



Jordan Springs Residential
Development
Mixed Use Site
Stage 2 (Concept Design) Road
Safety Audit

transportation planning, design and delivery

Jordan Springs Residential Development

Mixed Use Site

Stage 2 (Concept Design) Road Safety Audit


Issue: B 10/03/14

Client: C.I.D Group

Reference: 14S1013000

GTA Consultants Office: NSW

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	19/11/13	Final	Brigette Humphrey- Robinson	Wayne Johnson	Ken Hollyoak	Ken Hollyoak
B	10/03/14	Final	Wayne Johnson	Wayne Johnson	Ken Hollyoak	

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Executive Summary

RSA No.:	14S1013000/2
Audited Project:	Jordan Springs Mixed Use Site
Audit for:	C.I.D Group
Address:	PO Box 590, Niddrie, VIC 3042
Telephone:	0 418 363 333
Project Manager	Shane Osta
Auditors:	Ken Hollyoak [Eur Ing BSC, MSc, CEng, MICE, FIHT, MIEAUST, CPEng] Director] Senior Road Safety Auditor (Level 3 RMS) Audit Reviewer Brigitte Humphrey-Robinson [BE (Civil) Consultant], Road Safety Auditor (Level 1 RMS) Audit Team Member
Audit type	Concept Design (Stage 2 – Road Safety Audit)
Commencement meeting:	21 February 2014
Audit date:	7 March 2014
Completion meeting:	10 March 2014
Previous audit no:	14S1013000/1
Previous audit:	Concept Design Road Safety Audit

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1. Introduction

1.1 Background

This report has been prepared on behalf of C.I.D Group to present the results of a concept design Stage 2 Road Safety Audit (RSA). This RSA examined the proposed mixed use site.

Jordan Springs is bounded by Ninth Avenue to the north, The Northern Road to the west, and land zoned for the Regional Park to the south and east. The mixed use site is located south of Jordan Springs Boulevard, in the south-west corner of Jordan Springs.

The proposed Jordan Springs development has the following key features:

- A village centre zone in the southern part of the precinct, which would comprise a mix of retail, commercial, community, open space and residential uses
- Residential development
- Active and passive open space areas
- Collector road network, including connections to The Northern Road, Ninth Avenue and the Eastern Precinct.

The location of the site is shown in Figure 1.1.

Figure 1.1: Subject Site and its Environs



Basemap Source: Nearmap

1.2 Aim and Objectives

The aim of the project is to review road safety issues of the proposed layout of the mixed use site. This is to accompany the development application to be submitted to Penrith City Council.

A road safety audit is defined as "a formal examination of a future road or an existing road, in which independent, qualified team reports on the project's crash potential and safety performance" (Austroads 2009).

The objective of a road safety audit is to identify potential safety risks for road users and to ensure that measures to eliminate or reduce the risks are fully considered.

1.3 Supporting Information

The following documents have been provided by the Client and have been reviewed as part of this audit (attached in Appendix A).

- J Wyndham Prince, Dwg No 9776/ DA01 Overall Site Plan – Revision C (04/03/14)
- J Wyndham Prince, Dwg No 9776/ DA02 Typical Road Cross Sections – Revision A (14/02/14)
- J Wyndham Prince, Dwg No 9776/ DA03 Road Layout Plan - Revision C (04/03/14)
- J Wyndham Prince, Dwg No 9776/ DA06 Road Longitudinal Sections – Revision A (14/02/14)
- J Wyndham Prince, Dwg No 9776/ DA07 Road Longitudinal Sections, Sheet 2 - Revision A (14/02/14)
- J Wyndham Prince, Dwg No 9776/ DA08 Site Sections - Revision B (04/03/14)
- J Wyndham Prince, Dwg No 9776/ DA11 Turning Paths - Revision A (14/02/14)
- J Wyndham Prince, Dwg No 9776/ DA12 GPT Access Plan - Revision B (04/03/14).

1.4 Checklists and Reference Material

The audit has been carried out in accordance with the RMS Guidelines for Road Safety Audit Practices (2011) and the Austroads Guide to Road Safety Part 6: Road Safety Audit (2009). Key elements examined included:

- path grades
- path width
- kerb ramps and transitions
- pedestrian crossings
- pedestrian facilities and protection
- fixed items adjacent to the roadway, including trees and electricity/light poles
- roadside hazards
- adjacent land use access points
- sight distance and visibility
- readability of alignment and intersections
- intersection layout and geometry
- vehicle turning paths
- drainage
- landscaping considerations
- lighting.

2. Road Safety Audit Program

2.1 Commencement Meeting

Audit commencement was undertaken in the form of an email between Wayne Johnson (Road Safety Auditor), and Ramy Tawadros (Architect) which took place on 21 February 2014. The purpose, depth and scope of the project were discussed.

2.2 Site and Field Audits

The field audit was conducted on Thursday 7 November 2013 during the daytime period by the lead road safety auditor and audit team member. The weather for the day audit was fine and sunny/ overcast while the night audit was also fine.

It is noted that the site and its connections with the external road network were partially restricted due to surrounding construction sites. As such, this audit is predominately a desktop audit.

2.3 Completion Meeting

A completion meeting occurred in the form of a teleconference on the 10 March 2014 between the audit team and the design team.

3. Road Safety Audit Findings

3.1 Introduction

The risk ratings have been based on the risk matrix presented in Table 3.1, which has been adapted from the standard Austroads Risk Matrix.

Table 3.1: Risk Matrix

LIKELIHOOD \ SEVERITY	Improbable	Occasional	Highly Probable
Minor	Low	Low	Medium
Moderate	Low	Medium	High
Major	Medium	High	High

The terms in Table 3.1 are described below.

Likelihood:

- Highly probable: It is likely that more than one crash of this type could occur within a five year period.
- Occasional: It is likely that less than one crash of this type could occur within a five year period.
- Improbable: Less than one crash of this type could occur within a 10 year period.

Severity:

- Major: The crash is likely to result in a fatality or serious injuries.
- Moderate: The crash is likely to result in minor injuries or large scale of property damage.
- Minor: The crash is likely to result in minor property damage or many near miss crash events.

Priority:

- High: Very important, and needs to be addressed urgently.
- Medium: Important, and needs to be addressed as soon as possible.
- Low: Needs to be considered as part of regular maintenance/planning program.

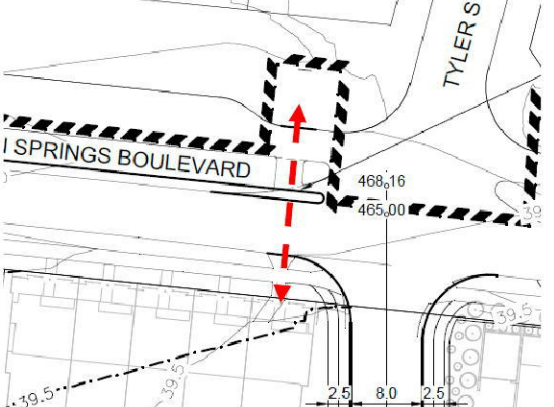
3.2 Responding to the Audit Report


As set out in the road safety guidelines, responsibility for the road design always rests with the designer/project manager, and not with the auditor. A project manager is under no obligation to accept all the audit findings. Also, it is not the role of the auditor to agree to or approve of the project manager’s response to the audit. Rather, the audit provides the opportunity to highlight potential problems and have them formally considered by the project manager, in conjunction with all other project considerations.

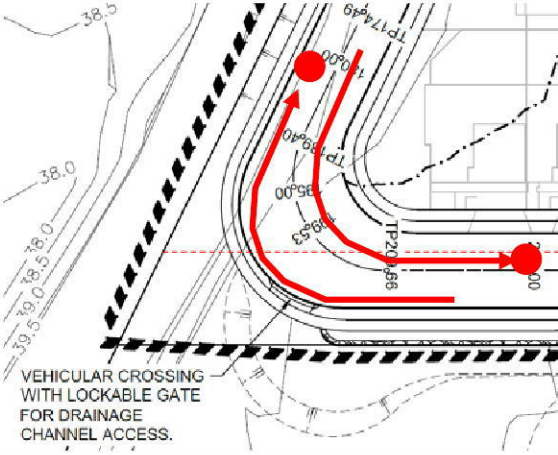
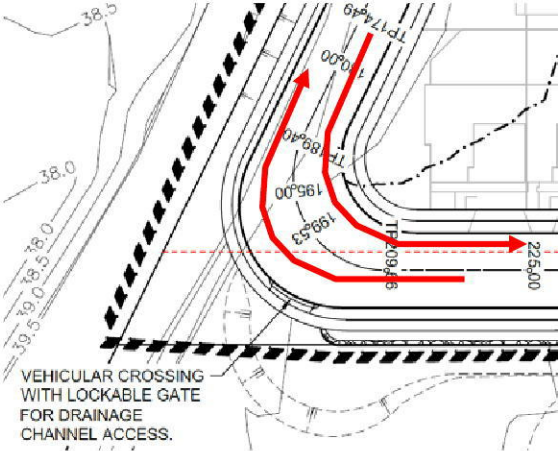
3.3 Audit Findings

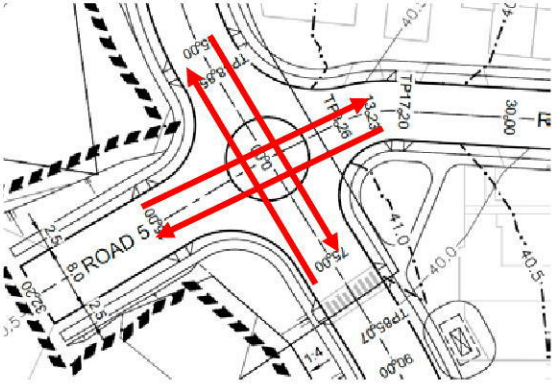
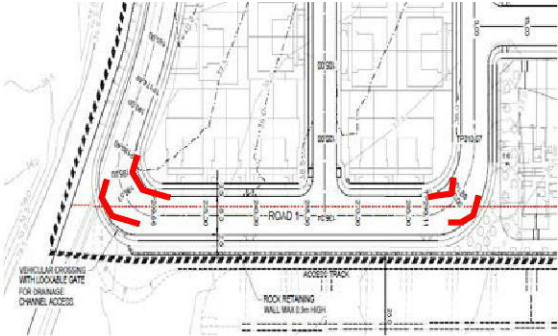
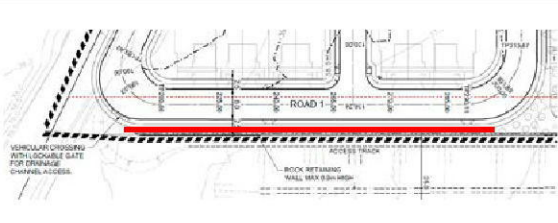
The audit are detailed in Table 3.2, including the specific details of the nature of the audit non-conformances and a risk rating as high, medium or low.

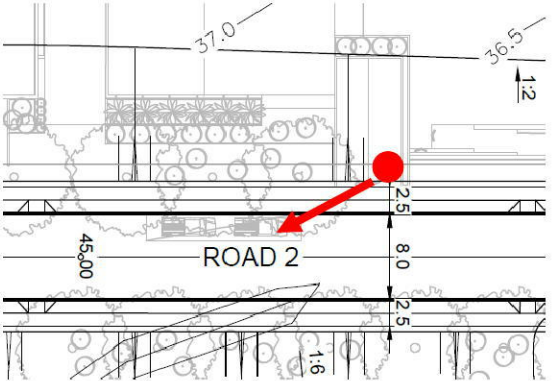
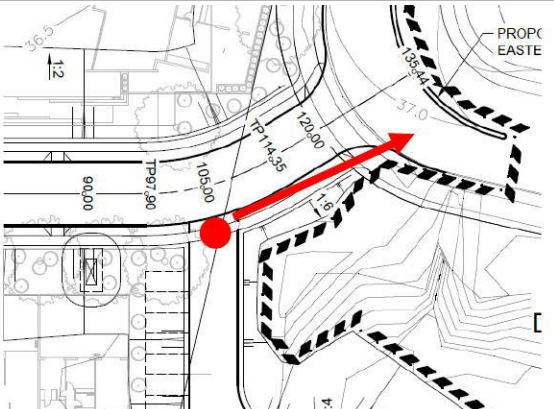
Table 3.2: Road Safety Audit Findings

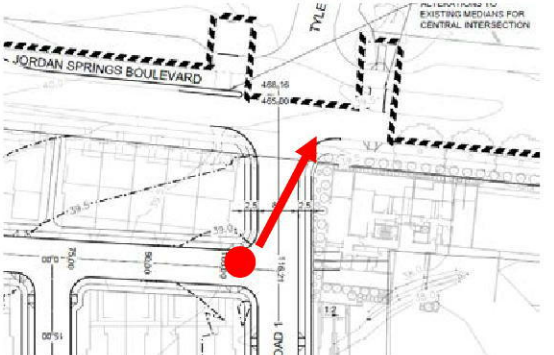
No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
1	<p>The pedestrian kerb ramp located on the western side of the intersection of Road 1 with Jordan Springs Boulevard guides pedestrians to cross at a location where there is a narrow central median, with insufficient width to provide pedestrian protection. As a result, a pedestrian waiting in the median could be hit by a car.</p>		Pedestrian infrastructure	Occasional	Major	High	<p>The existing median is to be modified to include a right turn lane into the development.</p> <p>Existing pedestrian crossing facilities are to be demolished in this location.</p> <p>New pedestrian crossing facilities are to be constructed on the eastern side of the intersection (shown in DA documents, to be detailed in CC).</p>

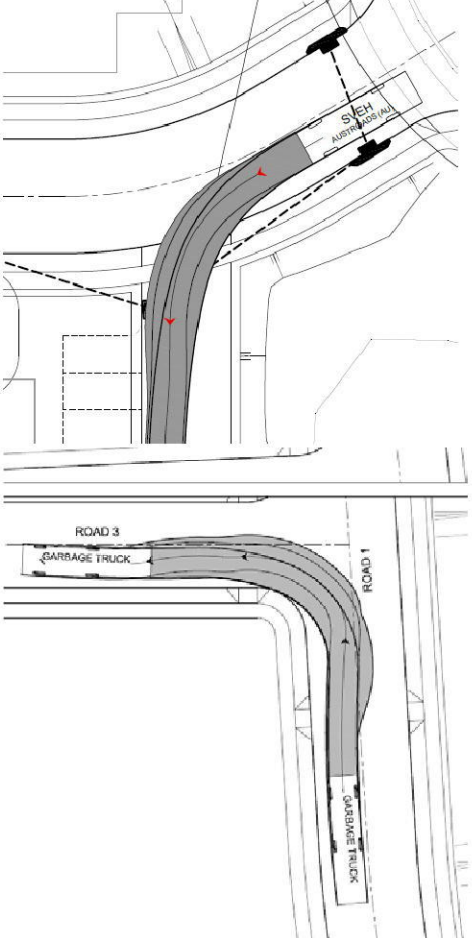
No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
2	<p>A light pole and directional signage is located within the Jordan Springs Boulevard central median. These could obstruct pedestrian crossing movements as they appear to be located in the same location as future pedestrian crossing facilities.</p> <p>As a result, there could be insufficient pedestrian storage capacity within the central median, increasing the risk of a collision between a pedestrian and an approaching vehicle.</p>		Pedestrian infrastructure	Occasional	Major	High	<p>Existing light pole and signage location to be confirmed.</p> <p>Pedestrian crossing location to be coordinated and finalised during CC with the existing light pole and signage taken into consideration.</p>

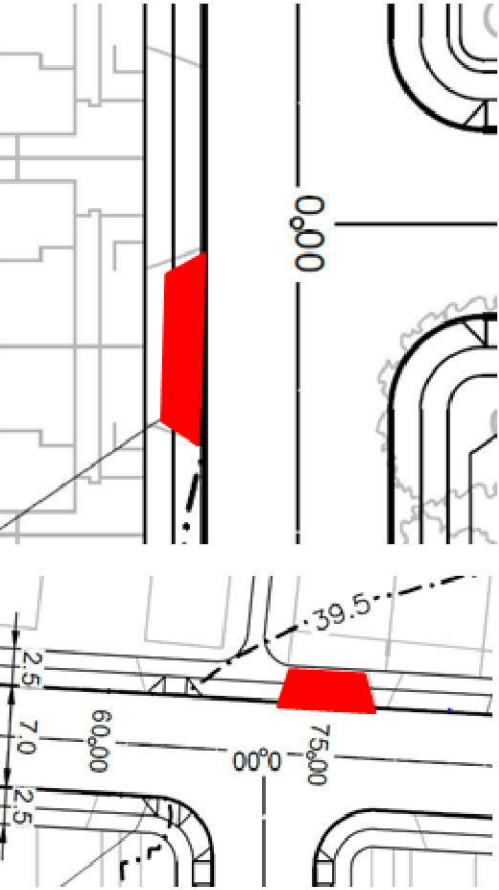
No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
3	The sight lines around the bend in Road 1 could be restricted by property boundaries. As a result, a vehicle driving around this bend does not have sufficient reaction time should an obstruction be located on the other side of a bend. These vehicles could collide with another vehicle, pedestrian or object unexpectedly located within the road.		Road alignment and cross section	Occasional	Moderate	Medium	The development is a low speed environment and a high level of driver alertness can be expected. Signage and linemarking to be provided in CC including parking restrictions and warning signs.
4	Drivers may misjudge the safe cornering speed and approach the tight bend located in Road 1 too fast which may result in a loss of control type crash.		Road alignment and cross section	Highly probable	Major	High	The development is a low speed environment and a high level of driver alertness can be expected. There may be opportunity to include advisory type signage (to be assessed by Penrith City Council traffic committee at CC)

No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
5	No indication has been given that the central island has been provided with material that will make it uncomfortable for cars to traverse whilst allowing trucks to traverse it. Without such treatment, vehicles could traverse the central island, with no deflection and higher travel speeds. These higher speeds could result in an increased frequency of crashes.		Road alignment and cross section	Highly probable	Moderate	High	Roundabout arrangement to be detailed in CC, typically a concrete apron with a mountable kerb central island.
6	If a driver parked their vehicle around the bends in Road 1, a passing driver would be required to cross onto the wrong side of the road to manoeuvre around the stopped vehicle, with limited sight distance to approaching vehicles.		Miscellaneous	Occasional	Minor	Low	Signage and linemarking to be detailed in CC to restrict parking in these areas.
7	There is no protection provided along the retaining wall which runs along the south of the site and includes a sheer drop of approximately 1m. As a result, an errant vehicle may not be able to regain its position in the roadway and could roll over the retaining wall.		Roadside hazards	Occasional	Major	High	200mm high kerb to run along this frontage, DA typical section to be amended. Full clear zone and risk assessment to be conducted during CC.

No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
8	The location of the Loading Zone on the north side of Road No 2 may restrict the safe intersection sight distance of vehicles exiting the residential car park. A restricted safe intersection sight distance may result in side impact incidents.		Road alignment and cross section	Occasional	Moderate	Medium	The development is a low speed environment and a high level of driver awareness can be expected. The location of the loading zone could be reconsidered at detail design stage.
9	The access to the future car park on the south side of Road 2 is located approximately 25m – 30m from Lakeside Parade. Consequently, there may be insufficient safe intersection sight distance for vehicles exiting the proposed future car park. A restricted safe intersection sight distance may result in side impact incidents.		Road alignment and cross section	Occasional	Moderate	Medium	The development is a low speed environment and a high level of driver awareness can be expected. Vehicles turning into Road 2 from the collector road will be operating at a very low speed. No parking signage can be considered along Road 2 in the vicinity of the intersection to ensure that sight lines are not restricted.

No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
10	<p>The intersection of Road 3 and Road 1 is located in close proximity to the intersection of Jordan Springs Boulevard and Tyler Street. Consequently, there may be insufficient safe intersection sight distance for vehicles exiting Road 3. A restricted safe intersection sight distance may result in side impact incidents.</p>	 <p>The diagram is a technical site plan showing road layouts. It features 'JORDAN SPRINGS BOULEVARD' at the top and 'TYLER' street on the right. A vertical road labeled 'ROAD 1' runs through the center, and a horizontal road labeled 'ROAD 3' intersects it. A red circle is placed at the intersection of Road 1 and Road 3, with a red arrow pointing to it from the right. Dashed lines indicate sight lines or medians. Text at the top right reads 'PROPOSED FOR EXISTING MEDIANS FOR CENTRAL INTERSECTION'. Various dimensions and labels like '488.00', '485.00', '118.00', and '118.11' are scattered throughout the plan.</p>	Road alignment and cross section	Occasional	Moderate	Medium	<p>The development is a low speed environment and a high level of driver awareness can be expected.</p> <p>Vehicles turning into Road 1 from the collector road will be operating at a very low speed. No parking signage can be considered along Road 1 in the vicinity of the intersection to ensure that sight lines are not restricted.</p>

No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
11	<p>The swept paths of a Garbage Truck illustrate a truck having to cross the centre line when undertaking a turning movement at an intersection which may lead to side impact incidents.</p>		Road alignment and cross section	Occasional	Minor	Low	<p>The development is a low speed environment and turning vehicles generally operate at a very low speed. Garbage trucks typically access a subdivision once a week which minimises the likelihood of an impact.</p>

No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
12	<p>Driveway accesses are located directly adjacent an intersection. An access driveway in this location creates uncertainty with regard to who has priority at the intersection.</p> <p>Motorist confusion at the intersection may increase the likelihood of a side impact collision.</p>		Access impacts	Improbable	Medium	Low	<p>This condition exists throughout Jordan Springs. Driveways in this location are generally compliant with AS2890.1, Fig 3.1.</p> <p>No action.</p>

No.	Description	Figure	Classification	Likelihood	Severity	Risk Rating	Designer Comments
13	It is presumed that traffic modelling has shown that traffic turning right into Road 1 (E) and Road 1 (W) does not extend into the through traffic lanes in Jordan Springs Boulevard.		Note Only				Turning lane storage (3 vehicles for each turning lane), based on advice provided by GTA.
14	Signage and line marking details have not been provided. As such, these have not been assessed as part of this audit and will need to be reviewed as part of a detailed design road safety audit.		Note Only				Signage and linemarking provided during CC. Penrith City Council traffic committee to provide comment when plans are prepared.
15	Details of the property accesses etc. have not been provided. As such, these have not been assessed as part of this audit and will need to be reviewed as part of a detailed design road safety audit.		Note Only				CC detail
16	Details of street lighting have not been provided and have not been reviewed as part of this audit.		Note Only				CC detail
17	No swept paths have been provided to indicate that trucks are capable of conducting safe turning movements around the proposed median for the eastern intersection.		Note Only				Median nose geometry to be detailed during CC where sweep paths are taken into consideration.

4. Formal Statement

We, the undersigned, declare that we have reviewed the material and data listed in this report and have identified the safety and operational deficiencies presented in Table 3.2 and Table 3.3.

It should be noted that while every effort has been made to identify potential safety hazards, no guarantee can be made that every deficiency has been identified.

Further, if all the deficiencies in this report were to be addressed, this would not guarantee that the site is "safe", rather, the level of safety of the facility should be improved.

We recommend that points of concern be investigated and corrective actions implemented as soon as is practicable.



Brigitte Humphrey-Robinson

Road Safety Auditor



Ken Hollyoak

Lead Road Safety Auditor

Date: 10 March 2014

Appendix A

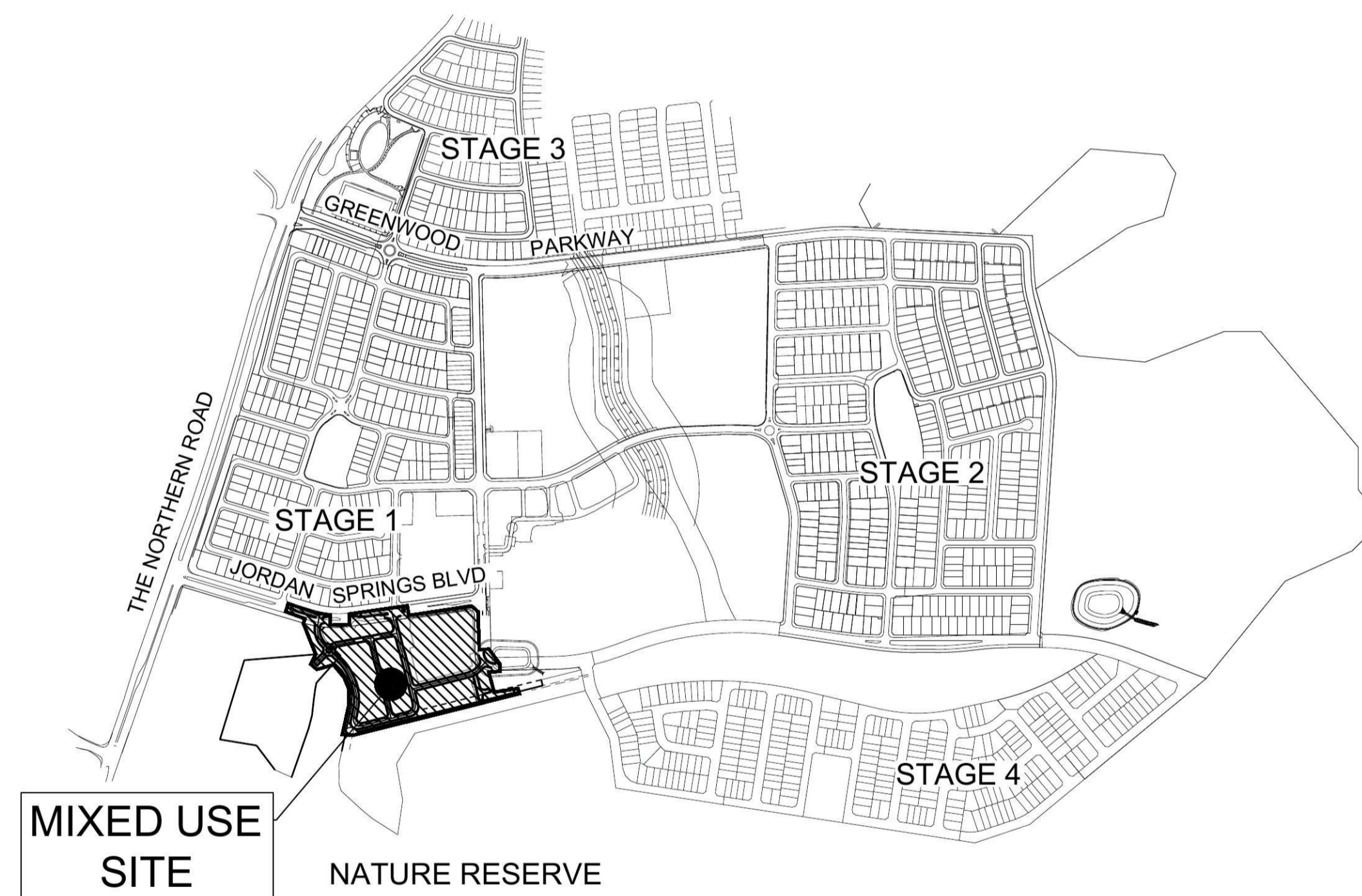


Audited Material

PENRITH CITY COUNCIL



JORDAN SPRINGS - MIXED USE SITE DEVELOPMENT APPLICATION PROPOSED SUBDIVISION AND ROADWORKS



CIVIL PLAN INDEX		
PLAN NO.	PLAN NAME	REV
9776/DA00	COVER SHEET	B
9776/DA01	OVERALL SITE PLAN	C
9776/DA02	TYPICAL ROAD CROSS SECTIONS	A
9776/DA03	ROAD LAYOUT PLAN	C
9776/DA04	STORMWATER DRAINAGE PLAN	C
9776/DA05	CUT/FILL PLAN AND TREE REMOVAL	C
9776/DA06	ROAD LONGITUDINAL SECTIONS SHEET 1	A
9776/DA07	ROAD LONGITUDINAL SECTIONS SHEET 2	A
9776/DA08	SITE SECTIONS	B
9776/DA09	SOIL & WATER MANAGEMENT PLAN & NOTES	B
9776/DA10	TEMPORARY SEDIMENT BASIN CALCULATIONS AND PLAN	B
9776/DA11	TURNING PATHS	A
9776/DA12	GPT ACCESS PLAN	B

LOCALITY SKETCH

Prepared By:

J. WYNDHAM PRINCE

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& PROJECT MANAGERS**

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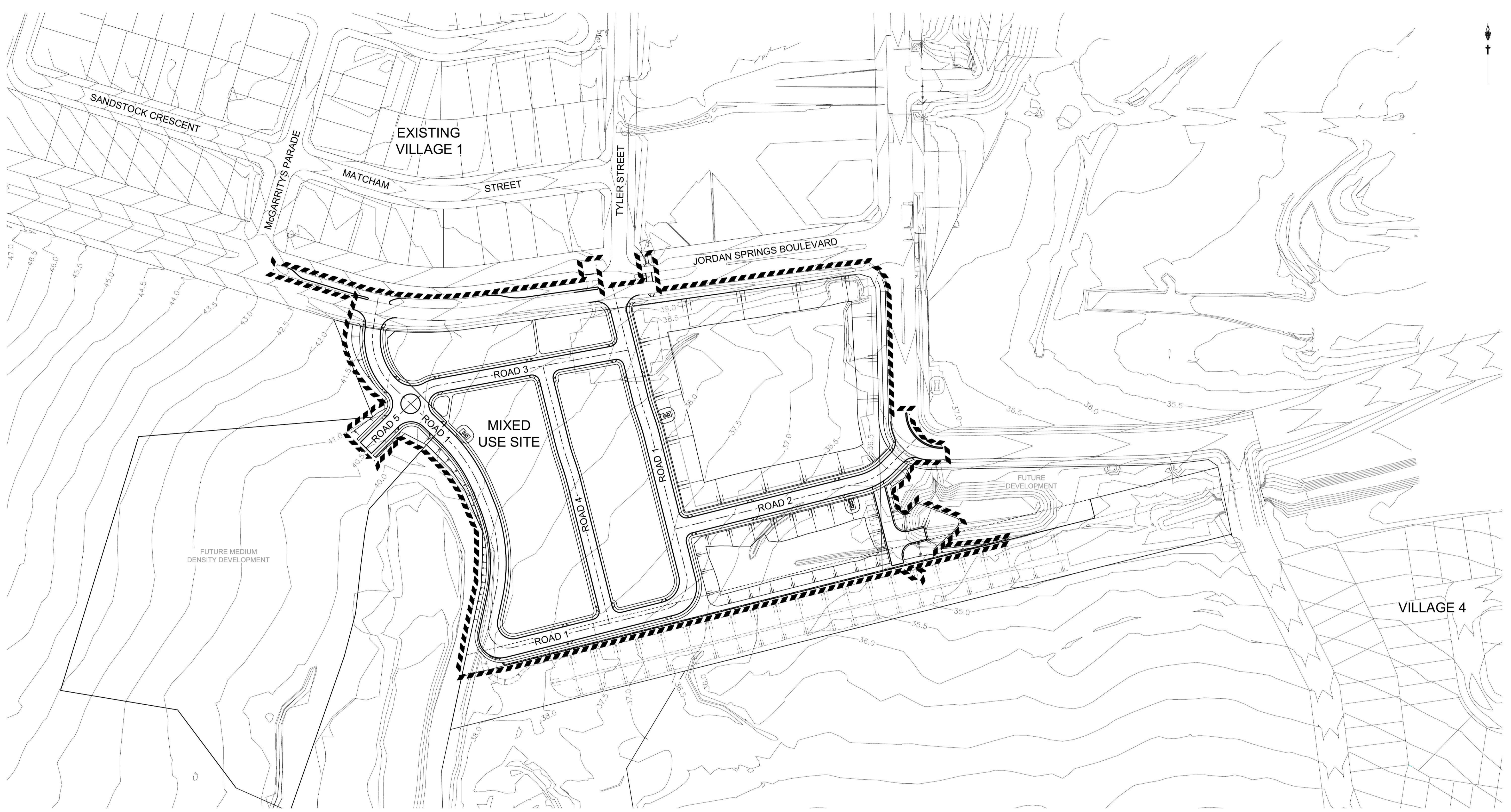
W www.jwprince.com.au

E jwp@jwprince.com.au

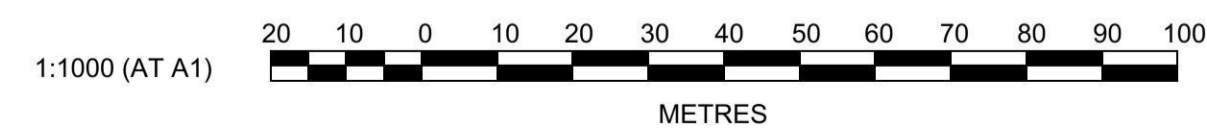
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PLAN No.
9776/DA00 **B**
FILE No. 9776DA00

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LEGEND	
	LIMIT OF WORKS



AMENDMENT	DES	DRN	CKD	APR	DATE
C	AS	AS			04/03/14
B	AS	AS			28/02/14
A	AS	TG	DH	MS	14/02/14

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AZIMUTH: AHD
 DATUM: MGA
 ORIGIN:

CLIENT:



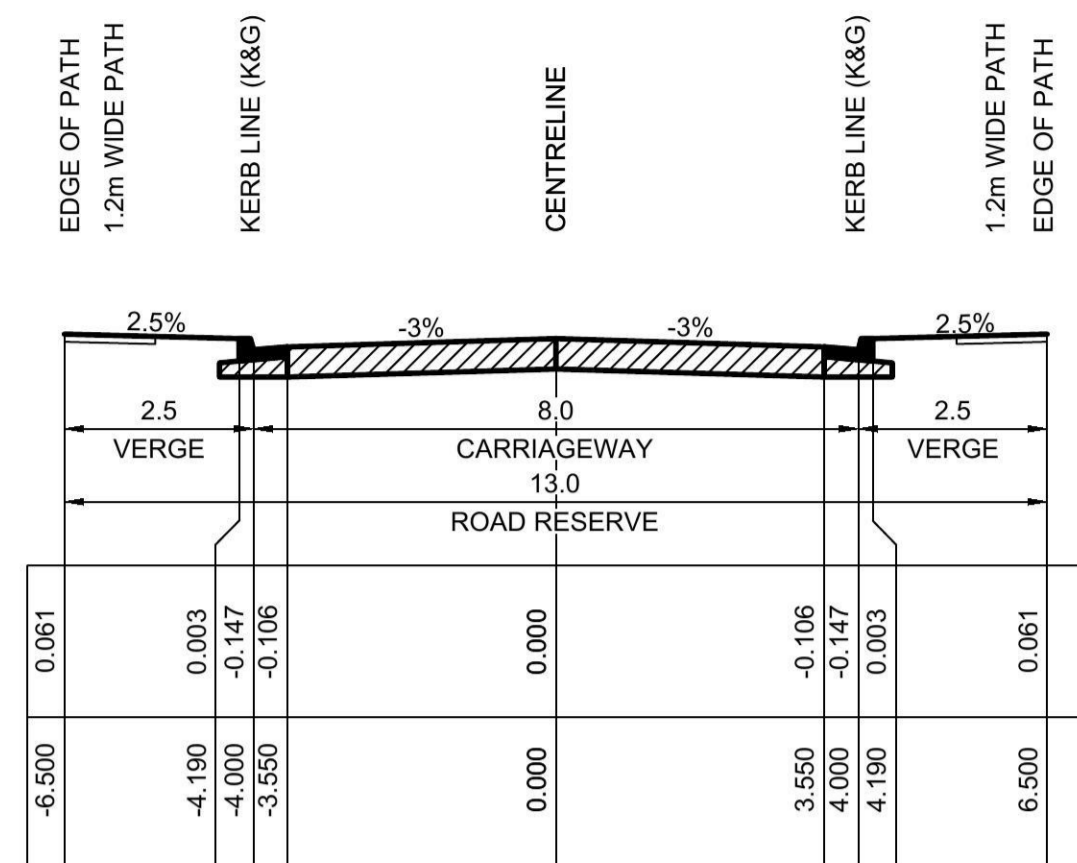
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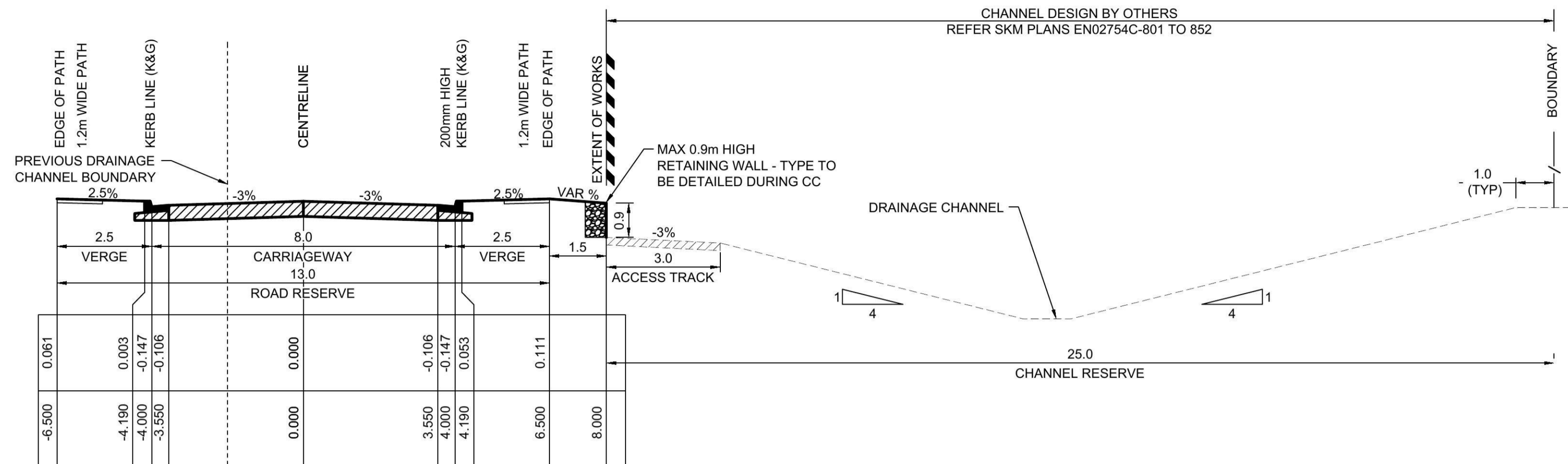
JORDAN SPRINGS MIXED USE SITE
OVERALL SITE PLAN

PLAN No: 9776/DA01	C
FILE No: 9776DA01	
SHEET SIZE: A1 ORIGINAL	

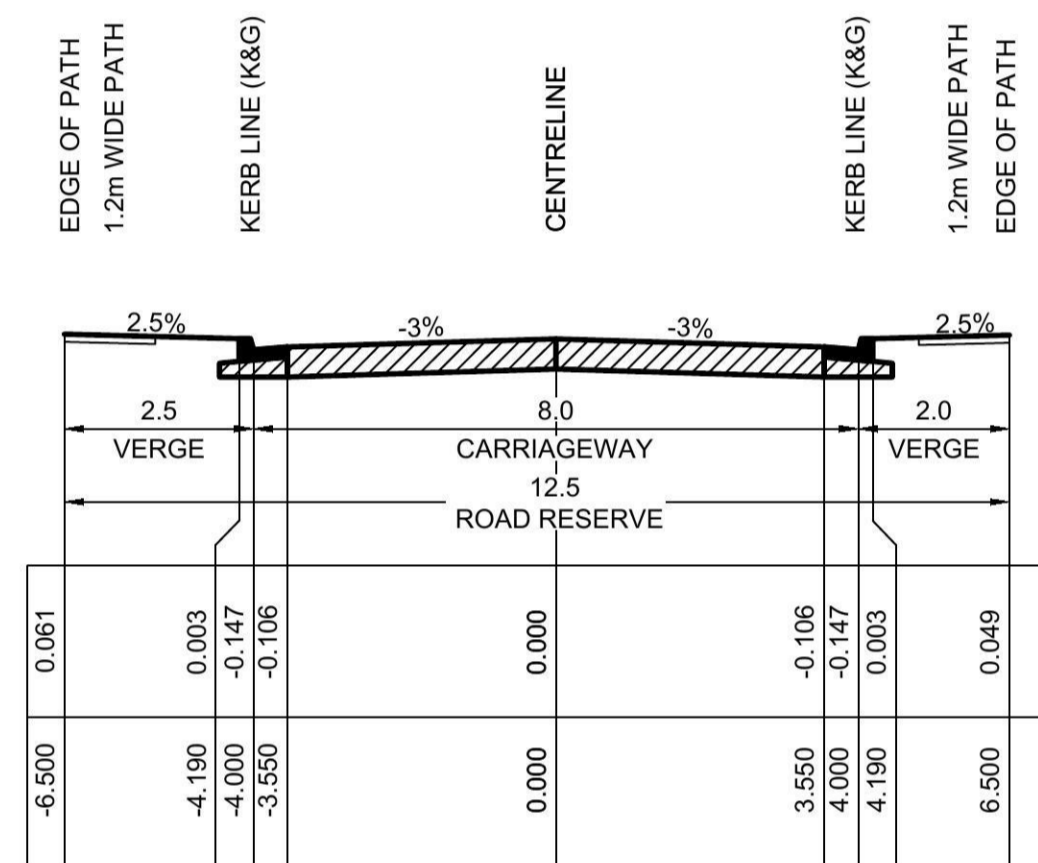
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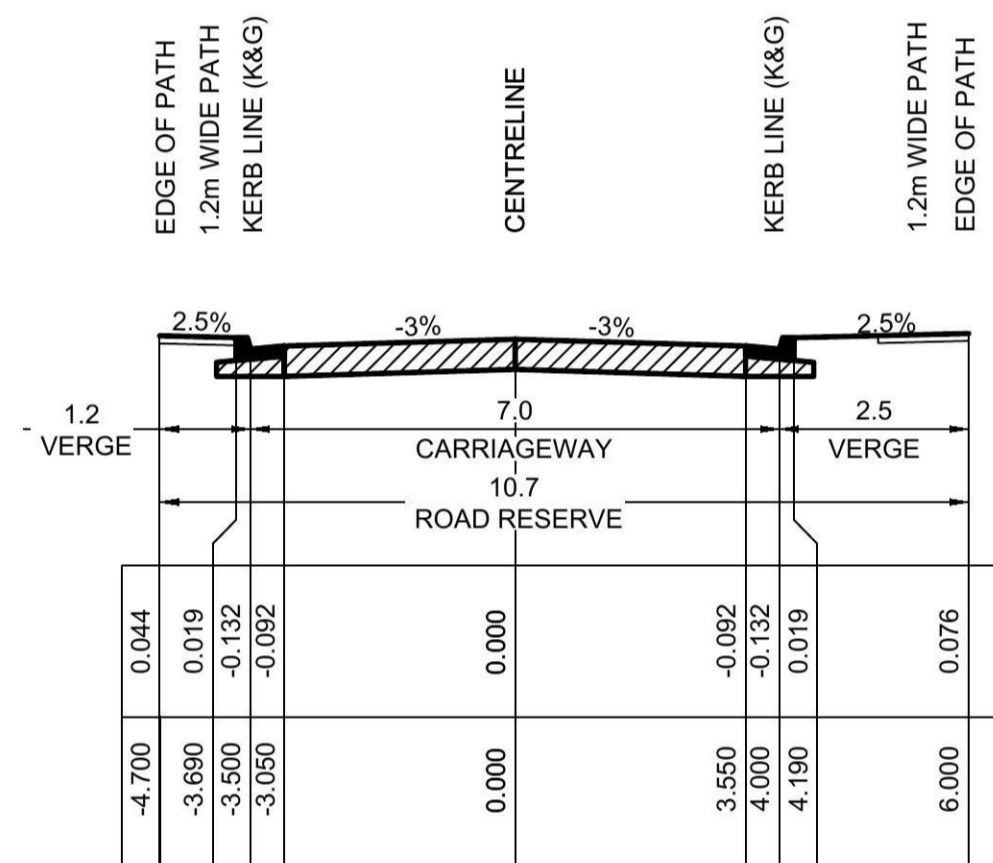
ROAD 1
(CH 0.00 - 61.20, 290.11 - 468.16)
ROAD 2
ROAD 5



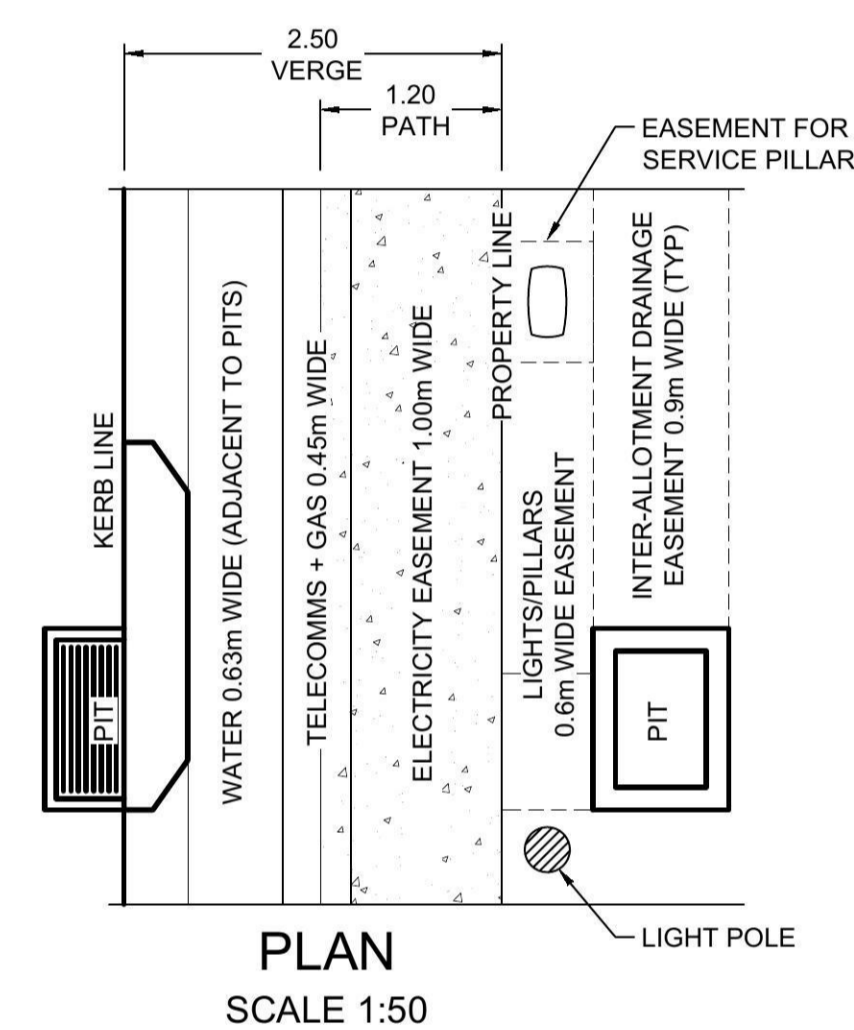
ROAD 1
(CH 209.66 - 290.11)



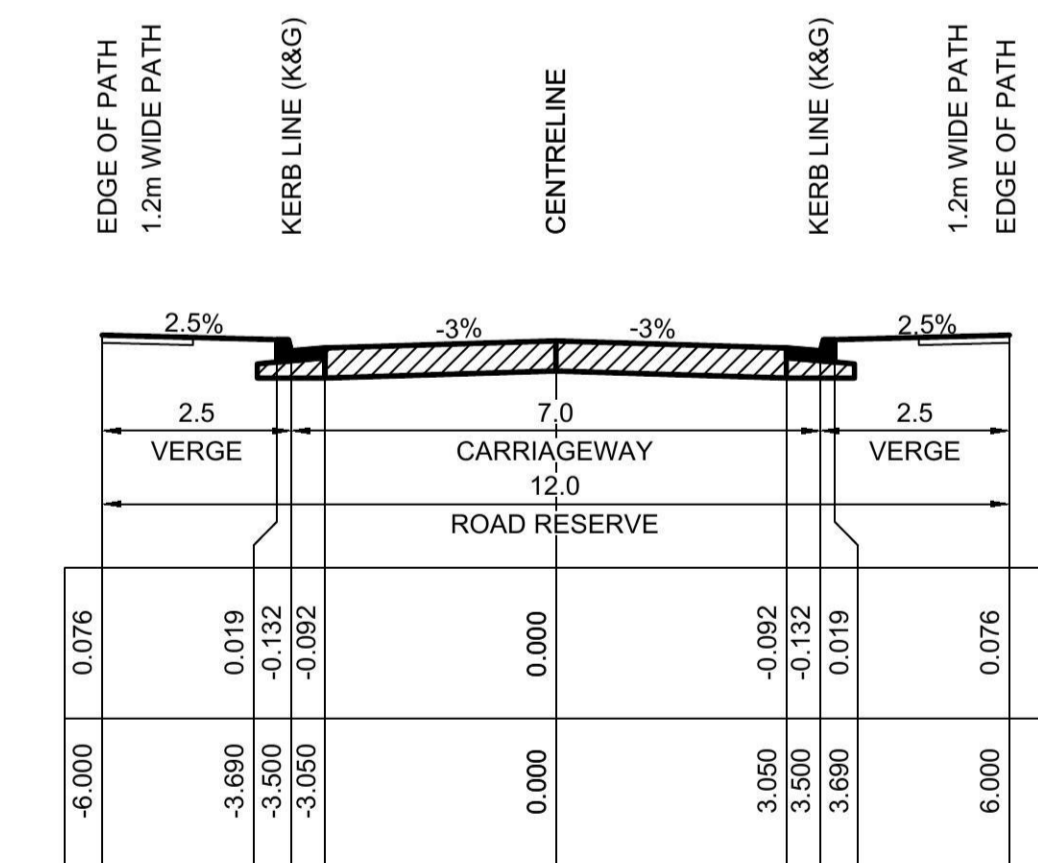
ROAD 1
(CH 61.20 - 209.66)



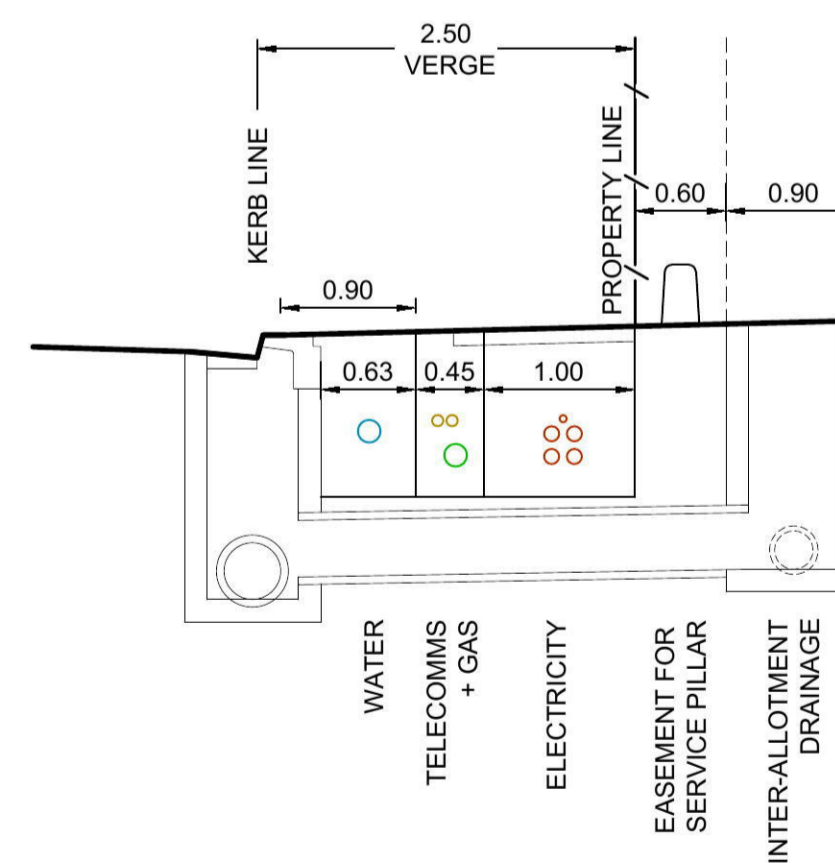
ROAD 4



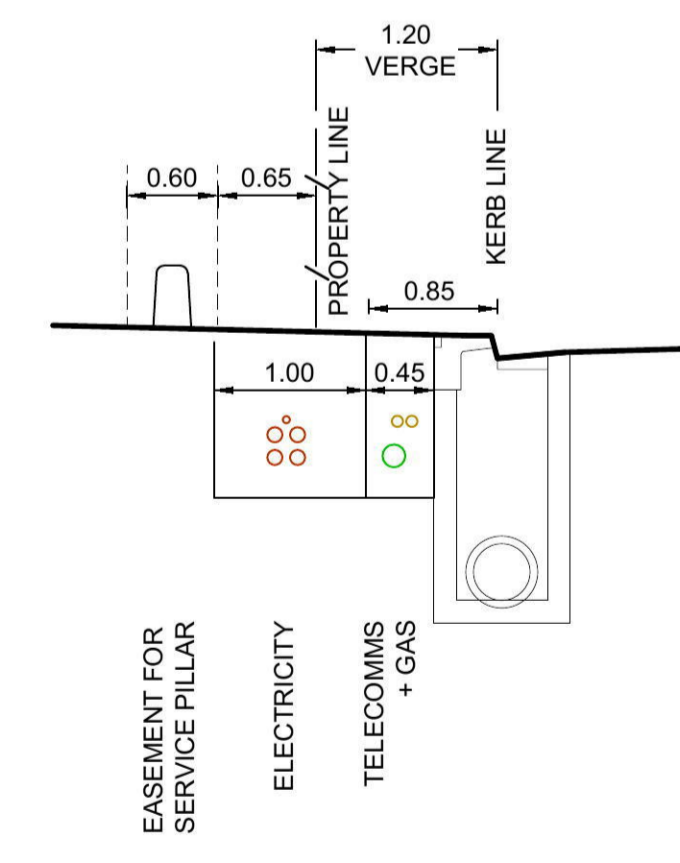
PLAN
SCALE 1:50



ROAD 3

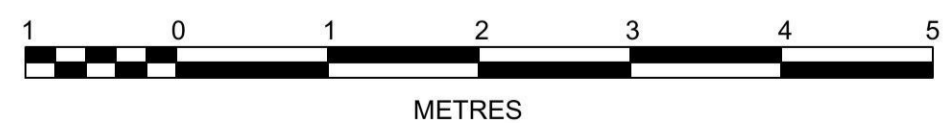


TYPICAL SECTION - SERVICES ALLOCATION IN VERGE AND LOT
SCALE 1:50



TYPICAL SECTION - SERVICES ALLOCATION ROAD 4 EASTERN VERGE
SCALE 1:50

1:50 (AT A1)



1:100 (AT A1)



A	ISSUED FOR DEVELOPMENT APPLICATION	AS	TG	DH	MS
	AMENDMENT	DES	DRN	CKD	APR
					DATE

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AZIMUTH: AHD
DATUM: MGA
ORIGIN:



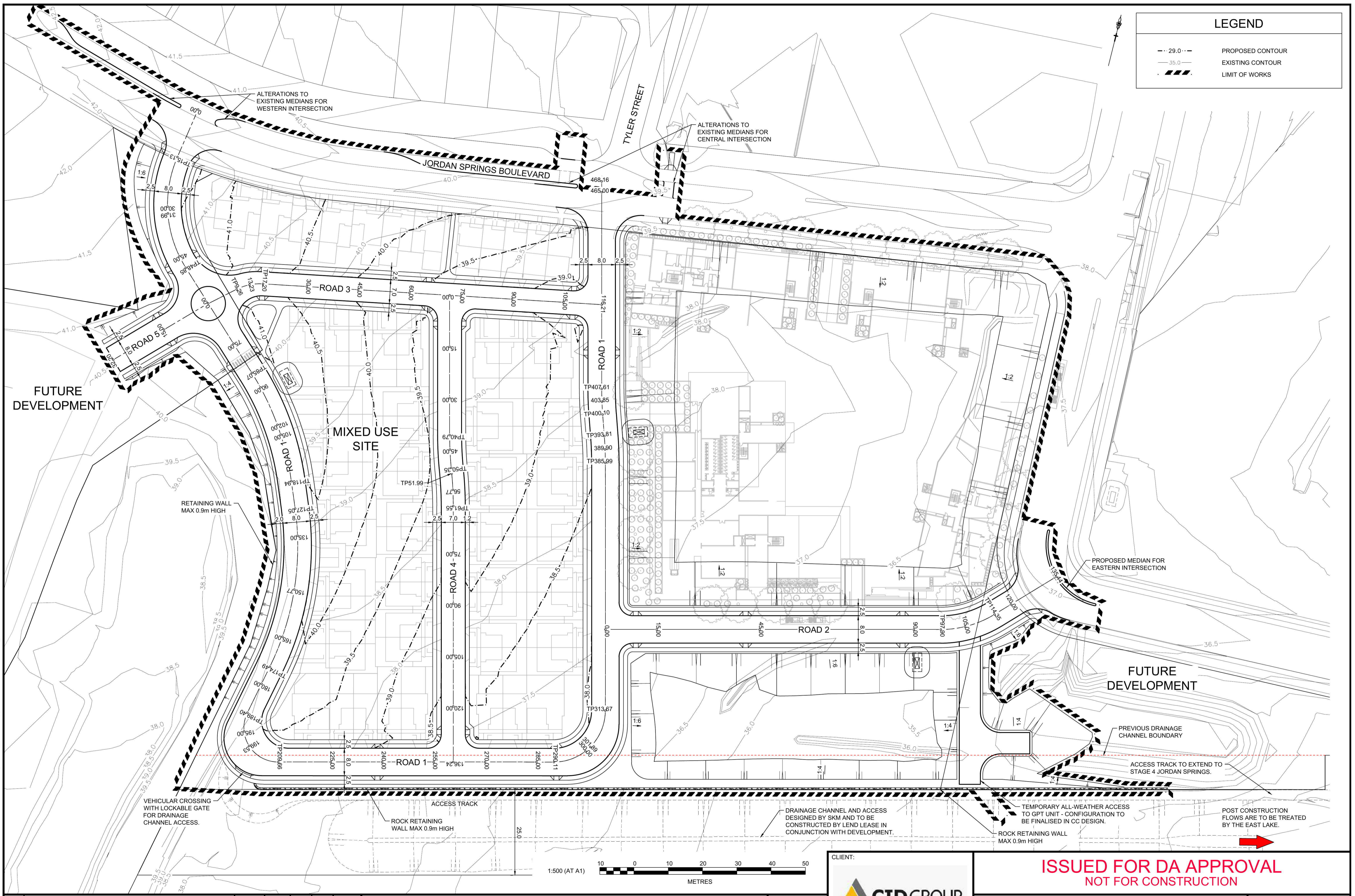
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JORDAN SPRINGS
MIXED USE SITE
TYPICAL ROAD CROSS SECTIONS

PLAN No:	9776/DA02	A
FILE No:	9776DA02	
SHEET SIZE:	A1 ORIGINAL	

LEGEND	
	PROPOSED CONTOUR
	EXISTING CONTOUR
	LIMIT OF WORKS



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AMENDMENT	DES	DRN	CKD	APR	DATE
C	AS	AS			04/03/14
B	AS	AS			28/02/14
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AZIMUTH: AHD
 DATUM: MGA
 ORIGIN:

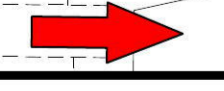
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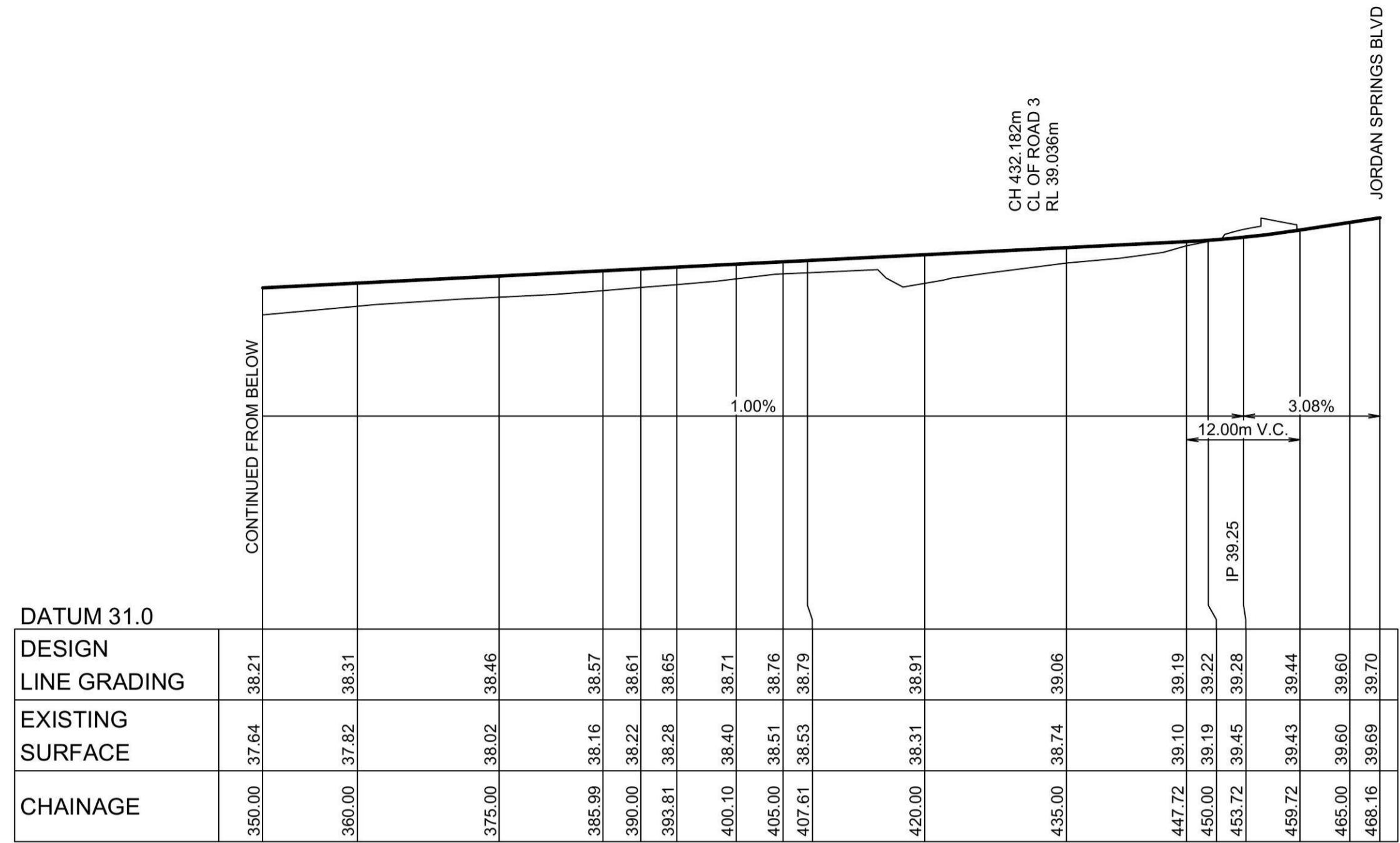
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NOT FOR CONSTRUCTION

JORDAN SPRINGS MIXED USE SITE
ROAD LAYOUT PLAN

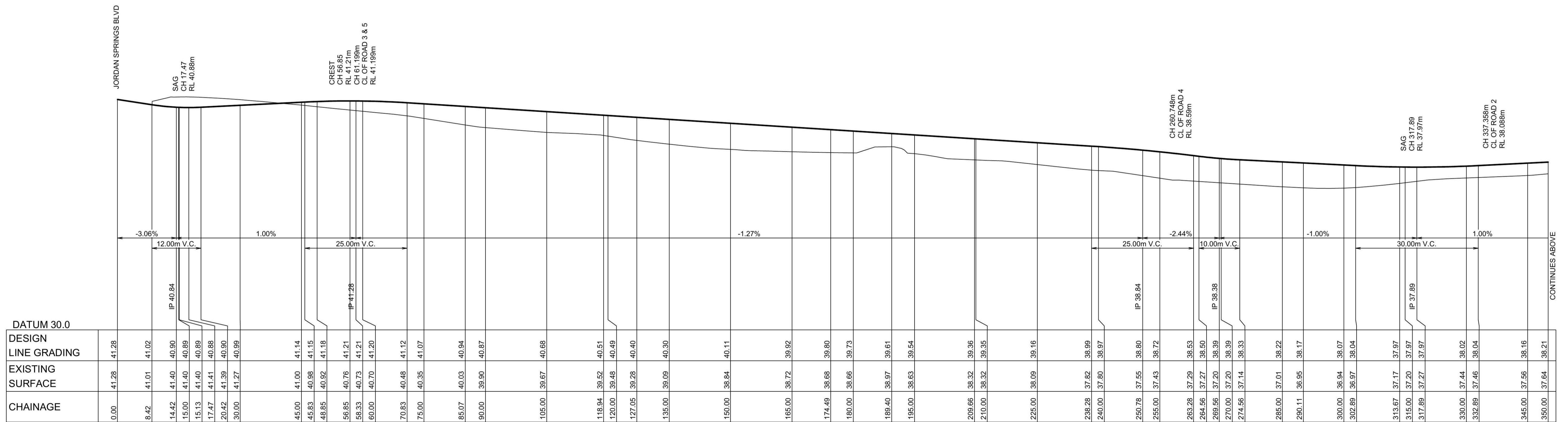
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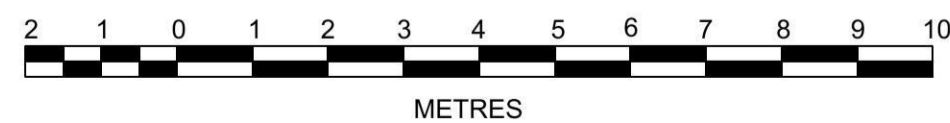


LONGITUDINAL SECTION ROAD 1
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

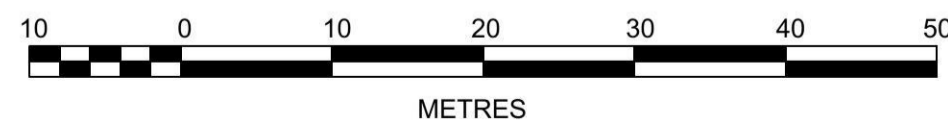


LONGITUDINAL SECTION ROAD 1
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

1:100 (AT A1)



1:500 (AT A1)



AS	TG	DH	MS	14/02/14
DES	DRN	CKD	APR	DATE

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AZIMUTH: AHD
DATUM: MGA
ORIGIN:

CLIENT:

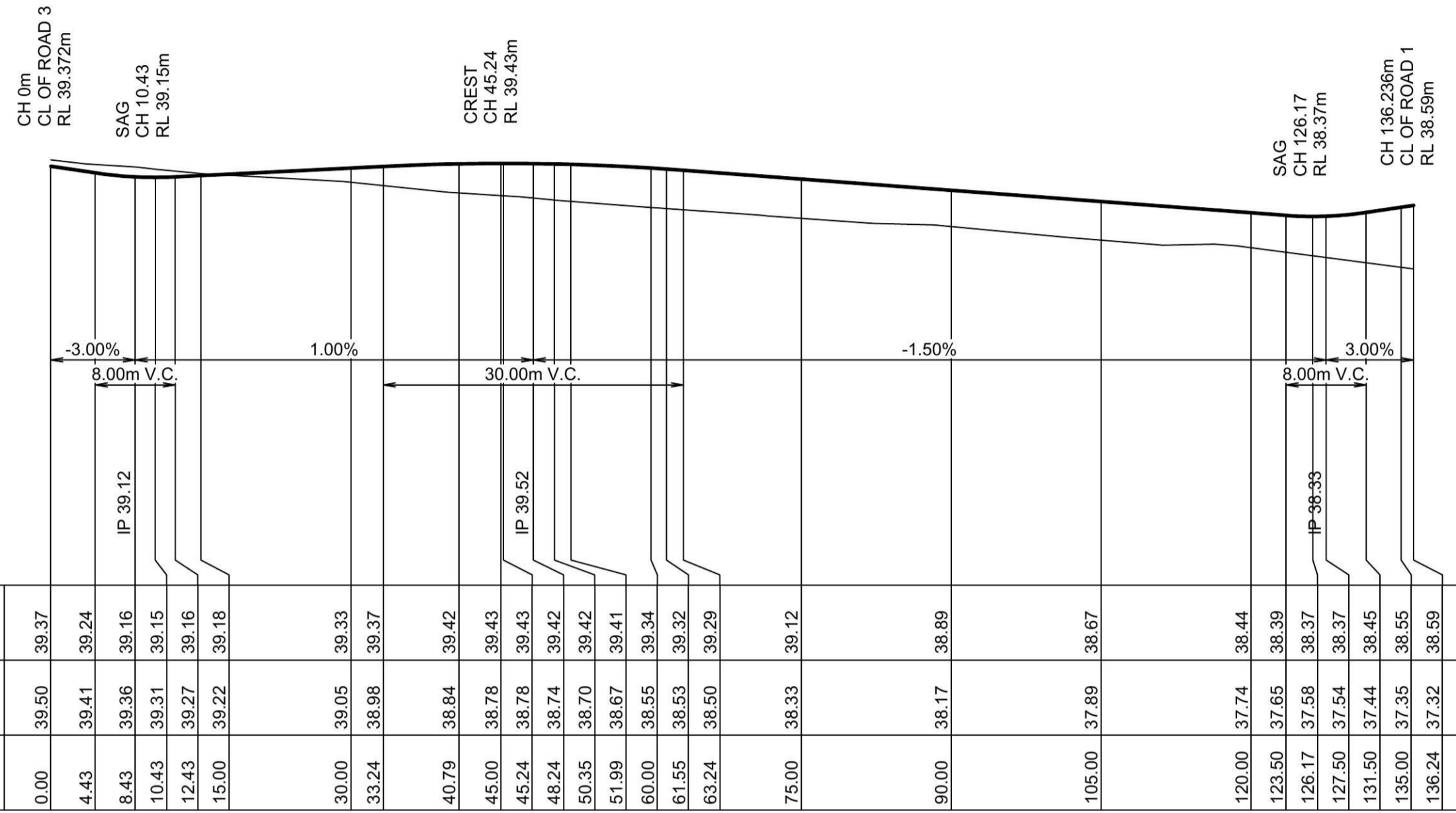
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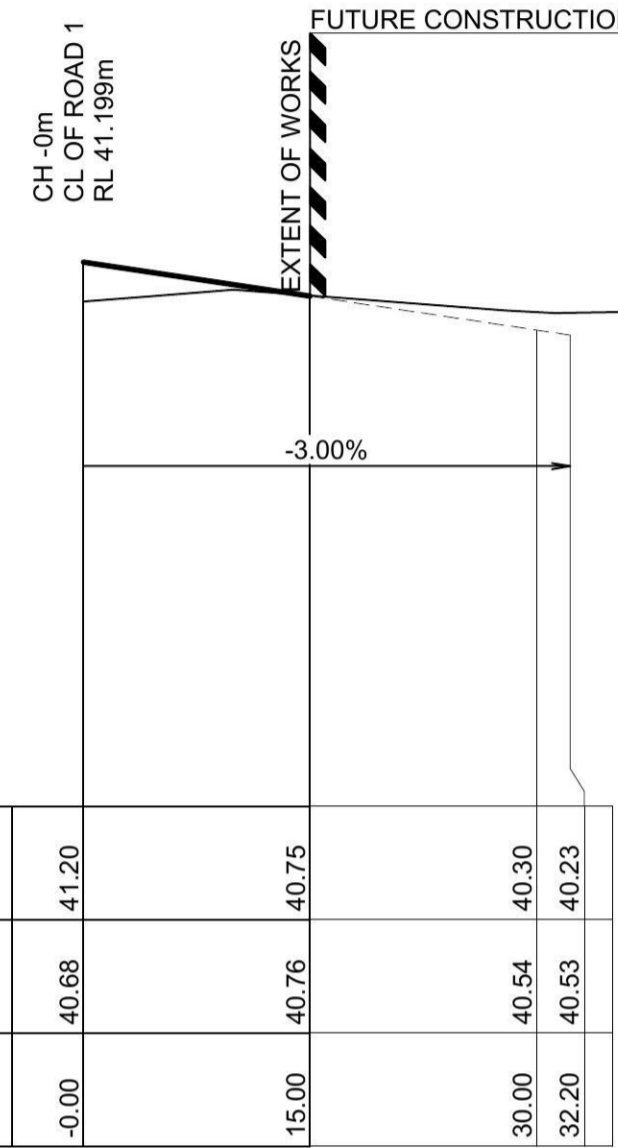
JORDAN SPRINGS
MIXED USE SITE
ROAD LONGITUDINAL SECTIONS
SHEET 1

PLAN No:	9776/DA06	A
FILE No:	9776DA06	
SHEET SIZE:	A1 ORIGINAL	

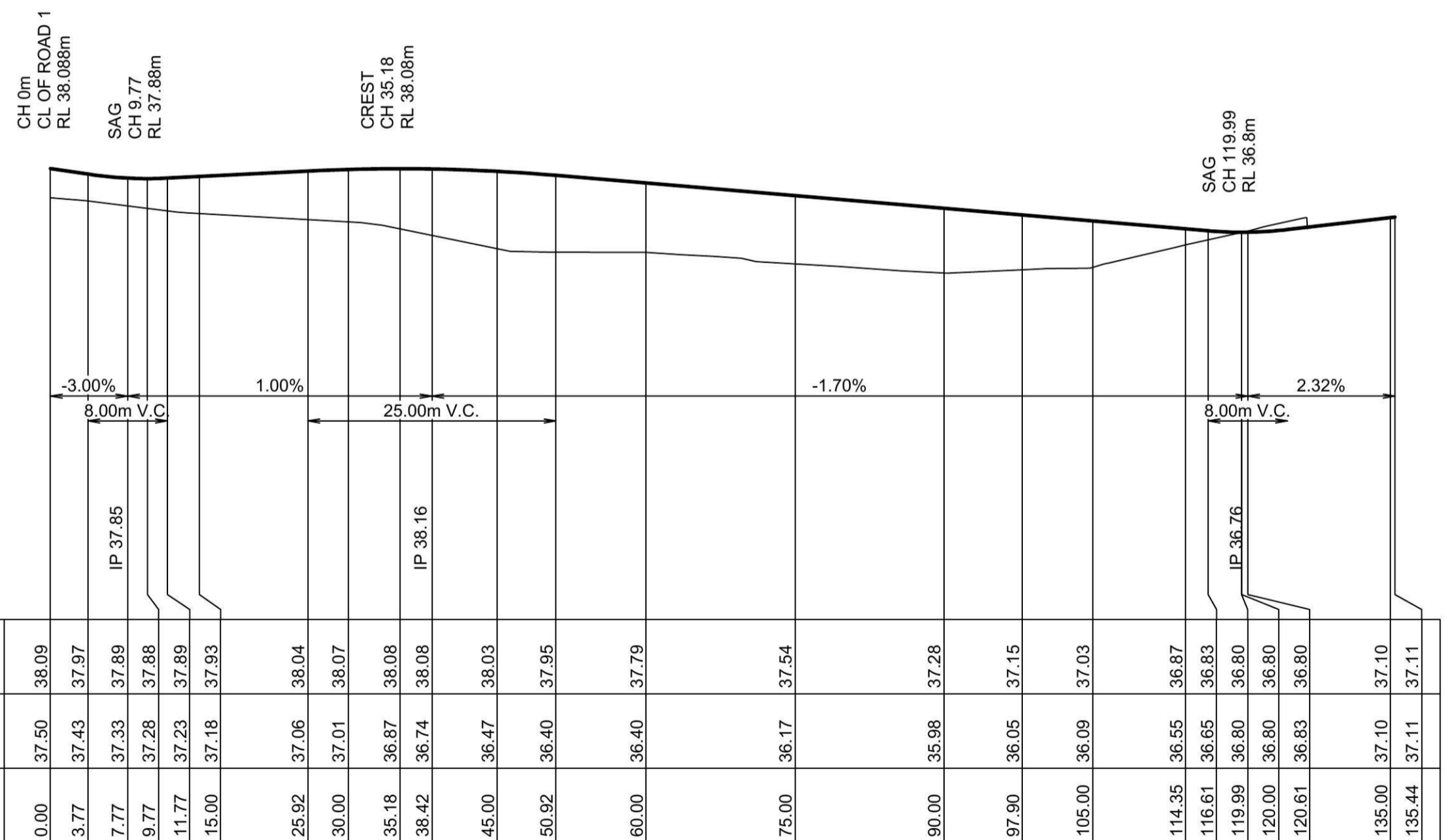
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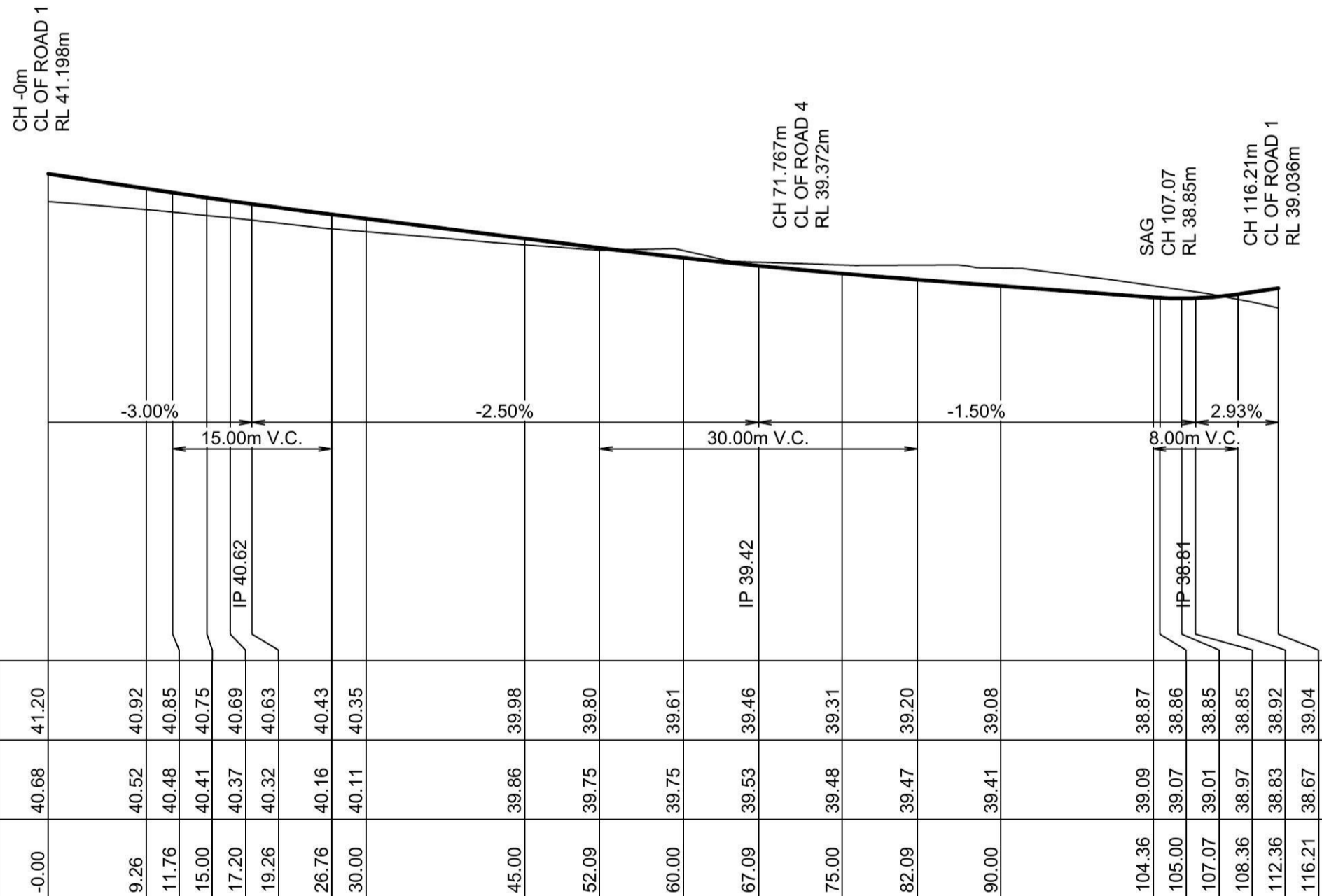
LONGITUDINAL SECTION ROAD 4
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



LONGITUDINAL SECTION ROAD 5
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

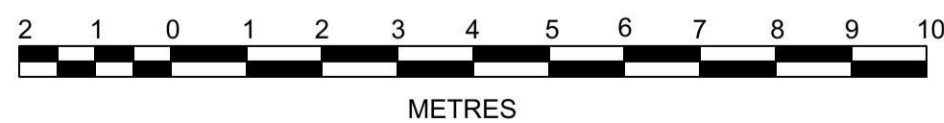


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HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

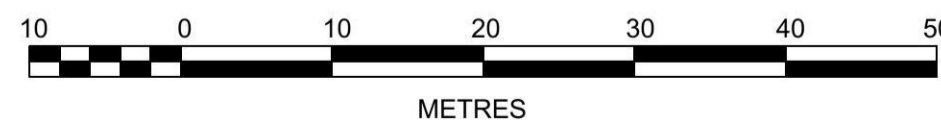


LONGITUDINAL SECTION ROAD 3
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

1:100 (AT A1)



1:500 (AT A1)



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AZIMUTH: AHD
DATUM: MGA
ORIGIN:



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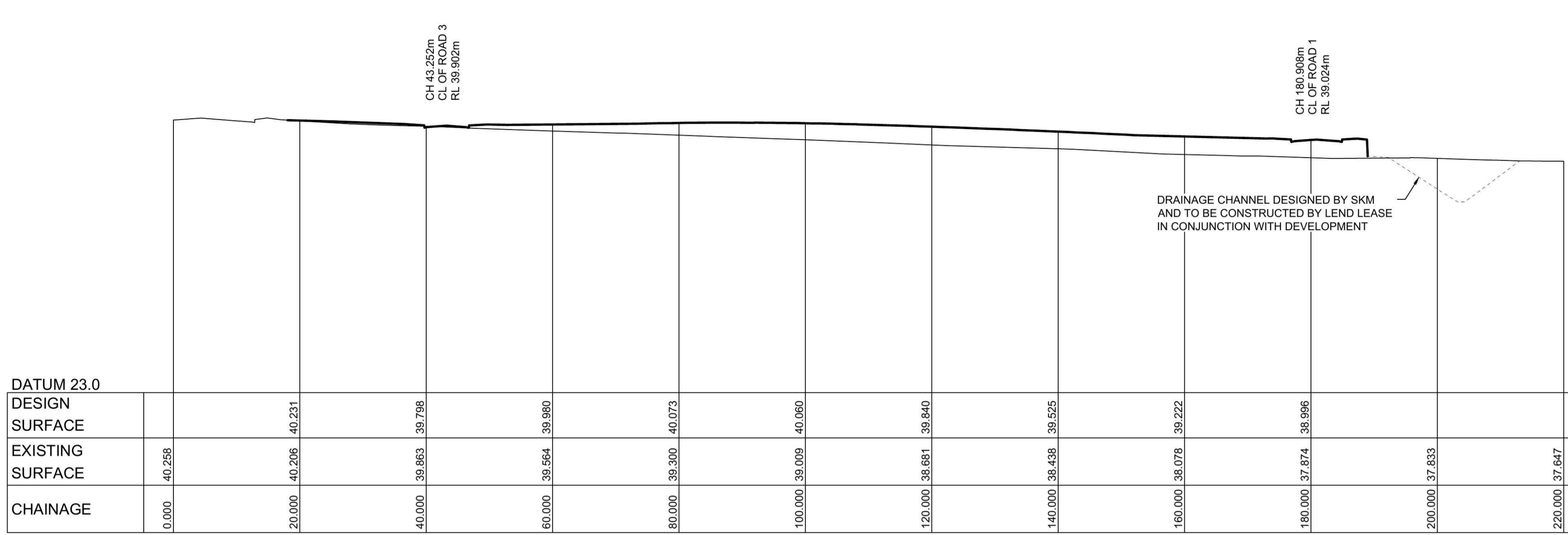
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JORDAN SPRINGS
MIXED USE SITE
ROAD LONGITUDINAL SECTIONS
SHEET 2

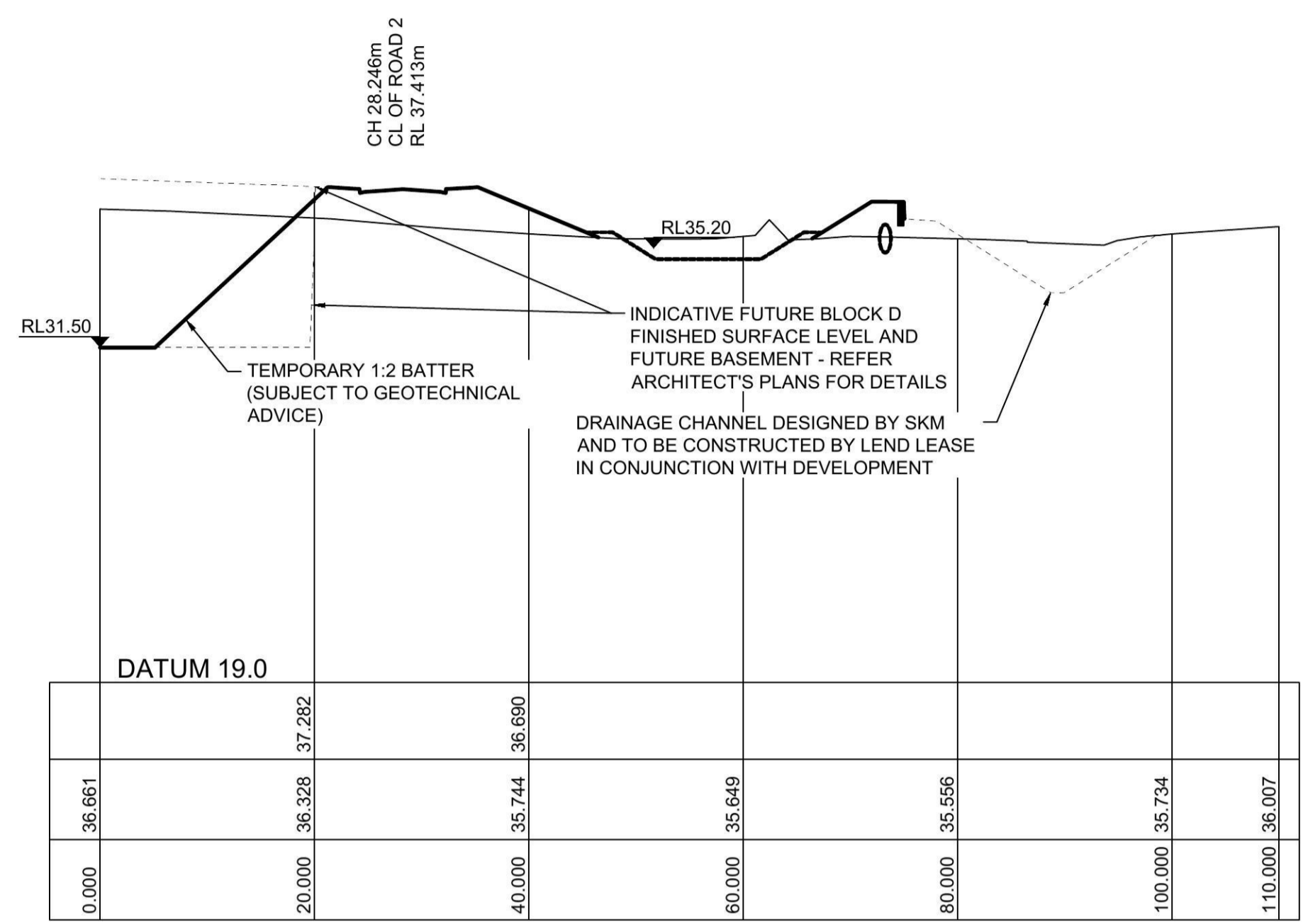
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FILE No: 9776DA07
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	AMENDMENT	DES	DRN	CKD	APR	DATE

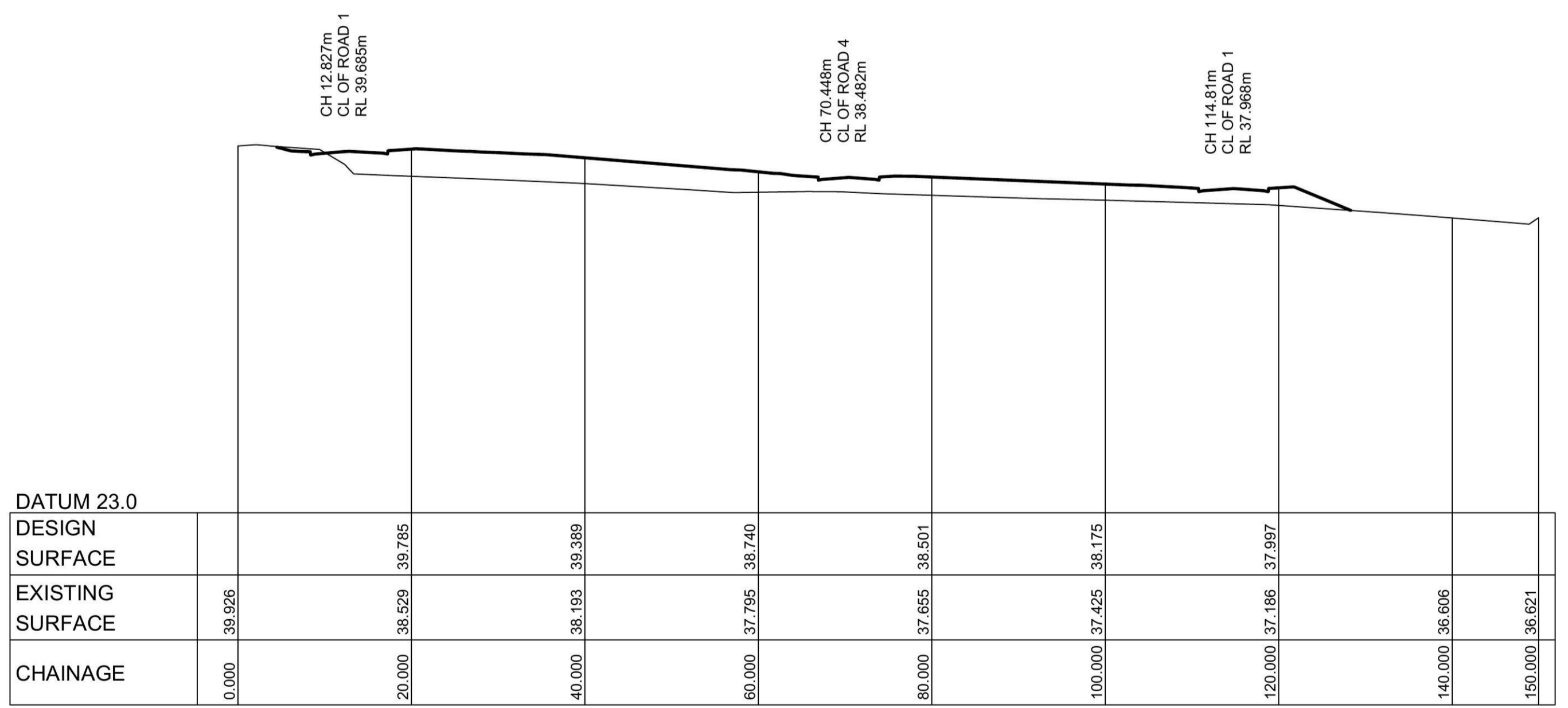
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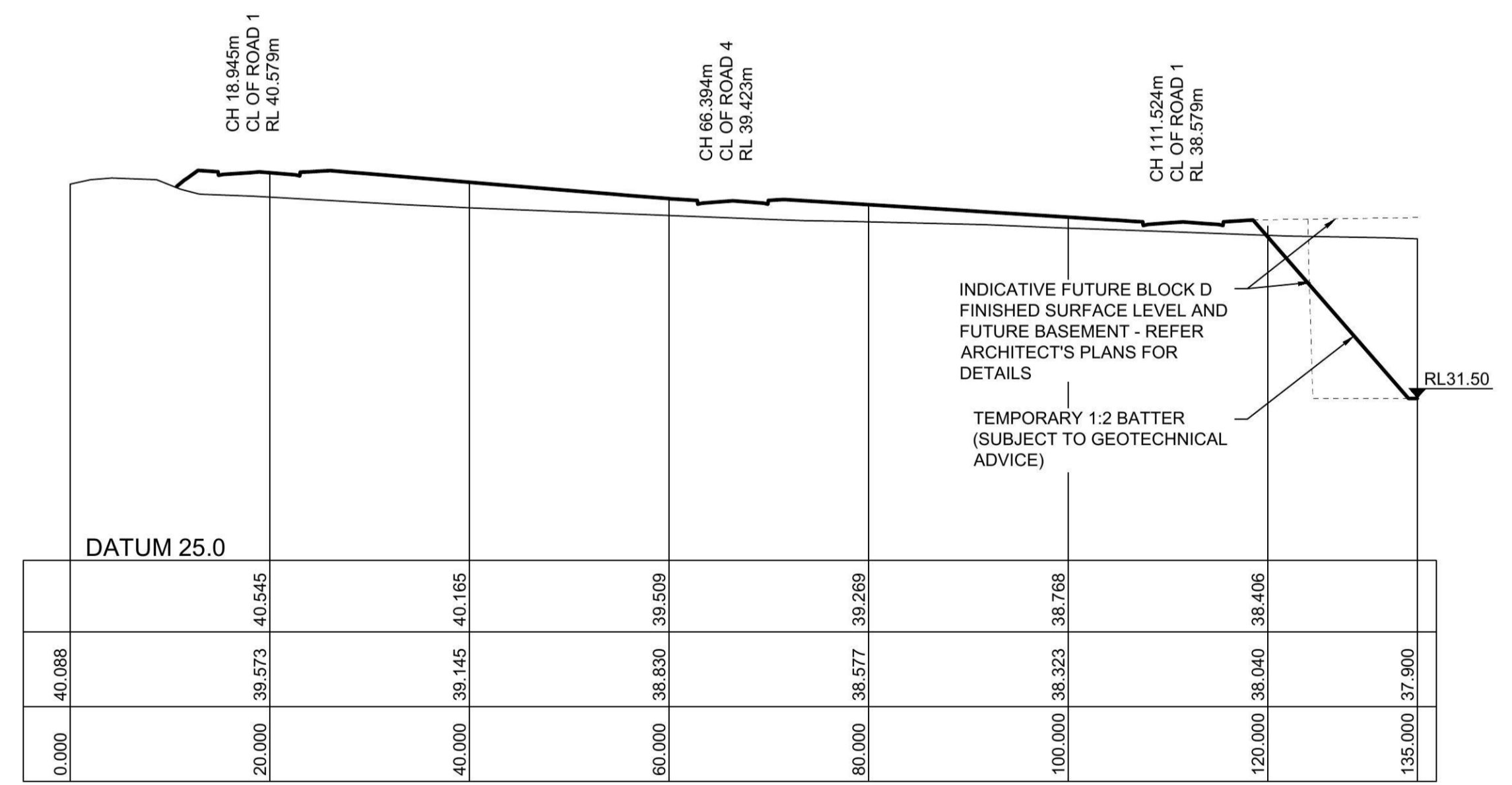
SECTION 3
SCALE H 1:500
V 1:200



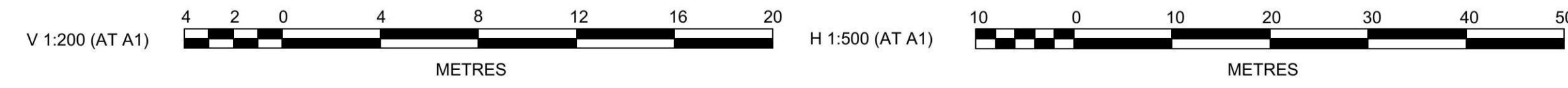
SECTION 4
SCALE H 1:500
V 1:200



SECTION 1
SCALE H 1:500
V 1:200



SECTION 2
SCALE H 1:500
V 1:200



NO.	DESCRIPTION	DES	DRN	CKD	APR	DATE
B	RE-ISSUED FOR DEVELOPMENT APPLICATION	AS	AS			04/03/14
A	ISSUED FOR DEVELOPMENT APPLICATION	AS	TG	DH	MS	14/02/14
	AMENDMENT	DES	DRN	CKD	APR	DATE

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AZIMUTH: AHD
 DATUM: MGA
 ORIGIN:

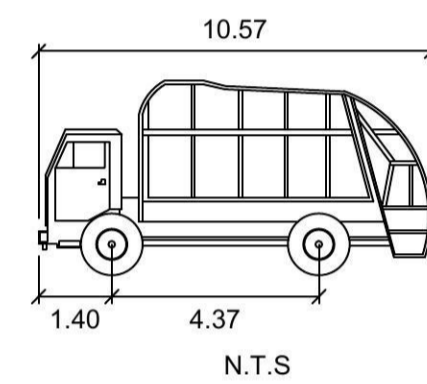
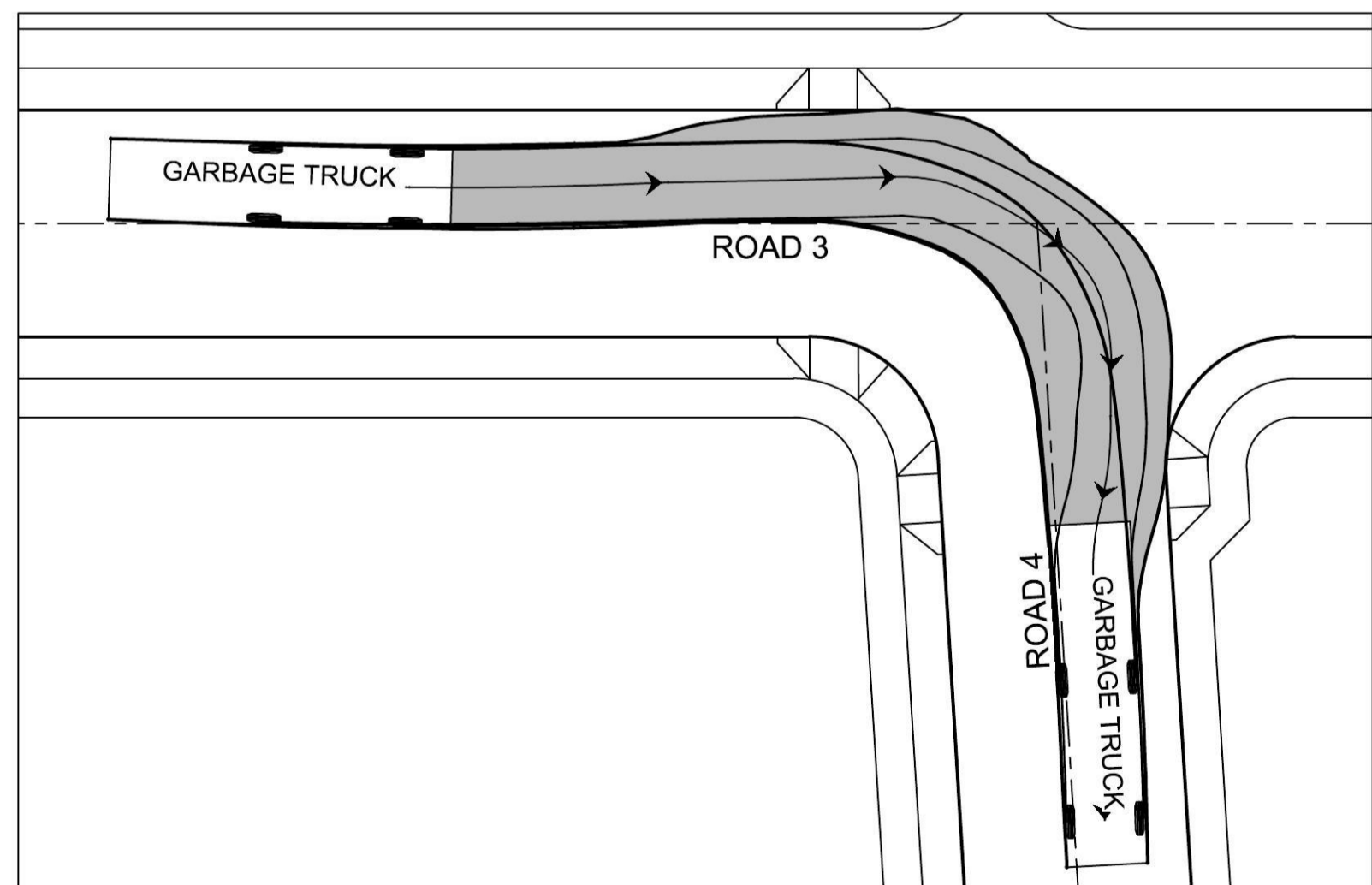
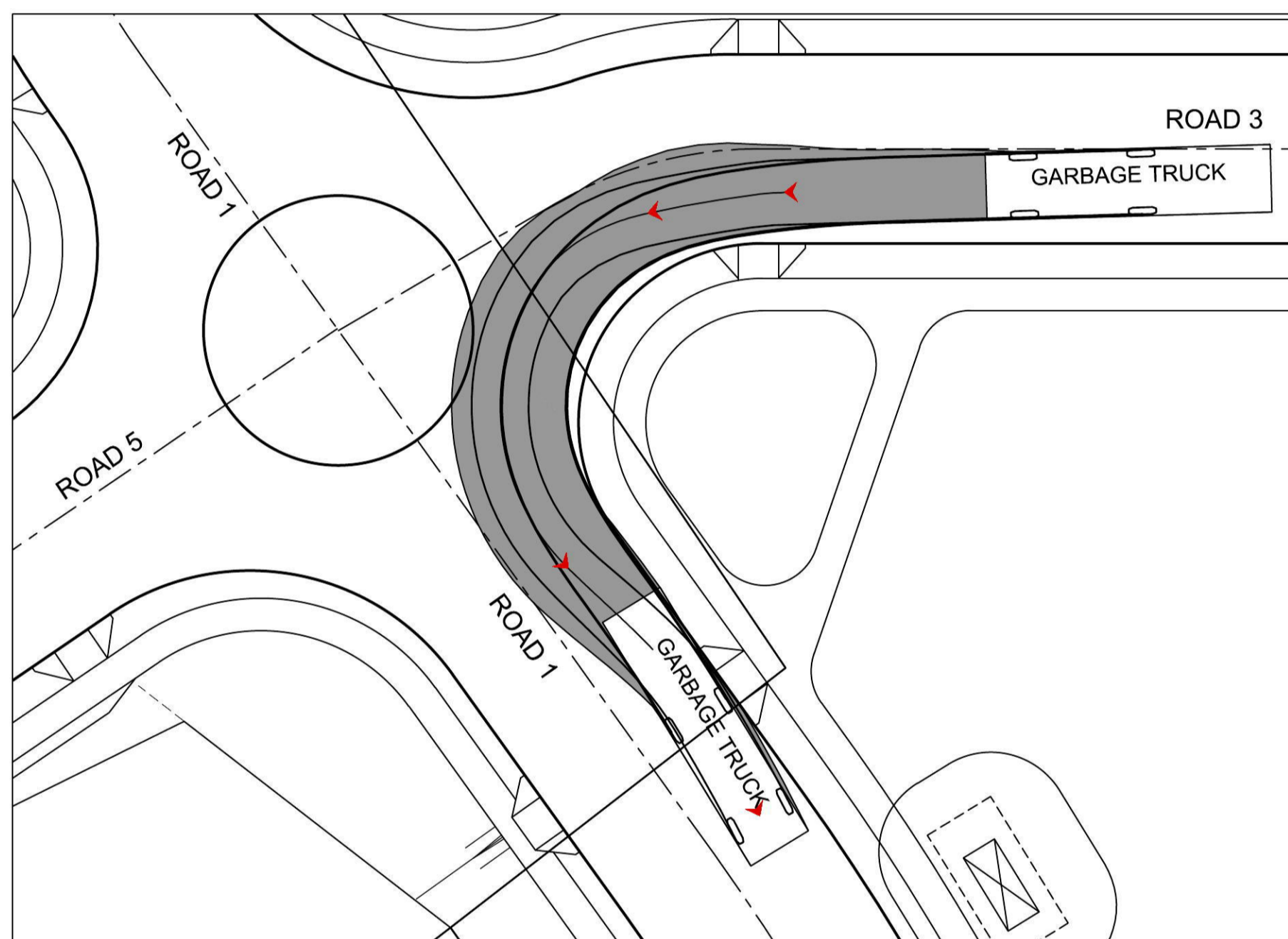
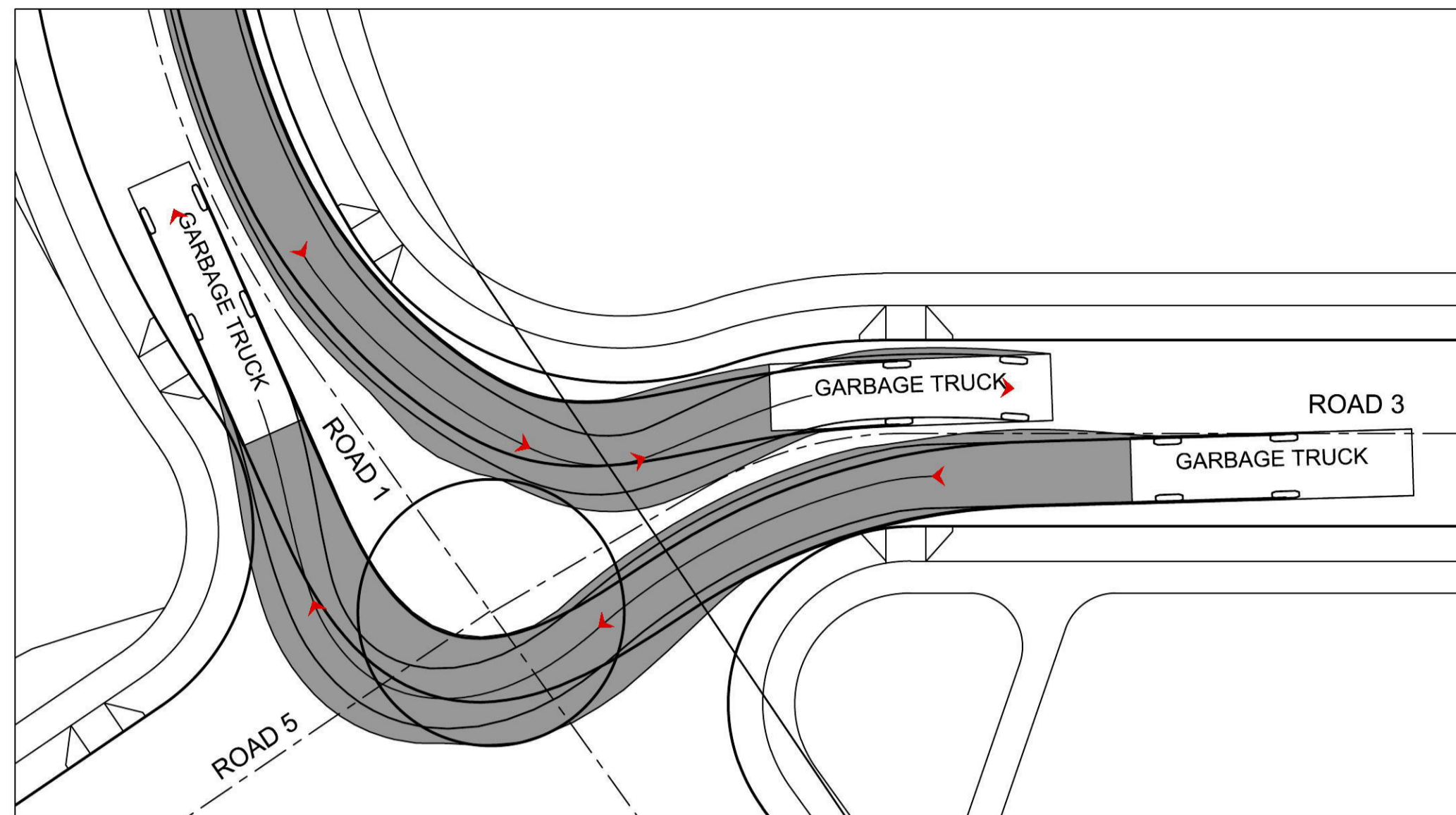
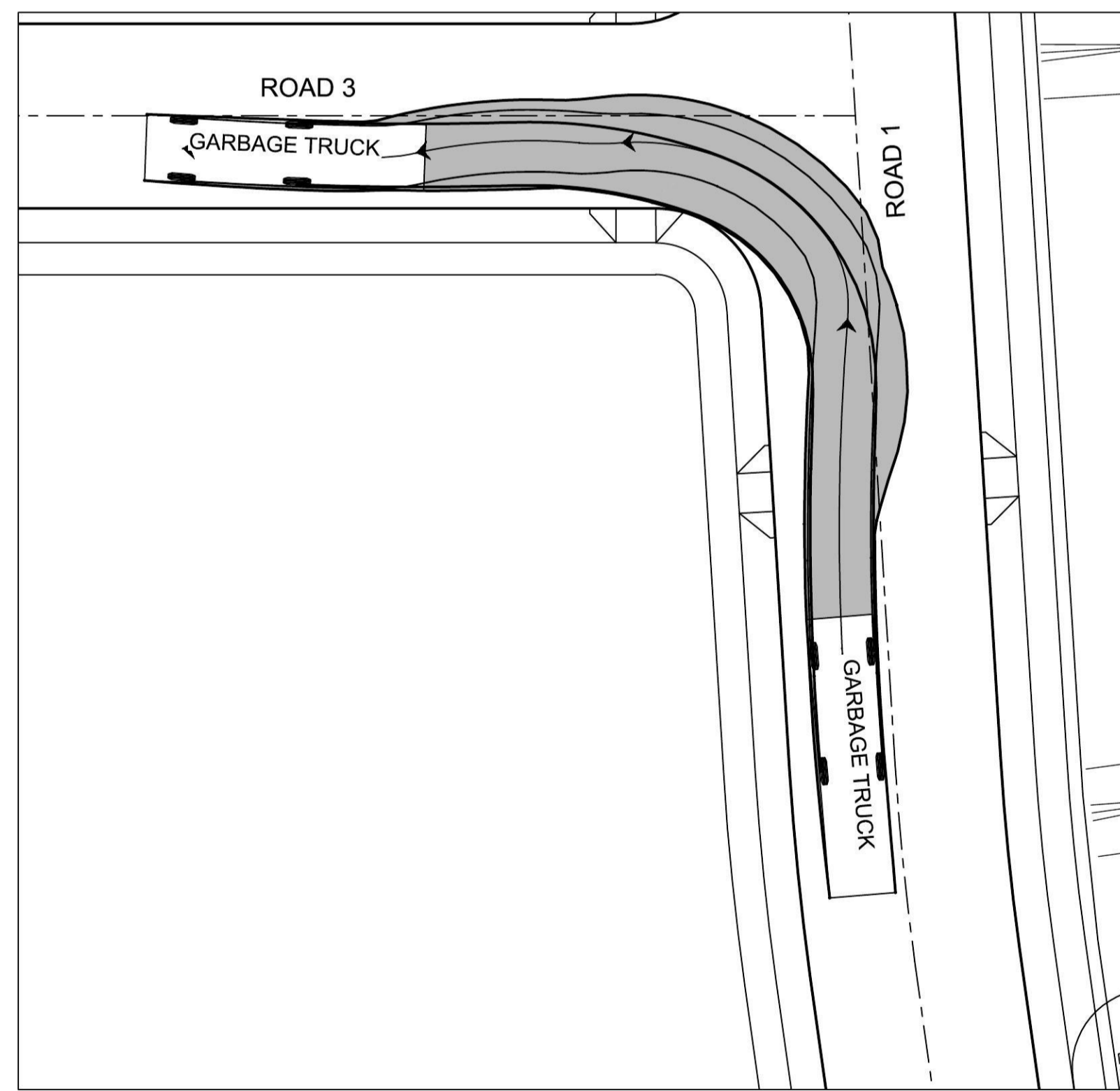
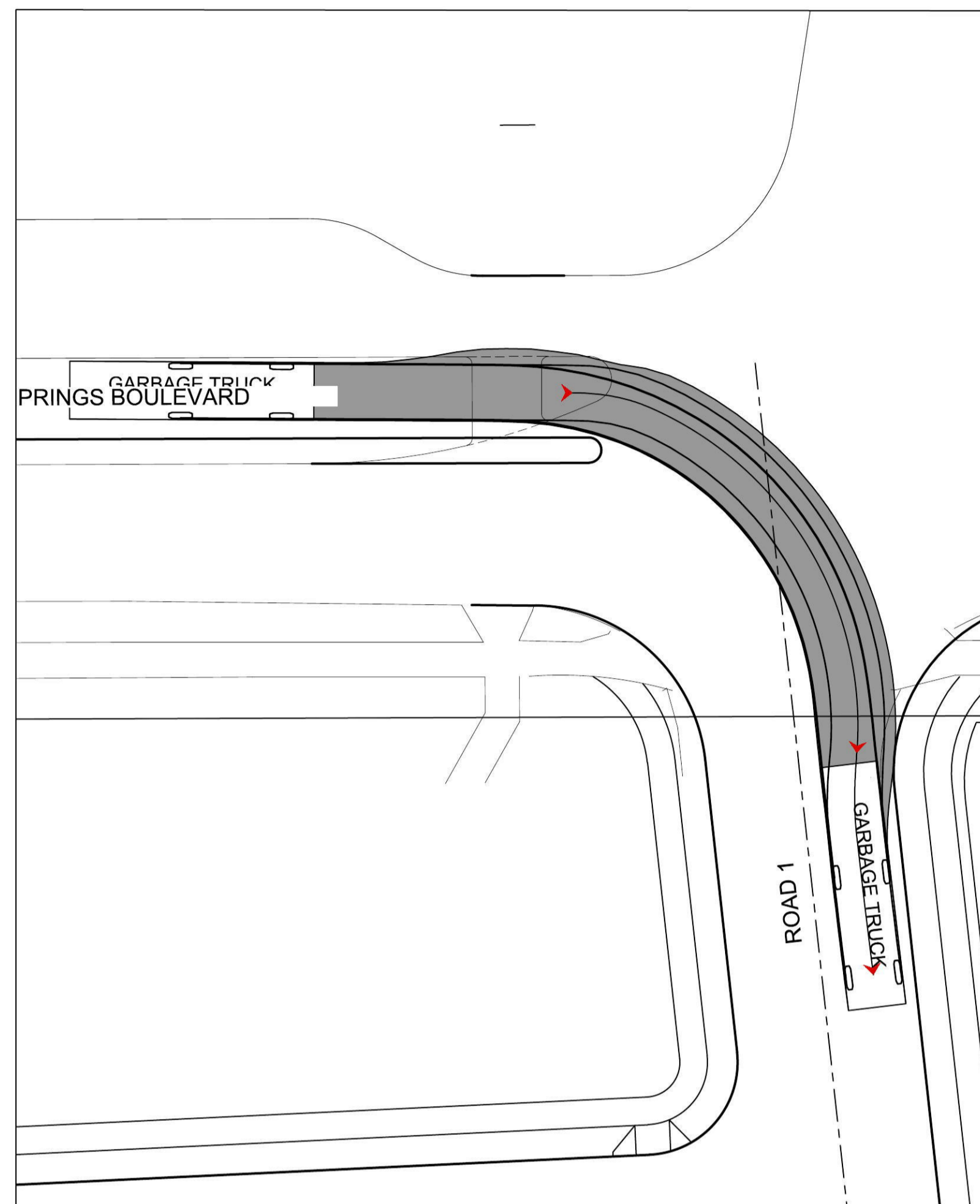
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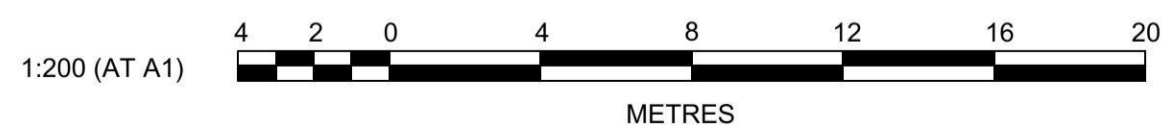
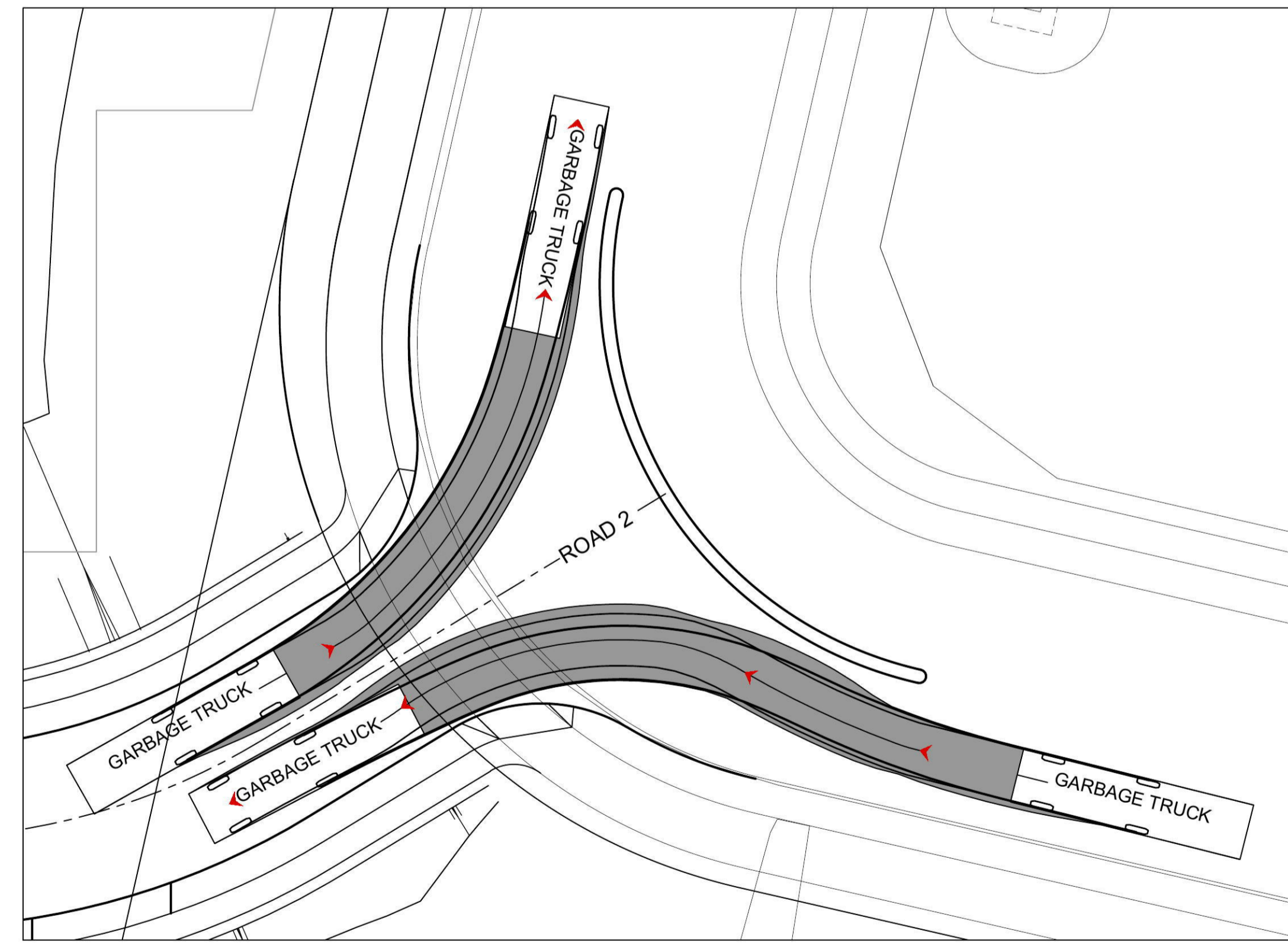
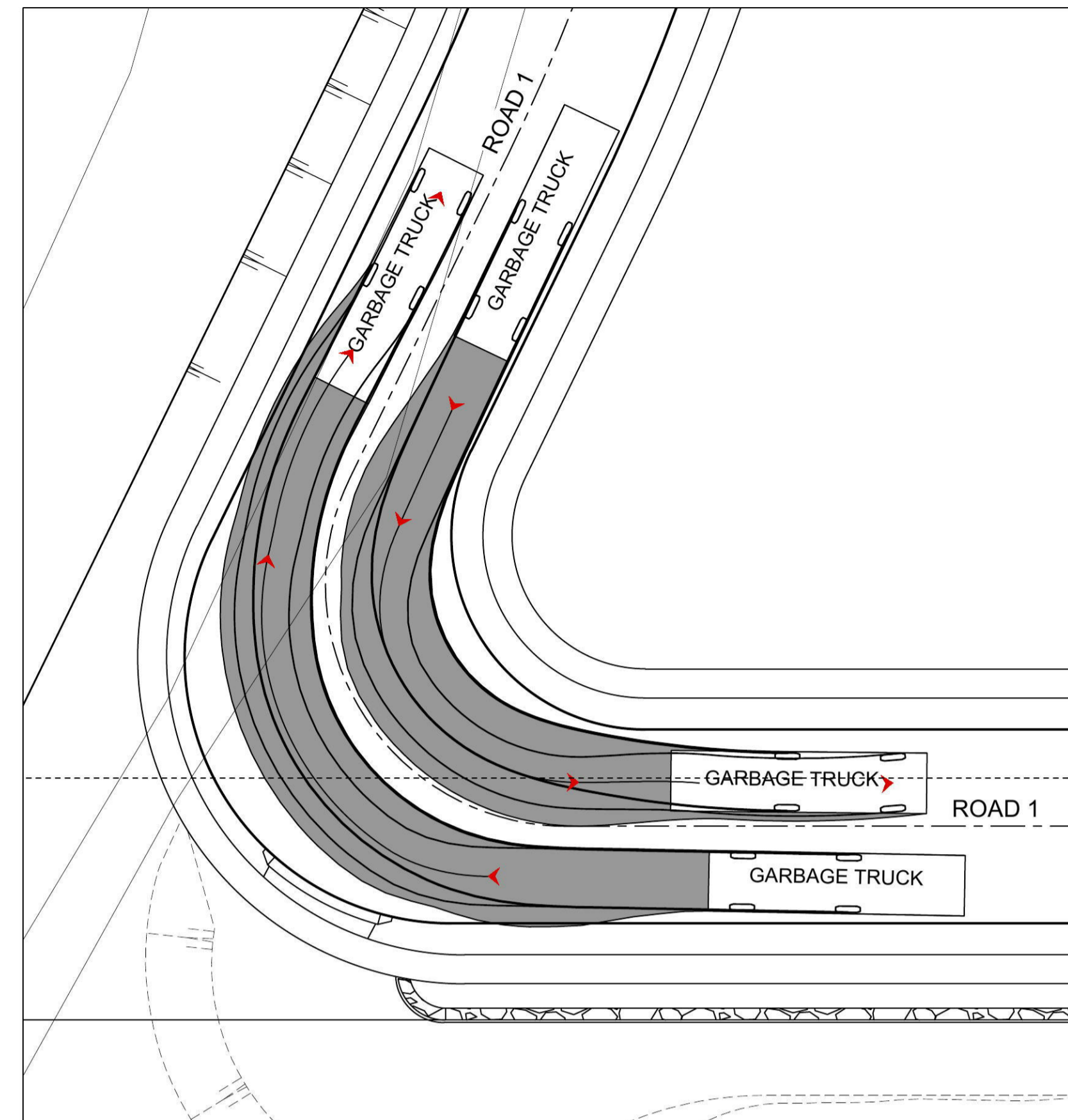
JORDAN SPRINGS MIXED USE SITE
 SITE SECTIONS

PLAN No: 9776/DA08 **B**
 FILE No: 9776DA08
 SHEET SIZE: A1 ORIGINAL

Plotted: 4 March, 2014 5:17:44 PM. File Name: J:\9776DA - Development Application Approval Plans\9776DA11.dwg



(GARBAGE TRUCK) meters
 Width : 2.50
 Track : 2.39
 Lock to Lock Time : 6.0
 Steering Angle : 41.8



NO.	DESCRIPTION	AS	TG	DH	MS	DATE
A	ISSUED FOR DEVELOPMENT APPLICATION AMENDMENT	DES	DRN	CKD	APR	14/02/14

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AZIMUTH: AHD
 DATUM: MGA
 ORIGIN:



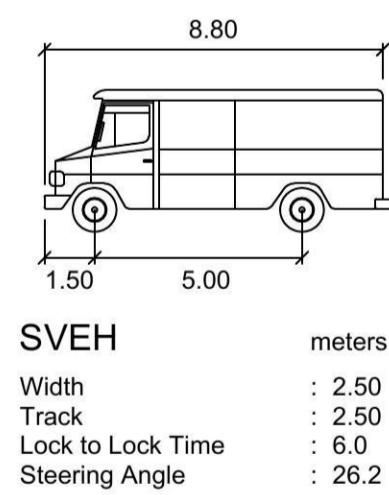
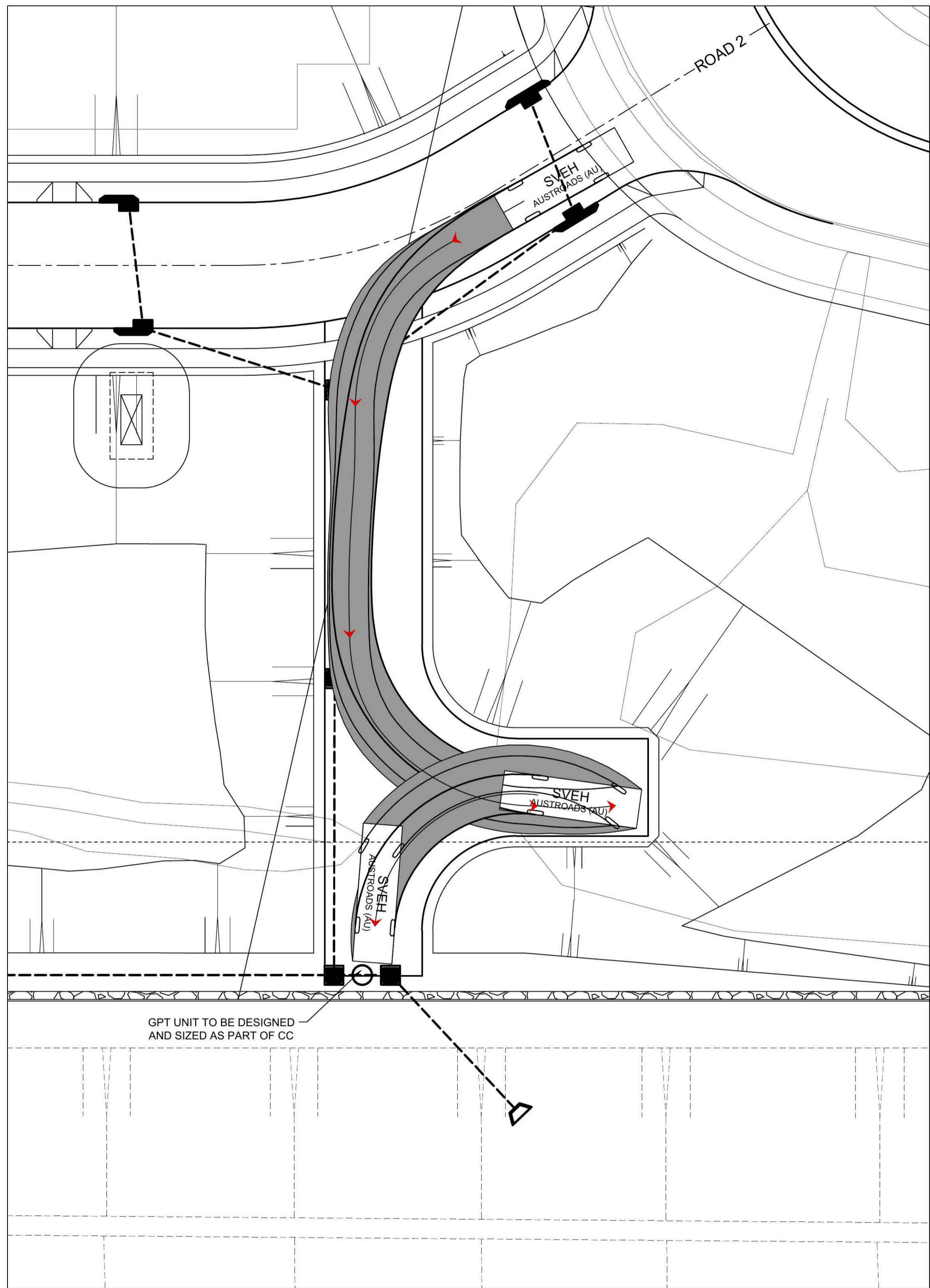
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 NOT FOR CONSTRUCTION

JORDAN SPRINGS
 MIXED USE SITE
 TURNING PATHS

PLAN No: 9776/DA11 **A**
 FILE No: 9776DA11
 SHEET SIZE: A1 ORIGINAL

Plotted: 4 March, 2014 5:15:06 PM, File Name: J:\9776\DA - Development Application Approval Plans\9776DA12.dwg



NO.	DESCRIPTION	DES	DRN	CKD	APR	DATE
B	RE-ISSUED FOR DEVELOPMENT APPLICATION	AS	AS			04/03/14
A	ISSUED FOR DEVELOPMENT APPLICATION	AS	TG	DH	MS	14/02/14
	AMENDMENT	DES	DRN	CKD	APR	DATE

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AZIMUTH: AHD
 DATUM: MGA
 ORIGIN:

CLIENT:

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JORDAN SPRINGS
MIXED USE SITE
GPT ACCESS PLAN

PLAN No:	9776/DA12	B
FILE No:	9776DA12	
SHEET SIZE:	A1 ORIGINAL	

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