and design for renewal of the lake.
4. As the lake is a shallow waterbody with a large surface area, there is significant evaporation over the summer months. Combined with poor water circulation and high nutrient loading from the recycled wastewater used to fill the lake, Rymill Park Lake often has poor water quality leading to outbreaks of algal blooms in the summer months, requiring it to be temporarily closed. This impacts on the kiosk operators (particularly the hiring of row boats), festival and events held in the Park, and general visitors.
5. In 2015, consultants commenced work to prepare preliminary design drawings and a specification to upgrade Rymill Park Lake under its asset lifecycle management. In 2016 the design project was delayed by the O-Bahn tunnel works directly impacting Rymill Park and then further delayed in 2018 with the City of Adelaide (CoA) deferring investigations into a suitable water quality improvement system (mechanical treatment plant) while the Rymill Park Master Plan was developed.
6. In 2016 the State Government granted \$75k in funding to CoA for the Rymill Park / Murlawirrapurka (Park 14) Master Plan to “Re-imagine Rymill” as one of the “Big Moves” in the Adelaide Park Lands Management Strategy. This funding was matched by CoA.
  - 6.1. One of the considerations during the development of the Master Plan was the long-term management of Rymill Park Lake, given its well-known maintenance and water quality issues.
  - 6.2. In early 2018, a series of workshops were held with consultants and CoA staff to consider if a lake was the best use of this area of Rymill Park, possible alternative water sources and management regimes to improve water quality.
  - 6.3. Because the Master Plan was constrained to the boundary of Rymill Park, two options for the renewal of the lake were deemed feasible at the time: a lake, and a wetland using stormwater from the adjacent eastern CBD catchment.
  - 6.4. One of the principles of the Draft Master Plan is to “embed environmentally sustainable principles - ensure that all design and outcomes include water and planting systems that are sensitive to the environment”.
  - 6.5. Both lake renewal options are relevant to Action 1 of the Draft Master Plan “to enhance the lake and surrounds” with a series of key actions including:
    - 6.5.1. Retain the existing form and footprint of the lake and island
    - 6.5.2. Improve the water quality and sustainability of the lake
    - 6.5.3. Upgrade the lake walk
    - 6.5.4. Enhance the lake environment.
  - 6.6. Action 1 addresses:
    - 6.6.1. The deteriorating structure and ongoing maintenance of the lake
    - 6.6.2. The degrading of water quality as a result of severe seasonal impacts on the lake and resultant public health concerns
    - 6.6.3. An increasingly unsustainable source of water for the lake, which is currently filled using Glenelg to Adelaide Pipeline (GAP) recycled wastewater.

7. At its meeting on 23 July 2019, Council approved the Draft Master Plan for key stakeholder and community consultation, including the vision, principles, actions and overall plan.
  - 7.1. Consultation on the Draft Master Plan and Draft Community Land Management Plan were undertaken in November 2019 and included a variety of approaches including an online survey, a community day held in Rymill Park and a drop-in session at the City Library, this identified several lake options that needed further investigation. More detail on the community engagement results will be provided in full, in a separate APLA and Council report with the updated Master Plan and CLMP in early 2022, with a recommendation to endorse both documents.
  - 7.2. The Draft Master Plan presented two options to enhance the lake; ornamental lake and vegetated wetland. The preferred option was to be further investigated and included in the final Master Plan and CLMP.
  - 7.3. The results from the community engagement with key stakeholders and the wider community (of around 100 people), showed 45% of respondents preferred the ornamental lake and 55% preferred vegetated wetland. Conversely, key stakeholders (who included park-adjacent stakeholders and major event organisers) were mostly in favour of the ornamental lake option. We are unable to recommend a preferred option based on the inconclusive results of the community engagement.
  - 7.4. Engagement on the Draft Master Plan was undertaken with Kaurana community representatives in 2017-2020. This engagement found that there was potential use of the site prior to settlement as a possible meeting place and/or camping site associated with a natural creek line (now known as Botanic Creek). This creek fed a waterhole that exists on the site of the Main Lake at the Adelaide Botanic Garden, and provided a wealth of food and other resources for the Aboriginal people of the area. Other than that, there is no particular association that has been recorded for this Park or the lake.
8. Rymill Park / Murlawirrapurka (Park 14) largely retains its original Park Lands shape and form as devised by Colonel Light in 1837, and over time became an individual park as sections became segregated through the construction of Bartels Road and Rundle Road. In the 1950s–60s, under Town Clerk William Veale, the Park was substantially transformed to accommodate an ornamental lake, picnic and recreation grounds, and a large rose garden, resulting in the semi-formal ‘gardenesque’ park. Originally, the Botanic Creek watercourse passed through the site of the lake, however when the lake was constructed in 1958, the creek line was diverted around the lake through an underground concrete stormwater pipe.
9. Rymill Park Lake is a defining feature of the Park and anecdotally there is strong sentimental attachment towards it in the community. This popularity is largely due to the ornamental features of the park, the island, adjacent kiosk, playground, open grass area for picnicking and the opportunity to row boats in the lake. It is one of only a few ornamental water features in the Adelaide Park Lands.

### Options considered

10. Options A and B were offered as part of the consultation on the Draft Master Plan.
11. We have considered the feedback received during the community engagement of the Draft Master Plan and have further investigated an additional alternative (Option C Sustainable Lake), that looks beyond the site constraints of Rymill Park.
12. The following options for renewal of the lake have been considered in the Lake Options and Comparison of Water Sources technical report (**Attachment A**) and are summarised below:

	Option A Ornamental Lake	Option B Wetland	Option C Sustainable Lake
<b>Design Summary</b>			
<b>Image</b>			
<b>Design overview</b>	Structural renewal of the ornamental lake with recycled wastewater (GARWS) with water quality managed by an onsite mechanical treatment facility.	Existing ornamental lake converted into a vegetated wetland, with permanent water supplied from stormwater in the eastern CBD, via a sediment basin and storage tank. The wetland vegetation will act as water quality treatment system, covering 80% of lake surface.	Structural renewal of the lake maintaining the existing footprint, with permanent water supplied from Botanic Creek stormwater catchment within Park 15 and Park 16.
<b>Footprint/ Impact to Park Lands</b>	This option requires some landscape alterations to Park 14 to accommodate the mechanical plant building. This is included in the Draft Master Plan.	This option requires substantial Park 14 landscape changes to accommodate stormwater treatment system and storage tank. In-lake alterations are also required to achieve water quality outcomes.	This option requires minimal landscape alterations to Park 14. Stormwater diversion to existing drainage networks in Park 15 and Park 16 will require the rehabilitation of Botanic Creek to act as a natural water quality treatment system. Complementary changes are anticipated in Park 16 and Park 15.
<b>Consistent with Draft CLMP</b>	Yes	Wetland design may be consistent with CLMP if lake footprint can be retained, however perimeter access to water would be reduced due to littoral vegetation.	Yes
<b>Facilitates row boats on lake</b>	Yes	No – the vegetated wetland does not provide the open water required for boating activities.	Yes
<b>Facilitates equestrian events</b>	Yes	No – the natural water treatment processes of the vegetated wetland will be disrupted by equestrian events (horse trial crossing).	Yes

	Option A Ornamental Lake	Option B Wetland	Option C Sustainable Lake
<b>Technical feasibility</b>			
<b>Technical Overview</b>	<p>Design includes renewal of lake walls, base and structures using precast concrete units.</p> <p>Mechanical water quality treatment plant requires sludge management, and disposal to sewer.</p>	<p>Design includes sediment basin and water quality infrastructure (UV/gross pollutant trap/CDS unit).</p> <p>Diversion of stormwater from existing the Grenfell Street and East Terrace drainage catchment modelled but not designed.</p>	<p>Design includes renewal of lake walls, base and structures using precast concrete units.</p> <p>The Botanic Creek catchment requires construction of WSUD (water sensitive urban design) features such as bio-filtration systems, sediment basins, water attenuation zones and the rehabilitation of sections of Botanic Creek and stormwater tributaries in Park 16 and Park 15.</p> <p>A concept design has been completed and modelled. Rehabilitation of stormwater tributaries in Park 15 and Park 16 are being designed currently (as a separate project).</p> <p>Site conditions in Parks 15 and Park 16 are conducive for a stormwater flow diversion and water quality improvement system along the length of Botanic Creek.</p>
<b>Additional impacts to Park Lands</b>	<p>Site location of plant room not yet confirmed but could be located in the side of the O-Bahn berm.</p> <p>Ongoing regular scheduled maintenance of lake and treatment plant is required.</p>	<p>Park 14 site topography and area constraints are limiting factors for location of sediment basin, water quality infrastructure and storage tank without significant landscape alterations.</p>	<p>A storage tank will be required for stormwater harvesting and top-up source of water to the lake in Park 15 – this could be either above or below ground. If above ground, it will be sensitively located and be sympathetic to its Park Lands setting.</p>
<b>Water Source &amp; Quality</b>			
<b>Water source</b>	Continued refill with existing recycled water (GARWS) to maintain water level.	Stormwater diverted from eastern CBD catchment (38 ha).	Stormwater diverted from Botanic Creek catchment (235 ha).
<b>Water treatment</b>	<p>Mechanical treatment plant ensures water quality is managed to acceptable standards.</p> <p>Annual sludge removal further alleviates water quality problems.</p>	<p>Water is treated for solid and sediment contaminants before discharge to lake.</p> <p>Vegetation within the lake to act as natural biofiltration of dissolved pollutants, supported by circulation.</p>	<p>Water is discharged into a series of natural linear treatment systems (WSUD approaches) within Park 16 and Park 15.</p> <p>Solid and sediment contaminants collected by gross pollutant traps and basins at multiple locations.</p> <p>Vegetation within attenuation zones along the length of Botanic Creek will act as natural filtration of dissolved pollutants.</p> <p>Constant low flow of cleansed water into lake from storage zone in Park 15 will increase in-lake water circulation.</p>

	<b>Option A Ornamental Lake</b>	<b>Option B Wetland</b>	<b>Option C Sustainable Lake</b>
<b>Water monitoring</b>	Water testing at plant site (post treatment) required to manage water quality.	Water monitoring in-lake required to manage water quality.	Water monitoring in Park 16 and Park 15 is required to manage water quality prior to discharge into lake.
<b>Improves downstream water quality</b>	No – water discharged from the lake will be via sewer.	Yes	Yes
<b>Capital Cost</b>			
	\$2,725,360	\$2,534,776	\$3,022,638
<b>Annual Operating Cost</b>			
	\$160,959	\$64,352	\$120,217
<b>Cost Estimate Confidence</b>			
	Low	Medium	Medium
<b>Annual Social, Environmental and Financial Benefits</b>			
	\$93,800	\$365,317	\$877,089
<b>Net Present Value Costs (30 years)</b>			
	\$5.51M	\$2.89M	\$4.19M
<b>Net Present Value Benefits (30 years)</b>			
	\$1.62M	\$6.32M	\$15.2M

Please refer to Attachment A for more information including footnotes.

13. Each Option underwent a cost and benefit analysis using the Investment Framework for Economics of Water Sensitive Cities (INFFEWS) value tool. Technical feasibility and concept designs were critically reviewed by CoA staff and an interdisciplinary working group.
14. Concepts, designs and costs for Option A and B were taken from existing reports and proposals without alteration. Option C was developed in response to community consultation undertaken in 2019 for the Draft Rymill Park / Murlawirrapurka (Park 14) Master Plan.
15. Options for the renewal/upgrade of the lake were assessed based on technical aspects, lake environment enhancement, water quality improvement, biodiversity and sustainability of the lake including improving and maintaining the amenity values of the lake and operational costs.

#### **Preferred Option (Option C Sustainable Lake)**

16. The sustainable lake (Option C) is the preferred option for several reasons:
  - 16.1. This option is in line with the community desires for an ornamental lake (open water lake with attractive views, boating and equestrian events) with the environmental benefits of a sustainable stormwater treatment and harvesting system (with upstream and downstream benefits).
  - 16.2. This option provides whole of catchment benefits and rehabilitates Botanic Creek.
    - 16.2.1. The Botanic Creek watercourse originally passed through the site of the lake prior to 1958. This water course was diverted around the lake through underground concrete stormwater pipe during the construction of the lake in 1958. Option C reinstates a stormwater flow-path into Rymill Park.
    - 16.2.2. It provides an opportunity to naturalise the Botanic Creek line in Parks 15 and 16. This will significantly improve the aesthetic and ecosystems in these Parks.

- 16.2.3. Downstream benefits include the opportunity to rehabilitate Botanic Creek in Rundle Park / Kadlitpina (Park 13) due to reduced water-flow velocity and reduced flood risk generally particularly during the festival and event season.
- 16.2.4. Further downstream, the River Torrens / Karrawirra Pari will receive reduced pollutant flows, improved water quality and it is anticipated that costs to dredge the River Torrens will be reduced, and in its place will be less-costly small-scale sediment removal in Parks 15 and 16.
- 16.3. These benefits will deliver multiple outcomes for the City of Adelaide, the community and key stakeholders such as the kiosk lease-holder and event organisers. Improved water quality will ensure the lake remains an attractor to the Park and is complementary to events and festivals. An even water depth will facilitate recreational use such as row boats and (non-powered) model boats.
- 16.4. This option is also consistent with the Community Land Management Plan (CLMP) which recommends reinforcing the 1961 landscape setting and characteristic of the park.
17. The upstream stormwater treatment and rehabilitation of Botanic Creek in Parks 15 and 16 is proposed to be separate from the wetland currently under construction in Victoria Park south (Park Lands Creek – part of the Brown Hill Keswick Creek catchment) but could potentially be connected with further investigation and modelling.

#### **Next steps**

18. Ongoing discussion with key stakeholders is needed for further action. There could be alternatives/modifications to the proposed options that have not been incorporated in this preliminary assessment, as in-principal support for the renewal of the lake is required prior to undertaking detailed designs and costings.
19. The Rymill Park/Murlawirrapurka (Park 14) Master Plan and Community Land Management Plan will be updated with the supported lake renewal option and presented back to APLA and Council for endorsement.

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## **Attachments**

### **Attachment A – Rymill Park / Murlawirrapurka (Park 14) Lake Options & Comparison of Water Sources**

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- END OF REPORT -



# RYMILL PARK / MURLAWIRRAPURKA (PARK 14)

LAKE OPTIONS & COMPARISON OF WATER SOURCES

30.09.2021



## ACKNOWLEDGEMENT OF COUNTRY

The City of Adelaide acknowledges that we are located on the traditional Country of the Kaurna people of the Adelaide Plains and pays respect to Elders past, present and emerging. We recognise and respect their cultural heritage, beliefs and relationship with the land. We also extend that respect to visitors of other Aboriginal Language Groups and other First Nations.

### Document Properties

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## APPENDICES

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## Rymill Park / Murlawirrapurka (Park 14)

# 1. EXECUTIVE SUMMARY

Rymill Lake (the Lake) is a premier ornamental water body within the Adelaide Park Lands and is the central feature of Rymill Park / Murlawirrapurka (Park 14).

Since 2007, asset condition and ongoing poor water quality resulting in lake closure and amenity complaints have raised questions for City of Adelaide (CoA) as to how to effectively renew the Lake to address these ongoing issues.

Concurrently, the 2015 Adelaide Park Lands Management Strategy to “Reimagine Rymill Park” and subsequent development of the Draft Rymill Park / Murlawirrapurka (Park 14) Master Plan work in 2019 also sought to determine the best option to renew the Lake in a manner that meets the needs of the City community, stakeholders and visitors.

This report consolidates the conceptual, technical, environmental and financial investigations for three options for the renewal of Rymill Lake which have been proposed between 2012 and 2021. For each option, technical feasibility, benefits and costs to address key structural, water quality and amenity matters are discussed.

The following Rymill Lake Options are considered:

**Baseline Scenario** – A like for like restoration of the lake lining and walls, continued use of recycled wastewater, same annual maintenance program (as currently undertaken) and management of water quality issues.

**Option A: Ornamental Lake** – Includes structural renewal of the Lake, retaining same footprint and installation of a mechanical water quality treatment plant to maintain in-lake water quality with supply sourced from the existing recycled wastewater.

**Option B: Wetland** – Converts the existing Lake into a vegetated water body (80% coverage) with water supplied from stormwater catchment of the City East End. The flow will be first diverted through a gross pollutant trap and then a separate sediment basin within the park prior to discharging into the Lake.

**Option C: Sustainable Lake** – Includes structural renewal of the lake, footprint and form retained with stormwater water supplied via an extensive rehabilitation of the ‘upstream’ Botanic Creek catchment within Park 15 and Park 16 implemented as a network of stormwater runoff treatment and storage systems. The treated stormwater will be used to fill the Lake (it currently bypasses the Lake and discharges into River Torrens).

Each Option underwent a cost and benefit analysis (prepared by WaterTech and BDO EconSearch) using the Investment Framework for Economics of Water Sensitive Cities (INFEWS) value tool.

Technical feasibility and concept designs were critically reviewed by CoA engineering subject matter experts and an interdisciplinary working group.

Concepts, designs and costs for Option A and Option B were taken from existing reports and proposals without alteration. Both these options were consulted on as part of the Draft Master Plan and Draft Community Land Management Plan for the park. Option C was developed by CoA stormwater and environmental experts in response to the community consultation undertaken, which suits the needs and feedback from the community and stakeholders.

## Rymill Park / Murlawirrapurka (Park 14)

## 1.1 Options Summary

Option A Ornamental Lake	Option B Wetland	Option C Sustainable Lake
<b>Design Summary</b>		
<p>Structural renewal of the ornamental lake with recycled water supplied by SA Water (GARWS with water quality managed by an onsite mechanical treatment facility).</p> <p>The lake design is consistent with the Community Land Management Plan (CLMP).</p> <p>The 1961 landscape design is reinforced and respects the historical and (colonial) cultural significance of the lake, retaining its shape and footprint.</p> <p>This option requires some landscape alterations to Park 14 to accommodate the mechanical plant building.</p>	<p>Existing ornamental lake converted into a vegetated wetland, with permanent water supplied from stormwater in the City East End, via a sediment basin and storage tank.</p> <p>The wetland vegetation will act as water quality treatment system, covering 80% of lake surface.</p> <p>Wetland design may be consistent with CLMP if lake footprint can be retained, however perimeter access to water would be reduced due to littoral vegetation.</p> <p>This option requires substantial Park 14 landscape changes to accommodate stormwater treatment system and storage tank. In-lake alterations are also required to achieve water quality outcomes.</p> <p>Change to on-water recreational activities as part of vegetation cover.</p>	<p>Structural renewal of the lake maintaining the existing footprint, with permanent water supplied from Botanic Creek stormwater catchment within Park 15 and Park 16.</p> <p>Retains ornamental quality of the lake. The lake design is consistent with the Community Land Management Plan (CLMP).</p> <p>The 1961 landscape design is reinforced and respects the historical and (colonial) cultural significance of the lake.</p> <p>This option requires minimal landscape alterations to Park 14.</p> <p>Stormwater diversion to existing drainage networks in Park 15 and Park 16 will require the rehabilitation of Botanic Creek to act as a natural water quality treatment system.</p> <p>Complementary landscape changes are anticipated in Park 16 and Park 15.</p>
<b>Technical feasibility</b>		
<p>Design for renewal of lake walls, base and structures using precast concrete units.</p> <p>Mechanical water quality treatment plant (20% designed)</p>	<p>Design of wetland at concept stage only.</p> <p>Construction of sediment basin and water quality infrastructure</p>	<p>Design for renewal of lake walls, base and structures using precast concrete units.</p> <p>The Botanic Creek catchment requires construction of bio-</p>

**Rymill Park / Murlawirrapurka (Park 14)**

<p>but untested) requires sludge management and disposal to sewer.</p> <p>Site location of plant room not yet identified.</p> <p>Ongoing regular scheduled maintenance of lake and treatment plant required.</p>	<p>(UV/gross pollutant trap/CDS unit) not designed or tested.</p> <p>Diversion of stormwater from existing the Grenfell Street and East Terrace drainage catchment modelled but not designed.</p> <p>Park 14 site topography and area constraints are limiting factors for location of sediment basin, water quality infrastructure and storage tank without significant landscape alterations.</p>	<p>filtration systems, sediment basins, water attenuation zones and the rehabilitation of sections of Botanic Creek and stormwater tributaries in Park 16 and Park 15.</p> <p>A concept design has been completed and modelled. Rehabilitation of stormwater tributaries in Park 15 and Park 16 are designed.</p> <p>Site conditions in Parks 15 and Park 16 are conducive for a stormwater flow diversion and water quality improvement system along the length of Botanic Creek.</p> <p>A storage tank will be required for stormwater harvesting and top-up source of water to the lake in Park 15.</p>
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### Water Source & Quality

<p>Continued refill with existing recycled water (GARWS) to maintain water level.</p> <p>Mechanical treatment plant ensures water quality is managed to acceptable standards.</p> <p>Annual sludge removal further alleviates water quality problems.</p> <p>Water testing at plant site (post treatment) required to manage quality.</p>	<p>Stormwater diverted from existing network servicing the City East catchment (38hectare) treated for solid and sediment contaminants before discharge to lake.</p> <p>Vegetation within the lake to act as natural biofiltration of dissolved pollutants, supported by circulation.</p> <p>Refill with stored treated stormwater to maintain water level.</p> <p>Water monitoring in-lake required to manage water quality.</p> <p>Improve downstream water quality.</p>	<p>Stormwater diverted from existing network servicing Botanic Creek catchment (235hectare) discharged into a series of natural linear treatment systems within Park 16 and Park 15.</p> <p>Solid and sediment contaminants collected by gross pollutant traps and basins at multiple locations.</p> <p>Vegetation within biofiltration and attenuation zones along the length of Botanic Creek will act as natural filtration of dissolved pollutants.</p> <p>Constant low flow of cleansed water into lake from storage zone in Park 15 increase in-lake circulation.</p>
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## Rymill Park / Murlawirrapurka (Park 14)

		Refilled with stored treated stormwater to maintain water level.
		Water monitoring in Park 16 and Park 15 required to manage quality prior to discharge into lake.
		Improve downstream water quality.
<b>Capital Cost</b>		
\$2,725,360 <sup>1</sup>	\$2,534,776 <sup>2</sup>	\$3,022,638 <sup>3</sup>
<b>Annual Operating Cost</b>		
\$160,959 <sup>4</sup>	\$64,352 <sup>5</sup>	\$120,217 <sup>6</sup>
<b>Cost Estimate Confidence</b>		
Low	Medium	Medium
<b>Annual Social, Environmental and Financial Benefits</b>		
\$93,800	\$365,317	\$877,089
<b>Net Present Value Costs (30 years)</b>		
\$5.51M	\$2.89M	\$4.19M
<b>Net Present Value Benefits (30 years)</b>		
\$1.62M	\$6.32M	\$15.2M

<sup>1</sup> 2015 GHD estimate at 2021 index. The estimate was based on quotes of some equipment items, extrapolation of then similar project pricing and their experience on similar projects. The accuracy of the estimate was expected to be within  $\pm 50\%$  for the items described. Refer GHD 2015 Rymill Park Boating Pond upgrade Preferred Option Review Report (ACC2021/49435) for more detail.

<sup>2</sup> Cost estimates are based on existing projects, but site-specific costs not market tested. Design & contingency estimated at 50% of estimated costs.

<sup>3</sup> 2021 CoA preliminary design and WaterTech estimations adapted from 2018 Design Flow.

<sup>4</sup> 2015 GHD estimate at 2021 index. Mechanical plant operation costs estimated at 1.5% of base capital costs

<sup>5</sup> 2018 DesignFlow estimations.

<sup>6</sup> Based on 2015 GHD OpEx for Lake maintenance plus WaterTech 2021 and 2018 DesignFlow. Contingencies estimated based on GHD & DesignFlow figures

## Rymill Park / Murlawirrapurka (Park 14)

### 1.2 Assessment Parameters

The assessment of Options A, B and C for the renewal of Rymill Lake considered the structural condition of the lake, improving water quality, maintaining amenity values, efficient operational costs and delivering strategic policies set by CoA in the 2020-24 Strategic Plan, Adelaide Park Lands Management Strategy and Water Sensitive City Action Plan 2021-2025.

Strong consideration was also given to the community feedback received during the consultation process undertaken in 2019 as part of the draft Rymill Park / Murlawirrapurka (Park 14) Master Plan and draft Community Land Management Plan process, current and proposed events held in the Park including the International 3 Day Event, the Kiosk tenancy and existing uses such as the Quentin Kenihan Play Space.

Benefits of each Option are calculated by South Australian Treasury approved Investment Framework For the Economics of Water Sensitive Cities to ascertain an estimated monetary value gained by different Lake renewal outcomes as a cost/benefit ratio.

### 1.3 Recommendation

Rymill Lake is the defining feature of Rymill Park / Murlawirrapurka (Park 14).

The community are attached to the cultural and nostalgic significance of an ornamental open water body in the eastern Adelaide Park Lands where recreational rowing boats provide access to water adjacent a relaxed park setting, however they understand future climate change challenges and are supportive of more sustainable water use and ensuring the quality of the Lake's water is maintained throughout the year.

Option A and Option C respond to the community's views, in that the Lake footprint shape and aesthetic features are relatively unchanged, in comparison to Option B which would not deliver an ornamental feature. Option B requires substantial Park 14 landscape changes to accommodate stormwater treatment system and storage tank. In-lake alterations are also required to achieve water quality outcomes.

Option A and B result in additional impacts directly within Park 14 due to the installation of constructed infrastructure such as sediment basins and treatment plant buildings. Option C results in changes within Parks 16 and Park 15 due to waterway rehabilitation.

Option C requires the most capital expenditure but offers a lower annual operating expense than Option A. Over 30 years, the value of benefits for Option C is significantly larger than for Option A or B with an estimated cost/benefit ratio of 1 : 3.6.

Option C responds to the community's perspectives, renews the Lake to address ongoing structural, water quality, amenity and maintenance issues and offers the best estimated cost/benefit.

Option C is therefore recommended as the preferred concept for the renewal of Rymill Lake.

Further detailed modelling, design and technical assessment of Option C is required to confirm assessment parameters, costs and benefits.

## 2. BACKGROUND

Rymill Lake is an ornamental water body located in the eastern Adelaide Park Lands (Murlawirrapurka / Park 14) providing amenity and recreational services to the Adelaide community and is maintained by the City of Adelaide.

The Lake is the central feature of Rymill Park since its installation in the 1960's.

### 2.1 Lake Condition

In 2007, a physical condition assessment of the Lake's structure noted a leaky base and pond walls that lean into the pond at a number of locations. There are also longitudinal gaps between the back of wall and surrounding soil at several locations. The wall shows evidence of repair at several locations and is generally in poor condition. Large trees in close proximity to the pond and their roots have visibly distressed the wall and perimeter paving.

Adjacent to the base of the wall is an annular shaped reinforced concrete slab 2m wide of unknown thickness. The junction between the annulus and perimeter wall is sealed with flexible sealant. It is believed that the Lake floor beyond the annulus consists of Bentonite clay and that previously defects to the floor have taken place using pelletised Bentonite mixed on site.

The bed of the Lake is lined with a flexible liner (assumed to be LDPE) which is held in place by regular pinning. Previous investigations indicated that the liner is deteriorated and was in very poor condition. Water has seeped behind the liner into both the lake-bed and the surrounding concrete walls and hence the Lake requires regular refilling.

Within the Lake, there are three raised crossings, which are used during equestrian events. The drainage pipe across the base of the crossing to enable water movement is prone to becoming blocked.

### 2.2 Lake Water

The Lake is filled with recycled water from the Glenelg to Adelaide Recycled Water Scheme (GARWS) and although treated to a high non-drinking water standard, nutrient levels (phosphorus and nitrogen) in the water supplied remain higher than for potable water (a previous source of refill prior to permanent water conservation measures in SA).

Use of recycled wastewater to fill Rymill Lake is regulated by the Glenelg-Adelaide Recycled Water Scheme Irrigation Risk Management Plan (ACC2009/170036) and associated EPA Exemption 24043 (SCAN2014/10836).

Furthermore, Rymill Lake is shallow (0.6m to 1.1 m depth) with limited circulation, rendering it a stagnant water body with a relatively large surface area (high solar radiation) resulting in very warm water temperatures and evaporation rates over the summer period.

Warm water temperatures and high nutrient loads result in excessive growth of floating aquatic plants (azolla and lemna minor) and contribute to a higher risk of cyanobacteria and green algae resulting in poor water quality and impacting the amenity of the lake.

Water quality in the Lake deteriorates rapidly. Ongoing water quality monitoring has detected that blue-green algae blooms escalate rapidly in summer months and exceed the public health thresholds

## Rymill Park / Murlawirrapurka (Park 14)

for primary contact, resulting in Lake closure which impacts the adjacent Kiosk customers and business offerings (row boat hire), and enjoyment of visitors to the park.

The visual state of the Lake water is perceived by the community to be a signal of its environmental health. CoA employs an annual cleaning process which is a labour intensive and lengthy procedure involving pumping out of the pond water (discharged to sewer) and manual removal of sludge from the lake bed. This often occurs prior to major events that are held in Park 14 which attract significant numbers of visitors that support the local economy (i.e. Borealis, International 3 Day Event, Gluttony).

### 2.3 Rymill Park / Murlawirrapurka (Park 14) Master Plan

City of Adelaide prepared a draft Master Plan for Rymill Park (ACC2019/197102) in 2019, as one of the key 'Big Moves' of the Adelaide Park Lands Management Strategy. The draft Master Plan considers recent changes within Park 14 and its surrounds and to address ongoing issues such as the Lake water quality.

In 2019, community consultation undertaken for the draft Master Plan offered two options to renew Rymill Lake. These are represented in this technical report as Option A and B.

Option A was to retain the ornamental lake and manage water quality with a mechanical treatment facility. Option B sought to "Re-imagine Rymill" with a central wetland which treated nearby city stormwater.

Results of the engagement showed the preference for the Lakes renewal as:

- 55% of the community preferred the vegetated wetland (Option B)
- 45% of the community preferred the ornamental lake (Option A).

Conversely, key stakeholders (those considered to have a higher vested interest in Park 14 than the community at large, such as kiosk operators and park-adjacent stakeholders) indicated a preference to retain the ornamental lake due to its status as a feature in Park 14 as a key attractor and potential service offering (row boats) providing financial benefit to the Kiosk.

### 3. OPTIONS ASSESSMENT

In considering the physical state (condition) of the Lake, the water quality issues and the community's perspective, three options to renew Rymill Lake as discussed in this report are:

**Option A: Ornamental Lake** – Includes structural renewal of the Lake, retaining same footprint and installation of a mechanical water quality treatment plant to maintain in-lake water quality with supply sourced from the existing recycled wastewater.

**Option B: Wetland** – Converts the existing Lake into a vegetated water body (80% coverage) with water supplied from stormwater catchment of the City East End. The flow will be first diverted through a gross pollutant trap and then a separate sediment basin within Park 14 prior to discharging into the Lake.

**Option C: Sustainable Lake** – Includes structural renewal of the lake, footprint and form retained with stormwater water supplied via an extensive rehabilitation of the 'upstream' Botanic Creek catchment within Park 15 and Park 16 implemented as a network of stormwater runoff treatment and storage systems. The naturally treated stormwater will be used to fill the Lake (it currently bypasses the Lake and discharges into River Torrens untreated) and stored for top-up.

Each Option has been assessed against a baseline scenario of like for like restoration of the Lake lining, continued use of recycled wastewater, same annual maintenance program and management of water quality issues.

This report explores each Option based on the following criteria:

- Technical review
- Water source and quality
- Cost Analysis Investigation [ACC2021/32969]
- Economic Benefits Analysis
- Community consultation responses - Draft Master Plan & Community Land Management Plan [ACC2019/197102].

Information used in the assessment of Options has been collated from existing proposals, technical reports, cost estimates and recent stormwater modelling. Economic benefits have been calculated based on capital and operating estimates in existing proposals and updated to 2021 values.

There have been no changes to original design concepts for Option A and B as put to the community in 2019.

## 4. BASELINE SCENARIO



**Figure 4.1: Deterioration of existing liner on pond bed and liner separation from pond wall**

### 4.1 Design Concept

Like-for-like asset renewal to secure the wall structure, replace the pond liner and continue to refill with recycle wastewater, ongoing annual pond clean out to manage water quality.

### 4.2 Technical Feasibility

This option taken as option SPCC in "Rymill Park Boating Pond Upgrade Preferred Option Review Report", 2015, GHD (ACC2021/49435). It includes the replacement of the current liner with a new spray-on coating and the use of welded LDPE liner similar to the current installation. The Lake base will be re-graded to improve the cross falls and shallow sumps will be constructed for solid management. The existing horse crossing will be removed and reconstructed to allow the installation of the new liner. Existing crossing pipes will be upgraded to larger diameter pipe to minimise the risk of blockage.

#### 4.2.1 Works includes:

- Improving condition of the lake wall
- Installation of liner/ spray on liner
- Regrading of the base of the lake
- Reinstating equestrian route and water flow crossings
- Perimeter strip-drain
- Establishing regular annual cleaning schedule and continuous monitoring.

### 4.3 Water Source & Quality

The Lake will be continued to be filled with recycled wastewater from Glenelg to Adelaide Recycled Water Scheme (GARWS) serviced by the Glenelg to Adelaide Pipeline (GAP) scheme.

The use of recycled water to fill the lake is regulated by the GARWS Irrigation Risk Management Plan (ACC2009/170036) and associated EPA Exemption 24043 (SCAN2014/10836).



## Rymill Park / Murlawirrapurka (Park 14)

Sewage effluent treated to wastewater standards contains higher concentrations of nutrients, such as nitrogen and phosphorus which increase algae growth and Cyanobacteria. Bacteria growth results in less oxygen in the water and when dissolved oxygen content decreases, fish and aquatic insects cannot survive.

### 4.4 Costs

Capital Expenditure	\$1,623,000
Annual Operating Expenditure	\$166,000
All costs NPV (20 years)	\$3.7M

Cost estimated for the baseline scenario is provided in "Rymill Park Boating Pond Upgrade Preferred Option Review Report", 2015, GHD. (ACC2021/49435) and includes capital cost to renew the Lake, maintenance costs and cost of refill water using GARWS. The cost confidence is considered medium as most known costs from similar projects had been applied in the estimates.

### 4.5 Benefit Values

Benefit values for the Baseline scenario were not calculated.

## 5. OPTION A: ORNAMENTAL LAKE

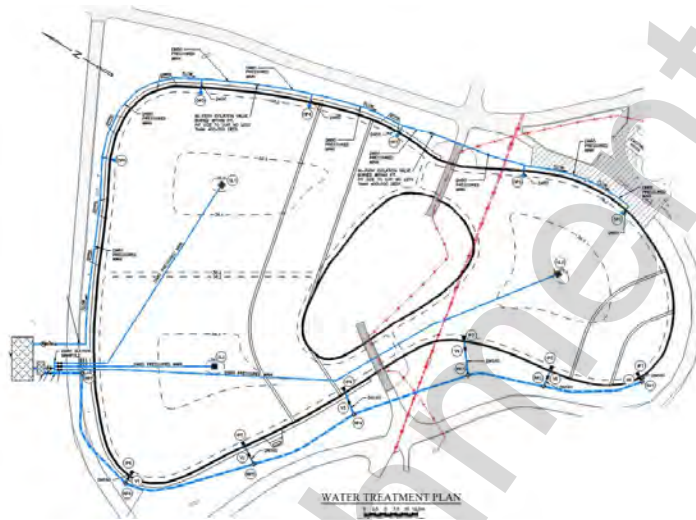


Figure 5.1: Ornamental Lake and GAP Water Treatment Plan

### 5.1 Design Concept

The option comprises a re-construction of the Lake with a new mechanical water quality management system to address the continued issues associated with high nutrient recycled water as a refill water source.

Preliminary investigation of this option commenced in 2015 but was deferred. Preliminary design of this option is attached as Appendix A.

Concept and cost for Option A were taken from existing reports and proposals without alteration.

### 5.2 Technical Feasibility

This Option is taken as option TR in "Rymill Park Boating Pond Upgrade Preferred Option Review Report", 2015, GHD. (ACC2021/49435). The mechanical water quality treatment system design was conceptual and requires substantial engineering review to ascertain if it provides the optimal desired water quality outcomes. Nutrient removal from water requires specific equipment and is expected to be more complex than the concept design.

#### 5.2.1 Work includes:

- Re-grading the pond base to allow a shallow fall away from the horse tracks, with solids directed into shallow sumps at either end
- Construction of lake retaining wall/structure, install precast concrete units
- Installation of liner/ spray on liner
- Reinstating equestrian route and water flow crossings. Refer Appendix D for typical cross section of equestrian track.
- Perimeter strip drain
- Installation of a mechanical treatment system, consisting of chemical dosing, dissolved air flotation treatment, filtration and UV disinfection, which will return treated water to the Lake.

## Rymill Park / Murlawirrapurka (Park 14)

- Sludge management included with discharge to sewer
- Establishing regular annual cleaning schedule and continuous monitoring.

### 5.3 Water Source & Quality

The Lake will be refilled with recycled wastewater from GARWS serviced by the Glenelg to Adelaide Pipeline (GAP) scheme.

Installation of the new treatment plant is expected to improve the quality of GARWS water by reducing the concentration of nutrients. Clear liquid effluent produced after treatment may still contain disease-causing micro-organisms and hence the lake water may remain a health risk for humans, birds and aquatic life.

Regular onsite and laboratory testing of water quality and the effectiveness of the mechanical treatment systems will be required to define nutrient management, temperature, pH and dissolved oxygen of the lake water.

### 5.4 Costs

Capital Expenditure (2021)	
<ul style="list-style-type: none"> <li>• Lake structure renewal: \$1,777,123</li> <li>• Mechanical water treatment: \$948,237</li> </ul>	\$2,725,360
Annual Operating Expenditure (2021)	\$160,959
All costs NPV	\$5.51M

The accuracy of the estimated costs was expected to be within  $\pm 50\%$  for the items described. Confidence of the proposed cost estimate is low due to the time lag from the original estimates and because the mechanical water treatment system was incomplete and unable to be reasonably estimated.

### 5.5 Benefit Values

Annual benefit	\$93,800
Business profit to Kiosk (annual) from clean water.	\$89,800
Business profit to Kiosk for Intl. 3Day Event	No change
Recreation + Event opportunities	\$4,000
Stormwater Water Quality	\$0
Local (residents) mortality	\$0
Local (residents) morbidity	\$0
Metro-wide (visitors) mortality	\$0
Metro-wide (visitors) morbidity	\$0
All benefits NPV (30 years)	\$1,621,993

**Rymill Park / Murlawirrapurka (Park 14)**

The largest benefit generated by Option A is the estimated additional profit the Kiosk would receive from increased patronage due to higher amenity of the Lake from cleaner water and a reduced risk of Lake closure during major events.

## 6. OPTION B: WETLAND



**Figure 6.1: Wetland and City East Catchment**

### 6.1 Design Concept

Like for different asset renewal option to convert the existing ornamental lake into a vegetated wetland of 8000m<sup>2</sup> surface area with permanent water body within the existing footprint of the lake. The wetland will act as water quality treatment system for stormwater diverted from the City East drainage system which covers 38.5 hectares of urban catchment adjacent Rymill Park.

Existing stormwater infrastructure flows past the north west corner of Rymill Park and contributes untreated stormwater directly into Park 13, the Botanic Gardens and further into River Torrens.

Converting the Lake into a wetland that can improve urban stormwater quality via natural biological filtration requires additional pre-treatment infrastructure including a UV/gross pollutant trap/CDS unit and sediment basin which needs to be located within Rymill Park.

Treated stormwater is stored in an underground tank used for top-up of the wetland in summer.

### 6.2 Technical Feasibility

This option is taken as per TCL / DesignFlow concept (2018) developed during the 'Re-imagine Rymill' process for the development of the draft Master Plan for Rymill Park / Murlawirrapurka (Park 14).

The diversion of stormwater from the City East drainage system at Grenfell Street and East Terrace intersection to Rymill Lake will involve:

- Significant underground service augmentation with:
  - Disruption to traffic including O-Bahn bus service.
  - Relocation of existing water, telecommunication, electrical and gas services.
  - Augmentation of stormwater infrastructure.
- Installation of a gross pollutant trap (primary treatment system).



## Rymill Park / Murlawirrapurka (Park 14)

- An 'upstream' sedimentation basin (second treatment) to capture suspended sediment before it enters the wetland:
  - Site topography, number of trees and limited available space constrains opportune location for a basin, resulting in augmentation of in-park underground services, removal of trees and realignment of the internal paths (refer Figure below).



**Figure 6.2: Site Topography Plan**

- Installation of an underground storage tank within Rymill Park to collect and store excess treated stormwater from the wetland for top-up during Summer. Previous investigation indicated that the top up volume required from the wetland option is approximately 8ML/year.

Construction of a wetland and its associated infrastructure and water quality pre-treatment devices will require significant landscape changes to Rymill Park. Whilst the Lake footprint and form could be retained pending design, additional basins and infrastructure in the vicinity of the Lake to accommodate first and second treatment systems, and a storage tank for water harvesting will be evident.

### Works include:

- Demolition of existing lake
- Construct wetland with approx. 8000 m<sup>2</sup> planted zone within the lake footprint (80% coverage).
- Construction of earth retaining structure to suit wetland and maintain the lake footprint.
- Diversion of stormwater drainage system from the Grenfell Street and East Terrace intersection into the wetland.
- Construction of a sedimentation basin within Rymill Park upstream of the wetland.
- Installation of UV treatment and gross pollutant trap/ CDS Unit at the upstream of the lake water inlet.
- Underground storage tank for treated stormwater from wetland
- Reinstating equestrian route and water flow crossings
- Perimeter strip drain

## Rymill Park / Murlawirrapurka (Park 14)

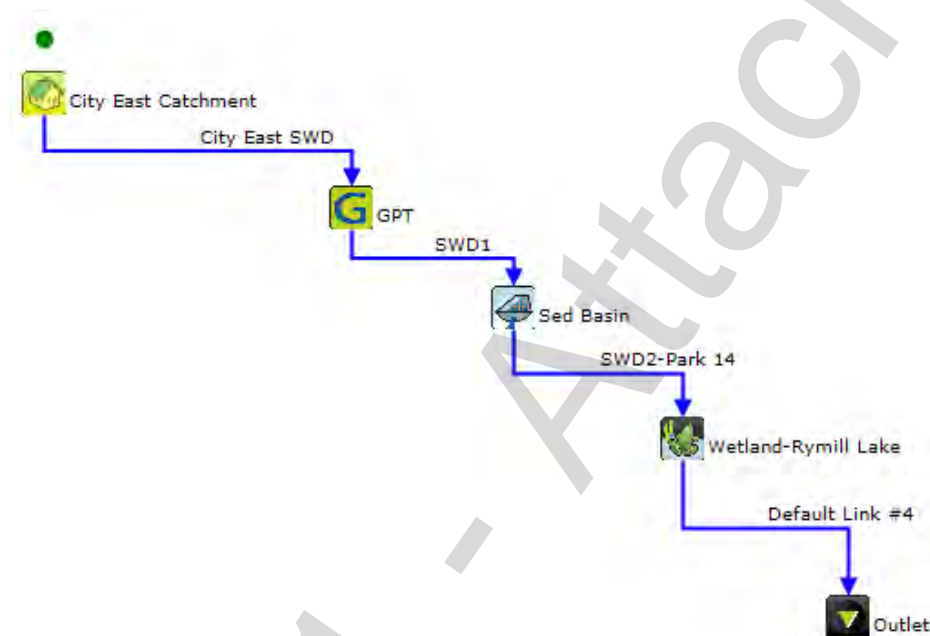
### 6.3 Water Source & Quality

The wetland will be filled with urban stormwater diverted from the City East drainage catchment.

The urban catchment is approximately 38.5 hectares generating approximately 128.6 ML/year of runoff and primarily services city streets and a high-density built form with higher levels of pollutant loads.

Water Sensitive Urban Design (WSUD) principles will be implemented to treat the urban stormwater runoff by removing associated pollutants such as fine to colloidal particles, dissolved contaminants, nutrients and hydrocarbons which currently drains untreated into the River Torrens, therefore water quality improvement is implicit in this design concept.

MUSIC modelling has been undertaken for the City East catchment with the proposed stormwater treatment train within Park 14 (Figure 6.3). The treatment train consists of a gross pollutant trap, storage tank, sedimentation basin (300 m<sup>2</sup>) and wetland (8000 m<sup>2</sup>). Extended detention depth of 200 mm was assumed for the wetland. The proposed treatment train modelling results indicate that the stormwater runoff diverted into the Lake meets the EPA water quality requirements.



(5) City East Catchment : Treatment Train Effectiveness : Outlet

	Sources	Residual Load	% Reduction
Flow (ML/yr)	128.6	116.9	9.16
Total Suspended Solids (kg/yr)	2.583E+04	2251	91.29
Total Phosphorus (kg/yr)	52.81	12.13	77.03
Total Nitrogen (kg/yr)	370.8	178.4	51.87
Gross Pollutants (kg/yr)	5538	80.8	98.54

Figure 6.3: MUSIC Model for City East Catchment and Treatment Train



## Rymill Park / Murlawirrapurka (Park 14)

### 6.4 Costs

Capital Expenditure (2021) <ul style="list-style-type: none"> <li>In-lake wetland + sediment basin: \$1,616,426</li> <li>Stormwater harvest + storage system: \$918,350</li> </ul>	\$2,534,776
Annual Operating Expenditure (2021)	\$64,352
All costs NPV	\$2.89M

Cost accuracy is considered medium as items are standard features of existing stormwater harvesting systems located in Adelaide although cost estimates are not based on detailed design. Operating costs assume potable water is used to top-up the Lake if on-site storage is low.

### 6.5 Benefit Values

Annual benefit	\$365,317
Business profit to Kiosk (annual) from clean water.	\$60,000
Business profit to Kiosk for Intl. 3Day Event	-\$24,000
Recreation + Event opportunities	\$4,000
Stormwater Water Quality	\$319,025
Local (residents) mortality	\$2,2274
Local (residents) morbidity	\$1,467
Metro-wide (visitors) mortality	\$1,550
Metro-wide (visitors) morbidity	\$1,000
All benefits NPV (30 years)	\$6,317,065

The wetland concept is assumed to prevent Rymill Lake from hosting the International 3 Day Event, with horses unable to enter the water feature. This is presented as a financial dis-benefit for the Kiosk. The benefit from improved water quality from the treatment and reuse of urban stormwater from 38.5hectare catchment generates the largest benefit. The pollutant values for Total Phosphorous (TP) (\$2,058 per kg) and Total Nitrogen (TN) (\$1,223) were applied based on Adelaide metro stormwater economics analysis in 2020 and research studies by the CRC for Water Sensitive Cities.

## 7. OPTION C: SUSTAINABLE LAKE

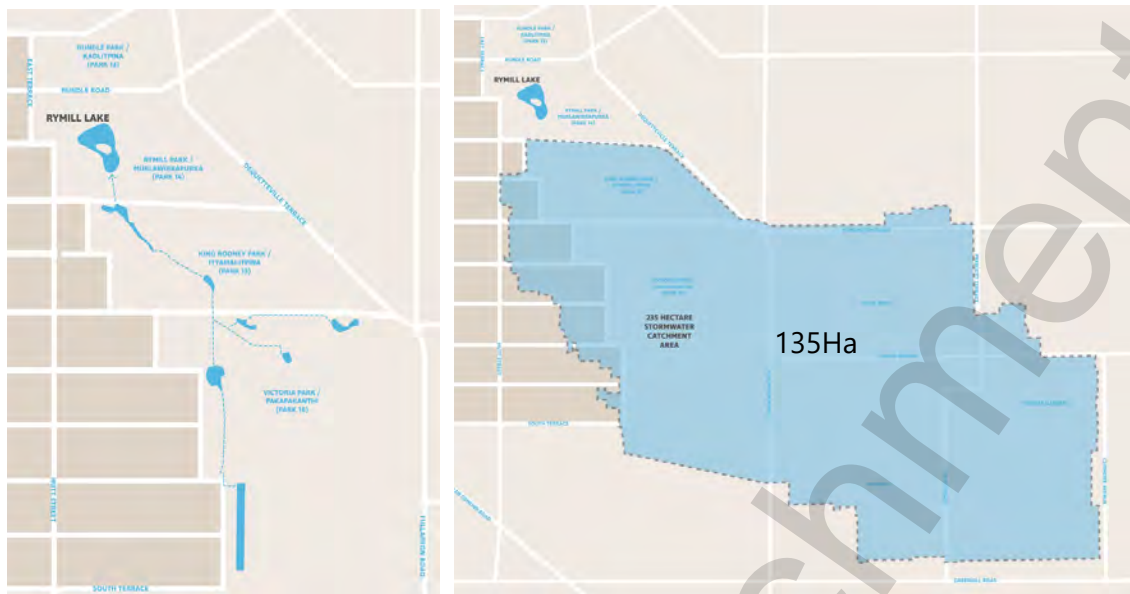


Figure 7.1: Stormwater Runoff Management in Park 15 and Park 16, and Catchment Plan

### 7.1 Design Concept

A like for catchment-wide benefit design, utilising stormwater from the 'upstream' Botanic Creek catchment to provide a sustainable and pre-cleansed water source to supply Rymill Lake. Maintaining its existing ornamental feature within Park 14, the Lake is structurally renewed and then supplied by inflowing stormwater that has been pre-treated via a series of biofiltration systems, sediment basins and gross pollutant traps in Parks 16 and Park 15. As part of the naturalised treatment system, the rehabilitation of Botanic Creek from an urban drain to a more natural waterway is required.

Rymill Lake will require the same structural renewal as in Option A to improve the physical condition and reduce water loss.

### 7.2 Technical Feasibility

This option has been designed by CoA stormwater engineers and water quality experts during 2021 with consideration of Option A technical aspects and concepts from Option B.

Utilising stormwater from the 235 hectare Botanic Creek catchment to supply Rymill Lake requires a series of naturalised water treatment and storage systems the 'upper' catchment before the water is transferred directly into the Lake via the existing stormwater infrastructure in Rymill Park. The catchment covers section of Adelaide City's south-east corner and the suburb of Rose Park (City of Burnside). Refer Appendix C for the proposed Stormwater Masterplan (Indicative).

Three new linear attenuation zones will be constructed in Park 15 and Park 16 where existing stormwater drains converge with the existing Botanic Creek drain. Natural biofiltration techniques and gross pollutant traps will be used to improve the quality of water. Excess water will be stored in a tank located in Park 15 to provide Summer top-up (approx. 15ML/year). Existing drainage infrastructure within Rymill Park will be used to transfer cleansed stormwater directly into Rymill Lake, minimising Park 14 landscape changes to a 'discharge' water feature at the Lake, with the form and footprint of the Lake retained (excluding depth) and no other onsite infrastructure required.

## Rymill Park / Murlawirrapurka (Park 14)

### 7.2.1 Work includes:

- Construction of lake retaining wall/structure, install precast concrete units
- Installation of liner/ spray on liner
- Regrading of the base of the lake
- Reinstating equestrian route and water flow crossings
  - The Australian International 3 Day Event (AI3DE) had engaged a structural engineer (Project Building Certifiers Pty Ltd) to provide relevant structural advice to construct horse track through the lake). Typical cross-section of the track is included in Appendix D (ACC2011/147572). The proposed track section will be revisited to suit the characteristics of the proposed new lake structure.
- Perimeter strip drain
- A series of biofiltration water treatment and attenuation zones in Park 15 and Park 16 as per the proposed indicative stormwater concept in Appendix C.
- Installation of UV treatment and gross pollutant trap/CDS unit at the upstream of the lake water inlet.
- Installation of above ground storage tank for treated stormwater harvesting
- Stormwater drainage system to direct treated water to the lake, storage tank and outlet drainage system/ bypass from the lake.

Significant rehabilitation of the Botanic Creek catchment within Park 15 and Park 16 is focussed on integration with watercourses and stormwater drainage channels. Naturalisation of landscapes along the length of Botanic Creek to enable biological processes to improve stormwater quality, remove pollutants and reduce flow rates. Two stormwater channels which contribute stormwater from the City south-east streets have been designed and costed in 2021 as part of drainage infrastructure renewals with water sensitive urban design features that will contribute to Option C.

### 7.3 Water Source & Quality

The Botanic Creek stormwater catchment of 235 hectares is primarily urban residential and converges runoff from Rose Park to the east with City South residential streets to the west at the northern tip of Park 16. The existing Botanic Creek is an open drain with sections of lined and unlined zones with a natural base and highly eroded banks. The creek traverses Park 15 and Park 16 before draining into an underground drainage system in Bartels Road. The system crosses under Park 14 on the eastern side Rymill Lake and flows into Park 13 through a surface creek and onwards to the Kainka Wirra / Main Lake in the Adelaide Botanic Garden, with high rainfall overflow to the River Torrens.

Water quality modelling (MUSIC) has been undertaken for the catchment with the proposed stormwater treatment train (Figure 7.2) as indicated on the indicative concept plan (Appendix C). The proposed treatment train results indicated that the Total Nitrogen (TN) removal doesn't meet the EPA standard and require investigation is required into additional treatment measures in the upstream reserves.

Rymill Park / Murlawirrapurka (Park 14)

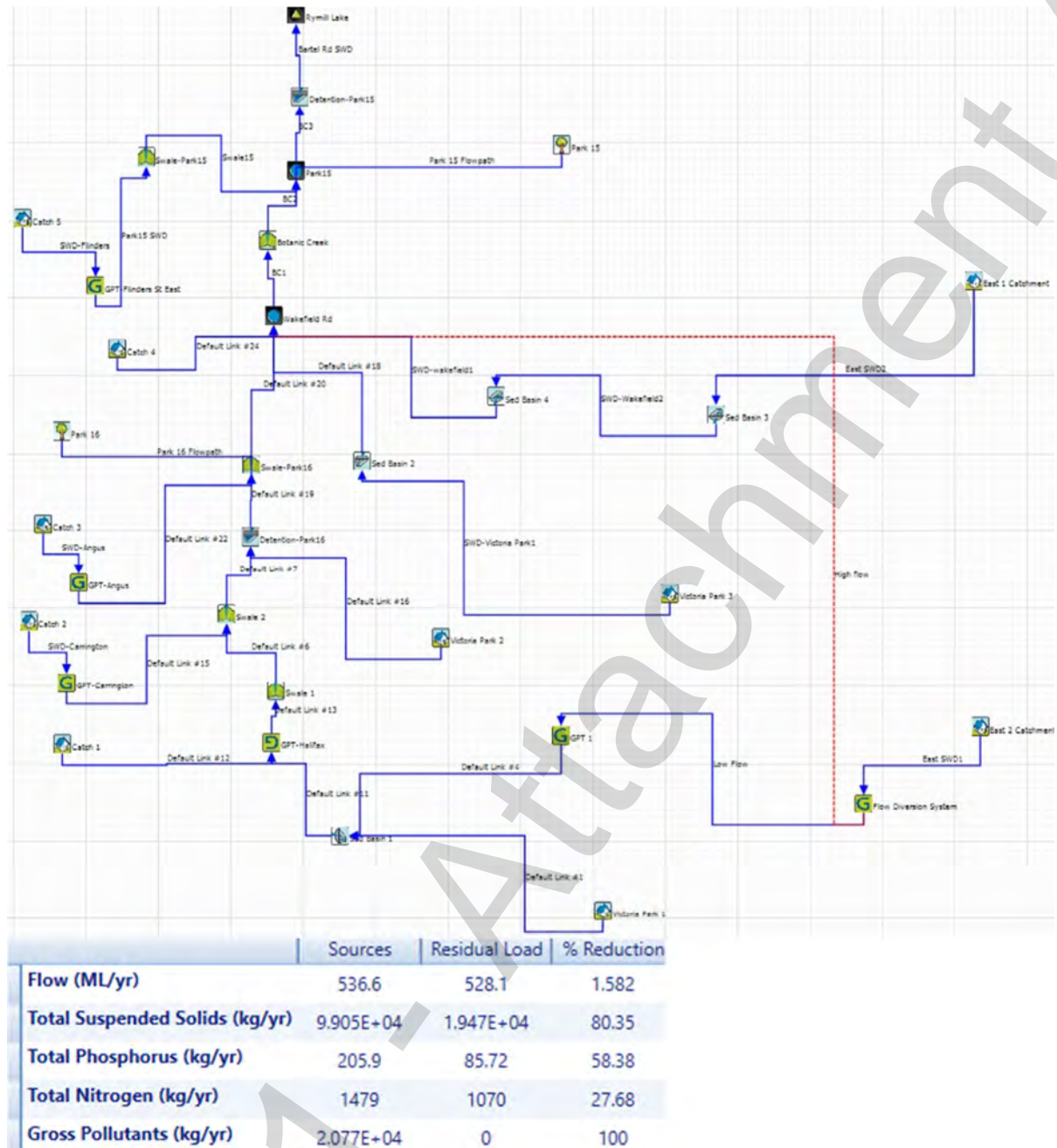
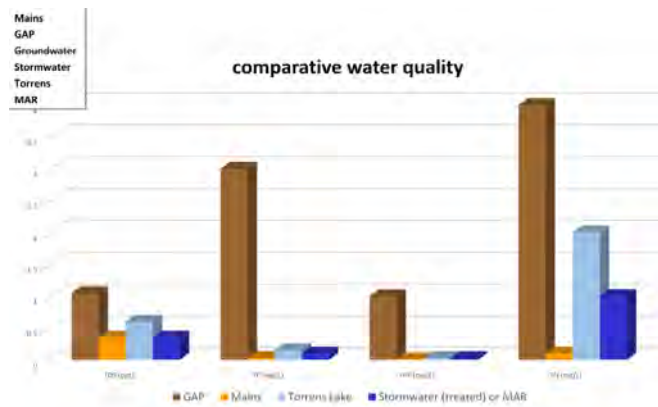


Figure 7.2: MUSIC model for City east catchment and treatment train

2018 *Designflow* study report diagram (Figure 7.3) indicated that the treated stormwater in-lake (Option B) will contain less total dissolved solid (TDS), total phosphorous (TP), filterable reactive phosphorous (FRP) and total nitrogen (TN) than using the GARWS water (Option A). Utilisation of drinking (mains) water and extraction from Torrens River are not environmentally sustainable nor economically viable and hence are excluded from the refilling option for Option C.

## Rymill Park / Murlawirrapurka (Park 14)



(WQ issues magnified with 'closed' system)

TDS Total Dissolved Solid  
 TP Total Phosphorous  
 FRP Filterable Reactive Phosphorous  
 TN Total Nitrogen

**Figure 7.3: Comparative Water Quality of Different Sources**

Source: Designflow Rymill Park Lake Study 2018

## 7.4 Costs

Capital Expenditure (2021)	
<ul style="list-style-type: none"> <li>Lake structure renewal: \$1,777,123</li> <li>Multiple linear stormwater treatment + harvest + waterways rehabilitation: \$1,245,516</li> </ul>	\$3,022,638
Annual Operating Expenditure (2021)	\$120,217
All costs NPV	\$4.19M

Cost confidence is medium reflecting the accuracy of the estimated costs for the structural renewal was expected to be within  $\pm 50\%$  for the items described. Cost associated with stormwater treatment and creek rehabilitation are based on local, recent examples including the Park Lands Creek project.

## 7.5 Benefit Values

Annual benefit	\$877,089
Business profit to Kiosk (annual) from clean water.	\$89,800
Business profit to Kiosk for Intl. 3Day Event	\$24,000
Recreation + Event opportunities	\$4,000
Stormwater Water Quality	\$745,685
Local (residents) mortality	\$5,169
Local (residents) morbidity	\$3,335
Metro-wide (visitors) mortality	\$3,100
Metro-wide (visitors) morbidity	\$2,000
All benefits NPV (30 years)	\$15,166,661

**Rymill Park / Murlawirrapurka (Park 14)**

Greater benefits are derived by Option C due to the larger stormwater catchment treating a larger volume of stormwater and the higher number of residents living adjacent Park 15 and Park 15 who would derive health benefits from higher amenity of the rehabilitated waterway. Catchment wide flood mitigation benefits were marginal and not included, however known peak flow impacts of the open stormwater drain in Rundle Park (Kadlitpina / Park 13) could be better managed by reducing flow rates and volumes upstream as per Option C. Potential restoration of the waterway in Park 13 and hence amenity improvement was not incorporated into the benefit analysis.

## APPENDICES

Item 7.1 - Attachment A

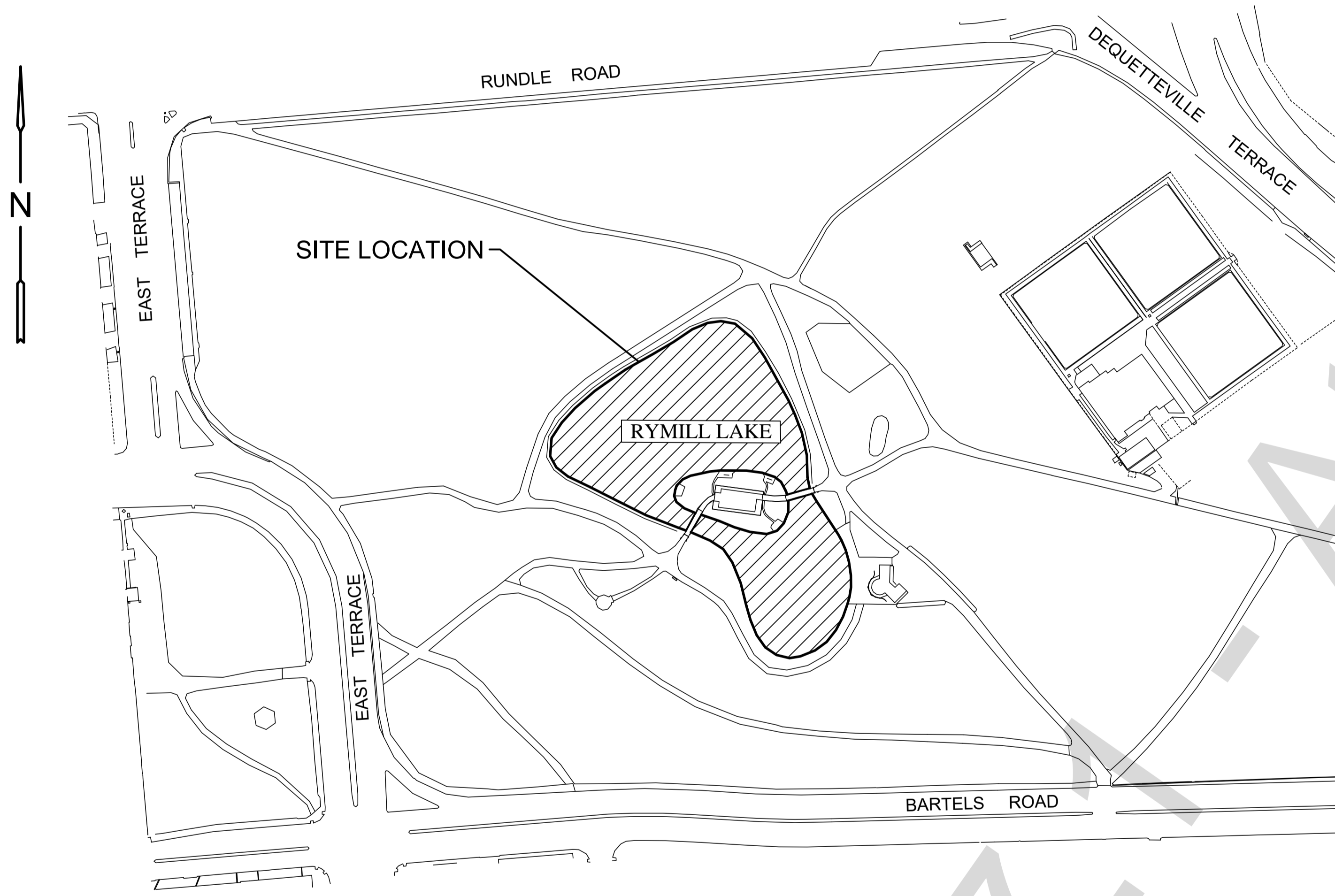


**Rymill Park / Murlawirrapurka (Park 14)****Appendix A**

Option A: Ornamental lake with treated GARWS and installation of mechanical treatment plant – Preliminary Design

Item 7.1 - Attachment A

# CITY OF ADELAIDE MURLAWIRRAPURKA (PARK 14) RYMILL LAKE RENEWAL



**LOCALITY PLAN**  
NTS

### DRAWING LIST

A1-2017-109-01	DRAWING LIST, LOCALITY PLAN & GENERAL NOTES
A1-2017-109-02	GENERAL CONSTRUCTION PLAN
A1-2017-109-03	STORMWATER AND DRAINAGE PLAN
A1-2017-109-10	TYPICAL CROSS SECTIONS
A1-2017-109-11	TYPICAL DETAILS - SHEET 1 OF 4
A1-2017-109-12	TYPICAL DETAILS - SHEET 2 OF 4
A1-2017-109-13	TYPICAL DETAILS - SHEET 3 OF 4
A1-2017-109-14	TYPICAL DETAILS - SHEET 4 OF 4
A1-2017-109-20	PROCESS AND INSTRUMENTATION DIAGRAM
A1-2017-109-21	WATER TREATMENT PLAN

### GENERAL NOTES

1. ANY DISCREPANCY BETWEEN DRAWINGS SHALL BE REPORTED TO THE SUPERINTENDENT BEFORE WORK PROCEEDS.
2. THESE DRAWINGS ARE NOT CADASTRAL PLANS AND MUST NOT BE USED IN DETERMINING PRECISE DETAILS WITH RESPECT TO BOUNDARIES.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE AND MEASURED FROM FACE OF KERB.
4. ALL DIMENSIONS SHALL BE VERIFIED ON SITE.
5. ALL LEVELS ARE EXPRESSED IN METRES AND AHD BASED.
6. ALL CO-ORDINATES ARE MGA BASED, UNLESS NOTED OTHERWISE.
7. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATIONS.
8. SPOIL TO BE STOCKPILED AS DIRECTED BY THE SUPERINTENDENT AND EXCESS NOT USED IS TO BE REMOVED FROM SITE BY CONTRACTOR.
9. THESE DRAWINGS ARE A SCHEMATIC REPRESENTATION OF SERVICES INFORMATION CONTAINED IN DRAWINGS ISSUED BY THE RELEVANT AUTHORITIES. THE INFORMATION CONTAINED IN THESE DRAWINGS IS INDICATIVE ONLY, AND REFERENCE SHOULD BE MADE TO THE RELEVANT AUTHORITIES DOCUMENTATION TO CONFIRM ACCURACY AND COMPLETENESS. WHERE INFORMATION IS AVAILABLE, THE SUBSURFACE SERVICES INSTALLED BY CONTRACTORS OTHER THAN THE AUTHORITIES HAVE BEEN SHOWN, BUT ADDITIONAL UNDOCUMENTED SERVICES MAY BE PRESENT. SHOULD THE CONTRACTOR BELIEVE THAT SUBSURFACE SERVICES ARE AT RISK OF DAMAGE DURING CONSTRUCTION, THE CONTRACTOR SHOULD NOTIFY THE RELEVANT AUTHORITIES AND ESTABLISH THE EXACT LOCATION OF THE SERVICES.
10. DEMOLISH AND REMOVE ALL EXISTING INSTALLATIONS WHICH ARE TO BE AFFECTED BY NEW WORKS. EXTENT OF DEMOLITION TO BE CONFIRMED ON SITE WITH THE SUPERINTENDENT PRIOR TO COMMENCEMENT OF WORKS.
11. CONTRACTOR TO ADJUST LIDS OF EXISTING SERVICE PITS TO MATCH FINISHED SURFACE LEVEL. PROVIDE HEAVY DUTY COVER AS REQUIRED.
12. WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE RELEVANT CURRENT AUSTRALIAN STANDARDS INCLUDING ALL AMENDMENTS, AND THE LOCAL STATUTORY AUTHORITIES, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
13. PRIOR TO COMMENCING CONSTRUCTION THE CONTRACTOR SHALL LOCATE AND DEPTH ALL EXISTING UNDERGROUND SERVICES. ANY DISCREPANCIES OF DEPTH OF LOCATION FROM THAT INDICATED ON THE DRAWINGS SHALL BE REPORTED TO THE SUPERINTENDENT.
14. IF TREE ROOTS ARE ENCOUNTERED DURING CONSTRUCTION CONTACT THE SUPERINTENDENT IMMEDIATELY.
15. TEMPORARY FENCING IS TO BE PROVIDED OUTSIDE OF CONSTRUCTION HOURS TO PREVENT VEHICLE AND PEDESTRIAN ACCESS TO THE SITE.
16. WORKS AREA TO BE DEFINED BY CITY OF ADELAIDE.

**PRELIMINARY - NOT FOR CONSTRUCTION**

DESIGNED	GHD	DATE	09/2018	THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.  The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.
DRAWN	GHD	DATE	09/2018	
CHECKED	GHD	DATE	09/2018	
QUALITY ASSURED	GHD	DATE	09/2018	
<small>Level 4, 211 Victoria Square Adelaide SA 5000 Australia GPO Box 1002 Adelaide SA 5001 T +61 8 8111 8800 F +61 8 8111 8889 E <a href="mailto:adelaide@ghd.com.au">adelaide@ghd.com.au</a> W <a href="http://www.ghd.com">www.ghd.com</a></small>				
<small>GHD Drawing No. 33-17198000 Drawn: PSK      Design: SG Modeling:      Design: Check:      Check: Approved:      Approved:</small>				

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	ISSUED FOR REVIEW	PSR	20.04.15
1	PRELIMINARY DESIGN	PSR	26.06.15
2	PRELIMINARY ISSUE FOR REVIEW	PSK	24.11.17
3	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

MURLAWIRRAPURKA (PARK 14)		<b>CITY OF ADELAIDE</b>
RYMILL PARK		
RYMILL LAKE RENEWAL		COA PROJECT NUMBER
DRAWING LIST, LOCALITY PLAN & GENERAL NOTES		P227
		SCALE
		NTS
		NUMBER OF SHEETS
		10
		ORIGINAL SHEET SIZE
		A1
		REVISION
		3
		DRAWING SET NUMBER
		SHEET
		A1-2017-109
		01



NOTES

- FOR POND EDGE TREATMENT REFER SHEET 10. CONCRETE WALL TO BE PLACED ON REINFORCED CONCRETE BASE.
- EXISTING LINERS TO BE REMOVED. THE BASE OF THE POND WILL BE GRADED TO ALLOW FOR NEW FALLS, AND INSTALLATION OF 100mm THICK FINE CRUSHED ROCK BASE COURSE.
- TWO PART POLYUREA SPRAY ON LINER (ADELAIDE WATERPROOFING SERVICES OR EQUIVALENT) TO BE APPLIED TO BASE OF POND AND TO EXTEND TO 250mm BELOW TOP OF CONCRETE WALL.
- HORSE TRAIL ROUTE TO BE REINSTATED TO MATCH EXISTING LEVELS AND GEOMETRIC SHAPE.
- WHERE NEW PATHWAY ABUTS CONCRETE WALL REFER SHEET 11, DETAIL 5.
- SLAB/ PARK BENCH - REINSTATE EXISTING PARK FURNITURE. PROVIDE NEW CONCRETE PAD FOR SEATING ADJACENT TO CONCRETE PATH. REFER SHEET 11, DETAIL 4. LOCATIONS TO BE CONFIRMED WITH SITE SUPERINTENDENT PRIOR TO CONSTRUCTION.
- KIOSK PAVED AREA - EXISTING CONCRETE PAVEMENT TO TIE INTO NEW CONCRETE WALL PROFILE. REFER SHEET 11, DETAIL 8.

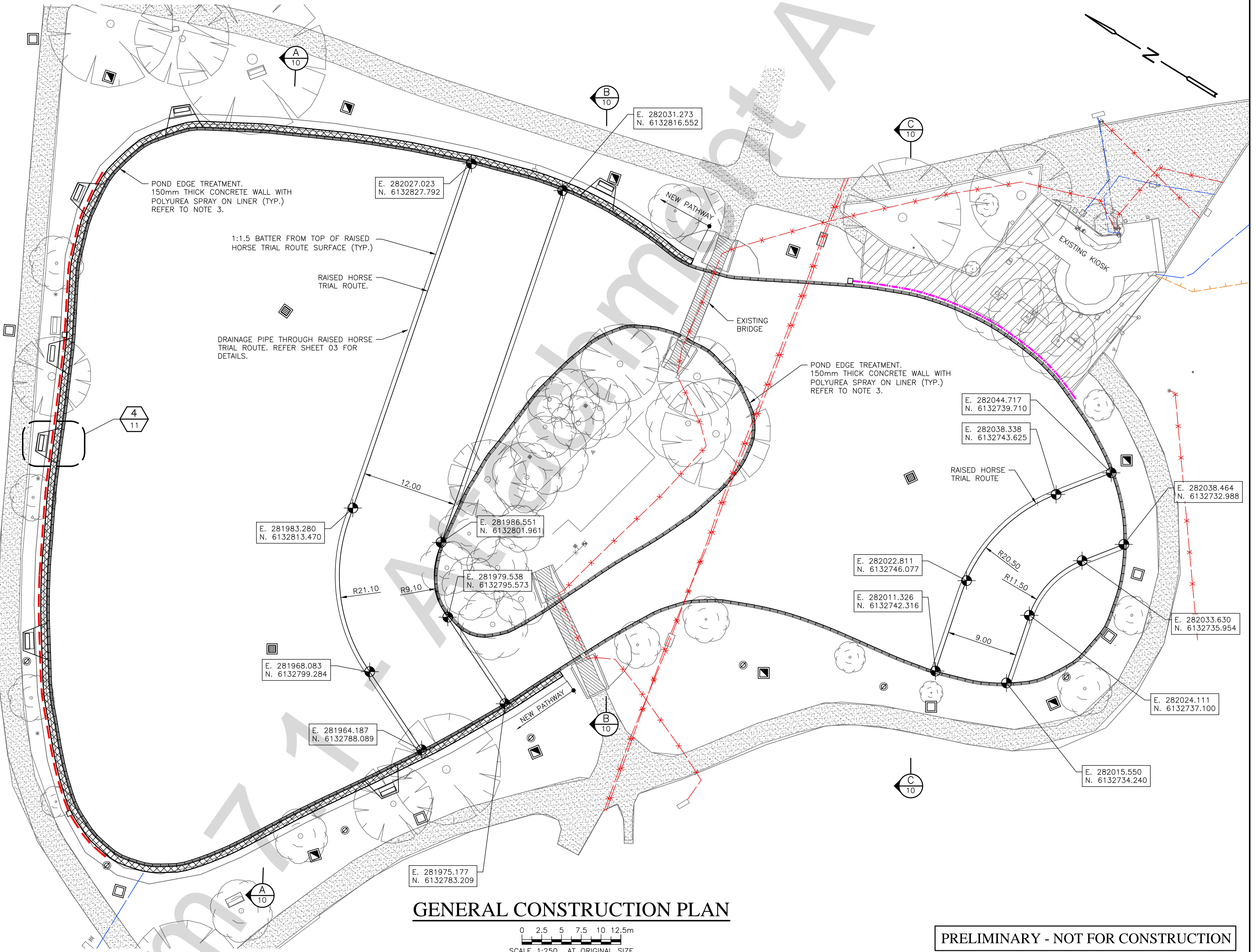
ALL EXISTING UNDERGROUND SERVICES HAVE NOT BEEN DEPTHEDED. CONTRACTOR TO CONFIRM ALL UNDERGROUND SERVICE LOCATIONS AND DEPTHS ON-SITE PRIOR TO UNDERTAKING ANY WORKS.

LEGEND - CONSTRUCTION:

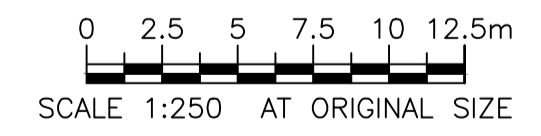
- SETOUT POINT
- EXISTING ASPHALT PATHWAY
- EXISTING CONCRETE FLAGSTONE PAVEMENT
- ACO KS100/KS200 IN-LINE PIT REFER SHEET 03 FOR DETAILS
- INSPECTION OPENING
- JUNCTION PIT (600x600mm) REFER SHEET 03 FOR DETAILS
- FIELD GULLY INLET PIT (600x600mm) REFER SHEET 03 FOR DETAILS
- SUCTION INLET PIT (600x600mm) REFER SHEET 21 FOR DETAILS
- ACO K100 STRIP DRAIN OR SIMILAR REFER SHEET 03 FOR DETAILS
- ACO K200 STRIP DRAIN OR SIMILAR REFER SHEET 03 FOR DETAILS
- NEW 900mm WIDE CONCRETE PATHWAY

LEGEND - EXISTING SERVICES:

- COMMUNICATIONS
- ELECTRICAL
- WATER



GENERAL CONSTRUCTION PLAN



PRELIMINARY - NOT FOR CONSTRUCTION

DESIGNED	GHD	DATE	09/2018
DRAWN	GHD	DATE	09/2018
CHECKED	GHD	DATE	09/2018
QUALITY ASSURED	GHD	DATE	09/2018

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.

The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.

GHD Drawing No. 33-1798000

Drawn: PSK  
Checked: GHD  
Designed: SG  
Approved: GHD

SERVICES	CHECKED BY	DATE
SEWER	GHD	04/2015
SWD	GHD	04/2015
WATER	GHD	04/2015
GAS	GHD	04/2015
ETSA	GHD	04/2015
TELSTRA	GHD	04/2015
COMMS	GHD	04/2015

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	ISSUED FOR REVIEW	PSR	20.04.15
1	PRELIMINARY DESIGN	PSR	26.06.15
2	PRELIMINARY ISSUE FOR REVIEW	PSK	24.11.17
3	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

MURLAWIRRAPURKA (PARK 14)	
RYMILL PARK	
RYMILL LAKE RENEWAL	
GENERAL CONSTRUCTION PLAN	

CITY OF ADELAIDE	COA PROJECT NUMBER	P227
	SCALE	1:250
	NUMBER OF SHEETS	10
	ORIGINAL SHEET SIZE	A1
	REVISION	3
	DRAWING SET NUMBER	SHEET
		A1-2017-109 02



STORMWATER DRAINAGE PIPE AND PIT SCHEDULE								
PIT NO.	DESCRIPTION	SURFACE RL	PIPE FROM/TO	PIPE SIZE	PIT IL	PIPE LENGTH (m)	EASTING	NORTHING
D01	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	37.00	D01-MH1	ø300	36.228	12.97	282047.135	6132739.107
MH1	600x600 JUNCTION PIT WITH ACCESSIBLE MANHOLE COVER (CLASS B)	37.05*	MH1-MH2	ø300	36.155	7.18	282036.534	6132729.316
MH2	600x600 JUNCTION PIT WITH ACCESSIBLE MANHOLE COVER (CLASS B)	37.05*	MH2-D02	ø300	36.119	9.59	282028.129	6132727.466
D02	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	36.90	D02-MH3	ø300	36.071	14.02	282017.066	6132727.952
MH3	600x600 JUNCTION PIT WITH ACCESSIBLE MANHOLE COVER (CLASS B)	37.05*	MH3-D03	ø300	36.001	20.15	282007.397	6132740.032
D03	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	36.90	D03-D04	ø300	35.900	29.11	281998.035	6132759.474
D04	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	37.00	D04-MH4	ø300	35.754	15.31	281972.625	6132776.438
MH4	600x600 JUNCTION PIT WITH ACCESSIBLE MANHOLE COVER (CLASS B)	37.05*	MH4-D05	ø300	35.677	12.82	281957.233	6132782.985
D05	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	36.90	D05-MH5	ø300	35.532	23.62	281945.382	6132790.834
MH5	600x600 JUNCTION PIT WITH ACCESSIBLE MANHOLE COVER (CLASS B)	-*	MH5-MH6	ø375	35.414	21.14	281926.866	6132807.790
MH6	600x600 JUNCTION PIT WITH ACCESSIBLE MANHOLE COVER (CLASS B)	-*	MH6-MH9	ø375	35.233	57.09	281925.629	6132830.215
MH7	600x600 JUNCTION PIT WITH ACCESSIBLE MANHOLE COVER (CLASS B)	-*	MH7-MH8	ø375	34.720	8.50	282006.133	6132881.487
D06	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	36.95	D06-D07	ø300	36.075	23.02	282044.985	6132787.908
D07	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	36.95	D07-D08	ø375	34.763	33.49	282038.663	6132811.373
D08	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	36.90	D08-D09	ø375	35.793	28.93	282025.554	6132844.038
D09	600x600 FIELD GULLY INLET PIT WITH GALVANISED MILD STEEL GRATE (CLASS B)	37.00	D09-MH7	ø375	35.552	8.61	282008.113	6132870.920
MH8	EXISTING JUNCTION PIT	-	-	-	34.72	-	282013.279	6132888.228
MH9	600x600 JUNCTION PIT WITH ACCESSIBLE MANHOLE COVER (CLASS B)	-*	MH9-MH7	ø375	34.94	35.54	281974.971	6132861.640

\* = MANHOLE COVER TO BE ADJUSTED TO SUIT FINISHED SURFACE LEVEL

**LEGEND - CONSTRUCTION:**

- ### SETOUT POINT
- ▨ EXISTING ASPHALT PATHWAY
- ▨ EXISTING CONCRETE FLAGSTONE PAVEMENT
- RCP CLASS 2
- DN150 PVC-U PIPE (MIN. 1% GRADE)
- ACO K100 STRIP DRAIN OR SIMILAR REFER NOTE 3
- ACO K200 STRIP DRAIN OR SIMILAR REFER NOTE 3
- ACO KS100/ KS200 IN-LINE PIT REFER NOTE 3
- INSPECTION OPENING
- JUNCTION PIT (600x600mm)
- FIELD GULLY INLET PIT (600x600mm)
- SUCTION INLET PIT (600x600mm) REFER SHEET 21 FOR DETAILS
- FIELD GULLY
- 36.2 --- DESIGN CONTOURS
- ▨ NEW 900mm WIDE CONCRETE PATHWAY

**LEGEND - EXISTING SERVICES:**

- COMMUNICATIONS
- ELECTRICAL
- WATER

DESIGNED GHD DATE 09/2018  
 DRAWN GHD DATE 09/2018  
 CHECKED GHD DATE 09/2018  
 QUALITY ASSURED GHD DATE 09/2018

**THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.**

The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.

GHD Level 4, 211 Victoria Square Adelaide SA 5000 Australia  
 GPO Box 1000 Adelaide SA 5001  
 T 61 8111 0000 F 61 8111 0000  
 E info@ghd.com.au W www.ghd.com.au

GHD Drawing No. 33-1719000

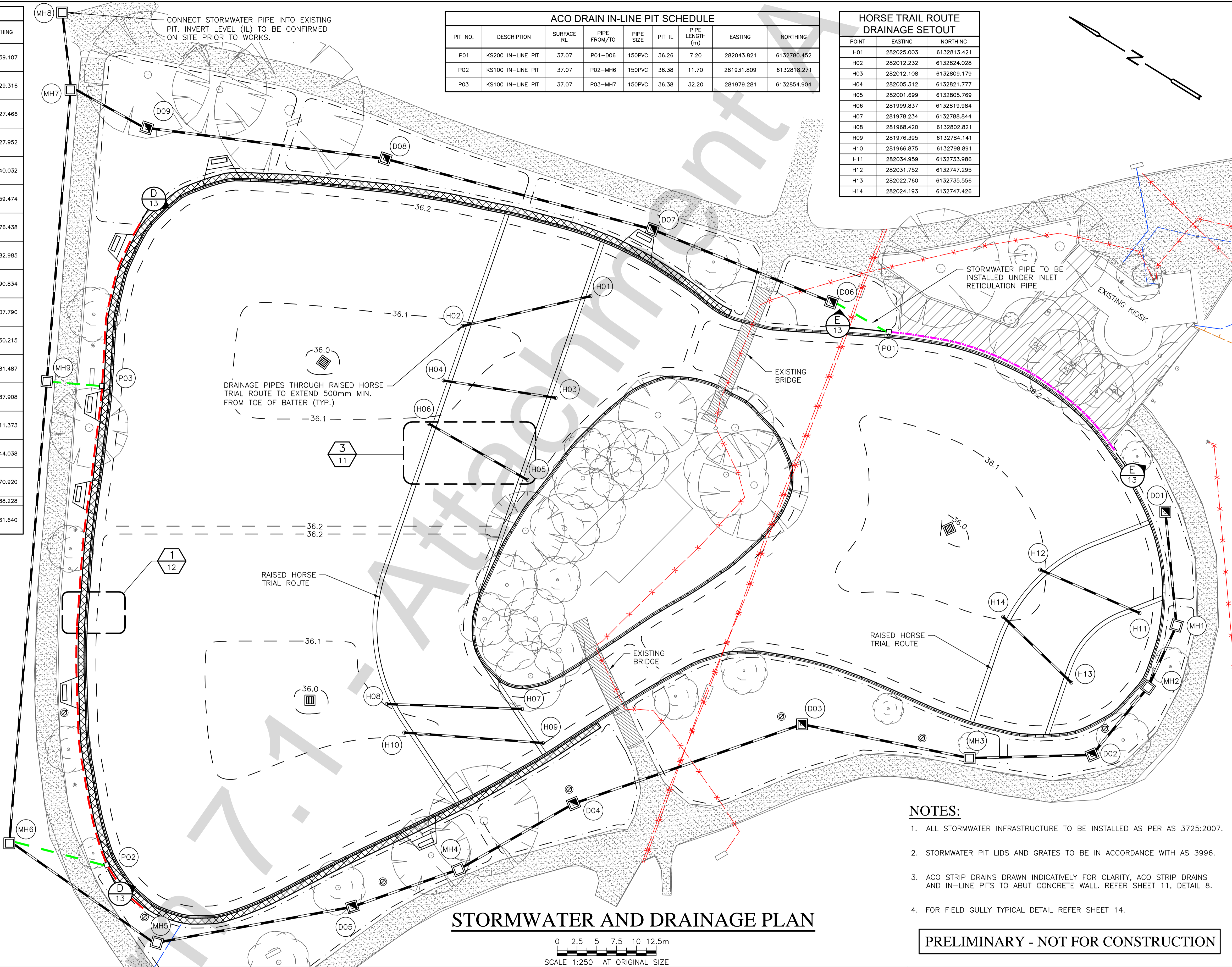
Drawn: PGR Design: SG  
 Checked: GHD  
 Approved: \_\_\_\_\_

This drawing must not be used for construction unless signed as Approved

SERVICES	CHECKED BY	DATE
SEWER	GHD	04/2015
SWD	GHD	04/2015
WATER	GHD	04/2015
GAS	GHD	04/2015
ETSA	GHD	04/2015
TELSTRA	GHD	04/2015
COMMS	GHD	04/2015

ACO DRAIN IN-LINE PIT SCHEDULE								
PIT NO.	DESCRIPTION	SURFACE RL	PIPE FROM/TO	PIPE SIZE	PIT IL	PIPE LENGTH (m)	EASTING	NORTHING
P01	KS200 IN-LINE PIT	37.07	P01-D06	150PVC	36.26	7.20	282043.821	6132780.452
P02	KS100 IN-LINE PIT	37.07	P02-MH6	150PVC	36.38	11.70	281931.809	6132818.271
P03	KS100 IN-LINE PIT	37.07	P03-MH7	150PVC	36.38	32.20	281979.281	6132854.904

HORSE TRAIL ROUTE DRAINAGE SETOUT		
POINT	EASTING	NORTHING
H01	282025.003	6132813.421
H02	282012.232	6132824.028
H03	282012.108	6132809.179
H04	282005.312	6132821.777
H05	282001.699	6132805.769
H06	281999.837	6132819.984
H07	281978.234	6132788.844
H08	281968.420	6132802.821
H09	281976.395	6132784.141
H10	281966.875	6132798.891
H11	282034.959	6132733.986
H12	282031.752	6132747.295
H13	282022.760	6132735.556
H14	282024.193	6132747.426



**STORMWATER AND DRAINAGE PLAN**



- NOTES:**
- ALL STORMWATER INFRASTRUCTURE TO BE INSTALLED AS PER AS 3725:2007.
  - STORMWATER PIT LIDS AND GRATES TO BE IN ACCORDANCE WITH AS 3996.
  - ACO STRIP DRAINS DRAWN INDICATIVELY FOR CLARITY, ACO STRIP DRAINS AND IN-LINE PITS TO ABUT CONCRETE WALL. REFER SHEET 11, DETAIL 8.
  - FOR FIELD GULLY TYPICAL DETAIL REFER SHEET 14.

**PRELIMINARY - NOT FOR CONSTRUCTION**

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	ISSUED FOR REVIEW	PSR	20.04.15
1	PRELIMINARY DESIGN	PSR	26.06.15
2	PRELIMINARY ISSUE FOR REVIEW	PSK	24.11.17
3	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

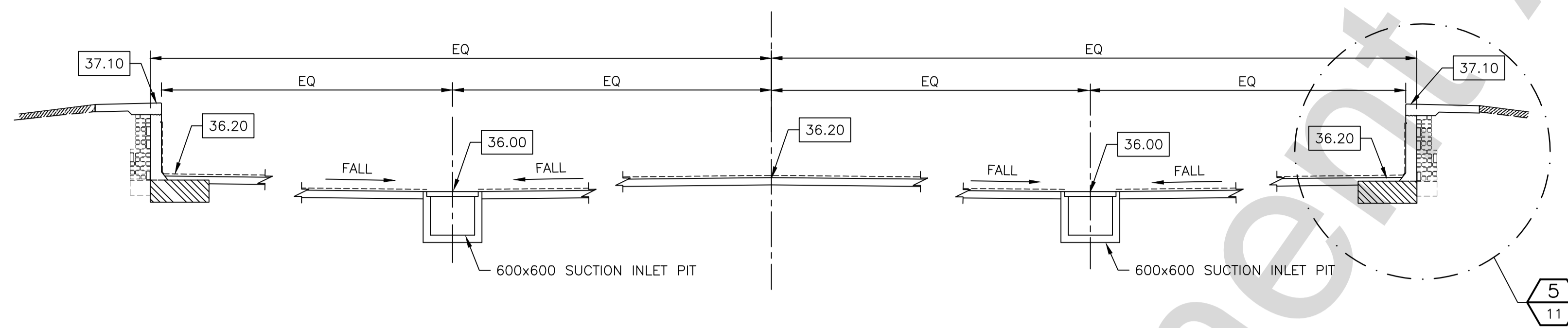
MURLAWIRRAPURKA (PARK 14)  
 RYMILL PARK  
 RYMILL LAKE RENEWAL  
 STORMWATER AND DRAINAGE PLAN

CITY OF ADELAIDE

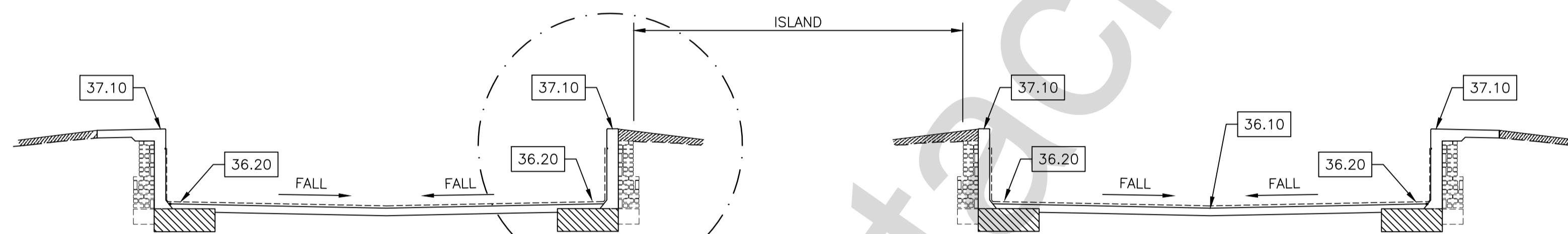
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 SCALE 1:250  
 NUMBER OF SHEETS 10  
 ORIGINAL SHEET SIZE A1  
 REVISION 3  
 DRAWING SET NUMBER SHEET  
**A1-2017-109 03**

COA PLOTSTAMP: 12/10/2018 8:34 AM

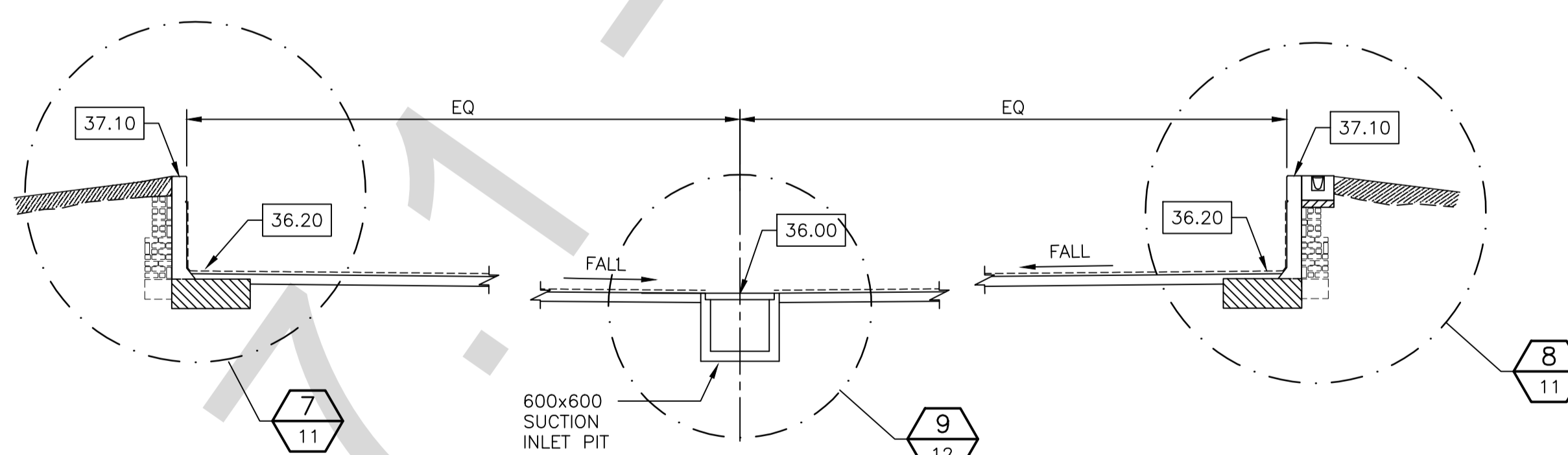




**A SECTION**  
02 NTS



**B SECTION**  
02 NTS



**C SECTION**  
02 NTS

**PRELIMINARY - NOT FOR CONSTRUCTION**

DESIGNED GHD DATE 09/2018  
 DRAWN GHD DATE 09/2018  
 CHECKED GHD DATE 09/2018  
 QUALITY ASSURED GHD DATE 09/2018

**THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.**

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 GPO Box 1002 Adelaide SA 5001  
 T +61 8 8111 8800 F +61 8 8111 8889  
 E info@ghd.com.au W www.ghd.com

GHD Drawing No: 33-1709000

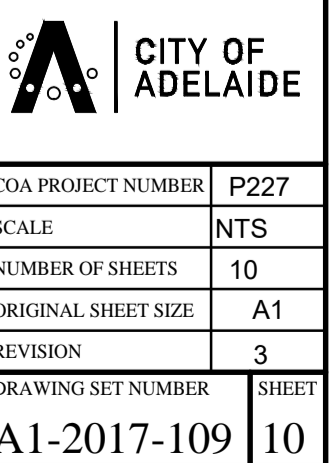
Drawn PSK Design SGJ  
 Checking Design SGJ  
 Checked Design SGJ  
 Approved Design SGJ

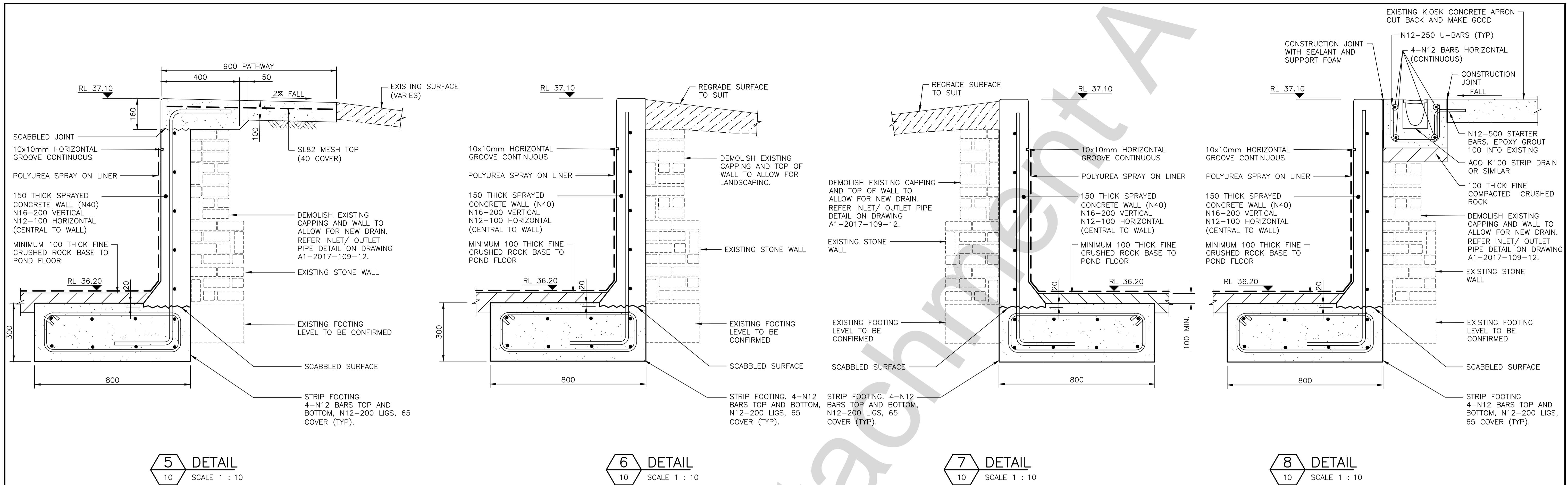
This drawing must not be used for construction without approval of the Designer.

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	ISSUED FOR REVIEW	PSR	20.04.15
1	PRELIMINARY DESIGN	PSR	26.06.15
2	PRELIMINARY ISSUE FOR REVIEW	PSK	24.11.17
3	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

MURLAWIRRAPURKA (PARK 14)  
 RYMILL PARK  
 RYMILL LAKE RENEWAL  
 TYPICAL CROSS SECTIONS

COA PROJECT NUMBER	P227
SCALE	NTS
NUMBER OF SHEETS	10
ORIGINAL SHEET SIZE	A1
REVISION	3
DRAWING SET NUMBER	SHEET
<b>A1-2017-109</b>	<b>10</b>





5 DETAIL  
10 SCALE 1 : 10

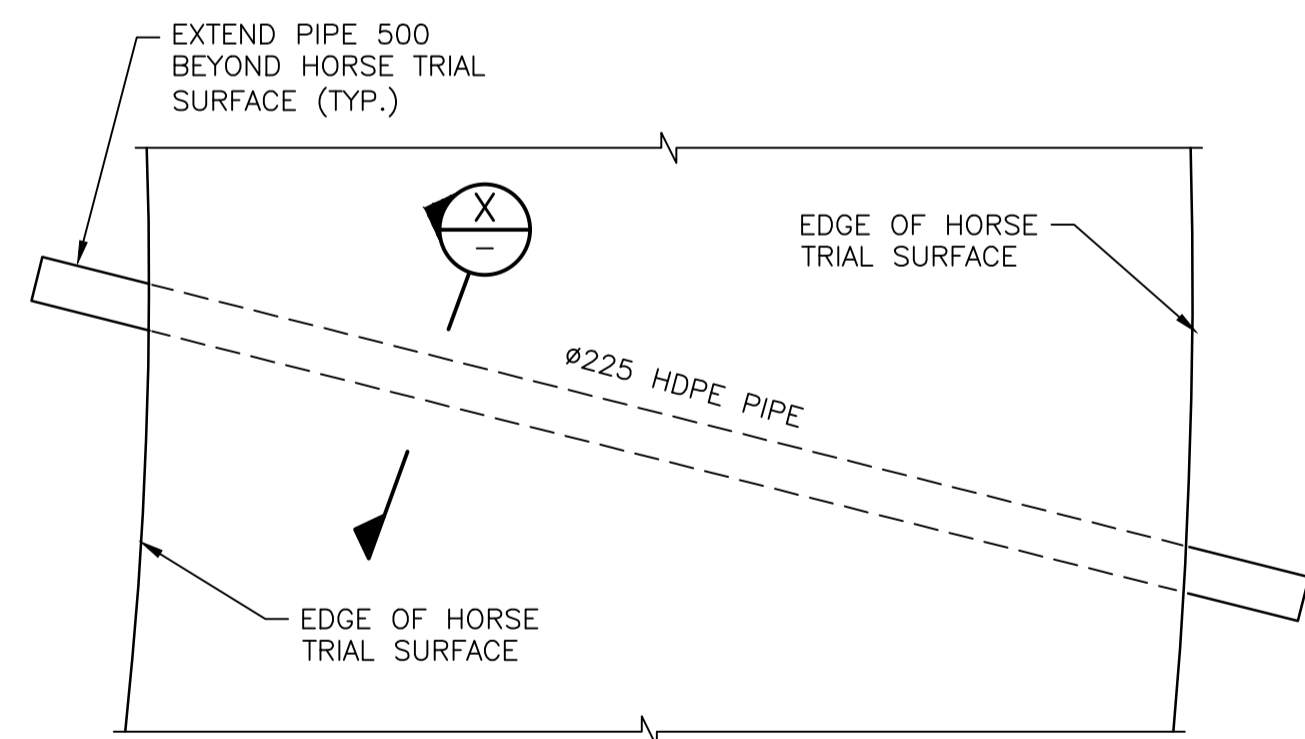
6 DETAIL  
10 SCALE 1 : 10

7 DETAIL  
10 SCALE 1 : 10

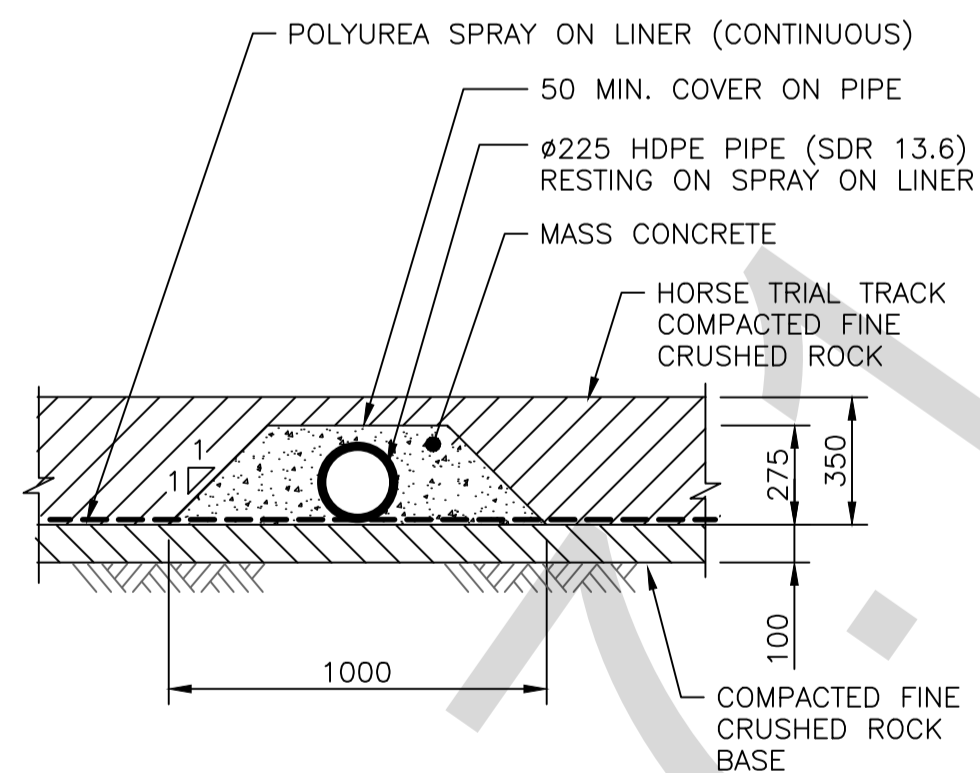
8 DETAIL  
10 SCALE 1 : 10

**NOTES**

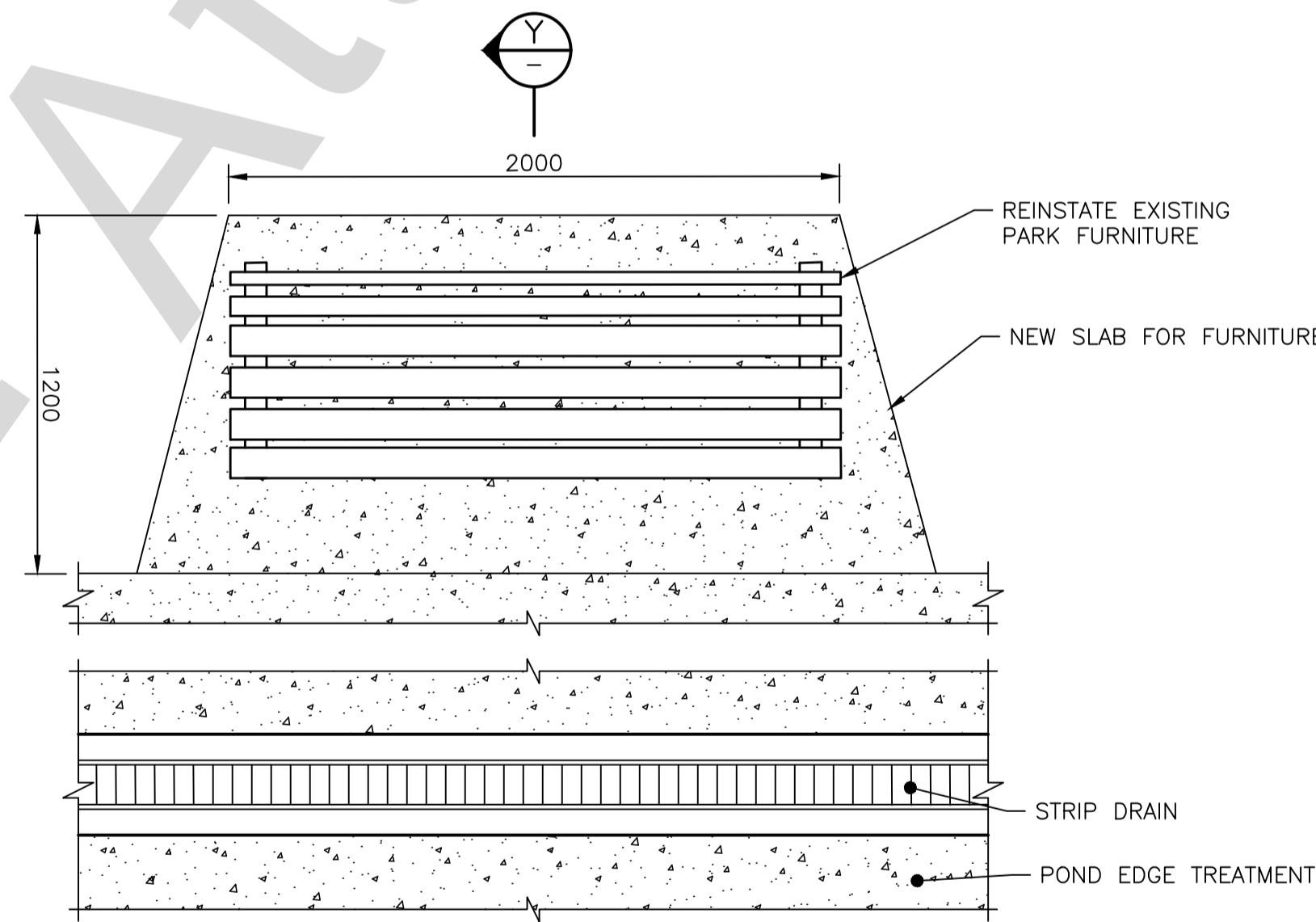
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.



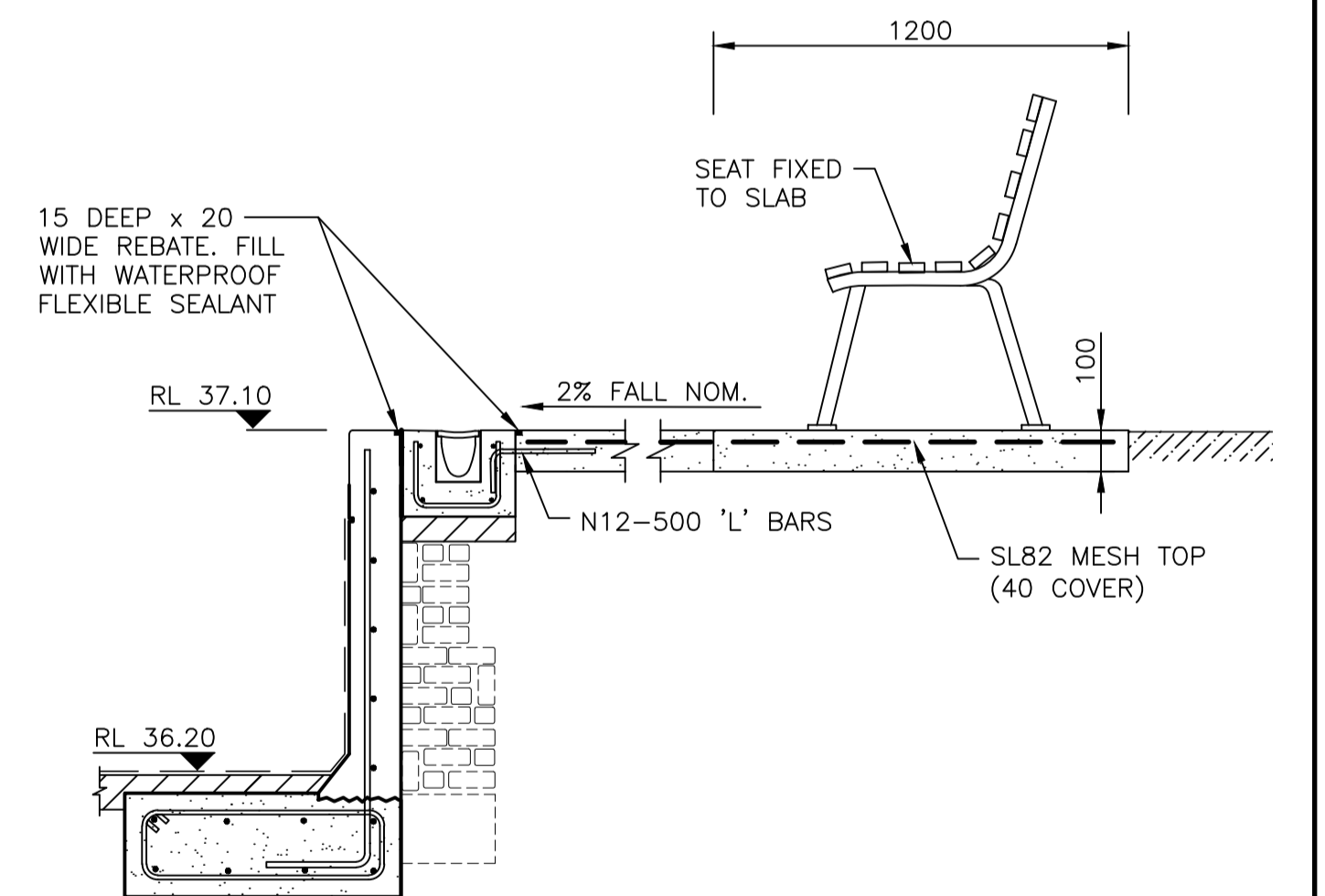
3 DETAIL  
03 SCALE 1 : 50



X SECTION  
SCALE 1 : 20



4 DETAIL  
02 SCALE 1 : 20



Y SECTION  
SCALE 1 : 20

PRELIMINARY - NOT FOR CONSTRUCTION

DESIGNED	GHD	DATE	09/2018
DRAWN	GHD	DATE	09/2018
CHECKED	GHD	DATE	09/2018
QUALITY ASSURED	GHD	DATE	09/2018

**THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.**

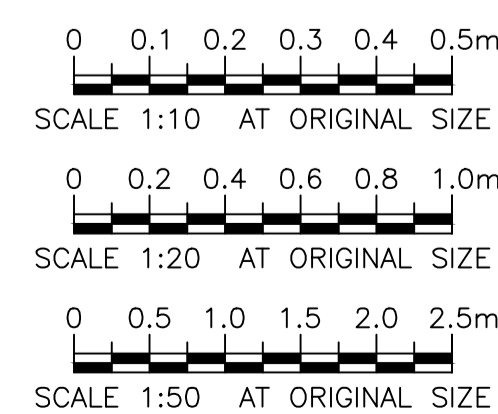
The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.

GHD Drawing No. 33-1709000

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Drawn: PSK Design: SGJ  
Checked: PSK Design: SGJ  
Approved: PSK Design: SGJ

This drawing must not be used for construction unless stated as Approved

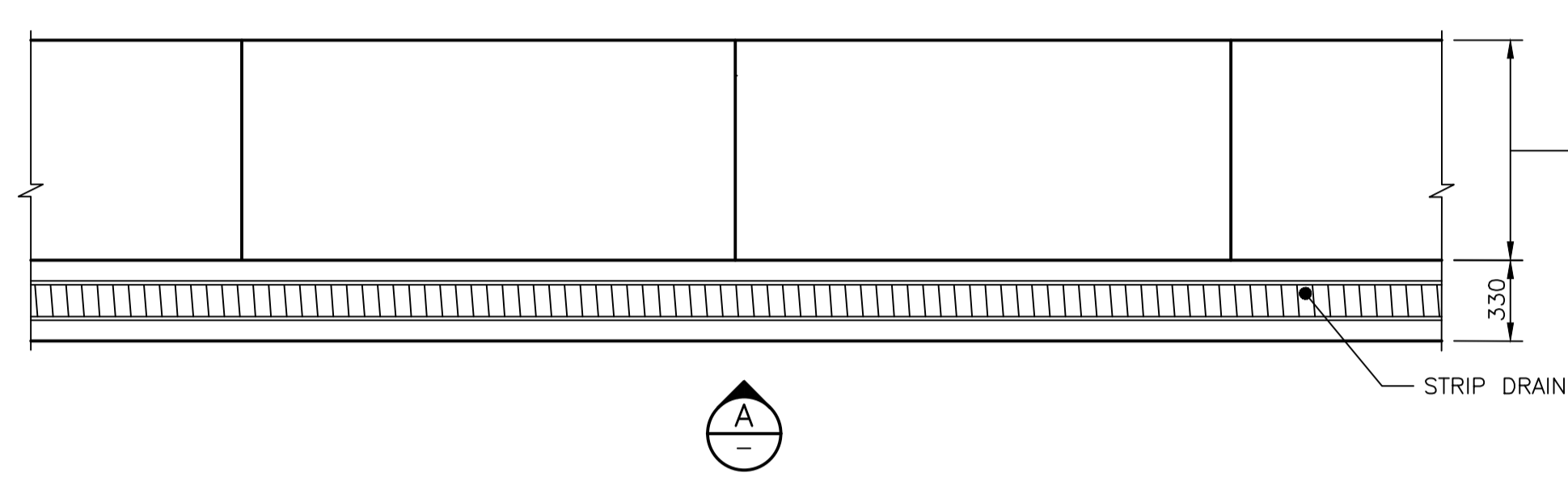


PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	ISSUED FOR REVIEW	PSR	20.04.15
1	PRELIMINARY DESIGN	PSR	26.06.15
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3	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

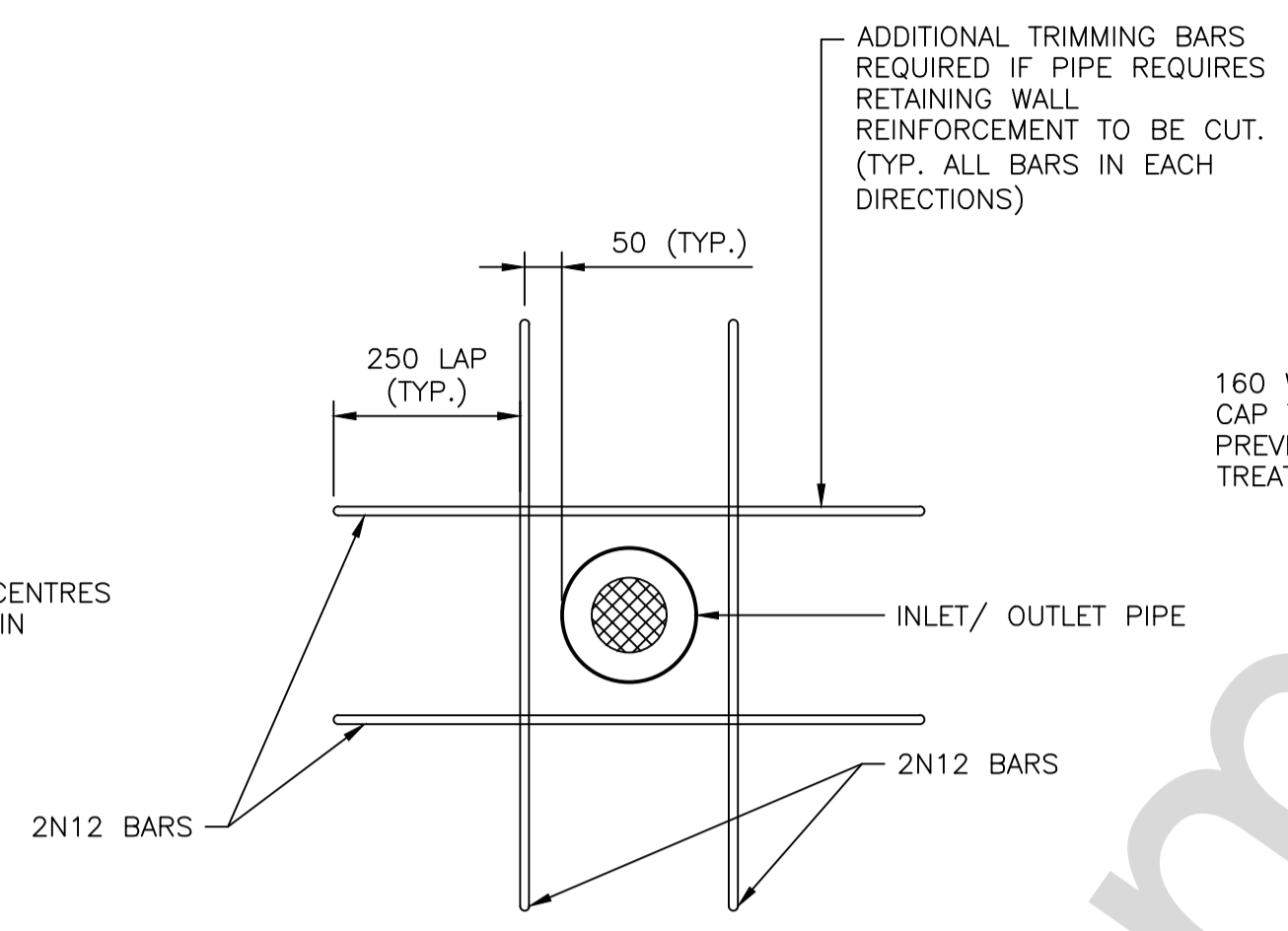
MURLAWIRRAPURKA (PARK 14)  
RYMILL PARK  
RYMILL LAKE RENEWAL  
TYPICAL DETAILS - SHEET 1 OF 4

CITY OF ADELAIDE	
COA PROJECT NUMBER	P227
SCALE	VARIABLES
NUMBER OF SHEETS	10
ORIGINAL SHEET SIZE	A1
REVISION	3
DRAWING SET NUMBER	SHEET
A1-2017-109	11

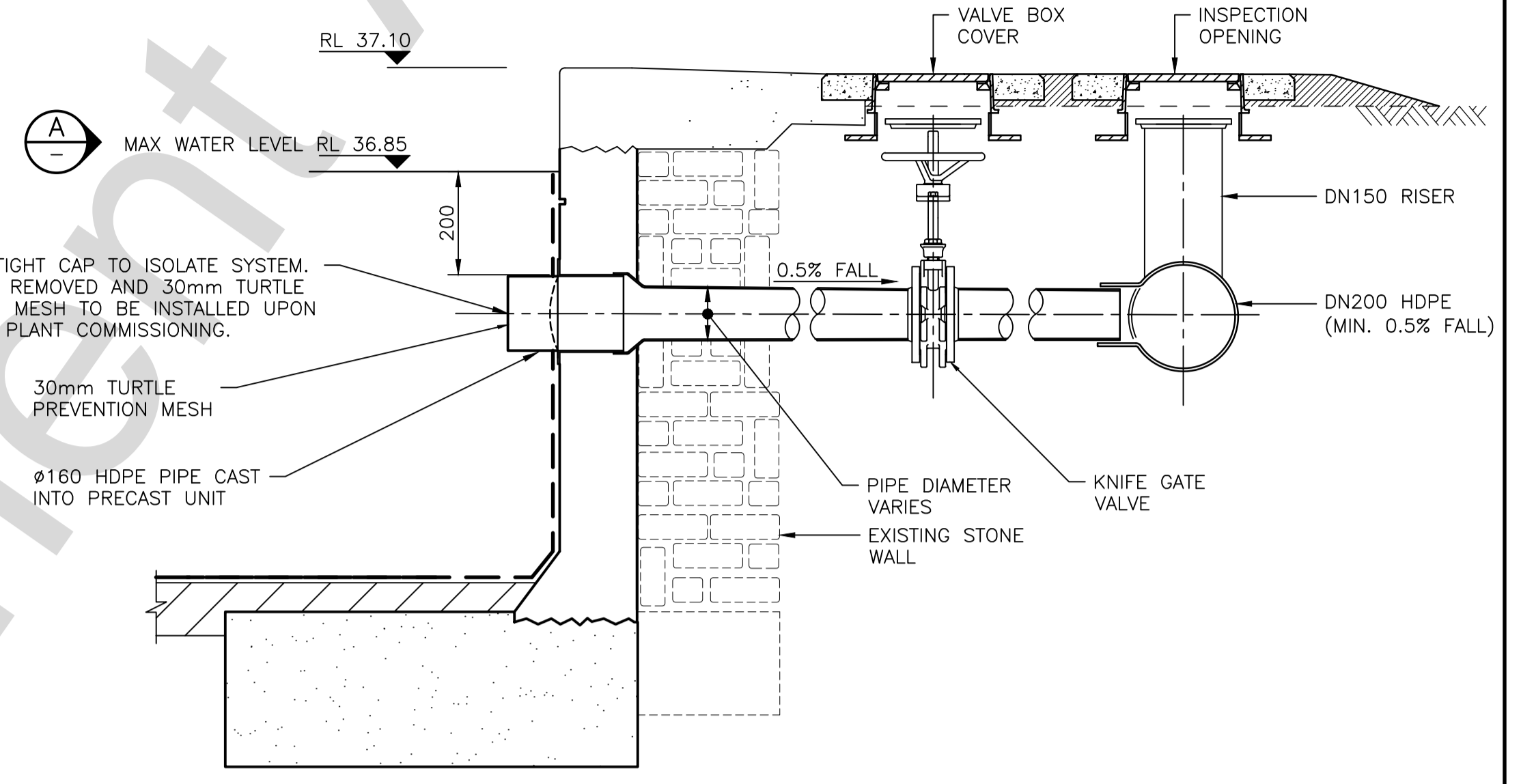




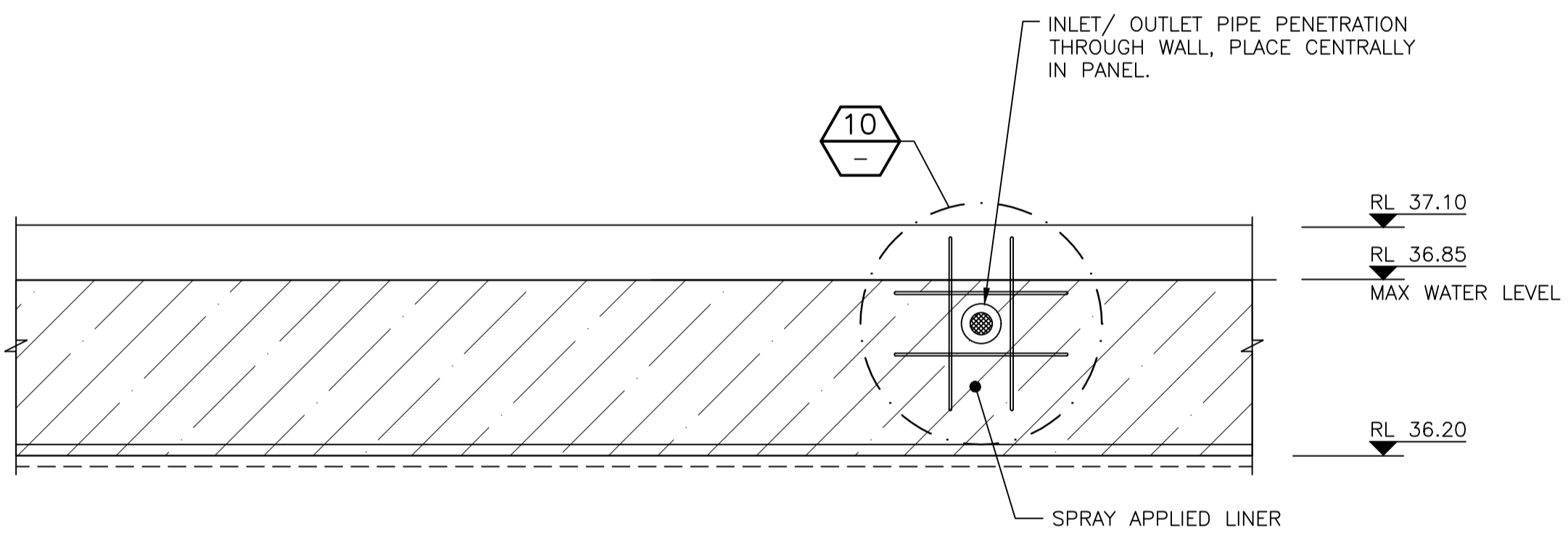
**PLAN**  
1 DETAIL  
03 SCALE 1 : 25



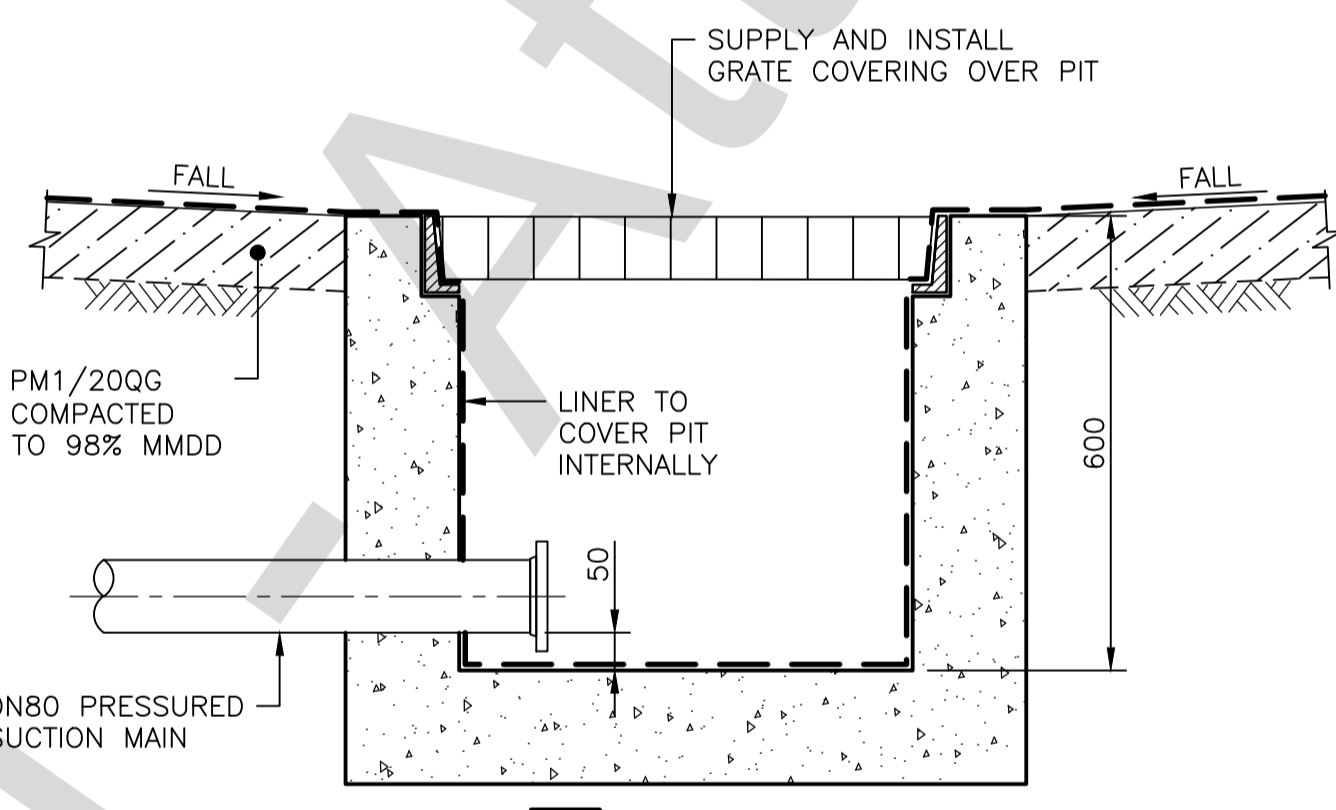
**PIPE PENETRATION THROUGH WALL DETAIL**  
10 DETAIL  
SCALE 1 : 10  
0 100 200 300 400 500mm  
SCALE 1:10 AT ORIGINAL SIZE



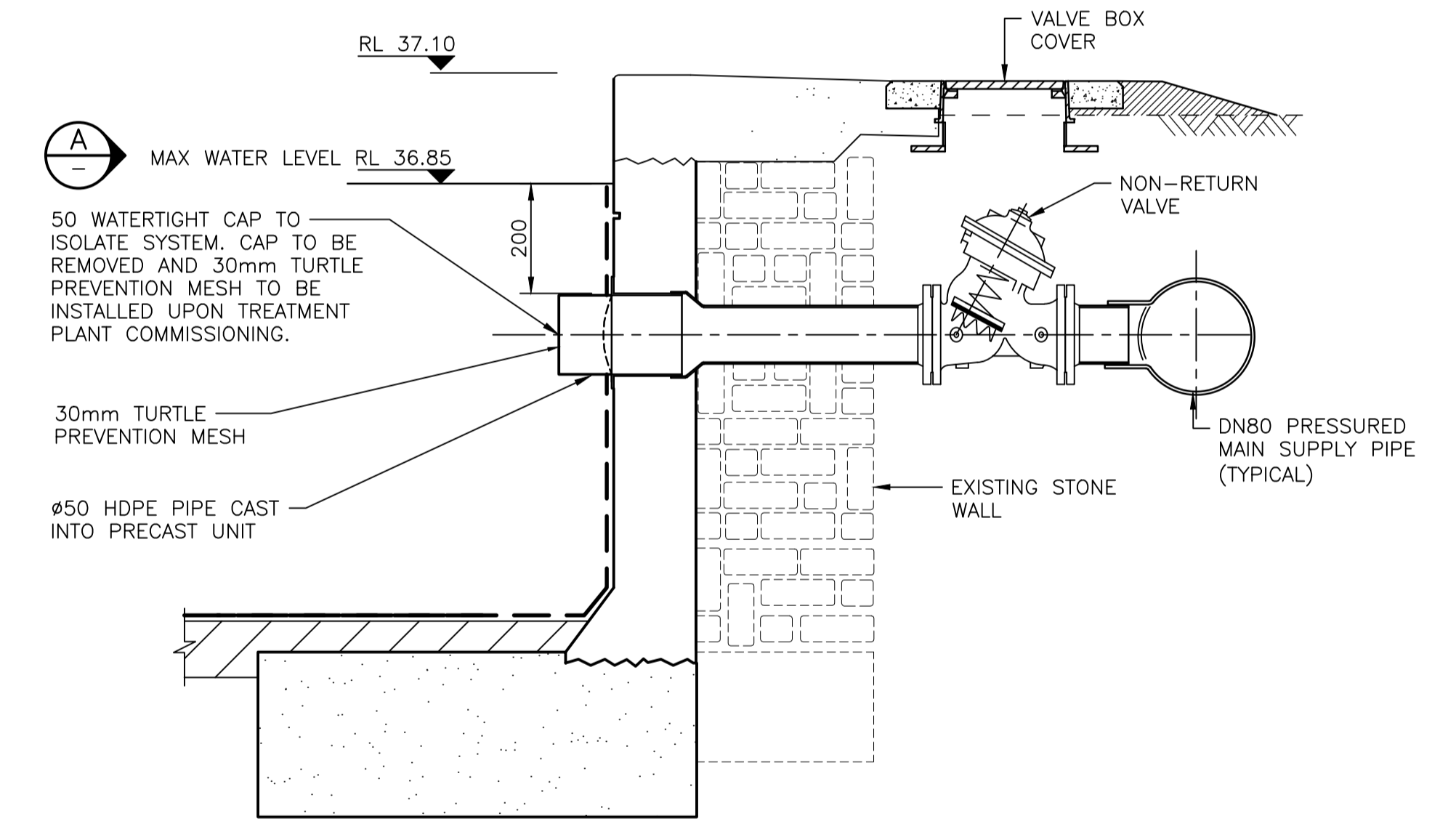
**INLET PIPE DETAIL**  
SCALE 1:10 AT ORIGINAL SIZE  
0 100 200 300 400 500mm



**ELEVATION**  
SCALE 1 : 25  
0 250 500 750 1000 1250mm  
SCALE 1:25 AT ORIGINAL SIZE



**SUCTION INLET PIT (600x600mm)**  
9 DETAIL  
10 SCALE 1 : 10  
0 100 200 300 400 500mm  
SCALE 1:10 AT ORIGINAL SIZE



**OUTLET PIPE DETAIL**  
SCALE 1:10 AT ORIGINAL SIZE  
0 100 200 300 400 500mm

**NOTES**  
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

**PRELIMINARY - NOT FOR CONSTRUCTION**

DESIGNED	GHD	DATE	09/2018
DRAWN	GHD	DATE	09/2018
CHECKED	GHD	DATE	09/2018
QUALITY ASSURED	GHD	DATE	09/2018

**THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.**

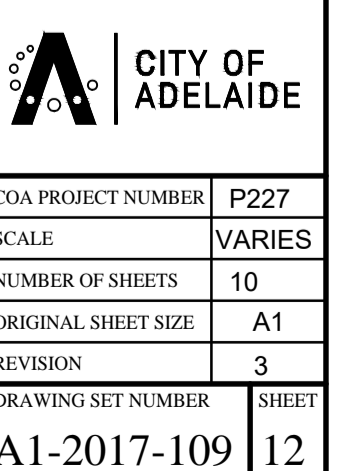
The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.

GHD  
Level 4, 211 Victoria Square Adelaide SA 5000 Australia  
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E [adelaide@ghd.com.au](mailto:adelaide@ghd.com.au) W [www.ghd.com](http://www.ghd.com)

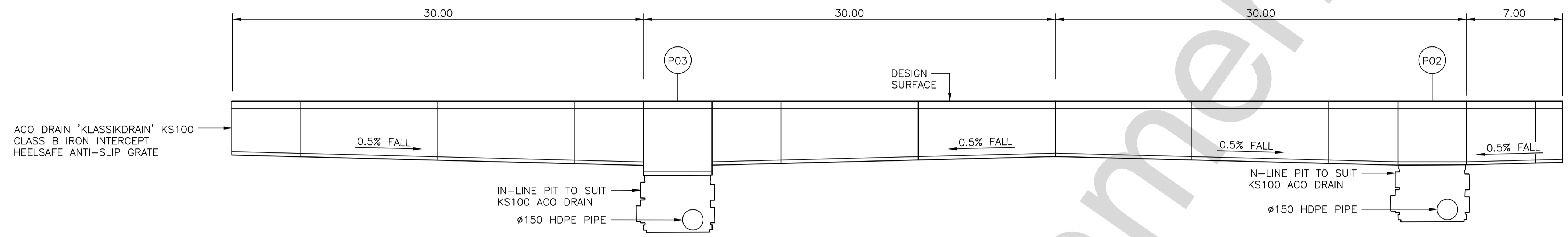
GHD Drawing No: 33-1709000  
Drawn: PJK Design: GJS  
Checked: GJS Design: GJS  
Approved: GJS Design: GJS

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	ISSUED FOR REVIEW	PSR	20.04.15
1	PRELIMINARY DESIGN	PSR	26.06.15
2	PRELIMINARY ISSUE FOR REVIEW	PSK	24.11.17
3	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

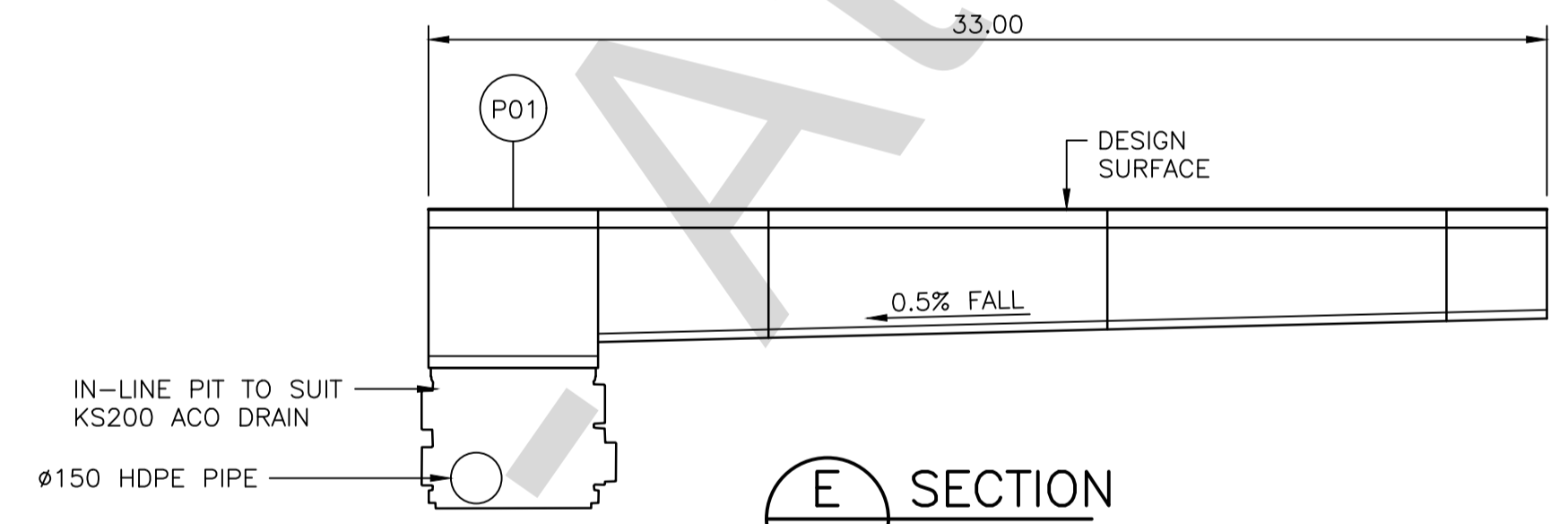
MURLAWIRRAPURKA (PARK 14)	
RYMILL PARK	
RYMILL LAKE RENEWAL	
TYPICAL DETAILS - SHEET 2 OF 4	
COA PROJECT NUMBER	P227
SCALE	VARIES
NUMBER OF SHEETS	10
ORIGINAL SHEET SIZE	A1
REVISION	3
DRAWING SET NUMBER	SHEET
A1-2017-109	12







**D SECTION**  
03 SCALE 1 : 20



**E SECTION**  
03 SCALE 1 : 20

**PRELIMINARY - NOT FOR CONSTRUCTION**

DESIGNED	GHD	DATE	09/2018
DRAWN	GHD	DATE	09/2018
CHECKED	GHD	DATE	09/2018
QUALITY ASSURED	GHD	DATE	09/2018

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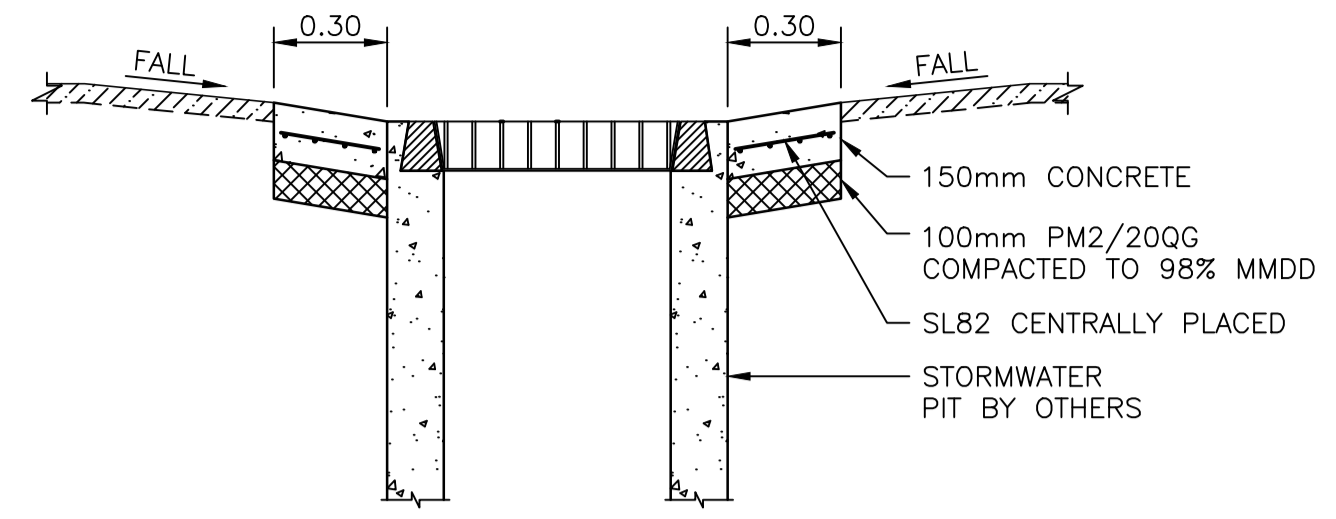
**CERTIFICATION OF TRAFFIC CONTROL DEVICES**

I, ..... pursuant to the Minister for Transport's Notice to Council of 22 August 2013, have authorised on this date ..... the installation of traffic control devices (except A.8 Excluded Traffic Control Devices) for and on behalf of the City of Adelaide as shown on this drawing.

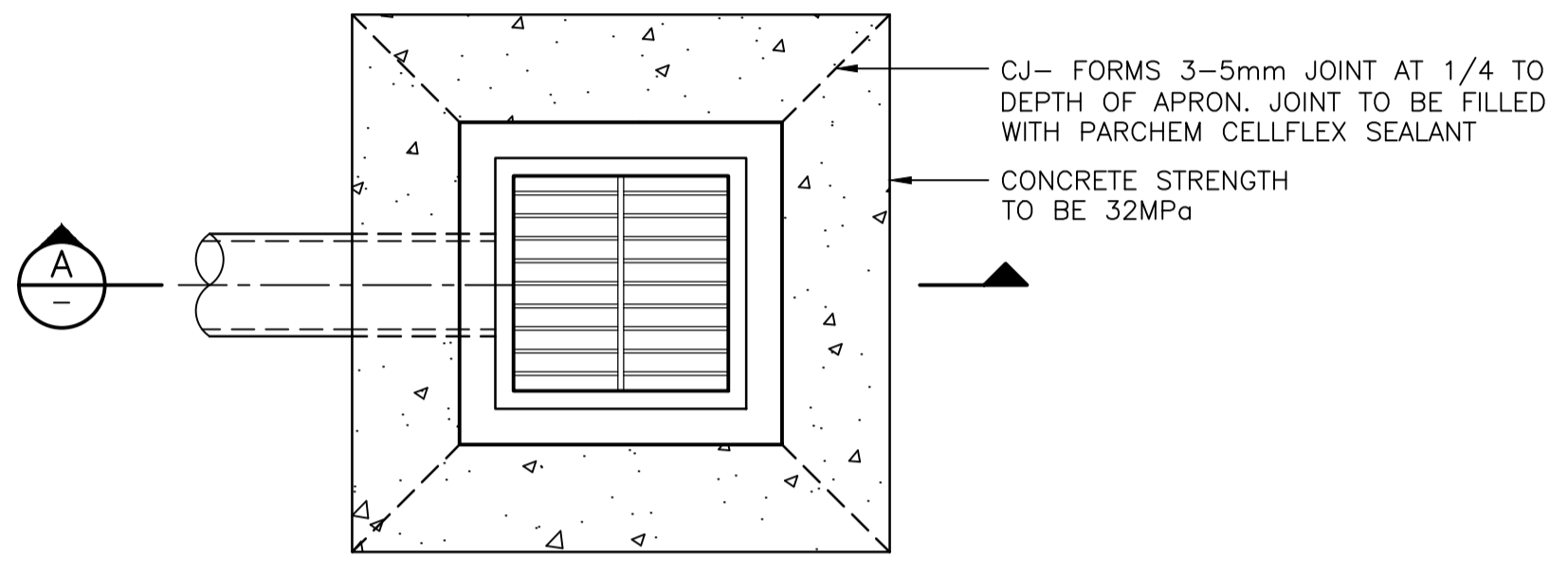
PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

<b>MURLAWIRRAPURKA (PARK 14)</b>	
<b>RYMILL PARK</b>	
<b>RYMILL LAKE RENEWAL</b>	
<b>TYPICAL DETAILS - SHEET 3 OF 4</b>	

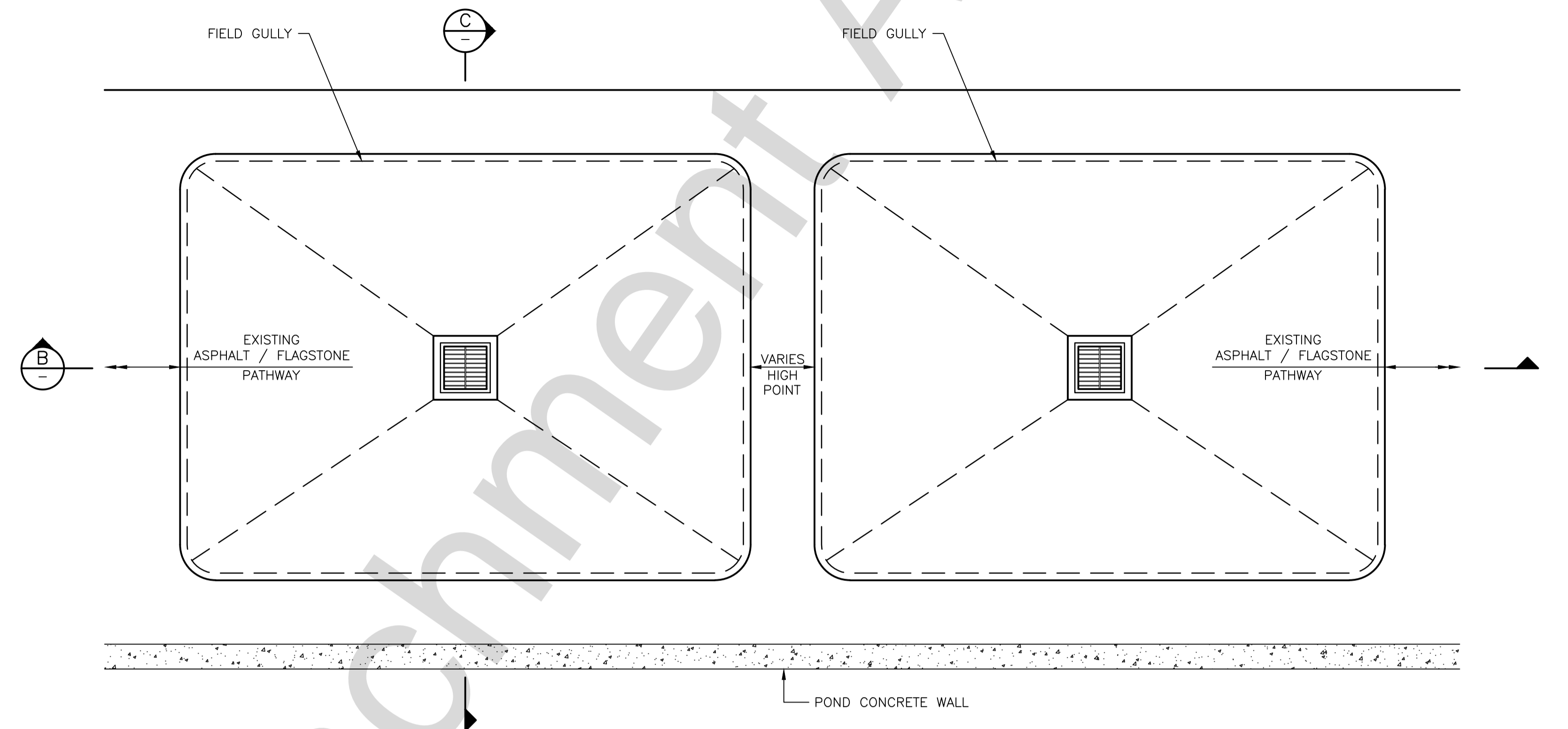
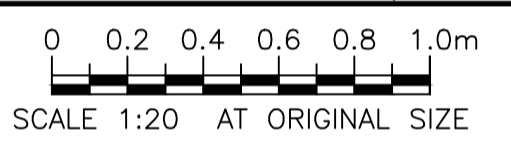
COA PROJECT NUMBER	P227
SCALE	1:200
NUMBER OF SHEETS	10
ORIGINAL SHEET SIZE	A1
REVISION	0
DRAWING SET NUMBER	A1-2017-109
SHEET	13



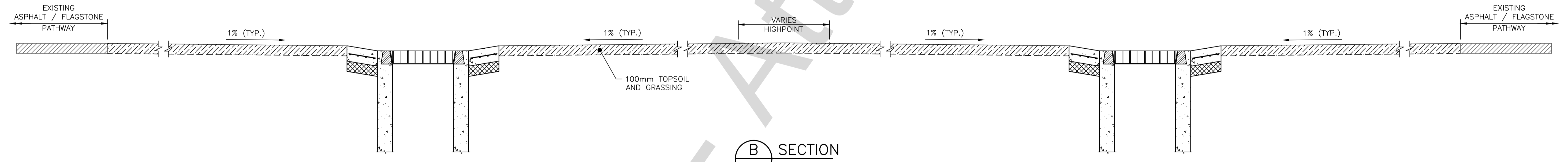
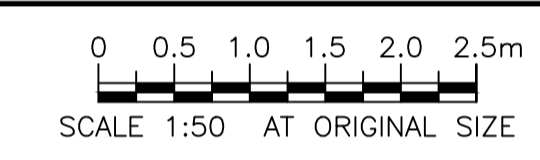
**A SECTION**  
SCALE 1 : 20



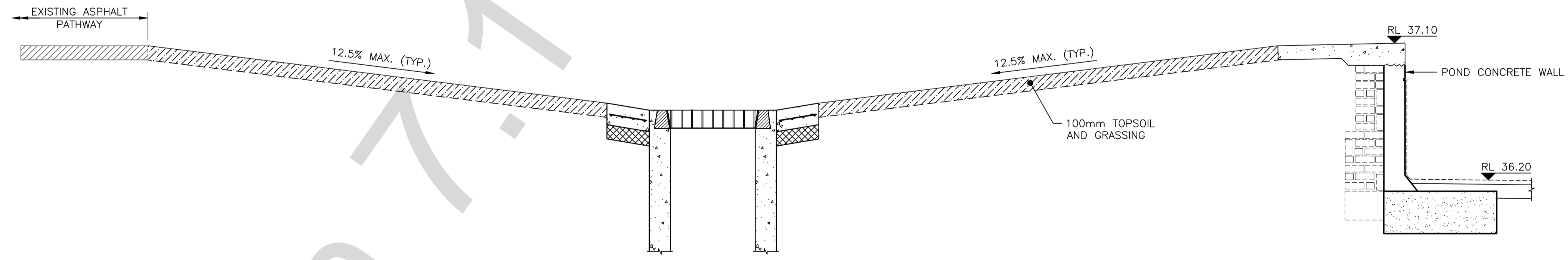
**FIELD GULLY PIT (600x600mm)**



**TYPICAL FIELD GULLY ARRANGEMENT LAYOUT**



**B SECTION**  
SCALE 1 : 20



**C SECTION**  
SCALE 1 : 20

**PRELIMINARY - NOT FOR CONSTRUCTION**

DESIGNED	GHD	DATE	09/2018
DRAWN	GHD	DATE	09/2018
CHECKED	GHD	DATE	09/2018
QUALITY ASSURED	GHD	DATE	09/2018

**THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.**

The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.

**CERTIFICATION OF TRAFFIC CONTROL DEVICES**

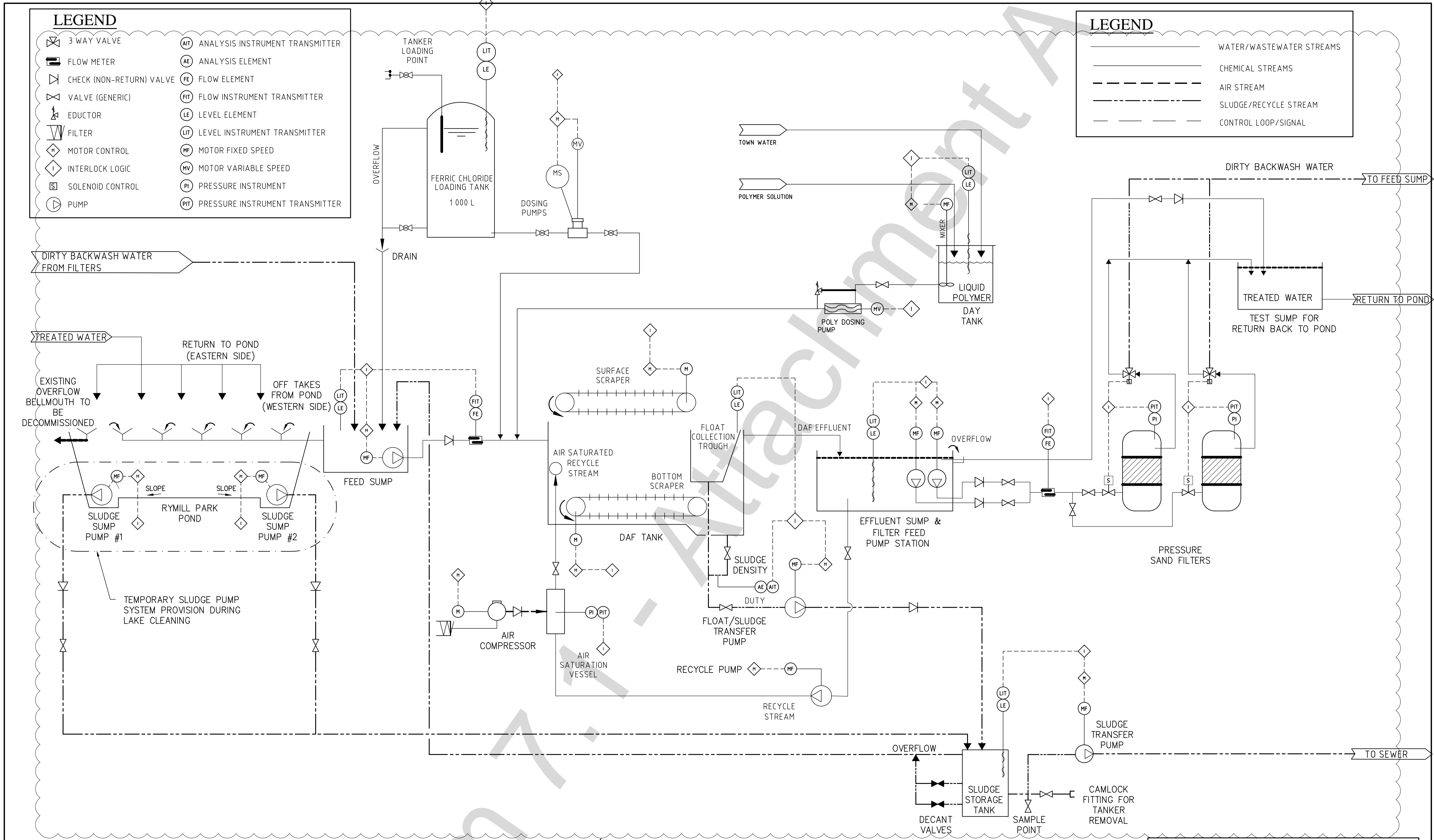
I, ..... pursuant to the Minister for Transport's Notice to Council of 22 August 2013, have authorised on this date ..... the installation of traffic control devices (except A.8 Excluded Traffic Control Devices) for and on behalf of the City of Adelaide as shown on this drawing.

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

MURLAWIRRAPURKA (PARK 14)	
RYMILL PARK	
RYMILL LAKE RENEWAL	
TYPICAL DETAILS - SHEET 4 OF 4	

CITY OF ADELAIDE	
COA PROJECT NUMBER	P227
SCALE	VARIES
NUMBER OF SHEETS	10
ORIGINAL SHEET SIZE	A1
REVISION	0
DRAWING SET NUMBER	SHEET
<b>A1-2017-109</b>	<b>14</b>





ON HOLD PENDING FUTURE WATER TREATMENT PLANT

PRELIMINARY - NOT FOR CONSTRUCTION

DESIGNED	GHD	DATE	09/2018	<b>THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.</b> The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.
DRAWN	GHD	DATE	09/2018	
CHECKED	GHD	DATE	09/2018	
QUALITY ASSURED	GHD	DATE	09/2018	
Level 4, 211 Victoria Square Adelaide SA 5000 Australia GPO Box 1002 Adelaide SA 5001 T 61 8 8111 9800 F 61 8 8111 9800 E info@ghd.com.au W www.ghd.com				

Drawn	PSK	Designed	SG
Checked		Checked	
Approved		Approved	

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
0	ISSUED FOR REVIEW	PSR	20.04.15
1	PRELIMINARY DESIGN	PSR	26.06.15
2	PRELIMINARY ISSUE FOR REVIEW	PSK	24.11.17
3	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

MURLAWIRRAPURKA (PARK 14) RYMILL PARK RYMILL LAKE RENEWAL PROCESS AND INSTRUMENTATION DIAGRAM		CITY OF ADELAIDE COA PROJECT NUMBER P227 SCALE NTS NUMBER OF SHEETS 10 ORIGINAL SHEET SIZE A1 REVISION 3 DRAWING SET NUMBER SHEET <b>A1-2017-109 20</b>
--	--	--



**NOTE:**

- ALL OUTLETS (OP1 TO OP6) TO BE PROVIDED WITH BACK FLOW PREVENTION VALVE.
- FOR SUCTION INLET PIT TYPICAL DETAIL REFER SHEET 10 & 12.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.

**LEGEND - CONSTRUCTION:**

- ### SETOUT POINT
- EXISTING ASPHALT PATHWAY
- EXISTING CONCRETE FLAGSTONE PAVEMENT
- DN200 HDPE OUTLET RETICULATION PIPE WITH MINIMUM 0.5% FALL
- 36.2--- DESIGN CONTOURS
- ☐ SUCTON INLET PIT (600x600mm)
- ☐ PUMP
- ✕ ISOLATION VALVE (ALWAYS OPEN)
- ✕ ISOLATION VALVE (ALWAYS CLOSE)
- ✕ NON-RETURN VALVE (ALWAYS CLOSE)
- ✕ KNIFE GATE VALVE
- ⊙ INSPECTION OPENING
- INLET PIPE REFER TO SHEET 12 FOR DETAIL
- OUTLET PIPE REFER TO SHEET 12 FOR DETAIL

**LEGEND - EXISTING SERVICES:**

- COMMUNICATIONS
- ELECTRICAL
- WATER

SUPPLY AND INSTALL CENTRIFUGAL CAST IRON TYPE PUMP. PUMP TO BE LOCATED IN FUTURE TREATMENT PLANT ROOM. PUMP-01 TO BE COMPLETE WITH PUMP ALARM PANEL AND CONTROLS. PROVIDE FAULT SIGNAL, AUDIBLE ALARM AND STROBE.

FUTURE NEW WATER TREATMENT PLANT ADJACENT TO O-BAHN TUNNEL (LOCATION TBC)

FEED PUMP STATION IL= 35.400

PUMP-02

DN100 FREE DISCHARGE TO FEED STATION HOLDING TANK

SUPPLY AND INSTALL DIAPHRAGM RECIPROCATING PUMP FOR SLUDGE SUCTION FROM 3 OFF POND PITS. PUMP TO OPERATE ONLY ON ONE SUCTION LINE AT A TIME. PROVIDE MANUAL VALVING ARRANGEMENT VIA A SUCTION MANIFOLD AS SHOWN. SUPPLY AND INSTALL ETCHED IN METAL PLAQUE WITH MINIMUM TEXT HEIGHT OF 10mm. OPERATE PUMP WITH ONLY ONE VALVE OPEN ON SUCTION MANIFOLD.

**PUMP SCHEDULE**

PUMP REFERENCE	PLACED SERVED	TYPE	LOCATION	FLUID	TEMP.	FLOW RATE (DUTY POINT)	HEAD	CAPACITY	QUANTITY	RISE MAIN (mm)	COMMENTS	EQUIPMENT SELECTION
PUMP-01	RYMILL PARK POND	RECIRCULATION PUMP	FUTURE WTP PLANT ROOM	WATER	VARIABLES	20 L/SEC	240 kPa	7.5 kW	1	ø80	SEE NOTES. DUAL 1	GRUNDFOS OR SIMILAR APPROVED
PUMP-02	RYMILL PARK POND	AIR DIAPHRAGM PUMP	FUTURE WTP PLANT ROOM	WATER/SLUDGE	VARIABLES	200-400 L/MIN	DRY LIFT 2.5m TO 100m HORIZONTAL RUN MINUS INDEX RUN		1	ø80	SUCTON PUMP FOR SLUDGE EXTRACTION ON A SUCTION MANIFOLD WITH MANUAL VALVING	REMKO RAH-30 OR VERDEIRAR VABO

- NOTES:**
- ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE AUTHORITY HAVING JURISDICTION, LOCAL CODE AND MANUFACTURERS RECOMMENDATIONS. PIPE SIZES SHOWN ARE INTERNAL DIAMETERS.
  - ALLOW FOR ALL VALVES AND FITTINGS.
  - SYSTEM HEAD IS INDICATIVE ONLY. PUMP IS TO DELIVER THE SPECIFIED FLOW RATE AGAINST THE AS-INSTALLED SYSTEM. PUMP TO BE DUTY ONLY.
  - PUMP CONTROL PANEL - PANEL TO BE COMPLETE WITH INDIVIDUAL PUMP SWITCHES - OFF/AUTO/RUN + INDICATOR LIGHT - STOP/RUN/FAULT - AUDIBLE/STROBE LIGHT.
  - AIR DIAPHRAGM MUST BE ABLE TO RUN DRY I.e. SELF STARTING OR FINISHING.

**INLET PIPE**

POINT	EASTING	NORTHING	INVERT LEVEL
IP1	282021.255	6132729.830	36.49
IP2	282009.787	6132747.396	36.49
IP3	282003.086	6132767.678	36.49
IP4	281976.540	6132782.725	36.49
IP5	281952.406	6132794.073	36.49
IP6	281930.640	6132811.265	36.49

**OUTLET PIPE**

POINT	EASTING	NORTHING	INVERT LEVEL
OP1	282050.356	6132756.083	36.60
OP2	282043.304	6132780.597	36.60
OP3	282032.650	6132809.458	36.60
OP4	282025.794	6132830.339	36.60
OP5	282013.098	6132852.828	36.60
OP6	281987.035	6132859.601	36.60

**VALVE BOX**

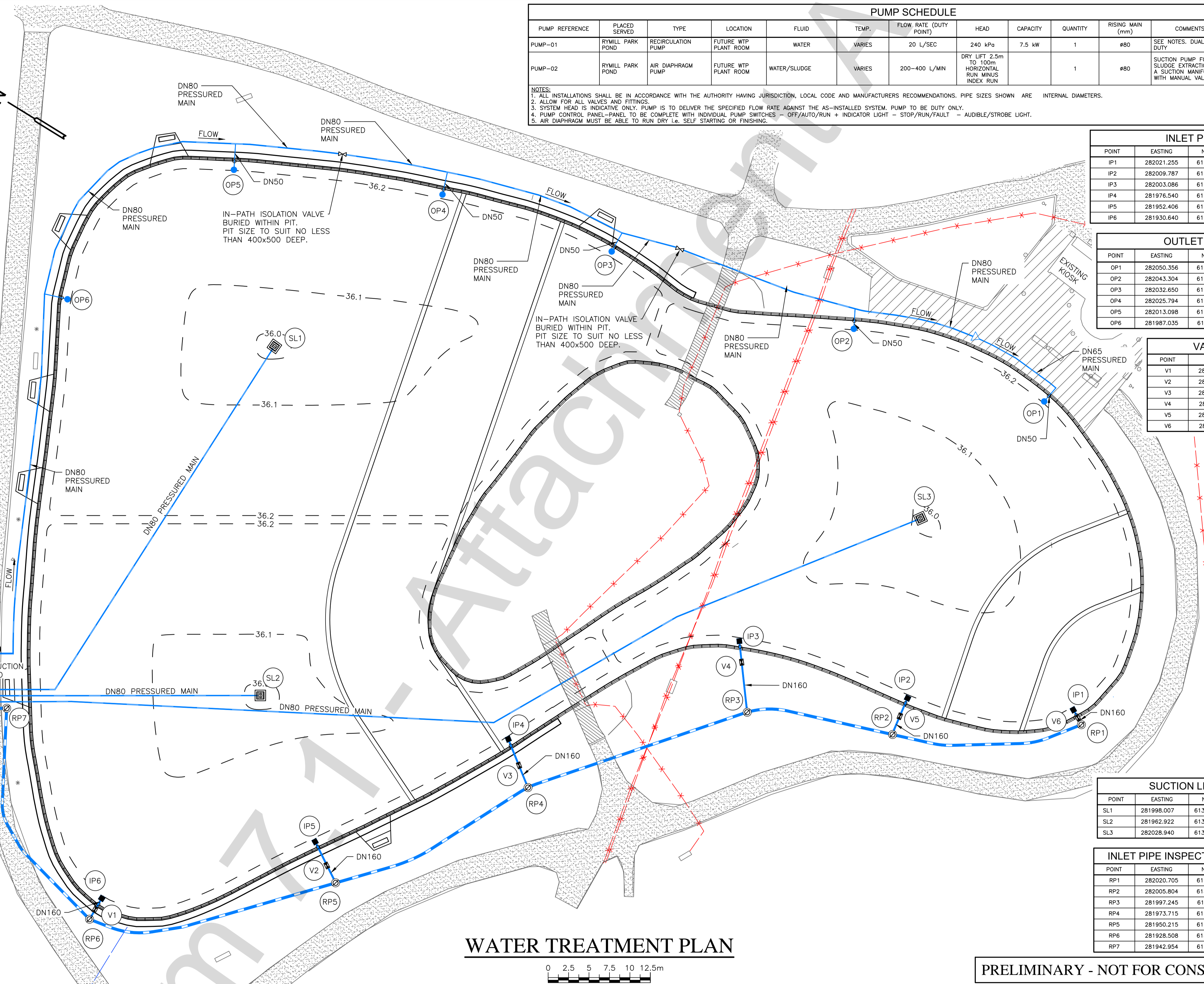
POINT	EASTING	NORTHING
V1	281929.864	6132811.174
V2	281951.270	6132791.832
V3	281975.224	6132780.475
V4	282001.711	6132766.381
V5	282008.128	6132746.970
V6	282021.121	6132729.493

**SUCTION LINE PITS**

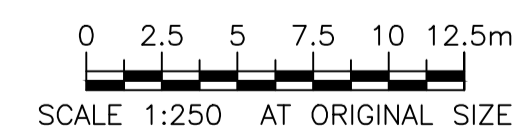
POINT	EASTING	NORTHING	INVERT LEVEL
SL1	281998.007	6132835.259	35.55
SL2	281962.922	6132810.843	35.55
SL3	282028.940	6132759.550	35.55

**INLET PIPE INSPECTION OPENINGS**

POINT	EASTING	NORTHING	INVERT LEVEL
RP1	282020.705	6132728.647	36.45
RP2	282005.804	6132746.334	36.33
RP3	281997.245	6132762.151	36.25
RP4	281973.715	6132777.965	36.11
RP5	281950.215	6132789.688	35.98
RP6	281928.508	6132810.994	35.83
RP7	281942.954	6132834.649	35.68



**WATER TREATMENT PLAN**



**PRELIMINARY - NOT FOR CONSTRUCTION**

DESIGNED	GHD	DATE	09/2018
DRAWN	GHD	DATE	09/2018
CHECKED	GHD	DATE	09/2018
QUALITY ASSURED	GHD	DATE	09/2018

**DESIGN INTENT:**  
TO RETURN TREATED WATER FROM NEW WASTE TREATMENT PLANT BACK TO POND VIA A PRESSURED MAIN. THE SUPPLY SHALL BE AT A FLOW OF 20L/s SO THAT THE OUTPUT THROUGH SIX (6) OF THE DISCHARGE POINTS MAY BE AT AN EQUAL CAPACITY.

SERVICES	CHECKED BY	DATE
SEWER	GHD	04/2015
SWD	GHD	04/2015
WATER	GHD	04/2015
GAS	GHD	04/2015
ETSA	GHD	04/2015
TELSTRA	GHD	04/2015
COMMS	GHD	04/2015

**PRELIMINARY REVISIONS**

No.	DESCRIPTION	BY	DATE
0	ISSUED FOR REVIEW	PSR	20.04.15
1	PRELIMINARY DESIGN	PSR	26.06.15
2	PRELIMINARY ISSUE FOR REVIEW	PSK	24.11.17
3	PRELIMINARY ISSUE FOR REVIEW	GHD	12.10.18

MURLAWIRRAPURKA (PARK 14)  
RYMILL PARK  
RYMILL LAKE RENEWAL  
WATER TREATMENT PLAN

COA PROJECT NUMBER	P227
SCALE	1:250
NUMBER OF SHEETS	10
ORIGINAL SHEET SIZE	A1
REVISION	3
DRAWING SET NUMBER	SHEET
<b>A1-2017-109</b>	<b>21</b>



**Rymill Park / Murlawirrapurka (Park 14)**

**Appendix B**

Option C: Channel rehabilitation and WSUD in Park 15 and park 16 – Concept Design

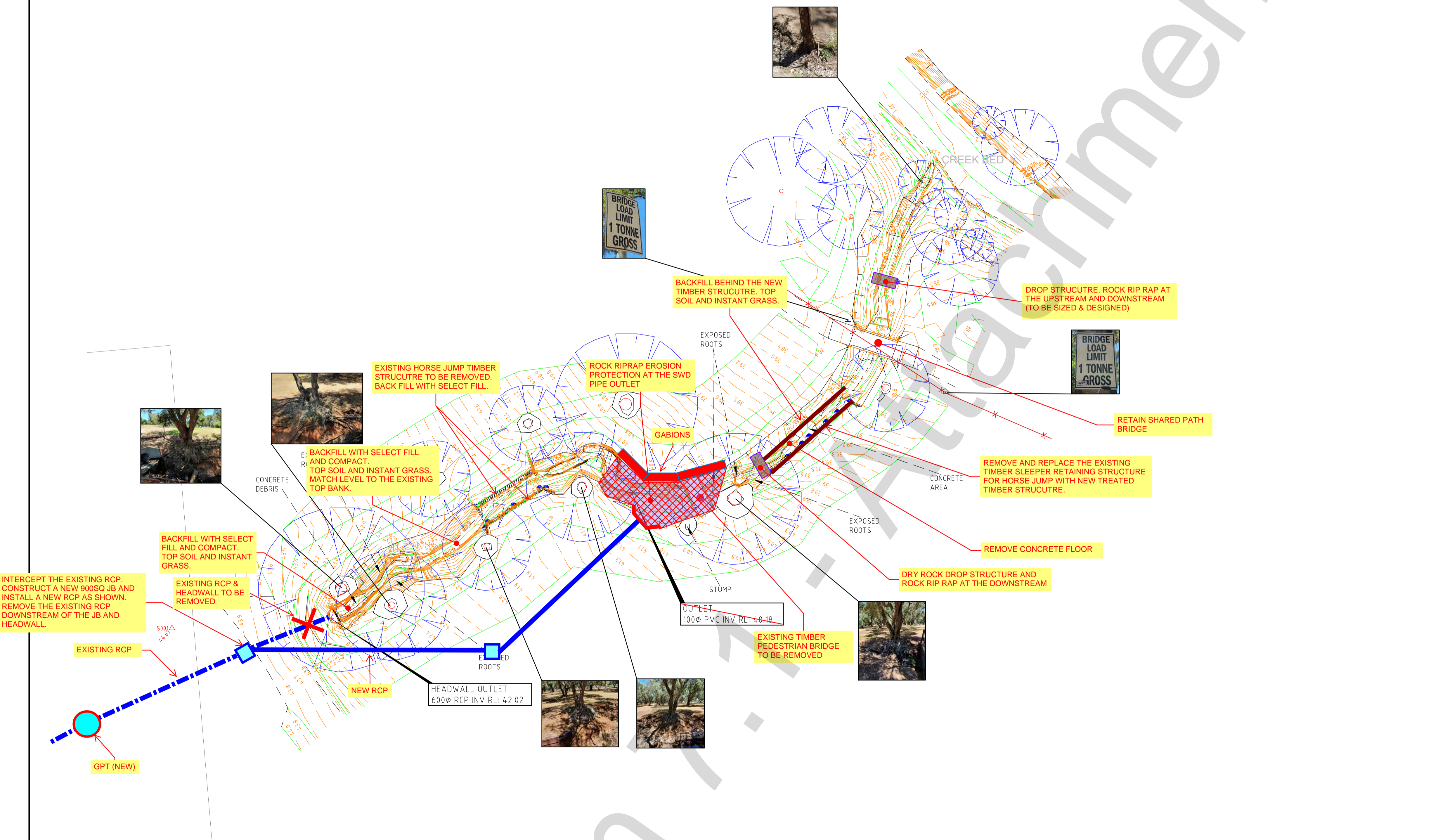
Item 7.1 - Attachment A



STORMWATER TREATMENT TRAIN TO BE CONSTRUCTED AT THE DOWNSTREAM OF THE CHANNEL. INCLUDES - SEDIMENTATION BASIN AND DETENTION SYSTEM WITH FLOW RESTRICTION SYSTEM.

**LEGEND**

SYMBOLS	LINETYPES
▲ SIGN (SINGLE SIDED)	--- CONTOUR - MAJOR (0.1m)
▲▲ SIGN (DOUBLED SIDED)	===== BUILDING
□ SIGN (BUS STOP)	===== RETAINING WALL
□ IRRIGATION CONTROL BOX	===== CONCRETE BORDER
○ LITTER BIN	----- VERANDAH
○ WATER METER	===== WALL
○ FIREPLUG MARKER POST	----- FENCE
○ FIREPLUG MARKER REFLECTOR	○ ○ ○ ○ ○ GUARD RAIL (FACE)
W WATER SERVICE	----- EDGE OF VEGETATION
⊕ GAS SERVICE	----- VEGETATION - HEDGE
⊕ SEWER SERVICE	----- BANK BOTTOM
⊕ COMMUNICATIONS SERVICE	----- BANK TOP
⊕ DOMESTIC OUTLET	----- SPOON DRAIN
○ BOLLARD	----- OVERHEAD WIRES
--- STOBIE POLE	----- STORMWATER U/G
○ LIGHT POLE	----- EDGE OF TRACK
○ STORMWATER INSPECTION COVER	----- TELECOMMUNICATIONS U/G SERVICE
○ TREE	----- ELECTRICAL U/G SERVICE
○ SHRUB	----- GAS U/G SERVICE
○ POLE (STEEL)	----- SEWER U/G SERVICE
○ UNCLASSIFIED POINT	----- WATER U/G SERVICE
○ POLE (WOODEN)	----- RECLAIMED WATER U/G SERVICE
○ SUMP - DOMESTIC	
○ TAP	
○ SAPM INSPECTION COVER	
○ GRATING	
○ POST (GUIDE)	
○ PIPE INVERT	
○ GAS MARKER POST	
○ SURVEY STATION	
○ EARTH PEG	
○ LIGHT POLE & TRAFFIC LIGHT	
○ TRAFFIC LIGHT	
○ DPTI SERVICE	
○ VENT	
○ COMMUNICATIONS CABLE MARKER	
○ SAPM CABLE MARKER	
○ TRAFFIC CAMERA	
○ RECLAIMED WATER SERVICE	
○ LIGHTING LUMINAIRE	
○ MAIL BOX	
○ PARKING TICKET MACHINE	
○ ELECTRICAL DEPTED SERVICE	
○ TELECOM DEPTED SERVICE	
○ WATER DEPTED SERVICE	
○ GAS DEPTED SERVICE	
○ SEWER DEPTED SERVICE	
○ STORMWATER DEPTED SERVICE	



PROPOSED LEVELS MAY VARY DURING DETAILED DESIGN PAHSE/ 3D MODELLING.

# PARK 15 CHANNEL REHABILITATION & EROSION PROTECTION OPTION 2

- NOTES**
1. SURVEY COMPLETED 24th NOVEMBER 2020.
  2. SURVEY BY BSM.
  3. ALL COORDINATES LOCAL, BASED ON THE MGA2020 POSITION OF S301 (6628/19607), AND ON THE JOIN BETWEEN S300 (6628/13938) AND S302 (6628/13911) OF 333°11'06".
  4. ALL LEVELS ARE AHD, BASED ON THE THIRD ORDER AHD LEVEL OF S301 (6628/19607) OF 45.604.
  5. CONTOUR INTERVAL 0.1m. ONLY MAJOR CONTOURS DISPLAYED.
  6. BOUNDARY SHOWN IS THE DCDB OF METROPOLITAN ADELAIDE. THE DCDB SHOULD NOT BE CONSIDERED AS AN ACCURATE REPRESENTATION OF THE BOUNDARY. TO DETERMINE THE TRUE BOUNDARY PLEASE REFER TO A LICENSED SURVEYOR.

**TOTAL CONSTRUCTION SURVEYS PTY LTD**

3 MARLOW ROAD  
KESWICK SA 5035  
M 0400 882 614  
T 08 8297 4600  
F 08 8297 6600  
fcs@tcsurveys.com  
A.B.N. 12 154 678 008

Rev.	Subject	Date	Init.

**TOPOGRAPHIC SURVEY**  
**PARK 15 CREEK**  
**ADELAIDE**

Prepared For: **City of Adelaide**

Plan No. 2859/T/01

Rev No. Scale 1:200 (A1)

Sheet 1 of 1

Plan Details

Surveyed: 27th Nov 2020

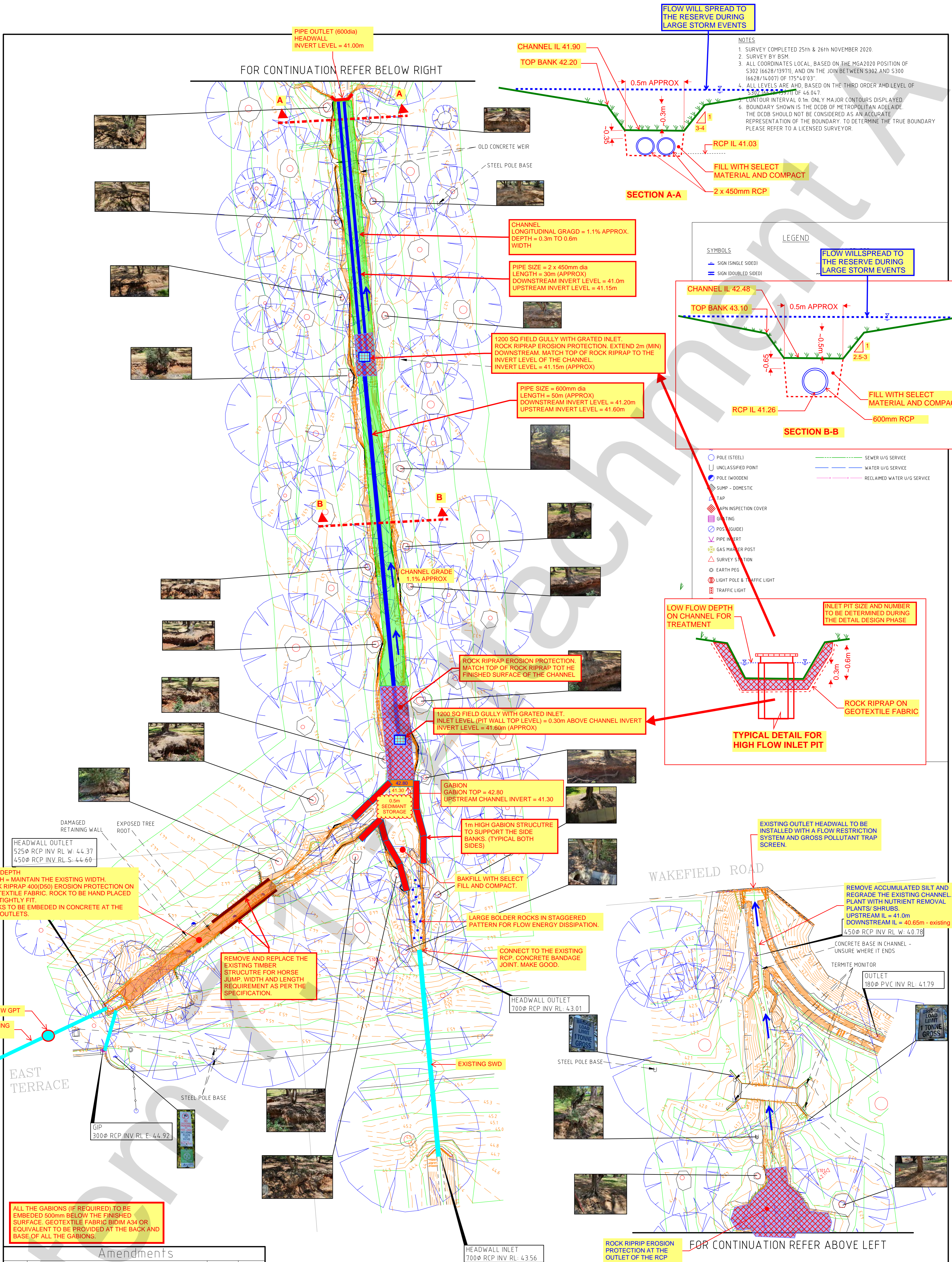
Drawn: 27th Nov 2020

Checked: 27th Nov 2020

Job No: 2859

PREPARED BY : BS  
REVISION : 02  
DATE : 29.07.2021





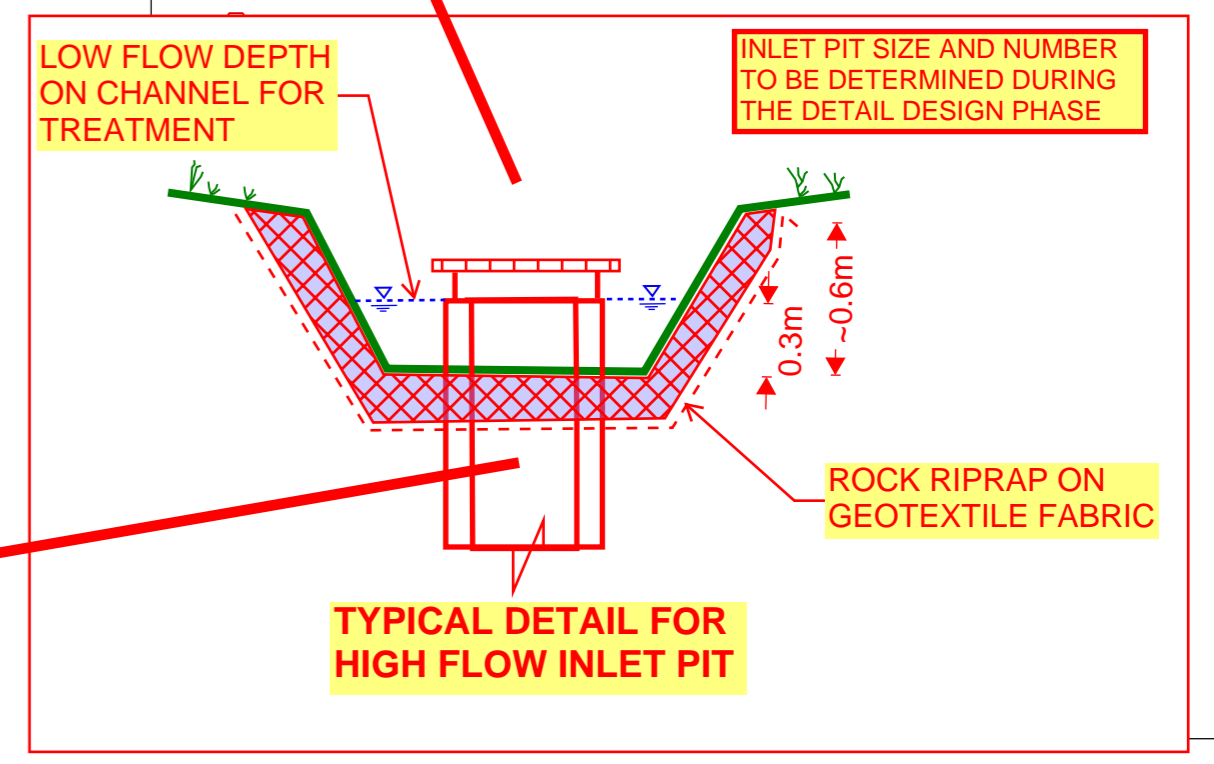
**NOTES**

1. SURVEY COMPLETED 25th & 26th NOVEMBER 2020.
2. SURVEY BY BSM.
3. ALL COORDINATES LOCAL, BASED ON THE MGA2020 POSITION OF S302 (6628/13971), AND ON THE JOIN BETWEEN S302 AND S300 (6628/14007) OF 175°4'03".
4. ALL LEVELS ARE AHD, BASED ON THE THIRD ORDER AHD LEVEL OF S302 (6628/13971) OF 46.047.
5. CONTOUR INTERVAL 0.1m. ONLY MAJOR CONTOURS DISPLAYED.
6. BOUNDARY SHOWN IS THE DCDB OF METROPOLITAN ADELAIDE. THE DCDB SHOULD NOT BE CONSIDERED AS AN ACCURATE REPRESENTATION OF THE BOUNDARY. TO DETERMINE THE TRUE BOUNDARY PLEASE REFER TO A LICENSED SURVEYOR.

**LEGEND**

**SYMBOLS**

- POLE (STEEL)
- UNCLASSIFIED POINT
- POLE (WOODEN)
- SUMP - DOMESTIC
- TAP
- APN INSPECTION COVER
- GRATING
- POST (GUIDE)
- PIPE INVERT
- GAS METER POST
- SURVEY STATION
- EARTH PEG
- LIGHT POLE & TRAFFIC LIGHT
- TRAFFIC LIGHT
- SEWER U/G SERVICE
- WATER U/G SERVICE
- RECLAIMED WATER U/G SERVICE



**Amendments**

Rev.	Subject	Date	Init

**TOTAL CONSTRUCTION SURVEYS PTY LTD**

3 MARLOW ROAD  
KESWICK SA 5035  
M 0400 882 614  
T 08 8297 4600  
F 08 8297 6600  
tcs@tcsurveys.com  
A.B.N. 12 154 678 008

**PARK 16 CHANNEL REHABILITATION & EROSION PROTECTION OPTION 3**

TOPOGRAPHIC SURVEY  
PARK 16 CREEK  
ADELAIDE

Prepared For: **City of Adelaide**

Plan No. 2859/T/02 | Rev No. | Scale 1:200 (A1) | Sheet 1 of 1

Checked: BSM | Date: 1st Dec 2020 | Job No: 2859

Prepared by: BS | Revision: 02 | Date: 29.07.2021



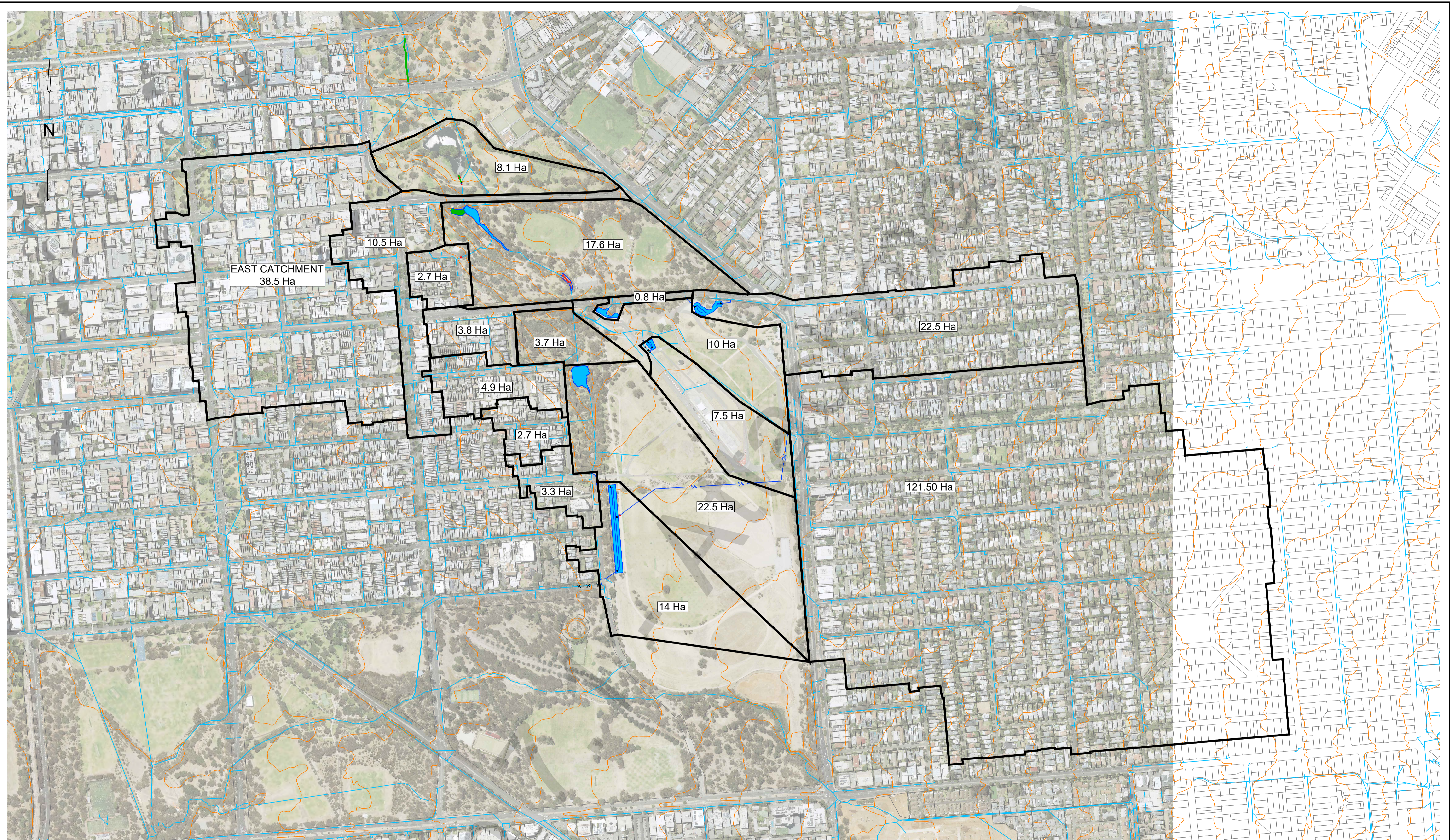
**Rymill Park / Murlawirrapurka (Park 14)**

**Appendix C**

Option C Draft version of Indicative Stormwater Concept plan for Park 14, 15 and 16 (Indicative Concept - In progress)

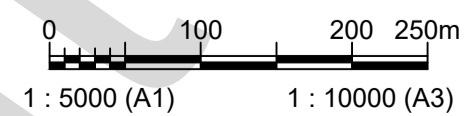
Item 7.1 - Attachment A





PRELIMINARY - NOT FOR CONSTRUCTION

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DESIGN CHECK		DATE	
DRAWN	BS	DATE	09/2021
DRAWN CHECK		DATE	



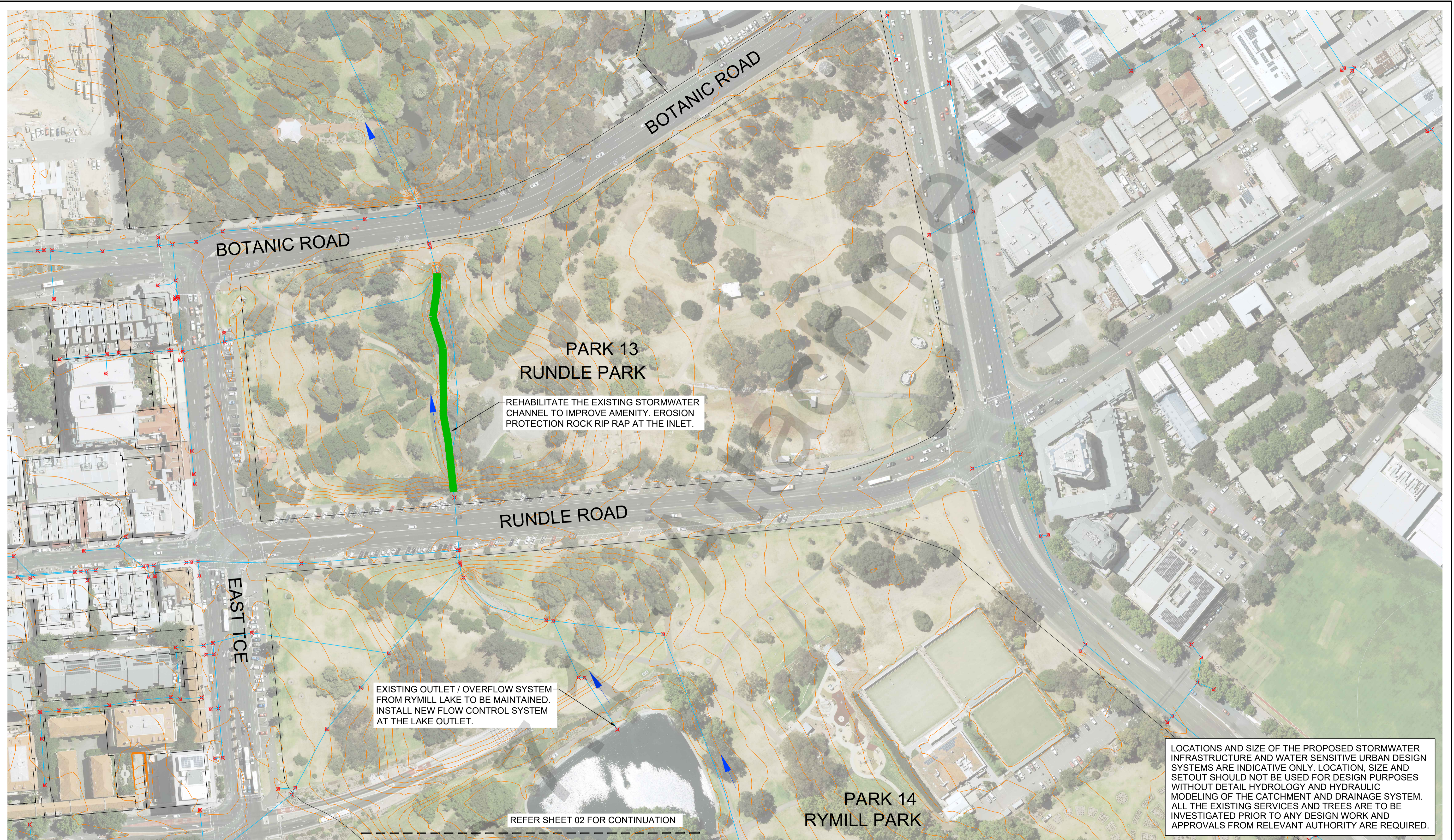
SERVICES	CHECKED BY	DATE
SEWER		
SWD		
WATER		
GAS		
ETSA		
TELSTRA		
COMMS		

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE

<b>RYMILL PARK</b> <b>MURLAWIRRAPURKA (PARK 14)</b> <b>STORMWATER CATCHMETN PLAN</b>	
COA USE - RECOMMENDED TO ARCHIVE	
PROJECT MANAGER	

<b>CITY OF ADELAIDE</b>	
COA PROJECT NUMBER	####
SCALE	1:5000
NUMBER OF SHEETS	1
ORIGINAL SHEET SIZE	A1
REVISION	A
DRAWING SET NUMBER	
	<b>01</b>





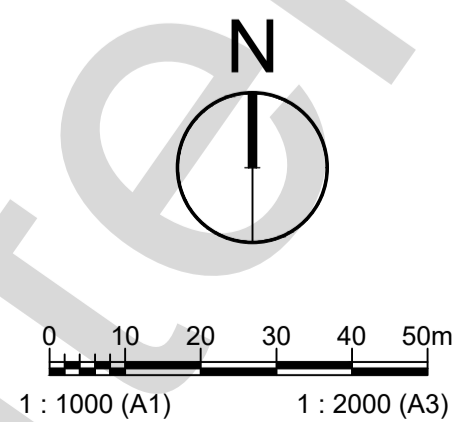
LOCATIONS AND SIZE OF THE PROPOSED STORMWATER INFRASTRUCTURE AND WATER SENSITIVE URBAN DESIGN SYSTEMS ARE INDICATIVE ONLY. LOCATION, SIZE AND SETOUT SHOULD NOT BE USED FOR DESIGN PURPOSES WITHOUT DETAIL HYDROLOGY AND HYDRAULIC MODELING OF THE CATCHMENT AND DRAINAGE SYSTEM. ALL THE EXISTING SERVICES AND TREES ARE TO BE INVESTIGATED PRIOR TO ANY DESIGN WORK AND APPROVALS FROM RELEVANT AUTHORITY ARE REQUIRED.

PRELIMINARY - NOT FOR CONSTRUCTION

DESIGNED	BS	DATE	08/2021
DESIGN CHECK		DATE	
DRAWN	BS	DATE	08/2021
DRAWN CHECK		DATE	

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.

The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.



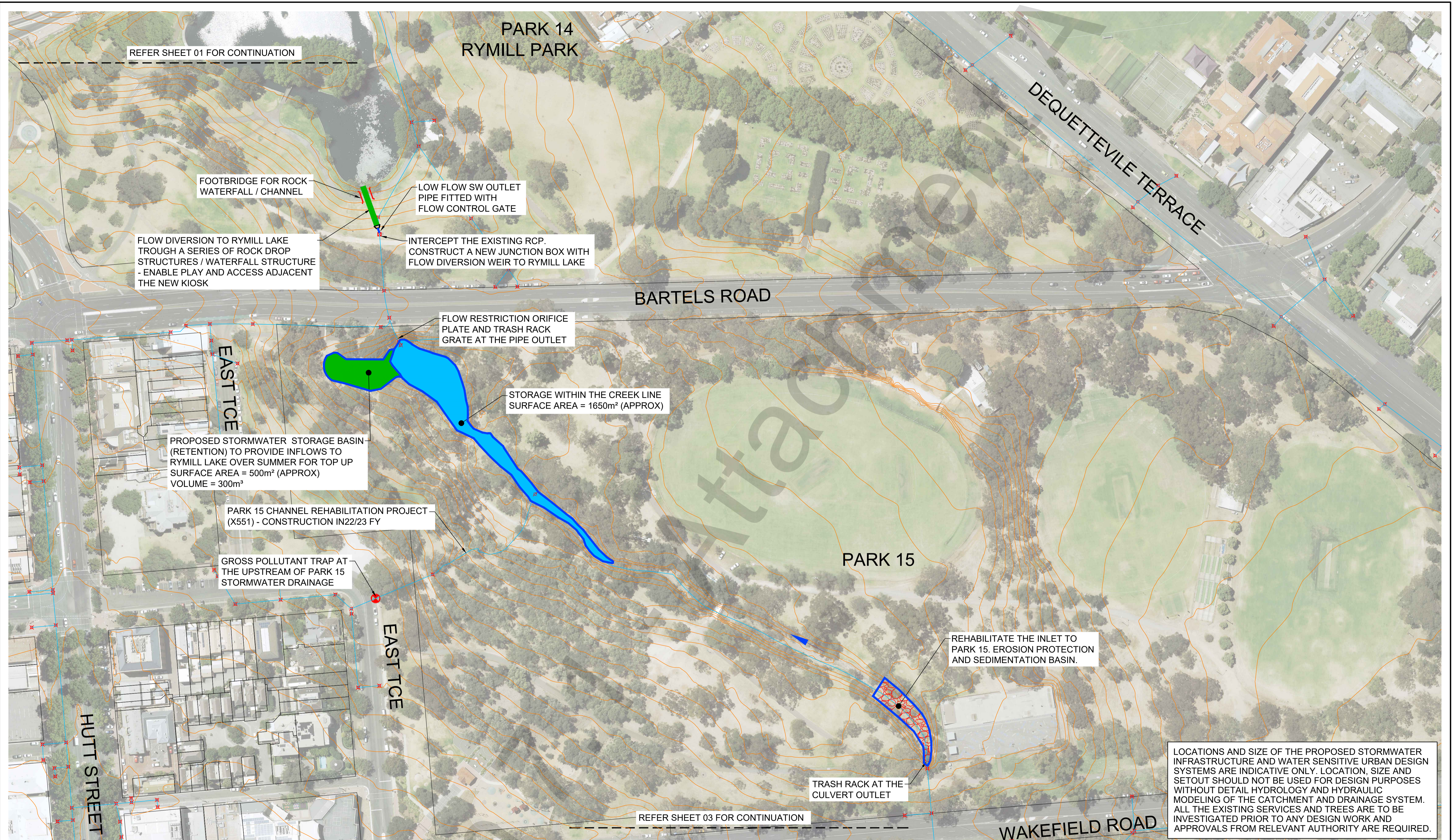
SERVICES	CHECKED BY	DATE
SEWER		
SWD		
WATER		
GAS		
ETSA		
TELSTRA		
COMMS		

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
A	FOR INFORMATION	MF	20/08/2021

STORMWATER DRAINAGE MANAGEMENT	
RYMILL LAKE	
UPSTREAM CATCHMENT MASTER PLAN	
LAYOUT 01 OF 04	
COA USE - RECOMMENDED TO ARCHIVE	
PROJECT MANAGER	

<b>CITY OF ADELAIDE</b>	
COA PROJECT NUMBER	XXXX
SCALE	1:1000
NUMBER OF SHEETS	4
ORIGINAL SHEET SIZE	A1
REVISION	A
DRAWING SET NUMBER	A1-21105-XXXX
SHEET	01





REFER SHEET 01 FOR CONTINUATION

PARK 14  
RYMILL PARK

DEQUETTEVILLE TERRACE

BARTELS ROAD

FOOTBRIDGE FOR ROCK WATERFALL / CHANNEL

LOW FLOW SW OUTLET PIPE FITTED WITH FLOW CONTROL GATE

FLOW DIVERSION TO RYMILL LAKE THROUGH A SERIES OF ROCK DROP STRUCTURES / WATERFALL STRUCTURE - ENABLE PLAY AND ACCESS ADJACENT THE NEW KIOSK

INTERCEPT THE EXISTING RCP. CONSTRUCT A NEW JUNCTION BOX WITH FLOW DIVERSION WEIR TO RYMILL LAKE

FLOW RESTRICTION ORIFICE PLATE AND TRASH RACK GRATE AT THE PIPE OUTLET

STORAGE WITHIN THE CREEK LINE SURFACE AREA = 1650m<sup>2</sup> (APPROX)

PROPOSED STORMWATER STORAGE BASIN (RETENTION) TO PROVIDE INFLOWS TO RYMILL LAKE OVER SUMMER FOR TOP UP SURFACE AREA = 500m<sup>2</sup> (APPROX) VOLUME = 300m<sup>3</sup>

PARK 15 CHANNEL REHABILITATION PROJECT (X551) - CONSTRUCTION IN 22/23 FY

GROSS POLLUTANT TRAP AT THE UPSTREAM OF PARK 15 STORMWATER DRAINAGE

PARK 15

REHABILITATE THE INLET TO PARK 15. EROSION PROTECTION AND SEDIMENTATION BASIN.

TRASH RACK AT THE CULVERT OUTLET

REFER SHEET 03 FOR CONTINUATION

WAKEFIELD ROAD

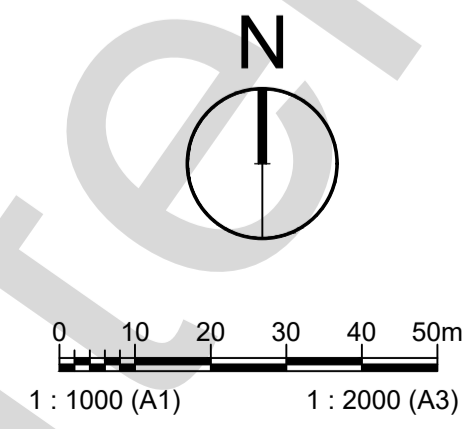
LOCATIONS AND SIZE OF THE PROPOSED STORMWATER INFRASTRUCTURE AND WATER SENSITIVE URBAN DESIGN SYSTEMS ARE INDICATIVE ONLY. LOCATION, SIZE AND SETOUT SHOULD NOT BE USED FOR DESIGN PURPOSES WITHOUT DETAIL HYDROLOGY AND HYDRAULIC MODELING OF THE CATCHMENT AND DRAINAGE SYSTEM. ALL THE EXISTING SERVICES AND TREES ARE TO BE INVESTIGATED PRIOR TO ANY DESIGN WORK AND APPROVALS FROM RELEVANT AUTHORITY ARE REQUIRED.

PRELIMINARY - NOT FOR CONSTRUCTION

DESIGNED BS DATE 08/2021  
 DESIGN CHECK DATE  
 DRAWN BS DATE 08/2021  
 DRAWN CHECK DATE

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.

The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.



SERVICES	CHECKED BY	DATE
SEWER		
SWD		
WATER		
GAS		
ETSA		
TELSTRA		
COMMS		

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
A	FOR INFORMATION	MF	20/08/2021

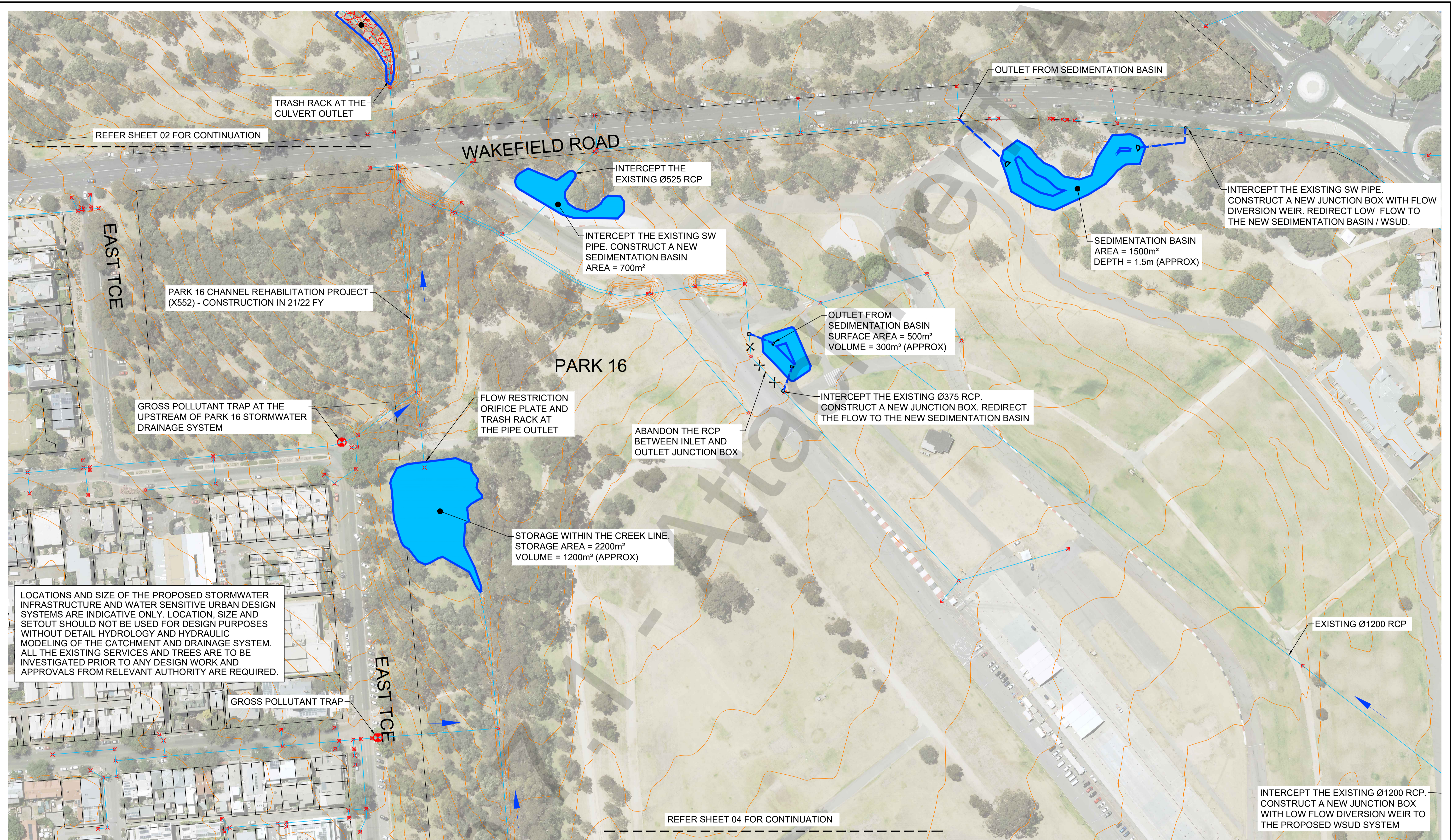
STORMWATER DRAINAGE MANAGEMENT  
 RYMILL LAKE  
 UPSTREAM CATCHMENT MASTERPLAN  
 LAYOUT 02 OF 03

COA USE - RECOMMENDED TO ARCHIVE

PROJECT MANAGER

CITY OF ADELAIDE  
 CoA PROJECT NUMBER XXXX  
 SCALE 1:1000  
 NUMBER OF SHEETS 4  
 ORIGINAL SHEET SIZE A1  
 REVISION A  
 DRAWING SET NUMBER A1-21105-XXXX  
 SHEET 01





REFER SHEET 02 FOR CONTINUATION

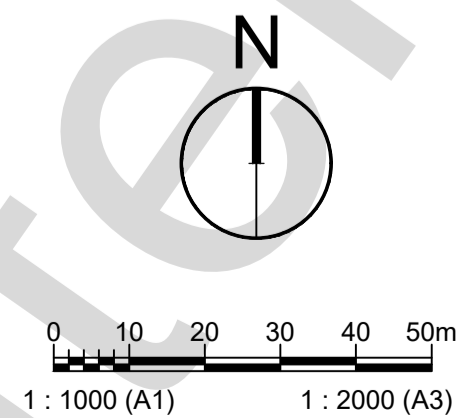
REFER SHEET 04 FOR CONTINUATION

PRELIMINARY - NOT FOR CONSTRUCTION

DESIGNED BS DATE 08/2021  
 DESIGN CHECK DATE  
 DRAWN BS DATE 08/2021  
 DRAWN CHECK DATE

THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.

The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.



SERVICES	CHECKED BY	DATE
SEWER		
SWD		
WATER		
GAS		
ETSA		
TELSTRA		
COMMS		

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
A	FOR INFORMATION	MF	20/08/2021

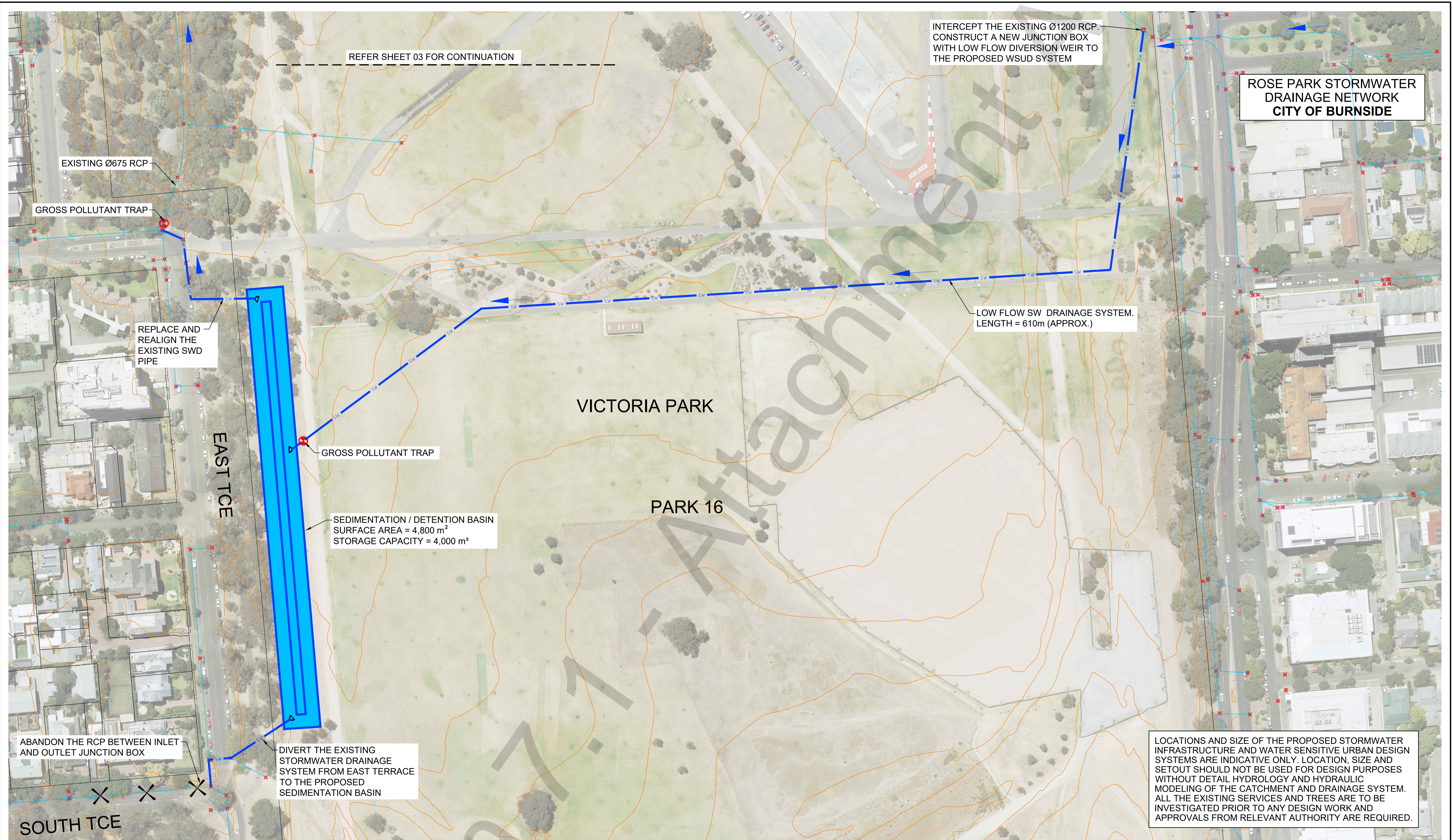
STORMWATER DRAINAGE MANAGEMENT  
 RYMILL LAKE  
 UPSTREAM CATCHMENT MASTERPLAN  
 LAYOUT 03 OF 04

	CITY OF ADELAIDE
CoA PROJECT NUMBER	XXXX
SCALE	1:1000
NUMBER OF SHEETS	4
ORIGINAL SHEET SIZE	A1
REVISION	A
DRAWING SET NUMBER	A1-21105-XXXX
SHEET	03

COA USE - RECOMMENDED TO ARCHIVE

PROJECT MANAGER





REFER SHEET 03 FOR CONTINUATION

INTERCEPT THE EXISTING Ø1200 RCP. CONSTRUCT A NEW JUNCTION BOX WITH LOW FLOW DIVERSION WEIR TO THE PROPOSED WSUD SYSTEM

ROSE PARK STORMWATER DRAINAGE NETWORK CITY OF BURNSIDE

EXISTING Ø675 RCP

GROSS POLLUTANT TRAP

REPLACE AND REALIGN THE EXISTING SWD PIPE

LOW FLOW SW DRAINAGE SYSTEM. LENGTH = 610m (APPROX.)

GROSS POLLUTANT TRAP

SEDIMENTATION / DETENTION BASIN SURFACE AREA = 4,800 m<sup>2</sup> STORAGE CAPACITY = 4,000 m<sup>3</sup>

VICTORIA PARK

PARK 16

EAST TCE

ABANDON THE RCP BETWEEN INLET AND OUTLET JUNCTION BOX

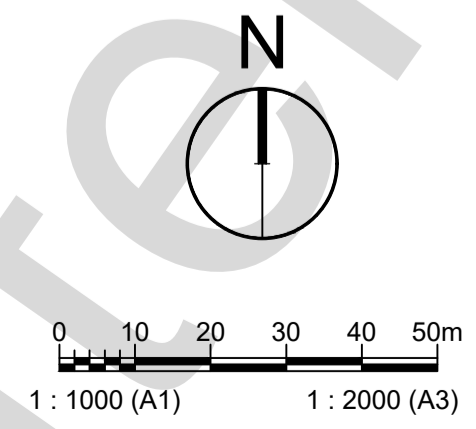
DIVERT THE EXISTING STORMWATER DRAINAGE SYSTEM FROM EAST TERRACE TO THE PROPOSED SEDIMENTATION BASIN

SOUTH TCE

LOCATIONS AND SIZE OF THE PROPOSED STORMWATER INFRASTRUCTURE AND WATER SENSITIVE URBAN DESIGN SYSTEMS ARE INDICATIVE ONLY. LOCATION, SIZE AND SETOUT SHOULD NOT BE USED FOR DESIGN PURPOSES WITHOUT DETAIL HYDROLOGY AND HYDRAULIC MODELING OF THE CATCHMENT AND DRAINAGE SYSTEM. ALL THE EXISTING SERVICES AND TREES ARE TO BE INVESTIGATED PRIOR TO ANY DESIGN WORK AND APPROVALS FROM RELEVANT AUTHORITY ARE REQUIRED.

PRELIMINARY - NOT FOR CONSTRUCTION

DESIGNED	BS	DATE	08/2021	THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION.
DESIGN CHECK		DATE		
DRAWN	BS	DATE	08/2021	The Contractor and his Sub-contractors shall verify all dimensions, lines, levels and existing service locations, prior to commencement on site, preparation of detail/shop drawings, and fabrication of construction/building components.
DRAWN CHECK		DATE		



SERVICES	CHECKED BY	DATE
SEWER		
SWD		
WATER		
GAS		
ETSA		
TELSTRA		
COMMS		

PRELIMINARY REVISIONS			
No.	DESCRIPTION	BY	DATE
A	FOR INFORMATION	MF	20/08/2021

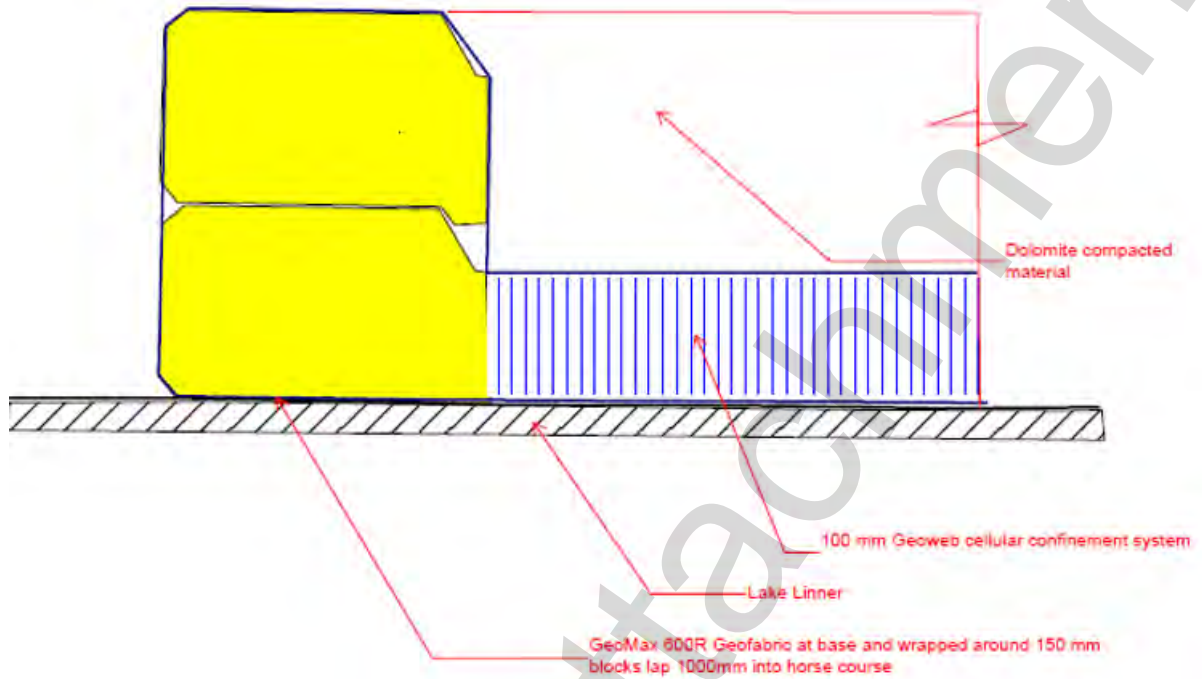
<b>STORMWATER DRAINAGE MANAGEMENT</b> <b>RYMILL LAKE</b> UPSTREAM CATCHMENT MASTERPLAN LAYOUT 04 OF 04		CITY OF ADELAIDE CoA PROJECT NUMBER XXXX SCALE 1:1000 NUMBER OF SHEETS 4 ORIGINAL SHEET SIZE A1 REVISION A DRAWING SET NUMBER A1-21105-XXXX SHEET 04
COA USE - RECOMMENDED TO ARCHIVE PROJECT MANAGER		



Rymill Park / Murlawirrapurka (Park 14)

Appendix D

Option A: Proposed Horse Track Trough Rymill Park Lake (ACC2011/147572)





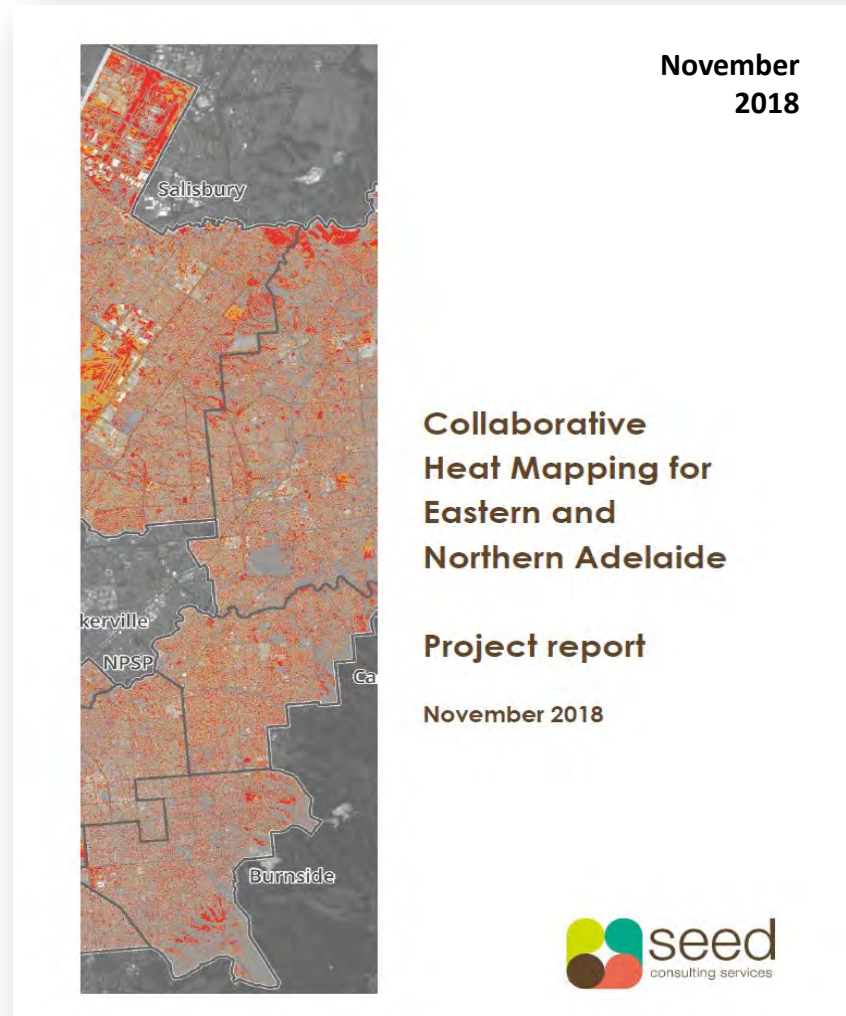
# Data and Insights – Urban Heat & Tree Canopy



**The purpose of this presentation is to provide data and insights on the heat mapping and metrics relating to % of tree canopy as this is outlined in the APLA Strategic Plan as a priority.**

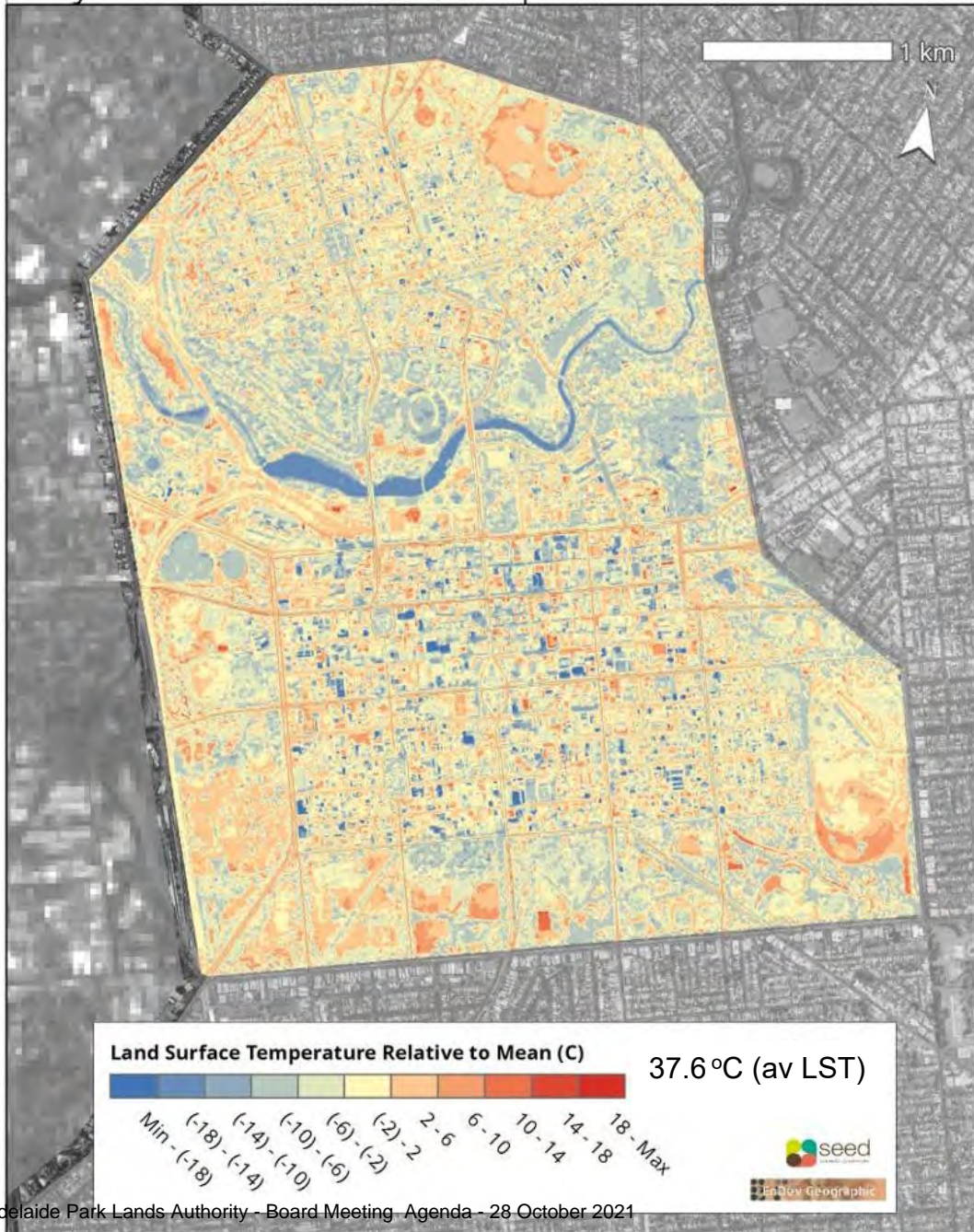


# Heat Mapping



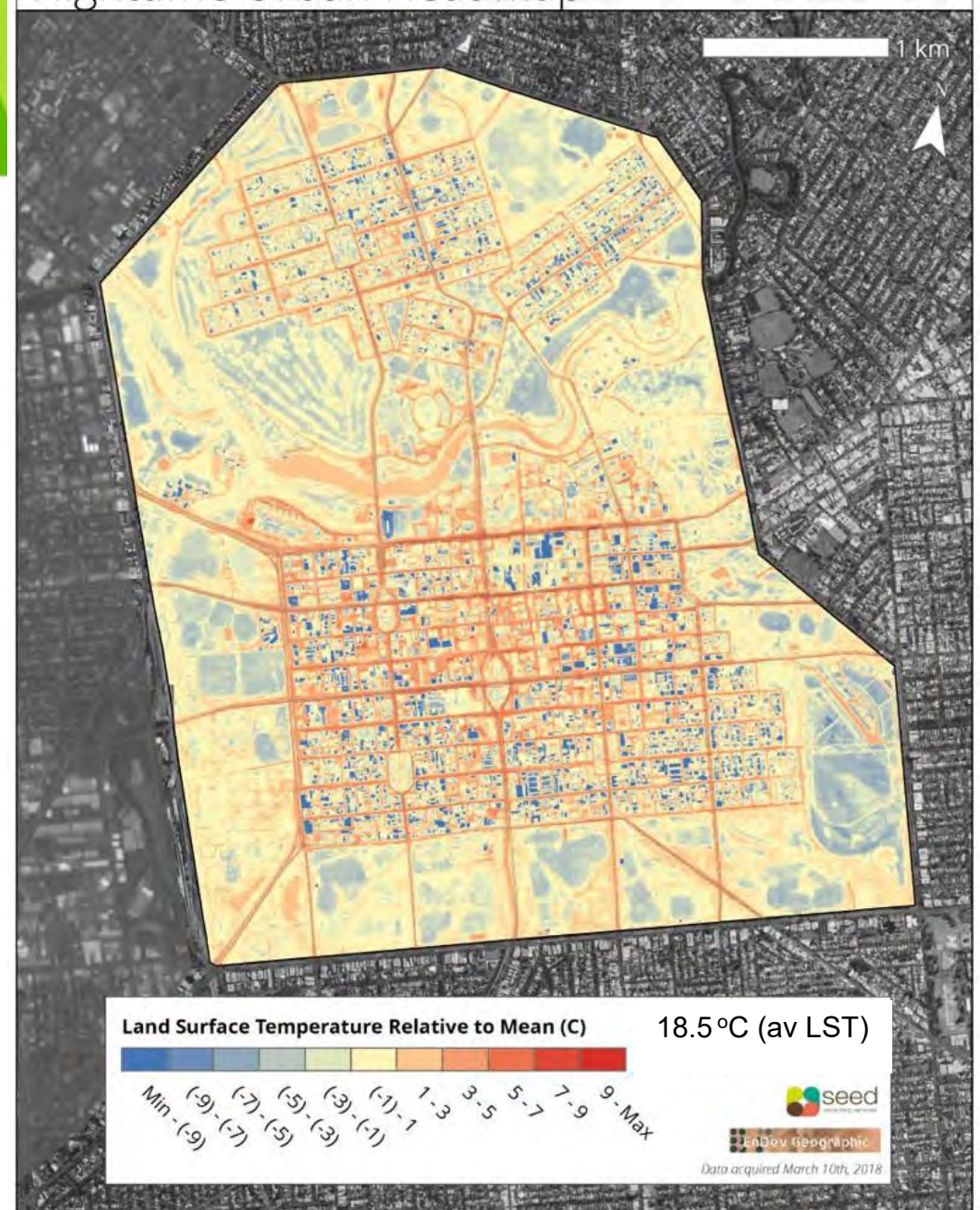


# Daytime Urban Heat Map



111

# Nighttime Urban Heat Map

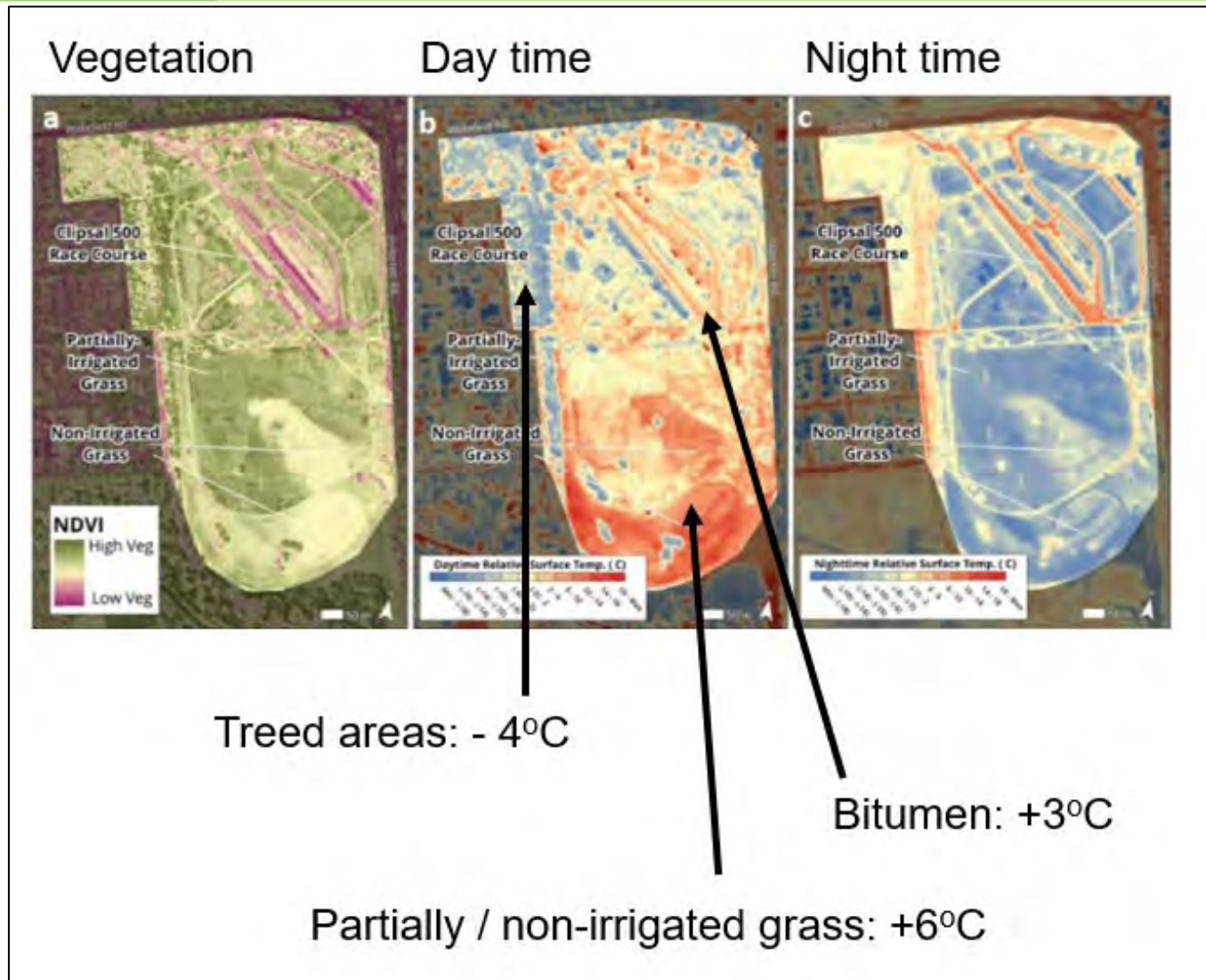




# Heat Mapping Case Study – Adelaide Park Lands Victoria Park

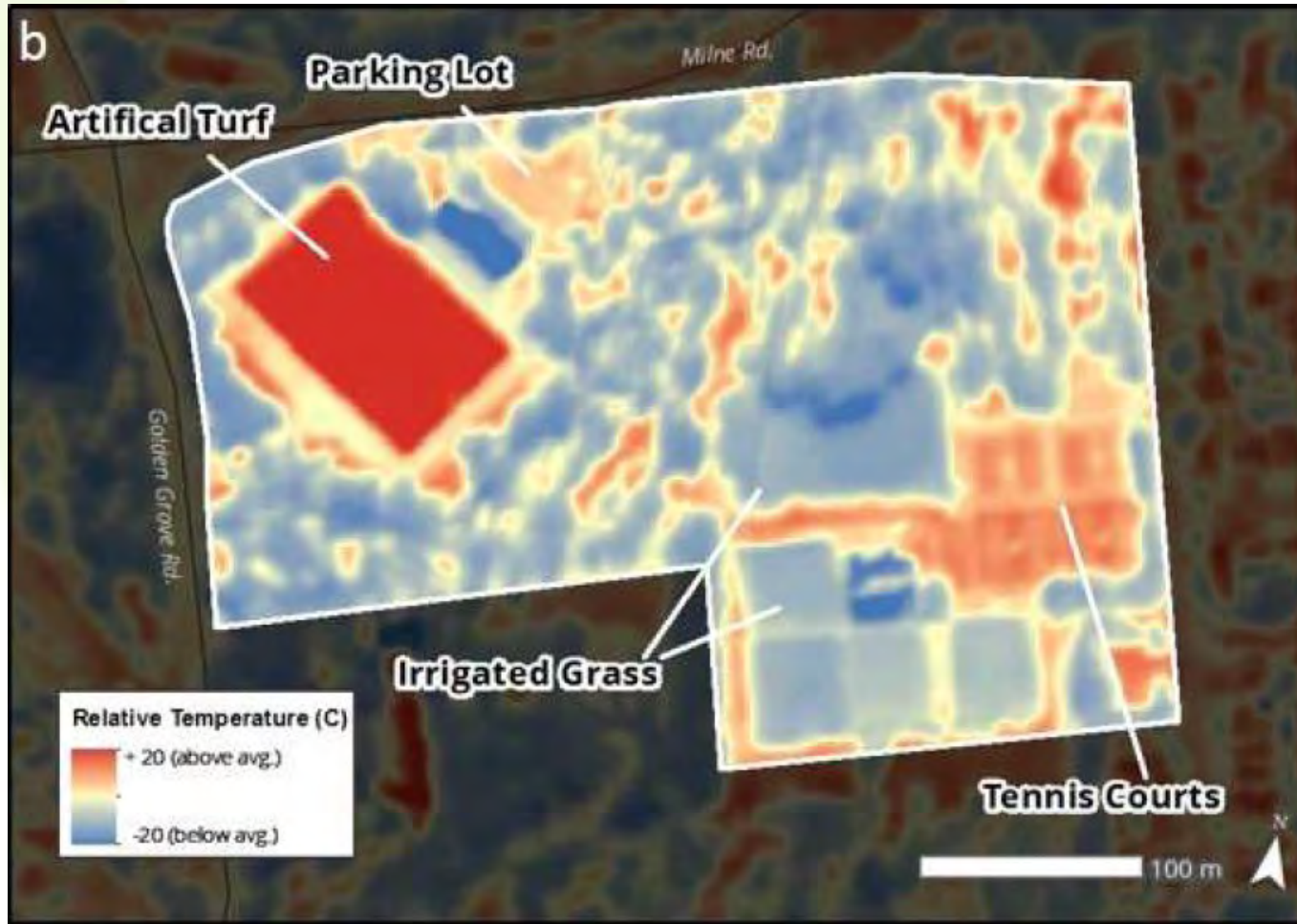


Victoria Park/Pakapakanthi Park 16





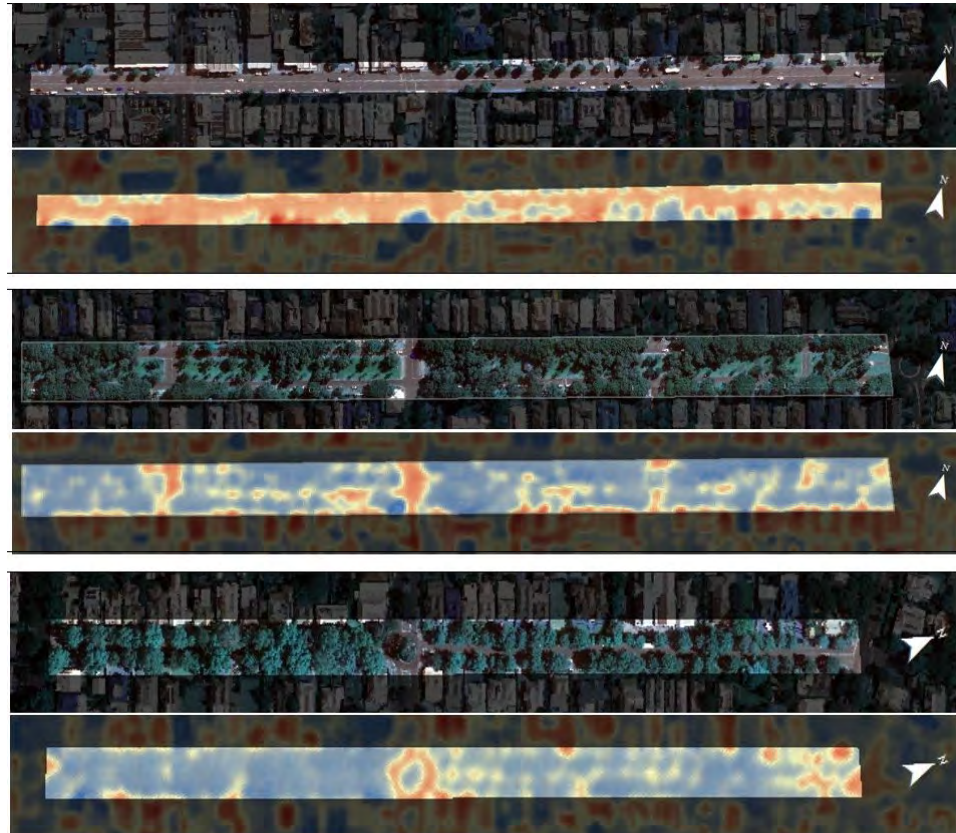
# Heat Mapping Case Study – Recreational / Modbury Soccer Club



# Heat Mapping Case Study – WSUD and Treelined Streets



3.6°C cooler than standard verge



3°C  
above  
average

7.5 °C  
difference

4.5°C  
below  
average

9.5 °C  
difference

6.5°C  
below  
average





# Heat Mapping – Moving Forward

The Heat Mapping provides data to enable decision making on:

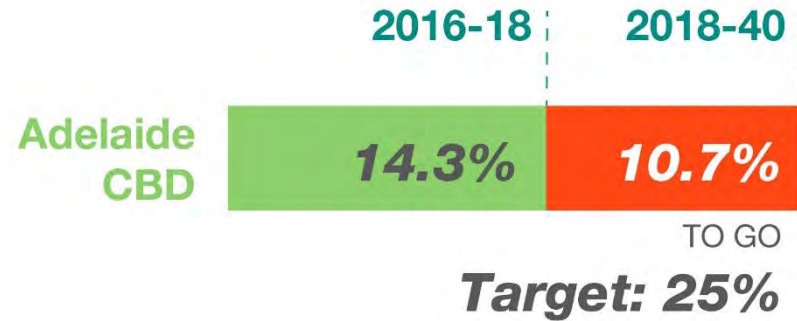
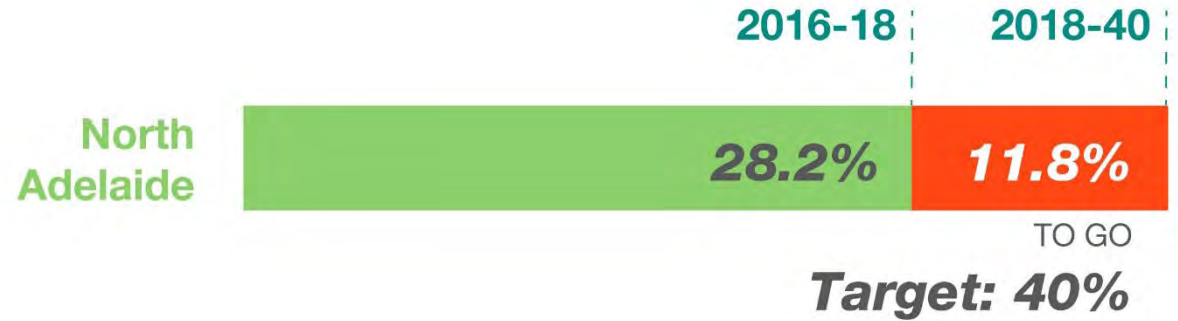
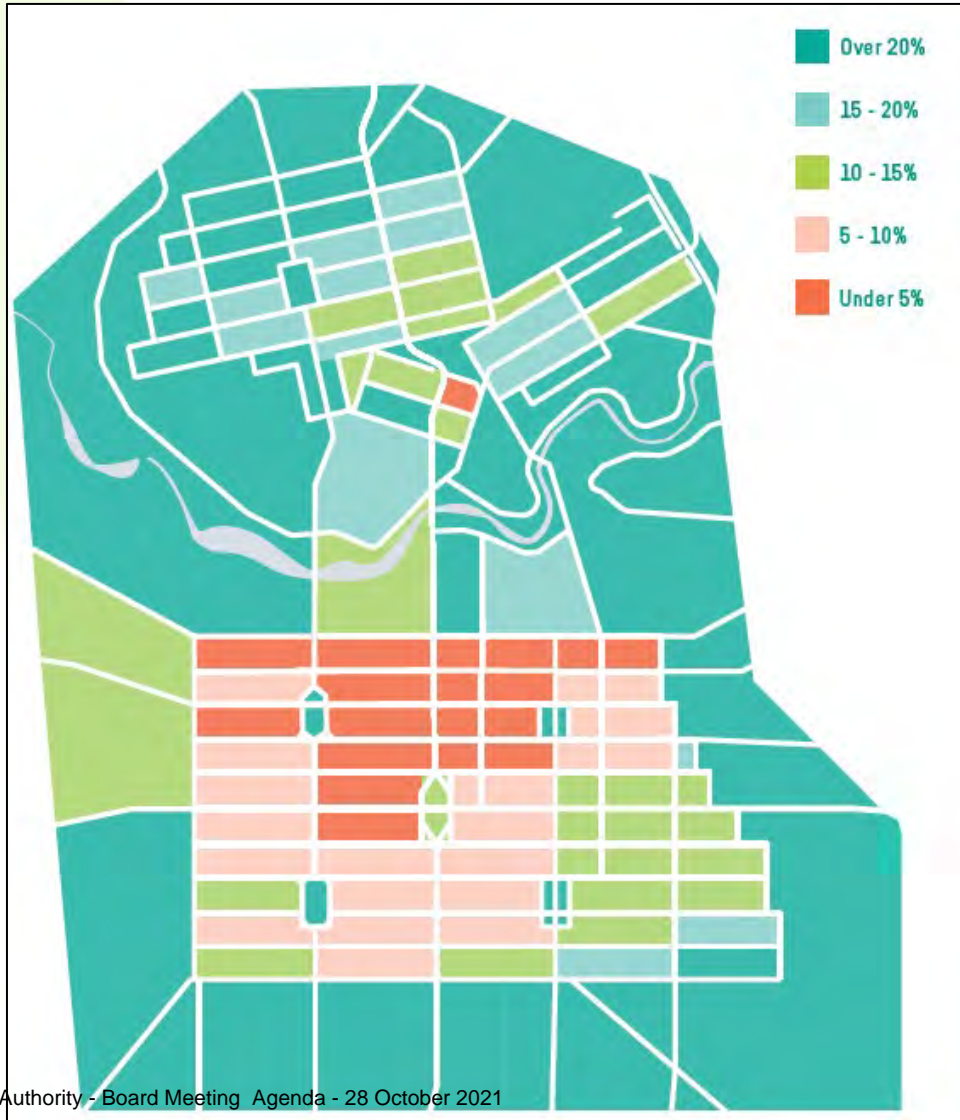
- hot spot areas in our Park Lands
- materials used in Park Lands to use to reduce the risk of urban heat.

Opportunity to partner with State Government (Green Adelaide) and other Councils to repeat the Heat Mapping in 2022.



# LiDAR Canopy Mapping

# LiDAR Canopy Mapping – 2015





# LiDAR Canopy Mapping – 2018/19

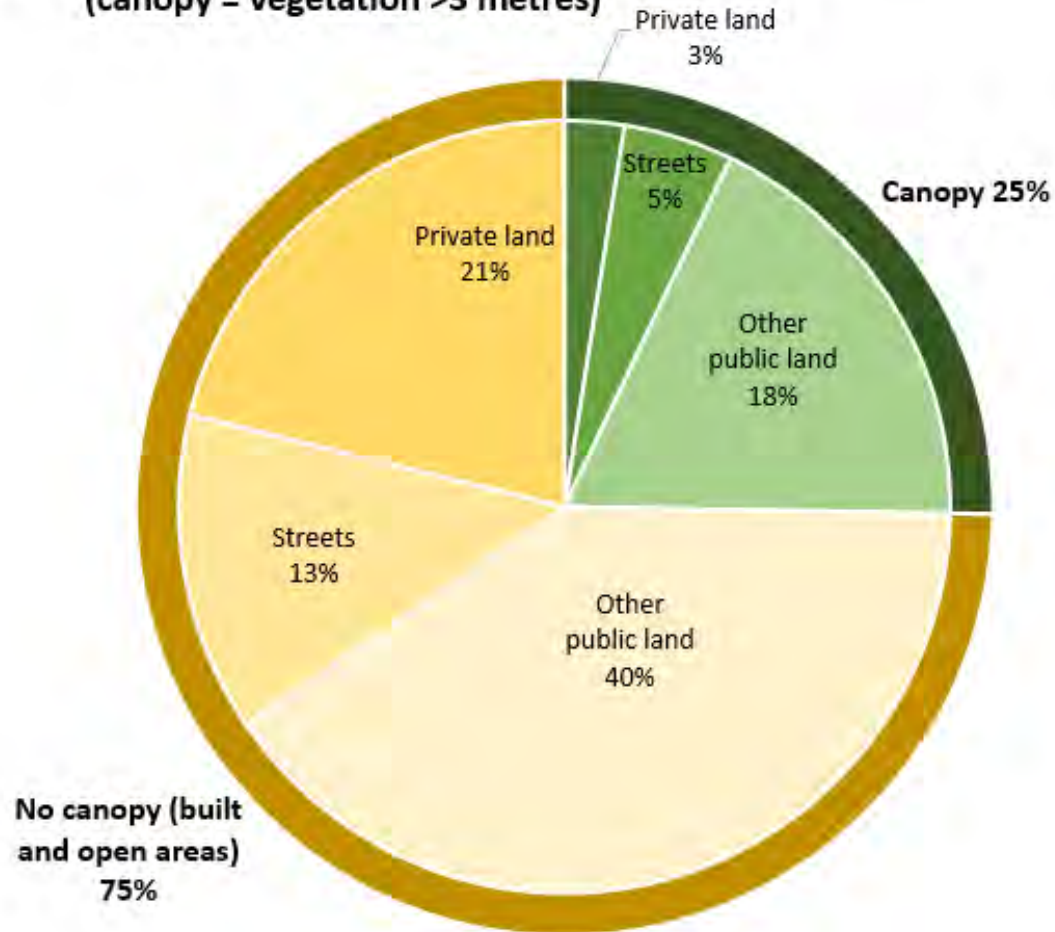


CITY OF ADELAIDE

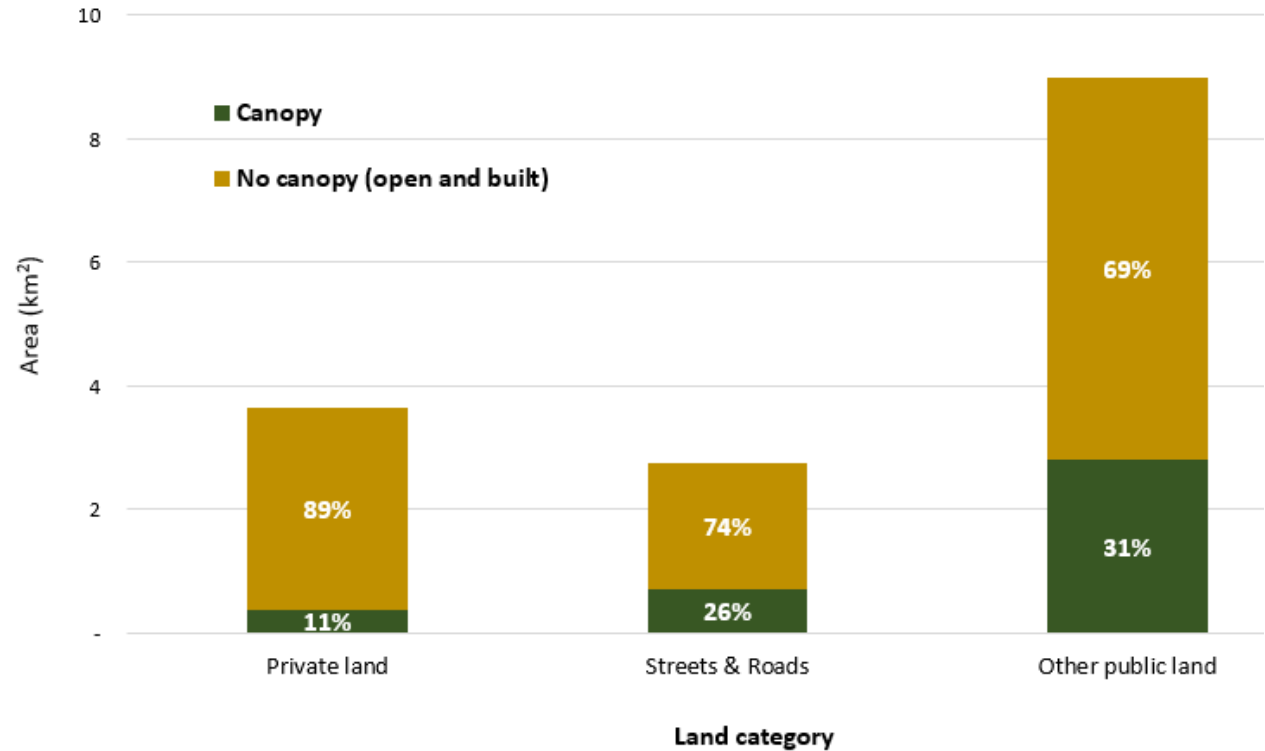


# LiDAR Canopy Data Analysis – 2018/19

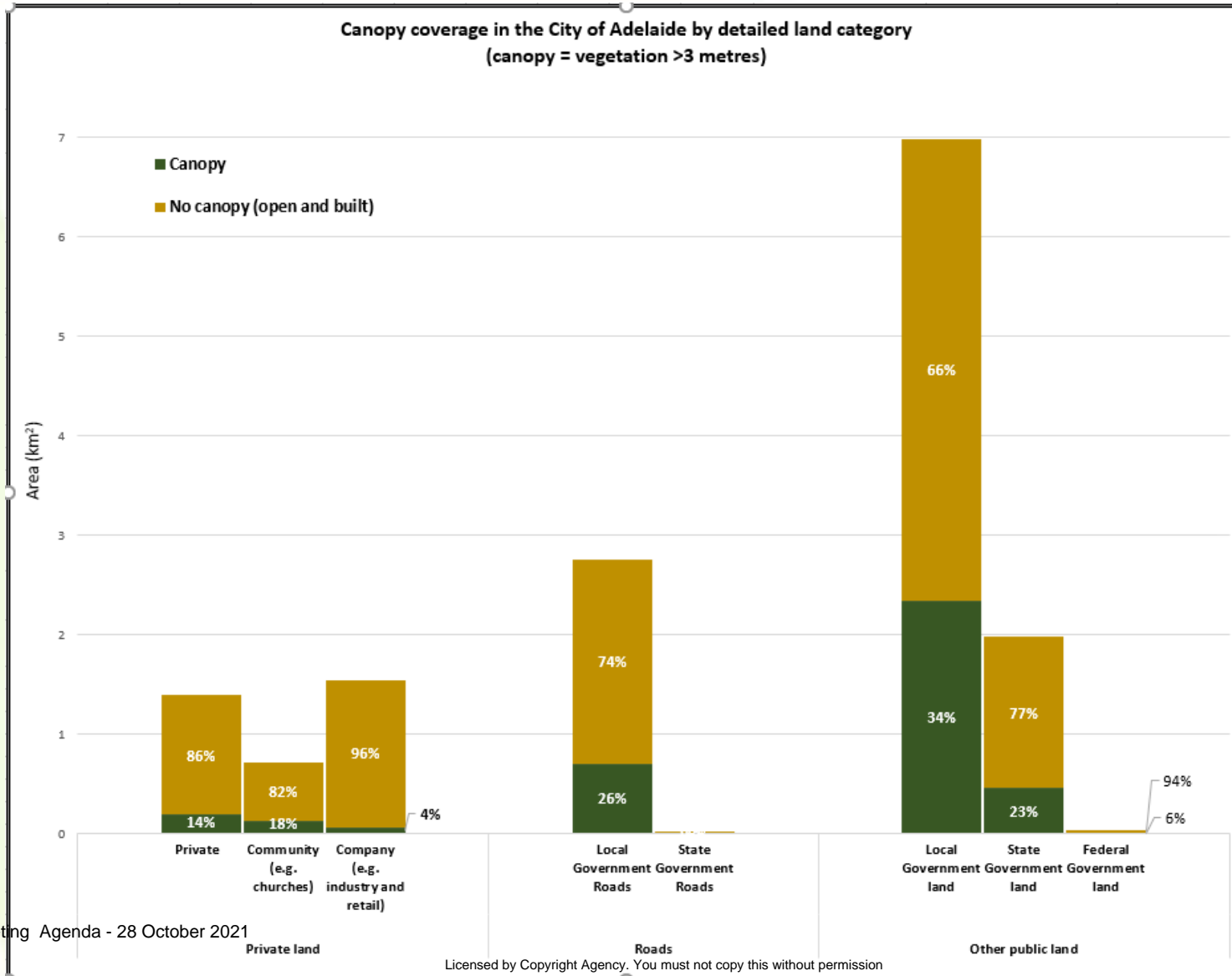
**Canopy coverage in the City of Adelaide by land category  
(canopy = vegetation >3 metres)**



**Canopy coverage in the City of Adelaide by land category  
(canopy = vegetation >3 metres)**

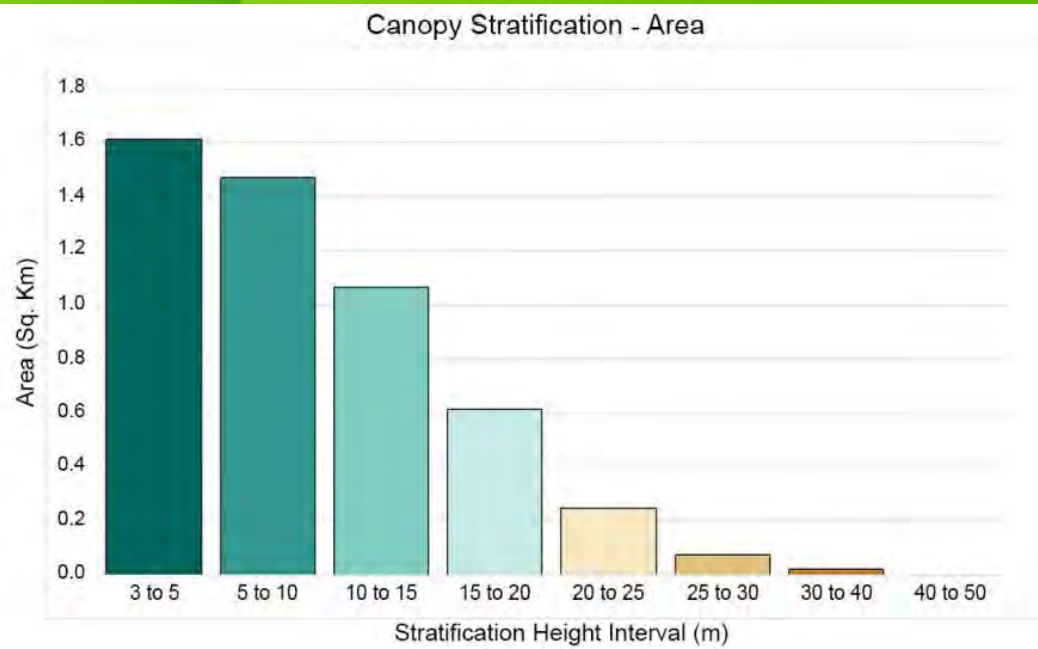


# LiDAR Canopy Data Analysis – 2018/19





# LiDAR Canopy Stratification– 2018/19



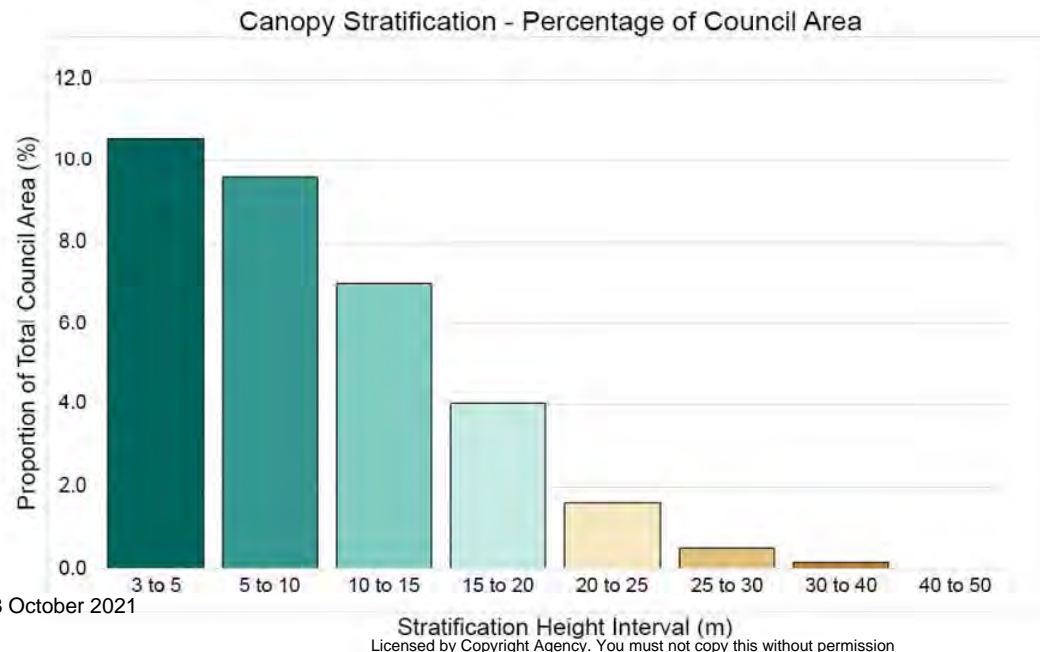
More than 10% of our trees are between 3-5m tall

Approximately 20% are between 3-10m tall

Less than 1% of trees >25m

- Indicator of age of tree
- Attract certain type of bird / pollinator
- Cast longer shadows (shader impact)

Could measure rate of tree growth (if compared different years )



# LiDAR Canopy Mapping – Moving Forward

The Canopy Mapping and Data provides excellent data on location and size of trees.

Infrastructure Program working on a proposal to analyse different years 2015 to 2018/19 and what this means for canopy targets.

There is an opportunity to partner with State Government (Green Adelaide) and other Councils to repeat the LiDAR capture and analysis at the same time as the Heat Mapping in 2022.





# Adelaide Park Lands Management Strategy

To provide an update of the audit of actions in the current APLMS as requested by APLA in August 2020

Daryl Tian  
Park Lands & Sustainability





Government of  
South Australia



CITY OF  
ADELAIDE

**apla**

Adelaide  
Park Lands  
Authority



## ADELAIDE PARK LANDS MANAGEMENT STRATEGY 2015-2025

JANUARY 2018

**An aspirational document which contains...**

- 26 policies
- 200+ actions / projects

Adelaide Park Lands Authority - Board Meeting Agenda - 28 October 2024



# Policies

26 policies across five themes with on-going application



**Dynamic, active + tranquil places**



**Connected places + spaces**



**Welcoming + attractive places**



**Sustainable + enduring places**



**Memorable + distinctive places**



# Example 1 – DYNAMIC, ACTIVE + TRANQUIL PLACES

Support activation of the Park Lands by upgrading and enhancing buildings and structures responsive to their park setting

Undertake a program of building consolidation, enhancement and development to ensure that all buildings in the Park Lands:

Play a role in supporting both active and passive use of the Park Lands for outdoor recreation – both organised sport and informal recreation.



**Dynamic, active +  
tranquil places**



## Example 2 – **CONNECTED PLACES + SPACES**

**Provide car parking on and adjacent to the Park Lands only where need has been demonstrated and no reasonable alternative exists**

**Reduce car parking on the Park Lands by 5% in the period to 2025.**



**Connected  
places + spaces**



## Example 3 – **WELCOMING + ATTRACTIVE PLACES**

Establish a range of natural, ornamental and cultural landscapes celebrating the diversity of the Park Lands

Strengthen the local character of landscapes across the Park Lands through consistent plantings, design of formal landscape features and interpretive signage.



**Welcoming +  
attractive places**



# Example 4 – **SUSTAINABLE + ENDURING PLACES**

**Design and manage the Park Lands to be resilient to the impacts of climate change**

**Create avenue plantings along pathways and provide landscaping around activity hubs and sporting areas to improve the amount of natural shade available to Park Land users**



**Sustainable +  
enduring places**



# Example 5 – MEMORABLE + DISTINCTIVE PLACES

Ensure the values of the National Heritage listing are protected and promoted

Map and document all features of the Park Lands contributing to the values of the National Heritage listing and ensure their protection through incorporating these features in relevant Council strategies, plans and processes

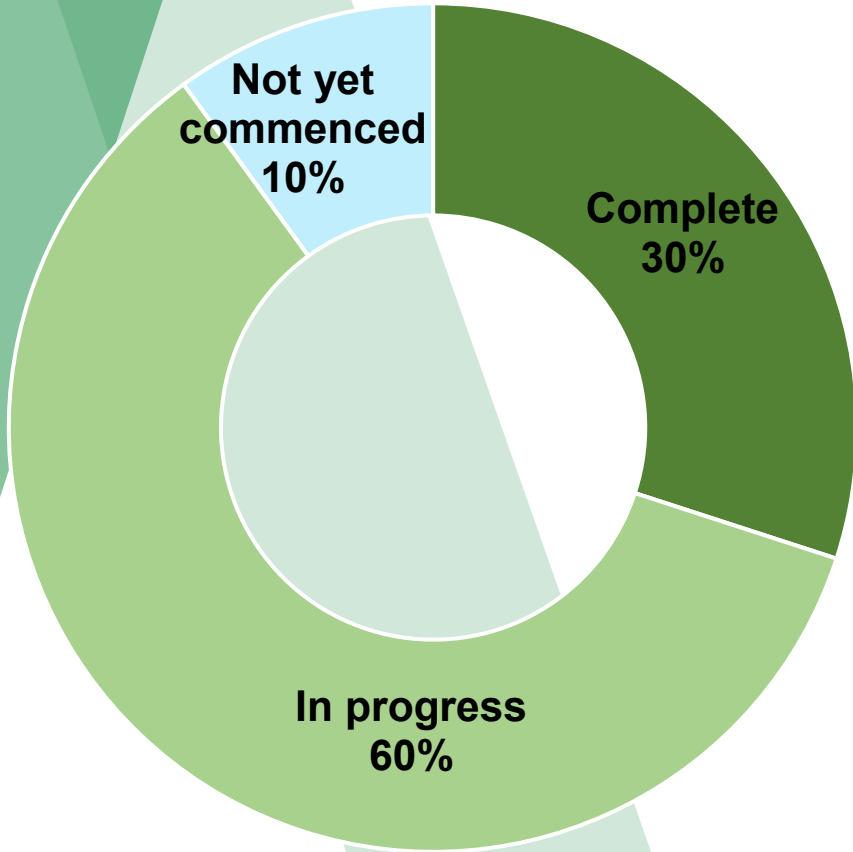


**Memorable +  
distinctive places**



# BIG MOVES

## Places and Spaces



**'Newmarket' Urban Park**



**Gladys Elphick Park / Narnungga (Park 25)**  
Completed 2019



**People's Park of the West**



**Ellis Park / Tampawardli (Park 24)**  
Ellis Road upgrade and new sports building in 2019/20



**BMX and Youth Activity Hub**



**Blue Gum Park / Kurangga (Park 20)**  
Improvements to 'Pump Track' in 2019. Concept for further improvements now developed



**Vibrant Veale**



**Veale Park / Walyu Yarta (Park 21)**  
Remains a popular park with beautiful formal gardens



**Central Park in the South**



**Pelzer Park / Pityarilla (Park 19)**  
Completed 2018



**Victoria Park - Final stages**



**Victoria Park / Pakapakanthi (Park 16)**  
Ongoing improvements since 2008, including grandstand, central gardens, changerooms, and now wetlands



**Re-imagined Rymill**



**Rymill Park / Murlawirrapurka (Park 14)**  
Quentin Kenihan Playspace 2020



**Northern Activity Hub**



**Denise Norton Park / Pardipardinyilla (Park 2) and Yam Daisy Park / Kantarilla (Park 3)**  
Completed 2020



**Master plans for the Squares**



**Whitmore Square / Iparrityi**  
Ongoing implementation of Master Plan developed in 2019



**City Skate Plaza**



**Gladys Elphick Park / Narnungga (Park 25)**  
Estimated completion early 2022



# BIG MOVES

## Invitations, Connections & Networks



A promenade in every park

✘ No progress



Park Lands Trail central to parks

✔ In progress



Wayfinding + interpretive signage

✔ In progress



100 mini hubs

✔ In progress



Restored + re-imagined riparian corridors

✔ In progress



Elm Carriageway



New signage on Park Lands Trail



Storyboard sign in Gladys Elphick Park / Narnungga (Park 25)



New facilities in Pelzer Park / Pityarilla (Park 19)



Creek rehabilitation in Carriageway Park / Tuthangga (Park 17)



# BIG MOVES

## Invitations, Connections & Networks



Amazing art

✓ In progress



Lights, lights, lights

✓ In progress



Avenues, avenues, avenues

✓ In progress



Great connections

✓ In progress

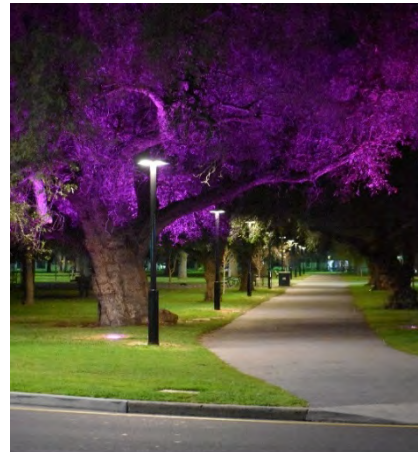


The Urban Address

✓ In progress



Vietnamese Boat People Memorial adjacent Victoria Drive



Whitmore Square / Iparrityi enhancement



Revegetation project in Reservoir Park / Kangatilla (Park 4)



New paths along Lefevre Terrace



Prospect Road upgrade



# SNAPSHOT OF ALL ACTIONS

## APLMS contains...

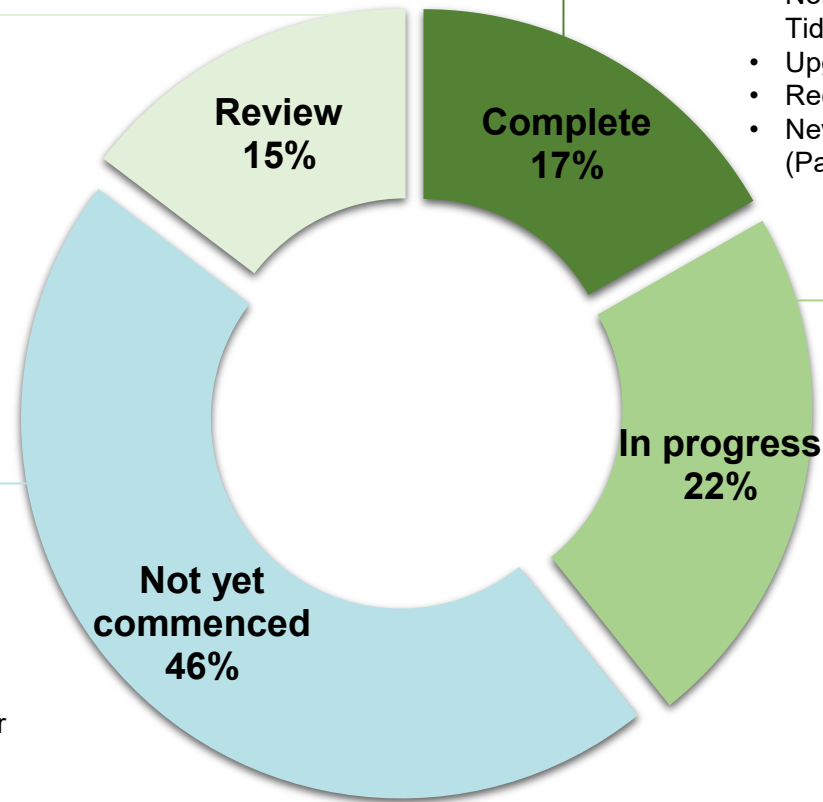
- 200+ actions
- 26 key policies
- 30 parks + 6 squares

### Some actions requiring review (may no longer be a priority)

- Connection over rail corridor to western Park Lands
- Enhance the Plateau in Ellis Park / Tampawardli (Park 24) as an events site
- Remove fencing and revitalize tram corridor along Peacock Rd
- Create fenced dog park in Josie Agius Park / Wikaparntu Wirra (Park 22)
- Create a recreational hub to service existing WCH in Peace Park
- Land bridge across rail lines from Golf Course to Bonython Park / Tulya Wardli (Park 27)
- Footbridge over Glover Avenue between Parks 24 and 25
- Integrate the existing Glover playground into Lefevre Park / Nantu Wama (Park 6)
- Improve connections to the Central Market Precinct in Victoria Square / Tarntanyangga.

### Some actions not yet commenced

- Create an urban address along Greenhill Road
- Provide a promenade between War Memorial Drive and Strangways Terrace through the Golf Course
- Provide walking trails and boardwalks along and over the River Torrens / Karrawirra Pari
- Provide more opportunities to access and interact with the River Torrens / Karrawirra Pari.



### Some actions completed

- Re-designed Ellis Road and sports hub
- Re-create sporting hub in Gladys Elphick Park / Narnungga (Park 25)
- Adaptive reuse of buildings: Velo Café and Kiosk @16
- Glover East Playspace upgrade, including public toilets and change rooms in King Rodney Park / Ityamai-itpina (Park 15)
- Quentin Kenihan Playspace in Rymill Park / Murlawirrapurka (Park 14)
- North-South Park Lands Trail link in Bunday's Paddock / Tidlangga (Park 9)
- Upgrade of Mary Lee Park (Park 27B) hub, with Exeloo
- Reconciliation Plaza in Victoria Square / Tarntanyangga
- New netball facilities in Josie Agius Park / Wikaparntu Wirra (Park 22).

### Actions in progress

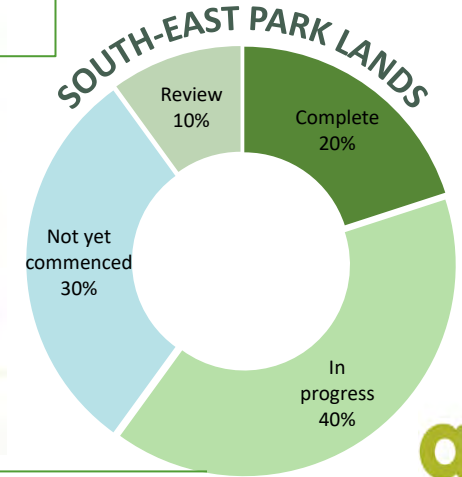
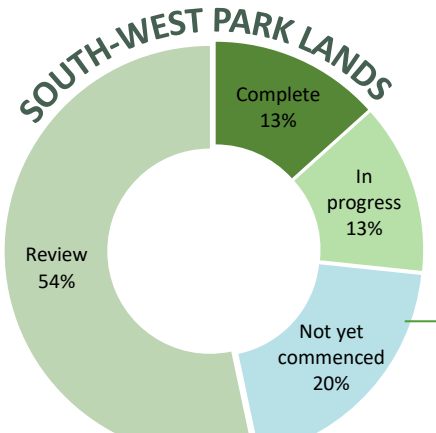
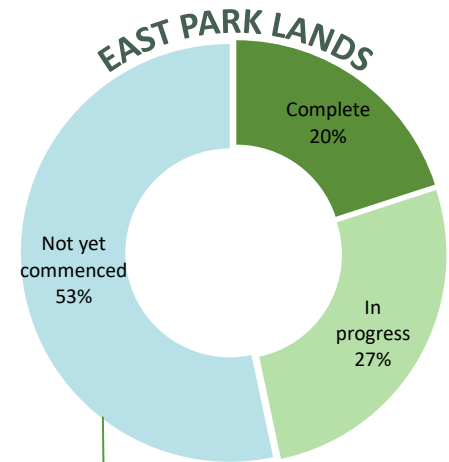
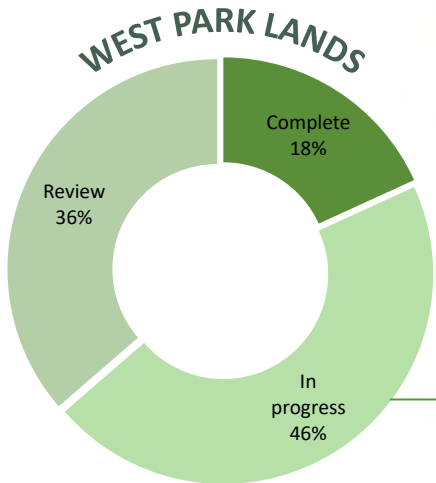
- Brown Hill Keswick Creek wetlands
- Rymill Lake & Botanic Creek improvements
- Protection and enhancement of remnant vegetation
- Skate Park in Gladys Elphick Park / Narnungga (Park 25)
- North-South bikeway through the Park Lands.



# AUDIT OF ACTIONS

For each precinct

135

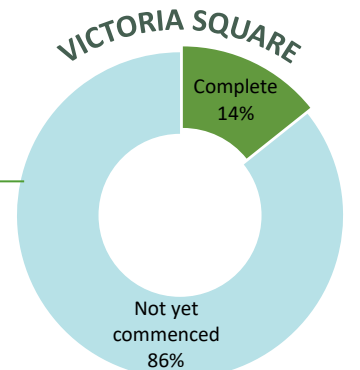
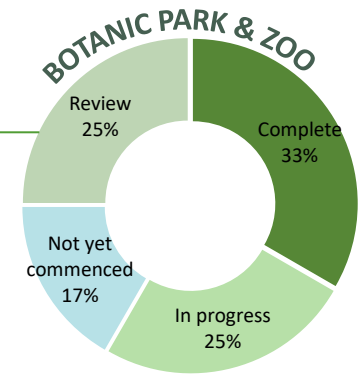
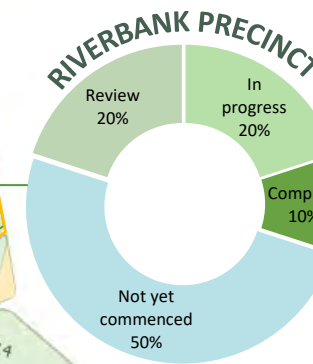
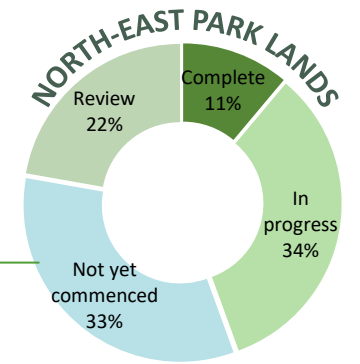
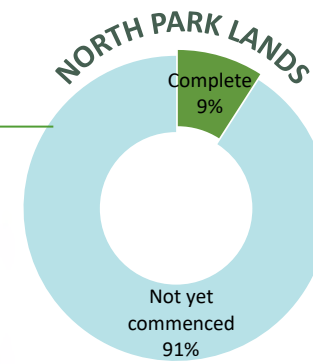
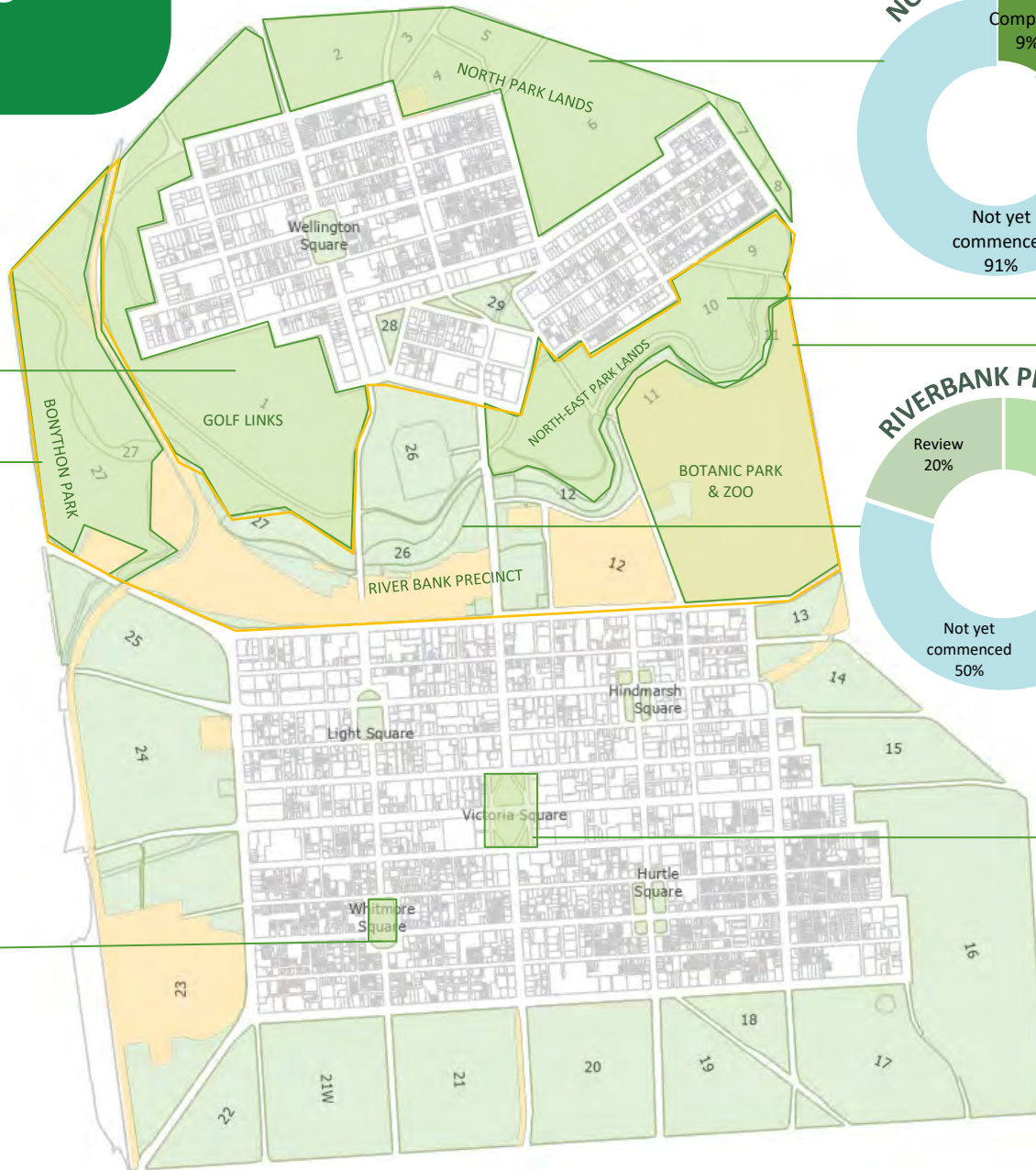
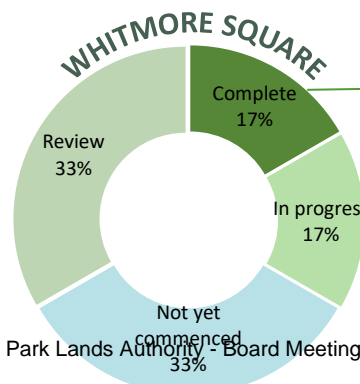
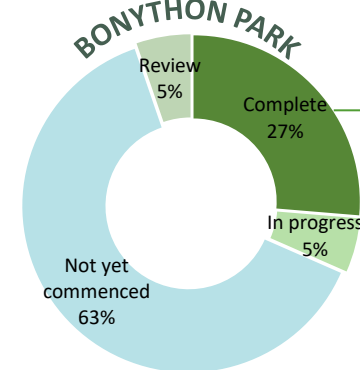
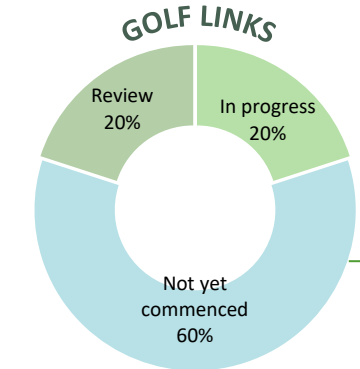




# AUDIT OF ACTIONS

For each precinct

136





# AUDIT OF ACTIONS

Tasks not commenced or requiring review

137

Many of these actions remain 'worthy ideas' but have not been implemented for various reasons.

## Examples of actions requiring review

- Connection over rail corridor to western Park Lands – **scale and cost make it difficult to implement**
- Enhance the Plateau in Ellis Park / Tampawardli (Park 24) as an events site – **requires a study to determine what is required to make it successful**
- Remove fencing and revitalize tram corridor along Peacock Rd – **Department for Infrastructure and Transport has advised not feasible from a safety perspective**
- Create fenced dog park in Josie Agius Park / Wikaparntu Wirra (Park 22) – **validity has subsequently been questioned and community support is not apparent**
- Create a recreational hub to service existing WCH in Peace Park – **WCH to move**
- Land bridge across rail lines from Golf Course to Bonython Park / Tulya Wardli (Park 27) – **scale and cost make it difficult to implement**
- Footbridge over Glover Avenue between Parks 24 and 25 - **scale and cost make it difficult to implement**
- Integrate the existing Glover playground into Lefevre Park / Nantu Wama (Park 6) – **medium priority overtaken by higher priorities**
- Improve connections to the Central Market Precinct in Victoria Square / Tarntanyangga – **awaiting funding for Victoria Square stage two**
- Link the Park Lands to the Squares (green street connections) – **requires clarity but improved street tree plantings are ongoing**



### Examples of actions not yet commenced

- Create an urban address along Greenhill Road – **major project requiring significant funding (but could be staged)**
- Provide a promenade between War Memorial Drive and Strangways Terrace through the Golf Course – **major project requiring significant funding**
- Provide walking trails and boardwalks along and over the River Torrens / Karrawirra Pari – **will form part of the Karrawirra Pari wetlands project (in design stage)**
- Provide more opportunities to access and interact with the River Torrens / Karrawirra Pari – **will form part of the Karrawirra Pari wetlands project (in design stage)**
- Re-imagine East Terrace (create urban address) – **low priority**
- Address the drainage channel on the south-western side of Glen Osmond Rd – **medium priority which is being considered as part of other stormwater works in the precinct**



# Current Park Lands Priorities

## Development & Potential Investment 2021 — 2022

### General (no specific location)

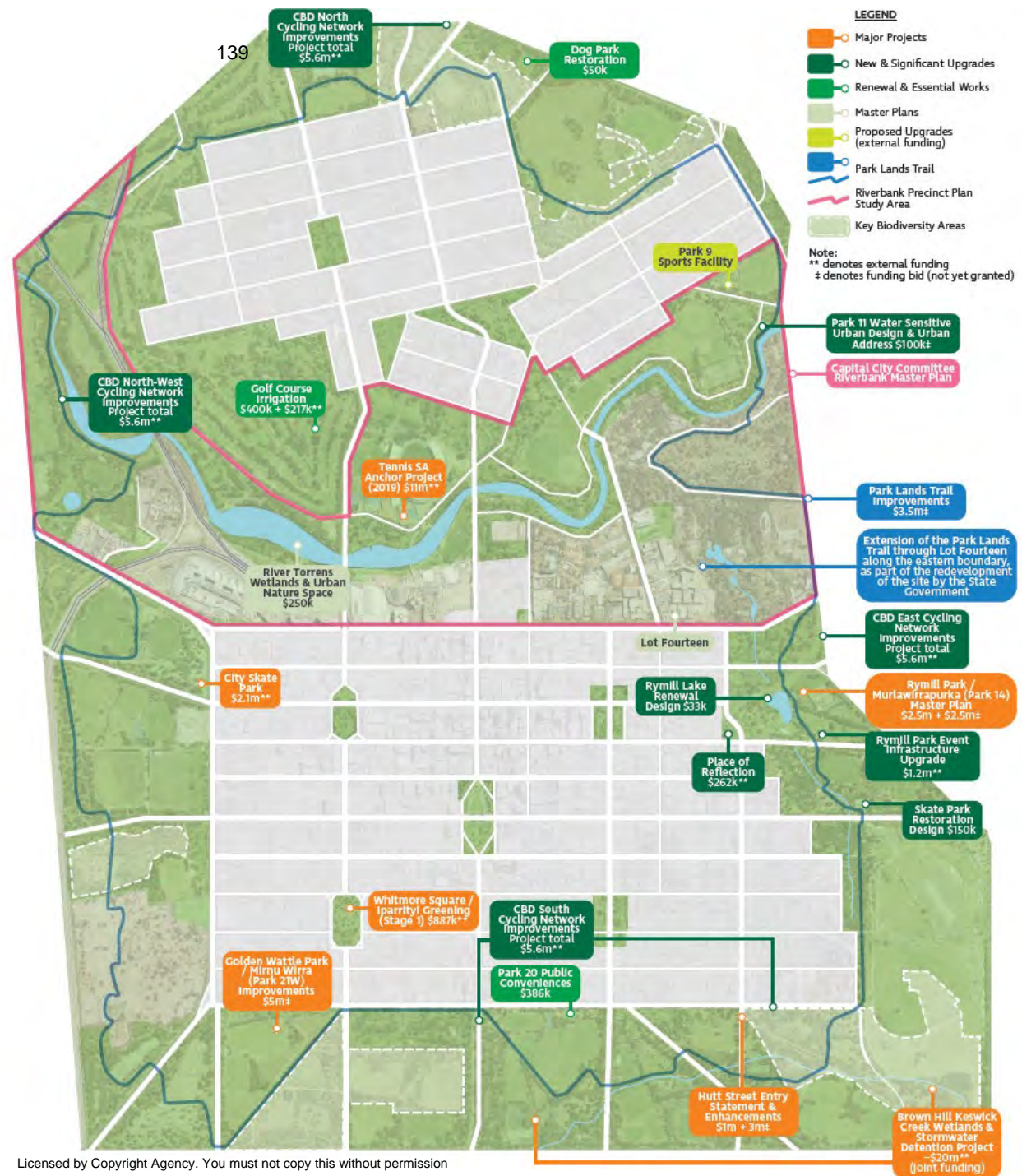
- 🌳 Kaurna Cultural Mapping
- 🌳 Recreation & Sports Grants ~\$12k granted so far
- 🌳 Wayfinding & interpretive signage
- 🌳 World Heritage Listing (Adelaide Park Lands & City Layout and Mount Lofty Ranges)

### Asset Renewals

- 🌳 Public art \$61k
- 🌳 Buildings, structures, bridges & walls \$700k
- 🌳 Lighting & electrical \$1.13m
- 🌳 Garden beds & landscapes \$50k
- 🌳 Urban elements \$91k
- 🌳 Roads & footpaths \$1.18m
- 🌳 Water infrastructure \$791k

### Total Park Lands expenditure by CoA including external funding

- 🌳 2020/21 financial year \$34.6m
- Adelaide Park Lands Authority - Board Meeting Agenda - 28 October 2021 (includes asset depreciation costs)





- Feedback from Community Forum 23 October (to be analysed and provided in a separate report)
- Re-examine / refine existing policies – first half 2022
- Develop a new set of priorities – second half of 2022 and beyond

