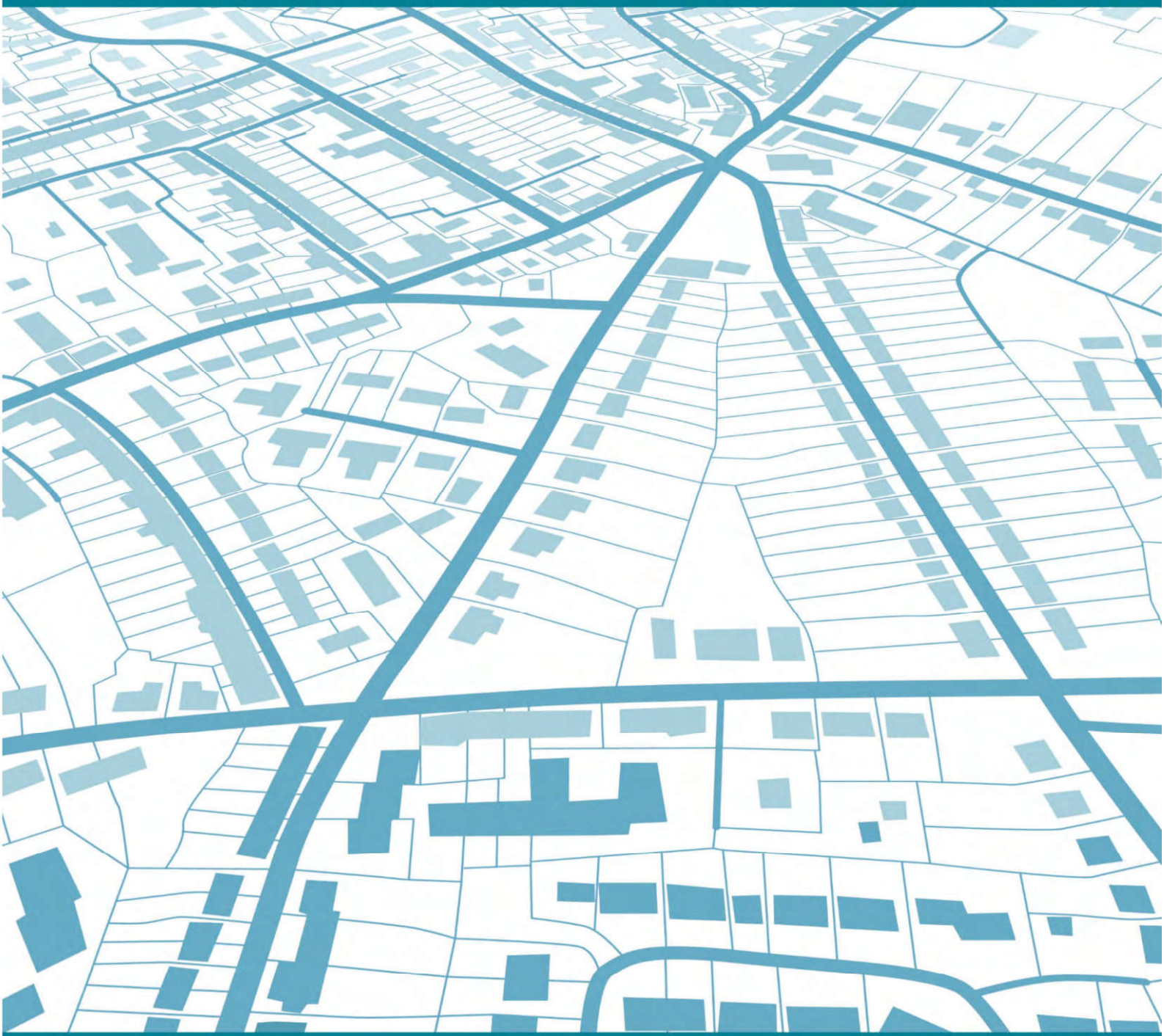
ttpa TRANSPORT AND TRAFFIC PLANNING ASSOCIATES
Established 1994

Suite 502, Level 5, 282 Victoria Avenue
Chatswood NSW 2067
T (02) 9411 5660 | F (02) 9904 6622
E info@ttpa.com.au | ttpa.com.au



Planning Proposal for Mixed Use Development
3 Ellis Street, Chatswood
Traffic and Parking Assessment

Ref: 20094
Date: May 2021
Issue: F

Table of Contents

List of Figures

List of Appendices

1.0 Introduction

This report has been prepared to accompany a Planning Proposal to Willoughby City Council amendment to Willoughby Local Environment Plan 2012 (WLEP2012) to permit an increased FSR for a mixed use development at 3 Ellis Street, Chatswood (Figure 1).

Chatswood has continued to evolve as a major regional centre and Council has foreseen the need to establish a strategy to guide future development for the next 20 years. To this end, Council has published draft report titled Chatswood CBD Planning and Urban Design Strategy which identifies the opportunities and constraints that impact on development in Chatswood CBD and recommends a planning framework that can be implemented to ensure that Chatswood continues to grow as a competitive centre.

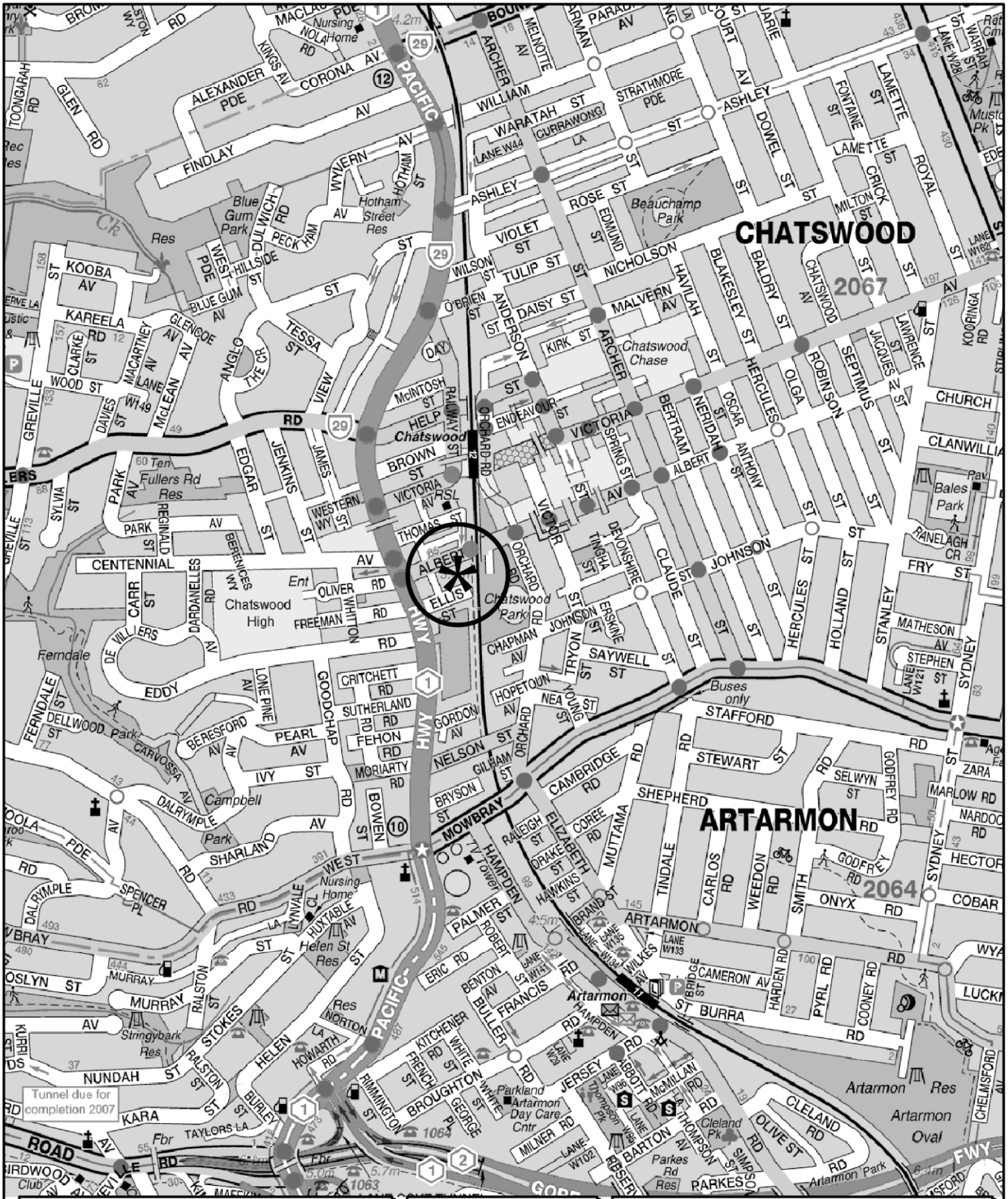
The study reacts to the projected urban growth in Chatswood over the next 30 years of:

- some 500,000m^2 resident floorspace
- some 300,000m^2 office floorspace
- some 136,000m^2 other commercial floorspace

In addition to the development site, the draft strategy recommends a mixed use zoning with a permitted FSR of up to 6:1. The Planning Proposal reflects this outcome with an envisaged development comprising:

30 apartments (3.98:1)
420m^2 commercial floorspace (0.52:1)

Total: 4.5:1



LEGEND

LOCATION

FIG 1

The purpose of this report is to:

- describe the site, its context and existing use
- describe the Planning Proposal and the envisaged development scheme
- describe the existing road network and traffic conditions as well as the proposed future circumstances in the vicinity of the site
- assess the adequacy of the envisaged parking provisions to serve the development
- assess the potential traffic implications of the envisaged development
- assess the envisaged vehicle access, internal circulation and servicing arrangements
- respond to traffic and parking issues raised by Council in the Record of the Pre Lodgement Meeting

2.0 Planning Proposal

2.1 Site, Context and Existing Circumstances

The site (Figure 2) is SP2715 which occupies a rectangular shaped area of some 808.6m^2 with frontages to the northern side of Ellis Street. The site is located on the eastern side of the highway on the edge of the CBD where there is significant ongoing development for residential apartment buildings with ground level retail/commercial uses.

The existing use on the site (see survey details overleaf) comprises:

- 9 x Two Bed units
- Vehicle accesses (2) on the Ellis Street frontage

2.2 Envisaged Development

The envisaged development outcome under the Planning Proposal is as follows:

Residential Apartments

1 x One-bed

18 x Two-bed

11 x Three-bed +

Total: 30 apartments

Commercial 425m^2

It is envisaged that a total of 39 parking spaces would be provided in basement levels with vehicle access located on the Ellis street frontage at the eastern site boundary.

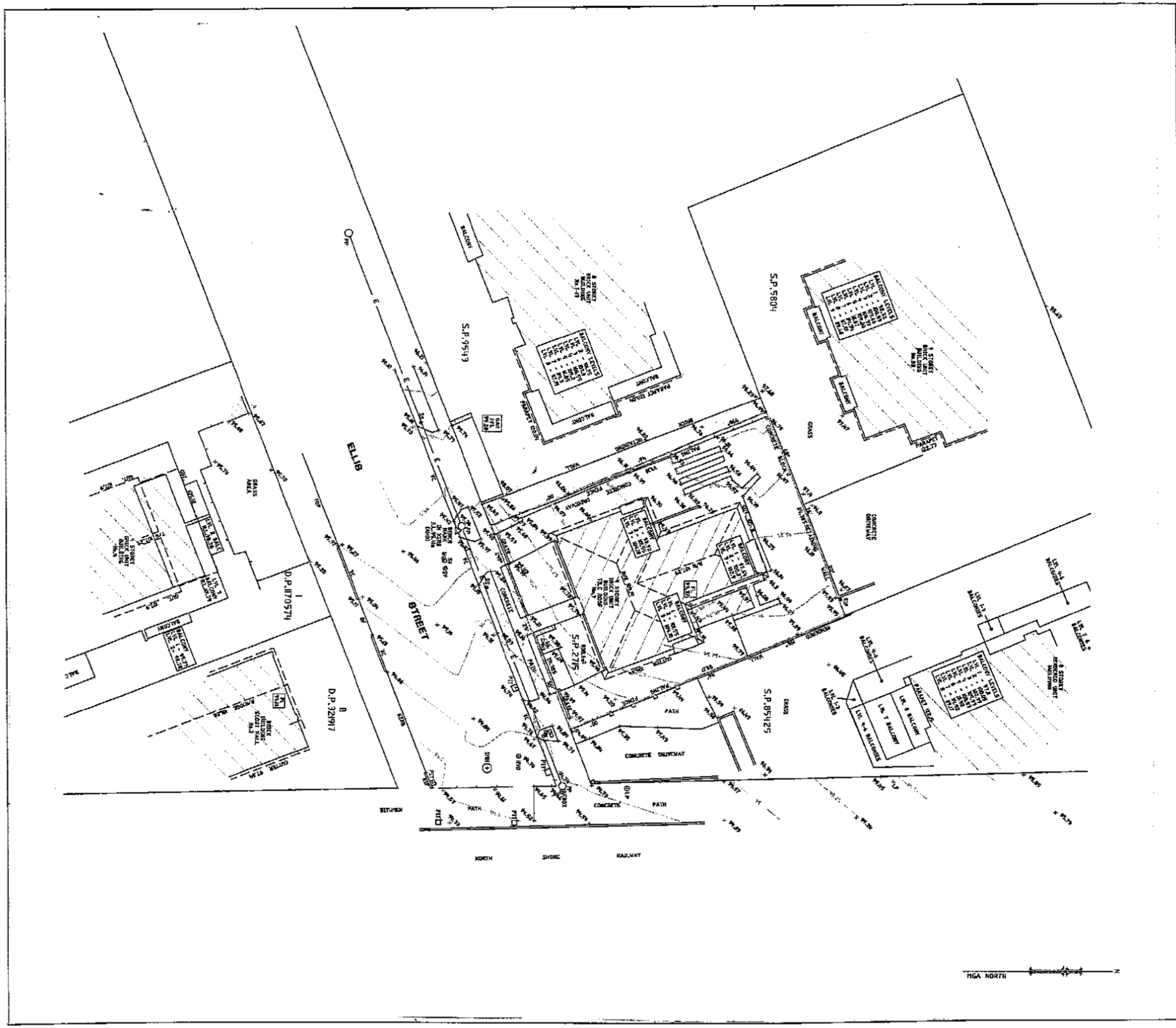
Details of the envisaged development scheme are shown on the concept plans which accompany the Planning Proposal and are reproduced in part in Appendix A.

LEGEND

N

SITE

FIG 2



LEGEND

BENCH MARK	
TELSTRA PIT	TEL
POWER POLE	PP
GRATED INLET PIT	PIT
KERB INLET PIT	KIP
HYDRANT	HYD
STREET SIGN	SS
LAMP POST	LP
SEWER MAN HOLE	SMH
GAS VALVE	GAS
PRAM CROSSING	PC
VEHICLE CROSSING	VC
ELECTRICITY (O'HEAD)	E
WATER METER	VM
SEWER INSPECTION PIT	SIP
STOP VALVE	SV
ELECTRICITY PIT	ELEC

TREES
102.97 SPOT LEVEL
3/.2/8
3 - 3m SPREAD
0.2 - 0.2m APPROX. TRUNK DIA.
8 - APPROX. HEIGHT

SCALE 1:200 @ A1 /1:400 @ A3
0 5 10 15 20 [m]

JRK SURVEYS PTY LTD COPYRIGHT STATEMENT

NOTES

1. NO INVESTIGATION OF UNDERGROUND SERVICES OR BUILDING FOOTINGS HAS BEEN UNDERTAKEN IN THE PREPARATION OF THIS SURVEY.
2. ORIGIN OF LEVELS BY G.N.S.S. SURVEY
3. ALL BUILDING AND FENCING INFORMATION IS APPROXIMATE ONLY.
4. TREE SIZES ARE ESTIMATES ONLY.
5. DATE OF SURVEY 15TH NOVEMBER 2017.

www.1100.com.au DIAL 1100 BEFORE YOU DIG

UNDERGROUND SERVICES SEARCH SHOULD BE UNDERTAKEN PRIOR TO ANY EXCAVATION TAKING PLACE UPON THE SITE

Liability Limited by a Scheme approved under the Professional Standards Legislation

TITLE:

SITE ANALYSIS SURVEY OVER S.P.2715 BEING No. 3 ELLIS STREET CHATSWOOD

Wollongong 4284 9822
Sydney 9548 1336
Fax 4284 6285
Email: info@surveying.com.au

Land Surveyors
www.surveying.com.au

CLIENT: MR WESLEY CHONG			
LEVEL DATUM: A.H.D.		NOTES: 0.25m CONTOURS	
SURVEY BY: B.S.		DRAWN BY: B.S./L.S.	
DRAWING No. 17-371P1	SCALE 1:200@A1 1:400@A3	SHEET 2 OF 2 SHEETS	DATE: 17TH NOVEMBER 2017

3.0 Road Network and Traffic Conditions

3.1 Road Network

The road network serving the development site (Figure 3) is dominated by:

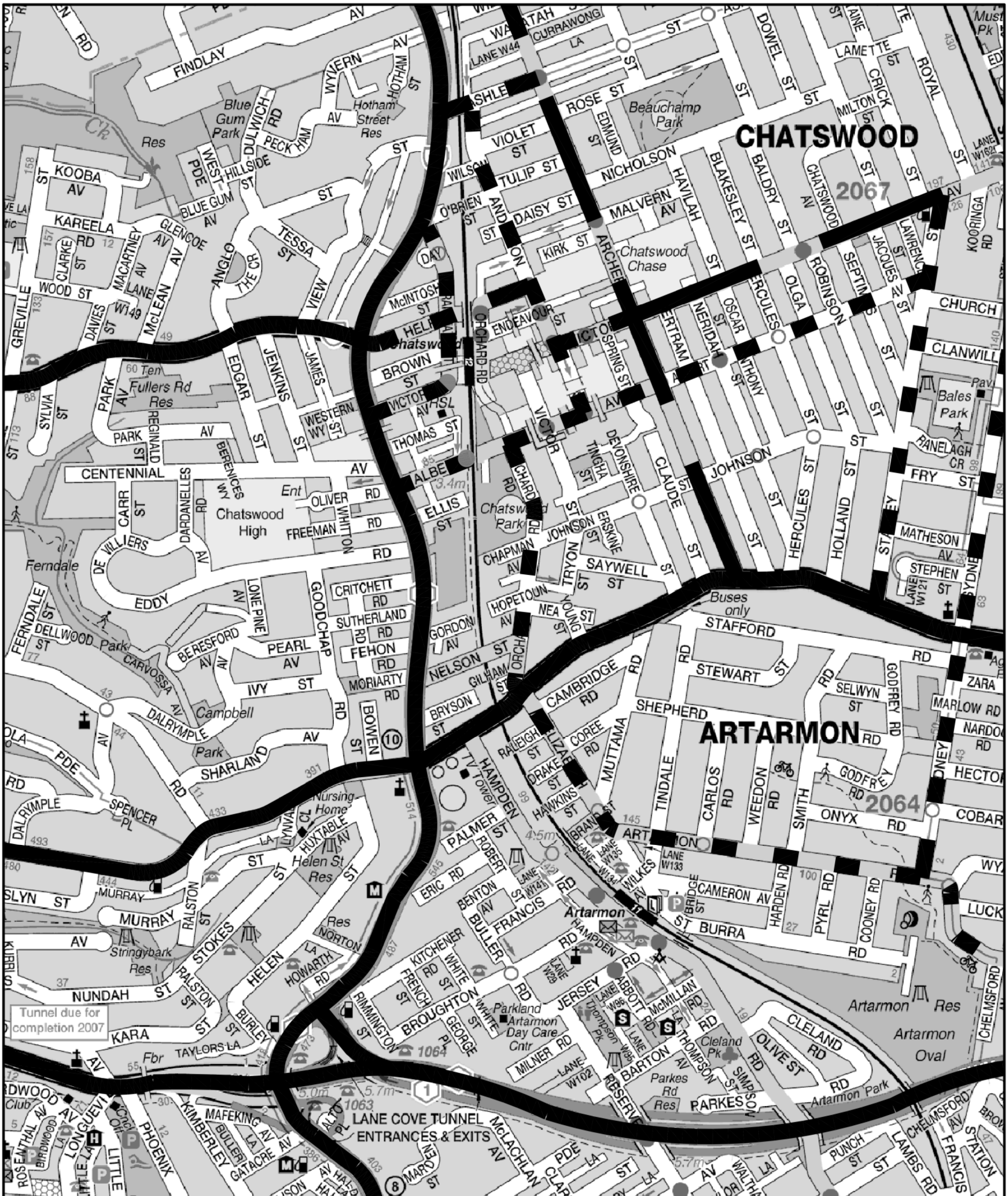
- *Pacific Highway* – a State Road and arterial route being the principal link between the City and Hornsby
- *Delhi Road, Mowbray Road and Boundary Street* – State Roads and sub-arterial routes connecting and/or crossing the Highway
- *Archer Street* – Regional Road and major collector road route connecting between Mowbray Road and Boundary Road
- *Help Street / Victoria Avenue* – a major collector road route through the town centre
- *Albert Avenue* – a collector road connecting to the Highway and running parallel to Victoria Avenue
- *Ellis Street* – a local dead end access road connecting to Pacific Highway
- *Crispe Lane* – a service lane connecting between Ellis Street and Albert Avenue

Ellis Street is some 12.8m wide with a relatively straight and level carriageway.

3.2 Traffic Controls

The traffic controls which have been applied to the road system in the vicinity of the site (Figure 4) comprise:

- the traffic signals at the Albert Avenue / Pacific Highway intersection.
- the traffic signals along the Pacific Highway at the Centennial Avenue, Victoria Avenue and Fullers Road / Help Street intersections



Legend

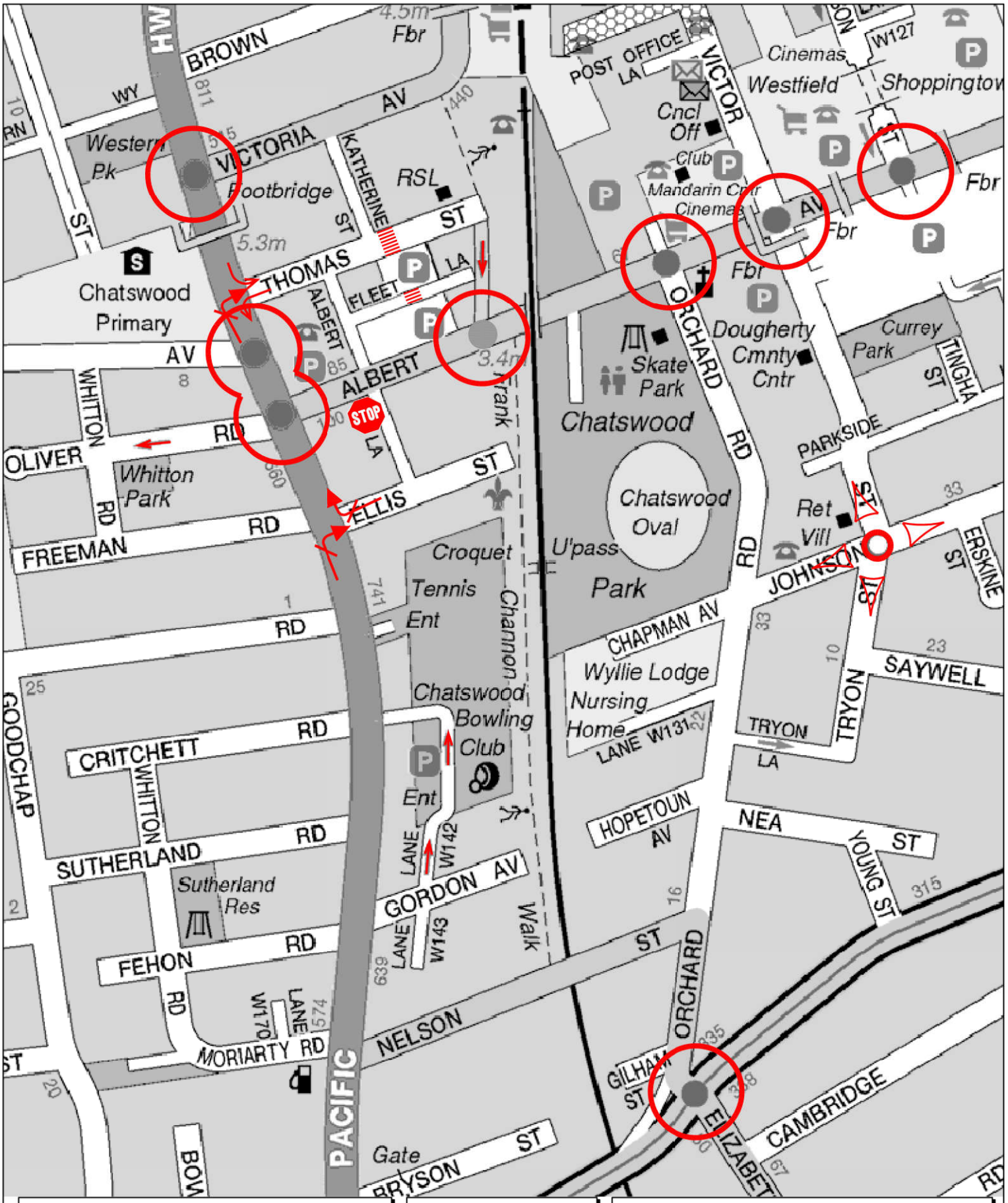
ARTERIAL

SUB-ARTERIAL

COLLECTOR

Road Network

Fig 3



LEGEND

- TRAFFIC SIGNAL CONTROL
- ROUNDABOUT
- RESTRICTED TURNING MOVEMENT

N

TRAFFIC CONTROLS

FIG 4

- the traffic controls at the Albert Avenue, Albert Lane and Crispe Lane intersection which comprise:
  - STOP sign in Crispe Lane and Albert Lane
  - NO RIGHT TURN into Crispe Lane 10.00am – 6.30pm Monday to Sunday
  - ALL TRAFFIC LEFT ONLY out of Albert Lane
- the NO RIGHT TURN restrictions into and out of Ellis Street at the Pacific Highway
- the ONE WAY westerly restriction on Oliver Road between the Pacific Highway and Whitton Road
- the 50 kmph speed restrictions except for the 40 kmph restriction in the CBD core area and 60 kmph on the Highway
- the NO STOPPING restrictions along the Pacific Highway and Albert Avenue (western part)
- the bicycle lane along Freeman Road terminating on the western side of the highway
- the NO STOPPING and NO PARKING restrictions in Crispe Lane

3.3 Traffic Conditions

An indication of the prevailing traffic conditions on the road system serving the site is provided by count data for the morning and afternoon peak periods is summarised in the following:

		AM	PM
Pacific Highway	Northbound	1,729	2,146
	Right-turn	151	121
	Left-turn	11	12
	Southbound	1,925	1,852
	Right-turn	35	50
	Left-turn	179	231

Albert Avenue	Westbound	33	63
	Right-turn	143	222
	Left-turn	38	118
Albert Avenue	Westbound	473	320
	Right-turn	84	79
	Left-turn	17	35
	Eastbound	317	477
	Left-turn	32	16
Albert Lane	Left-turn	80	69
Crispe Lane	Northbound	3	15
	Right-turn	11	17
	Left-turn	10	3

The operation of Pacific Highway intersection has been assessed using SIDRA and the results are summarised in the following.

	AM	**PM**
LOS	A-D	A-E
AVD	6.4s	6.6s

The operational performance of the Albert Avenue intersection during the morning and afternoon peak periods is relatively satisfactory although traffic flows in reality are at times disrupted by the congestion along the Highway (in peak traffic periods) and dictated by the critical Fullers Road and Mowbray Road intersections.

3.4 Proposed Traffic Changes

Ellis Street Shared Zone

Council has indicated that it is envisaged that Ellis Street could be converted to a Shared Zone and there are a number of options available to provide a "traffic calmed environment" for pedestrians in Ellis Street. These options include:

- Shared Zone
- Continuous Footway Treatment
- LATM measures

The envisaged development will not present any adverse implications to the implementation of any of these options which would be supported and form part of a VPA for the project. However, the Shared Zone and Continuous Footway options would need to comply with the criteria specified in the former RMS Technical Direction TTD 2016/001 and would require TfNSW approval. Any LATM measures could similarly require TfNSW concurrence due to the proximity to the highway.

Council's Bike Plan identifies the Foreman Road route being extended along Albert Avenue (Shared Path on the southern side), along Crispe Lane then along Ellis Street easterly to connect to the existing Shared Path along Frank Channon Walk which runs along the western side of the railway line.

4.0 Transport Services, Bicycles and Pedestrian

Chatswood CBD has excellent access for public transport services including:

Railway Services

The major North Shore and Western Lines as well as the Epping Line operates through Chatswood Railway Station which is located just to the north of the site. These lines provide 13 trains per hour in the morning and afternoon peak periods and there are currently some 32,000 passengers passing through the station each day.

Bus Services

There are services provided by 3 operators accessing Chatswood as well as 2 interstate operators with some 460 scheduled services operating each day out of the rail interchange and 220 per day operating out of Railway Street.

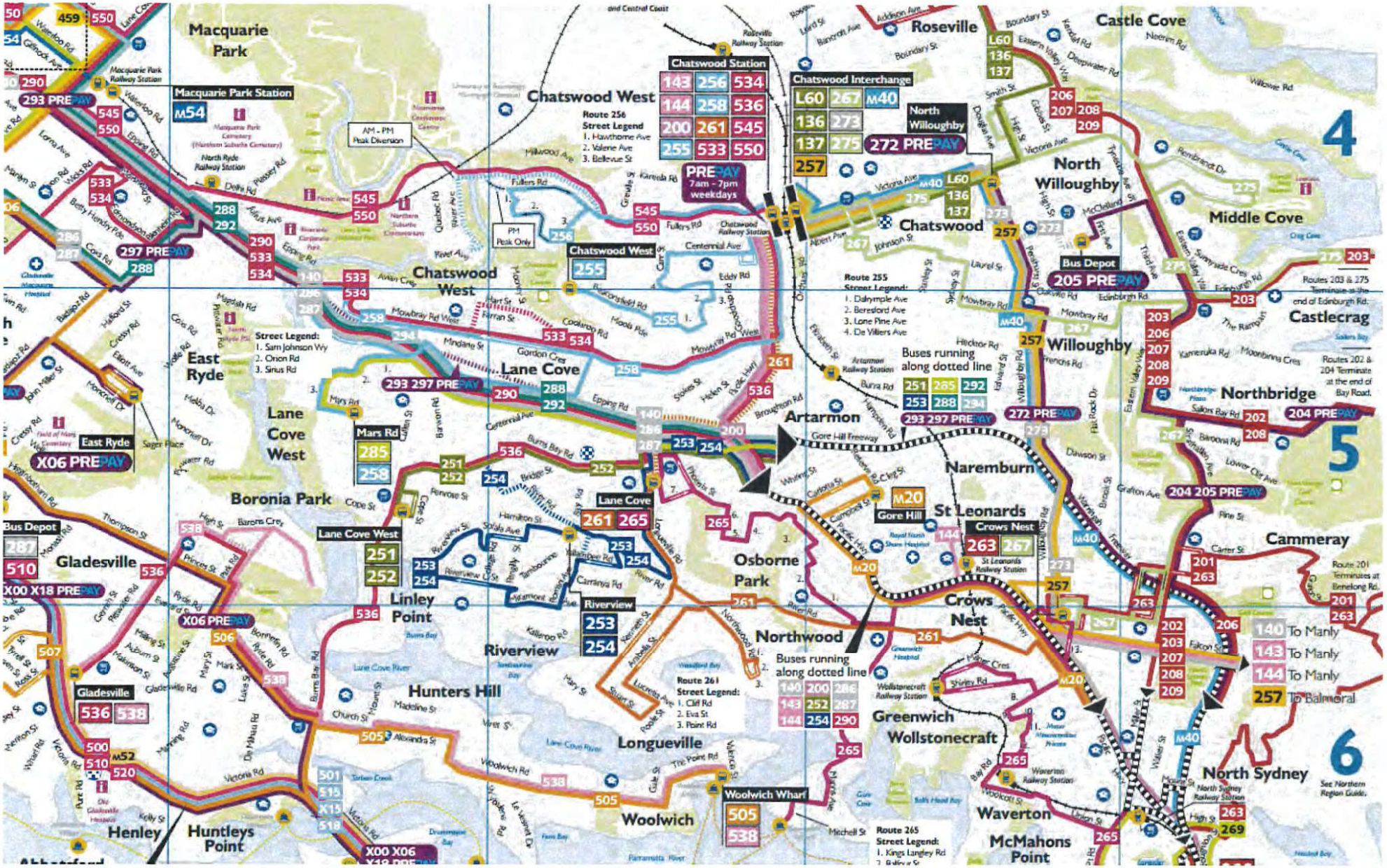
There are also excellent provisions for pedestrian access and circulation within the CBD (e.g. Victoria Mall) as well as provisions for bicycle access.

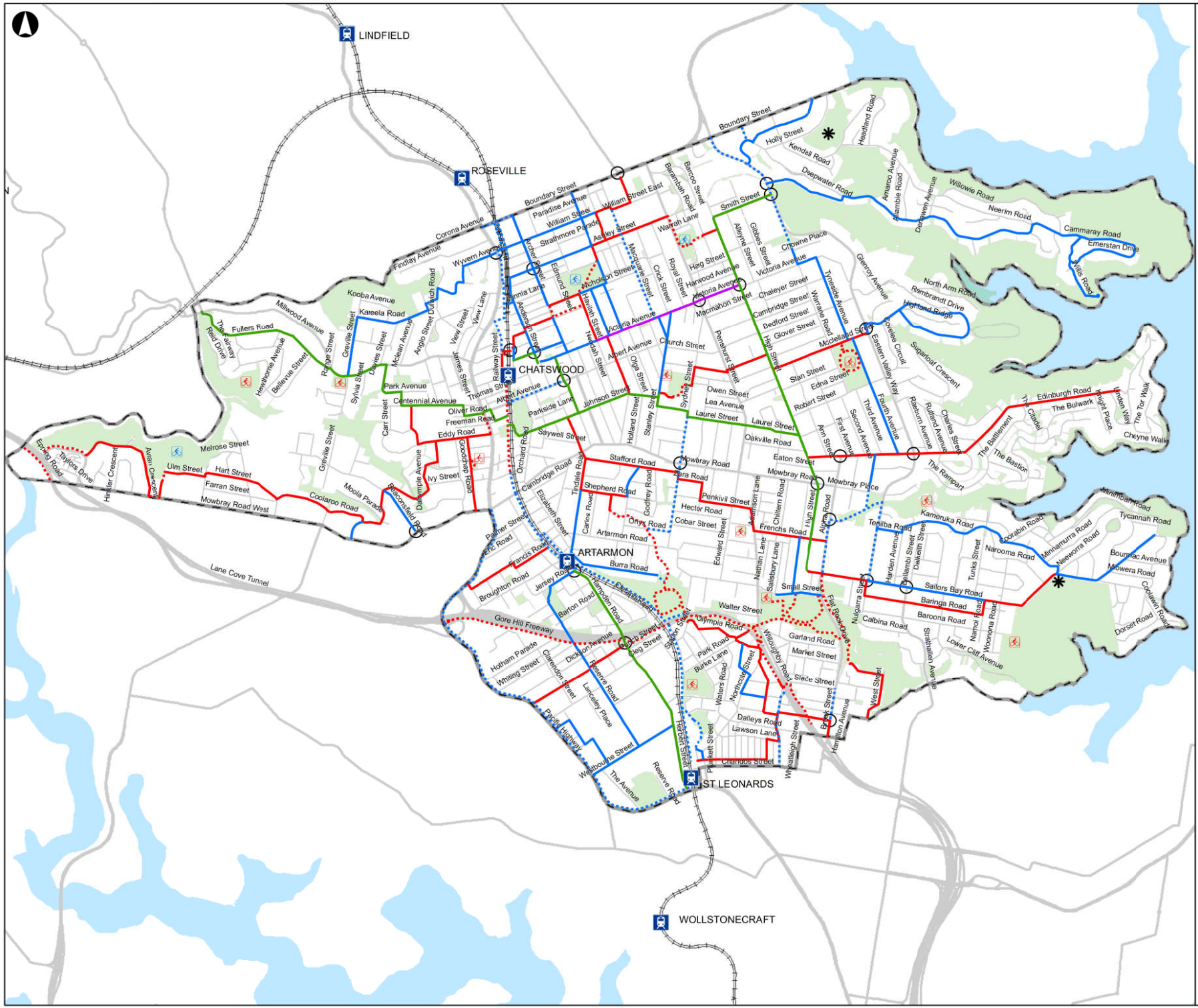
Bicycles and Pedestrian

Details of Council's existing and proposed Bike Network are provided on the plans reproduced overleaf which indicate:

- existing off-road bike and shared paths along Albert Avenue and along the corridor on the western side of the railway line

- a bicycle route "requiring upgrade" along Freeman Road (already exists), across the highway and along the southern side of Albert Avenue to Crispe Lane (2.5m wide footway exists), along Crispe Lane then along Ellis Street to the east connecting to the Shared Path along the railway line (not existing)


Macquarie Park
Macquarie Park Station
M54
Chatswood West
Chatswood Station
143 256 534
144 258 536
200 261 545
255 533 550
Route 256 Street Legend
1. Hawthorne Ave
2. Valerie Ave
3. Bellevue St
AM - PM Peak Diversion
PM Peak Only
PREPAY 7am - 7pm weekdays
Chatswood West
255
Route 255 Street Legend:
1. Dalrymple Ave
2. Beresford Ave
3. Lane Pine Ave
4. De Villiers Ave
Chatswood Interchange
L60 267 M40
136 273
137 275
257
North Willoughby
272 PREPAY
Chatswood
Roseville
Castle Cove
Middle Cove
Bus Depot
205 PREPAY
Willoughby
Northbridge
Castlecrag
Artarmon
Buses running along dotted line
251 285 292
253 288 294
293 297 PREPAY
272 PREPAY
Naremburn
Gore Hill
St Leonards
Crows Nest
263 267
Cammeray
Northwood
Buses running along dotted line
Greenwich
Wollstonecraft
North Sydney
Waverton
McMahons Point
Woolwich
Woolwich Wharf
505 538
Route 265 Street Legend:
1. Kings Langley Rd
Longueville
Hunters Hill
Riverview
Lane Cove
261 265
Riverview
253 254
Osborne Park
Lane Cove West
251 252
Linley Point
Boronia Park
Lane Cove West
Mars Rd
285 258
East Ryde
X06 PREPAY
Lane Cove
Gordon Cres
Street Legend:
1. Sam Johnson Wy
2. Orion Rd
3. Sirius Rd
293 297 PREPAY
290 288 292
Gladesville
536 538
X00 X18 PREPAY
X06 PREPAY
Bus Depot
510
Henley
Huntleys Point
X00 X06
Route 261 Street Legend:
1. Cliff Rd
2. Eva St
3. Point Rd
140 200 286
143 252 287
144 254 290
140 To Manly
143 To Manly
144 To Manly
257 To Balmoral
4
5
6
See Northern Region Guide.



Legend

- LGA Boundary

Existing Willoughby Network

- On-road route
- Off-road route (shared paths)

Willoughby Bike Plan Proposals

- On-road route
- Off-road route
- Separated cycleway
- Routes requiring upgrade
- New/Upgraded Crossing Facilities
- Existing childrens facility
- Proposed childrens facility
- Existing recreational facility/ pump track

Issue	Date	By	Chkd	Appd
P1	05-07-12	BL	KMC	DVD

Metres: 0, 312.5, 625, 1,250

GTAconsultants
www.gta.com.au

Client: **Willoughby City Council**

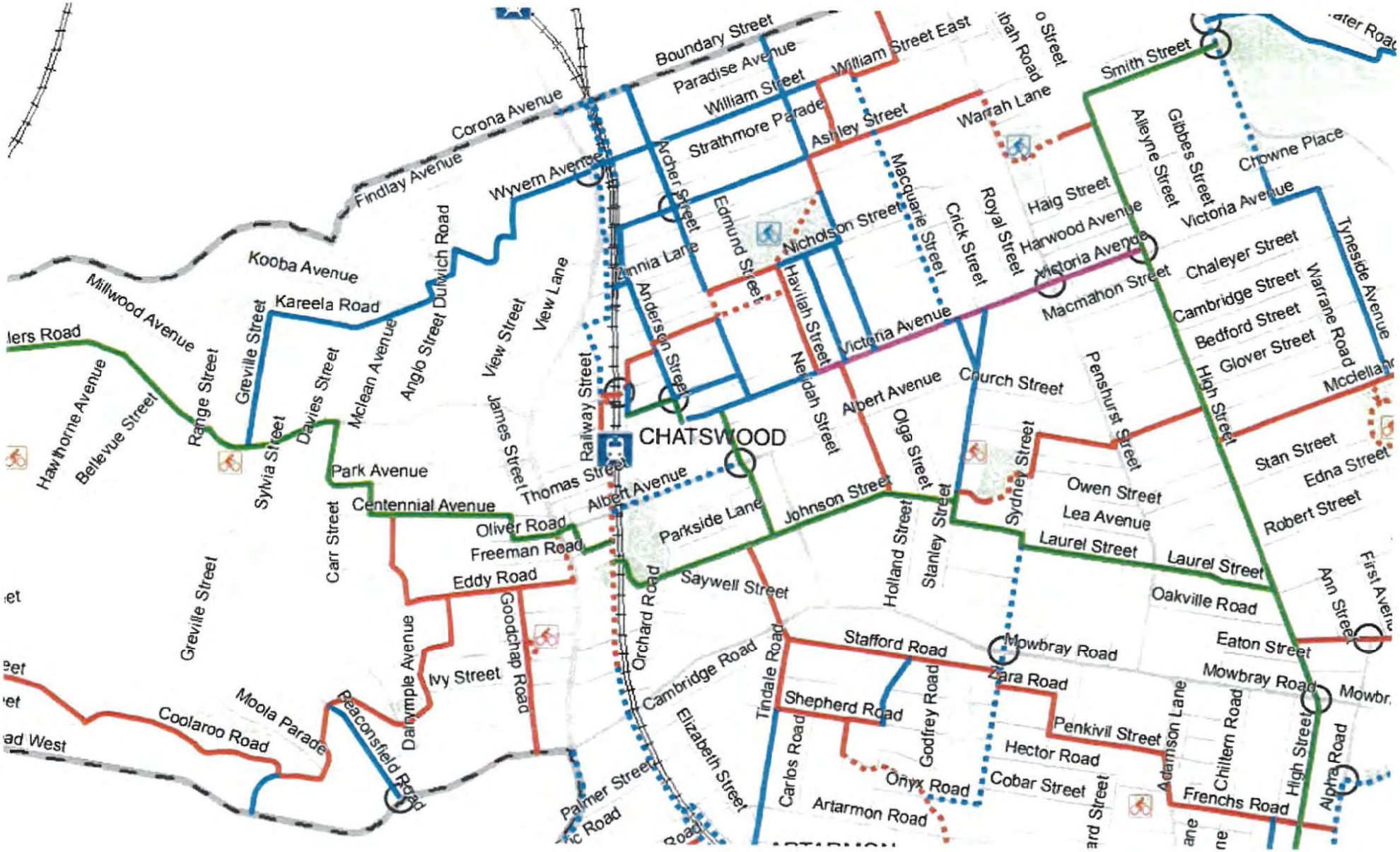
Job Title: **Willoughby Bike Plan**

Drawing Title: **Proposed Bike Network**

Scale at A3: **1:25,000**

Drawing Status: **Preliminary**

Job No	Drawing No	Issue
12S1120000	001	P2


Boundary Street
Paradise Avenue
William Street East
William Street
Corona Avenue
Findlay Avenue
Wyvern Avenue
Strathmore Parade
Ashley Street
Warrah Lane
Smith Street
Alleyne Street
Gibbes Street
Chowne Place
Victoria Avenue
Tyneside Avenue
Haig Street
Harwood Avenue
Macmahon Street
Chaleyer Street
Cambridge Street
Bedford Street
Glover Street
Warrane Road
Mcclellan
Kooba Avenue
Millwood Avenue
Kareela Road
Greville Street
Anglo Street
Dulwich Road
View Street
View Lane
Archer Street
Edmund Street
Nicholson Street
Macquarie Street
Crick Street
Royal Street
Zinnia Lane
Anderson Street
Havilah Street
Nerida Street
Victoria Avenue
Albert Avenue
Church Street
Penshurst Street
High Street
Stan Street
Edna Street
Robert Street
Hawthorne Avenue
Bellevue Street
Range Street
Sylvia Street
Davies Street
Mclean Avenue
James Street
Railway Street
CHATSWOOD
Thomas Street
Park Avenue
Centennial Avenue
Oliver Road
Freeman Road
Eddy Road
Carr Street
Parkside Lane
Johnson Street
Olga Street
Sydney Street
Owen Street
Lea Avenue
Laurel Street
Oakville Road
Ann Street
First Avenue
Eaton Street
Mowbray Road
Stafford Road
Zara Road
Penkivil Street
Hector Road
Cobar Street
Frenchs Road
Alpha Road
Adamson Lane
Chiltern Road
Holland Street
Stanley Street
Saywell Street
Orchard Road
Goodchap Road
Ivy Street
Dalrymple Avenue
Greville Street
Cambridge Road
Tindale Road
Shepherd Road
Godfrey Road
Carlos Road
Elizabeth Street
Onyx Road
Artarmon Road
Palmer Street
Moola Parade
Coolaroo Road
Beaconsfield Road

5.0 Parking

Willoughby City Council specifies parking provisions relevant to the proposed development scheme as follows:

Residential Apartments (Proposed/target rates under consideration)

One-bedroom	0.5 space
Two-bedroom	1.0 space
Three-bedroom	1.0 spaces
Visitors	1 space per 10 apartments

Commercial (DCP) 1 space per 200m^2

** If not whole number rounded down.*

Application of this criteria to the envisaged development scheme would indicate the following provision:

Residential Apartments	Required	Proposed
1 x One-bed	1 space	1 space
18 x Two-bed	18 spaces	18 spaces
11 x Three-bed+	11 spaces	12 spaces
Total:	**30 spaces**	**31 spaces**
Visitors (30)	3 spaces	3 spaces
Commercial 420m^2	2 spaces	3 spaces
Car Share		2 spaces
Total:	**35 spaces**	**39 spaces**

It is envisaged that a total of some 39 parking spaces including 6 accessible/adaptable spaces will be provided in compliance with the DCP criteria with charging points provided in some visitor spaces which can be shared by residents and visitors.

The DCP specifies bicycle and motorcycle parking provisions as follows:

Bicycle	**Lockers**	**Rail / Rack**
Residential	1 per 10 apartments	1 per 12 apartments
Commercial	1 per 600m^2	1 per 2,500m^2
Motorcycle	1 per 25 car spaces	

It is envisaged that bicycle and motorcycle parking will be provided in accordance with the DCP requirements along including charging points as follows:

Bicycles	7 spaces (3 resident spaces and 1 commercial tenant space in secure store on B1 and 3 resident visitor spaces on rack in B1.)
Motorcycles	4 spaces

End of Trip facilities are only required where there is a requirement for more than 3 lockers. The criteria specified in Cycling Aspects of Austroads Guidelines is derived for a publication for the Netherlands (see Appendix B details) and are therefore not really relevant to the Chatswood circumstance.

6.0 Traffic

The existing development on the site with 9 units is assessed to have a traffic generation during the morning and afternoon peak periods of some 2 vtph. The RMS Development Guideline (TDT 2013-04) specifies a peak traffic generation for high density residential apartments near a railway station of 0.19vtph in the morning peak and 0.15vtph in the afternoon peak.

Because the parking provision for commercial floorspace is "constrained" in the Railway Precinct the traffic generation will be lower than that indicated by the RMS Guidelines for office use. Extensive surveys undertaken by TTPA of existing parking for commercial uses in the Chatswood Railway Precinct indicate a generation rate of 0.32 vtph/space in the morning and 0.28 vtph/space in the afternoon. The generation of the envisaged development consequential to the Planning Proposal is as follows:

		AM	**PM**
Apartments	30	6	5
Commercial/Retail	3 spaces	1	1
Total:		**7**	**6**
Less Existing 9 apartments		2	2

Thus, it is apparent that the envisaged development outcome will only result in some 5 vtph additional in the morning peak and 4 vtph in the afternoon.

The vehicle access for the car park would be located on the Ellis Street frontage and there will be relatively flexible approach and departure routes (despite the various No Right Turn restrictions). These available routes will enable access to/from the north, south, east and west resulting in a relatively even distribution of the very minor additional generated traffic movements.

The flexibility will be such that the projected "additional" movements will spread as follows:

	AM		PM	
	IN	**OUT**	**IN**	**OUT**
TOTAL:	1	4	3	1

Vehicle movements of such a small magnitude will have no perceptible impact on the access road system and would not have any "measurable" impact on the operation of the intersections on the highway (which have an existing peak period throughput of some 4,500 to 5,000 vph). Accordingly, there will not be any adverse traffic outcome resultant to the envisaged development resultant to approval of the Planning Proposal.

7.0 Access, Internal Circulation and Servicing

Access

Vehicle access for the envisaged car park access would be located on the Ellis Street frontage located at the eastern site boundary with an appropriate separation from adjacent driveway and the existing western driveway will be removed and the roadway reinstated. The proposed access will comply with the requirements of AS2890.1 and there will be suitable sight distances available.

Internal Circulation

The envisaged internal circulation arrangements would adopt a flexible two-way system with the residents carparking on the lower basement levels. The layout of the basement areas will comply with the design requirements of AS2890.1 & 6 particularly in relation to ramps, aisles, bays and manoeuvring areas.

Servicing

Council requires that:

- refuse be removed by Council's MRV collection service
- all loading/unloading must occur on-site
- trucks must ingress and egress in a forward direction

Because of these requirements and the parameters of the site, the only feasible way in which Council's requirements can be accommodated is to provide a turn table to turn the trucks around. Truck turn tables are not a unique arrangement, they are used in numerous Meriton apartment buildings in the City of Sydney, in retail circumstance (e.g. Woolworths at Darlinghurst and Bunnings stores (e.g. approved by L&E Court for Rozelle). Small service vehicles (e.g. service personnel, couriers etc) will be able to park in the visitor spaces while any delivery vehicles will also use the loading bay. Details of the turning path assessment for the MRV are provided in Appendix C and it is proposed to provide a system of traffic signals to operate when the truck is ingressing and

egressing the loading bay with activation on entering the driveway and reactivation when exiting the bay with pre-set timers. These signals will be integrated with the signal system controlling vehicle movements on the ramps where ingressing cars will have priority with auto-revert and dwell green. An example of this system is provided in Appendix D for a 7 level basement car park in the Sydney CBD.

8.0 Issues

The Record of the Pre-Lodgement Meeting identifies the following issues:

- **Truck Turn Table**

  Additional justification is provided in Section 7 and all loading will be accommodated on site.

- **Reduced Car Parking Provision**

  Section 5 has been amended.

- **Provision of Car Share**

  Council's DCP does not specify a requirement for provision of a "car share" space on site. Share cars need to be accessible at all times and this presents problems for building security and access control. The suggested solution is to provide for a car share space to be allocated is Ellis Street on the site frontage.

- **Bicycle End of Trip Facilities**

  Residents have their own facilities and the circumstances for bicycles is addressed in Section 5.

9.0 Conclusion

The Planning Proposal seeks an amendment to WLEP2012 to permit an envisaged mixed use development with an FSR of 5:1.

Assessment of the envisaged development scheme, which comprises retail, commercial and residential apartment elements, has concluded that:

- there would be no adverse traffic implications
- parking can be provided to comply with Council's DCP criteria and AS2890 series design criteria

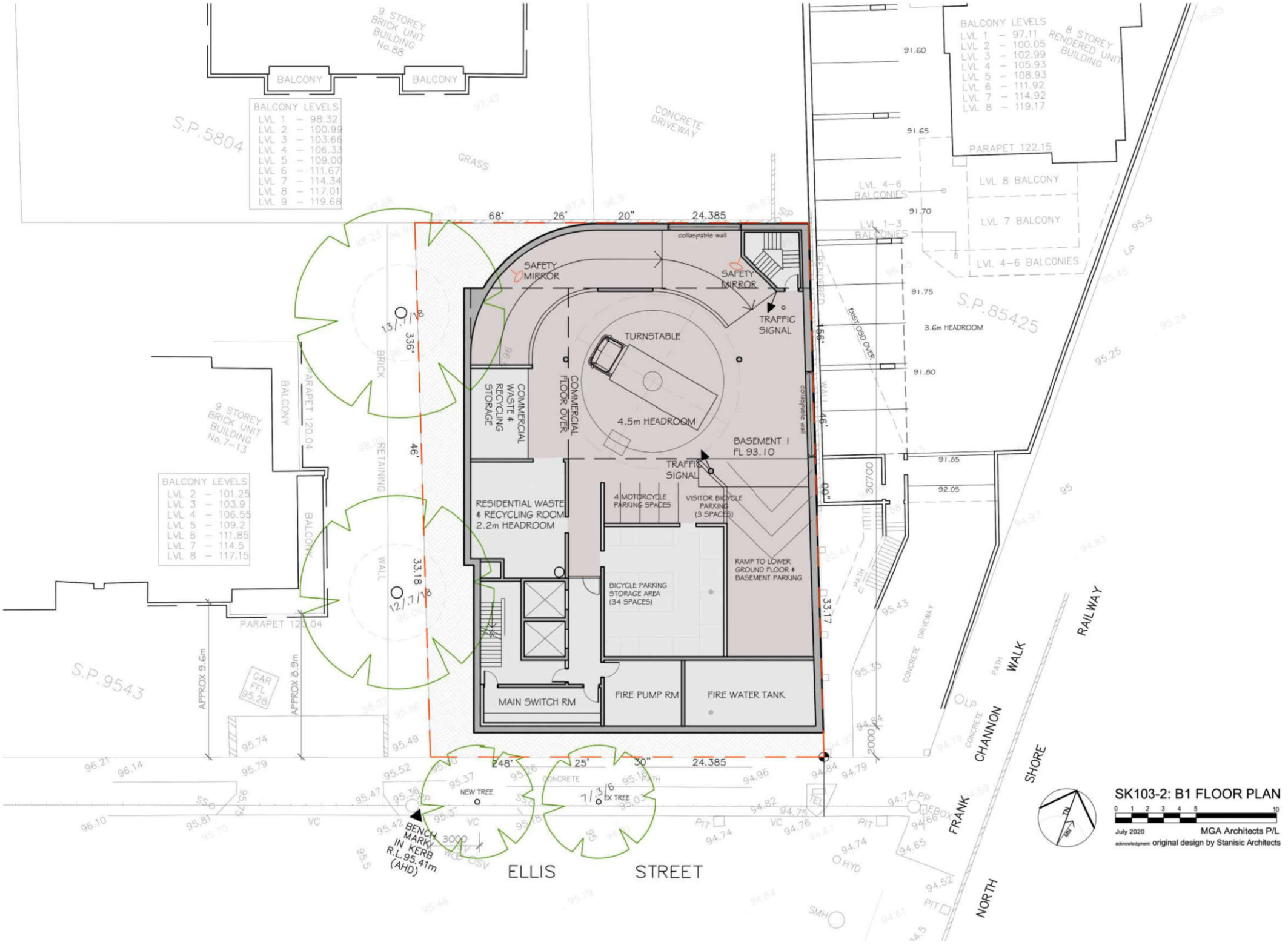
The proposed vehicle access, circulation and servicing arrangements would be suitable and appropriate.

Appendix A

Concept Plans


SITE AREA: 808.6m2
LANDSCAPED AREA 97.95
COMMUNAL OPEN SPACE 220m2 (27% OF LA)
TERRACE 98.10
COMMERCIAL SUITE GFA: 60m2
COMMERCIAL TENANCY GFA: 170m2
RL 98.70
LIFT LOBBY
PLANT ROOM
VOID
VOID
LANDSCAPE
PROPOSE LANDSCAPED PORTAL FRAME OVER EXISTING DRIVEWAY SUBJECT TO ADJOINING OWNERS' CONSENT
BALCONY LEVELS
LVL 1 – 98.32
LVL 2 – 100.99
LVL 3 – 103.66
LVL 4 – 106.33
LVL 5 – 109.00
LVL 6 – 111.67
LVL 7 – 114.34
LVL 8 – 117.01
LVL 9 – 119.68
BALCONY LEVELS
LVL 2 – 101.25
LVL 3 – 103.9
LVL 4 – 106.55
LVL 5 – 109.2
LVL 6 – 111.85
LVL 7 – 114.5
LVL 8 – 117.15
BALCONY LEVELS
LVL 1 – 97.11
LVL 2 – 100.05
LVL 3 – 102.99
LVL 4 – 105.93
LVL 5 – 108.93
LVL 6 – 111.92
LVL 7 – 114.92
LVL 8 – 119.77
LVL 8 BALCONY
LVL 7 BALCONY
LVL 4–6 BALCONIES
LVL 4–6 BALCONIES
BALCONIES
BALCONIES
BALCONY
BALCONY
S.P.5804
S.P.85425
S.P.9543
9 STOREY BRICK UNIT BUILDING No.7–13
CONCRETE DRIVEWAY
GRASS
GRASS
RETAINING
PARAPET 120.04
PARAPET 122.18
PARAPET 12
APPROX 8.1m
APPROX 9m
APPROX 9.6m
APPROX 8.9m
GAR FFL 95.28
min 9m
68°
26'
20"
24.385
24.385
PATH
PATH
NEW TREE
EX.TREE
BENCH MARK IN KERB R.L.95.41m (AHD)
ELLIS STREET
FRANK CHANNON WALK
NORTH SHORE RAILWAY
RAILWAY TRACK
SK105-2: L1 FLOOR PLAN
July 2020
MGA Architects P/L
acknowledgment: original design by Stanisic Architects


BALCONY LEVELS
LVL 1 – 98.32
LVL 2 – 100.99
LVL 3 – 103.66
LVL 4 – 106.33
LVL 5 – 109.00
LVL 6 – 111.67
LVL 7 – 114.34
LVL 8 – 117.01
LVL 9 – 119.68
S.P.5804
CONCRETE DRIVEWAY
GRASS
APPROX 8.1m
APPROX 9m
68°
26'
20"
96.00
SITE AREA: 808.6m2
LANDSCAPED AREA
4064
4060
LVL 8 – 119.77
PARAPET 122.18
LVL 8 BALCONY
LVL 7 BALCONY
LVL 4–6 BALCONIES
LVL 4–6
LVL 1–3 BALCONIES
S.P.85425
EXISTING TURFED LAWN & LANDSCAPED AREA
STORAGE
TERRACE OVER 98.10
TURNRABLE
RL 93.10
COLLAPSABLE WALL
COMMERCIAL SUITE GFA: 70m2
9 STOREY BRICK UNIT BUILDING No.7–13
BALCONY
PARAPET 120.04
approx 9m
RETAINING
46'
BALCONY LEVELS
LVL 2 – 101.25
LVL 3 – 103.9
LVL 4 – 106.55
LVL 5 – 109.2
LVL 6 – 111.85
LVL 7 – 114.5
LVL 8 – 117.15
SECURITY GATE
FCR
LIFT LOBBY
COMMERCIAL RETAIL TENANCY GFA: 125m2
COMMERCIAL FLOOR LEVELS GFL 95.40
1:8 RAMP DN
23100
PROPOSE LANDSCAPED PORTAL FRAME OVER EXISTING DRIVEWAY SUBJECT TO ADJOINING OWNERS CONSENT
APPROX 70m TO ALBERT AVENUE
APPROX 150m TO CHATSWOOD TRAIN STATION
RAILWAY
FRANK CHANNON WALK
NORTH SHORE
S.P.9543
APPROX 9.6m
APPROX 8.9m
GAR FFL 95.28
KIOSK SUBSTN
RES. ENTRY FOYER
COMMERCIAL ENTRY LOBBY
FHR
1:20 RAMP UP
TRAFFIC SIGNAL
94.70
95.00
6000
5000
x 95.50
24.385°
5500
6465
PAVED FOOTPATH
PAVED FOOTPATH
CAR SHARE ZONE
BENCH MARK IN KERB R.L. 95.41m (AHD)
APPROX 100m TO PACIFIC HIGHWAY
7700
7800
6000
ELLIS STREET
SSO
VC
TOP
OF
SK104-2: GL FLOOR PLAN
0 1 2 3 4 5 10
July 2020
MGA Architects P/L
acknowledgment: original design by Stanisic Architects



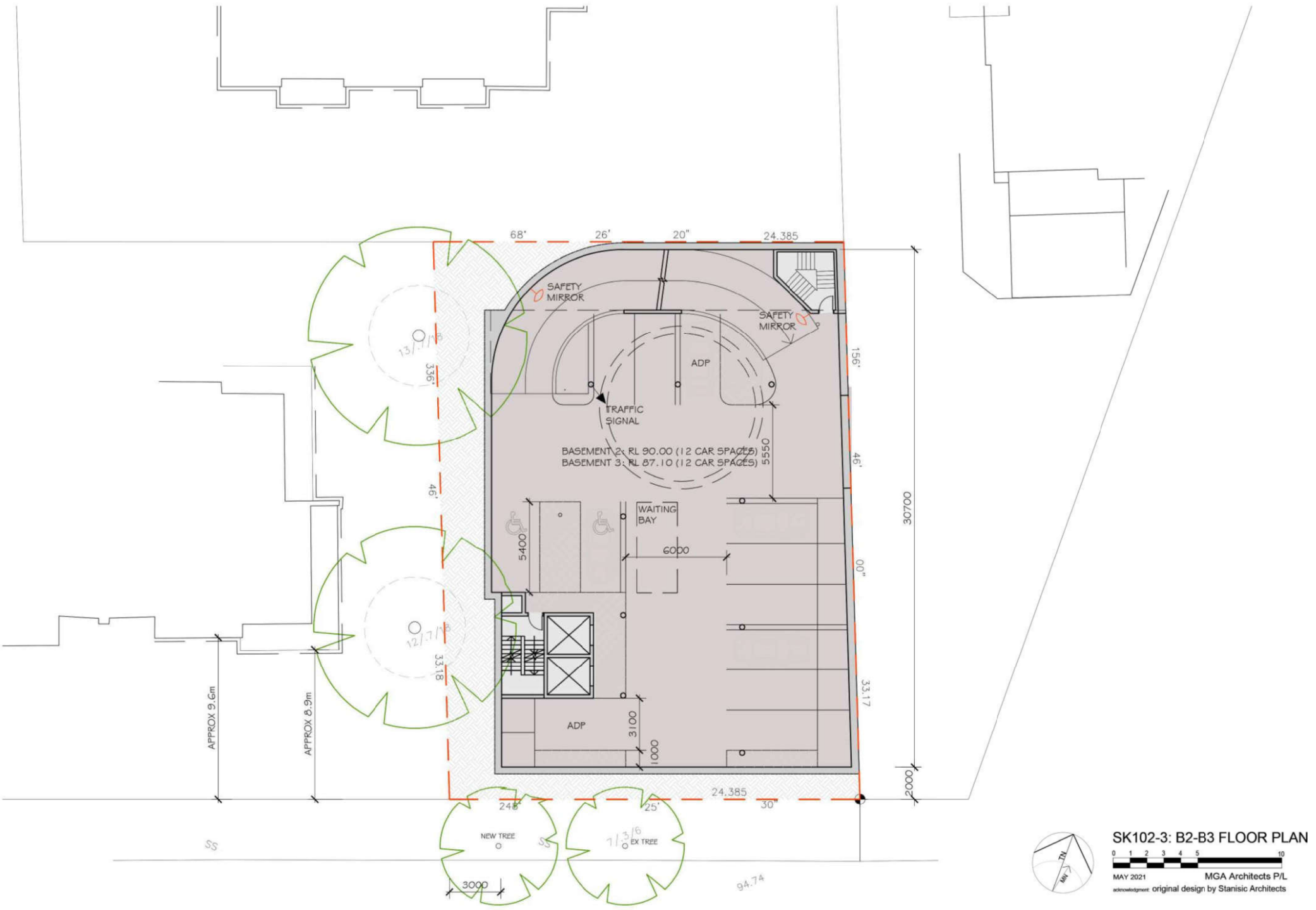
SK103-2: B1 FLOOR PLAN

0 1 2 3 4 5 10

July 2020

MGA Architects P/L

acknowledgment: original design by Stanisic Architects



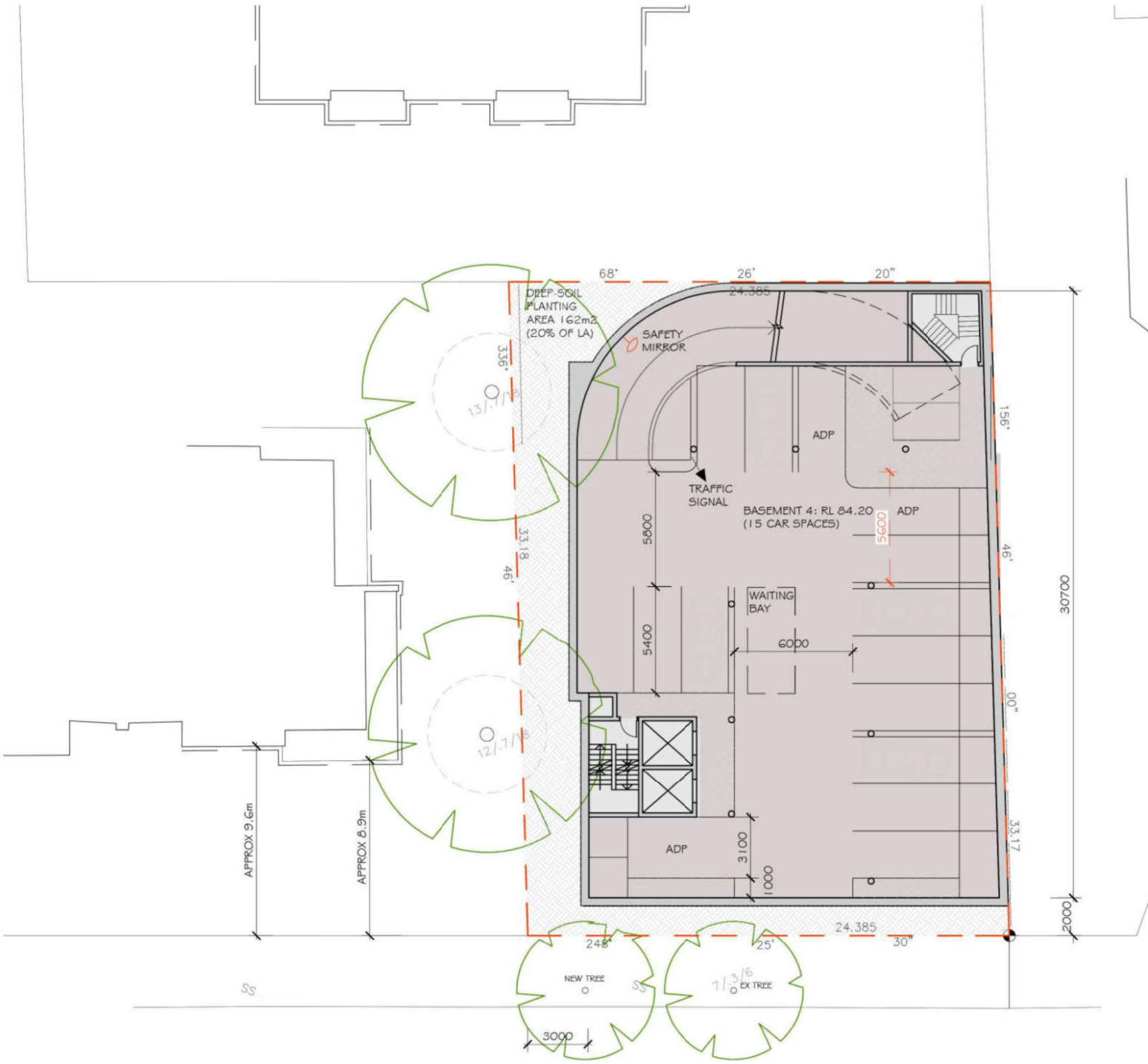
SK102-3: B2-B3 FLOOR PLAN

0 1 2 3 4 5 10

MAY 2021

MGA Architects P/L

acknowledgment original design by Stanisic Architects



CAR PARK SCHEDULE / TABLE:

PROPOSED / TARGETED CAR SPACES NUMBER:

COMMERCIAL: 1CS / 200m2 X 420 = 2.1CS (3 CS)

RESIDENTIAL:

1-BED APT: 0.5 CS / UNIT	X 1 =	0.5 CS
2-BED APT: 1 CS / UNIT	X 18 =	18 CS
3-BED APT: 1 CS / UNIT	X 10 =	10 CS
4-BED APT: 2 CS / UNIT	X 1 =	2 CS
VISITORS: 0.1 CS / UNIT	X 30 =	3 CS

TOTAL NO. of CAR SPACE REQUIRED: 34 CS

PROVIDED CAR SHARE SPACES: 2 CS

TOTAL NO. of CAR SPACE PROPOSED: 39 CS

ALLOCATION: COMMERCIAL: 3
RESIDENTIAL: 31
VISITORS: 3
CAR SHARE: 2

BASEMENT CAR PARK PROVISION:

Level:	no. of car space	incl no. of WCA space	incl no. of adaptable
B2	12	2	2
B3	12	2	2
B4	15	-	3
total	39	4	7

SK101-3: B4 FLOOR PLAN

0 1 2 3 4 5 10

MAY 2021

MGA Architects P/L

acknowledgment: original design by Stanisic Architects

Appendix B

Extracts from Cycling Documents

Cycling Aspects of Austroads Guides

Austroads

AGTM 11

C 2.3

Appendix I Bicycle Parking Provision Rates

Table I 1 gives an indication of the levels of bicycle parking needed to be provided for various land uses. These bicycle parking provision rates may be used to provide guidance if local standards or data are not available. It should be noted that the application of these types of provision rates needs to be undertaken with caution as local circumstances may often render them inappropriate.

Table I 1: Bicycle parking provision

Land use	Employee/resident parking spaces	Class	Visitor/shopper parking spaces	Class
Amusement parlour		1 or 2	2 plus 1 per 50 m² gfa	3
Apartment house	1 per 4 habitable rooms	1	1 per 16 habitable rooms	3
Art gallery	1 per 1500 m² gfa	2	2 plus 1 per 1500 m² gfa	3
Bank	1 per 200 m² gfa	2	2	3
Café	1 per 25 m² gfa	2	2	3
Community centre	1 per 1500 m² gfa	2	2 plus 1 per 1500 m² gfa	3
Consulting rooms	1 per 8 practitioners	2	1 per 4 practitioners	3
Drive-in shopping centre	1 per 300 m² sales floor	1	1 per 500 m² sales floor	3
Flat	1 per 3 flats	1	1 per 12 flats	3
General hospital	1 per 15 beds	1	1 per 30 beds	3
General industry	1 per 150 m² gfa	1 or 2	–	3
Health centre	1 per 400 m² gfa	1or 2	1 per 200 m² gfa	3
Hotel	1 per 25 m² bar floor area 1 per 100 m² lounge beer garden	1 1	1 per 25 m² bar floor area 1 per 100 m² lounge beer garden	3
Indoor recreation facility	1 per 4 employees	1 or 2	1 per 200 m² gfa	3
Library	1 per 500 m² gfa	1 or 2	4 plus 2 per 200 m² gfa	3
Light industry	1 per 1000 m² gfa	1 or 2	–	3
Major sports ground	1 per 1500 spectator places	1	1 per 250 spectator places	3
Market	–	2	1 per 10 stalls	3
Motel	1 per 40 rooms	1	–	3
Museum	1 per 1500 m² gfa	1	2 plus 1 per 1500 m² gfa	3
Nursing home	1 per 7 beds	1	1 per 60 beds	3
Office	1 per 200 m² gfa	1 or 2	1 per 750 m² over 1000 m²	3
Place of assembly	–	2	–	3
Public hall	–	1 or 2	–	3
Residential building	1 per 4 lodging rooms	2	1 per 16 lodging rooms	3
Restaurant	1 per 100 m² public area	1 or 2	2	3
Retail show room	1 per 750 m² sales floor	1	1 per 1000 m² sales floor	3
School	1 per 5 pupils over year 4	2	–	3
Service industry	1 per 800 m² gfa	1	–	3
Service premises	1 per 200 m² gfa	1	–	3
Shop	1 per 300 m² gfa	1	1 per 500 m² over 1000 m²	3
Swimming pool	–	1 or 2	2 per 20 m² of pool area	3

Guide to
Traffic Engineering Practice

Bicycles

PART

14

AUSTROADS

AUSTROADS

STANDARDS AUSTRALIA

LAND USE	EMPLOYEE/RESIDENT PARKING SPACES	CLASS	VISITOR/SHOPPER PARKING SPACES	CLASS
Amusement Parlour	-	1 or 2	2 plus 1 per 50m² gfa	3
Apartment house	1 per 4 habitable rooms	1	1 per 16 habitable rooms	3
Art Gallery	1 per 1500m² gfa	2	2 + 1 per 1500m² gfa	3
Bank	1 per 200m² gfa	2	2	3
Café	1 per 25m² public area	2	2	3
Community Centre	1 per 1500m² gfa	2	2+1 per 1500m² gfa	3
Consulting Rooms	1 per 8 practitioners	2	1 per 4 practitioners	3
Drive-in Shopping Centre	1 per 300m² sales floor	1	1 per 500m² sales floor	3
Flat	1 per 3 flats	1	1 per 12 flats	3
General Hospital	1 per 15 beds	1	1 per 30 beds	3
General Industry	1 per 150m² gfa	1 or 2	-	3
Health Centre	1 per 400m² gfa	1 or 2	1 per 200m² gfa	3
Hotel	1 per 25m² bar floor area & 1 per	1	per 25m² bar floor area & 1 per	3
	100m² lounge, beer garden	1	100m² lounge, beer garden	3
Indoor Recreation Facility	1 per 4 employees	1 or 2	1 per 200m² gfa	3
Library	1 per 500m² gfa	1 or 2	4 plus 2 per 200m² gfa	3
Light Industry	1 per 1000m² gfa	1 or 2	-	3
Major Sports Ground	1 per 1500 spectator places	1	1 per 250 spect. place	3
Market	-	2	1 per 10 stalls	3
Motel	1 per 40 rooms	1	-	3
Museum	1 per 1500m² gfa	1	2 & 1 per 1500m² gfa	3
Nursing Home	1 per 7 beds	1	1 per 60 beds	3
Office	1 per 200m² gfa	1 or 2	1 per 750m² over 1000m2	3
Place of Assembly	-	2	-	3
Public Hall	-	1 or 2	-	3
Residential Building	1 per 4 lodging rooms	1	1 per 16 lodging rooms	3
Restaurant	1 per 100m² public area	1 or 2	2	3
Retail Show Room	1 per 750m² sales floor	1	1 per 1000m2 sales floor	3
School	1 per 5 pupils over year 4	2	-	3
Service Industry	1 per 800m² gfa	1	-	3
Service Premises	1 per 200m² gfa	1	-	3
Shop	1 per 300m² gfa	1	1 per 500m² over 1000m²	3
Swimming Pool	-	1 or 2	2 per 20m² of pool area	3
Take-Away	1 per 100m² gfa	1	1 per 50m² gfa	3
University/Inst. of Tech.	1 per 100f/t students	1 or 2	-	3
	2 per 100f/t students	2	-	3

Notes:

1. '-' indicates that no parking demand information is available, and therefore planners should make their own assessment of the required bicycle parking provisions, on an individual project basis.
2. gfa – Gross floor area.
3. It is sometimes appropriate to make available 50% of the level of provision recommended in the table at the initial installation stage, however space should be set aside to allow 100% provision in the event that the full demand for bicycle parking is realised.

Source: Based on SBC 1987b

Table 10-1: Bicycle Parking - Provision for Planning Purposes

Spiegel, 1991, *German traffic – Learn and be startled,* in *Der Spiegel* 25/1991. Translated in Pedal Update 88 (newsletter of the Bicycle Institute of South Australia).

Squarcialupi Vera, 1987, *Cycling in Italy,* Member of the European Parliament, Milano, Italy, Proceedings of VeloCity 87.

Stockholm, 1991, *Stockholms Cykelkarta, 1:20,000 scale,* Södra Delen, Esselte Kartor AB, ISBN 91-7058-409-5.

Trevelyan Peter, 1976, *Bicycle planning in Sweden,* Alastair Dick and Associates, Traffic Engineering and Control, February.

Tschopp J, 1987, *Bike and ride, and the Introduction of the Green Reduction Card. Basel. A Success Story in Stimulating use of Public Transport and the Bicycle,* Verkehrsclub der Schweiz, Basel, Switzerland, Proceedings of VeloCity 87.

Weilenmann Theo, 1989, *More space for bicycles – less space for cars: Swiss examples,* Verkerhs-Club der Schwiez, Zurich, Proceedings of Velocity 89.

Wellemand AG and Dijkstra A, 1987, *Cyclists and road safety in the Netherlands,* Institute for Road Safety Research SWOV, Leidschendam, The Netherlands, Proceedings of VeloCity 87.

Wilmink A, 1987a, *The effects of state-subsidising of bicycle facilities,* Ministry of Transport and Public Work, The Hague, The Netherlands, Proceedings of VeloCity 87.

Wilmink A, 1987b, *The effects of an urban bicycle network – Results of the DELFT PROJECT,* Ministry of Transport and Public Works, The Hague, The Netherlands, Proceedings of VeloCity 87.

Winterthur, 1988, *Zweirad Verkehrs Anlagen Innerorts,* Winterthur-Versicherungen, Abt. IK, Schweiz, Postfach, 8401 Winterthur (date of publication unknown).

Cycling in the Netherlands

Cycling is a common mode of transport in the Netherlands, with 36% of the people listing the bicycle as their most frequent mode of transport on a typical day[1][nb 1] as opposed to the car by 45% and public transport by 11%. Cycling has a modal share of 27% of all trips (urban and rural) nationwide.[4] In cities this is even higher, such as Amsterdam which has 38%,[5] though smaller Dutch cities well exceed that: for instance Zwolle (pop. ≈123,000) has 46%[6] and the university town of Groningen (pop. ≈198,000) has 31%.[7][8] This high frequency of bicycle travel is enabled by excellent cycling infrastructure such as cycle paths, cycle tracks, protected intersections, ample bicycle parking and by making cycling routes shorter, quicker and more direct than car routes.

Everyday cycling in the Netherlands (Amsterdam).

In the countryside, a growing number of inter-city bicycle paths connect the Netherlands' villages, towns and cities: some of these paths are part of the Dutch National Cycle Network, a network of routes for bicycle tourism which reaches all corners of the nation.[9]

Contents

History


Amsterdam, 1982

Cycling became popular in the Netherlands a little later than it did in the United States and Britain who experienced their bike booms in the 1880s, but by the 1890s the Dutch were already building dedicated paths for cyclists.[10] By 1911, the Dutch owned more bicycles per capita than any other country in Europe.[10] After World War II, however, much like it had in other developed nations, the privately owned motor car became more affordable and therefore more commonly in use and bicycles as a result less popular. Even so, the number of Dutch people cycling was very high compared to other European nations.[10]

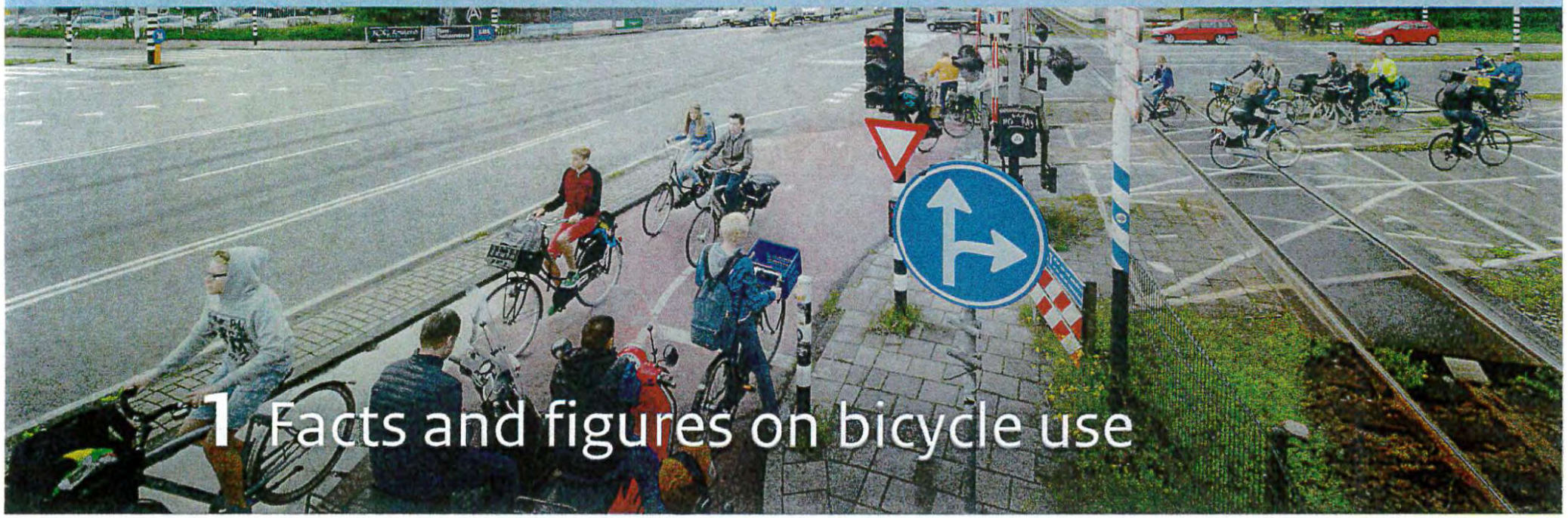
The trend away from the bicycle and towards motorised transport only began to decrease in the 1970s when Dutch people took to the streets to protest against the high number of child deaths on the roads: in some cases over 500 children were killed in car accidents in the Netherlands in a single year.[11] This protest movement was known as the *Stop de Kindermoord* (literally "Stop the Child Murder" in Dutch).[11] [12] The success of this movement — along with other factors, such as the oil shortages of 1973–74[13] and the publication of the CROW Design Manual for Bicycle Traffic — turned Dutch government policy around and the country began to restrict motor vehicles in its towns and cities and direct its focus on growth towards other forms of transport, with the bicycle perceived as critical in making Dutch streets safer and towns and cities more people-friendly and livable.

Overview


A typical Dutch bike path, Rotterdam.

Besides the history and social movements, there is no single reason as to why cycling remains so popular in the Netherlands: many bicycle friendly factors reinforce each other:

- *Bike-friendly infrastructure*
  - There is a continuous network of cycle paths, clearly signposted, well maintained and well lit, with road/cycle path junctions that often give priority to cyclists. This makes cycling itself convenient, pleasant, and safe.
  - There is also a good network of bicycle shops throughout the country.
- *Bike-friendly public policy, planning and laws*

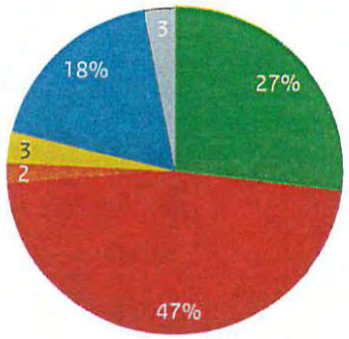


1 Facts and figures on bicycle use

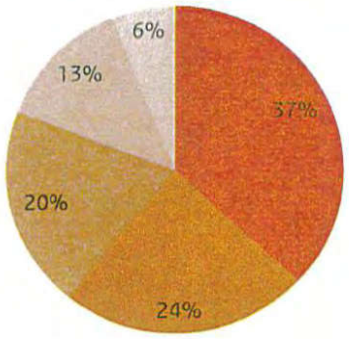
Bicycles account for 25% of daily mobility[1]

- More than one-quarter of all trips made by Dutch residents are travelled by bicycle.
- 2016 saw a total of 4.5 billion bicycle trips, spanning a distance of 15.5 billion bicycle kilometres.
- More than one-third of all bicycle kilometres are travelled for leisure purposes; one-quarter involve work-related trips.

Distribution of trips by mode of travel, 2016



Distribution of bicycle kilometres by purpose, 2016



1 Statistics Netherlands (CBS) (Netherlands Travel Survey (OViN) 2016 – data adapted by KiM).

In the Netherlands, bicycles outnumber residents[2]

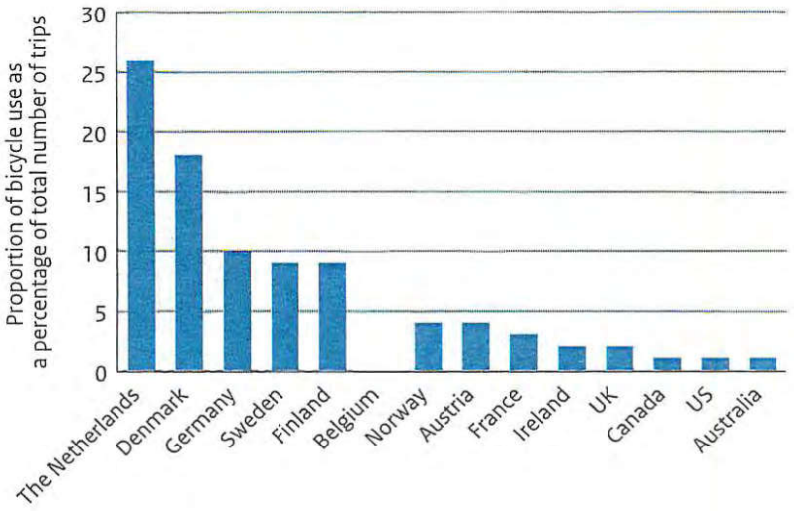
- The Netherlands accommodates 17 million inhabitants and 23 million bicycles.
- Increasingly more Dutch residents own an e-bike; of the 23 million bicycles, 2 million are e-bikes.

Half of all passenger car trips are shorter than 7.5 km[3]

- Half of all passenger car trips are shorter than 7.5 kilometres (=3.6 billion car trips), one-third are shorter than 5 kilometres (=2.5 billion car trips).
- Of all trips involving a distance up to 7.5 kilometres, one-third are made by car and one-third are made by bicycle.
- Of all trips involving a distance ranging from 7.5 to 15 kilometres, 70 per cent are made by car and 15 per cent are made by bicycle.

The Netherlands is the unrivalled number one bicycling nation[4]

Figure: *Proportion of bicycle use as a percentage of total number of trips in several countries.*



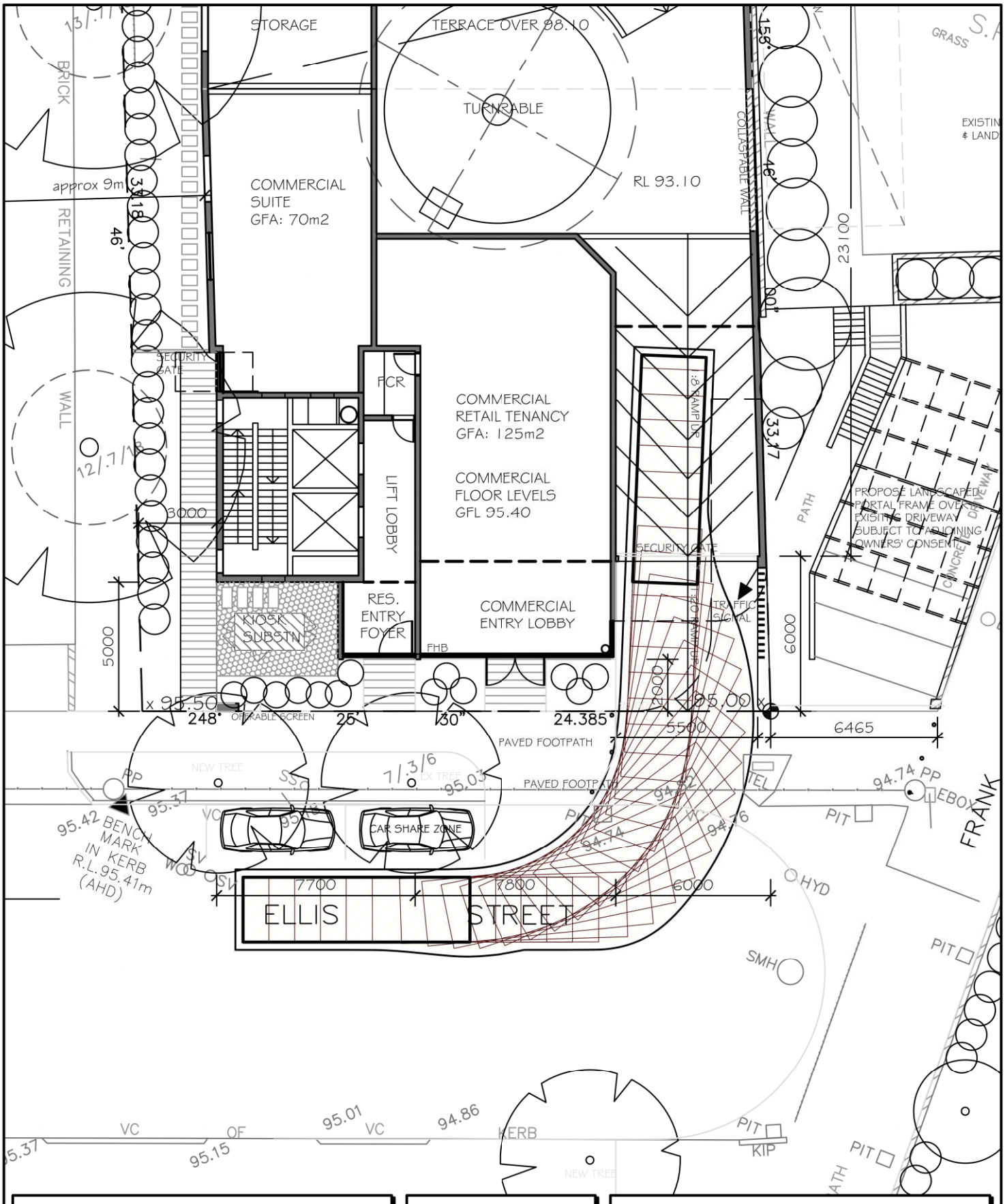
2 Bovag (2018). *Fietsverkopen na jaren weer in de lift* [After many years, bicycle sales on the rise again].

3 Statistics Netherlands (CBS) (Netherlands Travel Survey (OViN) 2016 – data adapted by KiM).

4 Buehler and Pucher, 2012.

Appendix C

Turning Path Assessment

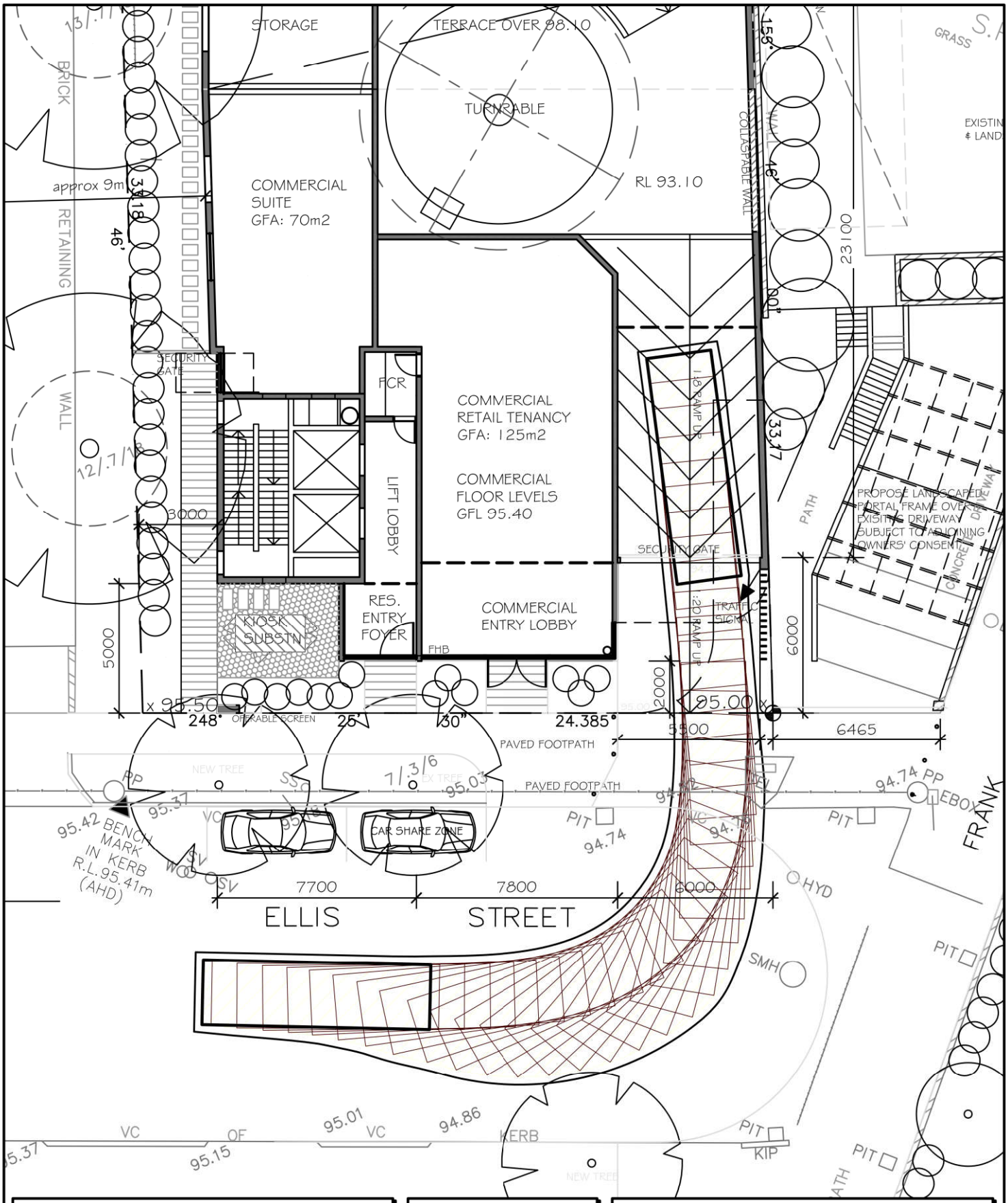


LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

SWEPT PATH ANALYSIS OF AN 8.8m RIGID VEHICLE ENTERING THE SITE (GROUND LEVEL)

SP 1

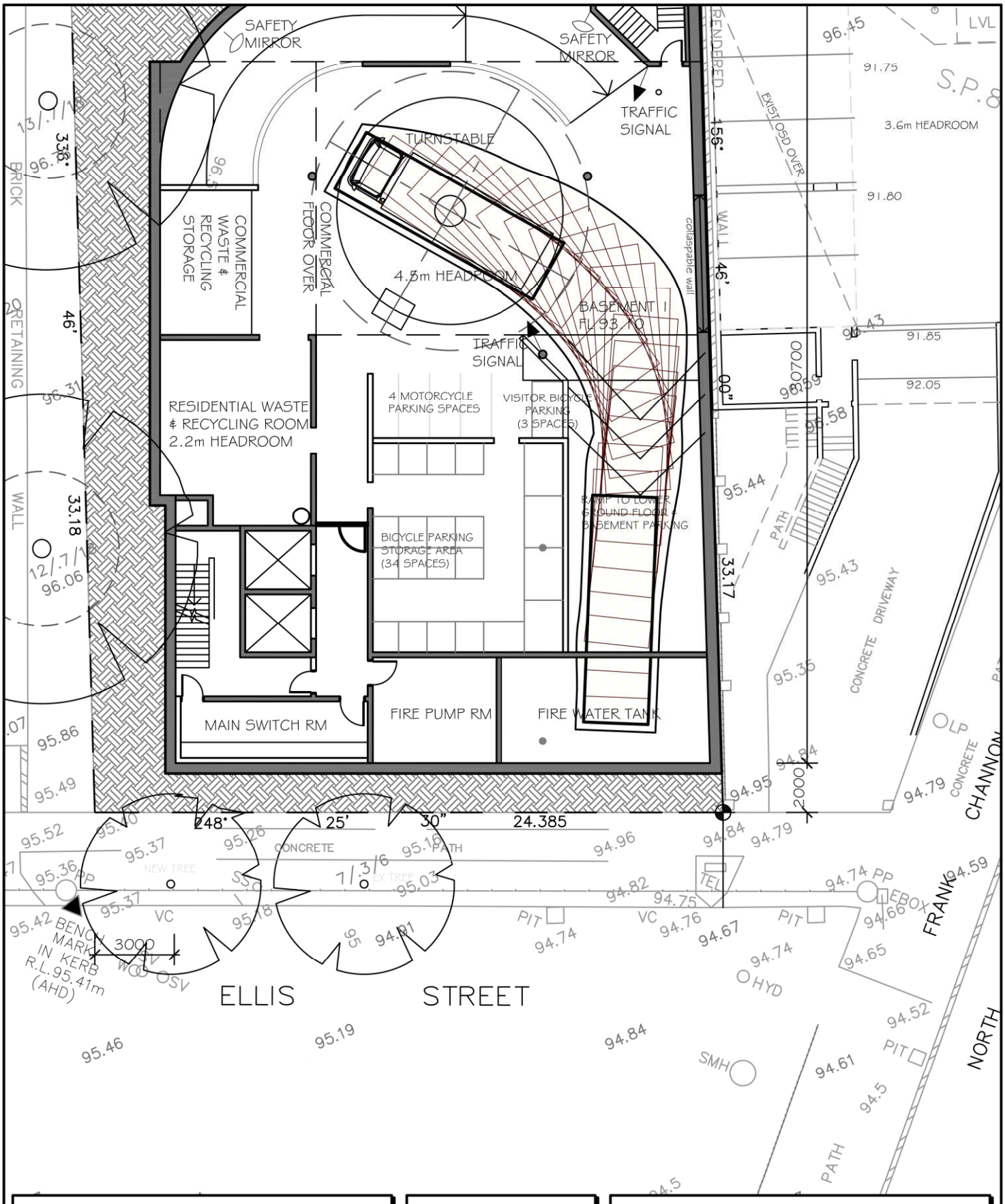


LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

SWEPT PATH ANALYSIS OF AN 8.8m RIGID VEHICLE EXITING THE SITE (GROUND LEVEL)

SP 2



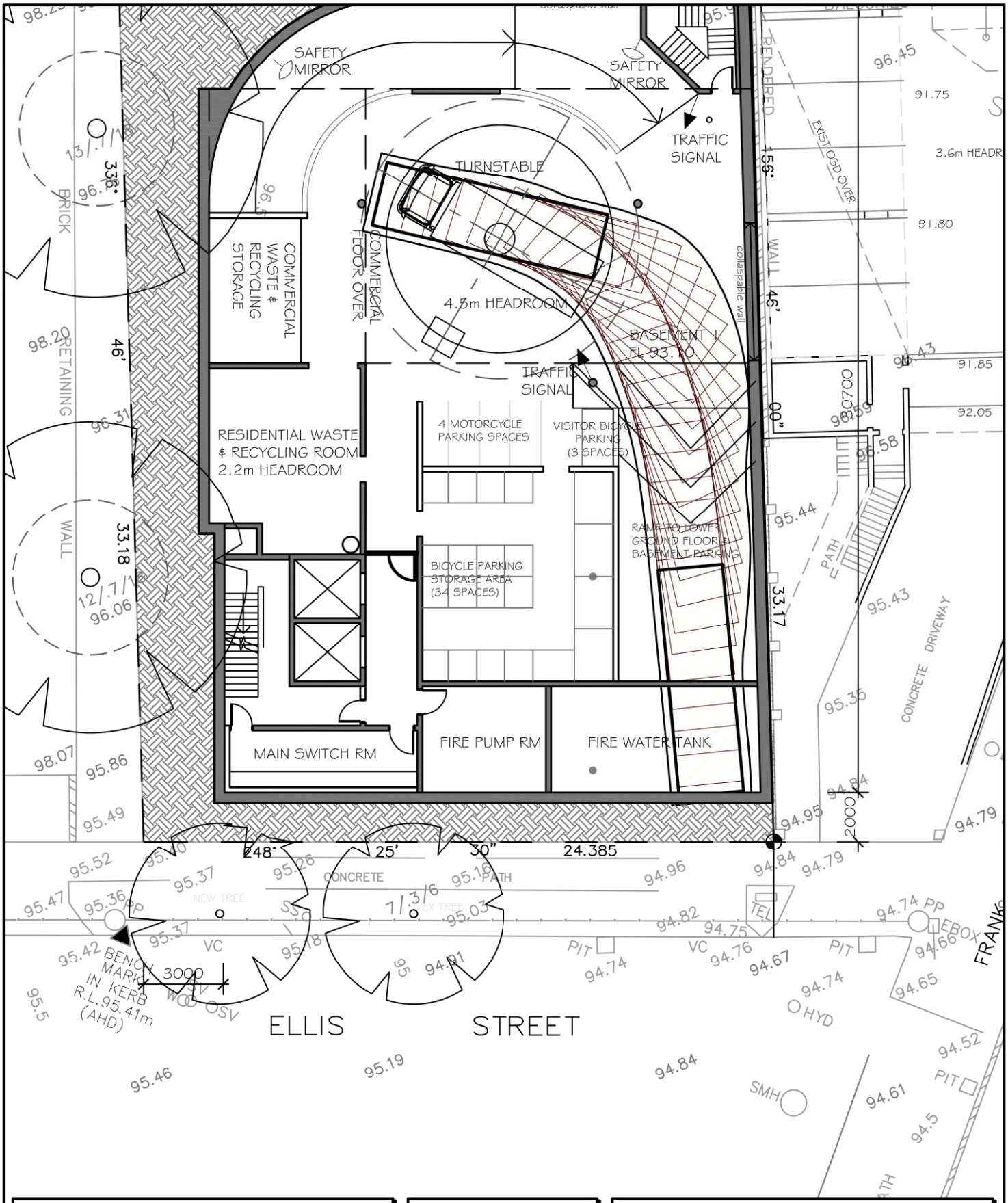
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF AN 8.8m RIGID VEHICLE ENTERING THE SITE (BASEMENT LEVEL)

SP 3



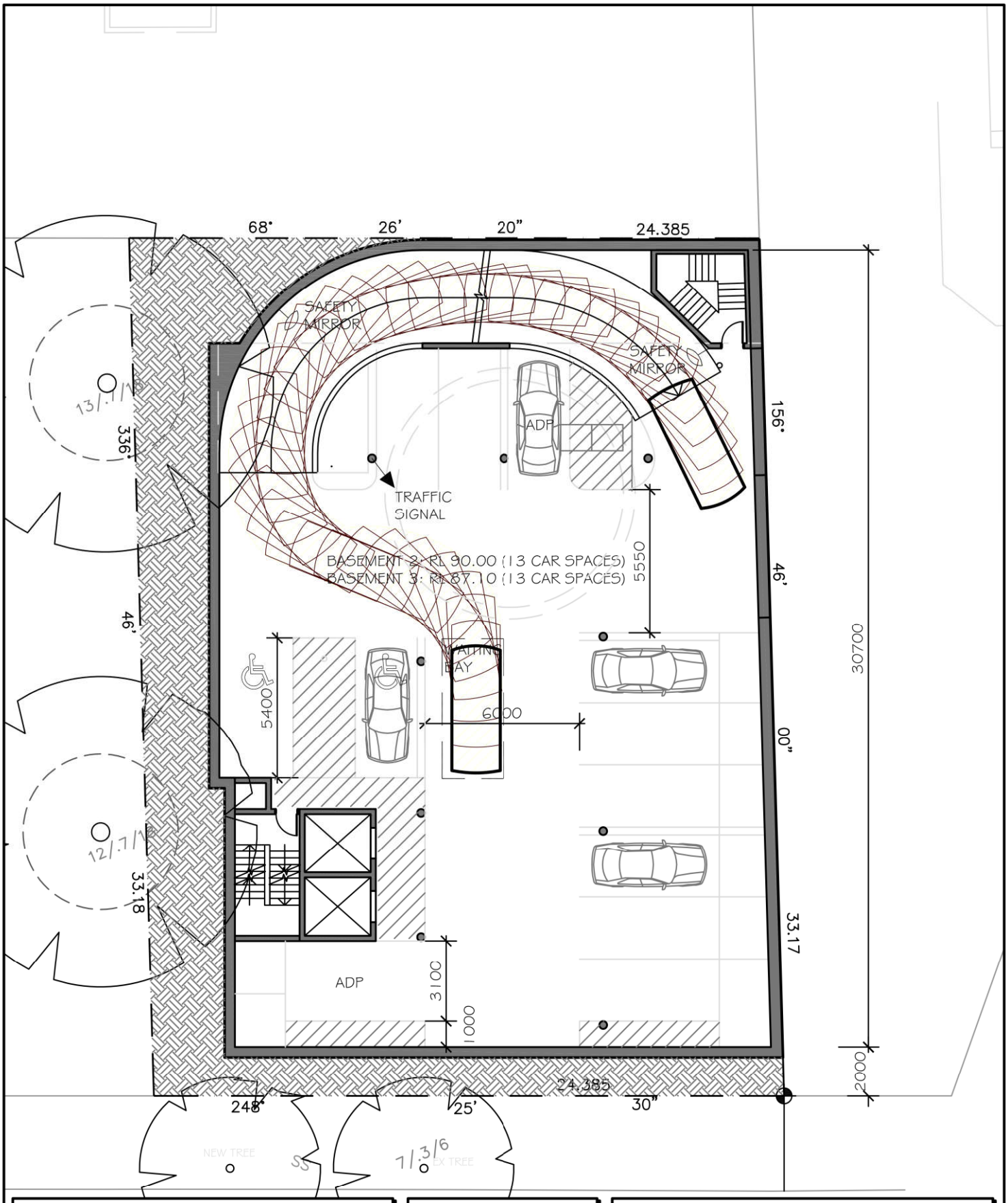
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF AN 8.8m RIGID VEHICLE EXITING THE SITE (BASEMENT LEVEL)

SP 4



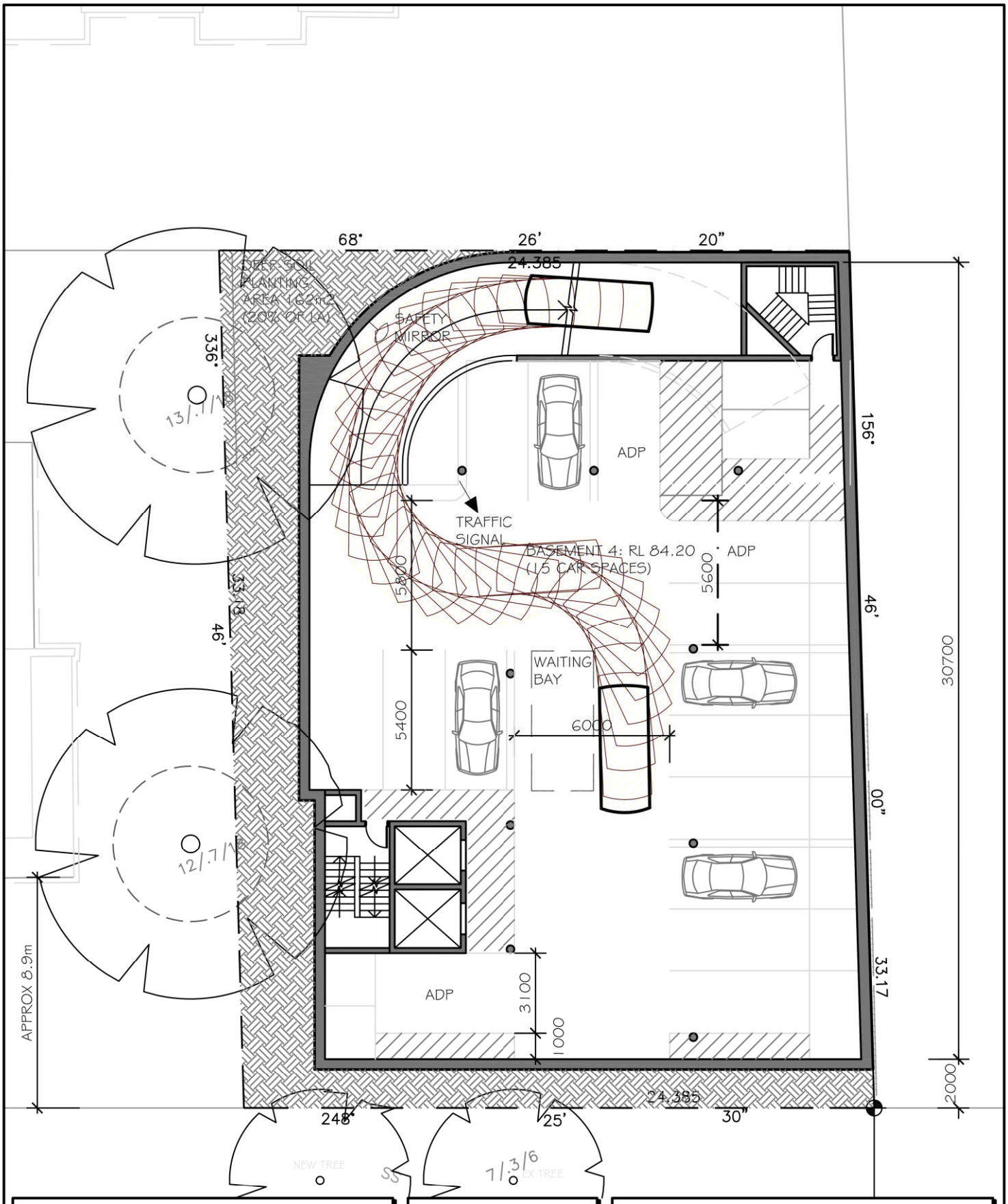
LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE ENTERING THE SITE

SP 5



LEGEND

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.

N

SWEPT PATH ANALYSIS OF AN 85th PERCENTILE VEHICLE EXITING THE SITE

SP 6

Appendix D

Example Traffic Signal System

Safer, Greener, More Efficient

AGD Systems Pty Ltd
Unit 17/15 Valediction Road
Kings Park, NSW 2148
T: (02) 9653 9934
E: Sales@agd-systems.com.au
W: www.agd-systems.com.au

Manual for the 130 Elizabeth Street, Hyde Park

Items

1) Operation
2) Maintenance
3) Component list
4) Trouble shooting
5) Electrical schematic

1) Operations

The system is based on each level working independently from each other.

The system has a red/ green traffic light at each end of the ramp, two holding bays, an overhead sensor located in the exiting vehicle holding bay and two photoelectric beams, 700mm apart, located at the bottom of the transference ramp.

The default phase on each level is a green display for entering vehicles and a red display for exiting vehicles, allowing vehicles to enter the ramp system and travel to their parking bay.

Vehicle exiting procedure:

- Default Phase: Vehicles entering the carpark have right of way, meaning the upper car parking level display is green and the lower car parking level display is red
- Vehicles wishing to exit the lower car parking level travels to the lower holding bay.
- The overhead sensor detects that there is a vehicle in the lower holding bay.
- The display on the upper basement level changes to red.
- The displays on the lower car parking levels are held on red for a set time to allow any vehicles entering the car park to complete their journey on the one-way ramp.
- When this time has lapsed the display for the lower car parking level changes to green for a set time, allowing the vehicle on the lower car parking level to exit.

- When this time has lapsed the display on the lower car parking level changes to red and the upper car parking level display is held on red for a set time to allow the car exiting the car park to complete their journey on the one-way ramp.
- When this has lapsed the display returns to the default phase.
- As the exiting vehicle travels up the two-way ramp to the next level it breaks the two PE beams.

- Using 'AB' logic the system determines that a vehicle is exiting the upper car park level.
- The display on the next upper car park level changes to red, in anticipation of a car exiting from below.
- The display on the upper car park level is held on red for a set time allowing vehicles entering the car park on the one-way ramp to complete their journey.
- The display for the lower car park level changes to green for a set time, allowing the vehicle to travel through the one-way ramp without being held up.
- When the green set time lapses, the display returns to red and the all red display is held for a set time.
- When the all red display time has lapsed the system returns to the default display.
- This process is repeated as the vehicle moves up the car park levels and exits the car park.

2) Maintenance

The maintenance plan requires the has a 12-month service of the system.

The service is to include,

- Inspection and clean each traffic light
- Test the operations of overhead sensors
- Test the operations of photoelectric beams
- Test operations of the system on each level
- Test and reset circuit breaker located in the controller

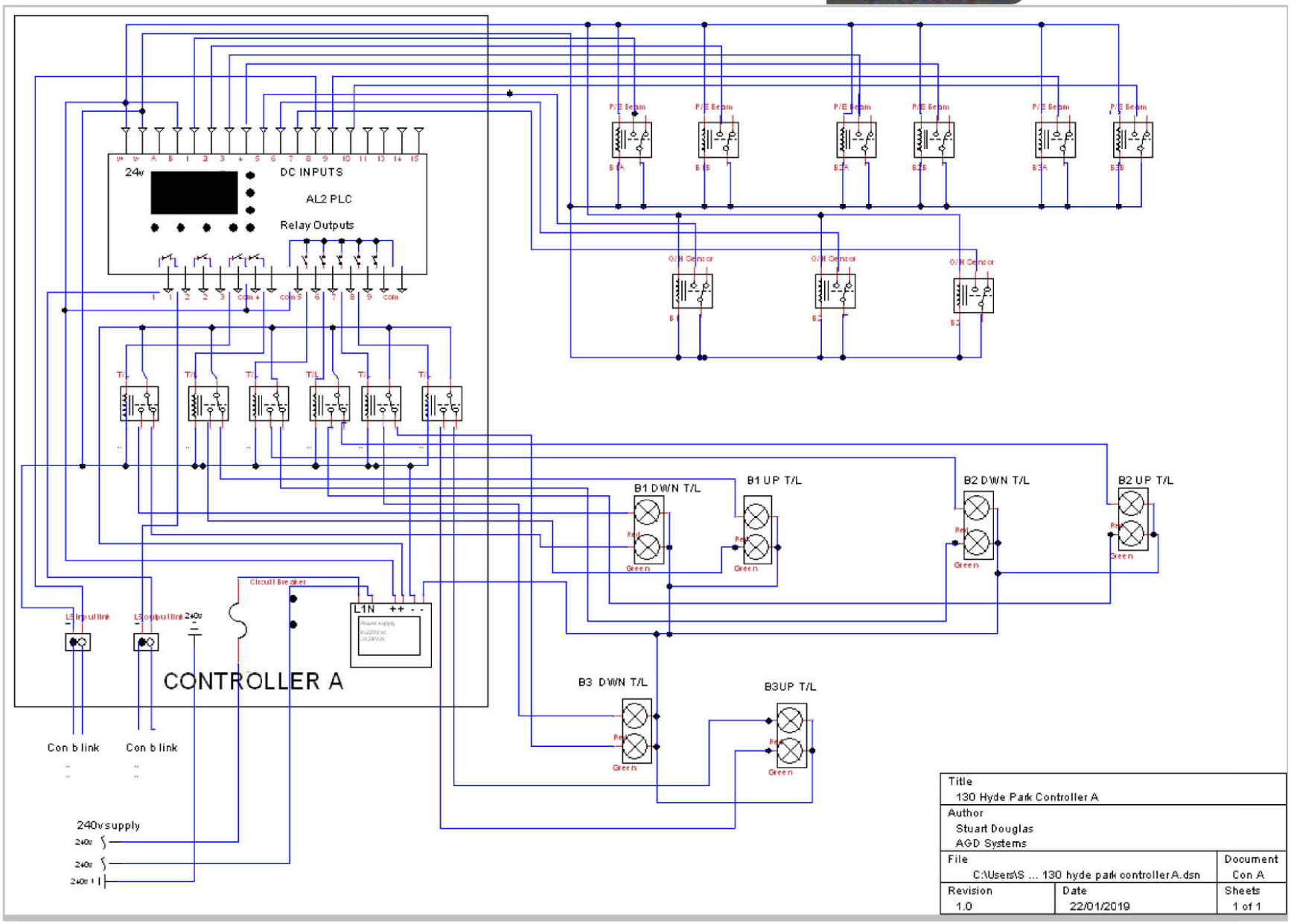
3) Component List

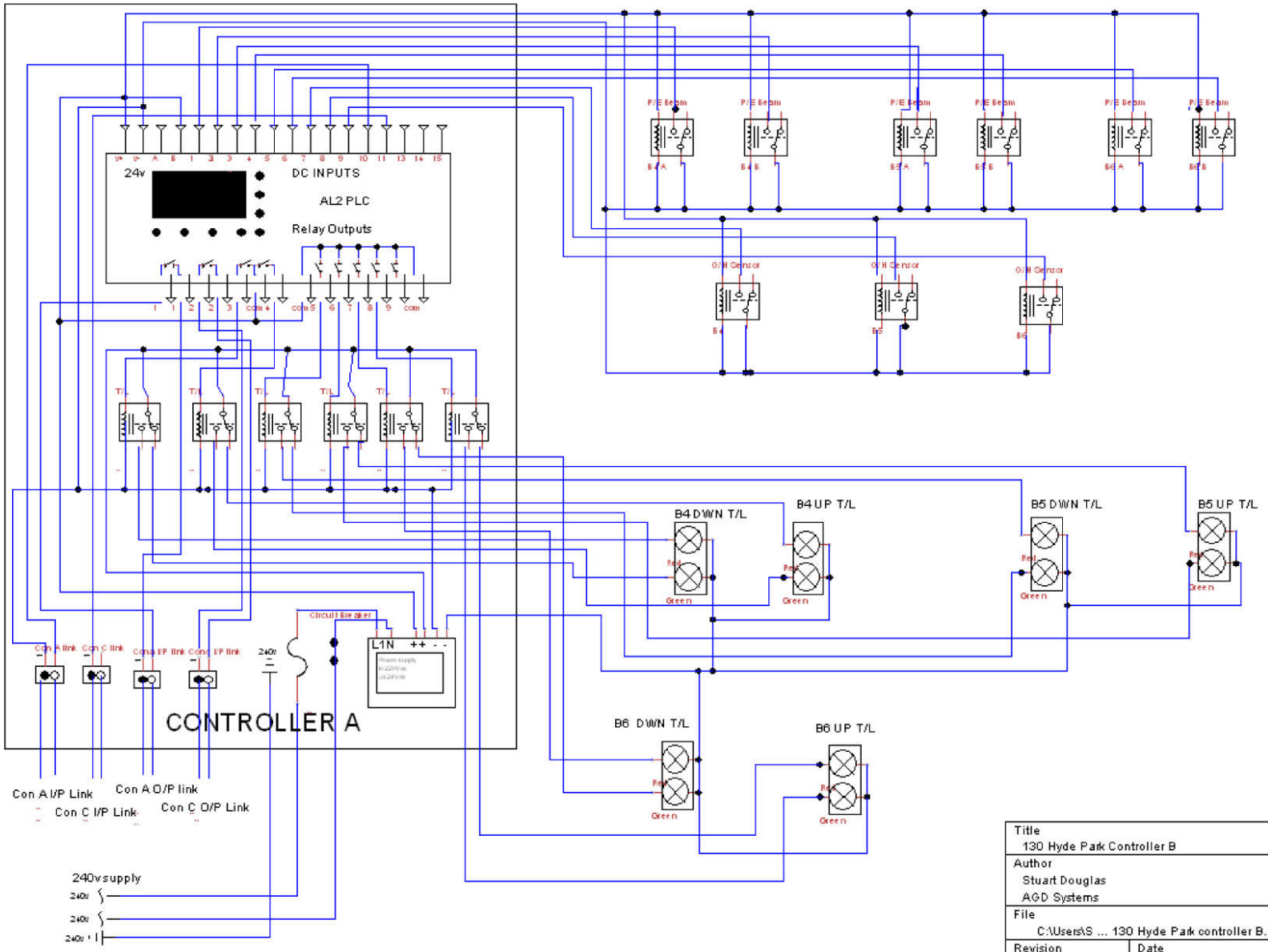
Items	Part Number	Description	Manufacturer
Programmable logic controller	AL2-24MR-D	Alpha 2 PLC 24vdc 15 inputs 9 outputs	Mitsubishi
Power Supply	MDR-60-24	Power Supply Slim 24vdc 60 watt	Meanwell
Photo electric beams	AGDPEB-1500	Polarized retro -reflective photoelectric beam	Elsema
Traffic light	AGD12	100mm Red/Green traffic lights 12/24vdc	Snow Dragon
Stop here on Red	AGDSHOR/S	225X300 Aluminum "stop here on red" sign	Hi-Vis
Overhead sensor	USVD-4X	Direction activated ultrasonic sensor	EMX
Relay	RV1H-G-D24	Single pole N/O N/C 24vdc relay	Idec

4) Trouble Shooting

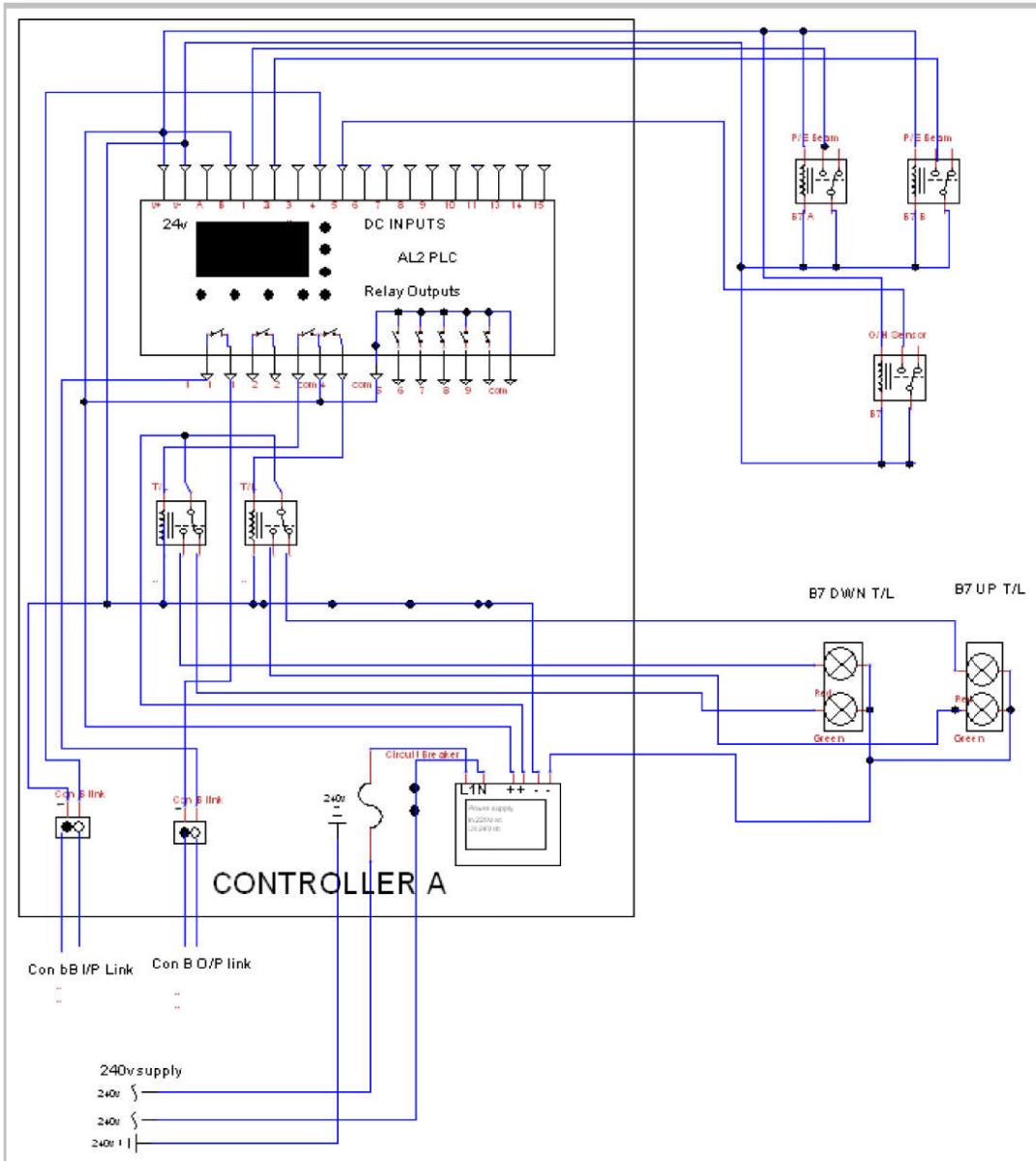
Fault	Action
No display on any of the traffic lights	Check 240v power to controller Check 24vdc power from power supply in controller
Display on exit and entrance traffic lights do not change	Test overhead sensor in holding bay Check programmable logic controller program
Entrance display changes but exit display does not change	Test relay controlling exit traffic light and replace if faulty
Exit display changes but entrance display does not change	Test relay controlling traffic light, replace if faulty
Display does not illuminate when required	Check LED module, replace if faulty
Continues Traffic light cycling	Check the operation of the overhead sensor Check if any of the photoelectric beams are obstructed Check the operation of the photoelectric beam
Traffic lights do not change when waiting in holding bay	Check the operation of the overhead sensor Check the operation of the programmable logic controller

5) Electrical Schematic - Attached


24v
DC INPUTS
AL2 PLC
Relay Outputs
P/E Beam
O/H Sensor
T/L
B1 DWN T/L
B1 UP T/L
B2 DWN T/L
B2 UP T/L
B3 DWN T/L
B3UP T/L
Red
Green
Circuit Breaker
L1N ++ - -
CONTROLLER A
Con b link
240v supply
Title
130 Hyde Park Controller A
Author
Stuart Douglas
AGD Systems
File
C:\Users\S ... 130 hyde park controller A.dsn
Document
Con A
Revision
1.0
Date
22/01/2019
Sheets
1 of 1



Title 130 Hyde Park Controller B		
Author Stuart Douglas AGD Systems		
File C:\Users\S ... 130 Hyde Park controller B.dsn		Document Con B
Revision 1.0	Date 22/01/2019	Sheets 1 of 1



Title 130 Hyde Park Controller B		
Author Stuart Douglas AGD Systems		
File C:\Users\S ... 130 Hyde Park controller C.dsn		Document Con C
Revision 1.0	Date 23/01/2019	Sheets 1 of 1