Structural
Civil
Traffic
Façade

Traffic and Parking Report

The Anglican School Googong Stage 4

Prepared for Cox Architecture / 23 September 2019

189119

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Contents

Revision Register

Rev	Date	Prepared By	Approved By	Remarks
1	23.09.19	KI	CP	Development Application

1.0 Introduction

Taylor Thomson Whitting was engaged to conduct engineering assessments for the traffic and parking arrangements to be constructed within The Anglican School Googong (TASG) site to support the Development Application submission for the Stage 4 development (Senior School Hub) whilst maintaining safe and efficient traffic and pedestrian conditions.

This report assesses the existing traffic and parking arrangements, conditions and behaviours of TASG and the surrounding road network.

The proposed development is then described to allow for suitable car parking and vehicular access arrangements to be assessed. The report nominates the total student and staff population to be catered to by the Stage 4 works and the associated parking facilities to be provided.

The impact of the parking provisions were then modelled in SIDRA to assess the impact of the Stage 4 works on the surrounding road network.

2.0 Existing Site Conditions

The proposed development is located in Lot 613 DP 1195842. It is bounded to the north by Gorman Drive, the south by Rogers Road, the east by Rosa Street, and the west by Hearne Street. Figure 1 shows the locality plan.

Figure 1. Locality Plan (Source: Google Earth; Imagery Date: 08.04.19)

Currently, there are ongoing construction works within the vicinity of TASG. These generally consist of continued development of the Googong Township including residential construction and road works.

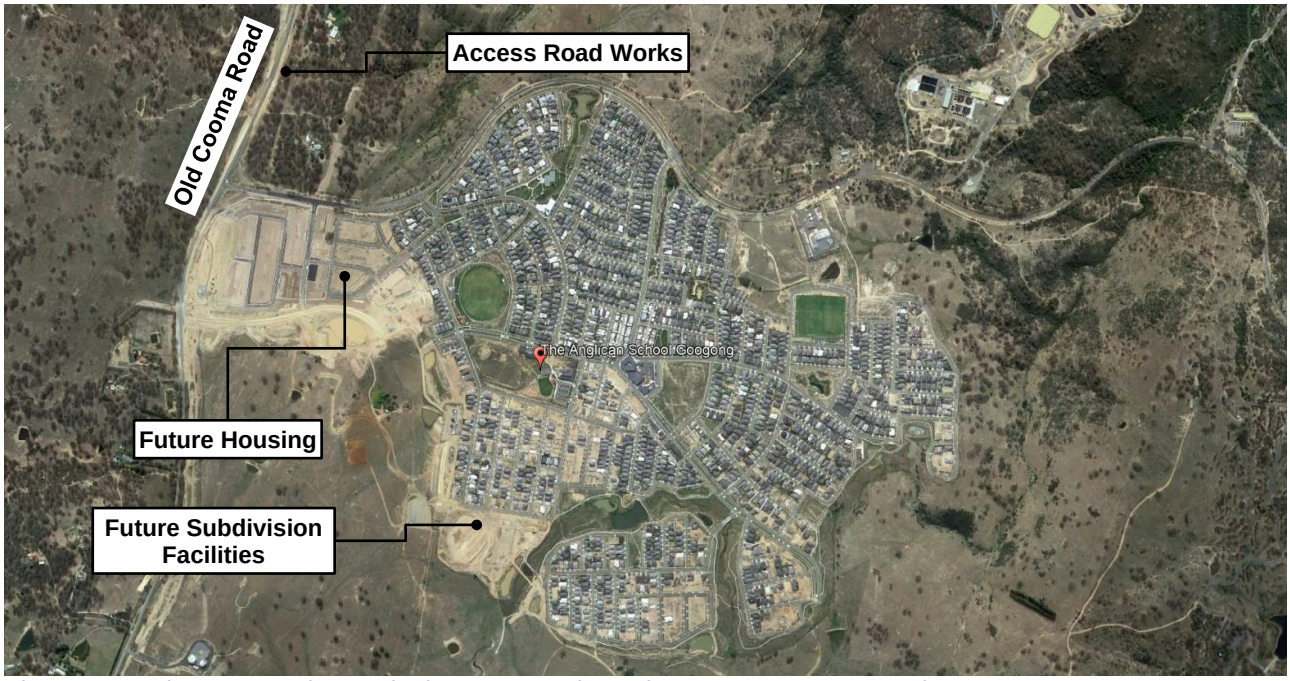

Figure 2. Ongoing Construction Works (Source: Google Earth; Imagery Date: 08.04.19)

2.1 Surrounding Roads

Gorman Drive is one of the major roads connecting the Googong Township to the Old Cooma Road. It is a single-lane road with a lane width of 3.0m and a 6.0m landscape median. Both sides of Gorman Drive have a 1.5m bike lane.

Rosa Street is a minor road connecting Gorman Drive and Rogers Road. It has a road width of approximately 6.5m and provides access to the school car park.

Rogers Road is a collector road extending from Helen Circuit to Hearne Street. It has a road width of approximately 6.5m and provides the residential streets a link to the major roads.

Hearne Street is a minor road linking multiple residential streets to major roads such as Gorman Drive and collector roads such as Rockley Parade. It has a road width of approximately 8.2m.

All the roads surrounding the school have a speed limit of 40 km/hr during peak pick up and drop off periods.

2.2 Current Parking Provisions

TASG currently caters to 245 students from kindergarten to year 8 and 35 staff.

The current parking provisions servicing TASG consists of:

- 36 on-street parking spaces along Gorman Drive and Rosa Street (Figure 3)
  - Both sides of Gorman Drive are available for on-street parallel parking
  - Only the side adjacent TASG of Rosa Street is available for on-street parallel parking
  - No available on-street parking along Hearne Street and Rogers Road.
- Off-street car park consisting of 71 parking spaces (Figure 4)
  - Predominantly used by school staff and parents picking up and dropping off students
  - 62 long stay 90-degree parking spaces
  - 7 short stay parallel parking spaces
  - 2 accessible car spaces
  - Access and exit from the car park are both via the vehicular crossings along Rosa Street

Figure 3. On-street Parallel Car Parks Adjacent the Project Site (Source: Google Earth; Imagery Date: 08.04.19)

Figure 4. Existing Car Park Layout

3.0 Proposed Development

Stage 4 of the proposed works at TASG involves the Senior School Hub with a gross floor area of ~2,400m^2. By the end of Stage 4, the Senior School Hub is expected to cater to 242 year 7 to 12 students and 34 staff. Refer Appendix A for the Student Numbers provided by TASG.

3.1 Parking Provisions

TTW has assessed the existing TASG parking arrangements and the projected enrolments up to 2030 against a number of municipal parking generation rates for similar facilities to form an opinion on the likely number of on-site car spaces required to service the school for the Stage 4 expansion.

For car parking generation rates for educational establishments, the current QBN DCP references the SEPP for Education Establishments and Extended Child Care (2017) which does not provide generation rates. In lieu, the ACTPLA parking generation rates were used as a guide. The generation rates used to determine the parking requirements of the school in 2030 and beyond are:

- Kindergarten to Year 10
  - 0.8 long stay car spaces per 10 students
  - 0.4 short stay car spaces per 10 students
- Year 11 to 12
  - 1.8 long stay car spaces per 10 students
  - 0.4 short stay car spaces per 10 students

TTW recommends the following on-site parking provisions for the Senior School Hub:

- 34 staff car spaces
- 23 long stay car spaces
- 10 drop-off and pick-up spaces
- 2 DDA car spaces

Refer Appendix B for the proposed Car Park Layout for Stage 4. The proposed layout consists of 60 perpendicular spaces and 13 parallel spaces. The 60 perpendicular spaces will accommodate 34 staff car spaces, 23 long stay car spaces, 2 DDA car spaces, and 1 shared space. The 13 parallel spaces will accommodate 10 drop-off and pick-up spaces, the remaining 3 will be available for loading service vehicles.

To cater for future development of the school, the proposed car park would be expanded to cater to the increased demand induced by future developments within TASG. This expansion has been considered in locating the proposed car park. Refer Appendix C for the expanded car park layout.

It is proposed that the 36 on-street short-stay car parks continue to be utilised for visitors and pick-up/ drop-off periods.

3.2 Access and Circulation

Three access driveways have been provided for the proposed car park – 1 entrance, 1 exit for pick-up/ drop-off vehicles, and 1 exit for parked vehicles. Refer Appendix B for the proposed Car Park Layout for Stage 4.

TASG has been included in the conceptualization process of the car park layout. They have expressed that they wanted to prevent delays or bottlenecking induced by a combined access for drivers intending to park and drivers intending to pick-up/ drop-off, which is what they have described as their experience with the existing car park adjacent Rosa Street.

With the layout provided (Figure 5), vehicles access the car park off the entrance driveway at Hearne Street. Once inside, they may proceed to the pick-up/ drop-off area or turn right into the parking area. If a vehicle is not able to find a space in the pick-up/ drop-off area, they may circulate through the parking aisle and re-join the pick-up/ drop-off line. Alternatively, if the pick-up/ drop-off area is congested at beginning of the pick-up/ drop-off area, then the driver may turn right into the parking aisle. The aisle at the pick-up/ drop off area is one

way while the aisle at the parking area is two-way. A turn around bay is provided at the end of the second row of perpendicular spaces to allow a driver to turn around if the long stay car spaces are occupied.

When a driver pick-ups or drops off their child, they then proceed to the exit driveway off Rogers Road where they exit the site via a left turn exit. From the long-stay parking lot, drivers may exit the site via the left and right turn exit driveway off Hearne Street or the left turn only exit driveway off Rogers Road.

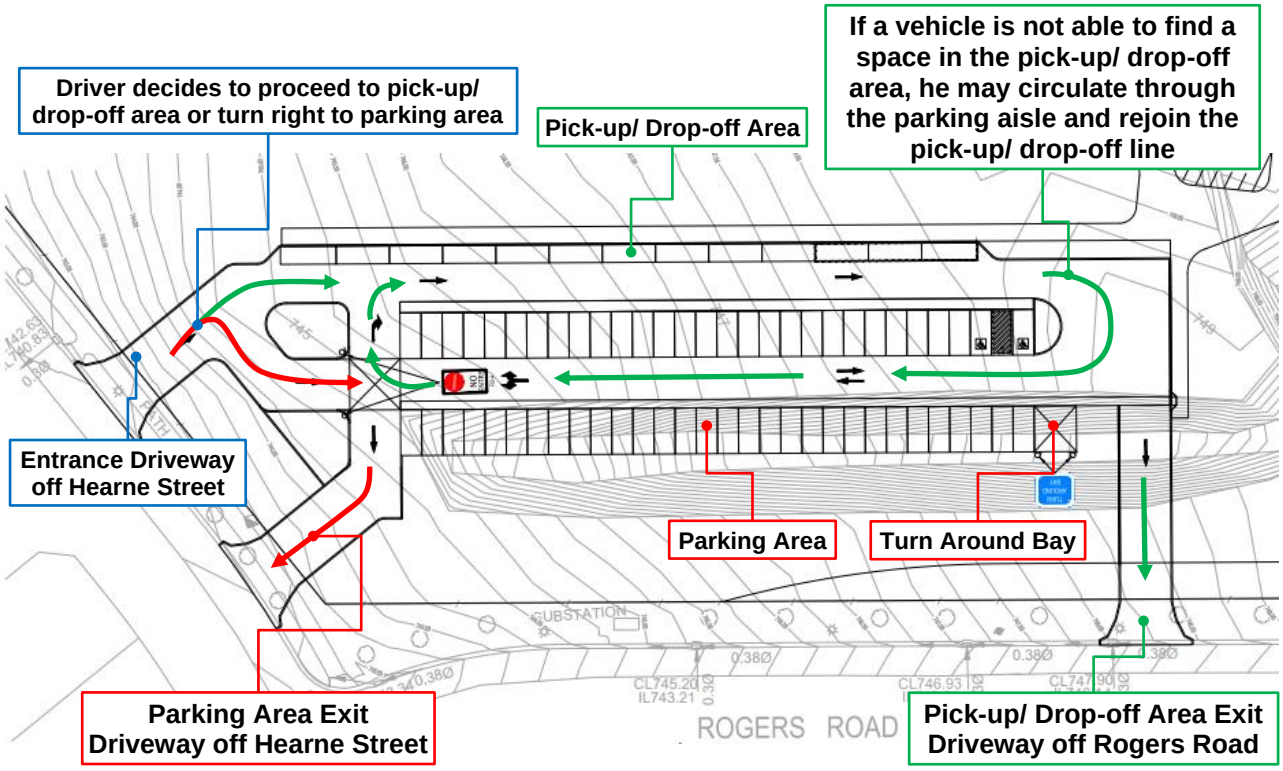

Figure 5. Vehicle Movements in Car Park

3.3 Heavy Vehicle Access

A vehicle turning simulation has been run for a 12.5m HRV for the proposed car park. Appendix D shows that the HRV can access the site at the entrance driveway off Hearne Street and exit at the driveway off Rogers Road.

3.4 Anticipated Traffic Impacts

The construction of the new car park is anticipated to result in up to 75 entry and exit vehicle movements per hour in the peak am drop off period, and up to 80 entry and exit movements in the peak pm pick up period.

The school based peak am and pm traffic periods have been found to not align with the peak am and pm traffic periods of the surrounding areas.

The locations of the proposed driveways have been modelled in SIDRA, and the additional vehicles utilising Hearne Street to access the school will not adversely affect the performance of the intersection of Gorman Drive and Hearne Street.

Carrying out sensitivity analysis of this intersection indicates that there is significant capacity on Hearne and Rogers Road to cater for the additional 80 entrance and exit movements into and out of the school car park without traffic on each road being impacted in an unacceptable manner.

Sensitivity modelling of the intersections of Rosa Street and Hearne Street with Gorman Drive indicates that the intersections in their current arrangement can cater for the increased traffic travelling to and from the school

in the peak am and pm school traffic periods. They key to the performance of these intersections is the peak am and pm school traffic periods occurring outside of the general traffic peak am and pm periods.

4.0 Conclusion

TTW has assessed the Stage 4 TASG parking demand and increase in traffic over existing parking and traffic arrangements, conditions and behaviours in support of the Works Approval Submission of the proposed development.

A car park of 60 perpendicular spaces and 13 parallel spaces with an entrance driveway off Hearne Street and exit driveways off Hearne Street and Rogers Road is recommended (Appendix B Car Park Layout for Stage 4). The car park caters to the demand induced by Stage 4 development (Senior School Hub) and has been located considering the later expansion which will cater to the additional demand induced by future developments within TASG (Appendix C Expanded Car Park Layout).

The driveways were also modelled in SIDRA and were found to not adversely impact the performance of the intersection of Gorman Drive and Hearne Street. A sensitivity analysis of the intersection also indicated that there is significant additional capacity available before the intersections approach a Level of Service of C.

TTW concludes that the proposed Stage 4 car park works at TASG is not anticipated to adversely impact the surrounding network and recommend them for approval.

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in its capacity as trustee for the
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Christie Player
Associate Director

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Appendix A

Student Numbers

From: Merryn Clarksmith <Merryn.Clarksmith@tasg.nsw.edu.au>
Sent: Tuesday, 3 September 2019 10:22 AM
To: Christie Player <Christie.Player@ttw.com.au>
Subject: Student Numbers

The Anglican School Googong
Student Numbers

	Actuals			Forecast	Projections										
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Pre-K															
K	25	34	27	36	33	40	40	40	40	40	40	40	40	40	40
1	21	21	29	26	37	33	40	40	40	40	40	40	40	40	40
2	9	21	27	25	25	37	33	40	40	40	40	40	40	40	40
3	10	11	21	27	30	25	37	33	40	40	40	40	40	40	40
4		13	16	21	42	30	25	37	33	40	40	40	40	40	40
5			25	22	22	42	30	25	37	33	40	40	40	40	40
6				27	21	22	42	30	25	37	33	40	40	40	40
7			40	27	62	60	60	60	60	60	60	60	60	60	60
8				34	26	62	60	60	60	60	60	60	60	60	60
9					34	26	62	60	60	60	60	60	60	60	60
10						34	26	62	60	60	60	60	60	60	60
11						0	34	26	62	60	60	60	60	60	60
12						0	0	34	26	62	60	60	60	60	60
Total K - 6	**65**	**100**	**145**	**184**	**210**	**229**	**247**	**245**	**255**	**270**	**273**	**280**	**280**	**280**	**280**
Total 7 - 12	**0**	**0**	**40**	**61**	**122**	**182**	**242**	**302**	**328**	**362**	**360**	**360**	**360**	**360**	**360**
Total K - 12	**65**	**100**	**185**	**245**	**332**	**411**	**489**	**547**	**583**	**632**	**633**	**640**	**640**	**640**	**640**
Total Pre-K - 12	**65**	**100**	**185**	**245**	**332**	**411**	**489**	**547**	**583**	**632**	**633**	**640**	**640**	**640**	**640**

Appendix B

Car Park Layout for Stage 4

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C001

PAVEMENT LEGEND:

P1 — PAVEMENT P1
20mm layer of 10mm blue metal graded evenly as temporary surface
180mm DGB20 COMPACTED TO 98% MMDD.
180mm DGS20 COMPACTED TO 98% MMDD.
SUBGRADE CBR>3% COMPACTED TO 95% MMDD.

P2 — PAVEMENT P2
150mm 32MPa CONCRETE WITH SL82 30 TOP COVER ON 150mm DGB20 COMPACTED TO 98% MMDD. SUBGRADE CBR>3% COMPACTED TO 95% MMDD.

P3 — PAVEMENT P3
30mm AC10, C230
180mm DGB20 COMPACTED TO 98% MMDD.
180mm DGS20 COMPACTED TO 98% MMDD.
SUBGRADE CBR>3% COMPACTED TO 95% MMDD.

P4 — PAVEMENT P4
120mm 32 MPa Concrete with SL72 centre
100mm DGB20 compacted to 98% MMDD.

PROPOSED BUILDING
FFL 747.50

PROVIDE OUTLET PROTECTION. INSTALL NOM. 5M² REINFORCED CONCRETE APRON WITH 100-300ø RIP-RAP

IL 742.77
ø 450 'Z'
1.0%
17.81m
Q=282 L/s
IL 742.59

GRATED INLET PIT TO COLLECT STORMWATER FROM SWALE IN PARKING BAY ISLAND

PATH TO HAVE MAX 2.5% CROSS FALL

TURN DOWN EDGE OF PATH TO FORM KERB

PICK UP AND DROP OFF ZONE

DELIVERY ZONE OUTSIDE OF PEAK AM AND PM DROP OFF AND PICK UP TIMES

IL 745.98
ø 225 'Z'
2.0%
13.63m
Q=62 L/s
IL 745.70

SWALE

DISH KG OUT INTO ROADWAY

F748.05 FALL 1:6 F748.00 FALL 1:6 FALL 1:80 FALL 1:60 F747.48 F747.48 F747.48 F747.48 FALL F747.48 F747.42 F746.68

1:6 BATTER TO EXISTING

PROVIDE GROSS POLLUTANT TRAP AT LAST STORMWATER PIT BEFORE OUTLET

RELOCATE EXISTING LIGHT POLE. REFER TO ELECTRICAL ENGINEERS DRAWINGS FOR DETAILS (TYP)

RELOCATE EXISTING SIGN

ENTRY DRIVEWAY

IL 743.43
ø 375 'Z'
2.9%
22.04m
Q=265 L/s
IL 742.80

CONNECT GRATED DRAIN TO STORMWATER MAIN USING SLOPING SADDLE JUNCTION

EXIT DRIVEWAY

IL 744.41
ø 300 'Z'
4.1%
17.50m
Q=133 L/s
IL 743.69

IL 743.66
ø 375 'Z'
1.5%
13.09m
Q=197 L/s
IL 4633

SWALE TO COLLECT CAR PARK RUNOFF

IL 745.28
ø 300 'Z'
2.3%
36.53m
Q=112 L/s
IL 744.44

IL 745.67
ø 300 'Z'
1.0%
36.53m
Q=73 L/s
IL 745.31

NO ENTRY R2-4

DELINEATE PEDESTRIAN PATH/ TRAVEL ROUTE

TURN AROUND BAY

DDA CAR SPACES TO HAVE MAX 2.5% FALLS

TYPE R SUMP (TYP)

PROVIDE TURN AROUND FOR FIRE BRIGADE APPLIANCE

DDA PATH OF TRAVEL

CONVERT EXISTING SUMP TO GRATED INLET PIT MATCHING VEHICLE CROSSING PROFILE

TREES TO BE REMOVED. REFER TO LANDSCAPE ARCHITECTS DRAWING FOR DETAILS (TYP)

SITE BOUNDARY

SUBSTATION

CL745.20 IL743.21 0.3Ø

CL746.93 IL745.24 0.3Ø

CL747.90 IL746.14 0.3Ø

0.38Ø CL743.34 0.38Ø IL741.84

ROGERS ROAD

SITE WORKS PLAN STAGE 1

SCALE 1:200

PRELIMINARY

A1 0 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date
D	DRAFT DA FOR COORDINATION	CP	KI	20.09.19
C	DRAFT DA FOR COORDINATION	CP	KI	17.09.19
B	DRAFT DA FOR COORDINATION	CP	KI	13.09.19
A	FOR COORDINATION	CP	KI	12.09.19

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Project: GOOGONG ANGLICAN SCHOOL STAGE 4

Sheet Subject: SITE WORKS PLAN SHEET 1 OF 3

Scale : A1 1:200 | Drawn KI | Authorized

Job No 189119 | Drawing No C040 | Revision D

Plot File Created: Sep 19, 2019 - 6:27pm

FileName: C040.dwg - USER: angelai - Plot File Created: Sep 19, 2019 - 6:27pm

Appendix C

Expanded Car Park Layout

WORKS COMPLETED IN GREY

NEW WORKS SHOWN IN BLACK

LOT BOUNDARY

PATH

SUBSTATION

ROGERS ROAD

745

747

749

11

43

44

129

130

F743.89 F744.76 F745.61 F746.47 F746.62 F746.42 F747.17 F747.07

F743.16 F743.60 F747.38 F747.58 F748.41

FALL 2.5%

FALL 4%

7.00 7.00 6.00

2.63
40.83
0.3Ø

0.38Ø CL743.34 0.38Ø IL741.84

CL745.20 0.3Ø IL743.21

0.38Ø

CL746.93 0.3Ø IL745.24

0.38Ø

CL747.90 0.3Ø IL746.14

0.38Ø

CAR PARK PLAN

SCALE 1:200

PRELIMINARY

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Rev	Description	Eng	Draft	Date
A	FOR INFORMATION	CP	KI	05.09.19

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GOOGONG ANGLICAN SCHOOL
STAGE 4

Sheet Subject

CAR PARK PLAN
STAGE 2

Scale : A1	Drawn	Authorized
1:200	KI	

Job No	Drawing No	Revision
189119	SK00C	A

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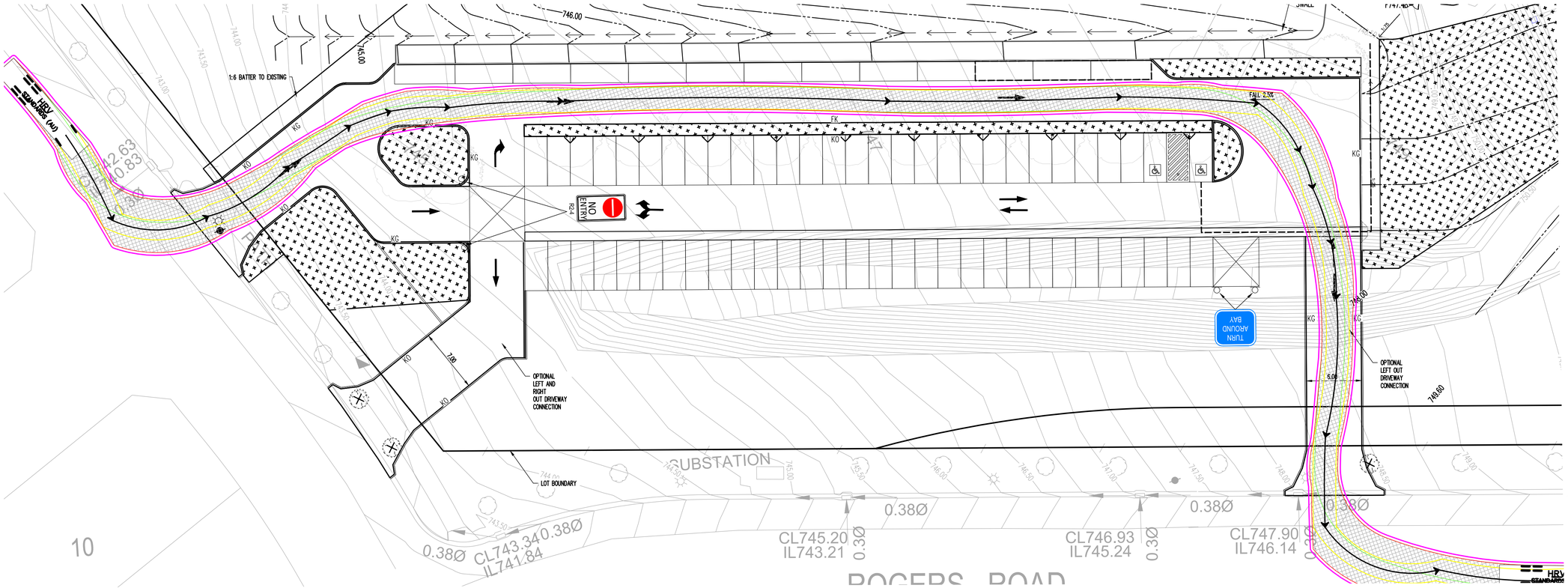
Appendix D

Vehicle Turning Demonstration

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING C001



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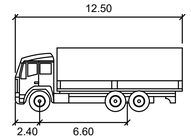

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HRV

	meters
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Track	: 2.50
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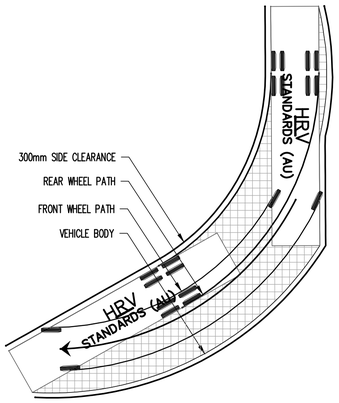
Steering Angle	: 35.2



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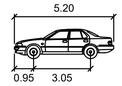
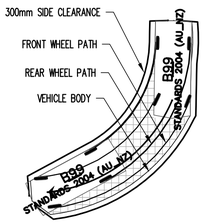


0.95 3.05

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9



VEHICLE TURNING DEMONSTRATION

SCALE 1:250

PRELIMINARY

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A	DRAFT DA FOR COORDINDATION	CP	EM	13.09.19

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Sheet Subject: VEHICLE TURNING DEMONSTRATION

Scale : A1	Drawn	Authorized
1:250	EM	

Job No	Drawing No	Revision
189119	C080	B

Plot File Created: Sep 19, 2019 - 6:44pm