

APPENDIX 7. STORMWATER MANAGEMENT PLAN



The Mandala Group

195 North Terrace PBSA

STORMWATER MANAGEMENT PLAN

WGA252192

WGA252192-RP-CV-0001_A

28 April 2026



Revision History

REV	DATE	ISSUE	ORIGINATOR	CHECKER	APPROVER
A	28/04/2026	For Approval	CH	CH	CH

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1 INTRODUCTION

1.1 Background

Wallbridge Gilbert Aztec (WGA) has been engaged by The Mandala Group to prepare a preliminary stormwater management report for the proposed new student accommodation development located at 195 North Terrace, Adelaide.

This report is intended to conceptually outline the stormwater design for the proposed development and detail the stormwater management methodology. A final detailed design should be carried out to provide construction documentation and incorporate the stormwater design principles outlined in this report. The final documentation is considered to be beyond the scope of this report.

1.2 Scope of the Assessment

The preparation of the plan comprises the scope of services listed below:

- Site visit
- Prepare a Stormwater Management Plan detailing the proposed method of collection and the disposal of site generated stormwater runoff
- Prepare a preliminary sketch plan showing possible site drainage infrastructure based on Council requirements

1.2.1 Documentation

The client has provided preliminary Architectural plans for the development and an engineering survey.

2 DETAILED REPORT

2.1 Development Description

It is understood the proposed development comprises the construction of 40 storey tower providing a significant Student Accommodation Development together with the retention and continued use of the Crown and Anchor Hotel as a Hotel. Refer to Appendix A for a list of the relevant Architectural drawings prepared by Brown Falconer.

2.2 Catchment Description

The site is located on the south-eastern corner of the North Terrace and Gawler Place intersection, Adelaide.

Currently the site is occupied by one large multi-storey building that is occupied by various tenancies. The site is fully developed within the property boundaries. No landscaping areas are apparent. Refer to Appendix B for a copy of the current aerial photo.

The proposed site for the new development is flat in the south-north direction, with only 300mm fall along the western boundary. The east-west fall is also minimal, with only 100mm fall along the southern boundary. Refer to Appendix C for a copy of the engineering survey that shows the site levels.

Below are photos that show the current site conditions.



Figure 1: Western Side of Site (Gawler Place)



Figure 2: Footpath on Western Side of Site (Gawler Place) Looking North-East



Figure 3: Footpath on Western Side of Site (Gawler Place) Looking East

WGA were engaged by the City of Adelaide in 2017 to undertake the civil design and documentation for the updated of Gawler Place. As part of this work, a Stormwater Design Report was submitted to Council in June 2018.

Stormwater infrastructure in Gawler Place includes Council catch puts and grated trench drains. There is a centrally located 450mm dia stormwater pipe that is approximately 1.5m deep, falling north towards North Terrace.

[illegible]

WGA | 195 North Terrace PBSA | WGA252192-RP-CV-0001 A

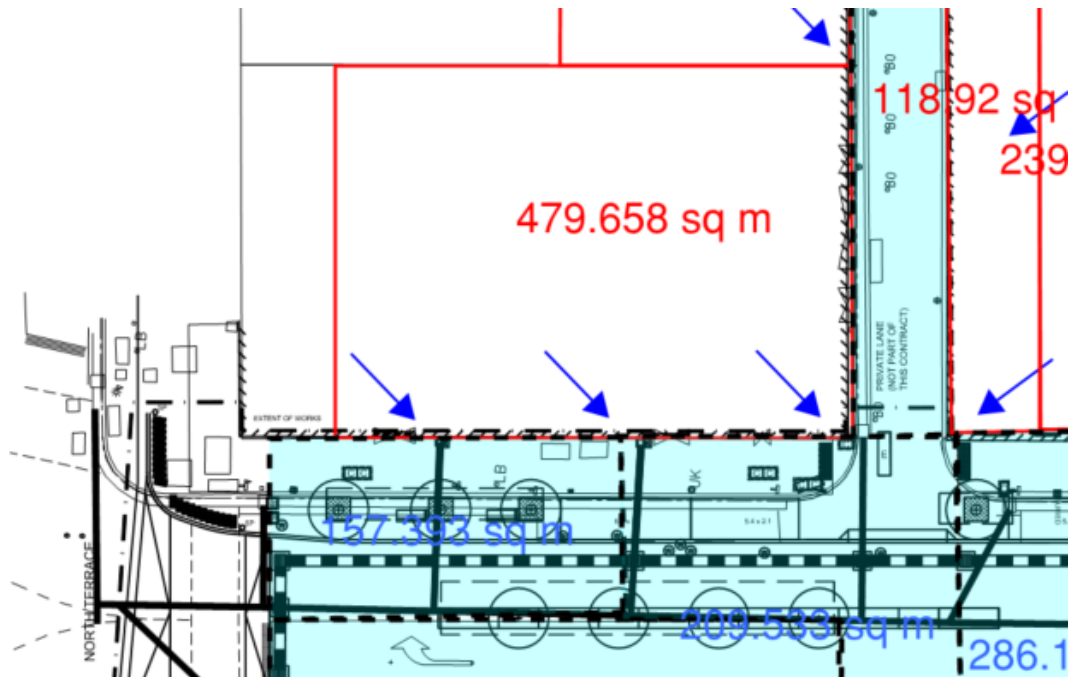


Figure 5: Extract From 2018 Stormwater Design Report

It is noted that the pipework in Gawler Place connects to a 450mm dia pipe in North Terrace. This pipe has a 1 in 20 year capacity and hence the system required a point of surcharge during major storm events. The surcharge point was created at the most northern part of Gawler place in order to reduce the freeboard issues with the adjacent properties. Once the pit surcharges, the surface flow will continue overland to North Terrace. See below extract from the 2018 Design Report.

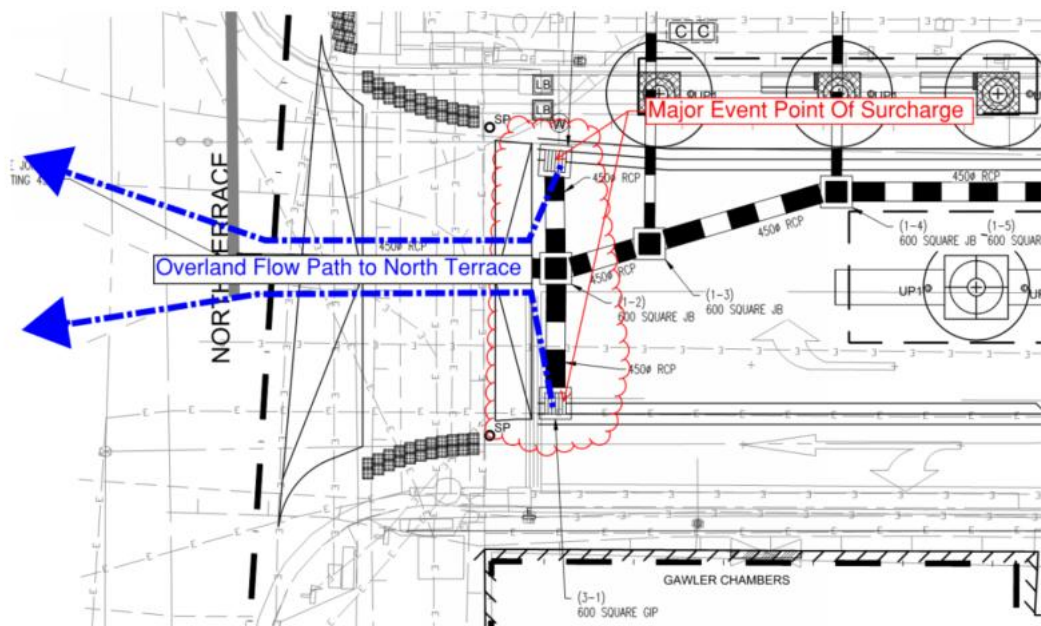


Figure 6: Extract From 2018 Stormwater Design Report

An overland flow analysis of the 1 in 100 year storm event (or in the event that the stormwater system becomes blocked) was undertaken using the software package HECRAS, with three different blockage scenarios modelled. The City of Adelaide typically require the modelling to include a 20% blockage factor for pits that are on grade, which is the case for this project.

Flow depths of 50mm is typical for the section of Gawler Place fronting the development site.

Refer to Appendix D for copoies of the relevant stormwater drawings.

Below are photos that show the existing stormwater infrastructure around the site.

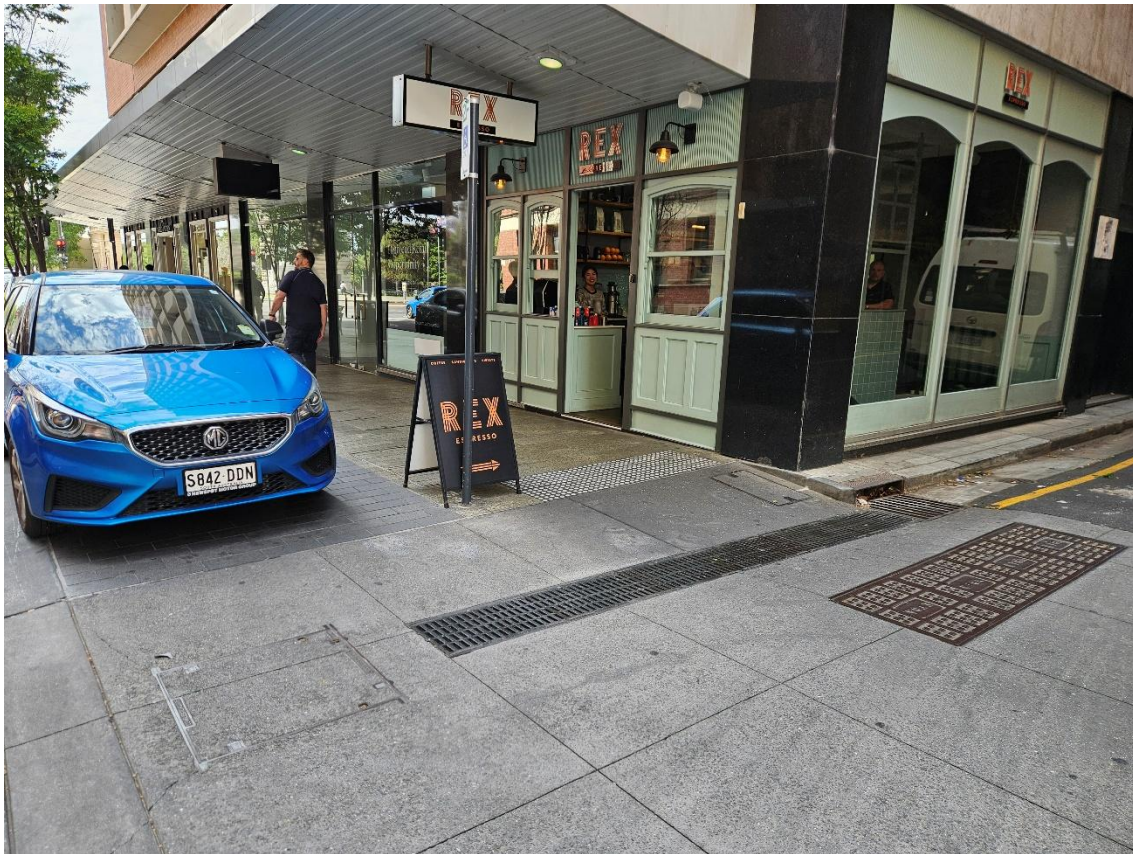


Figure 7: Checker Plate Drain on Gawler Place Adjacent South-East Corner of Site

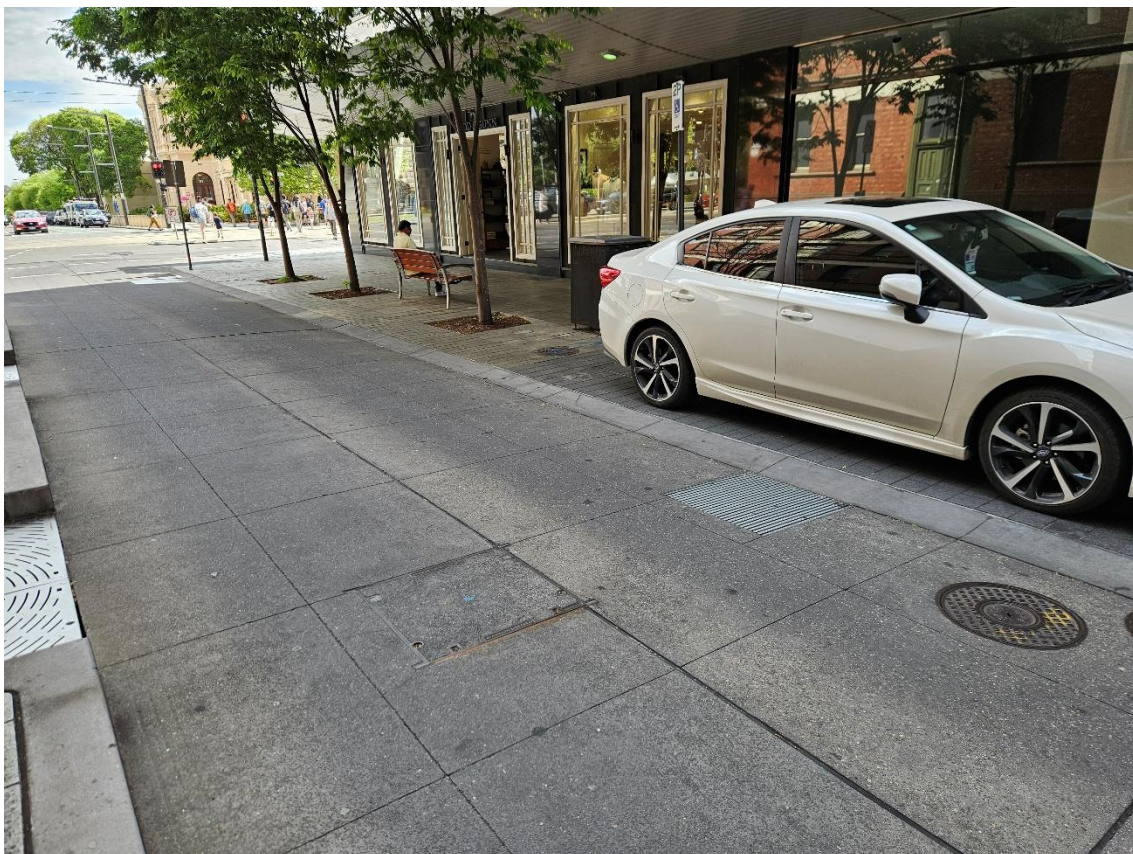


Figure 8: Catch Pit on Gawler Place

2.4 Council Requirements

Reference has been made to the City of Adelaide “Infrastructure Design Guidelines – Version 2024/1.3 that addresses the stormwater drainage collection, treatment and disposal requirements for the site.

The following is highlighted:

- A minimum of 375mm dia pipes (RRJ and Class 4) are required for all Council owned stormwater pipes.
- Water Sensitive Urban Design principles are to be employed to meet the targets in the South Australian Government WSUD policy (refer Water Sensitive SA website).
- Finished floor levels of new buildings must be (as a minimum) the greater of 50mm freeboard between the property boundary level or 300mm freeboard from the floor level and the major storm overland flow level.
- New stormwater connections from the site are to be to the existing underground stormwater infrastructure.
- Where there is no existing underground stormwater system adjacent the site, or connection is not physically possible due to existing services, connection to the kerb and gutter is permitted at a maximum rate of 15 l/s.
- Stormwater flows are to be limited to the pre-development flow rates. Given that the building is multi-storey, the increased vertical catchment area of the building is to be taken into account where comparing the pre-development and post-development flow rates.

It is noted that Council is requiring all new developments to complete the Water Sensitive SA’s “InSite Water Tool” as part of complying with the State Government Water Sensitive Urban Design Policy.

2.5 Stormwater Management Methodology

To address Council requirements, a preliminary stormwater management methodology has been prepared for the development and is outlined below.

Given Council’s requirements regarding the freeboard above the flood level, and the modelling previously undertaken, the finished floor level for the building should be set at 350mm above the water table level. It is noted that three separate levels are proposed, so the FFL for each section should be 350mm above the highest water table level associated with each section of the building.

It is also noted that there is not a traditional kerb and gutter in Gawler Place but rather the kerb is typically 30-40mm high only, with a 2.5m wide footpath.

The extent of internal ramping and steps will be further refined during the detailed design phase of the project.

Stormwater runoff from the roof areas will be directed to a detention tank that has a minimum volume of 13,000 litres. This is due to the increased vertical face of the building and hence the increased stormwater flow rate (meeting Council’s requirements). The exact location of this tank will be determined during detailed design. The tank outlet will connect to the existing stormwater pits in Gawler Place.

Refer to Appendix E for a copy of the detention calculations.

Refer to Appendix F for a copy of the sketch plan showing the proposed Finished Floor Levels and the methodology of stormwater collection and disposal.

2.6 Summary

The Preliminary sketch plan contained within this report has been prepared to demonstrate the philosophy behind proposed management of the stormwater runoff from this development. The information provided is preliminary and will be subject to detailed design and documentation.

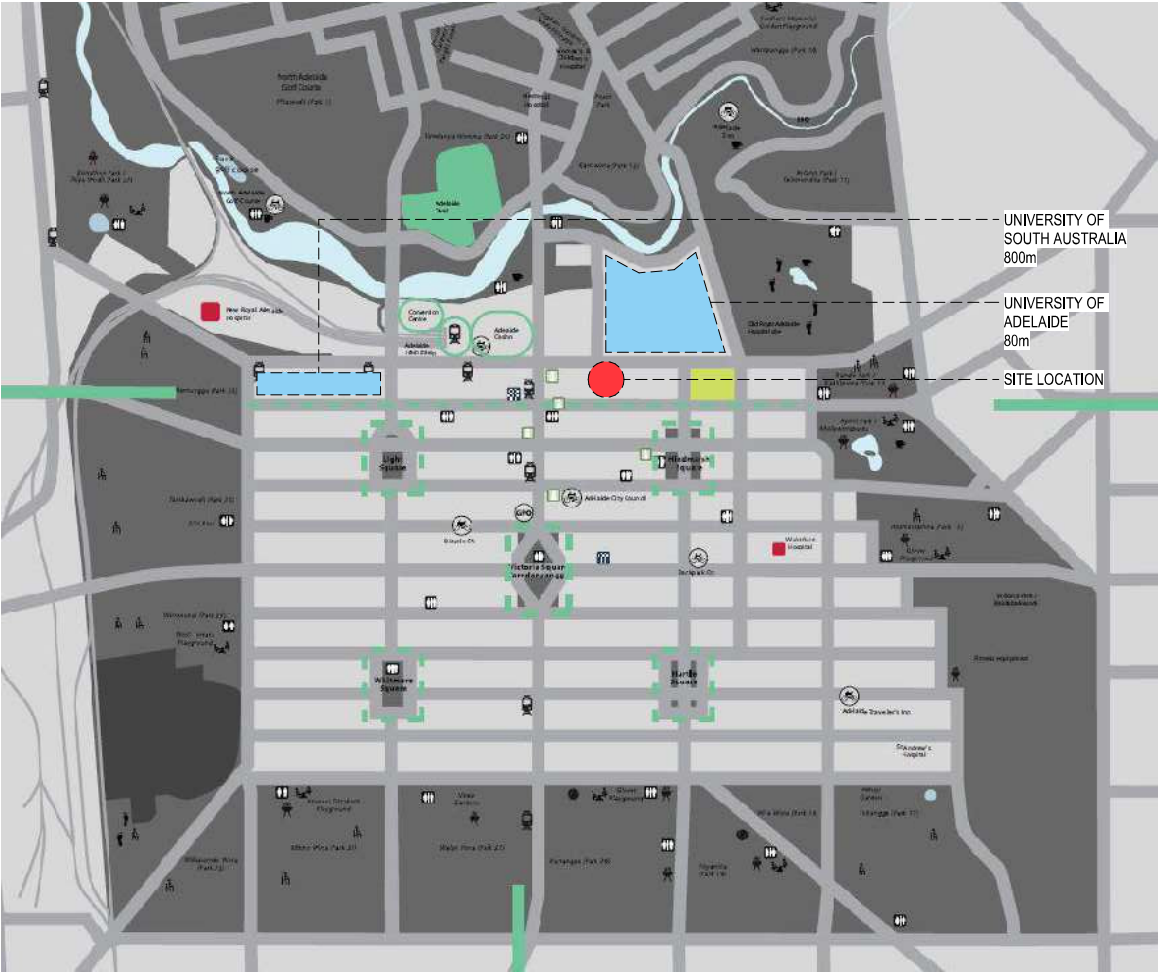
APPENDIX A

ARCHITECTURAL DRAWINGS



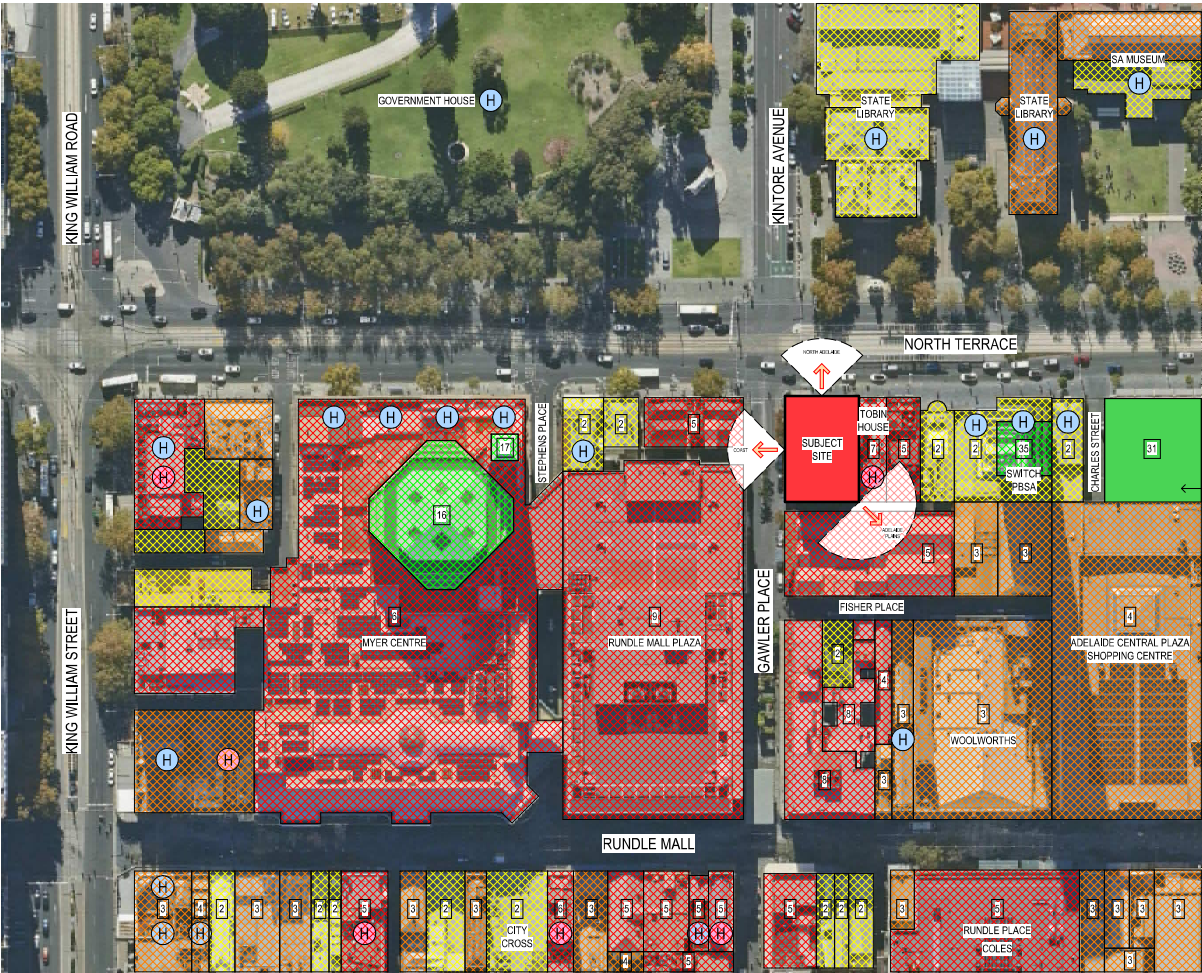


SITE PLAN



LOCATION PLAN

- LEGEND**
- PUBLIC TOILET
 - INFORMATION
 - PARKING
 - HOSPITAL
 - POLICE
 - PARK / RECREATION
 - CAFE
 - SPORTS / RECREATION
 - ADL TRAVELLERS INN
 - TRAIN
 - TRAM
 - SWIM
 - PARK / SEATING
 - PUBLIC BBQ



CONTEXT PLAN

- LEGEND**
- 1-2 LEVELS
 - 3-4 LEVELS
 - 5-14 LEVELS
 - 15+ LEVELS
 - SUBJECT SITE
 - STATE HERITAGE
 - LOCAL HERITAGE
 - VIEWS
 - APPROVED DEVELOPMENTS
 - ACTIVATED FACADE

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Do not scale drawings. Written dimensions govern.
Setting out is the responsibility of the Contractor.
All dimensions are to be verified on site before commencement of work or shop drawings.
Discrepancies are to be reported in writing to Brown Falconer.
Drawings are to be read in conjunction with all other contract documentation.

BROWN FALCONER

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brownfalconer.com.au

The Mandala Group

195 NORTH TERRACE PBSA

CONTEXT AND SITE ANALYSIS

Scale As indicated
Date APRIL 2026
BF Job/Site No. 2025045 / 3744
Dwg No. DA01





- STUDIO
- PREMIUM STUDIO TYPE 1
- PREMIUM STUDIO TYPE 2
- ACCESSIBLE STUDIO
- TWIN
- SERVICES
- RETAIL/ARRIVAL
- BOH
- COMMON

SITE AREA	567.5m2
GBA	20.601m2
OVERALL BUILDING HEIGHT	133.35m (excl. Plant) 177 260 AHD
 <u>YIELD</u>	
BEDS	635
APARTMENTS	612
INTERNAL COMMON AREA	1,613m2
EXTERNAL COMMON AREA	148m2
TOTAL COMMON AREA	1,761m2
COMMON/BED RATIO	
EXCLUSIVE OF EXTERNAL	2.5
INCLUSIVE OF EXTERNAL	2.7

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Do not scale drawings. Written dimensions govern.
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The Mandala Group

195 NORTH TERRACE PBSA

GROUND FLOOR PLAN

Scale 1 : 100
Date APRIL 2026
BF Job/Site No. 2025045 / 3744
Dwg No. **DA03**

Scale 1 : 100
Date APRIL 2026
BF Job/Site No. 2025045 / 3744
Dwg No. **DA03**



Rev:

A1 SHEET

Rev:

A1 SHEET

APPENDIX B

AERIAL PHOTOGRAPHS

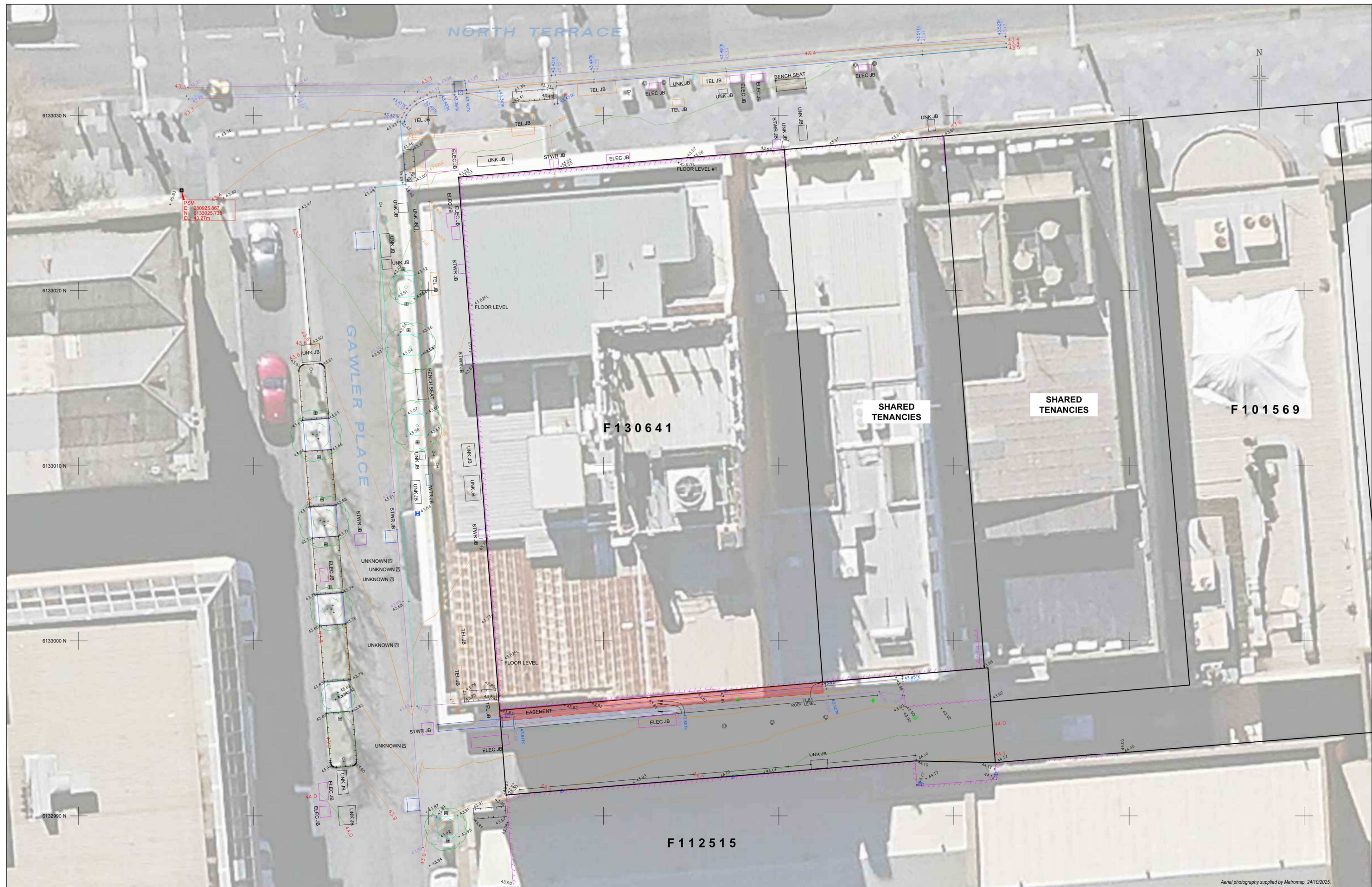




APPENDIX C

ENGINEERING SURVEY





Aerial photography supplied by Metromap, 24/10/2025.

REV	DATE	DESCRIPTION	INITIALS	FIELD
0	24/10/2025	INITIAL RELEASE		
ADDITIONS, AMENDMENTS AND APPROVALS				

LEGEND
47.51TK TOP KERB 47.36WT WATER TABLE 45.16FL FLOOR LEVEL 48.12IL INVERT LEVEL WATER METER SPRINKLER / IRRIG VALVE HYDRANT DOMESTIC OUTLET DOWNPIPE DOMESTIC SUMP STORMWATER WHOLE SEP / GRATING 47.91UE UNDERSIDE EAVES TEL COMM. PILLAR / PIT TRAFFIC LIGHT SIGN / BUS SIGN POWER LIGHT POLE MAIL BOX / SIGNAL BOX TICKET MACHINE ROAD / ELEC. SERVICE WATER SV / FP SEWER MH (10) / SIP ELEC. / GAS METER GAS SERVICE PSM SURVEY MARKS BOREHOLE CABLE MARKER STOBIE / WOODEN POLE POST / BOLLARD SEWER MH (10) / SIP UNKNOWN POINT / SERVICE EDGE OF VEGET. ROAD SIGN / HOARD. GRATING TOP OF KERB WATER TABLE EDGE OF BITUMEN TREE / SHRUB POSSIBLE REGULATED / SIGNIFICANT TREE by measurement only (trunk greater than 1.0m circumference). Professional advice from council / arborist required. 2000 = Total circumference (mm) 2 = Number of trunks BOTTOM OF BANK TOP OF BANK CHANGE OF GRADE DRAIN SEWER PIPE UG EASEMENT BOUNDARY LINE WALL GI BUILDING CONCRETE FENCE GATE

COORDINATE SYSTEM
VERTICAL: AHD
HORIZONTAL: GROUND PLANE ORIENTED TO: MGA 20 ZONE 54
SCALE: GROUND (CSF = 1.000183521)
ADOPTED STATION & AUTHORITY
PSM 6628/13816 RL: 43.268 SDB
PSM 6628/13816 E: 280925.867 SDB
N: 6133025.738 SDB
SDB denotes SA Government survey data base values (Dated: 26/08 / 1999)

0 1 2 4 6 8 10 m
1:100
ORIGINAL SHEET SIZE A1
Alexander & Symonds Pty Ltd Kaurna Country Level 1, 62 The Parade, Norwood, South Australia 5067 ABN 93007 753 958
T (08) 8130 1666 W www.alexander.com.au E adelaide@alexander.com.au
+ Property + Land Development + + Construction + Mining + + Spatial Information Management +

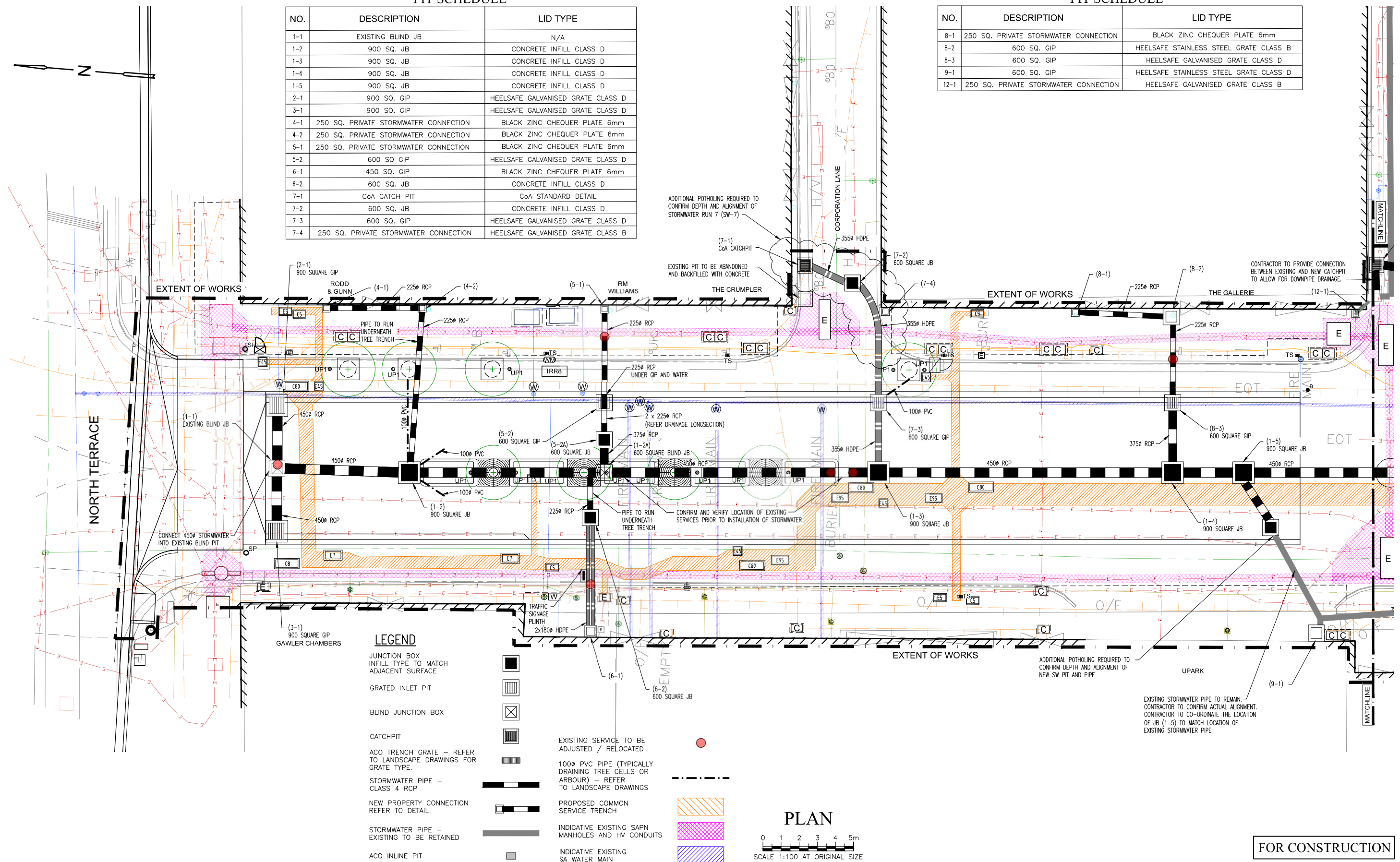
Alexander Symonds Surveying Consultants
DETAIL & LEVEL SURVEY M1 CENTRE NORTH TERRACE
DRAWING No. 25A0494 Detail 20P(0)
SHEET 1 OF 1
REVISION 0

APPENDIX D EXISTING STORMWATER DRAINAGE



NO.	DESCRIPTION	LID TYPE
1-1	EXISTING BLIND JB	N/A
1-2	900 SQ. JB	CONCRETE INFILL CLASS D
1-3	900 SQ. JB	CONCRETE INFILL CLASS D
1-4	900 SQ. JB	CONCRETE INFILL CLASS D
1-5	900 SQ. JB	CONCRETE INFILL CLASS D
2-1	900 SQ. GIP	HEELSAFE GALVANISED GRATE CLASS D
3-1	900 SQ. GIP	HEELSAFE GALVANISED GRATE CLASS D
4-1	250 SQ. PRIVATE STORMWATER CONNECTION	BLACK ZINC CHEQUER PLATE 6mm
4-2	250 SQ. PRIVATE STORMWATER CONNECTION	BLACK ZINC CHEQUER PLATE 6mm
5-1	250 SQ. PRIVATE STORMWATER CONNECTION	BLACK ZINC CHEQUER PLATE 6mm
5-2	600 SQ GIP	HEELSAFE GALVANISED GRATE CLASS D
6-1	450 SQ. GIP	BLACK ZINC CHEQUER PLATE 6mm
6-2	600 SQ. JB	CONCRETE INFILL CLASS D
7-1	CoA CATCH PIT	CoA STANDARD DETAIL
7-2	600 SQ. JB	CONCRETE INFILL CLASS D
7-3	600 SQ. GIP	HEELSAFE GALVANISED GRATE CLASS D
7-4	250 SQ. PRIVATE STORMWATER CONNECTION	HEELSAFE GALVANISED GRATE CLASS B

PIT SCHEDULE		
NO.	DESCRIPTION	LID TYPE
8-1	250 SQ. PRIVATE STORMWATER CONNECTION	BLACK ZINC CHEQUER PLATE 6mm
8-2	600 SQ. GIP	HEELSAFE STAINLESS STEEL GRATE CLASS B
8-3	600 SQ. GIP	HEELSAFE GALVANISED GRATE CLASS D
9-1	600 SQ. GIP	HEELSAFE STAINLESS STEEL GRATE CLASS D
12-1	250 SQ. PRIVATE STORMWATER CONNECTION	HEELSAFE GALVANISED GRATE CLASS B



FOR CONSTRUCTION

DESIGNED	JB	DATE	05/2018	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	DSK	DATE	05/2018	
CHECKED	DB	DATE	06/2018	
QUALITY ASSURED	QA	DATE	05/2018	



CONSTRUCTION COPY - CERTIFICATION

"I,,
(Representative's Name)
.....
being a duly authorised representative of
.....
(Consulting firm or company)
.....

hereto:

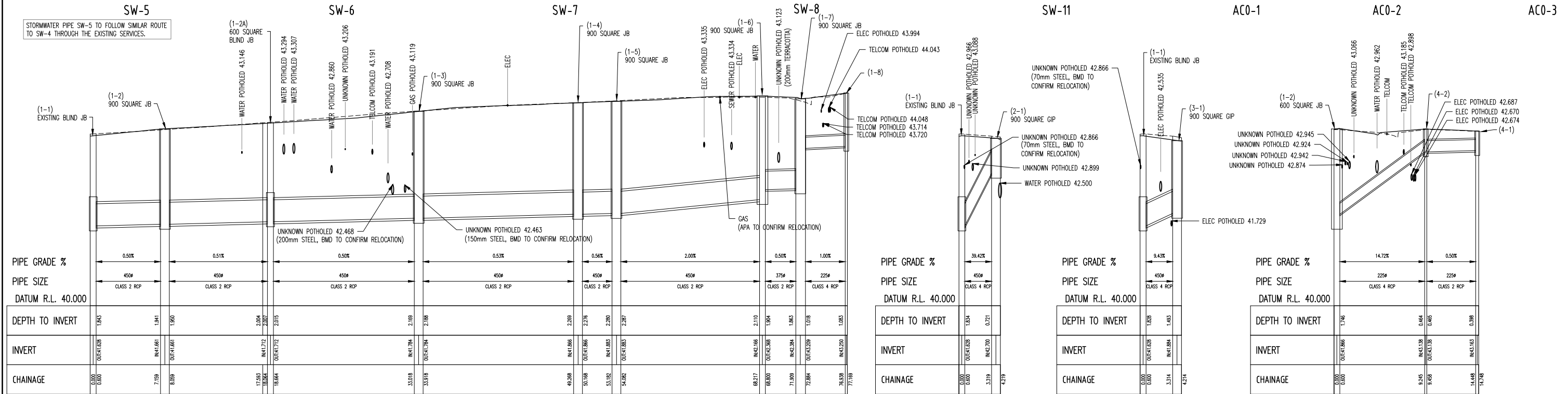
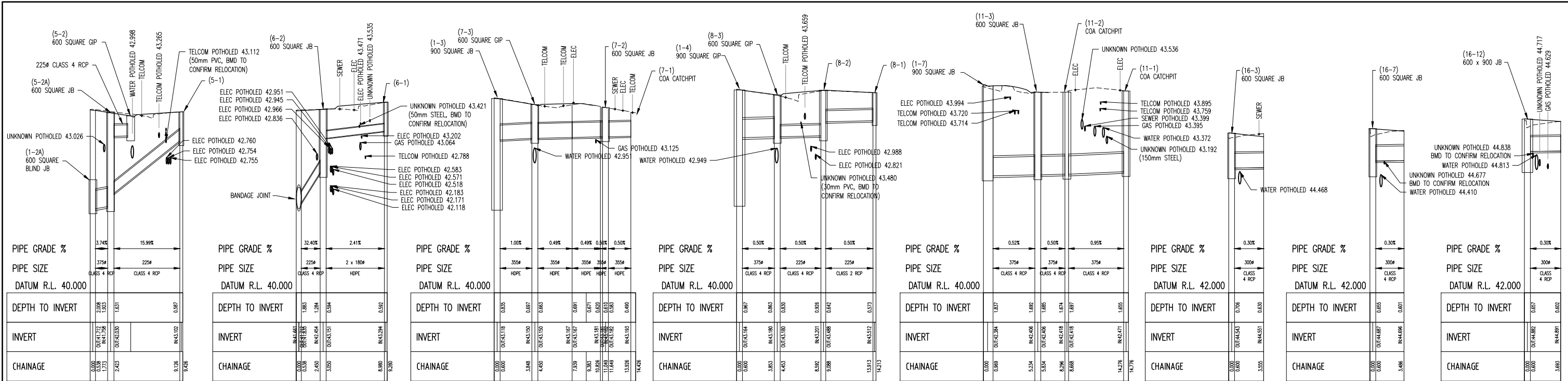
- certify the information in this drawing is an accurate "design" representation of the works.
- certify that the "design" is in accordance with the brief and amendments thereto.
- accept responsibility for the "design" information contained in this drawing.
- acknowledge the "design" information contained in this drawing may be relied on by Council and others.

Certification for Stage by (Stage No.) (Signature) on (Date) "....."

for: (Contract Name)

[illegible]

GAWLER PLACE BETWEEN NORTH TCE AND GRENFELL ST GAWLER PLACE UPGRADE PROJECT STORMWATER AND DRAINAGE - NORTH - SHEET 01				
ACC USE - SIGHTED FOR CONSTRUCTION			ACC PROJECT NUMBER	S710
			SCALE	1:100
			NUMBER OF SHEETS	-
			ORIGINAL SHEET SIZE	A1
			REVISION	A
			DRAWING SET NUMBER	A1-2018-024
PROJECT ASSET MANAGER	DESIGN TEAM LEADER	PROJECT MANAGER	SHEET	
			106	



SERVICE CLEARANCE REQUIREMENTS

SERVICE	DESIRABLE CLEARANCE
LOW PRESSURE GAS	300mm
HIGH PRESSURE GAS	500mm
WATER (EXISTING)	150mm*
WATER (NEW)	150mm*
SEWER CONNECTIONS TO MAIN	300mm
ELECTRICAL HV/LV	100-600mm**
COMMUNICATIONS	300mm

*CLEARANCE CAN BE REDUCED TO 100mm SUBJECT TO SA WATER INSPECTION AND APPROVAL.

**SA POWER NETWORKS APPROVAL REQUIRED.

DESIGNED
JB
DATE
05/2018

DRAWN
DSK
DATE
05/2018

CHECKED
DB
DATE
06/2018

QUALITY ASSURED
QA
DATE
05/2018

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.

WGA

WALLISBOROUGH & GILBERT

AS/EC

CONSTRUCTION COPY - CERTIFICATION

"I,
(Representative's Name)
being a duly authorised representative of
(Consulting firm or company)
hereby:
- certify the information in this drawing is an accurate "design" representation of the works.
- certify that the "design" is in accordance with the brief and amendments thereto.
- accept responsibility for the "design" information contained in this drawing.
- acknowledge the "design" information contained in this drawing may be relied on by Council and others.
Certification for Stage by on
(Stage No.) (Signature) (Date)
for:
(Company Name)

CONSTRUCTION REVISIONS

No.	DESCRIPTION	BY	DATE
A	ISSUED FOR CONSTRUCTION	DSK	28/09/2018

GAWLER PLACE
BETWEEN NORTH TCE AND GRENFELL ST
GAWLER PLACE UPGRADE PROJECT
DRAINAGE LONGSECTIONS - SHEET 01

ACC USE - SIGHTED FOR CONSTRUCTION

REVISION
DRAWING SET NUMBER
A1-2018-024

SHEET
114

PROJECT ASSET MANAGER

DESIGN TEAM LEADER

PROJECT MANAGER

ACC PROJECT NUMBER
SCALE
NUMBER OF SHEETS
ORIGINAL SHEET SIZE
REVISION
DRAWING SET NUMBER
SHEET

S710

1:200

-

A1

A

A1-2018-024

114

FOR CONSTRUCTION

0 2 4 6 8 10m
SCALE 1:200 HORIZONTAL

0 0.4 0.8 1.2 1.6 2.0m
SCALE 1:40 VERTICAL

APPENDIX E

STORMWATER CALCULATIONS



195 NT - Stormwater

• Adelaide City Council require the post-development flows to be limited to the pre-development flows for storm events up to the 1 in 100yr storm events.

• Need to allow for the increase in vertical area as the building height is increasing. Reference AS3500.3

• Pre-development - catchment area = 510 m^2 roof
 $= 45 \times 30 \times \frac{1}{2} \left[\frac{1}{2} \text{ vertical face (west side)} \right]$
 $= 675 \text{ m}^2$
 $\rightarrow \text{total} = 1185 \text{ m}^2$

- runoff coeff, $C = 0.9$

- $t_e = 6 \text{ mins}$

$\rightarrow I_{100} = 172 \text{ mm/hr}$

$$\therefore Q_{100 \text{ pre}} = 2.78 \times 0.9 \times 172 \times 0.1185$$

$$= \underline{80 \text{ l/s}}$$

• Post-development - catchment area = 510 m^2 roof
 $= 134 \times 30 \times \frac{1}{2}$ wall
 $= 2010 \text{ m}^2$
 $\rightarrow \text{total} = 2,520 \text{ m}^2$

- runoff coeff, $C = 0.9$

- $t_e = 6 \text{ mins}$

$\rightarrow$ Detention volume required = 13 m³ (refer attached spreadsheet)

Basic Stormwater Detention Assessment

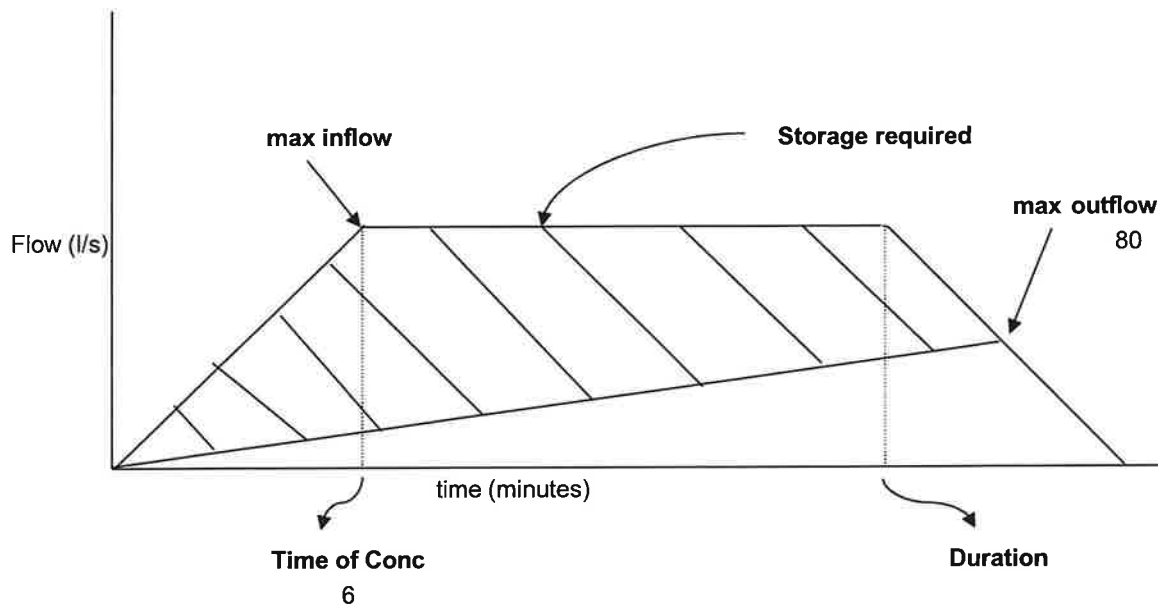
Title: 195 North Terrace, Adelaide

Date: 28/04/26

Job No: WGA252192

Area 2520 m²
Coeff Permeability 0.9
Time of conc. 6 min
ARI Storm 100 Year
Max Outflow Qp 80 l/sec

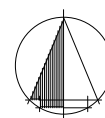
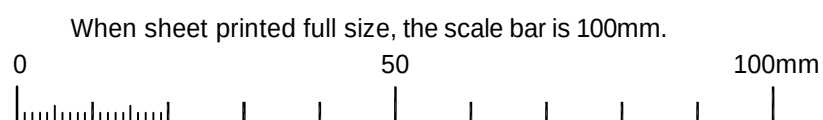
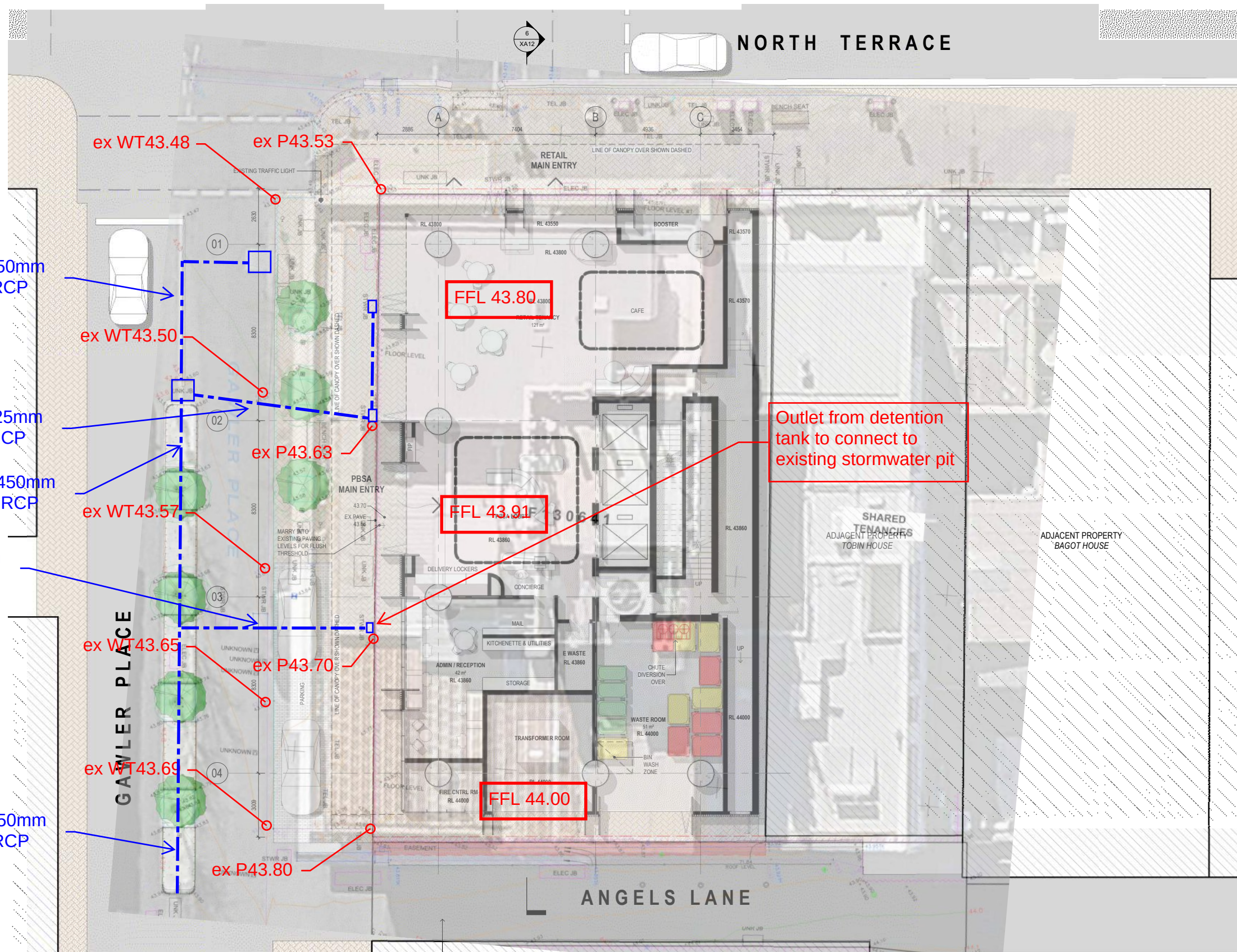
Duration min	Intensity mm/hr	Inflow rate Ip l/sec	Inflow Vol Vi m3	Max Storage Smax m3
6	172	108.4	39.01	10.21
8	152	95.8	45.96	12.36
10	136	85.7	51.41	13.01
12	124	78.1	56.25	13.05
14	115	72.5	60.86	12.86
16	107	67.4	64.71	11.91
18	100	63.0	68.04	10.44
20	94	59.2	71.06	8.66



APPENDIX F

PRELIMINARY STORMWATER PLAN





REV.	DATE	DESCRIPTION	DRAFT	ENG.	CHKD.
A	28.04.26	FOR APPROVAL	CH	CH	SDF

WGA

195 NORTH TERRACE PBSA
NORTH TERRACE, ADELAIDE

PRELIMINARY CIVIL SKETCH PLAN

A3	DOCUMENT NUMBER	Sheet No.	Rev
Design	Project Number		
CH	CH	WGA252192-SK-CV-1000	A



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