ATTACHMENT G – TMK STORMWATER INVESTIGATIONS

TMK Consulting Engineers

ADELAIDE | MELBOURNE | RIVERLAND

2102002_SMR-D
1 March 2022

STORMWATER MANAGEMENT REPORT

PROPOSED CODE AMENDMENT
FORMER METCASH SITE
ALLOTMENT 301 in F6069 & ALLOTMENT 401 in D19661
KIDMAN PARK SA 5025

prepared for

FAIRLAND GROUP PTY LTD

Our Ref: 2102002_SMR-D <CAT/bjh>
1 March 2022

Fairland Group Pty Ltd
19 Fullarton Road
KENT TOWN SA 5067

ATTENTION: SCOTT SEARLE Email: scotts@fairland.com.au

Dear Scott,

RE: STORMWATER MANAGEMENT REPORT
PROPOSED CODE AMENDMENT
FORMER METCASH SITE
ALLOTMENT 301 in F6069 & ALLOTMENT 401 in D19661
KIDMAN PARK SA 5025

TMK Consulting Engineers is pleased to present a PDF copy of our Stormwater Management Report for the above project. This report has been prepared to comply with the following relevant SAA Standards and Guides:

- ARRB Special Report 35: *Subsurface drainage of road structures*;
- Australian Rainfall and Runoff, Volumes 1 & 2: *A guide to flood estimation*;
- Australian Runoff Quality: *A guide to water sensitive urban design*;
- Storm Drainage Design in Small Urban Catchments: *A handbook for Australian practice;*
- *Water Sensitive Urban Design (WSUD) Technical manual for the greater Adelaide region*;
- *Urban Stormwater Best Practice Environmental Management Guidelines.*

This report must be read in conjunction with all attachments. Changes to the design or construction must not be made without further written advice from the Engineer.

This report is valid for a period of 24 months, based on current standards and regulations.

If you require further information or clarification regarding any aspect of this report, please do not hesitate to contact the undersigned.

For and on behalf of
TMK Consulting Engineers

CARLO TALLADIRA
Senior Associate / Civil Team Leader

DISTRIBUTION

Document Issue	Copy detail	Issued to	Issue date
2102002_SMR-A	1 x PDF	Fairland Group Pty Ltd	4 November 2021
2102002_SMR-B	1 x PDF	Fairland Group Pty Ltd	17 November 2021
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2102002_SMR-D	1 x PDF	Fairland Group Pty Ltd	1 March 2022

CONTENTS

1 INTRODUCTION

This report details the stormwater management strategies for the proposed rezoning (code amendment) located at the former Metcash site & adjoining commercial tenancies at 5 & 7 Valetta Road, Kidman Park ("the Affected Area"). The proposed re-zoning seeks to create a new residential precinct within the subject site including the creation of 227 allotments, several reserves and an internal local road network[1] connecting in with the surrounding area. The stormwater concept plan contained within **Appendix A** of this report has been developed in accordance with the *City of Charles Sturt* (Council) *Land Infrastructure Guidelines*[2] and based on further correspondence with Authorities[3] regarding the subject site.

1.1 Overview

Situated on the corner of Valetta Road & Findon Road in Kidman Park, the subject site covers a total area of approximately 12.6ha and was previously being utilized as commercial / industrial land consisting of predominantly impervious roof and sealed asphalt surfaces (refer Figure 1 – Site Aerial View).

FIGURE 1 - SITE AERIAL VIEW (SOURCE: LOCATIONSAMAPVIEWER)

1.2 Existing Stormwater Drainage Network

In its pre-developed state, the site grades from the south to the north at approximately 0.3%. There are however two distinct catchments draining via an existing internal stormwater network to both the north and to the south. It has been identified from the detail & level survey that there are multiple locations currently accepting stormwater discharge from the site[4].

The existing northern catchment is made up of both pervious and impervious surfaces that are collected by a private internal stormwater network made up of downpipes from roof gutters, surface inlet pits and underground pipes before ultimately discharging via a Ø750 pipe to the existing Council stormwater network located on Valetta Road. It has been identified by Council that the existing network is at capacity[5], hence cannot receive any additional stormwater runoff. The southern catchment is almost entirely impervious and is also collected by a private internal stormwater network made up of downpipes from roof gutters, surface inlet pits and underground pipes before ultimately discharging via multiple Ø450 - Ø900 pipes to the River Torrens.

[1] Proposed Plan of Division – 20A3103CONCEPT(L) (*Alexander Symonds,* October 2021).
[2] City of Charles Sturt Infrastructure Guidelines – Revision 4 (*City of Charles Sturt,* October 2019).
[3] Refer Appendix B – Correspondence
[4] Detail & Level Survey – 20A3103 DETAIL(B) MGA20P (*Alexander Symonds,* June 2021)
[5] Refer Appendix B – *Correspondence* (email dated: 28/10/21 Gronthos,J)

An assessment of Council's floodplain mapping identifies minor flooding (approx. 0.1m) at the north-eastern corner of the site (refer Figure 2 – Floodplain Mapping).

FIGURE 2 - FLOODPLAIN MAPPING (SOURCE: INTRAMAPS.CHARLESTURT.SA.GOV.AU)

2 STORMWATER OBJECTIVES AND STRATEGIES

2.1 Stormwater Objectives

The objective of the report is to demonstrate how stormwater runoff would be captured and conveyed from the subject site safely to the receiving drainage network while considering stormwater quality management and the incorporation of Water Sensitive Urban Design (WSUD) elements.

2.2 Stormwater Management Strategies

The stormwater management strategies discussed within this report have been prepared in accordance with *City of Charles Sturt Land Infrastructure Guidelines* and site specific advise provided by Council and *Green Adelaide*[6]. The overarching design requirement is to provide a minor and major drainage system to ensure that post-development flows from the proposed re-zoning (an anticipated likely yield) are captured and conveyed safely to receiving downstream networks.

The minor system will comprise of a conventional underground drainage system connecting directly into Council's existing stormwater drainage network capable of conveying the 1 in 5 year ARI rainfall event. The major system will utilize the road reserve as an overland flow path to safely convey flows that exceed the capacity of the minor system up to and in including the 1 in 100 year ARI rainfall event. Both drainage systems shall ensure that the limit of downstream drainage infrastructure is not exceeded.

In keeping with the current site discharge conditions, it is proposed that future development of the southern catchment utilize the existing outlets to the River Torrens. A condition assessment report would be undertaken during detailed design phase in order to determine the condition of any existing stormwater infrastructure proposed for re-use. If it is deemed by visual and CCTV inspection that the existing infrastructure is not up to current standards and works are required to remediate/replace stormwater infrastructure and/or improve erosion controls then the developer will require a Water Affecting Activity permit from Green Adelaide in order to undertake the works. Additional measures to minimize ongoing maintenance and improve outlet conditions, such as; reducing the amount of outlet locations and improving scour protection measures can be determined once detailed stormwater modelling is undertaken and findings from the condition assessment report are available.

[6] Refer Appendix B – *Correspondence* (email dated: 15/11/21 Stokes,M)

2.2.1 The Conventional Underground Drainage System

Stormwater runoff from the proposed development would be routed through a conventional underground drainage system comprising of Side Entry Pits (SEP), Junction Boxes (JB), Grated Sumps (GS), Reinforced Concrete Box Culverts (RCBC), Reinforced Concrete Pipes (RCP), unplasticized PolyVinyl Chloride pipes (uPVC) and Headwalls (HW) in accordance with Council specifications.

2.2.2 Flood Management

Flood protection measures including defined overland flow paths are planned to convey any gap flows due to seismic waves and other hydraulic factors including system blockage. Further investigation of the proposed system will be undertaken during the detail design stage of a future land division application once the land is rezoned and the proposed stormwater drainage system would be designed to provide sufficient capacity for both performance levels defined as the minor / major drainage system in accordance with Council design guidelines.

The minor system will be designed to accommodate the 1 in 5 year ARI rainfall event with a minimum freeboard of 150mm maintained between the hydraulic grade level (HGL) in a stormwater pit and the gutter invert level. The major system will be designed, as per Council requirements, so that no inundation of private land occurs as a result of a 1 in 100 year ARI rainfall event and the gap flows are conveyed within defined overland flows paths including roadways and reserves within the development.

2.2.3 Diversion Swales and Temporary Sedimentation Basins during Construction

Temporary measures for stormwater pollution and erosion control will be implemented within the development to ensure that pollutants are trapped prior to exiting the site or entering the existing drainage system and to prevent initial contamination of stormwater from roadside pollution during construction. This is achieved through the provision of silt fences, sedimentation basins, hay bale barriers and shaker pads. Soil Erosion and Drainage Management Plans (SEDMP) will be submitted to Council as part of detailed engineering design for each stage of the development.

2.3 Water Sensitive Urban Design (WSUD)

At source WSUD elements are proposed to manage the quality of stormwater runoff from the post-developed catchments. The stormwater treatment objectives for this development, as listed below and in accordance with *Environment Protection Authority* (EPA) water quality improvement guidelines are to remove the following percentages of pollutants from the annual urban load:

- 80% reduction of Total Suspended Solids (TSS) from a typical urban annual pollutant load.
- 60% reduction of Total Phosphorus (TP) from a typical urban annual pollutant load.
- 45% reduction of Total Nitrogen (TN) from a typical urban annual pollutant load.
- 90% reduction of litter and Gross Pollutants (GP) from a typical urban annual pollutant load.

WSUD elements proposed to achieve the water quality improvement targets for this development are summarized below. Further details will be provided during detailed engineering design.

2.3.1 Bio-filtration Tree Pits

Bio-filtration tree pits are proposed as part of the landscaped streetscape to capture to treat runoff from inconsequential rainfall events (i.e. 1 year ARI) through the bio-filtration process whilst also providing a valuable water source for street trees within the urban environment. Bio-filtration tree pit locations have been shown indicatively on the *Stormwater Concept Plan* to demonstrate typical locations; the exact amount and location of tree pits would ultimately be determined as part of detailed design of the land division and subject to coordination with other services and disciplines (e.g. building envelope plans and landscape streetscape plans) as required to achieve the WSUD reduction targets.

2.3.2 Infiltration Zones

In addition to biofiltration tree pits; infiltration tree pits are proposed as part of the landscaped streetscape to capture to treat runoff from inconsequential rainfall events (i.e. 3 month ARI) through the infiltration process. Unlike bio-filtration tree pits; infiltration tree pits retain the captured stormwater runoff providing a valuable water source for street trees within the urban environment. Infiltration zones are a low maintenance alternative and are ideal for street trees that cannot be provided with a bio-filtration tree pit due to spatial requirements or service clashes.

2.3.3 Raingardens

Raingardens (bio-retention systems) strategically placed throughout the development are proposed as a secondary treatment measure for the removal of soluble contaminants. Plants species known for their performance in nitrogen removal and bio-filtration applications will be determined as part of detailed design and incorporated into the landscaping design. Raingarden locations have been shown indicatively on the *Stormwater Concept Plan* to demonstrate how they are utilised; the exact amount and location of raingardens would be determined as part of detailed design of the land division and subject to coordination with other services and disciplines (e.g. building envelope plans and landscape streetscape plans) as required to achieve the WSUD reduction targets.

2.4 Detention Requirements

Site specific stormwater detention requirements have been identified through correspondence with Council. As the proposed discharge location for the northern catchment on Valetta Road is at capacity, it is a requirement of future development to ensure that post-development flows from the major 1 in 100 year ARI rainfall event are restricted to pre-development 1 in 5 year ARI rates[7]. To facilitate the detention requirements, it is proposed that the volume is detained via an on-site detention basin and oversized pipe network whilst commercial/retail allotments will be responsible for providing on-site detention specific to their build forms to be assessed by Council as part of the individual development applications.

Detention requirements for the southern catchment have been eased[8] due to the proximity to River Torrens and net reduction in stormwater discharge resulting from the reduction in previous area proposed.

2.5 Stormwater Concept Plan

A *Stormwater Concept Plan* has been prepared in order to illustrate the stormwater management strategies discussed above. The preliminary stormwater layout has been undertaken to demonstrate functionality of the likely future development once rezoned with respect to the proposed allotment plan and surrounding areas and will be further developed during detailed engineering design considering the location of other services within the proposed development. Refer to **Appendix A** of this report for further details.

3 STORMWATER MODELLING AND ASSESSMENT

Total site discharges are modeled as described in *Storm Drainage Design in Small Urban Catchments, a handbook for Australian practice* by John Argue & *Australian Rainfall and Runoff (ARR87) Book Eight - Urban Stormwater Management*. DRAINS ILSAX Hydrological Model was used for the hydrological and hydraulic modeling and analysis of the subject site.

3.1 DRAINS

DRAINS is a multi-purpose windows program for designing and analyzing various types of urban stormwater drainage systems and catchments. DRAINS can model drainage systems at all scales, from very small to very large. It simulates the conversion of rainfall patterns to stormwater runoff hydrographs and routes these through networks of pipes, channels and streams integrating;

- Design and analysis tasks,
- Hydrology and hydraulics,
- Closed conduit and open channel systems,
- Culverts and bridges,
- Stormwater detention systems,
- Large scale urban and rural catchments and
- Overflow elements, which provide paths for flows in the stormwater system once the capacity of the pipe system is exceeded.

The ILSAX hydrological model is the main model used to simulate the operation of urban stormwater drainage systems in DRAINS. It comes from the ILSAX program (O'Loughlin, 1993), which in turn was based on ILLUDAS and the TRRL method. This model uses time-area calculations and Herten Infiltration procedures to calculate flow hydrograph and sub-catchments. The various sub-catchments' flows are combined and routed through a pipe and channel system. Calculations are performed at specified times after the start of each storm, using small time intervals, one minute or less. At each time step, a hydraulic grade line analysis is performed throughout the drainage network determining flow and water levels.

[7] Refer Appendix B – *Correspondence* (email dated: 28/10/21 Gronthos,J)
[8] Refer Appendix B – *Correspondence* (email dated: 28/10/21 Gronthos,J)

The DRAINS model parameters selected for use are as follows:

- Residential sub-catchments modeled as 80% impervious / 20% impervious areas directly connected to underground stormwater infrastructure.

- DRAINS ILSAX hydrological loss model parameters have been adopted based on a typical urban environment.
  - Initial losses;
    - Paved = 1mm
    - Grassed = 10mm
  - Soil Type = 3
  - Antecedent Moisture Condition (AMC) = 3

- The stormwater drainage system has been designed using *Bureau of Meteorology* (*BoM*) published rainfall data as a minor / major system to accommodate the 5 / 100 year Average Recurrence Interval (ARI) rainfall events. As *ARR2019* procedures have been adopted the following terminology now applies to design storm events and rainfall occurrences:
  - Minor – 1 in 5 year ARI rainfall event = 0.2 EY average number of exceedances per year (EY)
  - Major – 1 in 100 year ARI rainfall event = 1% annual exceedance probability (AEP)

3.2 MUSIC

Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software will be used to determine the treatment potential of the proposed treatment train for the proposed development. MUSIC is Australia's leading tool for water sensitive urban design modeling and assessment and can be used to model a wide range of treatment devices in order to identify the best way to capture and treat stormwater runoff from the built environment.

MUSIC Modelling will be undertaken, as part of detailed engineering design, in accordance with the *Water Sensitive Urban Design Greater Adelaide Region Technical Manual* and typical urban pollutant loading generation from the *Guidelines for Pollutant Export Modeling* found in the MUSIC User Guide in order to simulate developed conditions and treatment train potential for this development.

4 RESULTS OF ANALYSIS

4.1 Pre-Development Flow Calculations

Pre-development flow rates have been calculated using the *Bransby-Williams Equation* to determine the Time of Concentration and DRAINS in order to determine the existing site discharge rate. A summary of the pre-development discharge flow rates is shown in **Table 1** below.

TABLE 1: PRE-DEVELOPMENT FLOW RATES

Catchment Area (ha)	**Time of Concentration** (min)	**Pre-Developed Site Discharge Rate** (m^3/sec)	
		5 year ARI	**100 year ARI**
Northern (3.376)	10	**0.323**	**0.858**
Southern (8.540)		**1.193**	**2.745**

Refer to ***Appendix C*** – *DRAINS Model Calculations* for further details.

4.2 Post Development Flow Calculations

Post-development flow rates have been calculated using DRAINS in order to determine the detention volume required to mitigate discharge from the post-development 1 in 100 year ARI rainfall event from the northern catchment to pre-development 1 in 5 year ARI rates. A summary of the post-development discharge rates and required detention volume is shown in **Table 2** below.

TABLE 2: DRAINS MODEL RESULTS SUMMARY

Catchment Area (ha)	**Post-Development Site Discharge Rate**				
	Minor 5 year ARI (m^3/sec)		**Major 100 year ARI** (m^3/sec)		**Maximum Detention Volume Required to Reduce Undetained Site Discharge Rate** (m^3)
	Undetained	**Detained**	**Undetained**	**Detained**	
Northern (3.376)	0.410	**0.163** < Pre	0.991	**0.323** = Pre	650
Southern (8.540)	**1.038** < Pre	n/a	**2.507** < Pre	n/a	n/a

Refer to **Appendix C** – *DRAINS Model Calculations* for further details.

The post-development flow calculations demonstrate that the requirements for future development (once rezoned) can be readily accommodated within the subject site via the use of conventional stormwater infrastructure and best practice engineering methods.

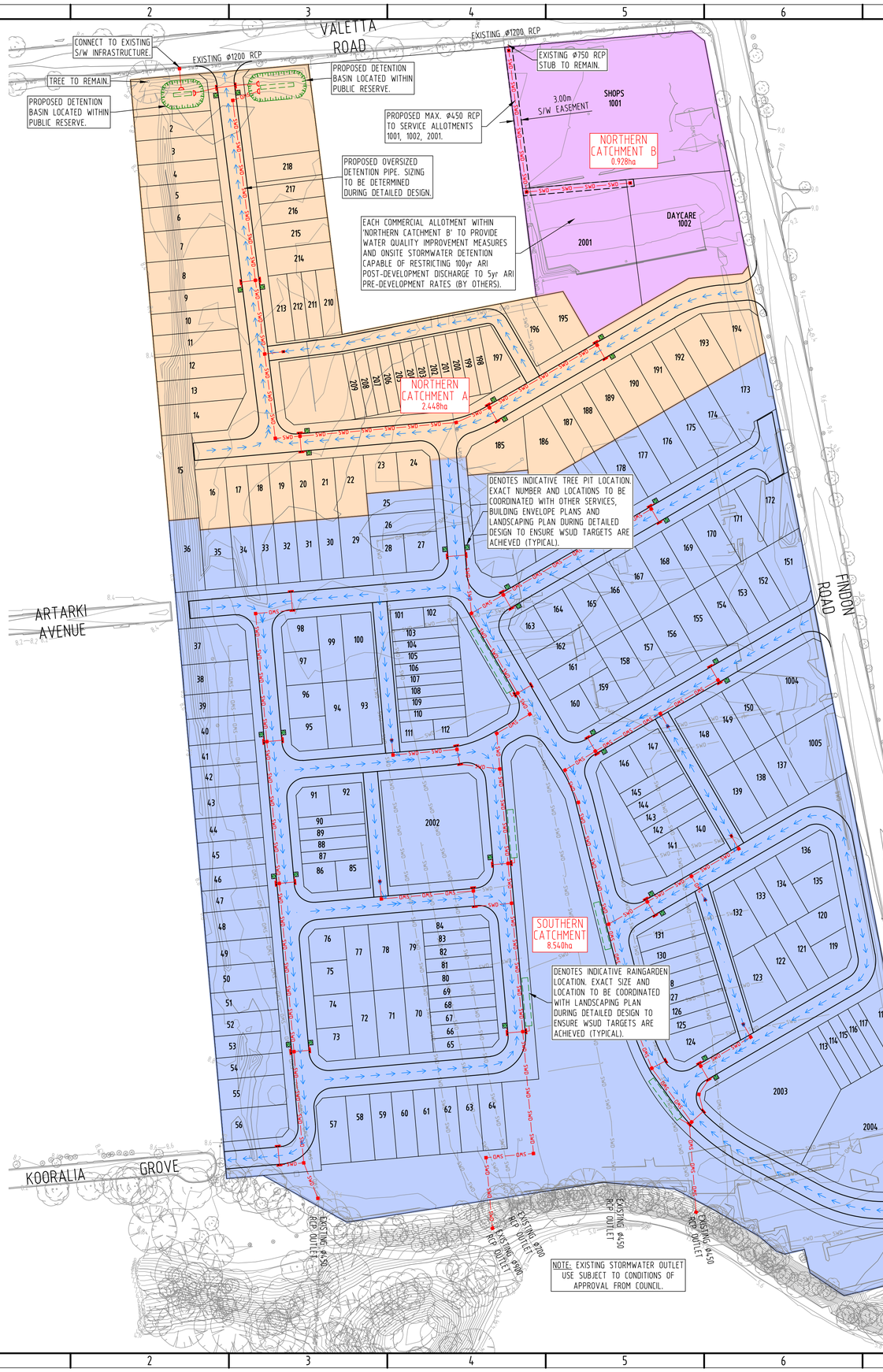
5 CONCLUSION

Future development of the rezoned land will in its post-developed state be drained by the construction of a conventional pit and pipe network designed to cater for the minor / major flows generated by stormwater runoff from allotments and road reserves within the site. The proposed drainage network will be located within road reserves and open space reserves before discharging into the existing drainage systems currently servicing the site in accordance with current *Council* & *Green Adelaide* requirements.

Whilst the overall re-development (once rezoned) will result in a net reduction in impervious area it has been identified by *Council* that the existing Valetta Road network is at capacity, hence on-site detention is required to ensure that the post-development site discharge rate for the major 1 in 100 year ARI rainfall event does not exceed the pre-development 1 in 5 year ARI event discharge rate for the portion of the proposed development draining to the north. It is proposed that a combination of an on-site detention basin and oversized pipe network will provide the detention capacity required to reduce the burden on the existing drainage network.

In order to mitigate the environmental impacts of future development, significant WSUD measures will be provided as part of future development for the treatment of stormwater runoff generated by the proposed development in order to achieve *Council, EPA* & *Green Adelaide* water quality improvement targets. Forming part of the streetscaped urban landscape and overall stormwater quality treatment train, biofiltration & infiltration tree pits as well as raingarden bioretention systems will be strategically placed throughout the development to capture and treat at source runoff from the street kerb & gutter before draining clean water back into the underground stormwater network.

APPENDIX A: Stormwater Concept Plan

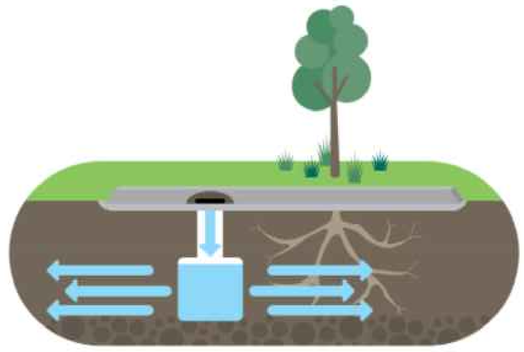


LEGEND

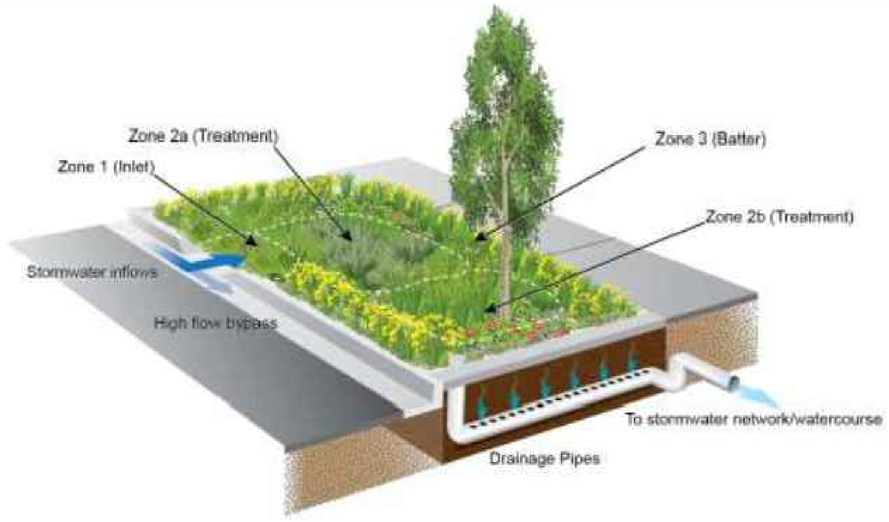
- EXISTING CONTOUR (0.2m INTERVALS)
- SWD — EXISTING STORMWATER PIPE
- SWD — PROPOSED STORMWATER PIPE
- PROPOSED JUNCTION BOX (JB)
- PROPOSED GRATED SUMP (GS)
- PROPOSED HEADWALL (HW)
- PROPOSED SIDE ENTRY PIT (SEP)
- PROPOSED OVERLAND FLOW DIRECTION
- P1-A 808m² — STORMWATER CATCHMENT AREA NO. STORMWATER CATCHMENT AREA
- PROPOSED STORMWATER CATCHMENT BOUNDARY

GENERAL NOTES:

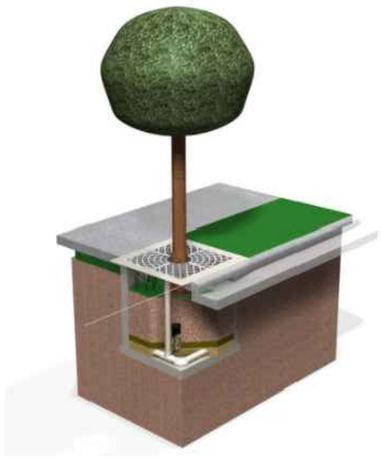
- DRAWING IS TO BE VIEWED IN CONJUNCTION WITH THE STORMWATER MANAGEMENT REPORT 2102002_SMR-A.
- REFER TO SURVEY FOR ADDITIONAL INFORMATION - A&S DRAWING No. 20A3103 DETAIL(B).
- ROAD LAYOUT & PIT/PIPE NETWORK ARE PRELIMINARY ONLY FOR THE PURPOSES OF PLANNING AND SUBJECT TO FURTHER DETAILED DESIGN ON A STAGED CONSTRUCTION BASIS.



TYPICAL KERB SIDE INLET & SUBSURFACE STREET TREE INFILTRATION LAYOUT



TYPICAL KERB SIDE RAINGARDEN BIO-FILTRATION LAYOUT



TYPICAL KERB SIDE TREE PIT BIO-FILTRATION LAYOUT

1:1000 @ A1
0 10 20 30 40 50m

PB	FOR INFORMATION PURPOSES	BJH	CAT	08.02.22
PA	FOR INFORMATION PURPOSES	BJH	ST	04.11.21
No.	REVISION	DRAWN	CHE'KD	DATE

PROJECT
PROPOSED LAND DIVISION
FORMER METCASH SITE
KIDMAN PARK SA 5025
FOR FAIRLAND GROUP PTY. LTD.
DEVELOPMENT No.

DRAWING TITLE
STORMWATER CONCEPT PLAN

Civil – Geotechnical
Environmental – Structural
Mechanical – Electrical
Fire – Hydraulics
Forensic – Construction Assist
Level 6, 100 Pirie Street
Adelaide SA 5000
Telephone 08 8238 4100
Facsimilie 08 8410 1405
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ACN 062 965 888 / 008 080 046

SCALES	AS SHOWN
DRAWN	MMA
DATE	OCTOBER 2021
ENGINEER	ST
CHECKED	CAT

DRAWING No.
2102002-C100/PB

APPENDIX B: Correspondence

From: Jim Gronthos <jgronthos@charlessturt.sa.gov.au>
Sent: Thursday, 28 October 2021 7:33 AM
To: Zoe Garnaut <zgarnaut@ekistics.com.au>
Cc: James Cursaro <jcursaro@charlessturt.sa.gov.au>; Chris Bentick <cbentick@charlessturt.sa.gov.au>
Subject: RE: Kidman Park - Preliminary Concept Plan

Hi Zoe,

Preliminary feedback on the concept from Council's Traffic and Stormwater Engineers.

Stormwater

- *Stormwater detention can be eased as the site is located adjacent the Torrens.*
- *Require significant WSUD throughout the development.*
- *Seeking improvements to water quality prior to discharge.*
- *Section proposed to drain to Valetta Road, CCS standard detention requirements of post 1 in100 down to pre 1 in 5 must be achieved as the drain in Valetta Road is already at capacity.*

Traffic

- *Single access in Valetta Road and 3 accesses in Findon Road are acceptable.*
- *Connection to Kooralla Grove acceptable for existing and future residents – provide greater permeability – gauge feedback through consultation.*
- *Located in a secluded and isolated location that it is likely to be used predominantly by local traffic, particularly if one considers that Kooralla Grove has no road connections to the west of the Office of Recreation and Sport site.*
- *Concerns with the southernmost connection in Findon Road and the likelihood that it will attract cut-through traffic between Findon Road and Valetta Road. Its intersection angle and road alignment almost invites northbound traffic in Findon Road seeking access to Valetta Road to veer left to cut through the Development. Require information from CIRQA to provide travel time analysis on this route vs turning left at the Valetta Road / Findon Road signals, particularly in peak hours.*
- *Assuming traffic volumes through this 'mini collector' reach the upper limits for a local street, then we would like to see an appropriate street design to reduce through traffic speeds to manage the risk associated with these traffic volumes. This means a narrow carriageway, tight intersection geometry and pedestrian priority near retail/cafés, etc. Consider Victoria Terrace in Walkerville as an example for narrow local street between the River Torrens Linear Park and retail sites.*

- *Concerns about the central intersection in Findon Road and the likelihood that it will attract cut-through traffic between Hartley Road, Gerard Road and Valetta Road, as well as the northern intersection in Findon Road and the likelihood that it will attract cut-through traffic between Valetta Road, Gerard Road and Hartley Road. Council will require some travel time analysis based on existing and projected delays at nearby arterial intersections.*
- *Seeking information from CIRQA on what is proposed for the upgrade of the signals at the intersection of Findon Road and Valetta Road as a result of this proposed Code Amendment.*
- *General street layout considered orderly, with generously landscaped local streets and laneways providing rear loading for townhouses.*
- *Streetscape perspective considered legible.*
- *Preference to extend a shared use path connection through the central reserve and then along the western side of the mini collector (or at least a 2m footpath), north to Valetta Road to create a continuous all-ages-and-abilities cycling connection between the River and Valetta Road.*
- *Desire for stairs at the Findon Road end to be a DDA ramp down to the Torrens shared path.*

Thank you and kind regards

Jim Gronthos
Senior Policy Planner
Urban Projects

72 Woodville Road, Woodville
T: (08) 8408 1265 F: (08) 8408 1122
www.charlesturt.sa.gov.au

Go Green - Think before you print.
This initiative forms part of our environmental plan

From: Zoe Garnaut <zgarnaut@ekistics.com.au>
Sent: Wednesday, 27 October 2021 3:18 PM
To: Jim Gronthos <jgronthos@charlessturt.sa.gov.au>
Subject: RE: Kidman Park - Open Space

Hi Jim,

I forgot to mention in our conversation yesterday – was there any update on open space for the Kidman Park Code Amendment as per the email below?

Kind regards,

Zoë Garnaut
Associate

ekistics

Level 1, 16 Vardon Avenue, Adelaide SA 5000

P 08 7231 0286
M 0411 805 528
W ekistics.com.au

Please note my office hours are Tuesdays, Wednesdays and Thursdays

From: "Stokes, Martin (DEW)" <Martin.Stokes@sa.gov.au>
Date: 15 November 2021 at 1:57:20 pm ACDT
To: Aleck Whitham <aleckw@fairland.com.au>
Cc: "Awbery, Jenny (DEW)" <Jenny.Awbery@sa.gov.au>, "Smith, De-Anne (DEW)" <De-Anne.Smith@sa.gov.au>
Subject: RE: Kidman Park - residential proposal on industrial land - stormwater into River Torrens question [SEC=OFFICIAL]

OFFICIAL

Hi Aleck,

As discussed on the telephone, I confirm that no Water Affecting Activity approval is required from Green Adelaide to retain the existing outlets, provided no physical works are proposed at those locations or in the river bed or on the river banks at those discharge points.

As you are working with the EPA regarding the quality of the water prior to discharge, there is no requirement to gain additional approval from Green Adelaide or DEW for this aspect of the proposal.

If at any point in the process physical works are proposed at any of the outlet points, I suggest you make contact with me again to check if any permitting requirements are activated

Regards

Martin Stokes
Team Leader Water Allocation Planning
Green Adelaide
Department for Environment and Water
M 0428 840 898
81-95 Waymouth Street, Adelaide 5000

Join us to create a cooler, greener, wilder and climate-resilient Adelaide.

From: Stokes, Martin (DEW) <Martin.Stokes@sa.gov.au>
Sent: Friday, 12 November, 2021 4:33 PM
To: aleckw@fairland.com.au
Cc: Awbery, Jenny (DEW) <Jenny.Awbery@sa.gov.au>
Subject: Fw: Kidman Park - residential proposal on industrial land - stormwater into River Torrens question [SEC=OFFICIAL]

Hi Aleck.

De-Anne passed your query onto me.

I would like to discuss it with a couple of colleagues early next week to ensure you get thorough feedback re any involvement DEW/Green Adelaide might need to have in the process.

Either myself or one of my colleagues will call you back once we have had the chance to discuss internally.

Regards

Martin Stokes
Team Leader Water Allocation Planning
Green Adelaide
Department for Environment and Water
M 0428 840 898
81-95 Waymouth Street, Adelaide 5000

Join us to create a cooler, greener, wilder and climate-resilient Adelaide.

From: Aleck Whitham <aleckw@fairland.com.au>
Sent: Thursday, 11 November, 2021 9:48 AM
To: Smith, De-Anne (DEW) <De-Anne.Smith@sa.gov.au>
Subject: Kidman Park - Contact details

Hi De-Anne,

Thanks for taking my phone call.

Our company has recently purchased the old Metcash site in Kidman Park, with the intention to redevelop this site into residential housing. Image below of the site location.

Currently the stormwater from the site is discharged directly into the Karrawirra Parri via a series of stormwater outlets. We plan to retain the existing outlets but will include upstream water quality measures to clean the water prior to discharge as per EPA and council requirements.

Can you please direct me to the suitable person that can confirm that we are able to retain the existing outlets to the river and who we need to coordinate with during this project?

Regards

Aleck Whitham
Development Manager

Fairland

Fairland Group Pty Ltd
19 Fullarton Road, Kent Town SA 5067

Direct: 0408 837 961
Email: aleckw@fairland.com.au
Phone: (08) 8112 3133
Web: https://fairland.com.au/

RLA 274625

APPENDIX C: DRAINS Model Calculations

JOB NUMBER:	2102002
DATE:	NOV' 2021
PAGE:	CAT NTH
DESIGN:	BJH

Determine Time of Concentration (Tc)

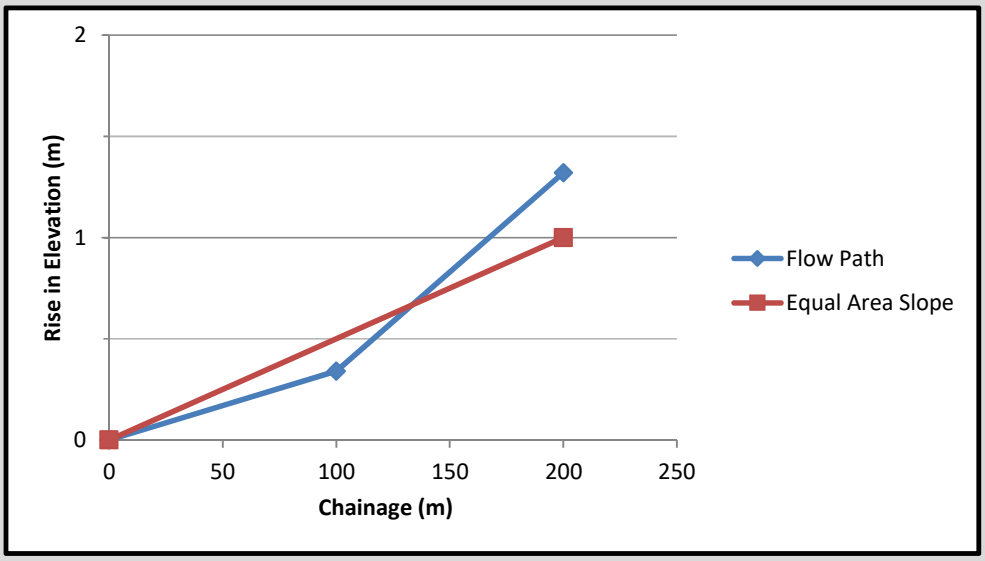
Bransby-Williams Equation (ARR1987)

$$T_c = \frac{F \cdot L}{A^{0.1} \cdot S_e^{0.2}}$$

Factor (F) =	**92.7**	(conversion for ha)
Length (L) =	**0.2**	km
Area (A) =	**3.376**	ha
Slope (S_e) =	**5.000**	m/km
Tc =	**11.9**	min
Adopt Tc:	**10**	**min**

Equal Area Slope (S_e)

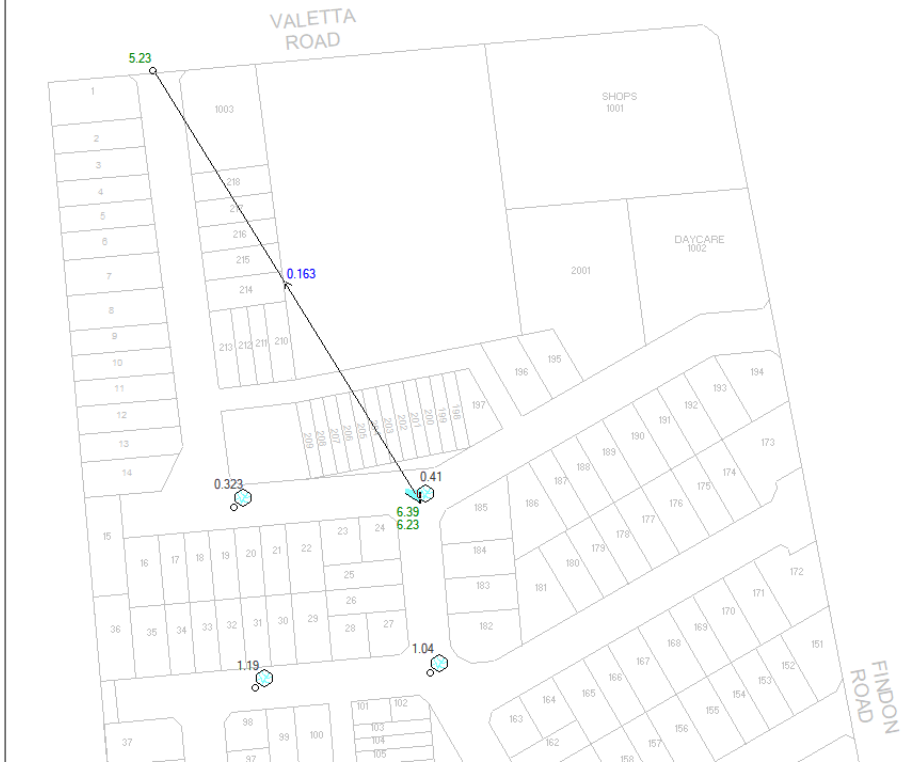
Chainage (m)	Elevation (m)
0	8.06
100	8.4
200	9.38



DRAINS LAYOUT (PLANNING)

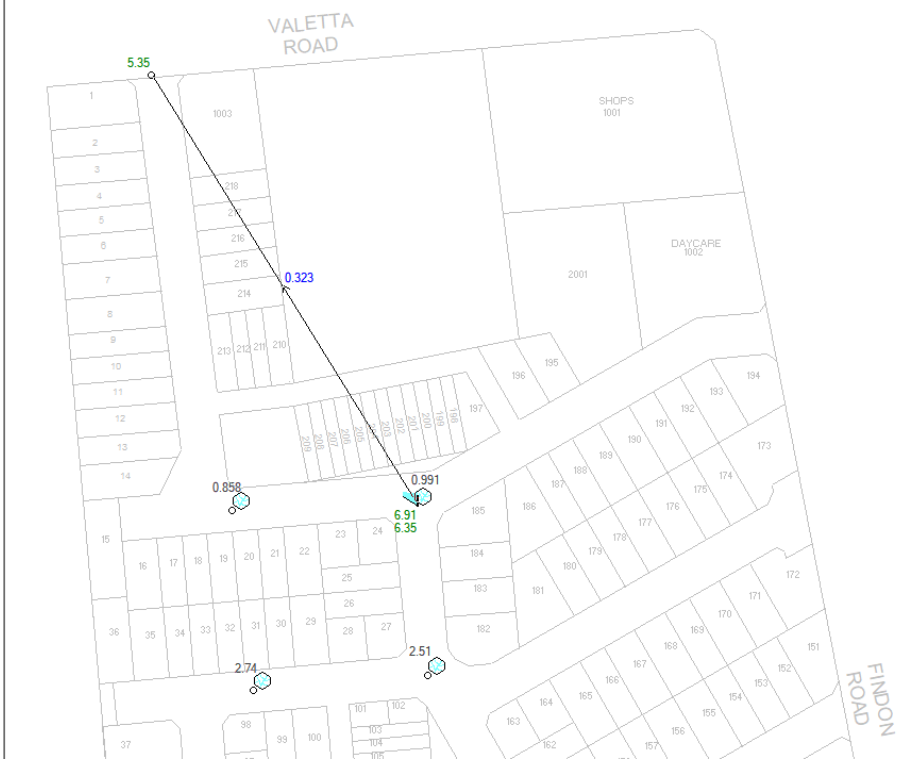
MINOR RESULTS (PLANNING)

Results for median storm in critical ensembles



MAJOR RESULTS (PLANNING)

Results for median storm in critical ensembles



DRAINS RESULTS - MINOR EVENT

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
CAT STH PRE	1.193	1.193	0	10	10	0	0.2EY AEP, 15 min burst, Storm 2
CAT STH POST	1.038	1.038	0	10	10	0	0.2EY AEP, 15 min burst, Storm 2
CAT NTH PRE	0.323	0.323	0	10	10	0	0.2EY AEP, 15 min burst, Storm 2
CAT NTH POST	0.41	0.41	0	10	10	0	0.2EY AEP, 15 min burst, Storm 2

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P NTH POST	0.163	1.59	6.361	5.234	0.2EY AEP, 45 min burst, Storm 8

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
NTH DETENTION	6.39	276.6	0.163	0.163	0

DRAINS RESULTS - MAJOR EVENT

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
CAT STH PRE	2.745	2.671	0.074	10	10	0	1% AEP, 10 min burst, Storm 9
CAT STH POST	2.507	2.323	0.184	10	10	0	1% AEP, 10 min burst, Storm 5
CAT NTH PRE	0.858	0.723	0.135	10	10	0	1% AEP, 10 min burst, Storm 3
CAT NTH POST	0.991	0.918	0.073	10	10	0	1% AEP, 10 min burst, Storm 2

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P NTH POST	0.323	1.92	6.789	5.346	1% AEP, 30 min burst, Storm 4

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
NTH DETENTION	6.91	646.5	0.323	0.323	0