

# Strathfield Central - Planning Proposal

Civil, Stormwater / Flood, Sewer & Key Services

80219044

Prepared for  
Memocorp Australia Pty Ltd

24 September 2019



## Contact Information

**Cardno (NSW/ACT) Pty Ltd**

ABN 95 001 145 035

Level 9 - The Forum

203 Pacific Highway

St Leonards NSW 2065

Australia

www.cardno.com

Phone +61 2 9496 7700

Fax +61 2 9439 5170

## Document Information

Prepared for Memocorp Australia Pty Ltd

Project Name Strathfield Central -Planning  
ProposalFile Reference 190920-Strathfield Planning  
Proposal-Civil SW services-  
Final Rev05.docx

Job Reference 80219044

Date 24 September 2019

Version Number 6

Author(s):

Name	Rod Garrett	Effective Date	23/09/2019
Job title	Manager Civil and Urban		

Approved By:

Name	Rod Garrett	Date Approved	23/09/2019
Job title	Manager- Civil and Urban		

## Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
A	7 June 2019	Early draft –issued for information only	Rod Garrett	
B	9 July 2019	Final Draft 2 for client review	Rod Garrett	
1	26 July 2019	Draft 3 Issued for client review	Alberto Ponce	Rod Garrett
2	1 August 2019	Draft 4 Issued for Client review	Alberto Ponce	Rod Garrett
3	12 August 2019	Issued for PP submission	Alberto Ponce/ David Stone/ Rod Garrett	Rod Garrett
4	13 September 2019	Re-issued for PP	Alberto Ponce/ David Stone	Rod Garrett
5	20 September 2019	Final - Re-issued for PP	Rod Garrett	Rod Garrett
6	24 September 2019	Final - Re-issued for PP	Rod Garrett	Rod Garrett

## EXECUTIVE SUMMARY

---

Memocorp Australia Pty Ltd owns and manages Strathfield Plaza. The existing site is surrounded by Churchill St to the North, The Boulevard to the East and Redmyre Rd to the South.

Memocorp Australia P/L proposes a major redevelopment of the site the approval for which is to be applied for via Planning Proposal Submission (PP).

Cardno has been engaged by Memocorp Australia Pty Ltd to provide advice inclusive of Civil, Stormwater, Flooding, Services and Traffic Engineering to support the Planning Proposal (PP). The proposed development will occupy the entire site including new basement overlayed by new retail space and new commercial and residential high-rise.

This report covers high level Civil, Stormwater/Flood, Sewer and services advice for the PP.

A separate Cardno report covers high level advice on Traffic and Parking.

Two existing trunk Sydney Water owned stormwater culvert assets traverse the site, one is live, one is dormant.

Two existing Sydney Water owned DN225 sewer services traverse the site.

Other services also exist onsite including electrical mains/kiosks and telecommunications services.

Other stormwater, sewer, power, gas and telecoms services exist on the site and on adjoining properties and road reserves that surround the site.

The subject site and its surrounding neighbours and roads are currently affected by the 1%AEP flood.

This Planning Proposal provides an opportunity to re-engineer, revitalise, renew and replace existing aged stormwater and sewer assets and to improve flooding conditions both on the site and in the broader region of the 'Strathfield Central' site.

The construction of a brand new stormwater culvert system as proposed would provide considerable new benefits over the existing stormwater culvert situation including:

- Replacement and amplification of the existing aged 2.54 x 1.83m stormwater culvert asset (both within the site and at substantial length immediately upstream of the site under Redmyre Rd.)
- the removal and unburdening of this trunk stormwater system under numerous adjoining neighbour properties fronting the "The Boulevard".
- a new culvert system which would be designed to not adversely impact on existing overland flow and flooding
- an opportunity for existing overland flooding to be diverted under the site within a specifically designed new secondary upper level culvert.
- Stormwater collected off the site would be suitably collected, detained, quality treated and recycled onsite (where viable)

Given the rationale provided herein, this Planning Proposal is overall supported.

## Table of Contents

EXECUTIVE SUMMARY	2
1 BACKGROUND	4
1.1 Existing Site - Strathfield Plaza	4
1.2 Planning Proposal	6
2 EXISTING SITE STORMWATER / SERVICES / GEOTECH / FLOOD BEHAVIOUR	9
2.1 Existing services search methods	9
2.2 Existing Sydney Water Assets	9
2.3 Existing Strathfield Council Stormwater Assets	11
2.4 Existing Ausgrid Assets	12
2.5 Existing Jemena Gas Assets	12
2.6 Existing NBN Assets	13
2.7 Existing AAPT Assets	13
2.8 Existing Nextgen Assets	14
2.9 Existing Optus Fibre Optic Assets	14
2.10 Existing Pipe Networks Telecommunication Assets	15
2.11 Existing RMS Traffic Signal Assets- Redmyre Rd/Lyons St/The Boulevard	16
2.12 Existing RMS Traffic Signal Assets- The Boulevard and Parnell St	16
2.13 Existing Verizon Assets	17
2.14 Indicative Existing Site Geotech	17
2.15 Existing Site Flood Behaviour	18
3 PLANNING PROPOSAL – Civil / Stormwater / Flood & Sewer Design Concepts.	19
3.1 On-site Stormwater Detention (OSD)	19
3.2 Proposed Sydney Water Trunk Stormwater Culvert Diversion	19
3.3 Proposed onsite DN225 sewer diversion	20
3.4 Preliminary Recommended Flood Planning Levels	21
4 CONCLUSION	22
Appendix A – Preliminary Flood Planning Levels	23
Appendix B - Concept Sewer & Stormwater Diversion Design	25

## Figures

Figure 1-1 Existing Strathfield Plaza Floor Plan	4
Figure 1-2 Existing Site Aerial	4
Figure 1-3 Existing Site	5
Figure 1-4 Planning Proposal - Aerial view	7
Figure 1-5 Planning Proposal – Proposed New Transport Bus Hub	7
Figure 1-6 Planning Proposal – Proposed Ground Floor Plan	8
Figure 2-1 Existing 1% AEP Flood Depths (m)	18
Figure 4-2 Reference Locations for 1% AEP and PMF Results (Ground Floor Plan)	24



# 1 BACKGROUND

## 1.1 Existing Site - Strathfield Plaza

Memocorp Australia Pty Ltd. owns and manages Strathfield Plaza.

The existing site is surrounded by Churchill St to the North, The Boulevard to the East and Redmyre Rd to the South. A layout of the existing shopping centre floorplate is shown in Figure 1-1. An existing site aerial is shown in Figure 1-2.



Figure 1-1 Existing Strathfield Plaza Floor Plan

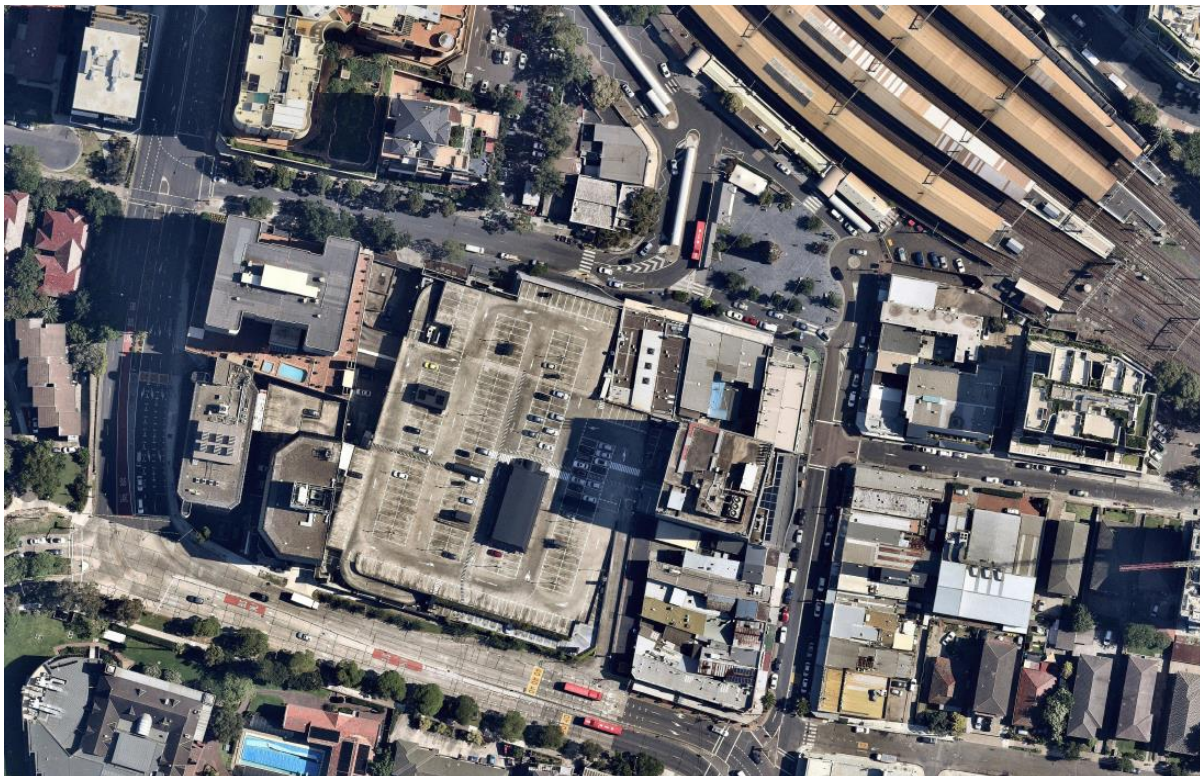


Figure 1-2 Existing Site Aerial

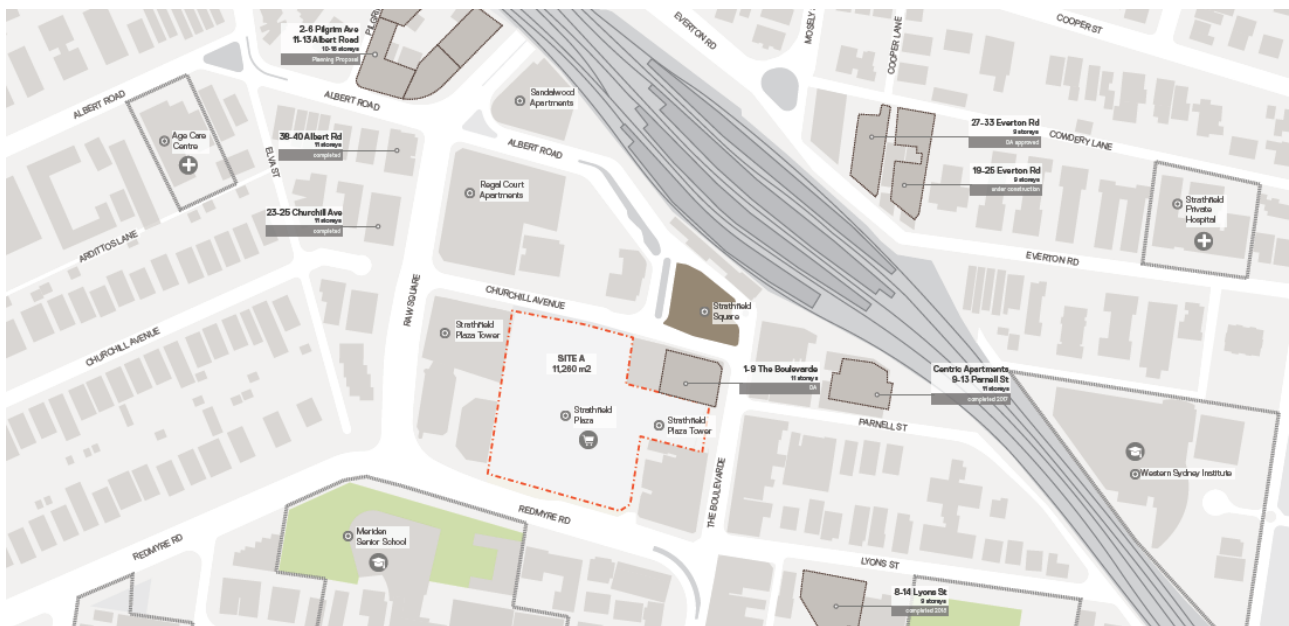
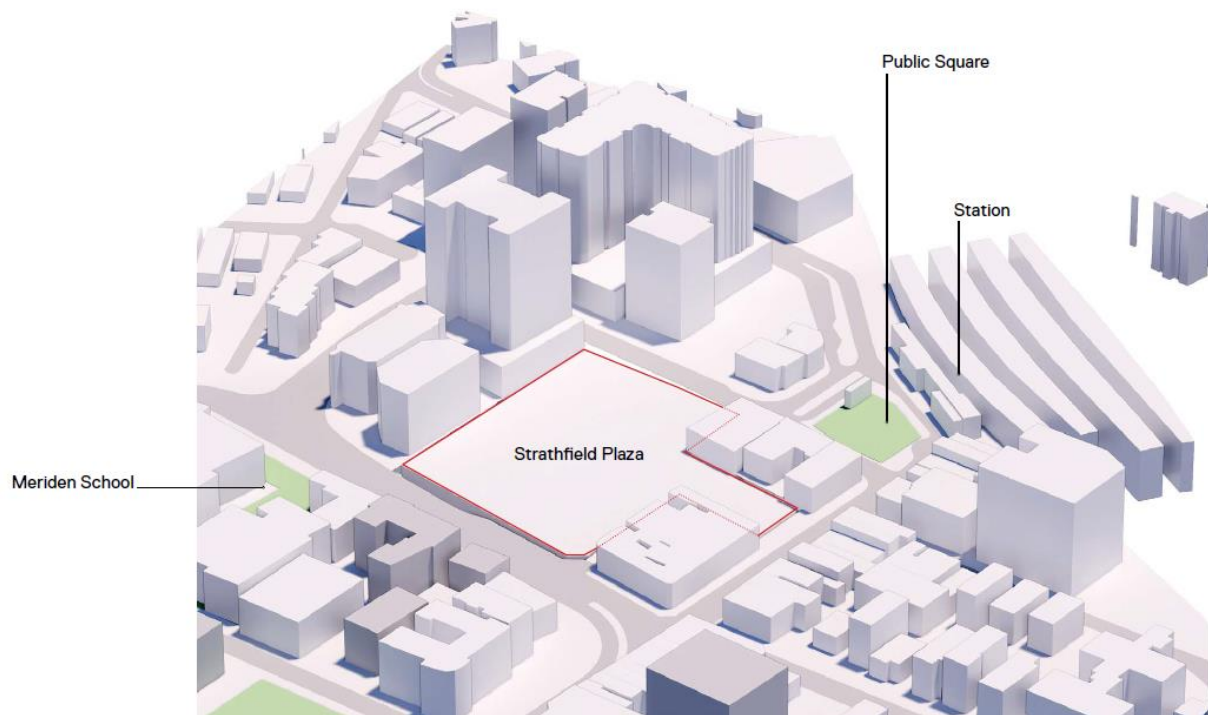


Figure 1-3 Existing Site

## 1.2 Planning Proposal

Memocorp Australia Pty. Ltd. proposes a major redevelopment of the site the approval for which is to be applied for via Planning Proposal Submission (PP).

Cardno has been engaged by Memocorp Australia Pty. Ltd. to provide advice inclusive of Civil, Stormwater, Flooding, Services and Traffic Engineering advice to support the Planning Proposal (PP).

The Planning Proposal seeks to amend the height of building and floor space ratio development standards applicable to the site, under the *Strathfield Local Environmental Plan 2012* (SLEP 2012), in accordance with Section 3.33 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). It also proposes to increase the cap on residential accommodation permitted on the site.

The intended outcome of the Planning proposal is to amend SLEP 2012 as follows:

- Amend the applicable maximum height of buildings development standard, under Clause 4.3: Height of buildings, to permit buildings with a height of up to **156 m**.
- Amend the applicable maximum floor space ratio development standard, under Clause 4.4 Floor Space Ratio to permit a floor space ratio of **9.5:1** and identify Strathfield Plaza as “Area 4”.
- Remove application of Clause 4.4B Exceptions to floor space ratio (Strathfield Town Centre) to Strathfield Plaza.
- Amend Clause 6.7 Design excellence for Strathfield Town Centre to include “Area 4” on the Floor Space Ratio Map.
- Amend Clause 6.8: Additional provisions for development in Strathfield Town Centre on “Area 4” to increase the cap on residential accommodation permitted on the site to **70%**.

These amendments will facilitate the redevelopment of the Strathfield Plaza site for a landmark mixed-use development, comprising:

- A vibrant and active retail plaza at the ground and lower floors with provision for supermarkets, speciality retail, restaurants and cafes.
- A publicly accessible through site link and plaza, providing much needed open space for the Town Centre, activating the ground plane and facilitating direct pedestrian connectivity between Strathfield Station and the wider precinct.
- A commercial office campus, with versatile floorplates to support a broad range of market requirements, interconnected by landscaped terraces and communal meetings spaces.
- Five residential towers ranging in height from 13 to 38-storeys providing approximately 753 apartments of varying sizes, typologies, and layouts including one, two, three and four bedroom units with rooftop communal open spaces.
- Provision for 10% of the GFA uplift dedicated to ‘key worker’ subsidised rental housing for 10 years.
- Dedication of a 700m<sup>2</sup> community hub.
- A new Transport Hub incorporating a bus hub, taxi / ride-share drop-off and pick-up, and bicycle parking with direct connections to the existing Strathfield Station, facilitating and encouraging use of sustainable transport options.



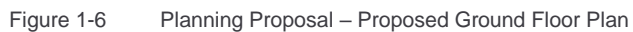


Figure 1-4 Planning Proposal - Aerial view



Figure 1-5 Planning Proposal – Proposed New Transport Bus Hub





## 2 EXISTING SITE STORMWATER / SERVICES / GEOTECH / FLOOD BEHAVIOUR

### 2.1 Existing services search methods

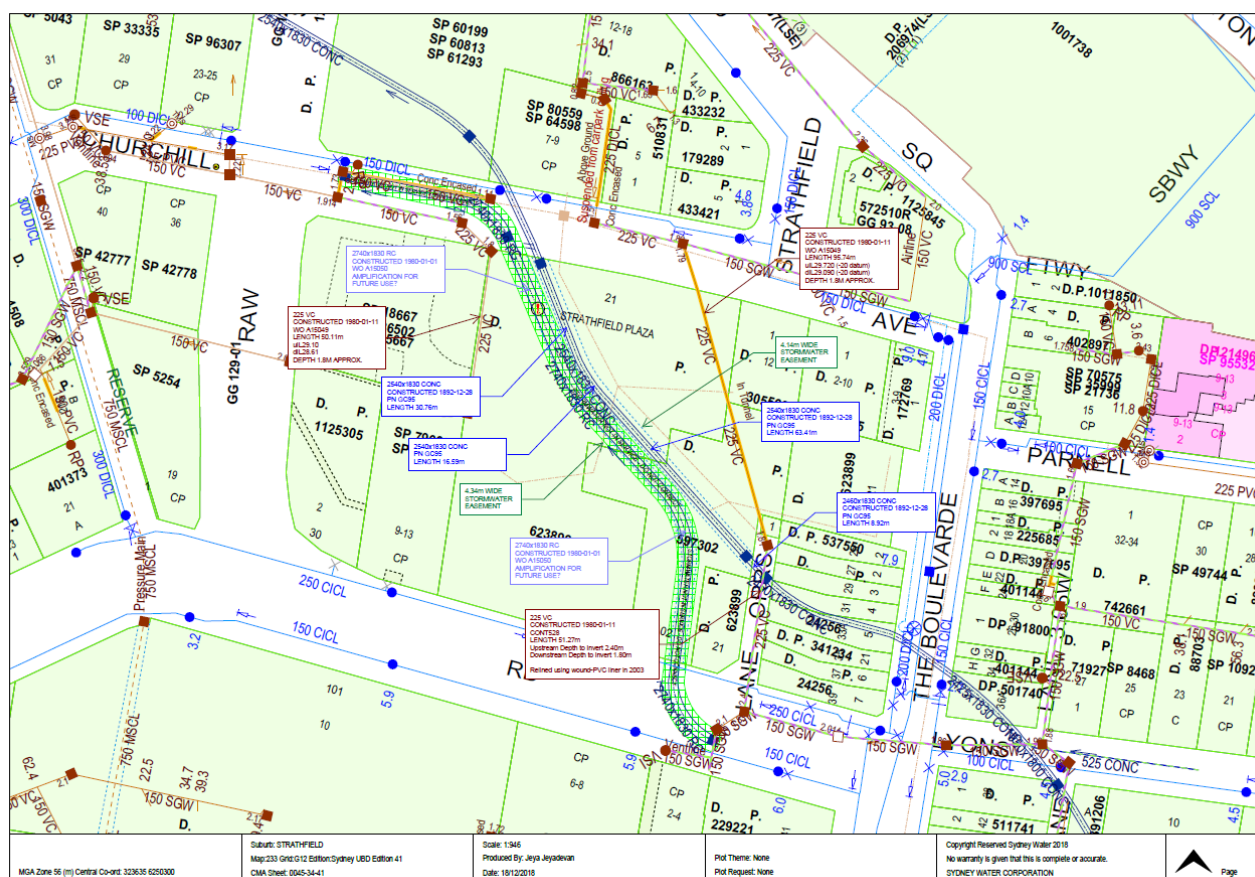
Methods used to determine existing services on or adjacent the site were limited to the following:

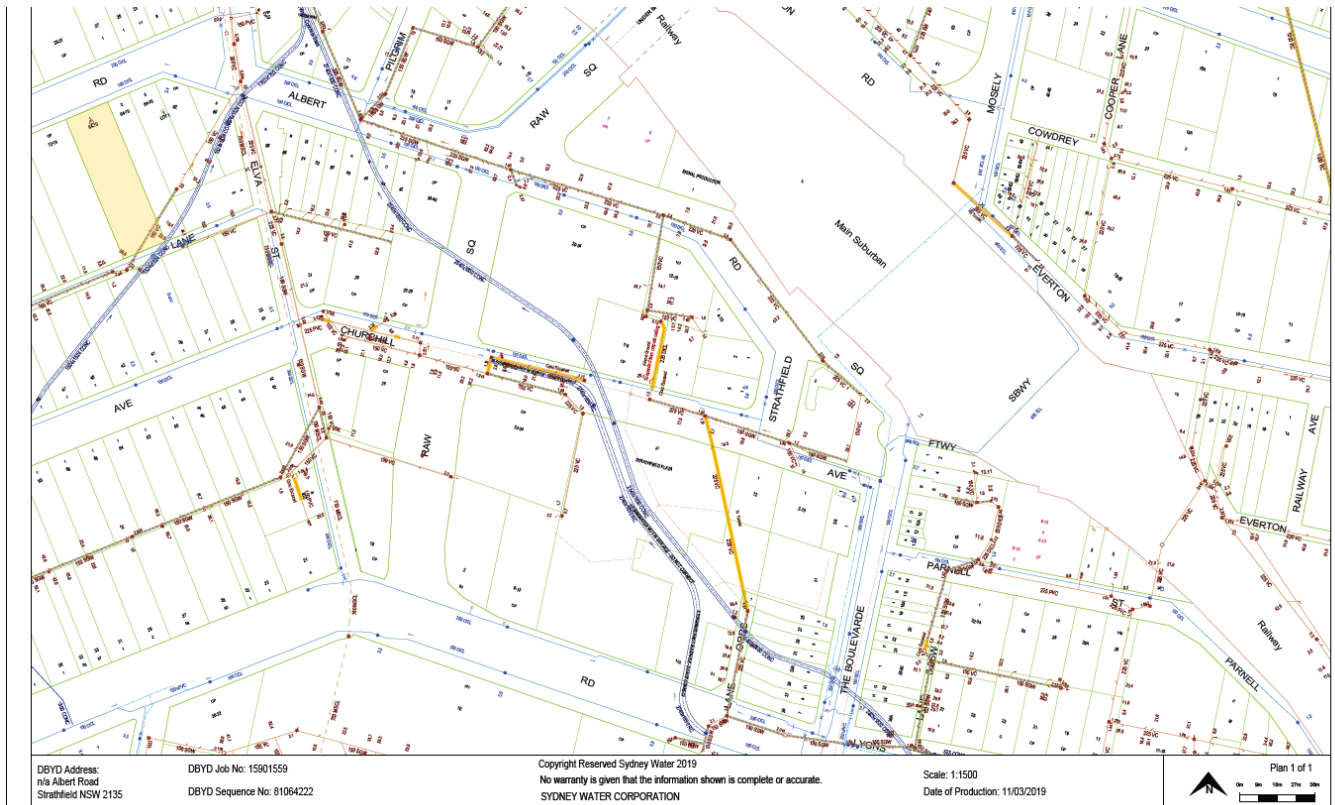
- a “dial before you dig” search enquiry, approx. April 2019
- discussions with Sydney Water
- WAE dwgs of the sewer and stormwater on the site provided by Sydney Water.

The above methods are suitable for the purposes of this Planning Proposal however detailed survey and site potholing are recommended to be undertaken for DA/CC design.

A summary of the existing sites civil/ stormwater / services / geotech and flood behaviour follows.

### 2.2 Existing Sydney Water Assets





### 2.2.1 Sydney Water Trunk Stormwater Culverts

Two existing Sydney Water owned trunk stormwater culverts diagonally cross the site and its surrounds.

- i) a 2540wx1830h mm (8'4" x 6'0") oval shaped mass concrete stormwater culvert constructed circa 1892, and
- ii) a 2740x1830 rectangular reinforced concrete culvert (at average grade 0.53%) was constructed in two stages circa 1978 and 1980 by A C Tipping P/L. The asset begins and ends a short distance either side of the plaza and was apparently intended as a future amplification asset however we understand that since it was built that it has never been connected to. Hence, it is currently not in service and is disused.

### 2.2.2 Sydney Water Sewer

Two existing Sydney water owned sewer assets traverse the site:

- i) to the East edge of the site, a 225mm VC (Vitrified Clay) sewer pipe of depth approx. 1.8m constructed in 1980 by AC Tipping. This asset is housed in 1800h x 1500w tunnel/chamber capable of man entry. Existing electrical assets owned by Ausgrid appear to traverse either through, or near to, this same tunnel (parallel to this sewer).
- ii) to the west edge of the site, a 225VC sewer pipe of depth approx. 1.8m constructed in 1978 by AC Tipping P/L.

External to the site Sydney Water owned sewers also exist in Churchill Ave (DN225), Orrs Lane (D225), Redmyre Rd and Lyons Rd



### 2.2.3 Sydney Water Potable Water

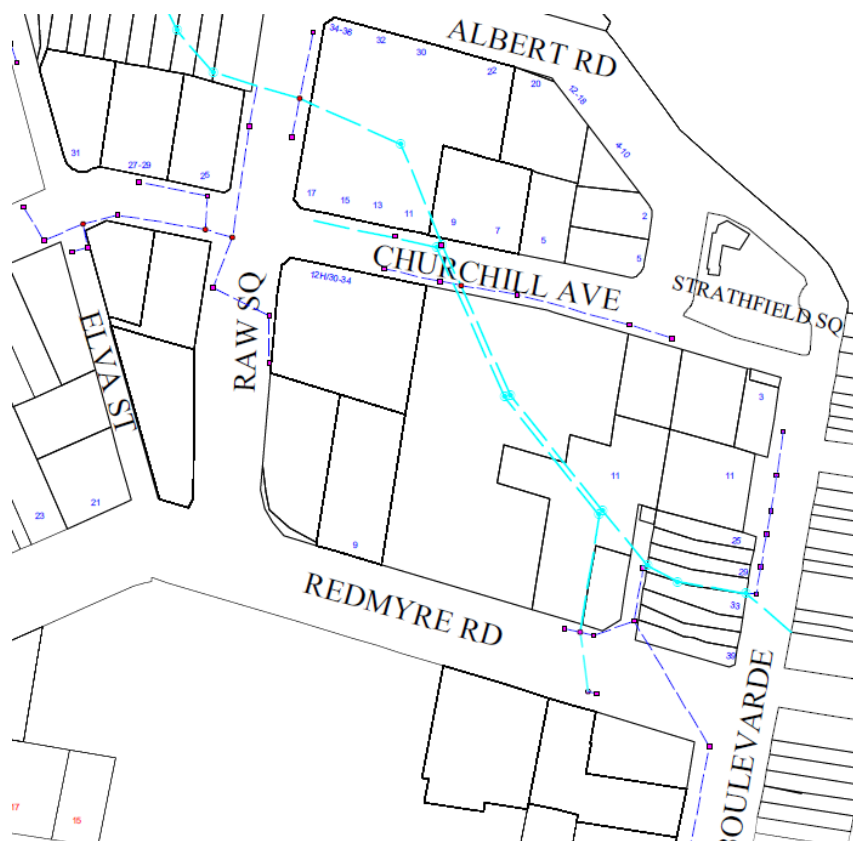
No existing Sydney Water potable water mains appear to traverse the site.

External to the site, of most relevance

- i) in “The Boulevard”. - a major 900mm diameter steel cement lined (SCL) potable trunk water main traverses North/South. The pipe has an approx. internal diameter ID of 810mm and was laid via trenching methods circa 1909. This pipe appears to reside under the West (Strathfield Council side) of the Roadway rather than the verge.
- ii) in Redmyre Rd, immediately adjacent to the site, a 250mm CICL (Cast iron Cement lined main exists) in the footpath verge.

## 2.3 Existing Strathfield Council Stormwater Assets

Several Council owned stormwater pipe kerb inlet pit assets surround the site (pipes in shown in purple and pits in red font below). These pipes connect into the above referenced Sydney Water Trunk stormwater system.



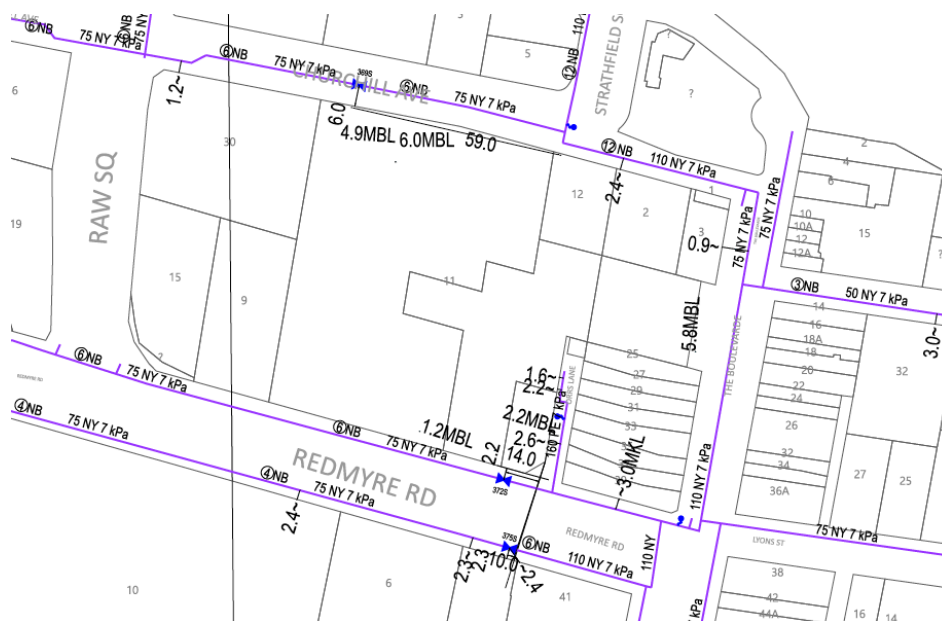
## 2.4 Existing Ausgrid Assets

Ausgrid assets exist on and adjoining the site as shown in the sketch below.



## 2.5 Existing Jemena Gas Assets

Jemena assets exist adjacent the site as shown in purple font in the sketch below.



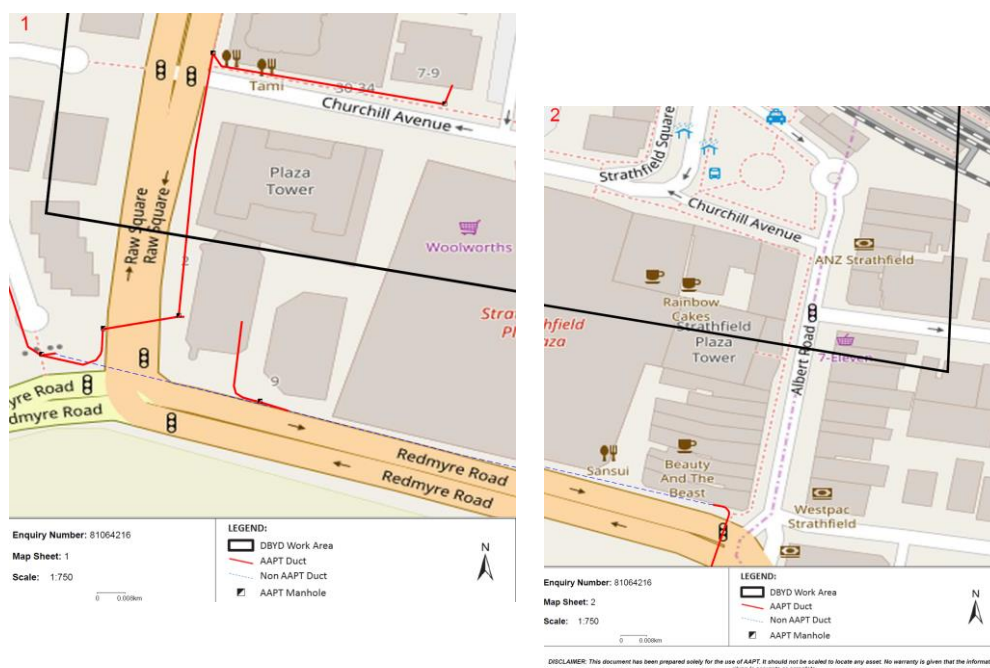
## 2.6 Existing NBN Assets

NBN assets exist on and immediately adjacent to the site as indicated in the sketch below



## 2.7 Existing AAPT Assets

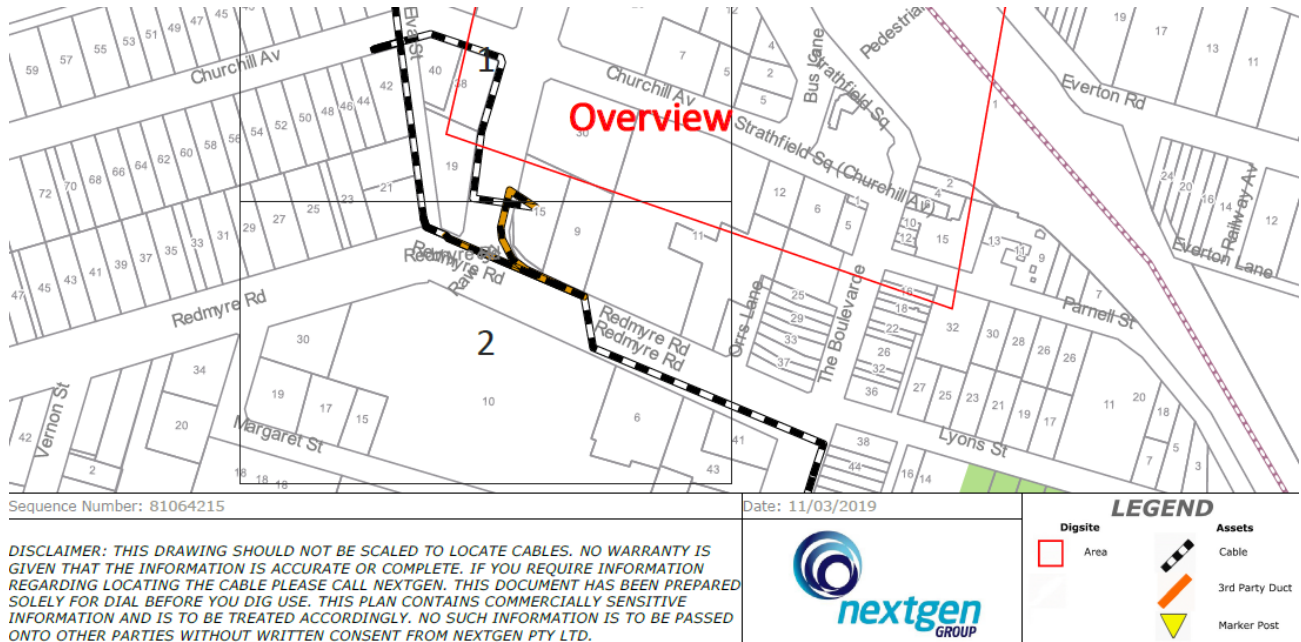
AAPT assets near to the site as indicated on the sketch below





## 2.8 Existing Nextgen Assets

Nextgen assets exist near to the site as indicated on the sketch below



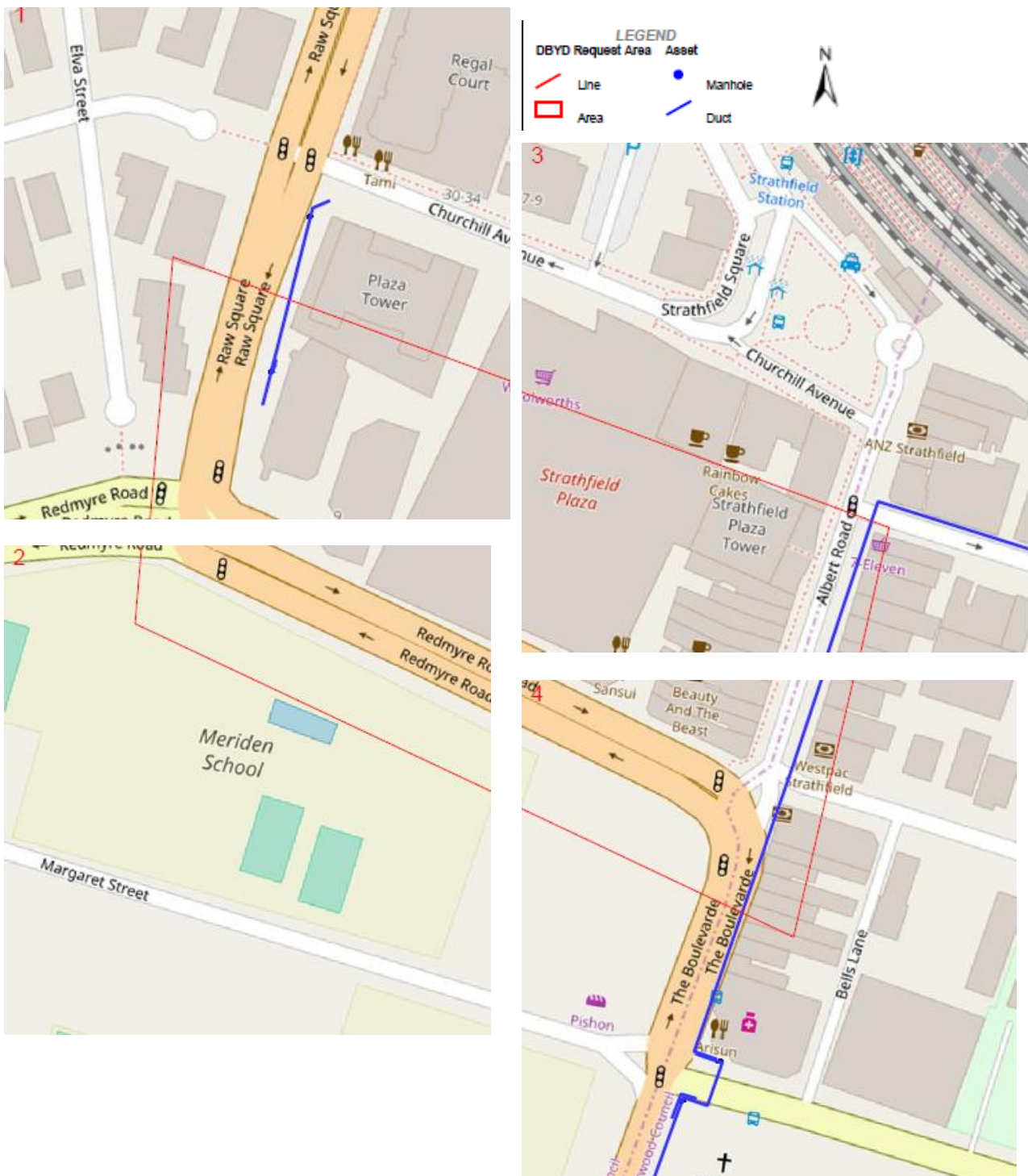
## 2.9 Existing Optus Fibre Optic Assets

Optus Fibre Optic assets exist near to the site as indicated on the sketch below

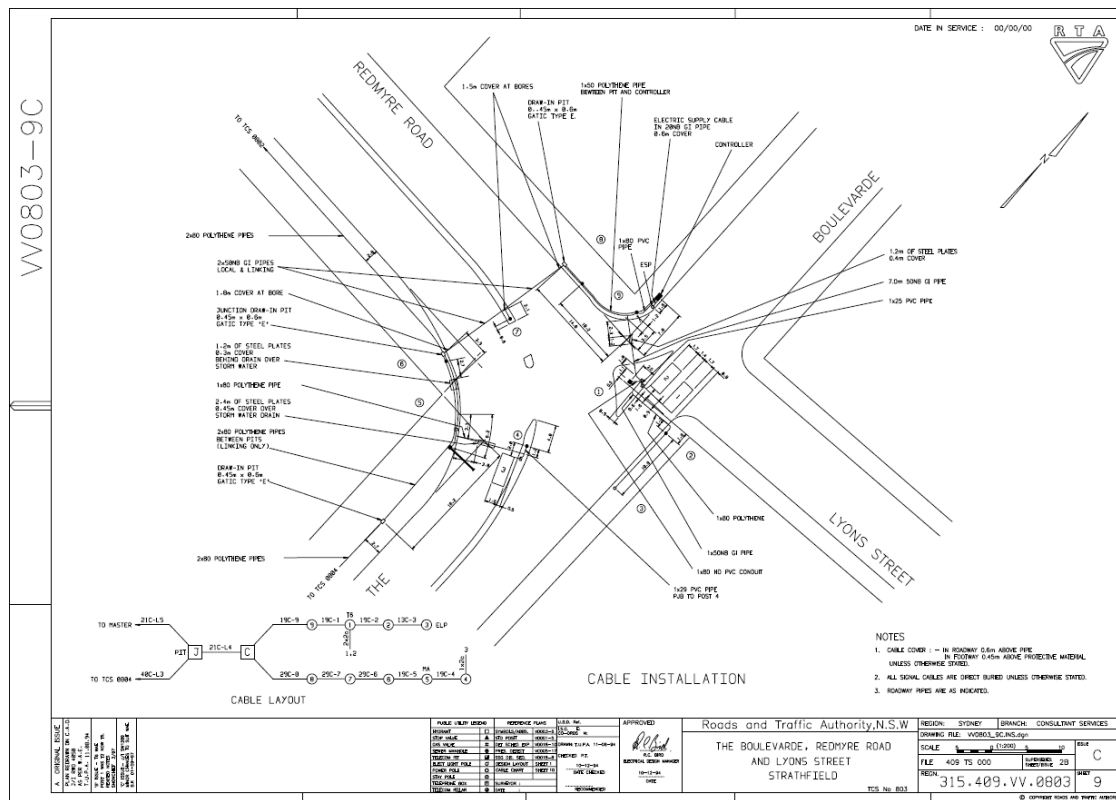


## 2.10 Existing Pipe Networks Telecommunication Assets

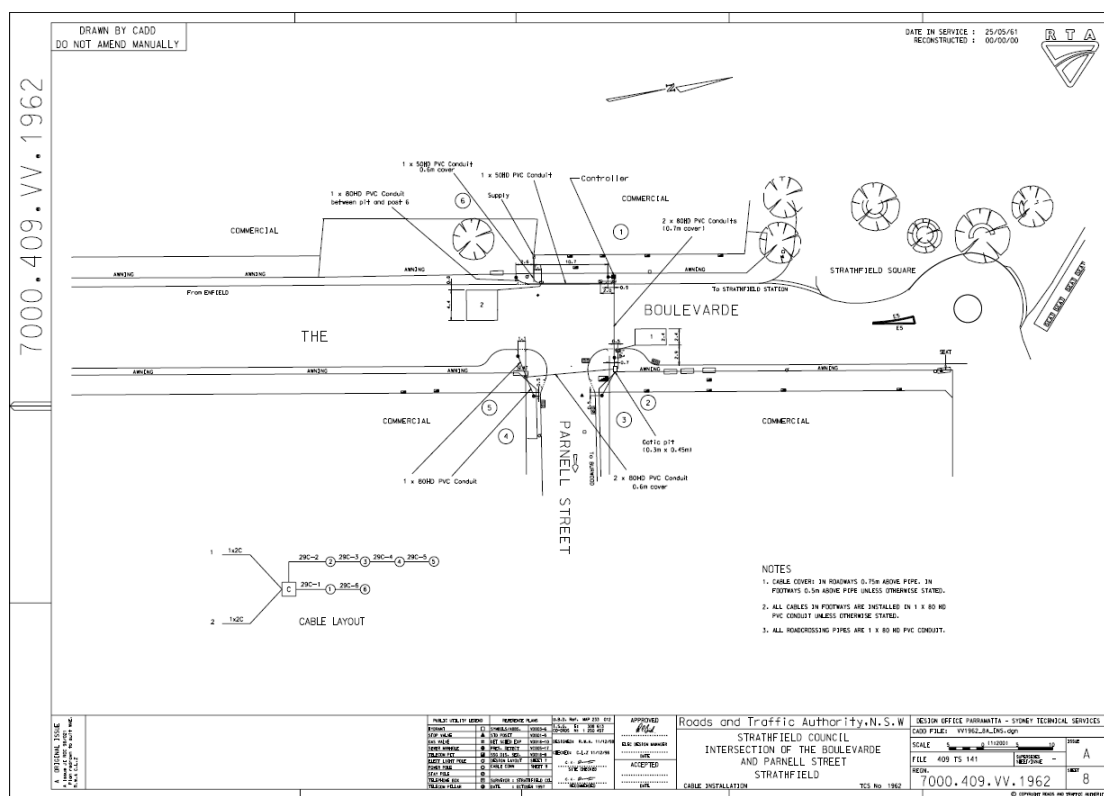
Pipe Networks assets exist near to the site as indicated on the sketch below.



## 2.11 Existing RMS Traffic Signal Assets- Redmyre Rd/Lyons St/The Boulevard



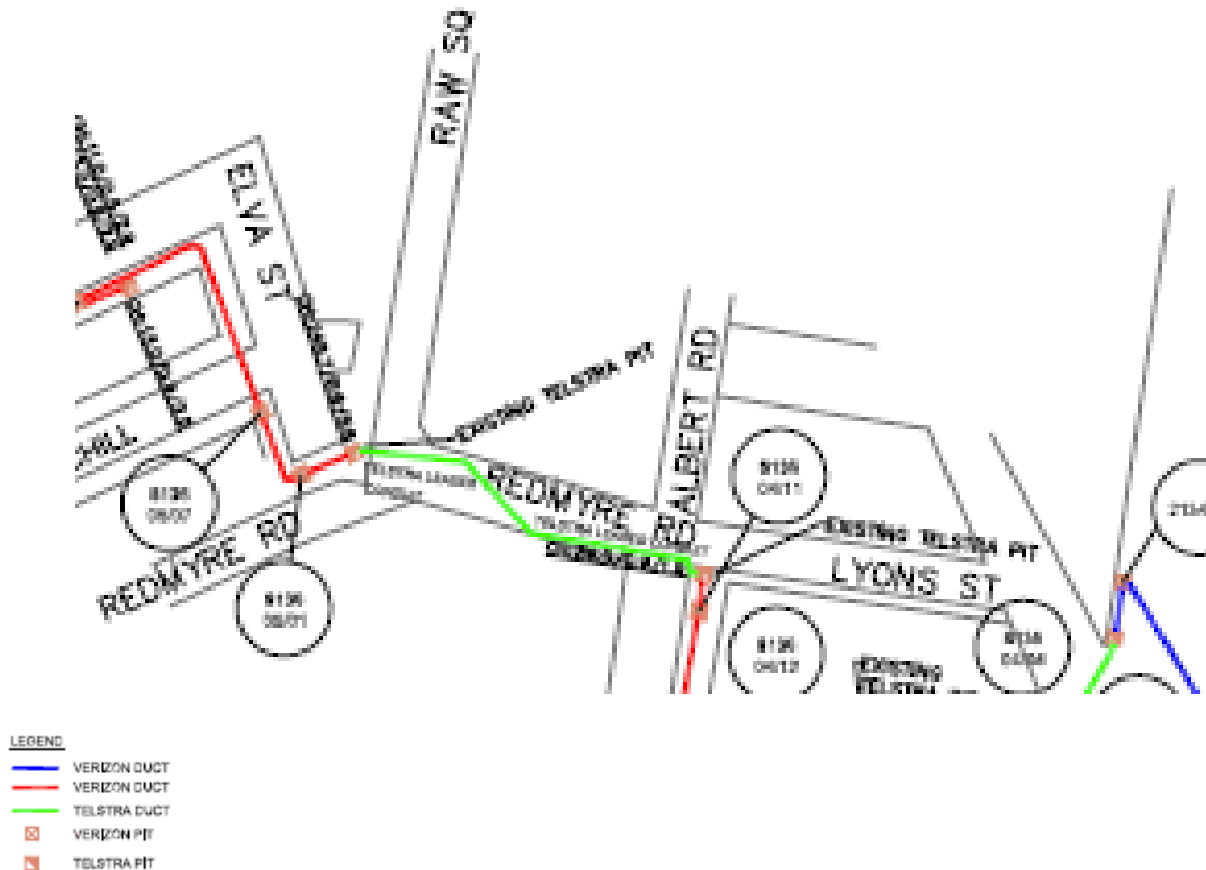
## 2.12 Existing RMS Traffic Signal Assets- The Boulevarde and Parnell St





## 2.13 Existing Verizon Assets

Verizon Assets exist on and immediately adjacent to the site as indicated in the sketch below.



## 2.14 Indicative Existing Site Geotech

### 2.14.1 Geotech for Adjacent site – 1, 3-9 The Boulevard, and 2-10 Churchill Ave, Strathfield.

A recent DA for an adjacent site (SPP 2016SYE067 / DA 2016/087) proposes 3 levels of underground basement (approx. 10.5m depth) plus 10 storeys above ground.

To support this DA a preliminary desktop Geotechnical site assessment was undertaken by JK Geotechnics

The preliminary recommendations of this Geotech report includes the following statement:

*“Based on the results of our desktop study research, discussed in more specific detail in Section 3.2, we infer that the subsurface profile at the site most likely comprise some fill underlain by residual clays grading into shale bedrock at general depths of around 3m-6m, based on nearby site as well as geotechnical information on part of the site itself. The upper layers of shale might be of an extremely low to very low strength nature, but improving with depth (probably around 5m-6m) to at least medium strength. Groundwater levels are likely to be encountered within the depth of the proposed three level basement excavation, since groundwater levels at nearby sites were at depths of around 4m.”*

## 2.15 Existing Site Flood Behaviour

Existing flood behaviour in the 1% Annual Exceedance Probability (AEP) event, as defined by the regional flood study (Powells Creek and Saleyards Creek Flood Study, WMAwater, 2016), is shown in **Figure 2-1**. This generally shows that overland flows approach the site from the south east and are then conveyed through the site, via the entrance on The Boulevard and also Orrs Lane, and also around the site to the north east. Flows then discharge towards Powells Creek to the north west. The peak depths in a 1% AEP event through the Plaza are indicatively 0.5 - 0.7 m.

The regional flood study includes a 10 m wide overland flowpath from The Boulevard entrance, through the plaza and connecting to the west and north. While this flowpath width appears a reasonable representation of the pedestrian thoroughfare through the plaza, a preliminary review suggests that the glass doors at the entry to the plaza would likely significantly reduce this width at the entry. If a reduced width or blockage was incorporated into the model at this location, this would be expected to reduce flows through the plaza and increase overland flows in other areas (most likely to the north east).

The stormwater pit and pipe network through and adjacent to Strathfield Plaza area is a complex collection of assets owned by Sydney Water Corporation (SWC), Burwood Council and Strathfield Municipal Council. While the regional study includes two major culverts beneath the plaza (red lines/arrows in **Figure 2-1**), as noted in section 2.2 or this report, only the northern culvert is considered to be in service/active. The southern culvert was intended as an amplification when it was constructed (circa 1978-1980), but was never connected to the trunk system.

Given the potential limitations of the regional flood study in relation to the representation of local overland flowpaths and the major stormwater culverts, following rezoning it is recommended that further review and refinements be made to the flood models to establish final flood planning levels for any future development applications. This updated model should also be used for any flood impact assessment.

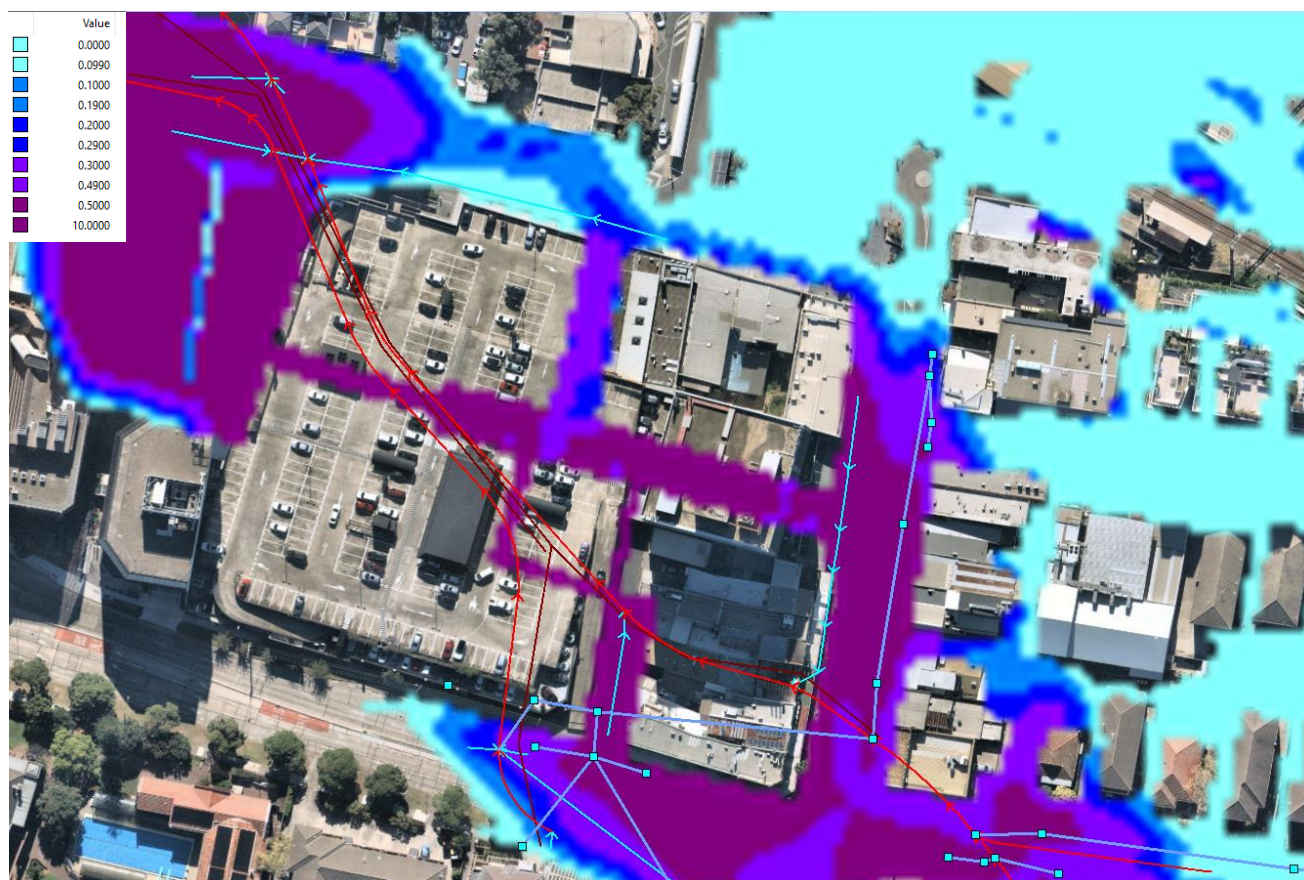


Figure 2-1 Existing 1% AEP Flood Depths (m)

### 3 PLANNING PROPOSAL – Civil / Stormwater / Flood & Sewer Design Concepts.

#### 3.1 On-site Stormwater Detention (OSD)

In accordance with Strathfield Council Stormwater Management Code (adopted by Council Oct 1994) an On-site stormwater detention system (OSD) is not required.

Clause 4.2 of this code dictates the following

*OSD is required to limit discharges from specified developments / building works to predevelopment conditions. Council's OSD requirements have been formulated to ensure there is no increase in discharges adjacent to the site or elsewhere in the catchment for all rainfall events through to 100 years ARI.*

*Other than for single residential dwelling projects OSD will be required for all developments / building works where the proposed increased paved and/or roofed areas exceed 100m<sup>2</sup>.*

Based on the existing site conditions the whole development is considered as impervious. The existing Strathfield Plaza complex is made up of a single storey retail shopping centre which fully covers the 11,253 sqm site. The complex also comprises of a two level above ground car park facility situated over the retail space. See Figure 1-2 for aerial image of existing site.

The proposed development reduces the impervious area with the introduction of landscaped areas. Based on this assessment OSD is not required and satisfies Strathfield Council's Stormwater Management Code.

#### 3.2 Proposed Sydney Water Trunk Stormwater Culvert Diversion

##### 3.2.1 Concept Design

A concept design has been undertaken per dwgs 80219044 - SWD - SK001 and SK002 contained in Appendix B.

In summary the overall design concept is for a narrow two level stacked trunk stormwater culvert system that hugs the internal southern and western edges of the Strathfield Plaza (SP) site. These would be:

- A new proposed low level stormwater trunk culvert would essentially imitate and replace the functional purpose of the existing live 2.54m x 1.83m oval culvert. Its prime design intent/mechanism would be to transfer the stormwater flow from the stormwater catchment upstream of the SP site through the SP site.
- A new proposed high level stormwater trunk culvert, within the Strathfield Plaza site, would be located immediately above the new low level culvert with the same internal width (approx. 2.5m) and at variable height but sits below the new proposed bus hub roadway. Its prime design intent would be twofold:
  - i) to be a channel mechanism to capture overland flow off Redmyre Rd and Orrs Lane (through a series of new gutter or other grated inlet/capture pits and pipes) and transfer it across the site to a new merge/release chamber in Churchill Ave (which at this point the stormwater would either drop into the new low culvert under it, or if need be surcharge up though grated pits onto the Churchill Ave roadway above in a design controlled manner. Upon detail design these grated pits could if desired be sized suitably to act as an orifice to suit required/desired outflows/ velocities.
  - ii) to create additional regional stormwater detention volume storage area in flood events.

All design would be refined and detailed designed and flood modelled as appropriate at the DA and CC design stage.







### 3.4 Preliminary Recommended Flood Planning Levels

The proposed development includes demolition of the existing plaza and construction of new basement overlaid by new retail space and new commercial and residential high-rise. The proposed development also includes realignment and amplification of the existing Sydney Water stormwater culvert which traverses the site.

Strathfield Council's flood planning policy provides limited guidance on flood planning levels. Consistent with adjacent developments, it is recommended that floor levels be set at a minimum of the 1% AEP level + 0.5 m freeboard or an equivalent level of protection be provided through the use of flood gates. The 1% AEP and PMF flood levels for the study area were extracted from the regional flood study model results. These are summarised in **Appendix A**. However, as noted previously, while the regional flood study provides indicative flood behaviour, it is expected that site specific refinements to the flood models will need to be made to inform final flood planning levels and flood impact assessment for the proposed development. The development proposes to use a combination of raised floor levels and flood barriers/gates to achieve appropriate levels of protection.

Given the proposed development is expected to include raised floor levels and flood barriers to eliminate overland flows through the site in events up to the 1% AEP event, without any mitigation works this would be expected to result in flood impacts to adjacent properties. Therefore, to mitigate any potential flood impacts, it is proposed to upgrade and realign the existing stormwater culverts (refer to section 3.2 of this report for additional details of the proposed culvert realignment). Increased inlet capacity and potentially a surcharge pit downstream of the site would also be required. Details and the performance of this system would be confirmed following update of the flood models.

The recently approved adjacent development (1-9 The Boulevard, DA 2016/87) has adopted a maximum flood planning level of 13.2 m AHD, being the accessed 1% AEP flood level of 12.7 m AHD plus 0.5 m freeboard and this same floor level rationale is used by this planning proposal. A suitable retail ground floor level could be adjusted from this level and this will be fully tested and determined once detailed architectural, detailed existing survey and new specific flood studies of the new proposed culvert situation are undertaken as a part of a future DA/CC.

#### Flood planning conclusion

We have undertaken review of the available flood information, including Council's regional flood study. This regional flood study provides indicative flood behaviour for existing conditions at the site.

Some limitations were found with the regional flood study models and recommendations have been made to refine/update this model following rezoning, to inform any future development applications.

The Strathfield Central development is proposed to incorporate a combination of raised floor levels and flood barriers/gates to achieve a suitable level of protection.

The existing stormwater culvert beneath the plaza is proposed to be amplified and realigned to offset any potential flood impacts as a result of modifying existing overland flow paths. Details and the performance of this system would be confirmed following update of detailed survey and flood models.

## 4 CONCLUSION

---

This report identifies that:

- two existing trunk Sydney Water owned stormwater culvert assets traverse the site, one is live and the other appears to be unused and dormant.
- two existing Sydney Water owned DN225 sewer services traverse the site.
- other services also exist onsite including electrical mains/kiosks and telecommunications services.
- other stormwater, sewer, power, gas and telecoms services exist on the site and on adjoining properties and road reserves that surround the site.
- the subject site and its surrounding neighbours and roads are currently affected by the 1%AEP flood.

This Planning Proposal provides an opportunity to re-engineer, revitalise, renew and replace existing aged stormwater and sewer assets and to improve flooding conditions both on the site and in the broader region of the 'Strathfield Central' site.

The construction of a brand new stormwater culvert system as proposed would provide considerable new benefits over the existing stormwater culvert situation including:

- Replacement and amplification of the existing aged 2.54 x 1.83m stormwater culvert asset (both within the site and at substantial length immediately upstream of the site under Redmyre Rd.)
- the removal and unburdening of this trunk stormwater system under numerous adjoining neighbour properties fronting the "The Boulevarde".
- a new culvert system which would be designed to not adversely impact on existing overland flow and flooding
- an opportunity for existing overland flooding to be diverted under the site within a specifically designed new secondary upper level culvert.
- Stormwater collected off the site would be suitably collected, detained, quality treated and recycled onsite (where viable).
- All habitable floors would be designed at suitable levels relative to large flood events.

Whilst future detailed designs will be subject to the gaining of more detailed survey, further detailed design development, further flood modelling and consultation with applicable authorities, this report demonstrates sound initial concept design solutions for this planning proposal including:

- a logical new diversion solution to the live Sydney water owned trunk stormwater system that traverses the site
- a logical new route for the secondary conveyance of overland stormwater events via new culverts and new stormwater overland conveyance flow paths.
- a logical diversion solution for the existing DN225 sewer that traverses the site.
- recommended preliminary flood planning levels

Given the rationale provided herein, this Planning Proposal is overall supported.

## Appendix A – Preliminary Flood Planning Levels

Table 4-1 Flood levels as adopted for DA 2016/87, 1-9 The Boulevard, Strathfield

ID	Location		Ground Level	1% AEP	1% AEP + 0.5m	PMF
A	The Boulevard Entrance (Taxis)	Level	12.25	12.7	13.2	
B	Corner of Strathfield Square/ The Boulevard	Level	12.60	12.7	13.2	

Table 4-2 Flood Levels taken from Powells Creek and Saleyards Creek Flood Study, WMAwater, 2016

ID	Location		Ground Level	1% AEP	1% AEP + 0.5m	PMF
A	The Boulevard Entrance (Taxis)	Level	12.25	12.85	13.35	14.00
		Depth	-	0.60	1.10	1.75
B	Corner of Strathfield Square/ The Boulevard	Level	12.60	12.85	13.35	13.85
		Depth	-	0.15	0.65	1.15
C	Strathfield Square/Churchill Avenue	Level	11.45	11.65	12.15	12.90
		Depth	-	0.20	0.70	1.50
D	Churchill Avenue/ Driveway	Level	10.15	10.80	11.3	12.30
		Depth	-	0.65	1.15	2.15
E	Driveway	Level	9.35	10.85	11.35	12.35
		Depth	-	1.50	2.00	3.00
F	Redmyre Road /Driveway	Level	13.70	N/A	N/A	14.35
		Depth	-	N/A	N/A	0.65
G	Redmyre Road/ Orrs Lane	Level	12.30	12.90	13.40	14.35
		Depth	-	0.60		2.05
H	Redmyre Road/ The Boulevard	Level	12.45	12.95	13.45	14.35
		Depth	-	0.50		1.90



Figure 4-2 Reference Locations for 1% AEP and PMF Results (Ground Floor Plan)

## Notes

- Table 4-2 1%AEP and PMF flood level data referenced herein has been interpreted from “Powell’s Creek and Saleyards Creek Flood Study, WMAwater, 2016.”
- Further site specific survey and flood modelling will be required to be undertaken at DA design stage to confirm all proposed flood planning levels.



## Appendix B - Concept Sewer & Stormwater Diversion Design

---

- i. Cardno Dwg 80219044 - SWD - SK001- Rev 4
- ii. Cardno Dwg 80219044 - SWD - SK002- Rev 3



## UNDERGROUND SERVICES LEGEND

### EXISTING SERVICES

- EXISTING COMMUNICATION LINE
- EXISTING GAS MAIN
- EXISTING POTABLE WATER
- EXISTING SEWER
- EXISTING SYDNEY WATER OWNED STORMWATER
- EXISTING HIGH VOLTAGE
- EXISTING LOW VOLTAGE
- SERVICE TO BE DISUSED
- EXISTING COUNCIL STORMWATER
- DENOTES EXISTING PROPERTY SERVICE INLET INTO SYDNEY WATER SEWER ASSET

NOTE: THIS PLAN HAS BEEN PREPARED USING DRYD, SERVICE DIAGRAMS TO SHOW EXISTING SERVICES FOR COORDINATION PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION.

### PROPOSED SERVICES

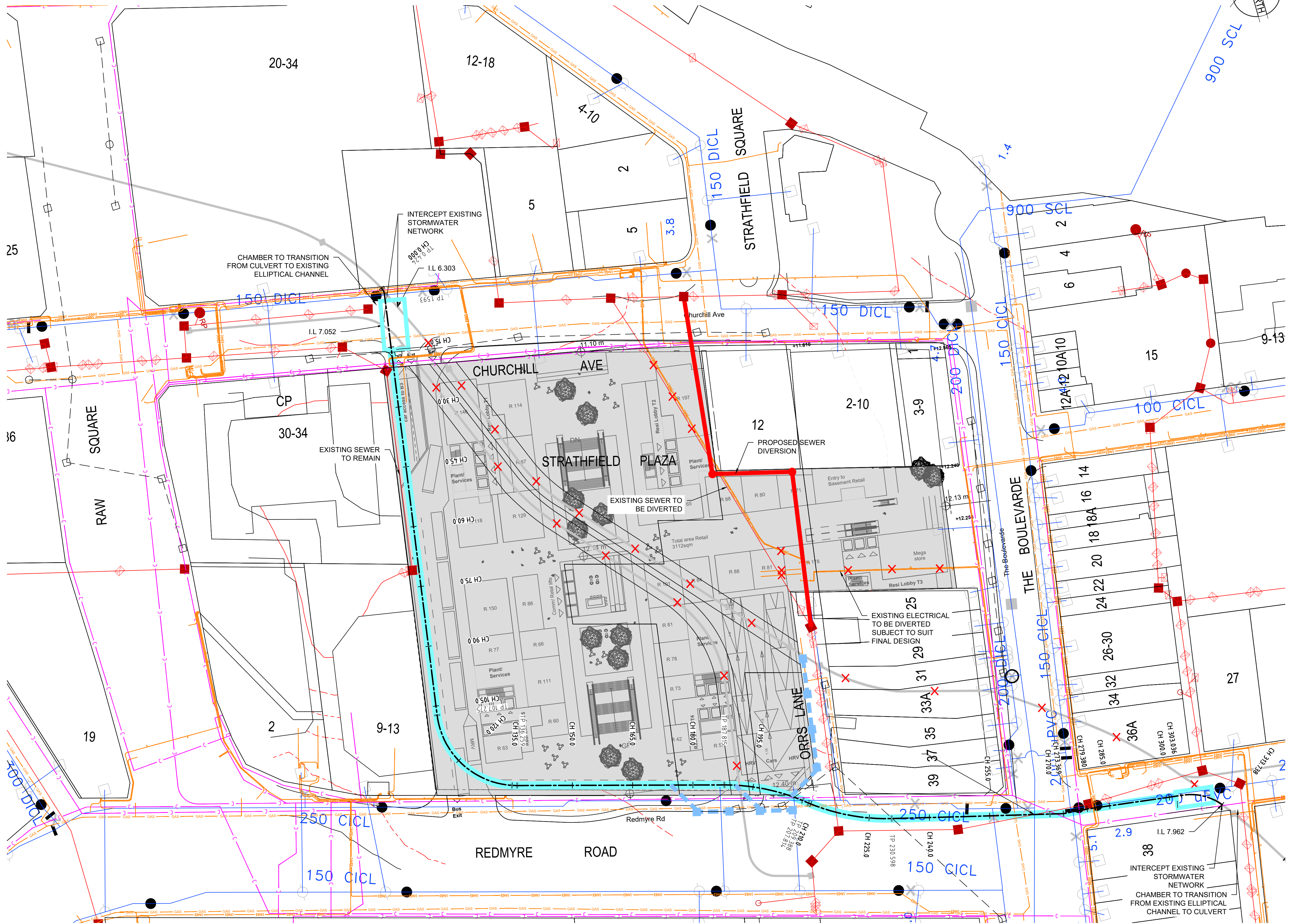
- STORMWATER REALIGNMENT OPTION  
- LENGTH = 313m  
DEVIATION GRADE = 0.54%
- DENOTES ADDITIONAL STORMWATER NETWORK CONNECTING TO PROPOSED REALIGNED CULVERT. INDICATIVE ONLY.
- DENOTES INLET STRUCTURE.
- DENOTES PROPOSED SEWER REALIGNMENT

### LEGEND

- PROPOSED DEVELOPMENT SITE  
INDICATIVE INVERT LEVEL BASED ON W.A.C PLANS.

## NOTES:

- PROPOSAL TO RECONSTRUCT STORMWATER ASSETS ON REDMEMRE THAN TRAVERSING THROUGH DEVELOPMENT SITE PARALLEL WITH SOUTHERN AND WESTERN BOUNDARY.
- ALTERNATIVE TO REMOVE ASSETS FROM DEVELOPMENT SITE. PROPOSED ASSETS BE CONSTRUCTED IN RAW SQUARE. NUMBER OF POTENTIAL SERVICE CLASHES RISES.
- CLASHES WITH SEWER AND DN810 WATER MAIN LOCATED AT INTERSECTION OF REDMEMRE ROAD AND THE BOULEVARDE TO BE REVIEWED. SERVICE INVERT LEVELS MAY NOT ALLOW FOR THIS OPTION.
- EXISTING SEWER FROM ORRS LANE TO CHURCHILL AVENUE TO BE RETAINED.
- REMOVAL OF STORMWATER ASSET BENEATH No. 31 AND No. 33A. POTENTIALLY WILL AFFECT THE STORMWATER CONNECTIONS FOR PROPERTIES No. 25 TO No. 39.



PRELIMINARY CONCEPT DESIGN

FOR INFORMATION ONLY  
NOT TO BE USED FOR CONSTRUCTION PURPOSES



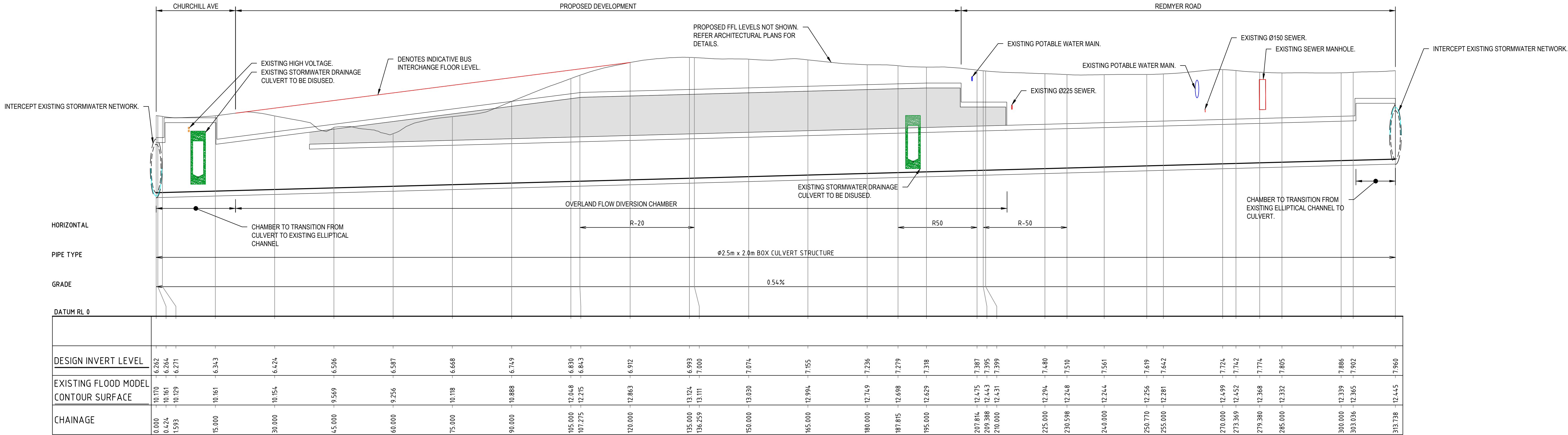
© Cardno Limited All Rights Reserved.  
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

**Cardno**  
Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035  
Suite 3.01, Level 3, 3 Horwood Place  
Parramatta, NSW 2150  
Tel: 02 9496 7700. Fax: 02 9439 5170  
Web: www.cardno.com.au

STRATHFIELD CENTRAL PLANNING PROPOSAL				
CONCEPT TRUNK STORMWATER REALIGNMENT AND SEWER REALIGNMENT PLAN				
Datum	Date	Scale	Size	
AHD	06.09.19	1:500	A1	
Drawing Number				Revision
80219044-SWD-SK001				04



DATE PLOTTED: 6 September 2019 4:35 PM BY: ALEXANDER RENCASTLE

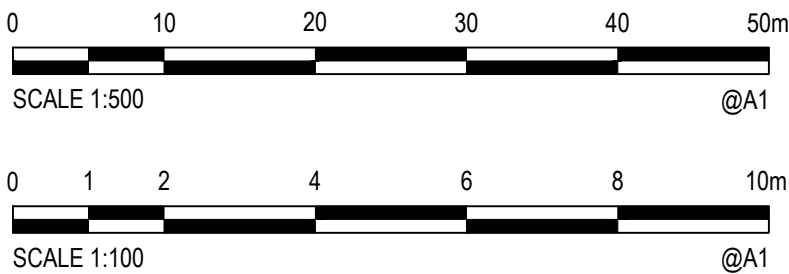


STORMWATER DIVERSION LONGITUDINAL SECTION - STACKED CHAMBER OPTION  
1:500 HORI.  
1:100 VERT.

- NOTES:
- ALL INFORMATION SHOWN IS BASED ON A DESKTOP STUDY UNDERTAKEN USING DBYD, SYDNEY WATER WAC PLANS AND EXISTING SURFACE DATA FROM COUNCIL FLOOD MODEL. THE INFORMATION SHOWN IS INDICATIVE ONLY AND IS SUBJECT TO CONFIRMATION VIA DETAILED SURVEY AND SERVICE LOCATION/DEPTH CONFIRMATION.
  - EXISTING SURFACE LEVEL HAS BEEN PRODUCED USING SURFACE DATA EXPORTED FROM COUNCIL'S TUFLOW MODEL AND IS INDICATIVE ONLY. EXISTING LEVELS SUBJECT TO DETAILED SURVEY TO CONFIRM MINIMUM COVER IS ACHIEVABLE OVER PROPOSED STORMWATER ASSETS.
  - ALTHOUGH WAC PLANS HAVE BEEN USED TO DETERMINE EXISTING INVERT LEVELS FOR ALL EXISTING STORMWATER ASSETS SURVEY AND SERVICE DEPTH CONFIRMATION WORKS ARE TO BE CARRIED OUT.
  - NOT ALL EXISTING SERVICES ARE SHOWN ON LONGITUDINAL SECTIONS FOR CLARITY. CRITICAL SERVICES HAVE BEEN SHOWN ONLY AND ARE BASED ON DBYD PLANS AND WAC WHERE AVAILABLE. SERVICE LOCATION AND TYPE TO BE CONFIRMED ON SITE. DEPTH OF SERVICE IS BASED ON STANDARD COVER INFORMATION TABLES AND SHOWN IN RELATION TO GEHUB SURFACE AS GUIDE ONLY.

PRELIMINARY CONCEPT DESIGN

FOR INFORMATION ONLY  
NOT TO BE USED FOR CONSTRUCTION PURPOSES



© Cardno Limited All Rights Reserved.  
This document is produced by Cardno Limited solely for the benefit of and use by the client in accordance with the terms of the retainer. Cardno Limited does not and shall not assume any responsibility or liability whatsoever to any third party arising out of any use or reliance by third party on the content of this document.

**Cardno**  
Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035  
Suite 3.01, Level 3, 3 Horwood Place  
Parramatta, NSW 2150  
Tel: 02 9496 7700 Fax: 02 9439 5170  
Web: www.cardno.com.au

**STRATHFIELD CENTRAL**  
STORMWATER DRAINAGE REALIGNMENT  
LONGITUDINAL SECTION  
STACKED CHAMBER OPTION

Datum	Date	Scale	Size
AHD	06.09.19	AS SHOWN	A1

Drawing Number: 80219044-SWD-SK002  
Revision: 03