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28 & 30 Mckay Avenue, Moorebank, NSW

Prepared by

LOKA CONSULTING ENGINEERS PTY LTD

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BSC, ME, MIE(AUST), CPEng, NPER, RPEQ

Senior Civil Engineer

Director

Table of Contents

1. Introduction

Loka Consulting Engineers Pty Ltd has been engaged by Morfosis Architects to provide a Traffic Management Report for the site at 28 & 30 Mckay Avenue, Moorebank, NSW (refer to Figure 1-1 and Figure 1-2) for DA. Stage.

A Traffic Management Plan and Report is required for the proposed development to identify the impacts of the proposal on the local street network and mitigation measures required to ameliorate any impacts. This includes:

- A description of the site and details of the development proposal;
- A review of the geometric design features of the proposed car parking facilities for compliance with the relevant codes and standards; and
- An assessment of the adequacy and suitability of the quantum of off-street car parking provided on site.

Figure 1-1 Subject site (from SIX maps)

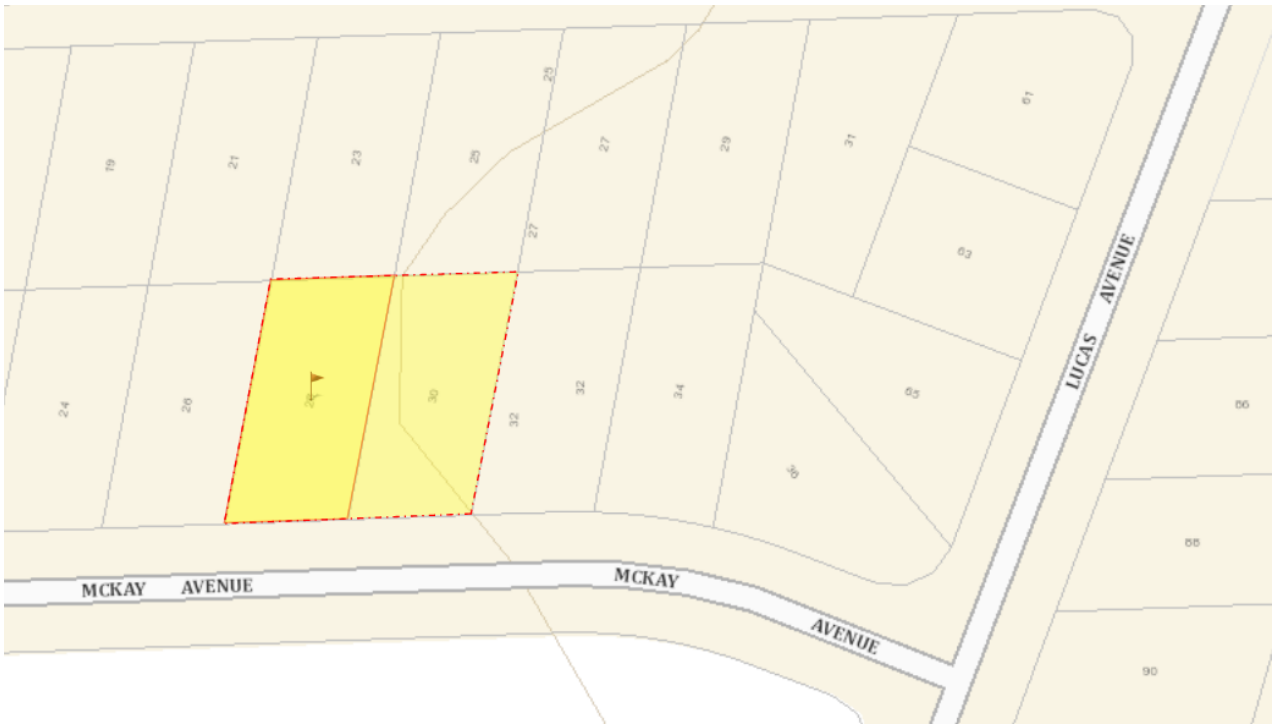


Figure 1-2 Site location (from SIX maps)

2. Proposed Development

The proposed development will facilitate the construction of a residential flat building development with a site area of approximately 1372.7 m^2.

The proposed development is bounded by

- No. 32 Mckay Avenue on the East,
- No. 26 Mckay Avenue on the West,
- No. 23 & 25 Harvey Avenue on the North, and
- Mckay Avenue on the South.

The development consists of two basement levels primarily for car parking with entry from Mckay Avenue, ground floor level and 5 upper levels to be residential with a total of 28 units.

2.1.Public Transportations

The area is connected to public transport, with bus stations located in close proximity to the site.

1. It takes 3 minutes walking (240m) from the site to Nuwarra Public School, Maddecks Ave bus stop (refer to Figure 2-1).
2. It takes 7 minutes walking (650m) from the site to 230 Newbridge Rd bus stop (refer to Figure 2-2).

Table 2-1 shows the bus line name; routes and the time between two successive trips. Refer to Transport NSW for accurate details.

Bus stop	Line Name	Route	Weekday hours	Weekday interval	Weekend hours	Weekend interval
1	902	Holsworthy to Liverpool via Moorebank	05:48-21:09	30 min	06:50-18:50	60 min
	902X	Holsworthy to Sandy Point via Voyager Point	15:00	Once per day	-	-
2	M90	Burwood to Liverpool	06:52-21:16	10 min	06:28-20:38	20 min
	903	Liverpool to Chipping Norton (Loop Service)	06:31-19:29	30 min	07:11-18:22	60 min

Table 2-1 Bus line, route, and time

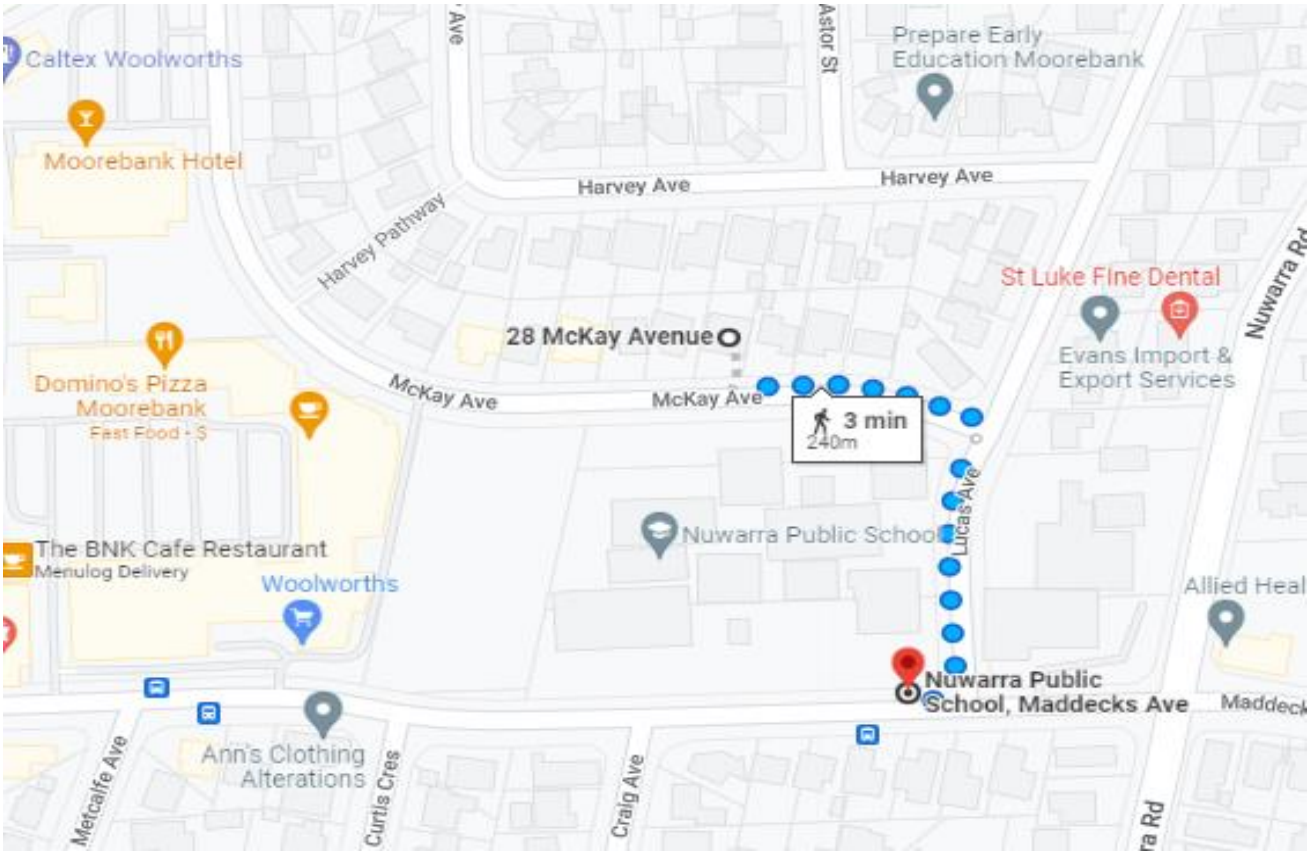


Figure 2-1 Subject Site to Nuwarra Public School, Maddecks Ave bus stop (from Google maps)

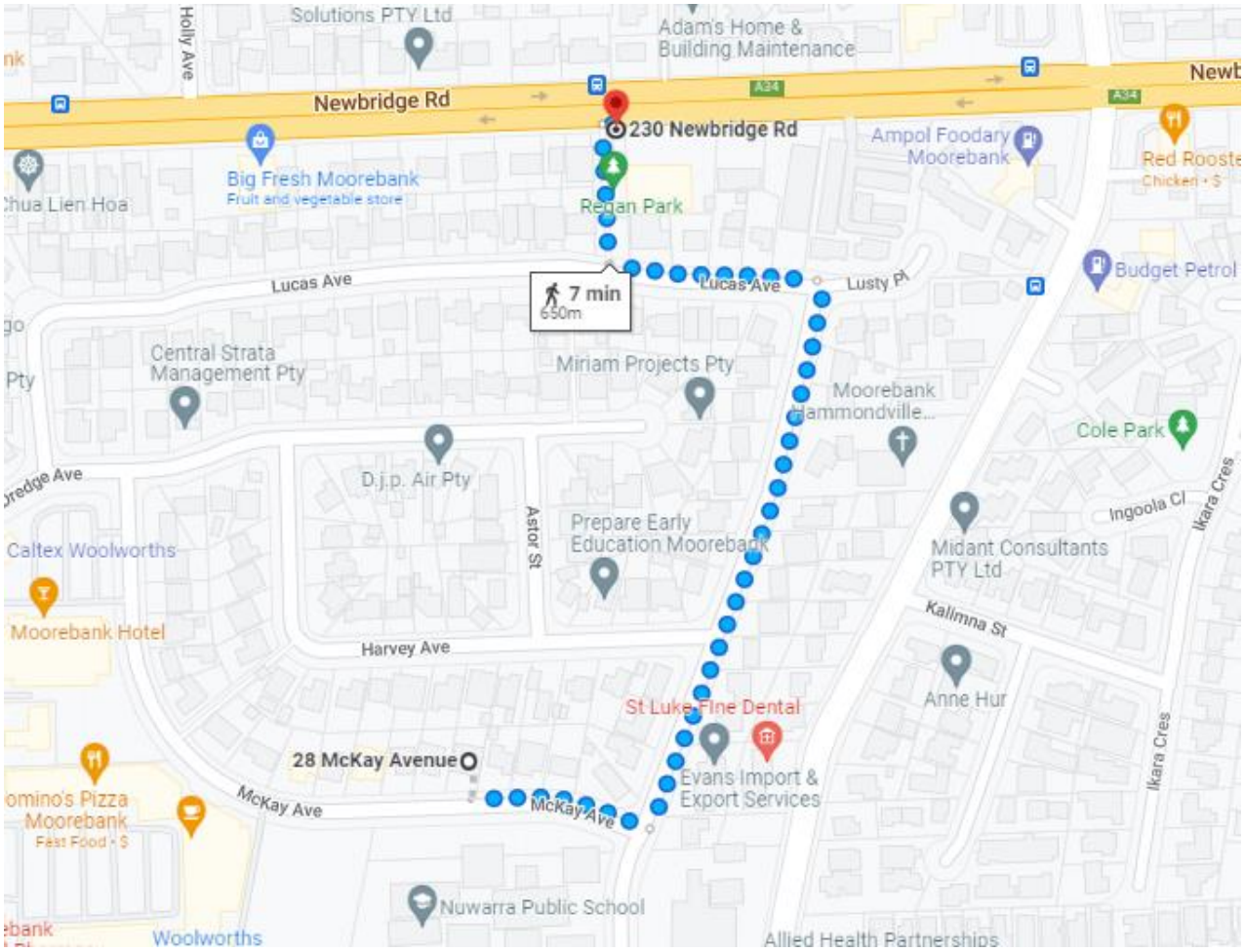


Figure 2-2 Subject Site to 230 Newbridge Rd bus stop (from Google maps)

3. Off Street Parking Provision

3.1. Car parking

The subject development is proposed to be under Affordable Rental Housing SEPP 2021. Since the development is not proposed by a social housing provider, the car parking requirement and summary are shown in Table 3-1 to 3-3.

Land use	Minimum number of car parking spaces	Service and Loading
High density residential flat buildings	(i) for each dwelling containing 1 bedroom—at least 0.5 parking spaces, or (ii) for each dwelling containing 2 bedrooms—at least 1 parking space, or (iii) for each dwelling containing at least 3 bedrooms—at least 1.5 parking spaces.	Service access for removalists and garbage servicing

Table 3-1 Off-street car parking space provision rate

Units and bedrooms provided are summarized in Table 3-2.

Bedroom	Number of units
1-bed	7
2-bed	20
3-bed	1
Total	28

Table 3-2 Bedroom summary

Required minimum parking spaces for the proposed development is shown in Table 3-3.

Parking type	Unit type	Amount	Parking rate	Required spaces	Required	Proposed
Residential	1-bed	7	0.5	3.5	**25**	**28**
	2-bed	20	1	20		
	3-bed	1	1.5	1.5		
Visitor						**4**
Total						**32**

Table 3-3 Required minimum car parking spaces

It's provided 28 residential parking spaces including 3 accessible parking spaces and 4 visitors parking spaces including 1 accessible parking space.

The design complies with the requirement from SEPP (2021).

The architectural plan of the proposed development has been prepared by Morfosis Architects and is attached in Appendix A.

3.2. Bicycle parking

According to Liverpool Development Control Plan (2008), the following bicycle parking shown in Table 3-4 must be provided.

Land use	Minimum number of car parking spaces
Residential Flat Buildings, Multi-Dwelling Housing	Resident (class 1 or 2) – 1 per 2 units, or 1 for every 4 bedrooms (whichever is greater) Visitor (class 3) – 1 per 10 units

Table 3-4 Off-street bicycle parking space provision rate

Required minimum parking spaces for the proposed development is shown in Table 3-5.

Parking type	Unit type	Amount	Parking rate	Required spaces	Required	Proposed
Residential	1-bed	7	Max. (1 per 2 units, 1 per 4 bedrooms)	Max. (14, 12.5)	**14**	**21**
	2-bed	20				
	3-bed	1				
Visitor		28	0.1	3	**3**	
Total					**17**	

Table 3-5 Required minimum bicycle parking spaces

The design complies with the requirement from LDCP 2008.

The bicycle parking spaces are provided inside basement 01.

4. Car Park and Driveway Layout

4.1.Driveway and Ramp Design

The design of the driveway, internal roadways & ramps, and car parking spaces must comply with relevant Australian Standards; details are shown in the architectural plan. Table 4-1 and Table 4-2 assess the compliance of the site to Australian Standard and LDCP 2008.

FEATURE	AS 2890.1:2004	LDCP 2008	Architectural Plan	Compliance
Driveway width	• 3.0 to 5.5 for Category 1. • 6.0 to 9.0 for Category 2.	Min. 5m for less than 40 parking spaces with "major" street frontage Max. 6m for residential	5.5m at boundary	The design is complied with AS2890.1 & council DCP
Ramp width	• One-way – 3.0m minimum between kerbs • Two- way – 5.5m minimum between kerbs • Note: 300mm clearance on both side when there is a high kerb or barrier on both sides.	1-15 spaces and length <= 40m 3.5m 15-40 spaces 5m Over 40 spaces 6-6.5m	G.F to B01 5.5m between two 300mm kerbs on both sides B01 to B02 5.5m between two 300mm kerbs on both sides Ensure min. 300mm kerbs on both sides of ramp at CC stage.	The design is not complied with AS2890.1 & council DCP However, there is enough space for kerb to be provided at CC stage.
Ramp grade	Longer than 20m – 1:5 maximum. Up to 20m long – 1:4 maximum. Transition grade no more than 1:8. First 6m no more than 1:20.	To comply with AS2890.1 Max. 5% within 6m of the site boundary or any pedestrian way Transition zone 1:12	G.F to B01 1% @ 6m 12.5% @ 2m 20% @ 8.7m 12.5%@2m B01 to B02 12.5% @ 2m 20% @ 7.6m 12.5%@2m Flat grade @9m 12.5%@2m	The design is not complied with council DCP However, it is complied with AS2890.1

	Changes of grade no more than 1:8.	Max. 1:6 if length more than 20m, or 1:5 if less than 20m	20% @3.4m 12.5%@2m	
Headroom	2.2m min between the floor and an overhead obstruction. Headroom above each dedicated space and adjacent shared area should be a minimum of 2.5m.	To comply with AS2890.1	Head clearance with slab thickness & mechanical services is shown <u>B01</u> 3.18m <u>B02</u> 3.2m Ensure min. 2.2m overall and 2.5m at disabled parking at CC stage	The design is complied with AS2890.1, 6 & council DCP

Table 4-1 Driveway and ramp design

4.2.Dimensions of Parking Spaces

The design of the car parking spaces should be in compliance with AS 2890.1, 3 & 6.

FEATURE	AS/NZS 2890.1, 2890.3 & 2890.6	LDCP 2008	Architectural Plan	Compliance
Residential parking space	5.4m x 2.4m. Additional 300mm when adjacent a wall	5.4m x 2.4m. Additional 300mm when adjacent a wall	5.5m x 2.40m Additional 300mm when adjacent a wall	The design is complied with AS2890.1 & council DCP
Visitor parking space	5.4m x 2.4m. Additional 300mm when adjacent a wall	5.4m x 2.4m. Additional 300mm when adjacent a wall	5.5m x 2.40m	The design is complied with AS2890.1 & council DCP
Accessible parking space	5.4m x 2.4m adjacent a 5.4m x 2.4m shared zone	5.4m x 3.2m	5.5m x 2.4m adjacent a 5.5m x 2.4m shared zone	The design is not complied with council DCP However, it is complied with AS2890.6
Aisle Widths	5.8m minimum	6.2m	<u>B01 & B02</u> 6.2m minimum	The design is complied with AS2890.1 & council DCP
Blind aisle	1m offset minimum beyond the last parking space	To comply with AS2890.1	<u>B01</u> <u>1.74m</u> <u>B02</u> 1m & 1.74m	The design is complied with AS2890.1 & council DCP

Parking envelope	According to AS2890.1 Figure 5.2	To comply with AS2890.1	Comply with AS2890.1	The design is complied with AS2890.1 & council DCP
Bicycle parking space	1.8m x 0.5m horizontal 1.2m x 0.5m vertical	To comply with AS2890.3	1.8m x 0.5m	The design is complied with AS2890.3 & council DCP
Bicycle parking aisle	1.5m	To comply with AS2890.3	1.8m	The design is complied with AS2890.3 & council DCP

Table 4-2 Dimensions of parking spaces

As required in AS 2890.1:2004, a triangular area with 2.5m (face to driveway) by 2.0m (face to street) will be kept clear of obstructions to visibility (Refer to Figure 4-1).

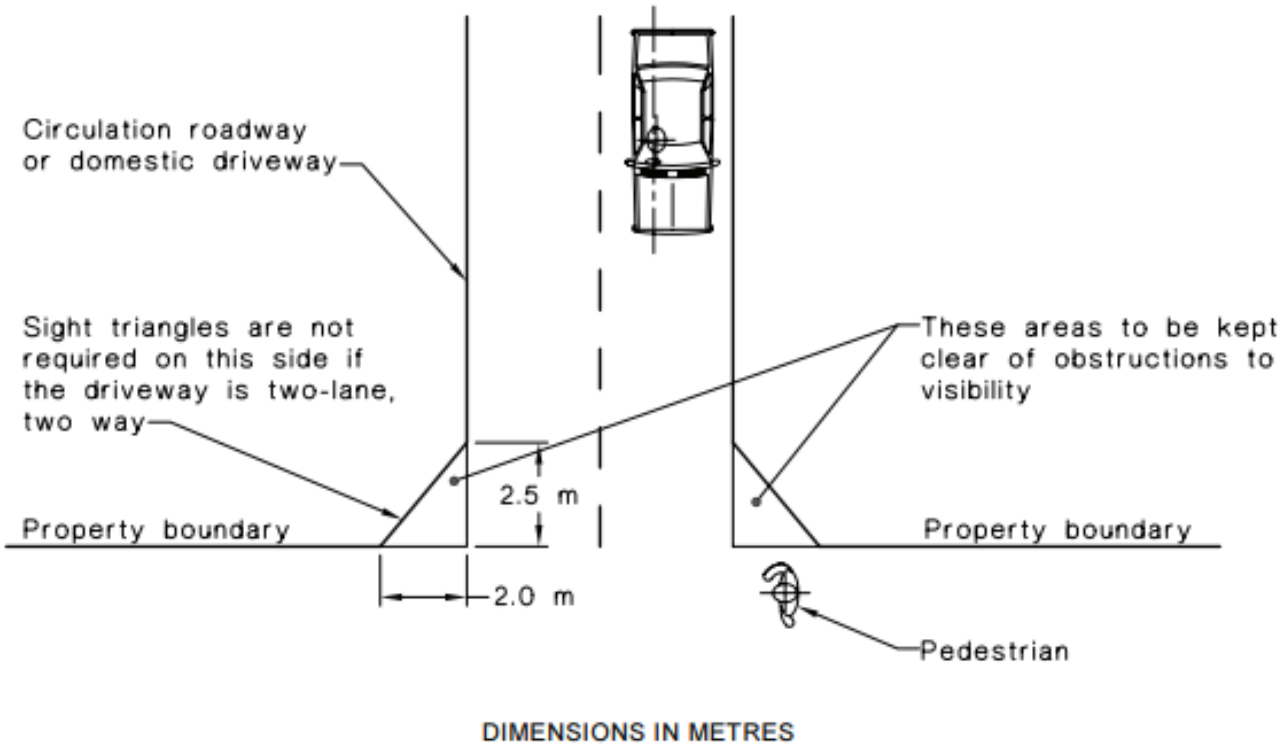


Figure 4-1 AS 2890.1:2004 requirement

In accordance with AS 2890.1:2004, sight triangle is hatched in red and shown in the following Figure 4-2.

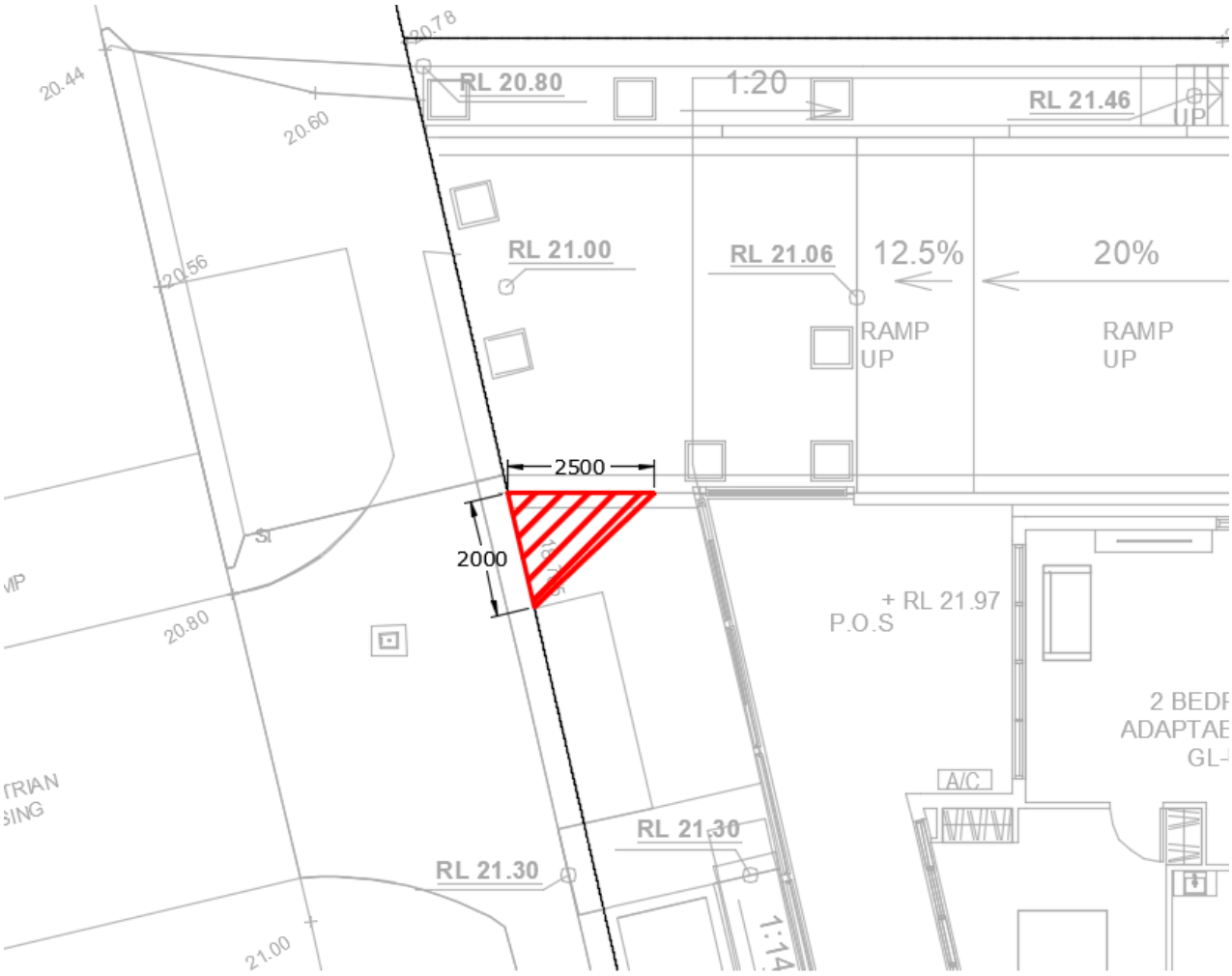


Figure 4-2 Sight triangle

Ensure any object within the sight triangle is max. 1.15m high or 50% transparent above 0.9m if higher than 1.15m.

5. Traffic Generation

An indication of the traffic generation potential of the development proposal is provided in accordance with Roads and Maritime Services (RMS) publication 'Guide to Traffic Generating Developments 2002'.

The RMS guidelines are based on extensive survey of a wide range of land uses.

The subject site is residential

Residential

Weekday peak hour vehicle trips = 0.85 per dwelling
Identified as high-density residential flat building

Rates.
Metropolitan Sub-Regional Centres.
Daily vehicle trips = not available

Peak Hour Vehicle Trips = 0.29 trips per unit.
For the proposed development there are 28 units in total. Therefore, there is a traffic generation potential of approximately 9 vehicles per hour during peak periods.

Existing dwellings

Daily vehicle trips = 9.0 per dwelling

Weekday peak hour vehicle trips = 0.85 per dwelling

For the existing site, there are 2 dwellings. Therefore, there is a traffic generation potential of approximately 2 vehicles per hour during peak periods.

The future vehicle trips should be discounted by the existing trips to evaluate the net increase in traffic generation due to the proposed development. This is shown in Table 5-1.

Time	Land use	Rate	Unit	Work days
Future	Residential	0.29 per unit	28 proposed	8.12
Existing	Dwelling	0.85 per dwelling	2 existing	1.7
Net				+7

Table 5-1 Traffic generation for future and existing development net Increase in peak hour

.According to the Table above, it is likely that the proposed development will result in a change in the traffic generation by approximately **7 additional** vehicle trips/hr during weekday peak hour from Monday to Friday.

6. Swept Path Analysis

To ensure all vehicles enter and exit the site in a forward direction, swept path analysis has been conducted in the Appendix B.

It is our opinion that the proposed car parking and driveway comply with Australia Standards.

APPENDIX A

Architectural Plan

SITE BOUNDARY

WIND DIRECTION

PROPOSED BUILDING

VEHICULAR ACCESS

PEDESTRIAN ACCESS

TREES TO BE RETAINED

EXISTING STRUCTURE TO BE DEMOLISHED

EXISTING DRIVEWAY/PATHWAYS TO BE DEMOLISHED

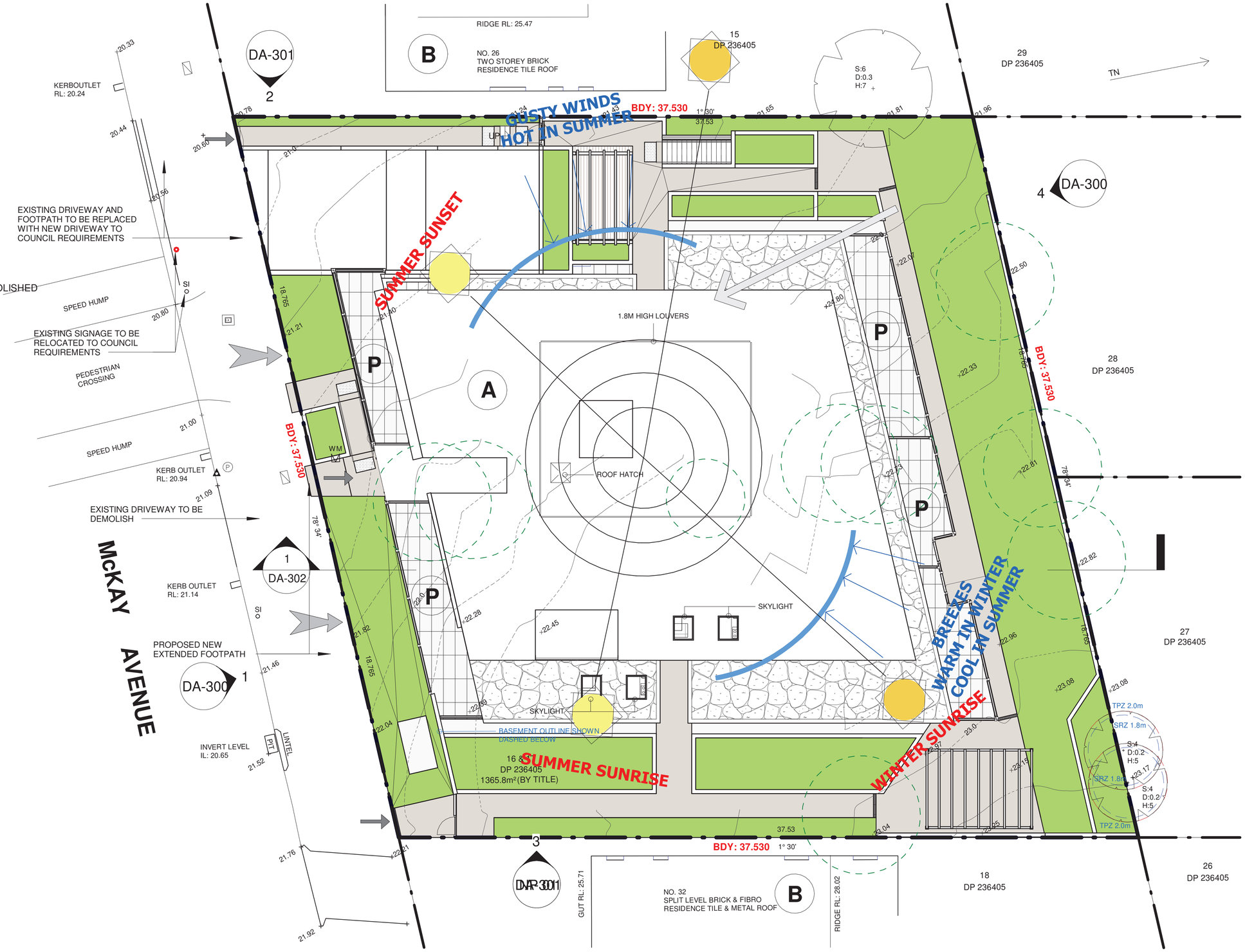
APPROX. LOCATION OF SEWERAGE LINE

NEIGHBORHOOD PROPERTIES

PRIVATE OPEN SPACE

TRAFFIC NOISE

TREES TO BE REMOVED



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GENERAL NOTES

1. ALL DIMENSIONS AND FLOOR AREAS TO BE VERIFIED BUILDIER PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK.
2. ANY DESCREPANCIESW ARE TO BE CONFIRMEND BY THE DESIGNER.
3. LEVELS SHOWN ARE APPROXIMATE UNLESS ACCOMPANIED BY REDUCED LEVELS BY A REGISTERED SURVEYOR.
4. FIGURED DIMENSIONS ARE TO BE TAKEN IN PREFERENCE TO SCALING.
5. ALL BOUNDARY CLEARANCE MUST BE VERIFIED BY THE SURVEYOR PRIOR TO THE COMMENCEMENT OF ANY BUILDING WORK.
6. WHERE ENGINEERING OR HYDRAULIC DRAWINGS ARE REQUIRED , SUCH MUST TAKE PREFERENCE TO THIS DRAWING.
7. STORMWATER TO BE CONNECTED AND DISCHARGED TO COUNCIL'S REQUIREMENTS AND TO AS 3500.3
8. ALL SERVICES TO BE LOCATED AND VERIFIED BY THE BUILDER WITH THE RELEVANT AUTHORITIES PRIOR TO THE COMMENCEMNET OF ANY BUILDING.

ISSUE	AMENDMENTS	DATE
A	DA ISSUE	14/12/22

ISSUE: **A**

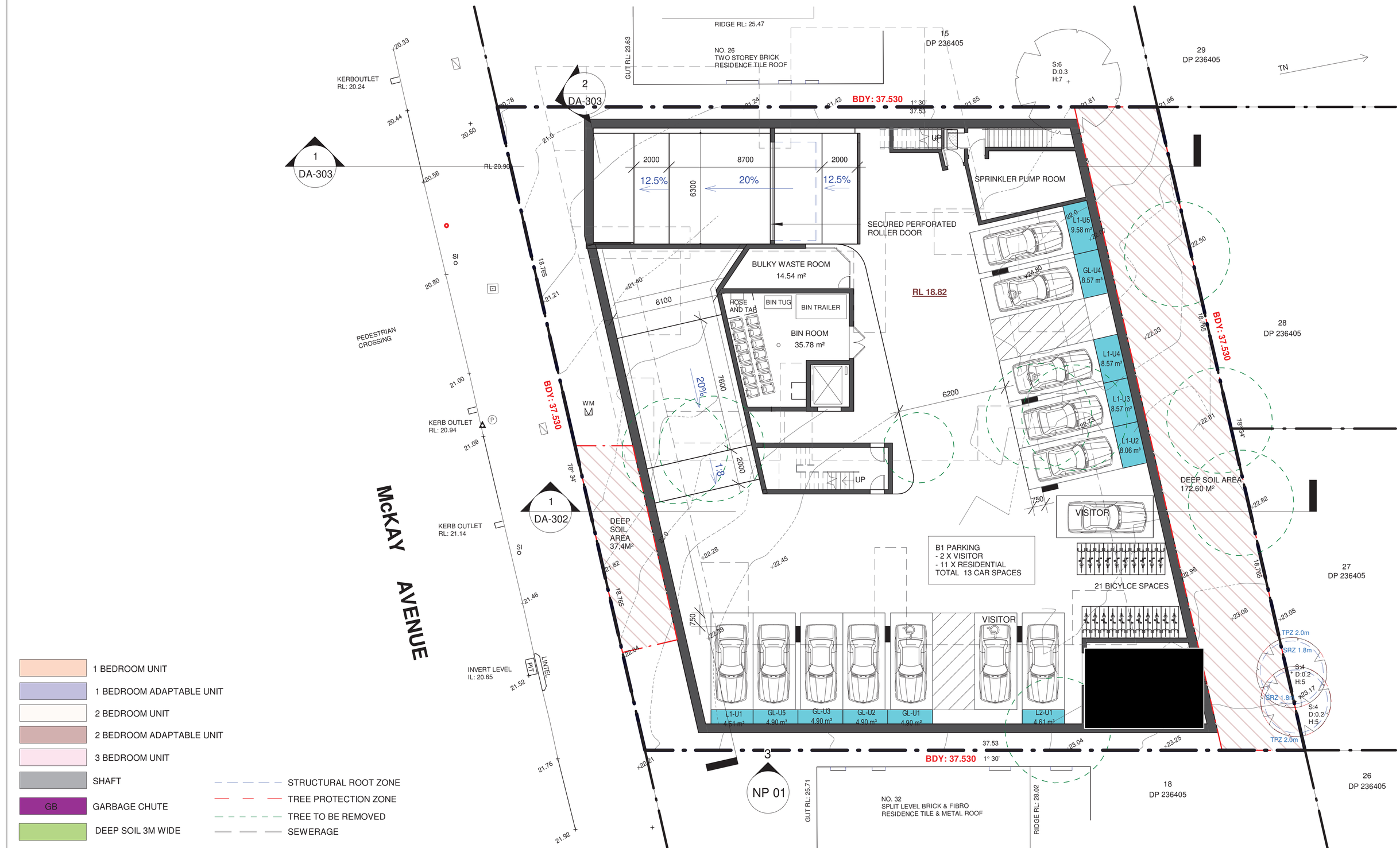
CLIENT: [redacted]

DRAWING NUMBER: DA-200

DRAWING TITLE: SITE-ROOF PLAN

SCALE: As indicated @ A3

PROJECT: RESIDENTIAL FLAT BUILDING DEVELOPMENT AT 28 & 30 MCKAY AVENUE MOOREBANK



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ISSUE	AMENDMENTS	DATE
A	DA ISSUE	14/12/22

ISSUE: **A**

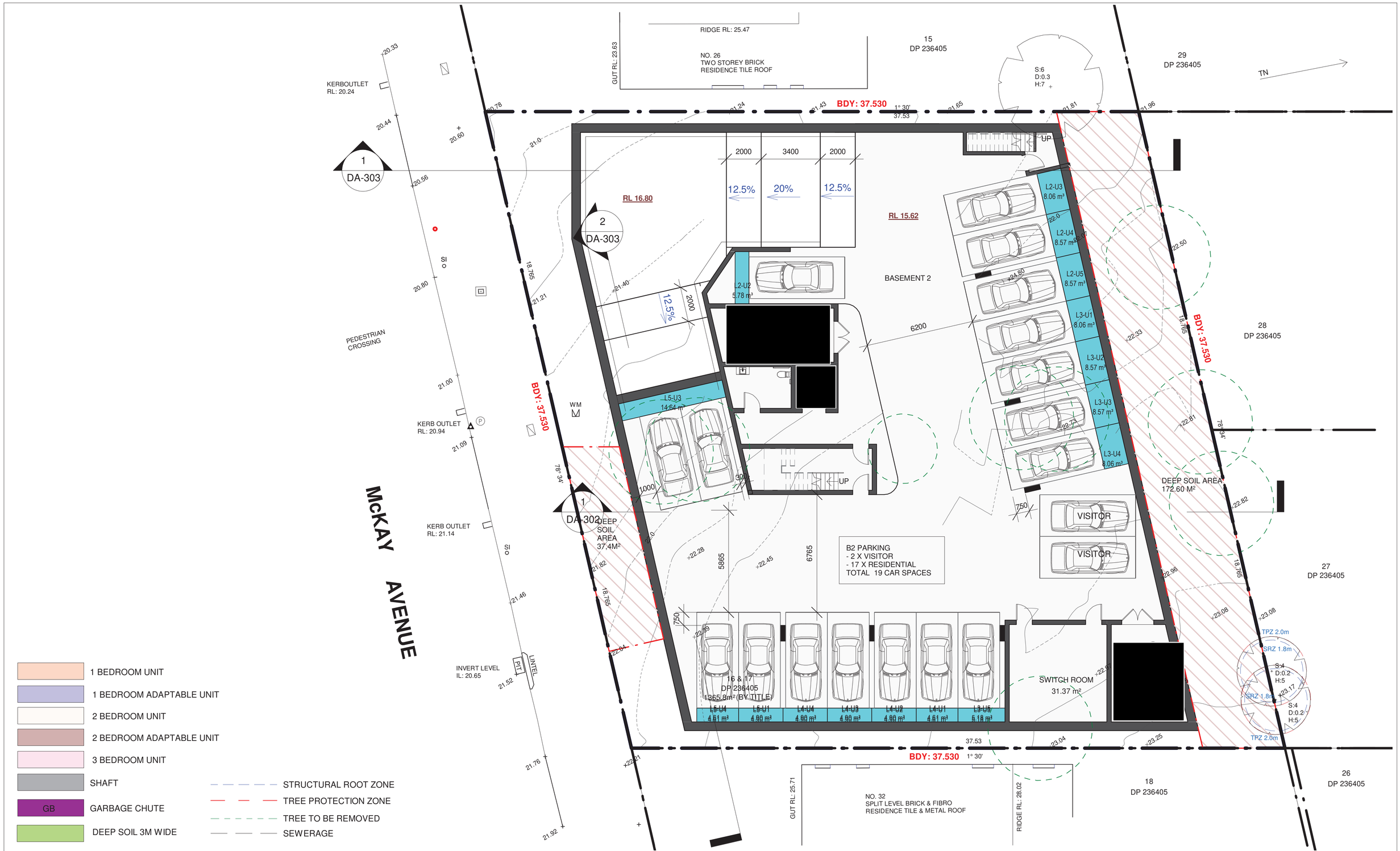
CLIENT: [redacted]

DRAWING NUMBER: DA-201

DRAWING TITLE: BASEMENT LEVEL 01 PLAN

SCALE: As indicated @ A3

PROJECT: RESIDENTIAL FLAT BUILDING DEVELOPMENT AT 28 & 30 MCKAY AVENUE MOOREBANK



1 BEDROOM UNIT
1 BEDROOM ADAPTABLE UNIT
2 BEDROOM UNIT
2 BEDROOM ADAPTABLE UNIT
3 BEDROOM UNIT
SHAFT
GB GARBAGE CHUTE
DEEP SOIL 3M WIDE

STRUCTURAL ROOT ZONE
TREE PROTECTION ZONE
TREE TO BE REMOVED
SEWERAGE

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ISSUE	AMENDMENTS	DATE
A	DA ISSUE	14/12/22

ISSUE
A

CLIENT
[redacted]

DRAWING NUMBER:
DA-202

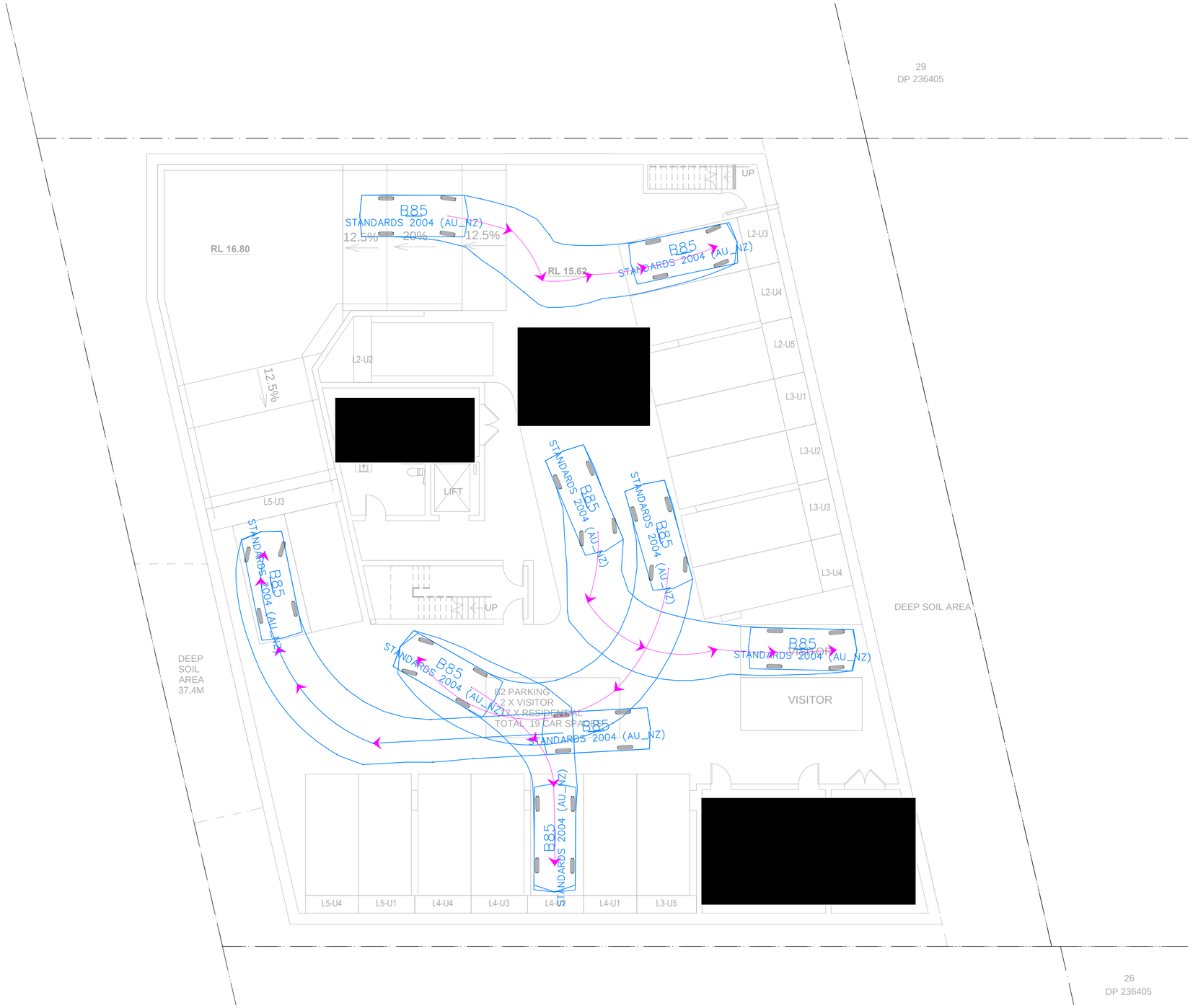
DRAWING TITLE:
BASEMENT LEVEL 02 PLAN

SCALE
As indicated @ A3

PROJECT
RESIDENTIAL FLAT BUILDING DEVELOPMENT AT 28 & 30 MCKAY AVENUE MOOREBANK

APPENDIX **B**

Swept Path Analysis



SWEPT PATH ANALYSIS ENTRY AT BASEMENT 02

SCALE 1:100

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NOT FOR CONSTRUCTION

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B	FOR COORDINATION	B.V.	B.V.	06-02-23
A	FOR COORDINATION	B.V.	B.V.	13-09-22

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PROJECT
PROPOSED RESIDENTIAL FLAT BUILDING AT 28 & 30 MCKAY AVENUE, MOOREBANK, NSW

CONSENT AUTHORITY:
LIVERPOOL CITY COUNCIL

SHEET SUBJECT
SWEPT PATH ANALYSIS ENTRY AT BASEMENT 02

PROJECT 28 & 30 MCKAY AVENUE, MOOREBANK, NSW

DATE	DRAWN	DESIGNED	CHECKED
SEP 22	B.V.	B.V.	N.L.

SCALE @ A1	JOB No	REV
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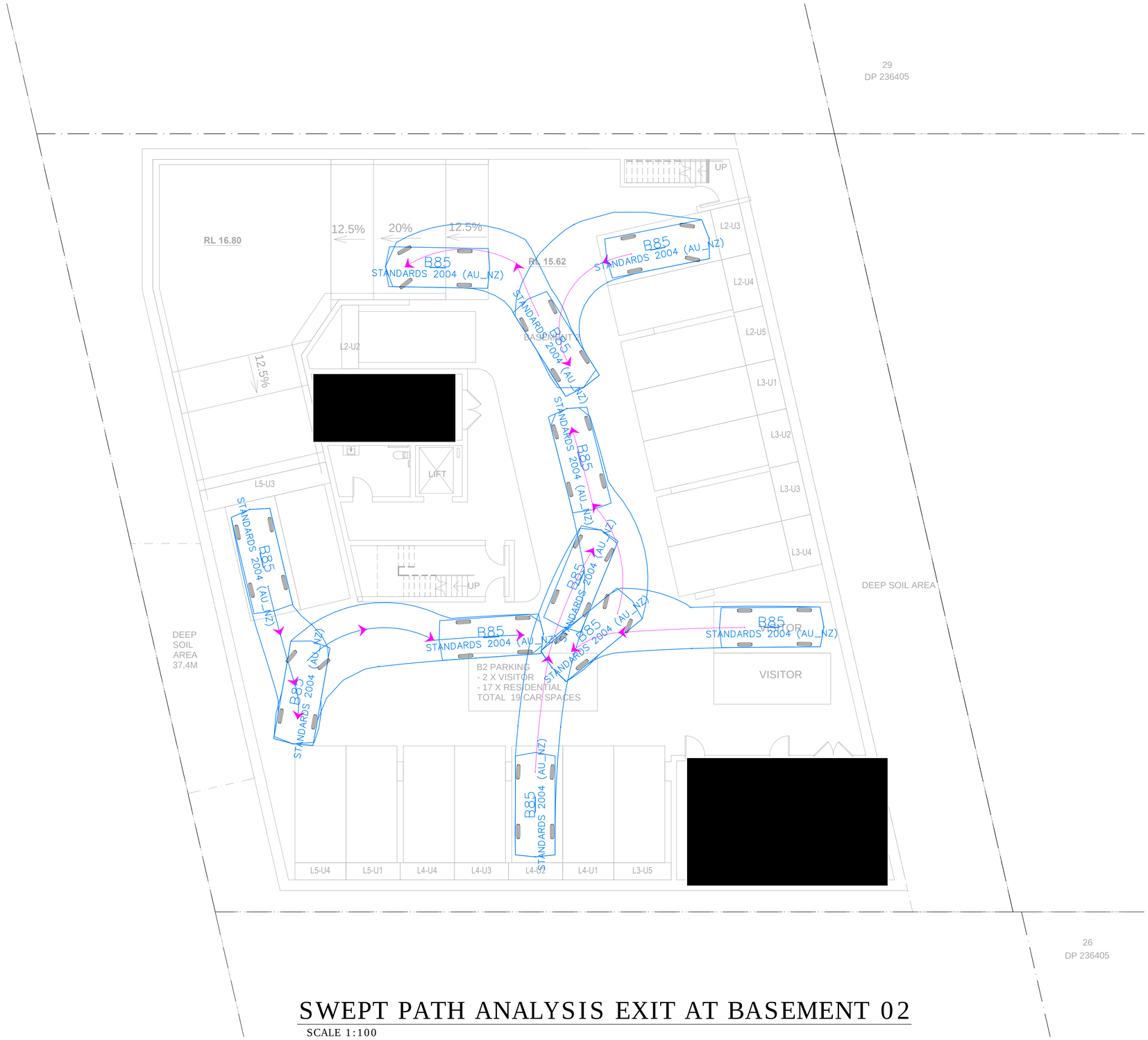
AUTHORISED [redacted]

DWG No T01



SWEPT PATH ANALYSIS EXIT AT BASEMENT 02

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B	FOR COORDINATION	B.V.	B.V.	06-02-23					
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SHEET SUBJECT
SWEPT PATH ANALYSIS EXIT AT BASEMENT 02

PROJECT 28 & 30 MCKAY AVENUE, MOOREBANK, NSW			
DATE SEP 22	DRAWN B.V.	DESIGNED B.V.	CHECKED N.L.
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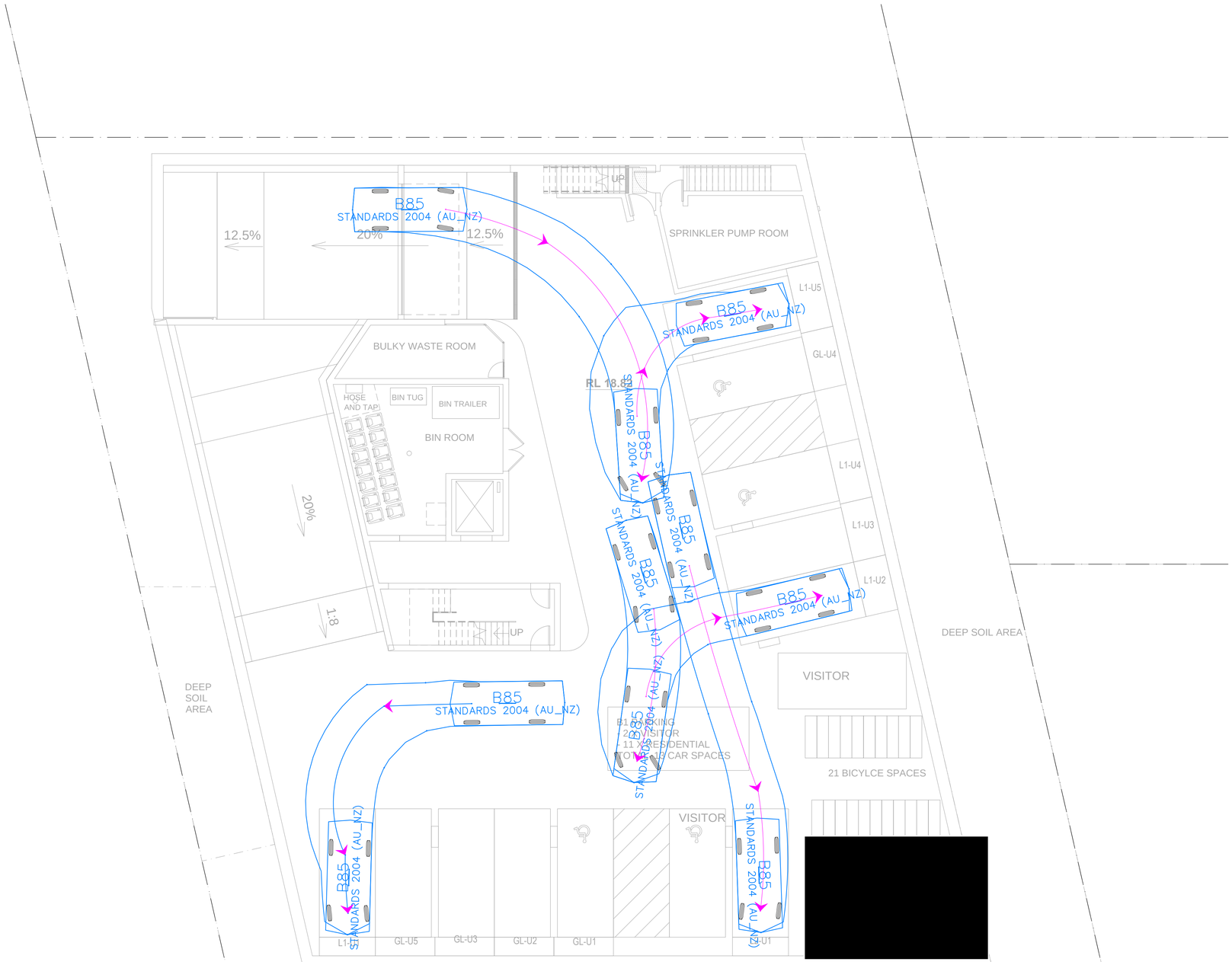

SWEPT PATH ANALYSIS ENTRY AT BASEMENT 01

SCALE 1:100

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NOT FOR CONSTRUCTION

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PROPOSED RESIDENTIAL FLAT BUILDING AT 28 & 30 MCKAY AVENUE, MOOREBANK, NSW

CONSENT AUTHORITY:
LIVERPOOL CITY COUNCIL

SHEET SUBJECT
SWEPT PATH ANALYSIS ENTRY AT BASEMENT 01

PROJECT 28 & 30 MCKAY AVENUE, MOOREBANK, NSW			
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SWEPT PATH ANALYSIS EXIT AT BASEMENT 01

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A	FOR COORDINATION	B.V.	B.V.	13-09-22					

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