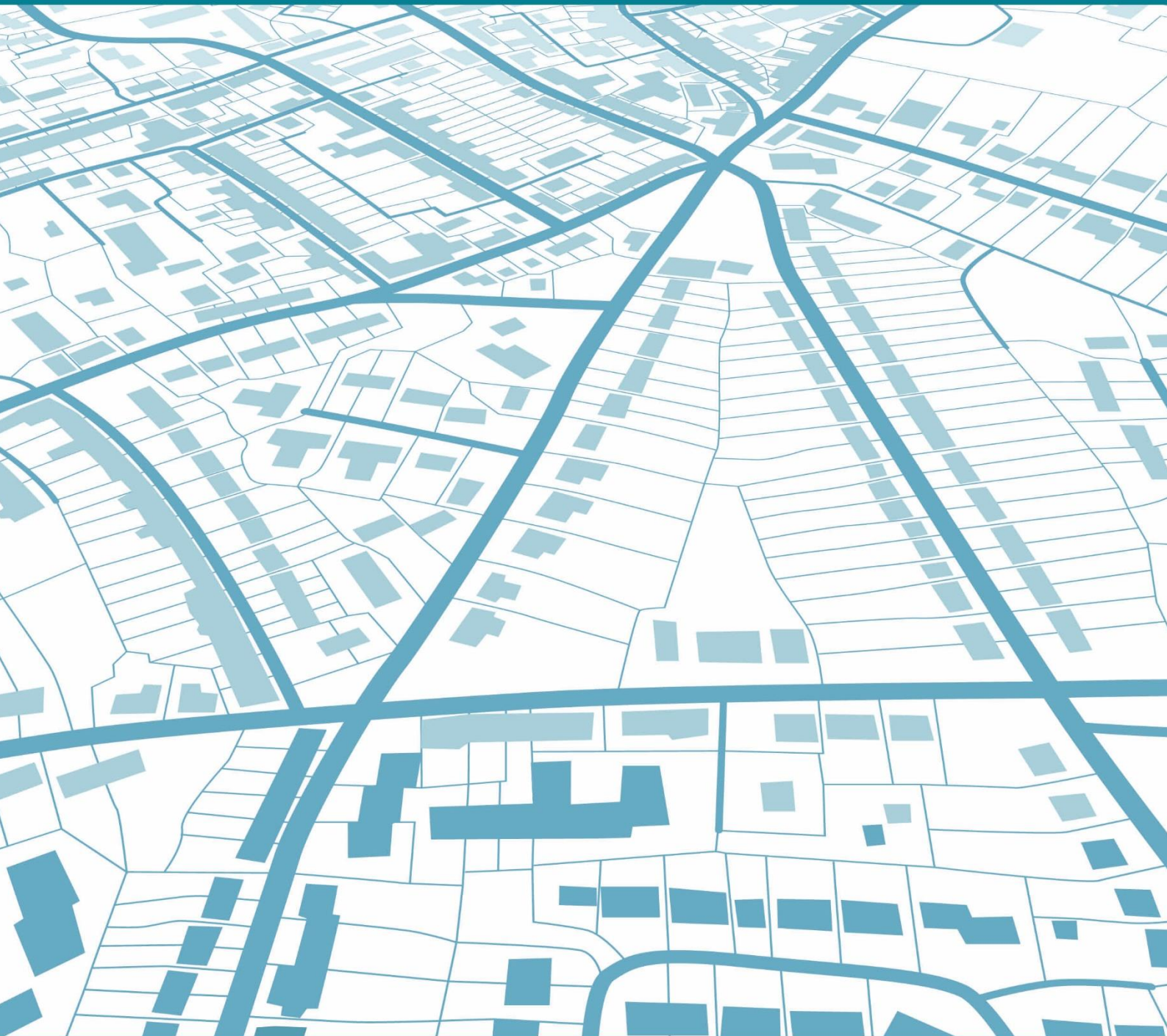




## **The Crest, Lot 100 Meatworks Avenue, Oxford Falls Proposed Industrial Development (Stage 2) Assessment of Traffic and Parking Implications**

Ref: 19179  
Date: October 2019  
Issue: A

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## 1.0 Introduction

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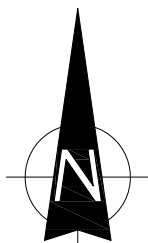
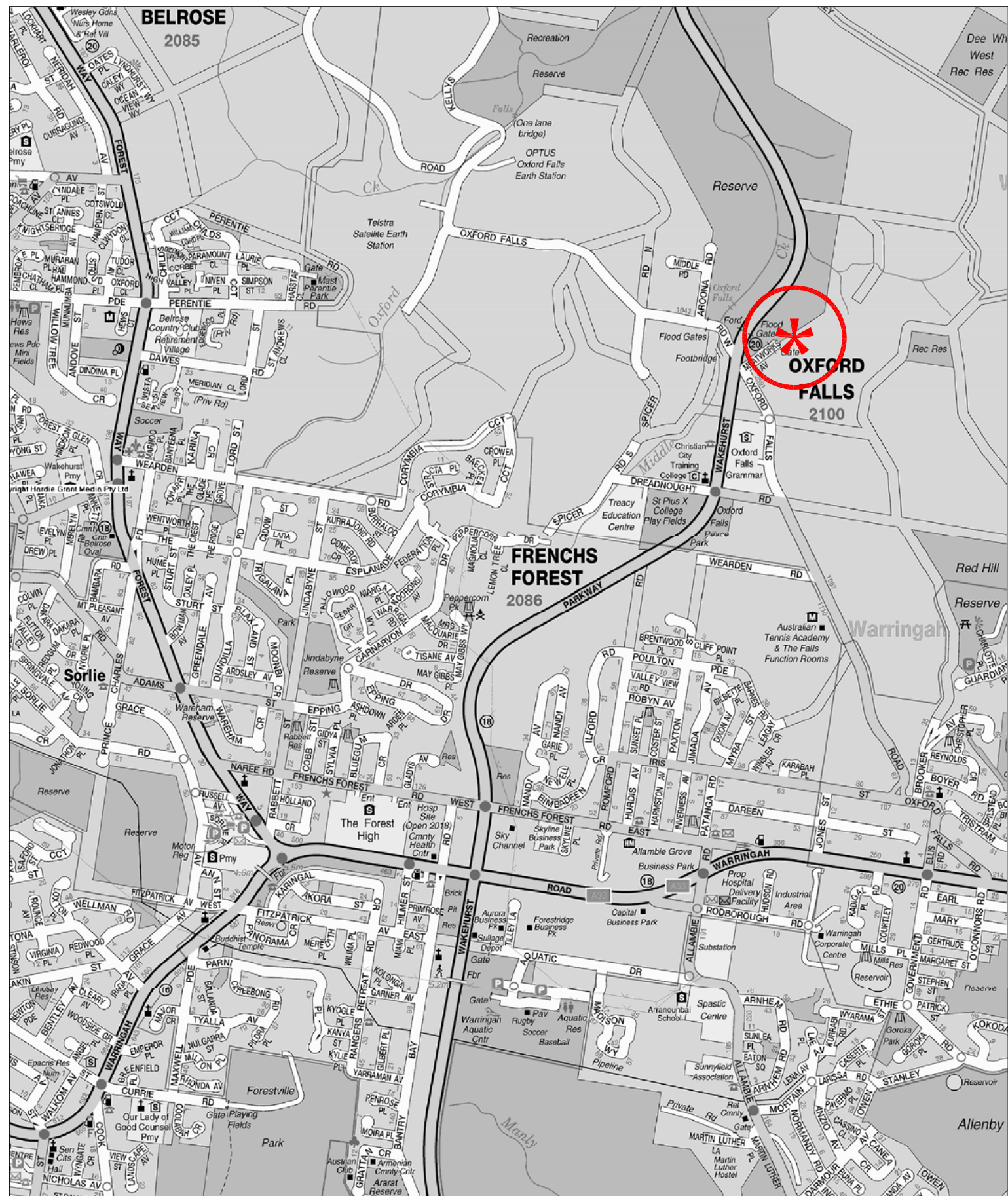
This report has been prepared to accompany a Development Application to Northern Beaches Council for the proposed industrial development (Stage 2) of the Industrial Estate on a site at Lot 100, Meatworks Avenue, Oxford Falls (Figure 1). The site is located to the south of the Stage 1 development which is currently under construction.

The proposed development scheme involves the construction of:

- 13 industrial units with a total of some 2,318m<sup>2</sup>
- a commercial/industrial building of some 1,433m<sup>2</sup>
- an ancillary building of some 398m<sup>2</sup>
- vehicle access through the Stage 1 area.

The purpose of this report is to:

- \* describe the site, its context and the proposed development scheme
- \* describe the road network serving the site and the prevailing traffic conditions
- \* assess the potential traffic implications
- \* assess the adequacy of the proposed parking provision
- \* assess the suitability of the proposed vehicle access, internal circulation and servicing arrangements



LOCATION

FIG 1

## 2.0 Proposed Development

---

### 2.1 Site, Context and Existing Use

The development site (Figure 2) is a consolidation of Lot 100 - DP 102318, Part Lot 1046 - DP 752038, Part Lot 1047 - DP 752038 Part Lot 1053 DP 752038, which occupies an irregular shaped area of 18,525.73m<sup>2</sup>.

The site is located at the north eastern end of Meatworks Avenue, which comprises a cul-de-sac of 150 metres in length and intersects with Oxford Falls Road. The site is bounded on all sides by wooded bushlands. The Oxford Falls Grammar School is located 400m to the southwest of the site on Oxford Falls Road while the C3 Church is located 700m to the southwest of the site on the western side of the Wakehurst Parkway.

The Stage 1 development on the site comprises:

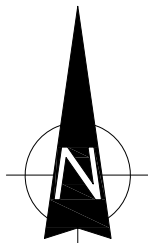
- \* 7 new buildings accommodating a total of 30 small industrial units with each unit will include a loading door and external standing area for service vehicles.
- \* Vehicle access via a circulation roadway
- \* parking will be located throughout the site in close proximity to the related unit.

Details of the approved Stage 1 development are provided on the plans prepared by Gelder Architects and are reproduced in part in Appendix A.

### 2.2 Proposed Development Scheme

It is proposed to demolish the existing structures and construct 3 new buildings comprising:

|                                |                       |
|--------------------------------|-----------------------|
| Commercial/Industrial Building | 1422.86m <sup>2</sup> |
| Ancillary Building             | 364.71m <sup>2</sup>  |



**SITE**

**FIG 2**

13 industrial units (total of 2,317.93m<sup>2</sup>) with the following breakdown:

- |                                 |                                 |
|---------------------------------|---------------------------------|
| - Unit 30: 152.38m <sup>2</sup> | - Unit 37: 120.13m <sup>2</sup> |
| - Unit 31: 151.43m <sup>2</sup> | - Unit 38: 120.13m <sup>2</sup> |
| - Unit 32: 151.43m <sup>2</sup> | - Unit 39: 120.82m <sup>2</sup> |
| - Unit 33: 151.43m <sup>2</sup> | - Unit 40: 397.78m <sup>2</sup> |
| - Unit 34: 152.13m <sup>2</sup> | - Unit 41: 278.69m <sup>2</sup> |
| - Unit 35: 120.58m <sup>2</sup> | - Unit 42: 280.87m <sup>2</sup> |
| - Unit 36: 120.13m <sup>2</sup> |                                 |

The overall floor area of the Stage 2 development equates to 4,105.50m<sup>2</sup>

Parking will be provided on 3 levels comprising:

|                     |                                                   |
|---------------------|---------------------------------------------------|
| Ground              | 8 on-grade spaces + 37 covered spaces             |
| Ground (Mezzanine)  | 48 spaces (including 2 accessible spaces)         |
| Level 1 (Mezzanine) | 18 spaces                                         |
| <b>Total:</b>       | <b>111 spaces (including 2 accessible spaces)</b> |

It is proposed to provide 2 combined ingress/egress driveways on the proposed access roadway to be constructed as part of Stage 1 development.

Details of the proposed Stage 2 development are provided on the plans prepared by Gelder Architects which accompany the application and are reproduced in part in Appendix B.

## 3.0 Existing Road Network and Traffic Conditions

---

### 3.1 Road Network

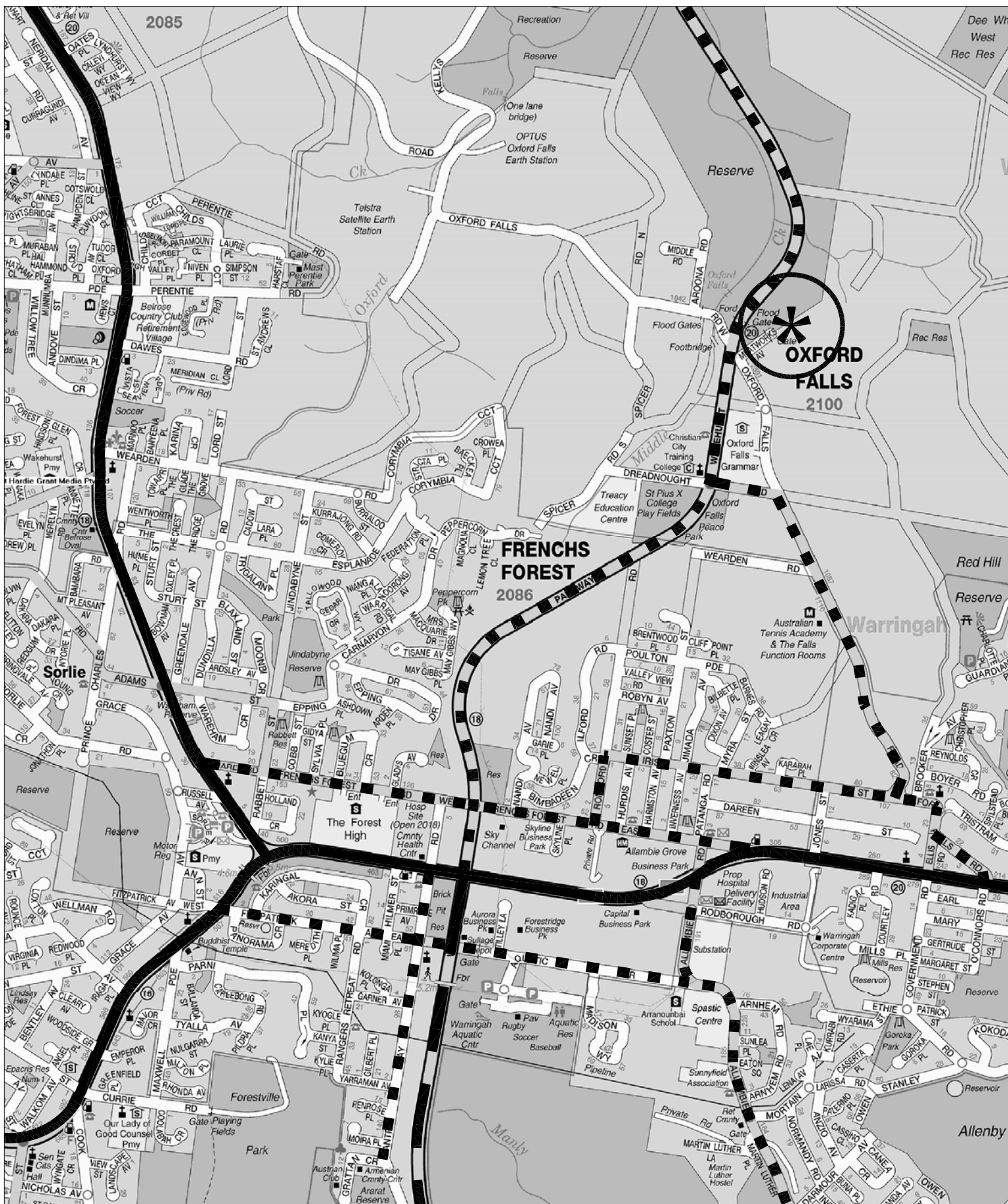
The road network serving the site (Figure 3) comprises:

- ❖ *Wakehurst Parkway* – a 2-lane carriageway State Road and arterial/sub-arterial route connecting between Pittwater Road at Narrabeen and Sydney Road at Balgowlah. Wakehurst Parkway provides an alternative to Pittwater Road for motorists travelling between the northwest (e.g, Chatswood) and the peninsular.
- ❖ *Warringah Road* – a State Road and arterial route connecting between Pittwater Road at Brookvale and across Roseville Bridge to Eastern Valley Way and Pacific Highway via Boundary Road
- ❖ *Pittwater Road* – a State Road and sub-arterial route running along the northern beaches peninsular connecting between North Sydney (as Military Road) and Palm Beach
- ❖ *Oxford Falls Road* – a local road and provides a connection between Beacon Hill and Oxford Falls, intersecting Wakehurst Parkway via Dreadnaught Road and a traffic signal-controlled intersection.
- ❖ *Meatworks Avenue* – a local cul-de-sac, having a length of 150 metres, which connects between the northern end of Oxford Falls Road and the site. Meatworks Avenue currently provides access to the site only.

### 3.2 Traffic Controls

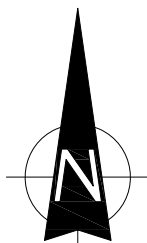
The existing traffic controls, which have been applied to the road system serving the site (Figure 4) comprise:

- ❖ the traffic signals at the intersection of Wakehurst Parkway/Dreadnought Road
- ❖ the roundabout at Oxford Falls Road/Oxford Falls Grammar School access



## LEGEND

-  ARTERIAL
-  SUB-ARTERIAL
-  COLLECTOR



## ROAD NETWORK

**FIG 3**



- ❖ give-way intersections of:
  - Oxford Falls Road/Dreadnought Road
  - Oxford Falls Road/Iris Street
  - Spicer Road/Dreadnought Road
- ❖ the 80 kmph speed restriction on Wakehurst Parkway and 50 kmph speed restriction on the local and collector roads
- ❖ the 40 kmph school zone on Dreadnought Road and Oxford Falls Road

### 3.3 Traffic Conditions

An indication of traffic conditions on the road system serving the area is provided by surveys undertaken as part of the study. Traffic surveys have been undertaken at the Wakehurst Parkway/Dreadnought Road intersection during the AM and PM peak periods on Tuesday, 27 August 2019.

The operational performance of intersection of Wakehurst Parkway/Dreadnought Road has been assessed using SIDRA and the results indicating satisfactory performances are provided in Appendix C and summarised in the following, while the criteria for interpreting the results are reproduced overleaf:

| AM Peak |       | PM Peak |       |
|---------|-------|---------|-------|
| LOS     | AVD   | LOS     | AVD   |
| C       | 37.7s | D       | 54.4s |

The results of the SIDRA assessments indicate that the intersection operates at acceptable LOS D or better during the AM and PM peak periods.

# Criteria for Interpreting Results of SIDRA Analysis

## 1. Level of Service (LOS)

| LOS | Traffic Signals and Roundabouts                                                                       | Give Way and Stop Signs                        |
|-----|-------------------------------------------------------------------------------------------------------|------------------------------------------------|
| 'A' | Good                                                                                                  | Good                                           |
| 'B' | Good with acceptable delays and spare capacity                                                        | Acceptable delays and spare capacity           |
| 'C' | Satisfactory                                                                                          | Satisfactory but accident study required       |
| 'D' | Operating near capacity                                                                               | Near capacity and Accident Study required      |
| 'E' | At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode | At capacity and requires other control mode    |
| 'F' | Unsatisfactory and requires additional capacity                                                       | Unsatisfactory and requires other control mode |

## 2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below, which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

| Level of Service | Average Delay per Vehicle (secs/veh) | Traffic Signals, Roundabouts                                                                          | Give Way and Stop Signs                     |
|------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------|
| A                | Less than 14                         | Good operation                                                                                        | Good operation                              |
| B                | 15 to 28                             | Good with acceptable delays and spare capacity                                                        | Acceptable delays and spare capacity        |
| C                | 29 to 42                             | Satisfactory                                                                                          | Satisfactory but accident study required    |
| D                | 43 to 56                             | Operating near capacity                                                                               | Near capacity and accident study required   |
| E                | 57 to 70                             | At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode | At capacity and requires other control mode |

## 3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**<sup>1</sup> both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

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<sup>1</sup> the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs

## 4.0 Parking

---

Council's (Warringah) DCP specifies the following parking criteria in relation to the proposed development elements:

|                    |                                                                                                                                                                 |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Warehouse/Industry | 1.3 spaces per 100 m <sup>2</sup> GFA (including up to 20% of floor area as office space component. Office space component above 20% determined at office rate) |
| Office             | 1 space per 40 m <sup>2</sup> GFA.                                                                                                                              |

While both the commercial/industrial and ancillary buildings are more likely serve as a business park, to provide a conservative assessment, it has been assumed that all the floor areas in these buildings will be used as offices.

Application of these criteria to the proposed development would indicate the following:

|                       |                                 |                  |
|-----------------------|---------------------------------|------------------|
| Industrial units      | 13 units (2,318m <sup>2</sup> ) | 31 spaces        |
| Commercial/industrial | 1,423m <sup>2</sup>             | 36 spaces        |
| Ancillary building    | 365m <sup>2</sup>               | 10 spaces        |
| <b>Total:</b>         |                                 | <b>77 spaces</b> |

It is proposed to provide a total of 111 parking spaces in compliance with the Council's DCP criteria. Two spaces designated for the proposed development will be suitable for disabled drivers in accordance with BCA.

It is noted that the proposed parking provision is higher than required a strict application of the DCP minimum requirements. This has been achieved partly through the availability of land, but also in response to the lack of alternative forms of transport serving the site, and the somewhat isolated location in relation to residential or commercial uses. The proposed provision will ensure that the proposed development does not result in overflow parking on to the surrounding road network.

## 5.0 Traffic

---

An indication of the potential traffic generation of the proposed development is provided by the RMS Development Guidelines and RMS TDT 2013/04, which specify the following peak hour generation rates:

### **Warehouse<sup>1</sup>**

AM & PM Peaks : 0.5 vtpm per 100m<sup>2</sup> GFA

### **Business Park and Industrial Estate<sup>2</sup>**

AM Peak : 0.15 – 1.31 vtpm per 100m<sup>2</sup> GFA

PM Peak : 0.16 – 1.50 vtpm per 100m<sup>2</sup> GFA

Given that lack of public transport services in the vicinity of the site, the highest rates of 1.31 and 1.50 vtpm per 100m<sup>2</sup> GFA have been used in this assessment.

Based on the above rates, the proposed development will result in the following AM and PM peak hour traffic generations:

|            | <b>Industrial units</b>   | <b>Commercial/Industrial Building</b> | <b>Ancillary Building</b> |              |
|------------|---------------------------|---------------------------------------|---------------------------|--------------|
| <b>GFA</b> | <b>2,318m<sup>2</sup></b> | <b>1,423m<sup>2</sup></b>             | <b>365m<sup>2</sup></b>   | <b>Total</b> |
| AM Peak    | 12 vtpm                   | 19 vtpm                               | 5 vtpm                    | 36 vtpm      |
| PM Peak    | 12 vtpm                   | 22 vtpm                               | 6 vtpm                    | 40 vtpm      |

Based on the traffic and parking assessment report provided by Parking & Traffic

---

<sup>1</sup> Roads and Maritime Services, Guide to Traffic Generating Developments. Version 2.2 October 2002

<sup>2</sup> RMS Technical Direction TDT 2013/04: Guide to Traffic Generating Developments - Updated traffic surveys

Consultants<sup>3</sup>, the Stage 1 development is anticipated to generate a peak hour traffic activity of 68 vehicle movements.

The projected vehicle generation of Stage 1 and Stage 2 developments during the peak traffic periods will therefore be:

| Stage        | AM        |           | PM        |           |
|--------------|-----------|-----------|-----------|-----------|
|              | IN        | OUT       | IN        | OUT       |
| 1            | 28        | 8         | 32        | 8         |
| 2            | 54        | 14        | 14        | 54        |
| <b>Total</b> | <b>82</b> | <b>22</b> | <b>46</b> | <b>62</b> |

A SIDRA assessment of the intersection of Wakehurst Parkway/Dreadnought Road with the projected additional volumes reveals that acceptable operations will continue as follows:

| AM Peak |       | PM Peak |       |
|---------|-------|---------|-------|
| LOS     | AVD   | LOS     | AVD   |
| C       | 42.2s | D       | 56.4s |

Overall, the intersection would continue to operate at the same levels of service with only minor increases to average delays predicted when compared with existing conditions with a minor increase of delay up to 4.5 seconds per vehicle.

The traffic generation of this order of magnitude being equivalent to some 2 vehicles every minute during the peak hours is minor in the context of the local and arterial road system and will not act to create unacceptable traffic congestion or conflict either at the vehicle access point or at the adjacent intersection.

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<sup>3</sup> Proposed Industrial Estate, Meatworks Avenue, Oxford Falls, T2-507, August 2011 by Parking & Traffic Consultants

## 6.0 Access, Internal Circulation and Servicing

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### 6.1 Access

The proposed vehicle access arrangements to the Stage 2 development will comprise 2 combined ingress/egress driveways and 5 individual industrial unit accesses on the internal access road (to be constructed as part of the Stage 1 development) frontage located towards the western site boundary.

The proposed vehicle access arrangements include:

- ❖ Western driveway: A 13.5m wide, combined ingress/egress driveway to/from Level 1 Mezzanine to allow truck access (Industrial Units 35 through 42) for up to 6.4m small rigid vehicle (SRV) and carpark access for up to B99 cars. The western driveway also provides access for B99 cars to/from commercial/industrial building carpark.
- ❖ Eastern driveway: A 9.4m wide, combined ingress/egress driveway to/from Ground and Ground (Mezzanine) levels to allow carpark access for up to B99 cars. The access to/from the Ground Level will be provided off the driveway to/from Ground (Mezzanine) level.
- ❖ 5 truck accesses to/from Industrial Units 30 through 34.

These driveways comply with the design requirements of AS2890.1 & 2 and will accommodate the vehicle access needs of the relevant elements of the development. The driveway will be located on a straight on a higher reduced level section of the internal access road, allowing good sight distances and visibility for the existing vehicle to the vehicles along the access road.

The proposed ingress and egress manoeuvring arrangements at these driveways will be satisfactory as confirmed by the turning path assessment for an SRV at the western driveway and a B99 car for the eastern driveway which is provided in Appendix D.

## 6.2 Internal Circulation

The carpark arrangement internal circulation and parking arrangements have been designed in accordance with the requirements of AS2890.1 of a Class 1A facility. A Class 1A facility requires parking space dimensions of 2.4 x 5.4 metres with an access aisle width of 5.8 metres. The proposed carpark has been designed to provide compliant parking space widths of 2.45 x 5.5 metres and aisle widths of 7.2 metres.

The design of the internal arrangements including truck manoeuvring, carpark aisles/bays, etc. have been designed in accordance with AS2890.1, AS2890.2 and AS2890.6. Details of the turning path assessment for the internal circulation arrangements indicating satisfactory provision for all accessing vehicles are provided in Appendix D.

## 6.3 Servicing

Each of the industrial units will have a dedicated loading area which can accommodate up to an SRV.

The servicing arrangement for Industrial Units 35 through 39, a commercial/industrial and ancillary buildings will be completed on-street along the internal access road southern frontage. The vehicle will stop temporarily on the access road with the waste collection personnel wheeling the bins out onto the road for collection. The internal road width can adequately provide for the standing of refuse vehicle and there will be no reversing of the waste vehicle on the access road. In summary, the on-road refuse collection activities will have a very minor impact on vehicle circulation.

All loading activities related to deliveries, courier activity, maintenance, etc. can be reliant on the available on-street and off-street parking within the site, as is normal for industrial development of this nature.

Details of the turning path assessment for service vehicles are provided in Appendix D indicating that the proposed arrangements will be satisfactory.

There will only be a relatively minor level of servicing required for the development (i.e., apart from receipt and dispatch movements). The refuse removal will be undertaken by a 6.4m private contractor's waste vehicle, which will take place outside of the development's peak periods.

It is assessed on this basis that the proposed servicing arrangements will be adequate for the needs of the envisaged operations at the site.

## 7.0 Conclusion

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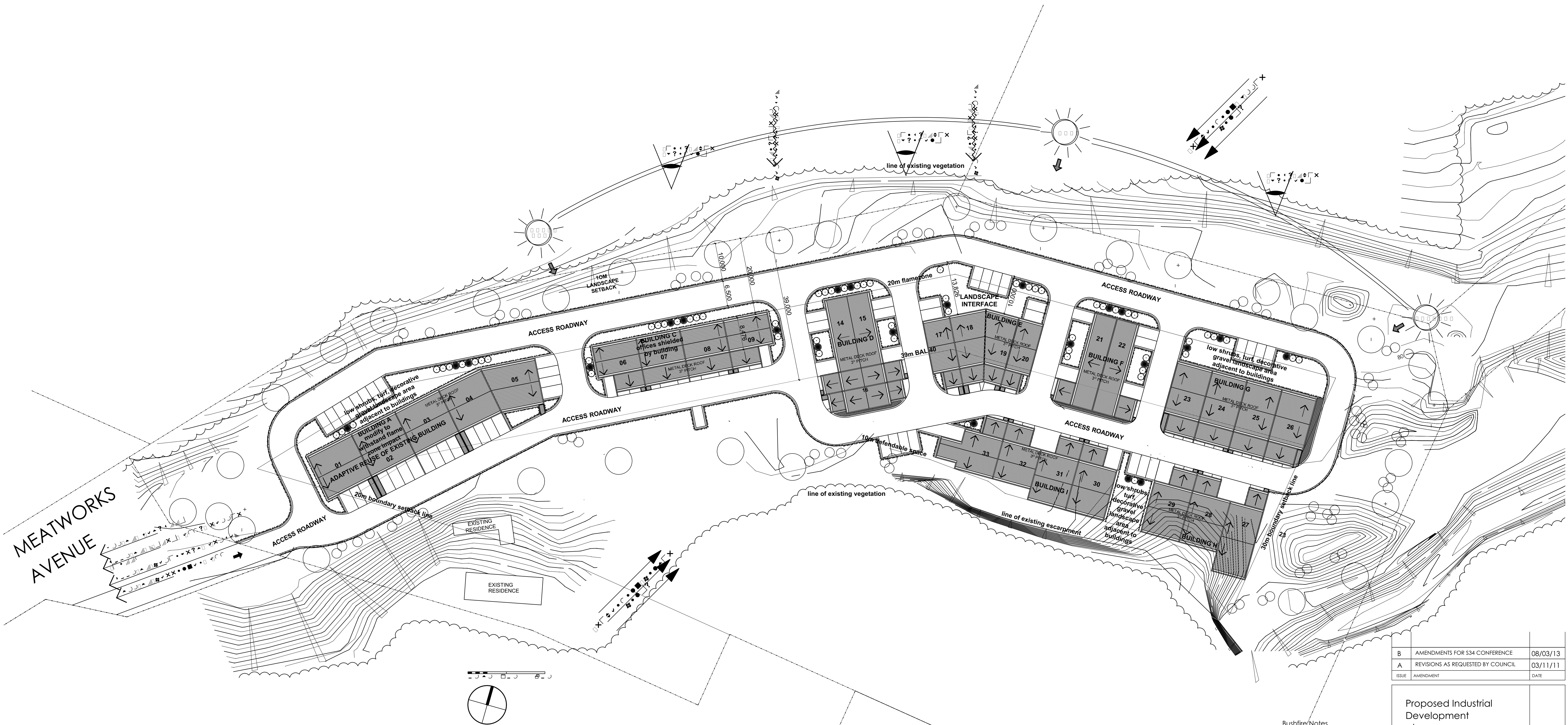
A Development Application is to be submitted to Northern Beaches Council for the proposed industrial development (Stage 2) of the Industrial Estate on a site at Lot 100, Meatworks Avenue, Oxford Falls. The traffic, transport and parking assessment provided in this report confirms that:

- ❖ the traffic generation of the proposed development will not present any adverse traffic implications and traffic-related environmental impacts
- ❖ the proposed parking provision will be adequate
- ❖ the vehicle accesses on the internal road access will be suitable and appropriate
- ❖ the proposed internal circulation and servicing arrangements will be in accordance with the current AS2890.1, 2 and 6 design standards
- ❖ the proposed servicing arrangements are suitable

## Appendix A

# Approved Stage 1 Architectural Plans





**Bushfire Notes**  
All work to comply with the Building Code Of Australia.  
All work to comply with Australian Standard 3959 2009.  
All parts of the existing buildings to be converted and located within BAL FZ shall comply with AS 3959 Section 9 (within 30m).  
All parts of the buildings located within BAL FZ shall comply with AS 3959 Section 9 (within 30m).  
Floors (BAL FZ)  
Concrete slabs on ground shall comply with AS 3959 Section 9.3.1.  
Elevated floors (first floors) to comply with AS 3959 Section 9.3.2.1 for enclosed floors.  
Elevated floors (first floors) to comply with AS 3959 Section 9.3.2.2 part (a-d) for unenclosed subfloor spaces.  
External Walls (BAL FZ)  
Exposed components of external walls shall comply AS 3959 Section 9.4.  
External Glazed Elements and Assemblies and External Doors (BAL FZ)  
Bushfire shutters and screens for windows and doors to comply with AS 3959 Sections 8.5.1 & 8.5.1A.  
Windows, doors and openings in the building to comply with AS 3959 Section 9.5.2, 9.5.3, 9.5.4 & 8.5.5.  
Roofs (BAL FZ)  
Construction of roofs to comply with AS 3959 Section 9.6.  
Steps, Ramps & Landings (BAL FZ)  
Construction of steps, ramps & landings to comply with AS 3959 Section 9.7.  
All parts of the building located in BAL 40 shall comply with AS 3959 Section 6 (more than 30m).  
Floors (BAL 40)  
Concrete slabs on ground to comply with AS 3959 Section 9.3.1.  
Elevated floors (first floors) to comply with AS 3959 Section 8.3.2.1 for enclosed floors.  
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Steps, Ramps & Landings (BAL 40)  
Construction of steps, ramps & landings to comply with AS 3959 Section 8.7.

|       |                                   |          |
|-------|-----------------------------------|----------|
| B     | AMENDMENTS FOR S34 CONFERENCE     | 08/03/13 |
| A     | REVISIONS AS REQUESTED BY COUNCIL | 03/11/11 |
| ISSUE | AMENDMENT                         | DATE     |

Proposed Industrial Development  
at  
Meatworks Avenue  
Oxford Falls 2100  
for  
Mr K Edwards

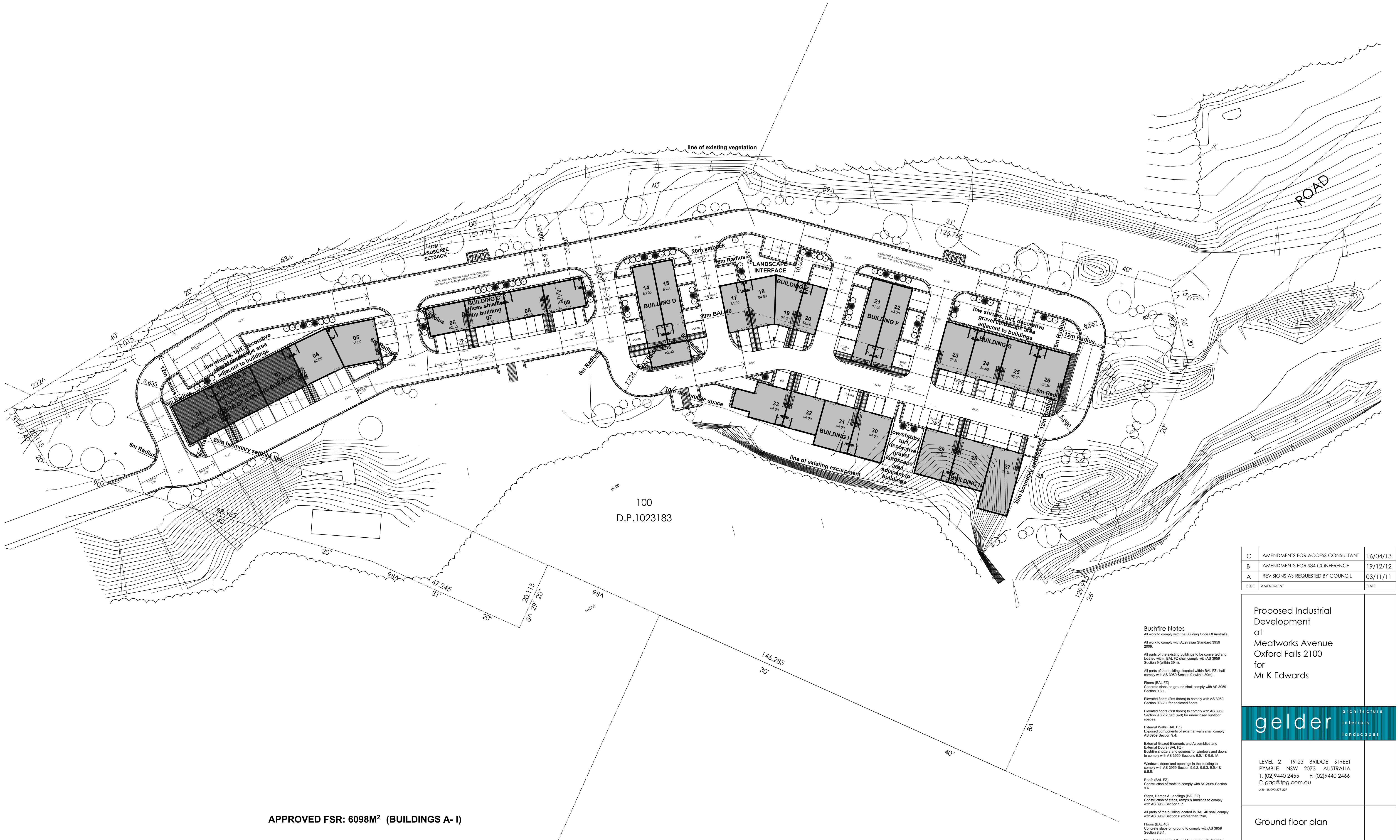
architecture  
interiors  
landscapes

LEVEL 2 19-23 BRIDGE STREET  
PYMBLE NSW 2073 AUSTRALIA  
T: (02)9440 2455 F: (02)9440 2466  
E: gag@tpg.com.au  
ABN 48 090 878 827

Site Analysis/Roof Plan

THE PROPERTY IN THIS DRAWING AND IN THE CONCEPTS REMAIN WITH ART 2 DESIGN TRADING AS GELDER. ANY UNAUTHORISED USE OF THIS DRAWING, AS TO THE WHOLE OR PART MAY RENDER THE USER LIABLE TO AN ACTION FOR DAMAGES. CONSEQUENTIAL EVENTS OR DAMAGES ARISING FROM UNWARRANTED OR UNAUTHORISED USE SHALL NOT RENDER ART 2 DESIGN TRADING AS GELDER OR ITS ASSOCIATED COMPANIES LIABLE.

|                         |                  |       |
|-------------------------|------------------|-------|
| Date: Jan 2005          | Project No: 823  | AMEND |
| Scale: 1 : 100          | Drawing No: DA01 | B     |
| Date Plotted: 4/09/2017 |                  |       |



APPROVED FSR: 6098M<sup>2</sup> (BUILDINGS A- I)

PROPOSED FSR (BUILDINGS J-M) TOTAL 2766 m<sup>2</sup>

PROPOSED SECTION 96 FSR + 6098M<sup>2</sup> TOTAL 8864m<sup>2</sup>

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|       |                                   |          |
|-------|-----------------------------------|----------|
| C     | AMENDMENTS FOR ACCESS CONSULTANT  | 16/04/13 |
| B     | AMENDMENTS FOR S34 CONFERENCE     | 19/12/12 |
| A     | REVISIONS AS REQUESTED BY COUNCIL | 03/11/11 |
| ISSUE | AMENDMENT                         | DATE     |

Proposed Industrial Development  
at  
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for  
Mr K Edwards

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Ground floor plan

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Date: Jan 2005  
Scale: 1 : 100  
Date Plotted: 4/09/2017

Project No: 823  
Drawing No: DA02

AMEND  
C



**Bushfire Notes**  
All work to comply with the Building Code Of Australia.  
All work to comply with Australian Standard 3959 2009.  
All parts of the existing buildings to be converted and located within BAL FZ shall comply with AS 3959 Section 9 (within 39m).  
All parts of the buildings located within BAL FZ shall comply with AS 3959 Section 9 (within 39m).  
Floors (BAL FZ)  
Concrete slabs on ground shall comply with AS 3959 Section 9.3.1.  
Elevated floors (first floors) to comply with AS 3959 Section 9.3.2.1 for enclosed floors.  
Elevated floors (first floors) to comply with AS 3959 Section 9.3.2.2 part (a-d) for unenclosed subfloor spaces.  
External Walls (BAL FZ)  
Exposed components of external walls shall comply AS 3959 Section 9.4.  
External Glazed Elements and Assemblies and External Doors (BAL FZ)  
Bushfire shutters and screens for windows and doors to comply with AS 3959 Sections 8.5.1 & 8.5.1A.  
Windows, doors and openings in the building to comply with AS 3959 Section 9.5.2, 9.5.3, 9.5.4 & 9.5.5.  
Roofs (BAL FZ)  
Construction of roofs to comply with AS 3959 Section 9.6.  
Steps, Ramps & Landings (BAL FZ)  
Construction of steps, ramps & landings to comply with AS 3959 Section 9.7.  
All parts of the building located in BAL 40 shall comply with AS 3959 Section 6 (more than 39m).  
Floors (BAL 40)  
Concrete slabs on ground to comply with AS 3959 Section 9.3.1.  
Elevated floors (first floors) to comply with AS 3959 Section 8.3.2.1 for enclosed floors.  
Elevated floors (first floors) to comply with AS 3959 Section 8.3.2.2 part (a-d) for unenclosed subfloor spaces.  
External Walls (BAL 40)  
Exposed components of external walls shall comply AS 3959 Section 8.4.  
External Glazed Elements and Assemblies and External Doors (BAL 40)  
Bushfire shutters and screens for windows and doors to comply with AS 3959 Sections 8.5.1 & 8.5.1A.  
Windows, doors and openings in the building to comply with AS 3959 Section 8.5.2, 8.5.3, 8.5.4 & 8.5.5.  
Roofs (BAL 40)  
Construction of roofs to comply with AS 3959 Section 8.6.  
Steps, Ramps & Landings (BAL 40)  
Construction of steps, ramps & landings to comply with AS 3959 Section 8.7.

|       |           |                                   |          |
|-------|-----------|-----------------------------------|----------|
| B     |           | AMENDMENTS FOR S34 CONFERENCE     | 08/03/13 |
| A     |           | REVISIONS AS REQUESTED BY COUNCIL | 03/11/11 |
| ISSUE | AMENDMENT |                                   | DATE     |

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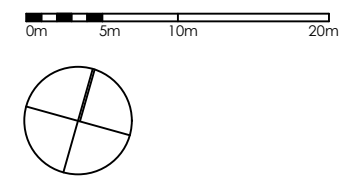
First floor plan

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|-------------------------|------------------|-------|
| Date: Jan 2005          | Project No: 823  | AMEND |
| Scale: 1 : 100          | Drawing No: DA03 | B     |
| Date Plotted: 4/09/2017 |                  |       |

## Appendix B

### Stage 2 Architectural Plans

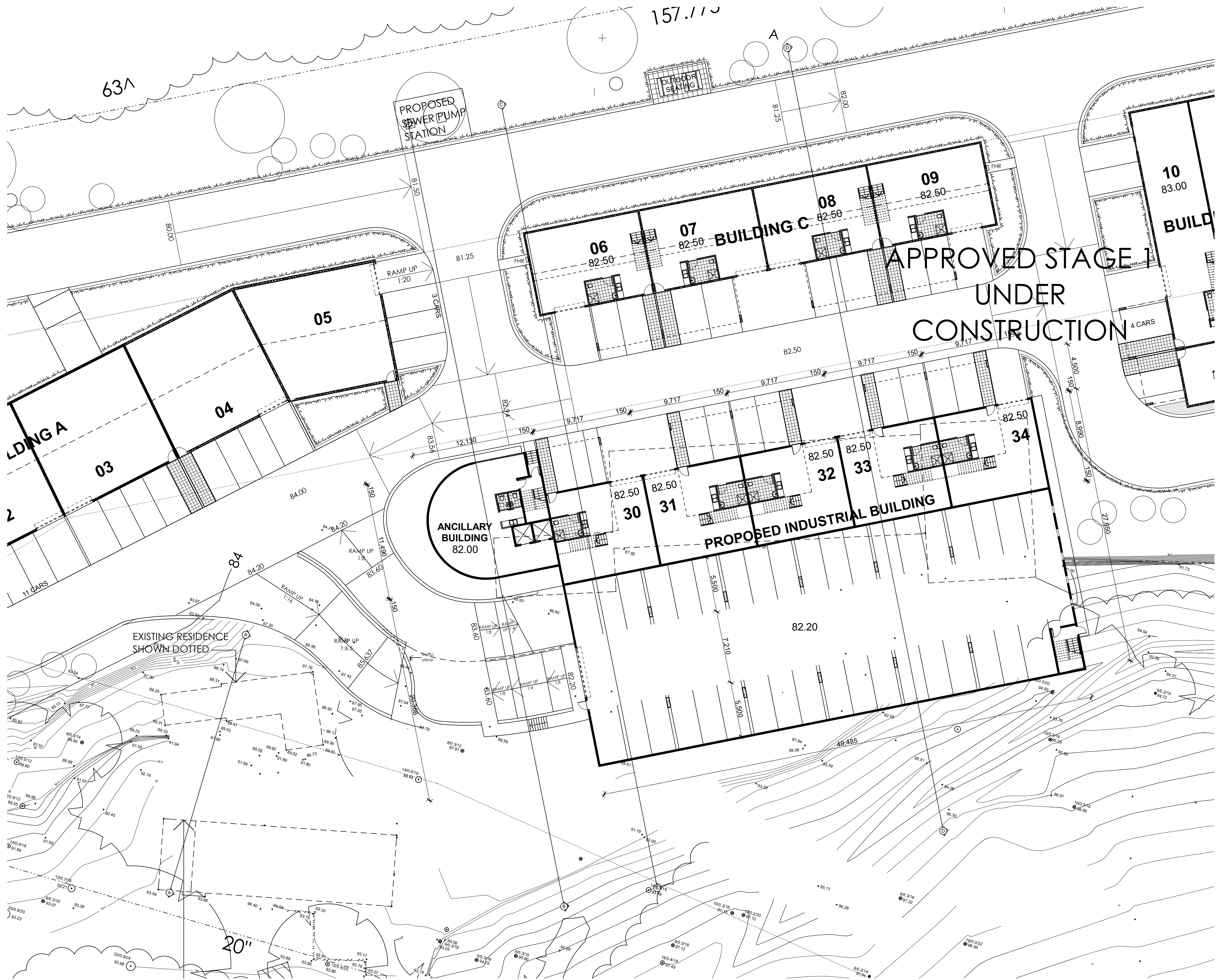


|                                                                                                          |  |
|----------------------------------------------------------------------------------------------------------|--|
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|                            |                     |                                    |
|----------------------------|---------------------|------------------------------------|
| Date:<br>Jan 2005          | Project No:<br>823  | AMEND<br><br><br><br><br><br><br>B |
| Scale:<br>1 : 100          | Drawing No:<br>DA00 |                                    |
| Date Plotted:<br>01-Oct-19 |                     |                                    |



STAGE 2 AREAS

COMMERCIAL/INDUSTRIAL BUILDING

|                    |                   |
|--------------------|-------------------|
| Level 1            | 540.86sqm         |
| Roof Terrace Level | 445.00sqm         |
| Upper Roof Level   | 437.00sqm         |
| <b>TOTAL</b>       | <b>1422.86sqm</b> |

ANCILLARY BUILDING

|               |                  |
|---------------|------------------|
| Ground Level  | 110.06sqm        |
| Carpark Level | 108.96sqm        |
| Level 1       | 145.69sqm        |
| <b>TOTAL</b>  | <b>364.71sqm</b> |

UNITS 30-42

|              |                   |
|--------------|-------------------|
| Unit 30      | 152.38sqm         |
| Unit 31      | 151.43sqm         |
| Unit 32      | 151.43sqm         |
| Unit 33      | 151.43sqm         |
| Unit 34      | 152.13sqm         |
| Unit 35      | 120.58sqm         |
| Unit 36      | 120.13sqm         |
| Unit 37      | 120.13sqm         |
| Unit 38      | 120.13sqm         |
| Unit 39      | 120.82sqm         |
| Unit 40      | 397.78sqm         |
| Unit 41      | 278.69sqm         |
| Unit 42      | 280.87sqm         |
| <b>TOTAL</b> | <b>2317.93sqm</b> |

OVERALL TOTAL STAGE 2 4105.50sqm

|       |                              |          |
|-------|------------------------------|----------|
| D     | DRIVEWAY REVISION            | 30/09/19 |
| C     | PRELIMINARY CONSULTANT ISSUE | 02/08/19 |
| B     | REVISED STAGE 2              | 19/09/18 |
| A     | UPDATED CONSULTANT ISSUE     | 04/09/18 |
| ISSUE | AMENDMENT                    | DATE     |

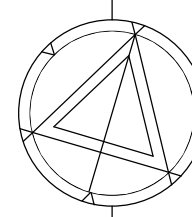
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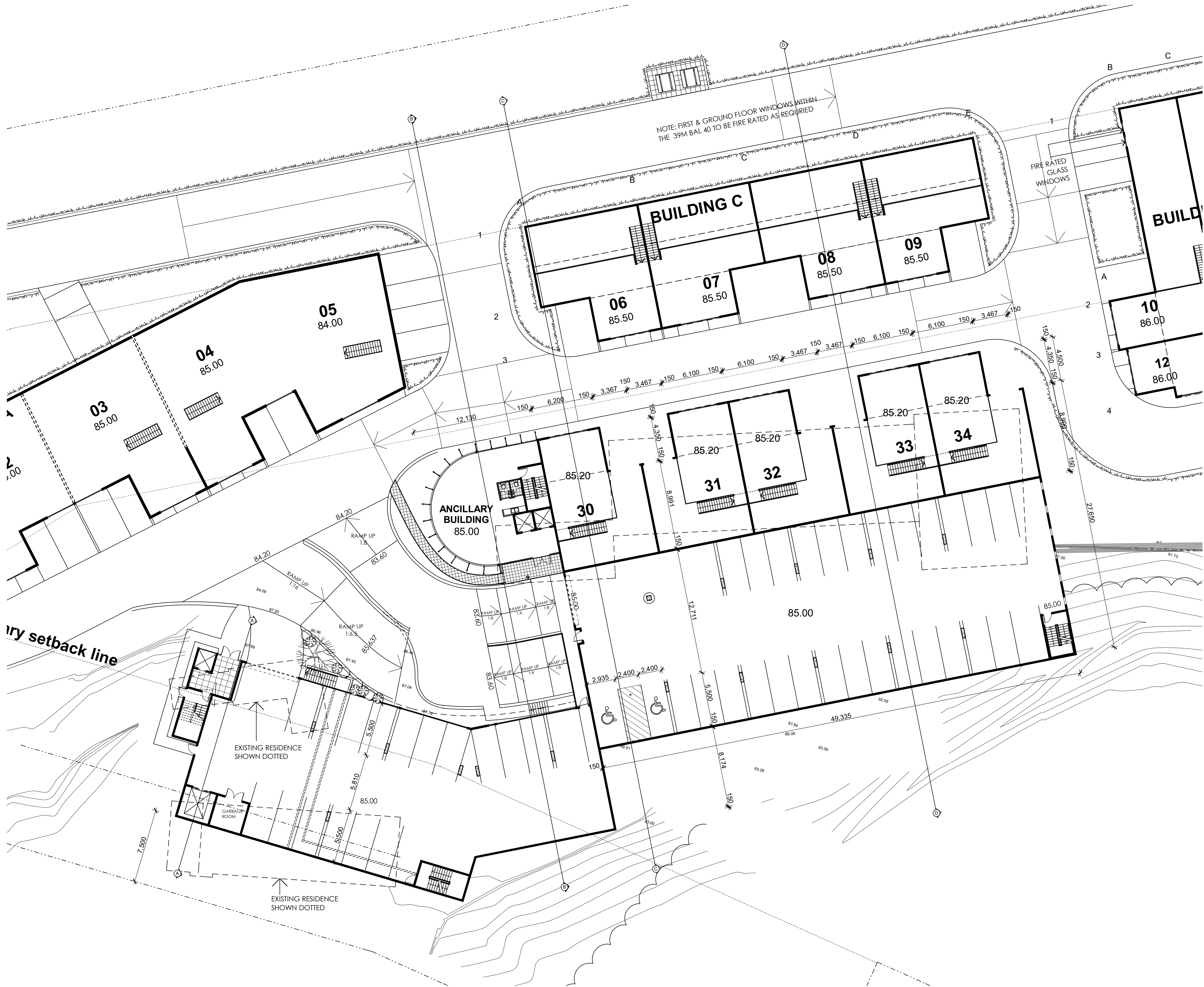
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Ground floor Stage 2

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| Date: Jan 2005          | Project No: 823  | AMEND |
| Scale: 1 : 100          | Drawing No: DA01 | D     |
| Date Plotted: 01-Oct-19 |                  |       |



|       |                                                     |          |
|-------|-----------------------------------------------------|----------|
| E     | DRIVEWAY REVISION COMMERCIAL INDUSTRIAL BLD REVISED | 30/09/19 |
| D     | UPDATED CONSULTANT ISSUE                            | 06/09/19 |
| C     | PRELIMINARY CONSULTANT ISSUE REVISED STAGE 2        | 02/08/19 |
| B     | UPDATED CONSULTANT ISSUE                            | 19/09/18 |
| A     | PRELIMINARY CONSULTANT ISSUE                        | 04/09/18 |
| ISSUE | AMENDMENT                                           | DATE     |

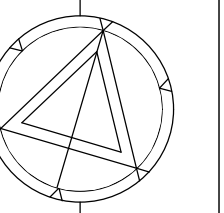
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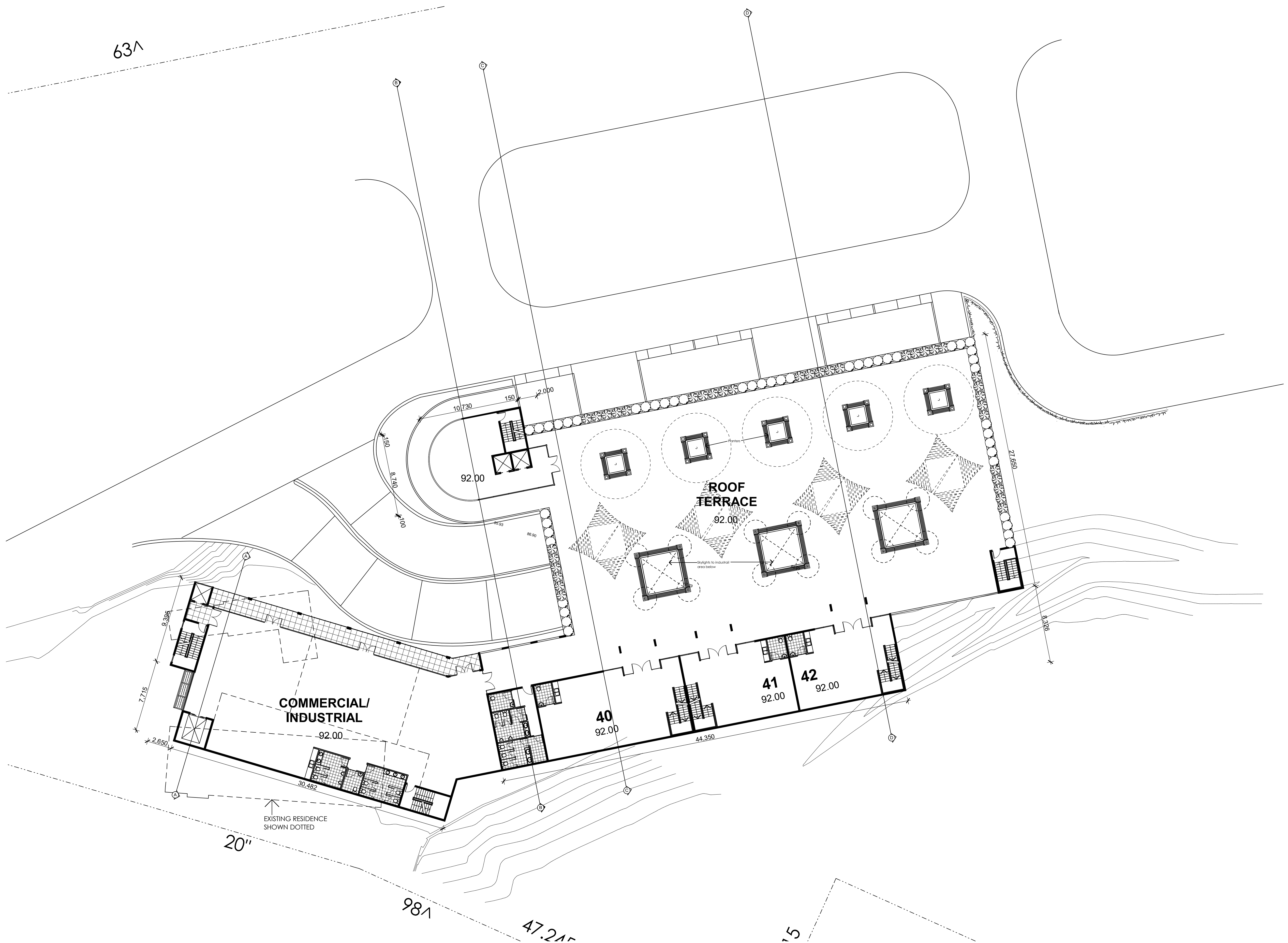
Ground floor mezzanine Stage 2

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|-------------------------|------------------|-------|
| Date: Jan 2005          | Project No: 823  | AMEND |
| Scale: 1 : 100          | Drawing No: DA02 | E     |
| Date Plotted: 01-Oct-19 |                  |       |





|       |                                                 |          |
|-------|-------------------------------------------------|----------|
| D     | COMMERCIAL INDUSTRIAL BLD REVISED               | 30/09/19 |
| C     | PRELIMINARY CONSULTANT ISSUE<br>REVISED STAGE 2 | 02/08/19 |
| B     | UPDATED CONSULTANT ISSUE                        | 19/09/18 |
| A     | PRELIMINARY CONSULTANT ISSUE                    | 04/09/18 |
| ISSUE | AMENDMENT                                       | DATE     |

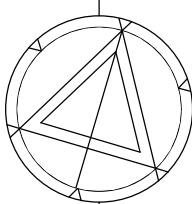
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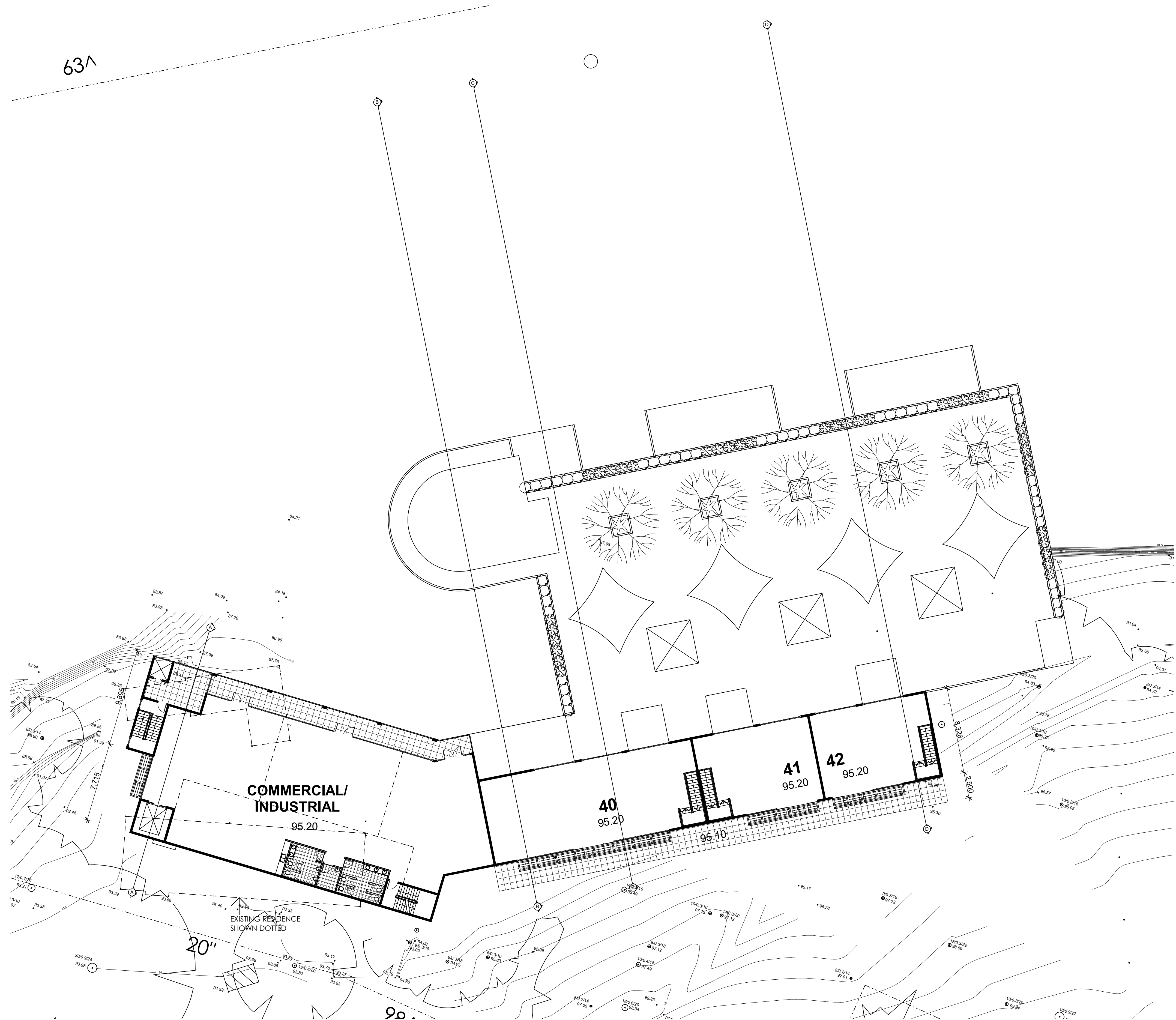
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Roof Terrace Level

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|-------------------------|------------------|-------|
| Date: Jan 2005          | Project No: 823  | AMEND |
| Scale: 1 : 100          | Drawing No: DA04 | D     |
| Date Plotted: 01-Oct-19 |                  |       |



|       |                                                 |          |
|-------|-------------------------------------------------|----------|
| D     | COMMERCIAL INDUSTRIAL BLD REVISED               | 30/09/19 |
| C     | PRELIMINARY CONSULTANT ISSUE<br>REVISED STAGE 2 | 02/08/19 |
| B     | UPDATED CONSULTANT ISSUE                        | 19/09/18 |
| A     | PRELIMINARY CONSULTANT ISSUE                    | 04/09/18 |
| ISSUE | AMENDMENT                                       | DATE     |

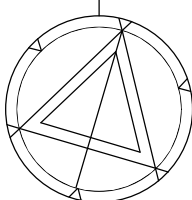
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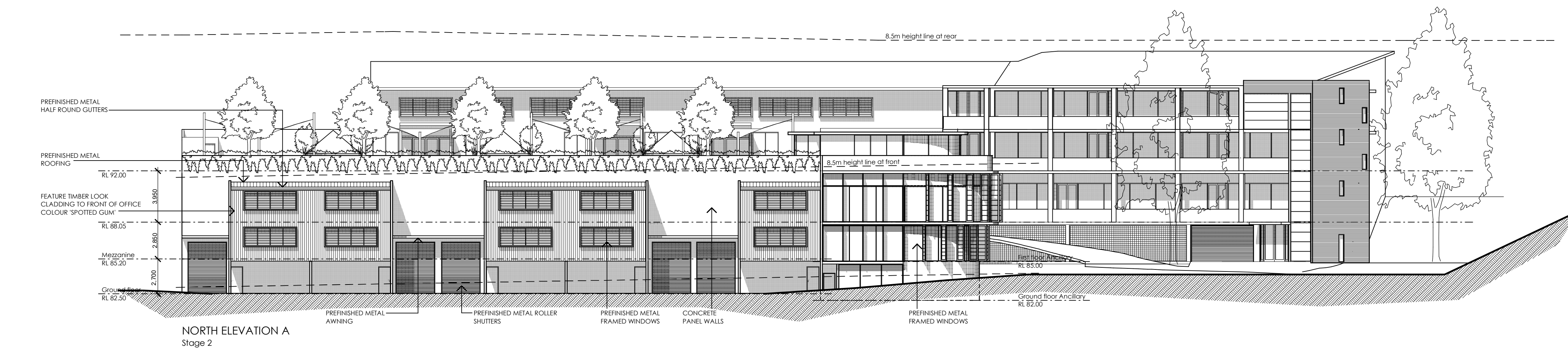
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Upper Roof Terrace

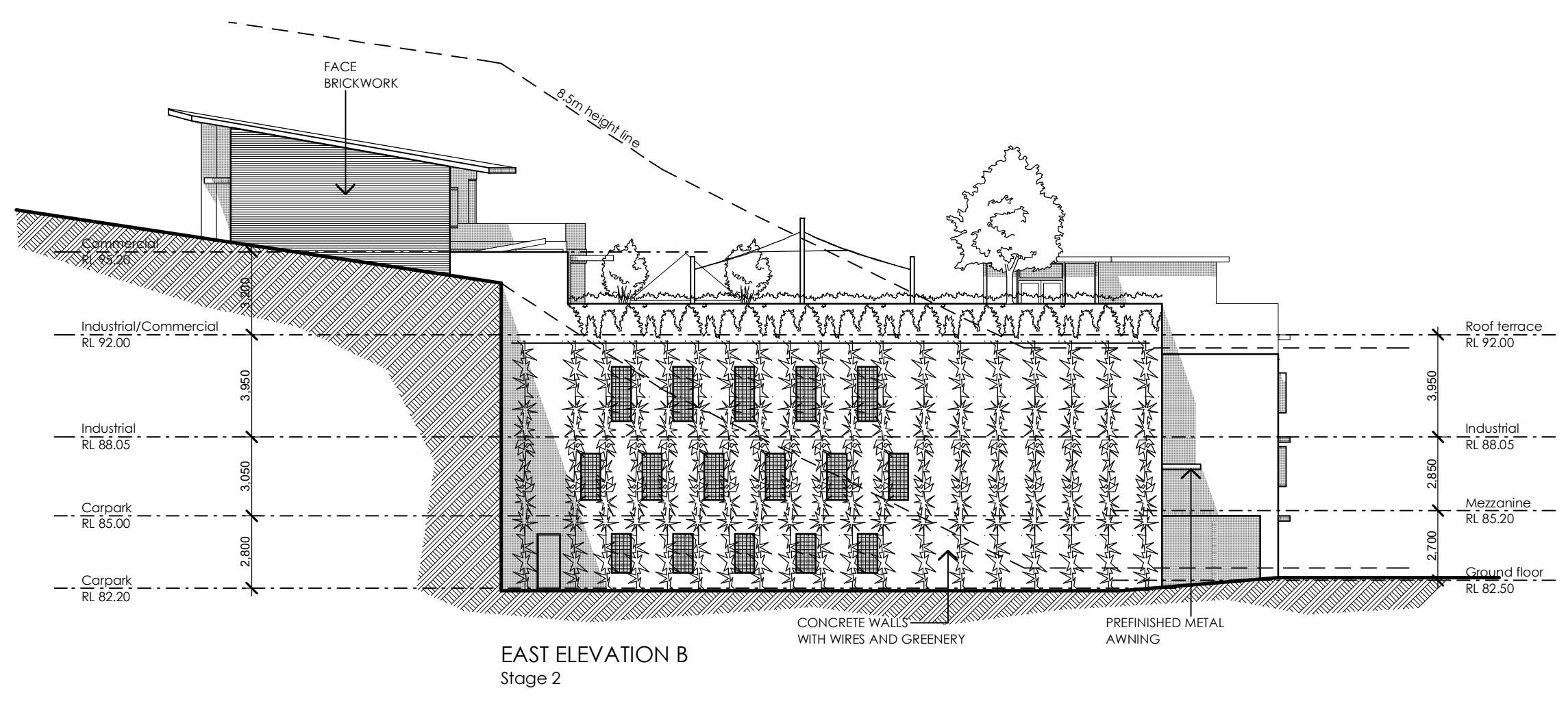
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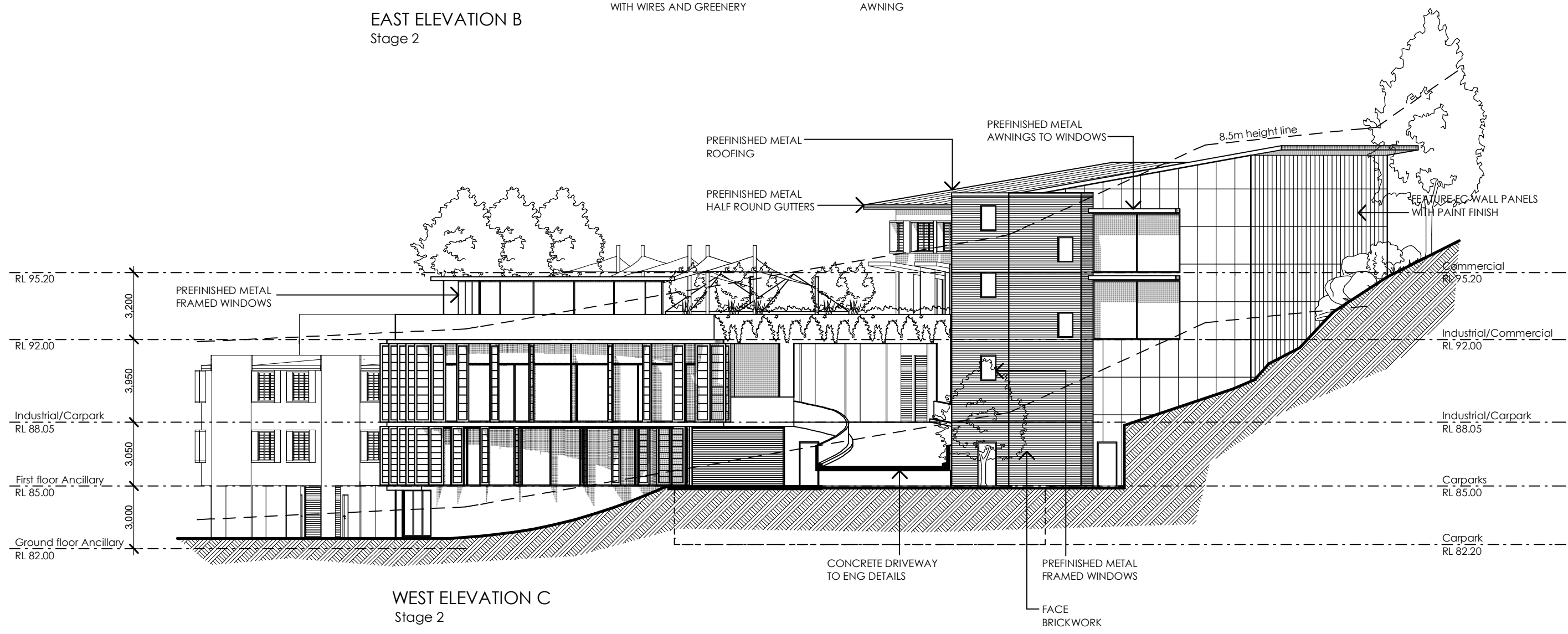
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| Scale: 1 : 100          | Drawing No: DA05 | D     |
| Date Plotted: 01-Oct-19 |                  |       |



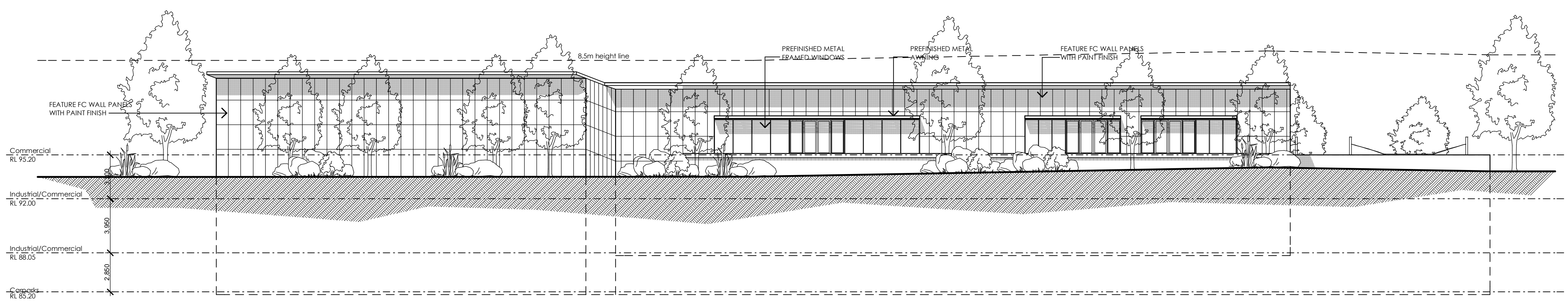
NORTH ELEVATION A  
Stage 2



EAST ELEVATION B  
Stage 2



WEST ELEVATION C  
Stage 2



SOUTH ELEVATION D  
Stage 2

|       |                                 |          |
|-------|---------------------------------|----------|
| C     | ELEVATIONS UPDATED AS PER PLANS | 30/09/19 |
| B     | UPDATED CONSULTANT ISSUE        | 26/08/19 |
| A     | PRELIMINARY CONSULTANT ISSUE    | 04/09/18 |
| ISSUE | AMENDMENT                       | DATE     |

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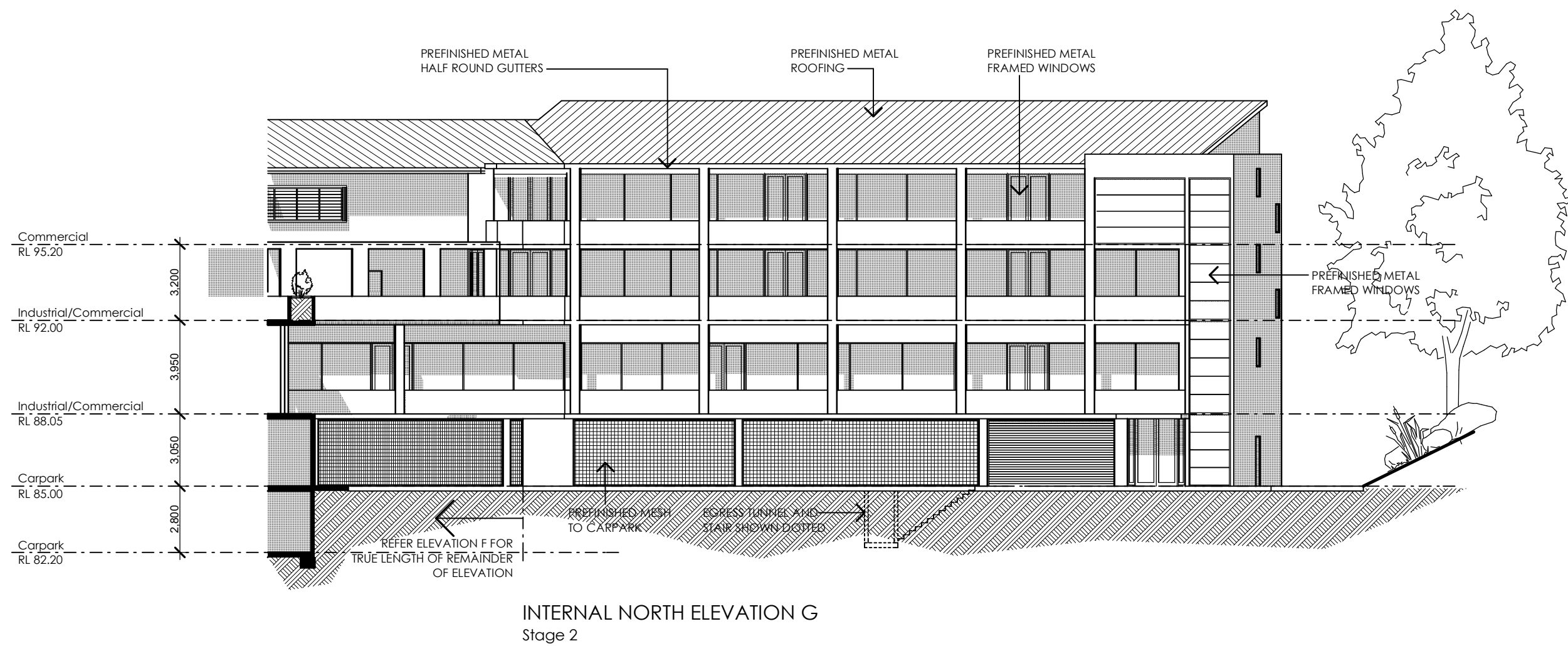
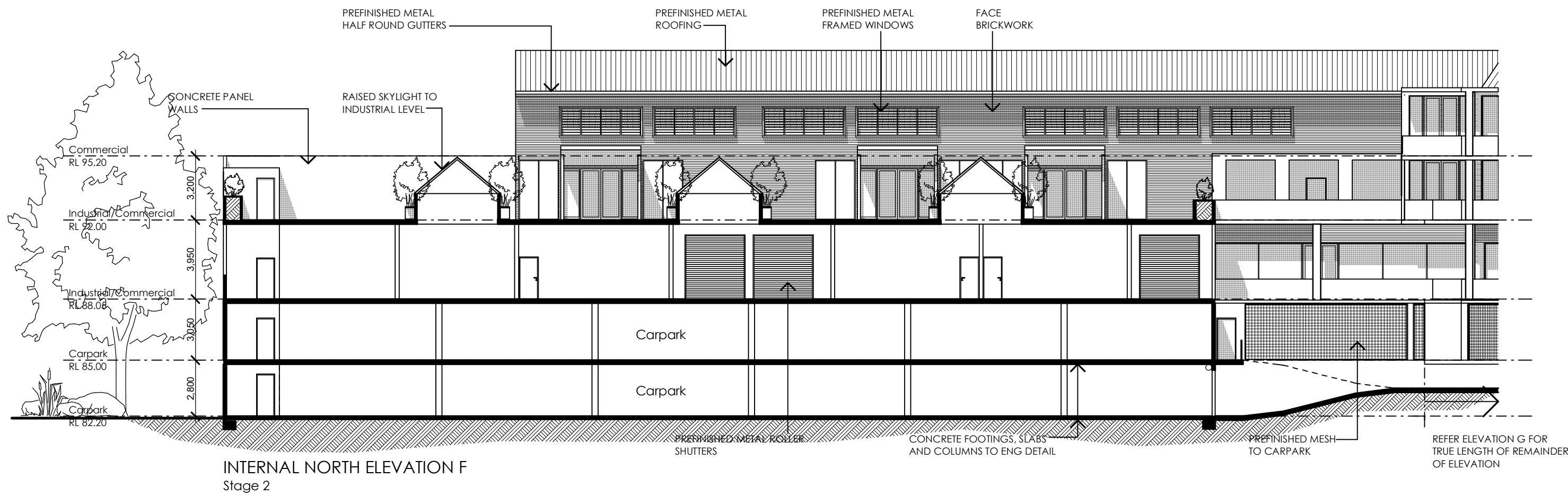
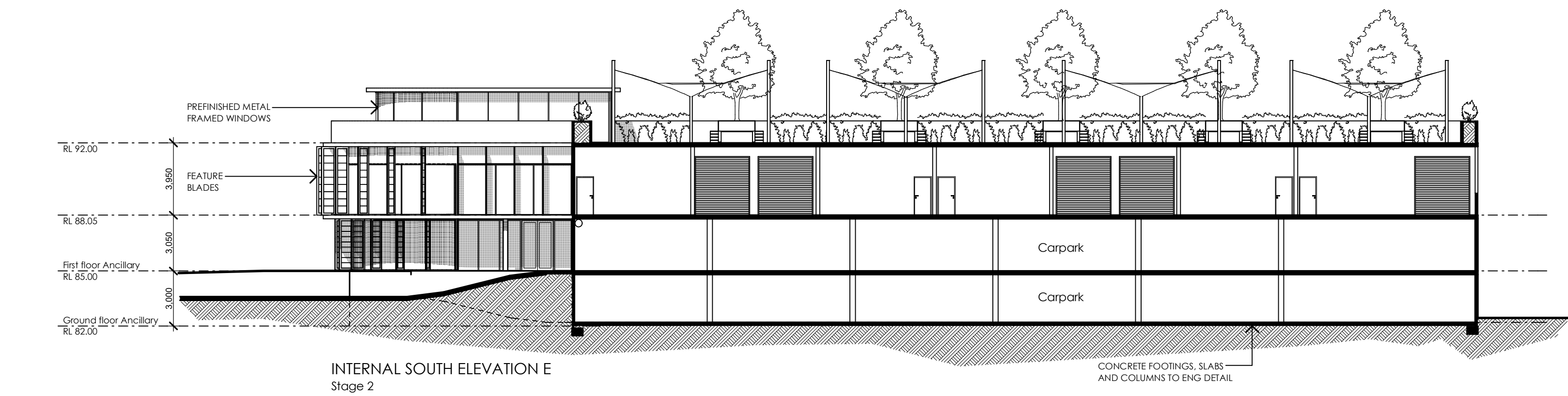
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Elevations

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| Date: Jan 2005          | Project No: 823  | AMEND |
| Scale: 1 : 100          | Drawing No: DA06 | C     |
| Date Plotted: 01-Oct-19 |                  |       |



|       |                                |          |
|-------|--------------------------------|----------|
| C     | ELEVATIONS UPDATED AS PER PLAN | 30/09/19 |
| B     | UPDATED CONSULTANT ISSUE       | 26/08/19 |
| A     | PRELIMINARY CONSULTANT ISSUE   | 04/09/18 |
| ISSUE | AMENDMENT                      | DATE     |

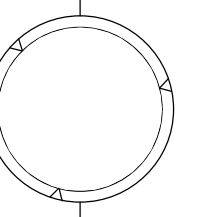
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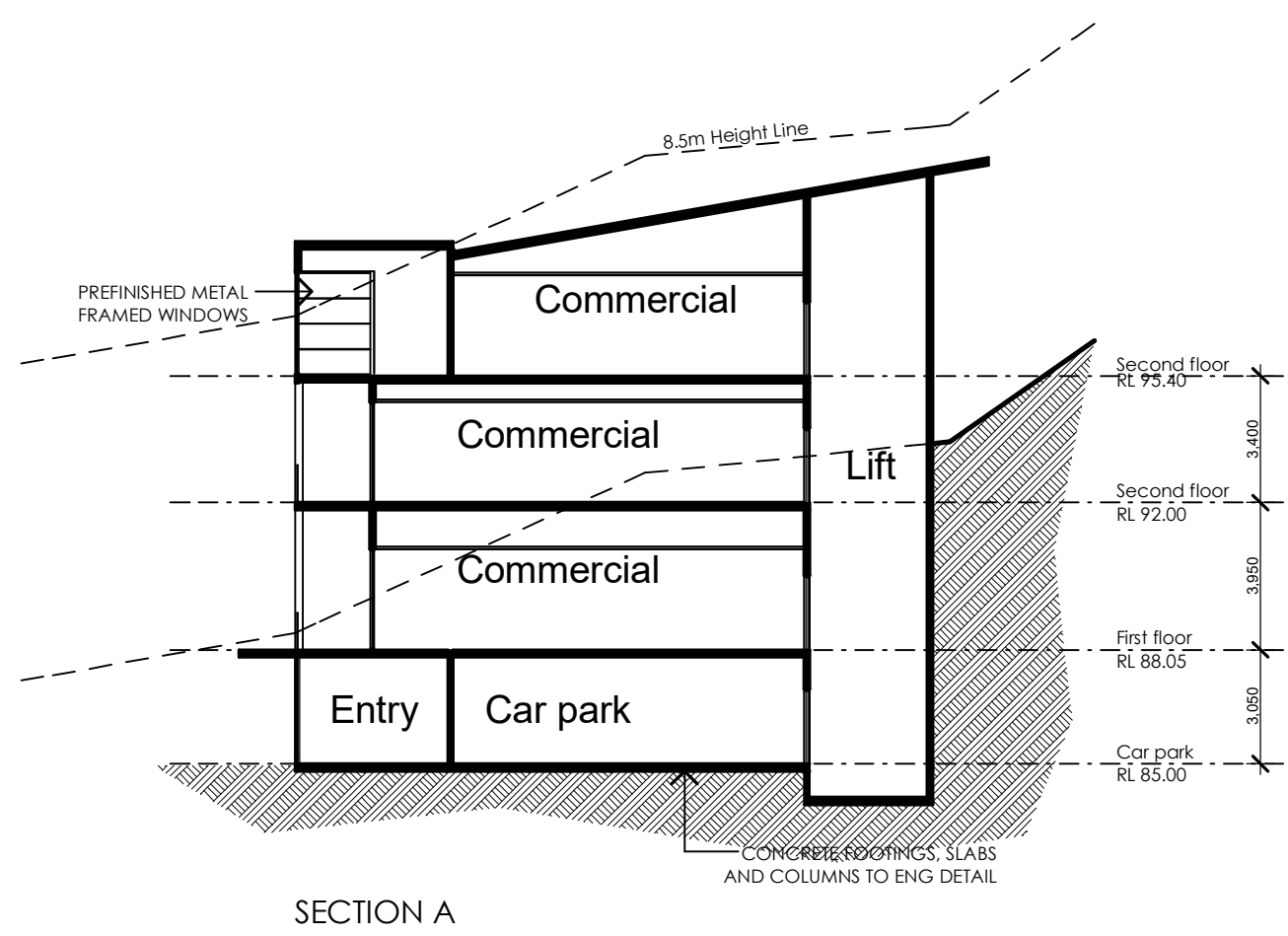
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Elevations

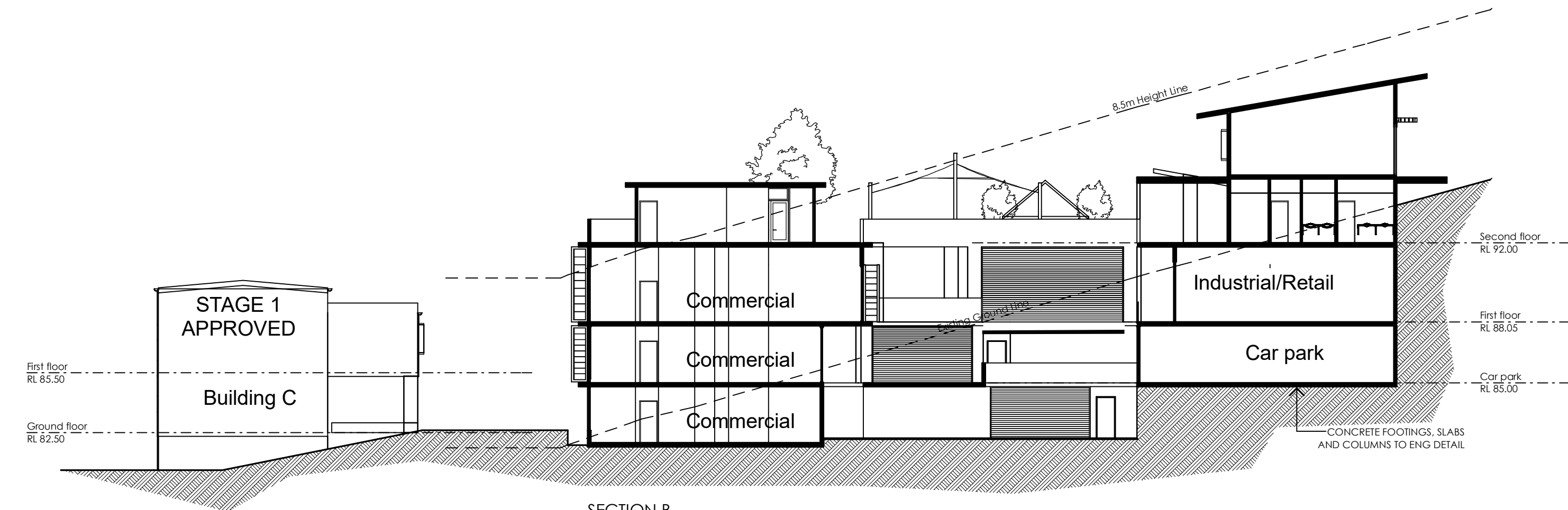
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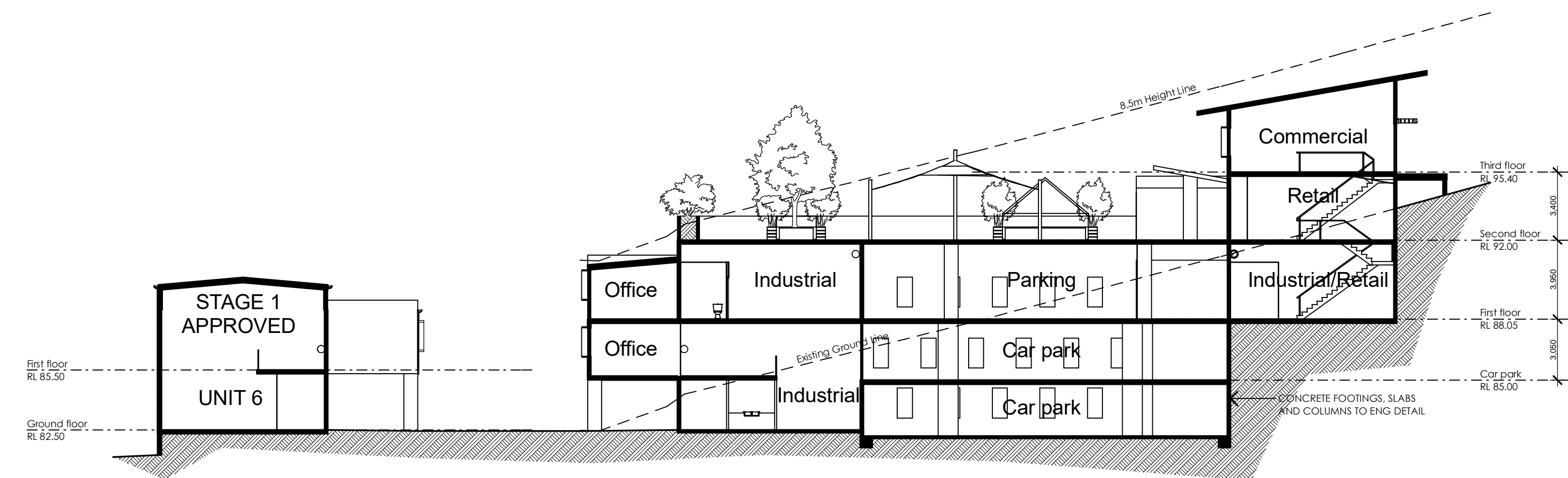
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| Date Plotted: 01-Oct-19 |                  |       |



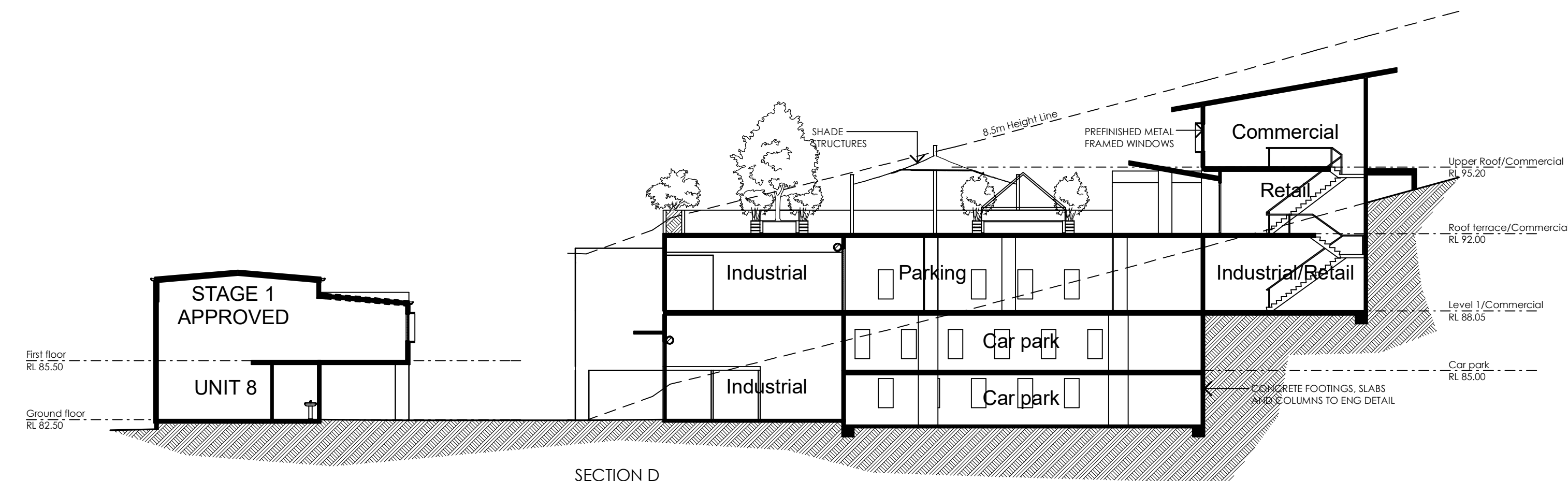
SECTION A



SECTION B



SECTION C



SECTION D

|       |                                                 |          |
|-------|-------------------------------------------------|----------|
| C     | PRELIMINARY CONSULTANT ISSUE<br>REVISED STAGE 2 | 02/08/19 |
| B     | UPDATED CONSULTANT ISSUE                        | 19/09/18 |
| A     | PRELIMINARY CONSULTANT ISSUE                    | 04/09/18 |
| ISSUE | AMENDMENT                                       | DATE     |

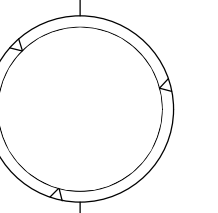
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|-------------------------|------------------|-------|
| Date: Jan 2005          | Project No: 823  | AMEND |
| Scale: 1 : 100          | Drawing No: DA08 | C     |
| Date Plotted: 01-Oct-19 |                  |       |

## Appendix C

### SIDRA Output



# MOVEMENT SUMMARY



**Site: 101 [EX AM PEAK WAKEHURST PARKWAY - DREADNOUGHT ROAD]**

New Site

Site Category: (None)

Signals - Actuated Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
|---------------------------------|------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|---------------------|------------------|--------------------|
| Mov ID                          | Turn | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
| South: WAKEHURST PARKWAY        |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
| 1                               | L2   | 17                 | 2.0        | 0.030         | 27.9              | LOS B            | 0.5                            | 3.3        | 0.70         | 0.69                | 0.70             | 43.5               |
| 2                               | T1   | 360                | 2.0        | 0.595         | 28.8              | LOS C            | 15.1                           | 92.6       | 0.88         | 0.76                | 0.90             | 49.0               |
| 3                               | R2   | 113                | 2.0        | 0.508         | 47.8              | LOS D            | 5.8                            | 35.5       | 0.94         | 0.79                | 0.94             | 37.6               |
| Approach                        |      | 490                | 2.0        | 0.595         | 33.1              | LOS C            | 15.1                           | 92.6       | 0.88         | 0.76                | 0.91             | 45.6               |
| East: DREADNOUGHT ROAD          |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
| 4                               | L2   | 150                | 2.0        | 0.194         | 28.1              | LOS B            | 6.3                            | 39.0       | 0.60         | 0.70                | 0.60             | 36.0               |
| 5                               | T1   | 13                 | 2.0        | 0.194         | 23.5              | LOS B            | 6.3                            | 39.0       | 0.60         | 0.70                | 0.60             | 34.2               |
| 6                               | R2   | 328                | 2.0        | 0.822         | 48.5              | LOS D            | 19.1                           | 117.4      | 0.89         | 0.83                | 0.89             | 29.9               |
| Approach                        |      | 491                | 2.0        | 0.822         | 41.6              | LOS C            | 19.1                           | 117.4      | 0.79         | 0.79                | 0.79             | 31.6               |
| North: WAKEHURST PARKWAY        |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
| 7                               | L2   | 335                | 2.0        | 0.876         | 43.1              | LOS D            | 28.8                           | 177.0      | 0.82         | 0.82                | 0.85             | 40.6               |
| 8                               | T1   | 722                | 2.0        | 0.876         | 35.9              | LOS C            | 29.1                           | 178.7      | 0.81         | 0.76                | 0.84             | 44.1               |
| 9                               | R2   | 14                 | 2.0        | 0.031         | 30.9              | LOS C            | 0.6                            | 3.4        | 0.66         | 0.67                | 0.66             | 41.6               |
| Approach                        |      | 1071               | 2.0        | 0.876         | 38.1              | LOS C            | 29.1                           | 178.7      | 0.81         | 0.78                | 0.84             | 42.9               |
| West: DREADNOUGHT ROAD          |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
| 10                              | L2   | 2                  | 2.0        | 0.013         | 24.4              | LOS B            | 0.3                            | 2.0        | 0.65         | 0.48                | 0.65             | 36.8               |
| 11                              | T1   | 7                  | 2.0        | 0.013         | 19.8              | LOS B            | 0.3                            | 2.0        | 0.65         | 0.48                | 0.65             | 37.2               |
| 12                              | R2   | 3                  | 2.0        | 0.006         | 37.2              | LOS C            | 0.1                            | 0.8        | 0.66         | 0.61                | 0.66             | 30.7               |
| Approach                        |      | 12                 | 2.0        | 0.013         | 24.9              | LOS B            | 0.3                            | 2.0        | 0.65         | 0.51                | 0.65             | 35.3               |
| All Vehicles                    |      | 2064               | 2.0        | 0.876         | 37.7              | LOS C            | 29.1                           | 178.7      | 0.82         | 0.77                | 0.85             | 40.0               |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

| Movement Performance - Pedestrians |                     |                   |                   |                  |                                      |            |              |                     |  |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------|--------------|---------------------|--|
| Mov ID                             | Description         | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |  |
| P3                                 | North Full Crossing | 53                | 64.3              | LOS F            | 0.2                                  | 0.2        | 0.96         | 0.96                |  |
| All Pedestrians                    |                     | 53                | 64.3              | LOS F            |                                      |            | 0.96         | 0.96                |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY



**Site: 101 [EX PM PEAK WAKEHURST PARKWAY - DREADNOUGHT ROAD]**

New Site

Site Category: (None)

Signals - Actuated Isolated Cycle Time = 142 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |                       |               |                  |                      |                  |                                      |               |              |                     |                  |                       |
|---------------------------------|------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|---------------|--------------|---------------------|------------------|-----------------------|
| Mov ID                          | Turn | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Distance<br>m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed<br>km/h |
| South: WAKEHURST PARKWAY        |      |                       |               |                  |                      |                  |                                      |               |              |                     |                  |                       |
| 1                               | L2   | 12                    | 0.0           | 0.012            | 17.9                 | LOS B            | 0.3                                  | 1.8           | 0.49         | 0.67                | 0.49             | 51.2                  |
| 2                               | T1   | 1004                  | 2.0           | 1.001            | 56.9                 | LOS E            | 64.4                                 | 395.6         | 1.00         | 1.10                | 1.30             | 29.3                  |
| 3                               | R2   | 59                    | 2.0           | 0.086            | 30.9                 | LOS C            | 2.3                                  | 14.4          | 0.66         | 0.70                | 0.66             | 45.4                  |
| Approach                        |      | 1075                  | 2.0           | 1.001            | 55.0                 | LOS D            | 64.4                                 | 395.6         | 0.98         | 1.07                | 1.26             | 30.0                  |
| East: DREADNOUGHT ROAD          |      |                       |               |                  |                      |                  |                                      |               |              |                     |                  |                       |
| 4                               | L2   | 82                    | 2.0           | 0.111            | 30.4                 | LOS C            | 3.5                                  | 21.7          | 0.61         | 0.68                | 0.61             | 35.2                  |
| 5                               | T1   | 6                     | 0.0           | 0.111            | 25.8                 | LOS B            | 3.5                                  | 21.7          | 0.61         | 0.68                | 0.61             | 33.4                  |
| 6                               | R2   | 298                   | 2.0           | 0.911            | 65.0                 | LOS E            | 20.8                                 | 127.6         | 0.97         | 0.89                | 1.05             | 26.4                  |
| Approach                        |      | 386                   | 2.0           | 0.911            | 57.0                 | LOS E            | 20.8                                 | 127.6         | 0.89         | 0.84                | 0.95             | 27.9                  |
| North: WAKEHURST PARKWAY        |      |                       |               |                  |                      |                  |                                      |               |              |                     |                  |                       |
| 7                               | L2   | 103                   | 0.0           | 0.692            | 59.4                 | LOS E            | 20.3                                 | 123.8         | 0.93         | 0.81                | 0.93             | 35.2                  |
| 8                               | T1   | 564                   | 2.0           | 0.692            | 52.6                 | LOS D            | 21.0                                 | 129.2         | 0.93         | 0.81                | 0.93             | 36.8                  |
| 9                               | R2   | 6                     | 2.0           | 0.045            | 73.3                 | LOS F            | 0.4                                  | 2.4           | 0.94         | 0.64                | 0.94             | 26.2                  |
| Approach                        |      | 673                   | 1.7           | 0.692            | 53.8                 | LOS D            | 21.0                                 | 129.2         | 0.93         | 0.81                | 0.93             | 36.5                  |
| West: DREADNOUGHT ROAD          |      |                       |               |                  |                      |                  |                                      |               |              |                     |                  |                       |
| 10                              | L2   | 16                    | 0.0           | 0.066            | 27.6                 | LOS B            | 1.1                                  | 6.7           | 0.74         | 0.61                | 0.74             | 35.0                  |
| 11                              | T1   | 19                    | 0.0           | 0.066            | 23.0                 | LOS B            | 1.1                                  | 6.7           | 0.74         | 0.61                | 0.74             | 35.3                  |
| 12                              | R2   | 41                    | 0.0           | 0.111            | 48.1                 | LOS D            | 2.1                                  | 12.8          | 0.77         | 0.71                | 0.77             | 27.6                  |
| Approach                        |      | 76                    | 0.0           | 0.111            | 37.5                 | LOS C            | 2.1                                  | 12.8          | 0.76         | 0.67                | 0.76             | 30.7                  |
| All Vehicles                    |      | 2210                  | 1.8           | 1.001            | 54.4                 | LOS D            | 64.4                                 | 395.6         | 0.94         | 0.94                | 1.09             | 31.3                  |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

| Movement Performance - Pedestrians |                     |                      |                      |                  |                                            |               |              |                     |  |
|------------------------------------|---------------------|----------------------|----------------------|------------------|--------------------------------------------|---------------|--------------|---------------------|--|
| Mov ID                             | Description         | Demand Flow<br>ped/h | Average Delay<br>sec | Level of Service | Average Back of Queue<br>Pedestrian<br>ped | Distance<br>m | Prop. Queued | Effective Stop Rate |  |
| P3                                 | North Full Crossing | 53                   | 65.3                 | LOS F            | 0.2                                        | 0.2           | 0.96         | 0.96                |  |
| All Pedestrians                    |                     | 53                   | 65.3                 | LOS F            |                                            |               | 0.96         | 0.96                |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

## MOVEMENT SUMMARY



**Site: 101 [EX AM PEAK WAKEHURST PARKWAY - DREADNOUGHT ROAD + STAGES 1 + 2]**

New Site

Site Category: (None)

Signals - Actuated Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |                       |               |                  |                      |                  |                                      |                                |              |                     |                  |                       |
|---------------------------------|------|-----------------------|---------------|------------------|----------------------|------------------|--------------------------------------|--------------------------------|--------------|---------------------|------------------|-----------------------|
| Mov ID                          | Turn | Demand Total<br>veh/h | Flows HV<br>% | Deg. Satn<br>v/c | Average Delay<br>sec | Level of Service | 95% Back of Queue<br>Vehicles<br>veh | Back of Queue<br>Distance<br>m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed<br>km/h |
| South: WAKEHURST PARKWAY        |      |                       |               |                  |                      |                  |                                      |                                |              |                     |                  |                       |
| 1                               | L2   | 17                    | 0.0           | 0.029            | 27.8                 | LOS B            | 0.5                                  | 3.3                            | 0.70         | 0.69                | 0.70             | 43.8                  |
| 2                               | T1   | 403                   | 2.0           | 0.666            | 31.9                 | LOS C            | 18.2                                 | 111.9                          | 0.90         | 0.79                | 0.96             | 47.1                  |
| 3                               | R2   | 113                   | 2.0           | 0.517            | 48.6                 | LOS D            | 5.8                                  | 35.8                           | 0.94         | 0.79                | 0.94             | 37.3                  |
| Approach                        |      | 533                   | 1.9           | 0.666            | 35.3                 | LOS C            | 18.2                                 | 111.9                          | 0.91         | 0.79                | 0.94             | 44.5                  |
| East: DREADNOUGHT ROAD          |      |                       |               |                  |                      |                  |                                      |                                |              |                     |                  |                       |
| 4                               | L2   | 150                   | 2.0           | 0.193            | 28.1                 | LOS B            | 6.3                                  | 38.9                           | 0.60         | 0.70                | 0.60             | 36.0                  |
| 5                               | T1   | 13                    | 0.0           | 0.193            | 23.5                 | LOS B            | 6.3                                  | 38.9                           | 0.60         | 0.70                | 0.60             | 34.2                  |
| 6                               | R2   | 367                   | 2.0           | 0.917            | 57.1                 | LOS E            | 24.4                                 | 149.9                          | 0.92         | 0.89                | 1.02             | 27.9                  |
| Approach                        |      | 530                   | 2.0           | 0.917            | 48.1                 | LOS D            | 24.4                                 | 149.9                          | 0.82         | 0.83                | 0.89             | 30.0                  |
| North: WAKEHURST PARKWAY        |      |                       |               |                  |                      |                  |                                      |                                |              |                     |                  |                       |
| 7                               | L2   | 342                   | 2.0           | 0.913            | 48.0                 | LOS D            | 31.8                                 | 195.5                          | 0.82         | 0.85                | 0.91             | 38.5                  |
| 8                               | T1   | 737                   | 2.0           | 0.913            | 40.8                 | LOS C            | 32.1                                 | 197.3                          | 0.82         | 0.80                | 0.90             | 41.7                  |
| 9                               | R2   | 14                    | 0.0           | 0.033            | 31.3                 | LOS C            | 0.6                                  | 3.3                            | 0.68         | 0.67                | 0.68             | 41.5                  |
| Approach                        |      | 1093                  | 2.0           | 0.913            | 43.0                 | LOS D            | 32.1                                 | 197.3                          | 0.82         | 0.81                | 0.90             | 40.6                  |
| West: DREADNOUGHT ROAD          |      |                       |               |                  |                      |                  |                                      |                                |              |                     |                  |                       |
| 10                              | L2   | 2                     | 0.0           | 0.013            | 24.4                 | LOS B            | 0.3                                  | 2.0                            | 0.65         | 0.48                | 0.65             | 36.8                  |
| 11                              | T1   | 7                     | 0.0           | 0.013            | 19.8                 | LOS B            | 0.3                                  | 2.0                            | 0.65         | 0.48                | 0.65             | 37.2                  |
| 12                              | R2   | 3                     | 0.0           | 0.006            | 37.2                 | LOS C            | 0.1                                  | 0.8                            | 0.66         | 0.61                | 0.66             | 30.7                  |
| Approach                        |      | 12                    | 0.0           | 0.013            | 24.9                 | LOS B            | 0.3                                  | 2.0                            | 0.65         | 0.51                | 0.65             | 35.3                  |
| All Vehicles                    |      | 2168                  | 1.9           | 0.917            | 42.2                 | LOS C            | 32.1                                 | 197.3                          | 0.84         | 0.81                | 0.91             | 38.1                  |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

| Movement Performance - Pedestrians |                     |                      |                      |                  |                                            |                                |              |                     |  |
|------------------------------------|---------------------|----------------------|----------------------|------------------|--------------------------------------------|--------------------------------|--------------|---------------------|--|
| Mov ID                             | Description         | Demand Flow<br>ped/h | Average Delay<br>sec | Level of Service | Average Back of Queue<br>Pedestrian<br>ped | Back of Queue<br>Distance<br>m | Prop. Queued | Effective Stop Rate |  |
| P3                                 | North Full Crossing | 53                   | 64.3                 | LOS F            | 0.2                                        | 0.2                            | 0.96         | 0.96                |  |
| All Pedestrians                    |                     | 53                   | 64.3                 | LOS F            |                                            |                                | 0.96         | 0.96                |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY



**Site: 101 [FUT PM PEAK WAKEHURST PARKWAY - DREADNOUGHT ROAD + STAGES 1 + 2]**

New Site

Site Category: (None)

Signals - Actuated Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

| Movement Performance - Vehicles |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
|---------------------------------|------|--------------------|------------|---------------|-------------------|------------------|--------------------------------|------------|--------------|---------------------|------------------|--------------------|
| Mov ID                          | Turn | Demand Total veh/h | Flows HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
| South: WAKEHURST PARKWAY        |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
| 1                               | L2   | 12                 | 0.0        | 0.012         | 17.7              | LOS B            | 0.3                            | 1.8        | 0.47         | 0.66                | 0.47             | 51.4               |
| 2                               | T1   | 1039               | 2.0        | 1.008         | 60.0              | LOS E            | 68.8                           | 422.6      | 1.00         | 1.12                | 1.33             | 28.6               |
| 3                               | R2   | 59                 | 2.0        | 0.083         | 30.8              | LOS C            | 2.3                            | 14.3       | 0.64         | 0.70                | 0.64             | 45.5               |
| Approach                        |      | 1110               | 2.0        | 1.008         | 57.9              | LOS E            | 68.8                           | 422.6      | 0.98         | 1.09                | 1.29             | 29.3               |
| East: DREADNOUGHT ROAD          |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
| 4                               | L2   | 82                 | 2.0        | 0.110         | 29.4              | LOS C            | 3.4                            | 21.1       | 0.60         | 0.68                | 0.60             | 35.5               |
| 5                               | T1   | 6                  | 0.0        | 0.110         | 24.9              | LOS B            | 3.4                            | 21.1       | 0.60         | 0.68                | 0.60             | 33.7               |
| 6                               | R2   | 309                | 2.0        | 0.929         | 66.6              | LOS E            | 21.9                           | 134.6      | 0.98         | 0.91                | 1.09             | 26.1               |
| Approach                        |      | 397                | 2.0        | 0.929         | 58.3              | LOS E            | 21.9                           | 134.6      | 0.89         | 0.86                | 0.98             | 27.7               |
| North: WAKEHURST PARKWAY        |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
| 7                               | L2   | 113                | 0.0        | 0.853         | 61.0              | LOS E            | 23.0                           | 140.2      | 0.96         | 0.84                | 0.97             | 34.7               |
| 8                               | T1   | 616                | 2.0        | 0.853         | 54.0              | LOS D            | 23.1                           | 142.0      | 0.96         | 0.83                | 0.97             | 36.3               |
| 9                               | R2   | 6                  | 2.0        | 0.049         | 73.2              | LOS F            | 0.4                            | 2.4        | 0.95         | 0.64                | 0.95             | 26.2               |
| Approach                        |      | 735                | 1.7        | 0.853         | 55.2              | LOS D            | 23.1                           | 142.0      | 0.96         | 0.83                | 0.97             | 36.0               |
| West: DREADNOUGHT ROAD          |      |                    |            |               |                   |                  |                                |            |              |                     |                  |                    |
| 10                              | L2   | 16                 | 0.0        | 0.065         | 26.9              | LOS B            | 1.1                            | 6.5        | 0.74         | 0.61                | 0.74             | 35.3               |
| 11                              | T1   | 19                 | 0.0        | 0.065         | 22.3              | LOS B            | 1.1                            | 6.5        | 0.74         | 0.61                | 0.74             | 35.6               |
| 12                              | R2   | 41                 | 0.0        | 0.109         | 47.1              | LOS D            | 2.1                            | 12.6       | 0.76         | 0.71                | 0.76             | 27.9               |
| Approach                        |      | 76                 | 0.0        | 0.109         | 36.6              | LOS C            | 2.1                            | 12.6       | 0.75         | 0.66                | 0.75             | 30.9               |
| All Vehicles                    |      | 2318               | 1.8        | 1.008         | 56.4              | LOS D            | 68.8                           | 422.6      | 0.95         | 0.96                | 1.12             | 30.9               |

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

| Movement Performance - Pedestrians |                     |                   |                   |                  |                                      |            |              |                     |  |
|------------------------------------|---------------------|-------------------|-------------------|------------------|--------------------------------------|------------|--------------|---------------------|--|
| Mov ID                             | Description         | Demand Flow ped/h | Average Delay sec | Level of Service | Average Back of Queue Pedestrian ped | Distance m | Prop. Queued | Effective Stop Rate |  |
| P3                                 | North Full Crossing | 53                | 64.3              | LOS F            | 0.2                                  | 0.2        | 0.96         | 0.96                |  |
| All Pedestrians                    |                     | 53                | 64.3              | LOS F            |                                      |            | 0.96         | 0.96                |  |

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

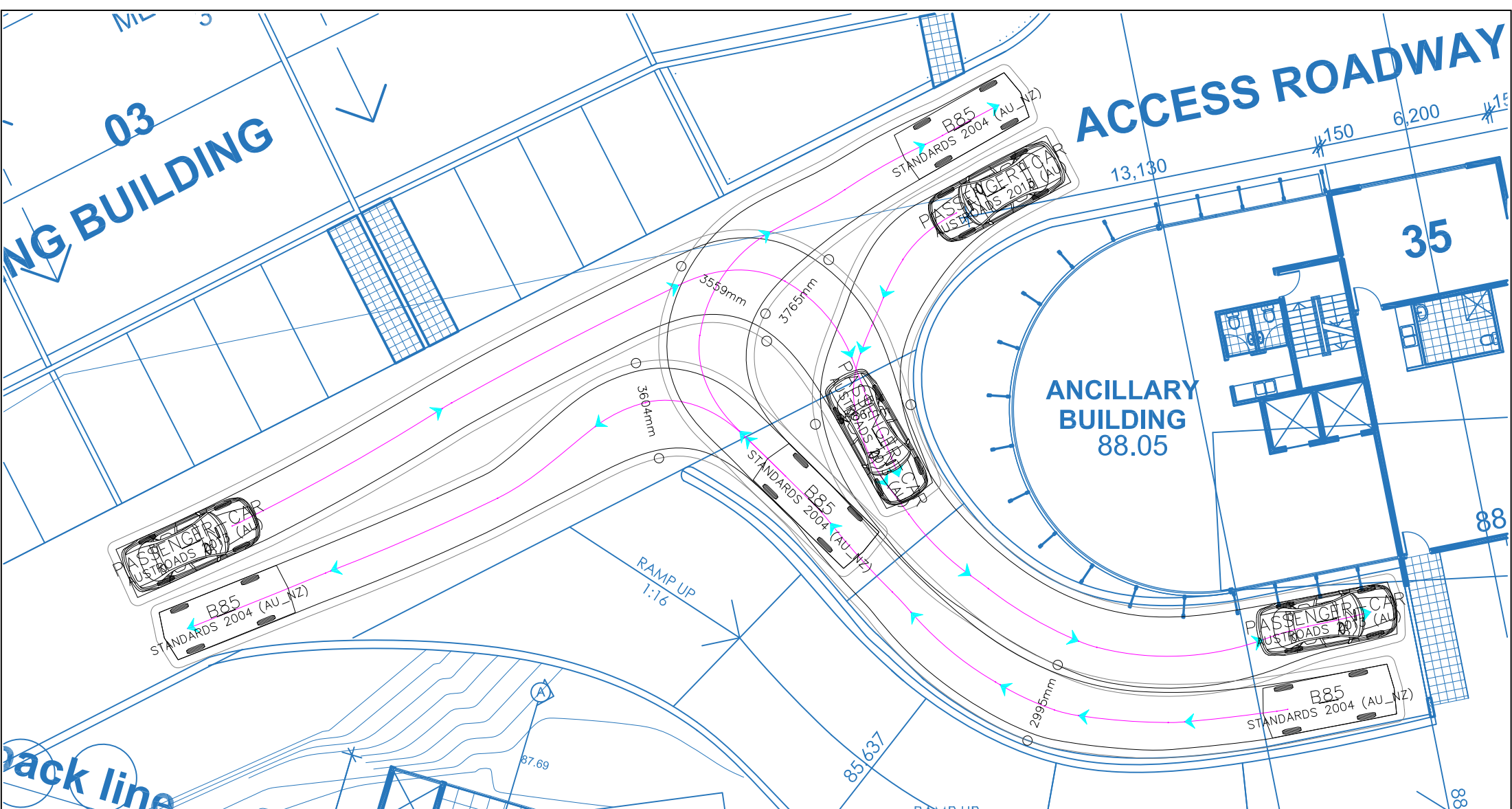
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

## Appendix D

# Turning Path Assessment

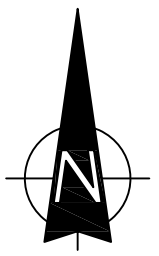




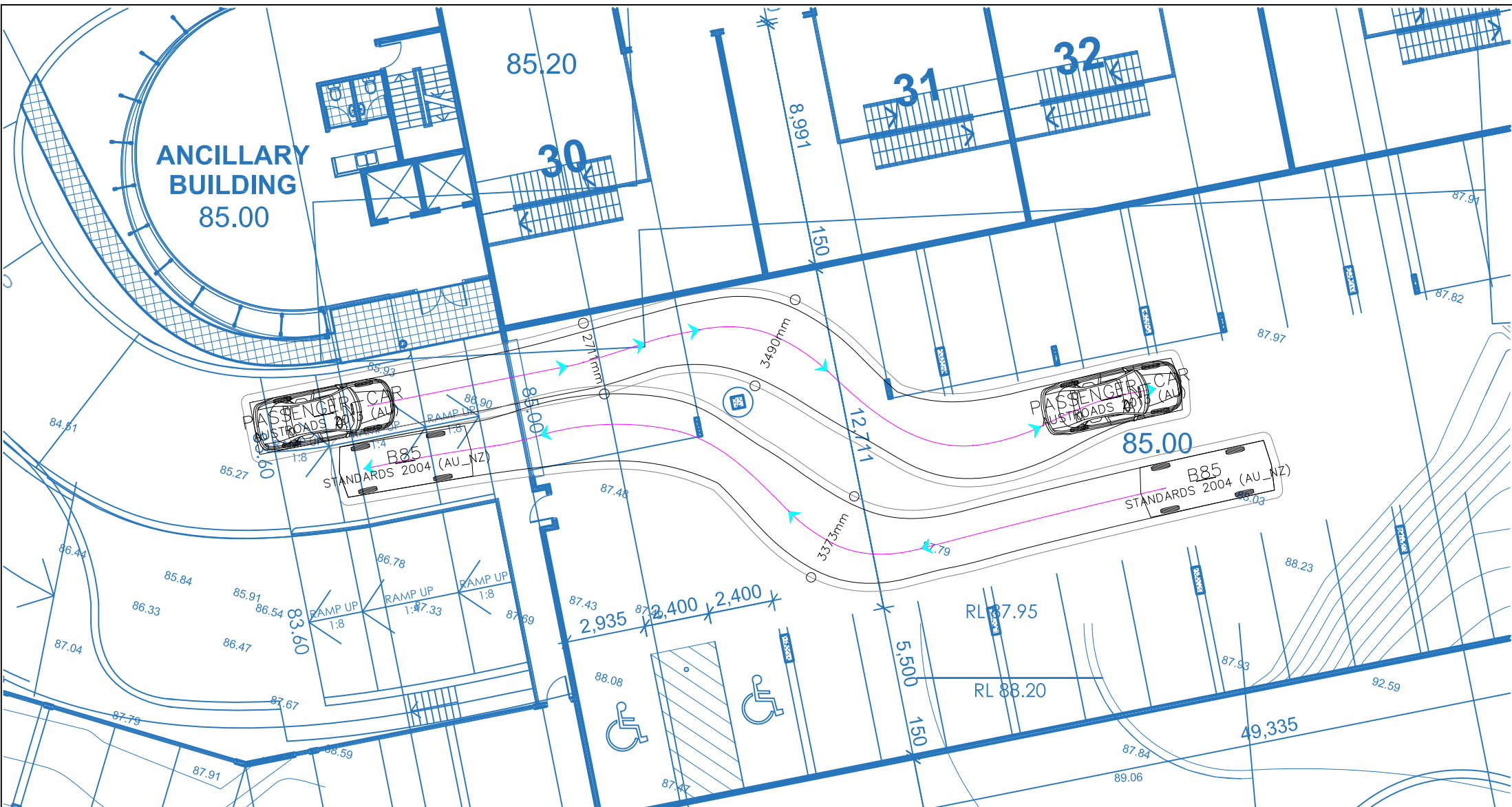


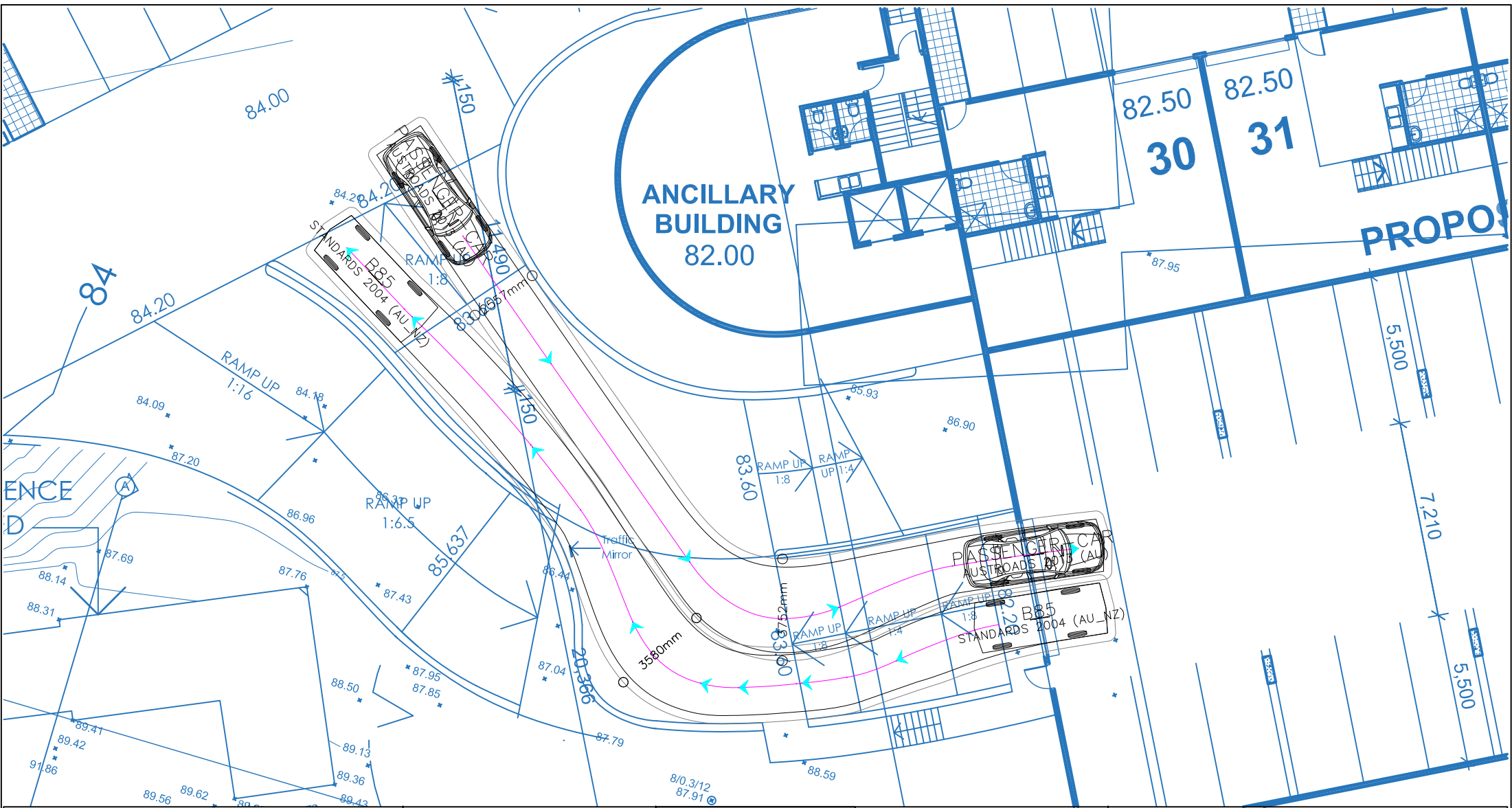
**LEGEND**

This drawing has been prepared using vehicle modelling computer software AutoTURN PRO10 in conjunction with AutoCAD 2018. 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.



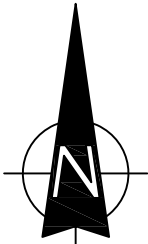
**SWEPT PATH ANALYSIS  
OF B99 CARS ENTERING AND  
B85 CARS EXITING GROUND  
FLOOR MEZZANINE**



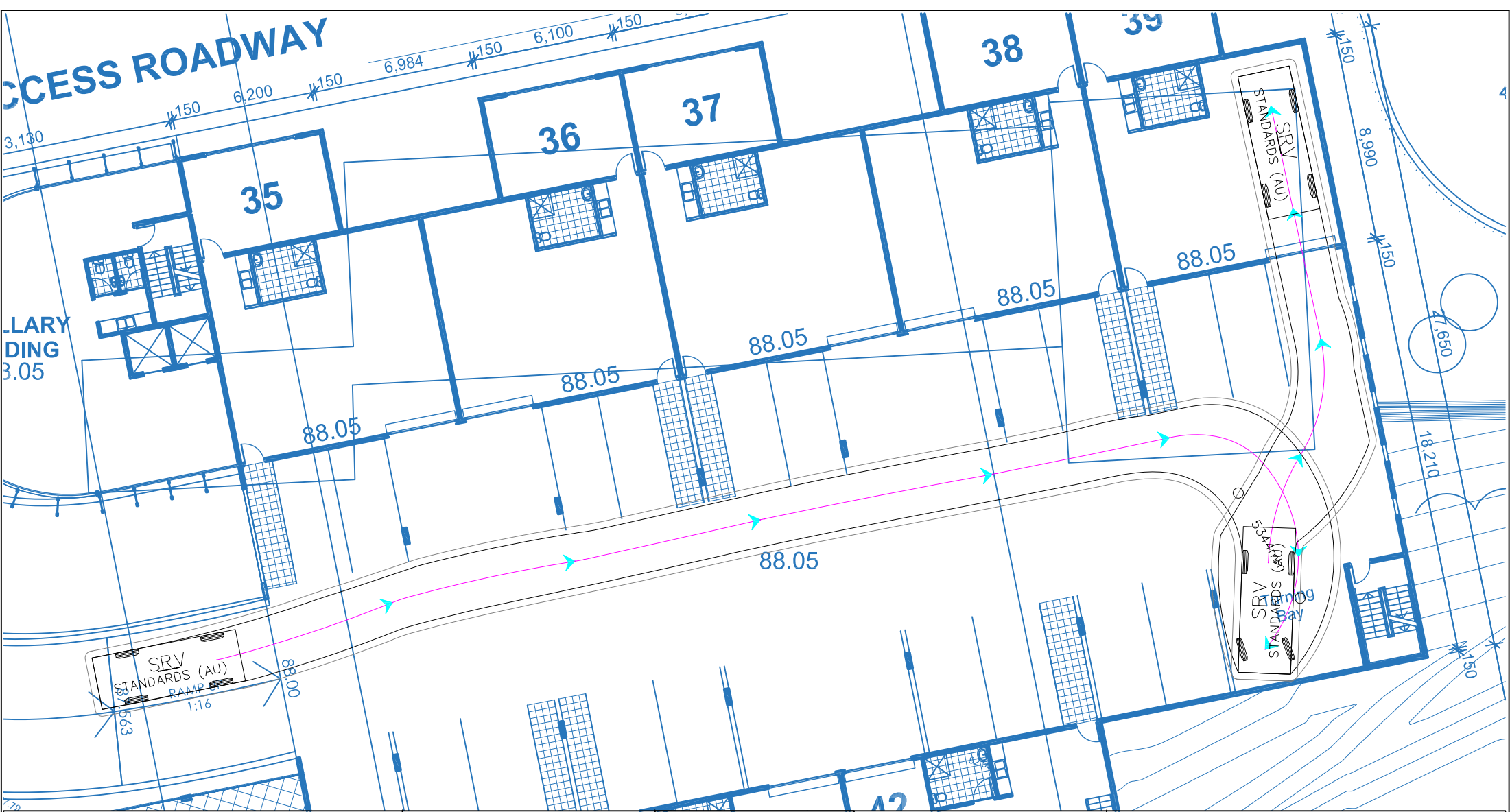


**LEGEND**

This drawing has been prepared using vehicle modelling computer software AutoTURN PRO10 in conjunction with AutoCAD 2018. 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.

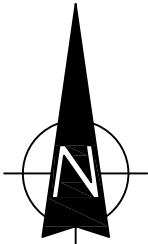


**SWEPT PATH ANALYSIS  
OF B99 CARS ENTERING AND  
B85 CARS EXITING GROUND  
FLOOR**



**LEGEND**

This drawing has been prepared using vehicle modelling computer software AutoTURN PRO10 in conjunction with AutoCAD 2018. 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 6.4m SMALL RIGID  
VEHICLE ENTERING  
INDUSTRIAL UNIT 39 ON LEVEL  
1 MEZZANINE**







## Transport and Traffic Planning Associates