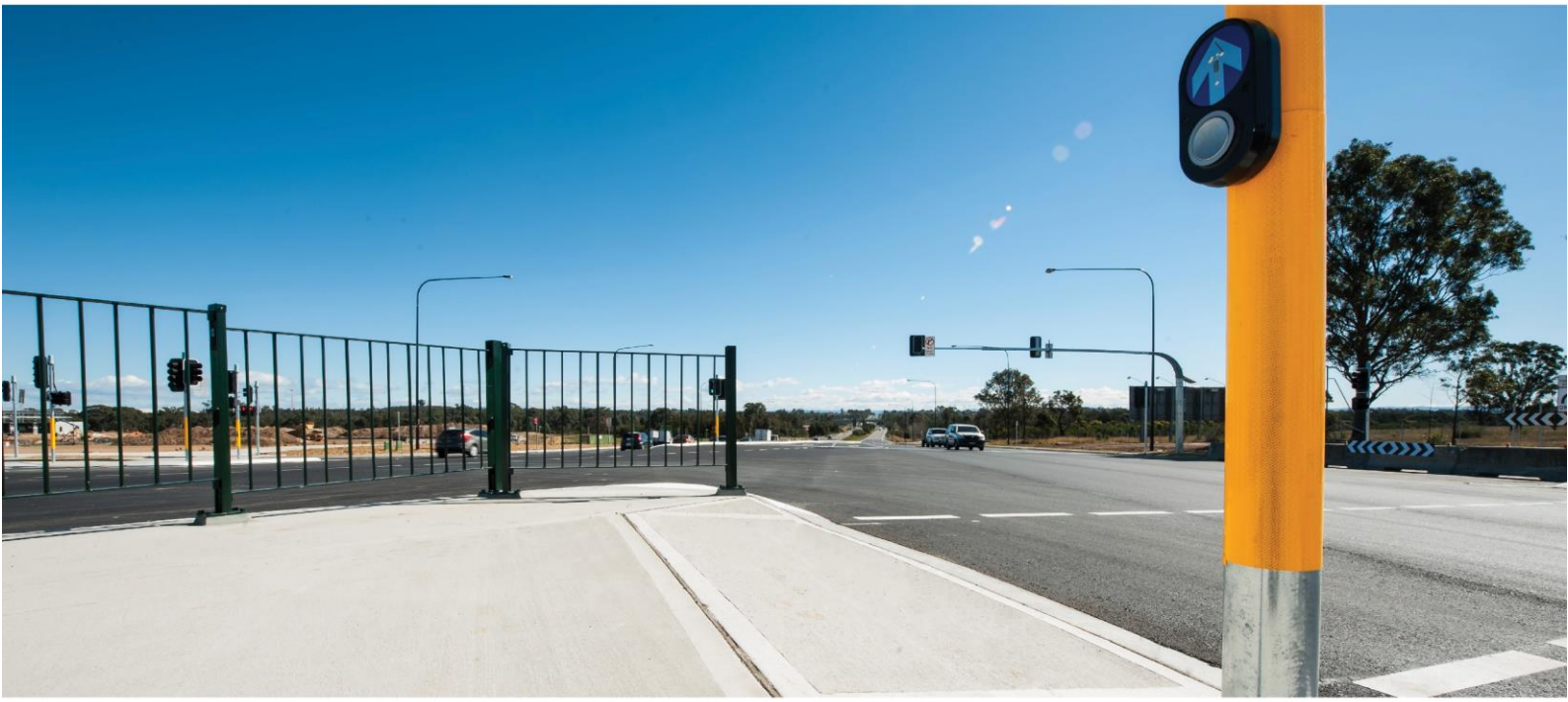
BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS



Traffic and Parking Impact Assessment

Contract Properties Pty. Ltd.

71 Fig Hill lane, Dunmore

October 2020

ENGINEERING
PLANNING
PROJECT MANAGEMENT
SURVEYING
CERTIFICATION

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Document Set ID: 11554662
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Project No.	CC190065
Author	AJ
Checked	RD
Approved	RD

Rev No.	Status	Date	Comments
1	Final	5/09/2019	
2	Final	04/10/2019	Site plans updated
3	Amended Final	19/10/2020	Proposal amended

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SYDNEY
P (02) 9659 0005
E sydney@brs.com.au

CENTRAL COAST
P (02) 4325 5255
E coast@brs.com.au

HUNTER
P (02) 4966 8388
E hunter@brs.com.au

SOUTH EAST QUEENSLAND
P (07) 5582 6555
E seqld@brs.com.au

brs.com.au

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SYDNEY
P (02) 9659 0005
E sydney@brs.com.au

CENTRAL COAST
P (02) 4325 5255
E coast@brs.com.au

HUNTER
P (02) 4966 8388
E hunter@brs.com.au

SOUTH EAST QUEENSLAND
P (07) 5582 6555
E seqld@brs.com.au

brs.com.au

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1 Introduction

Barker Ryan Stewart have been engaged by Contract Properties Pty. Ltd. to provide preliminary advice regarding the traffic and parking requirements for a proposed Eco-Tourist Resort Facility consisting of 33 rooms, gymnasium and spa, restaurant, lounge bar, panoramic terrace and pool, and roof top bar at 71 Fig Hill Lane, Dunmore. These requirements have been assess based on the Shellharbour City Council DCP and LEP.

2 Existing Conditions

2.1 The Site

The site is located at 71 Fig Hill Lane, Dunmore (Lot 3 / DP717776) within the following zones:

- RU2 – Rural Landscape
- E2 – Environmental Conservation
- E3 – Environmental management

The site is surrounded by Minnamurra River to the east, south and southwest, Dunmore House to the north and unoccupied rural land to the west. The site itself is largely unoccupied with the exception of an incomplete dwelling (Minnamura Mansion) at the northern side of the site.

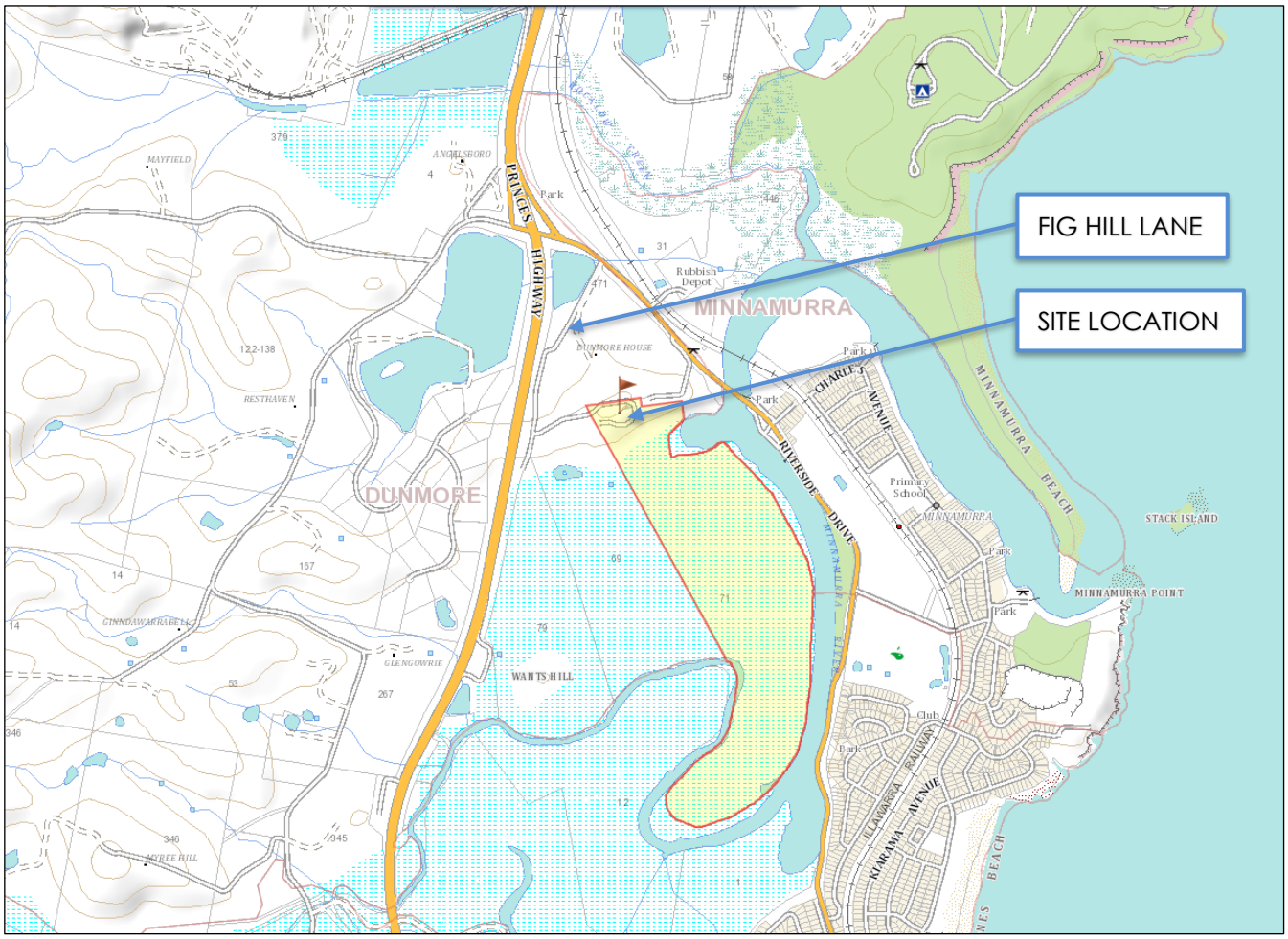

Figure 1: Site Location *(source: NSW Land & Property Information SIX Maps 2019)*

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2.2 Existing Road Network

Princes Highway is a State Highway which carries traffic in a north-south direction and generally consists of two 3.4m wide lanes in each direction, separated by an 8.2 metre wide landscaped median. It is sign posted for 100km/hr and provides on-ramps and off-ramps on the northern side of Riverside Drive only. A 1 metre wide buffer-zone separates the 1.8 metre wide cycle lanes from the traffic lanes on both sides of the road.

Within the vicinity of the site, Riverside Drive is sign posted at 80km/hr with two 3.5 metre wide travel lanes and 2 to 3 metre wide shoulders. It forms an informal priority-controlled intersection with Fig Hill Lane and forms a merging lane (eastbound on Riverside Drive) and priority-controlled intersection (westbound on Riverside Drive) with the Princes Highway off-ramp.

The Riverside Drive / Fig Hill Lane intersection is classified as a BAR / BAL type intersection. BAR and BAL refer to basic turn treatments where turning vehicles may share the lane with through traffic movements as specified in Austroads "*Guide to Road Design Part 4: Intersections and Crossings – General*". Drivers accessing Fig Hill Lane from Princes Highway are provided with approximately 150 metre length of road to merge into Riverside Drive and then turn right into Fig Hill Lane.

The site is accessed via Fig Hill Lane (a private access road) which has an all-weather pavement (combination of bitumen sealed and concrete segments) that varies in width between 3.5m-4.2m with grass verges on both sides of the road.

2.3 Existing Traffic Volumes

Traffic surveys have been conducted by Barker Ryan Stewart at the Riverside Drive / Fig Hill Lane intersection to assess the existing traffic volumes at this location. The surveys were conducted on Wednesday 30 September 2020 from 7.00am to 9.00am and from 4.00pm to 6.00pm.

The surveys demonstrated that the peak times on Riverside Drive were 8.00am to 9.00am and 4.00pm to 5.00pm. During the morning peak a total of 395 vehicles were recorded on Riverside Drive (139 eastbound and 266 westbound). During the afternoon peak 572 vehicles were recorded (384 eastbound and 188 westbound).

During the morning peak no vehicles were recorded on Fig Hill Lane and 2 vehicles were recorded during the afternoon peak.

The results of these surveys are illustrated below in Figures 2 and 3.

2.3.1 Intersection Sight Distance

Austroads *Guide to Road Design Part 4A: Unsignalised and Signalised Intersections* provides guidance on the sight distance requirements at intersections. Safe intersection Sight Distance (SISD) is the minimum sight distance which should be provided on the major road at any intersection.

Riverside Drive has a posted speed limit of 80km/h which equates to an SISD of 170 metres. An investigation of the sight distance available along Riverside Drive at the Fig Hill Lane intersection indicates that 170 metres of sight distance is available to the south of the intersection but only 110 metres is available to the north due to the curved alignment of Riverside Drive.

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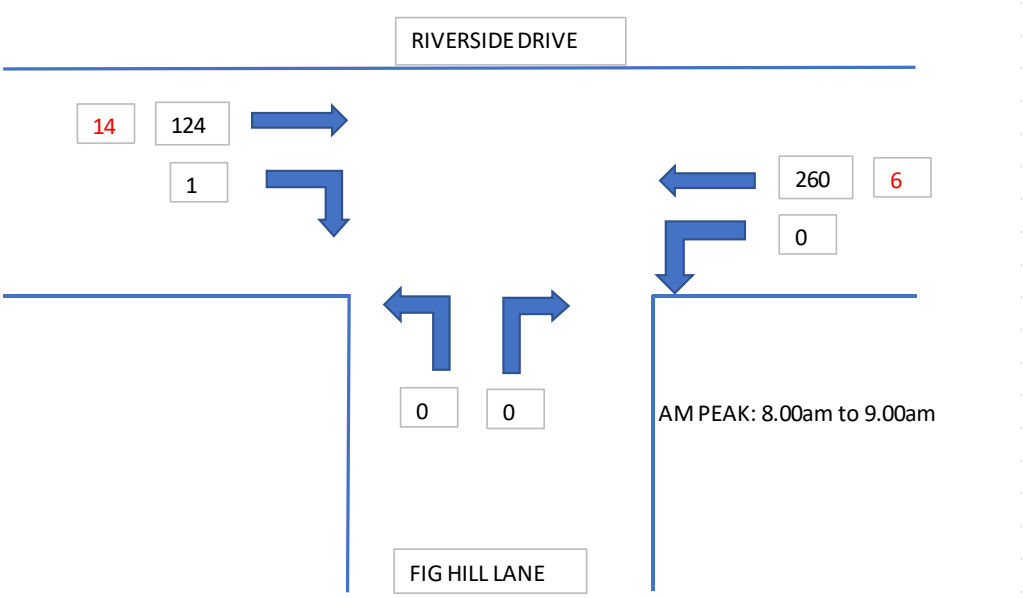

Figure 2: Riverside Dr / Fig Hill Lane – AM Peak

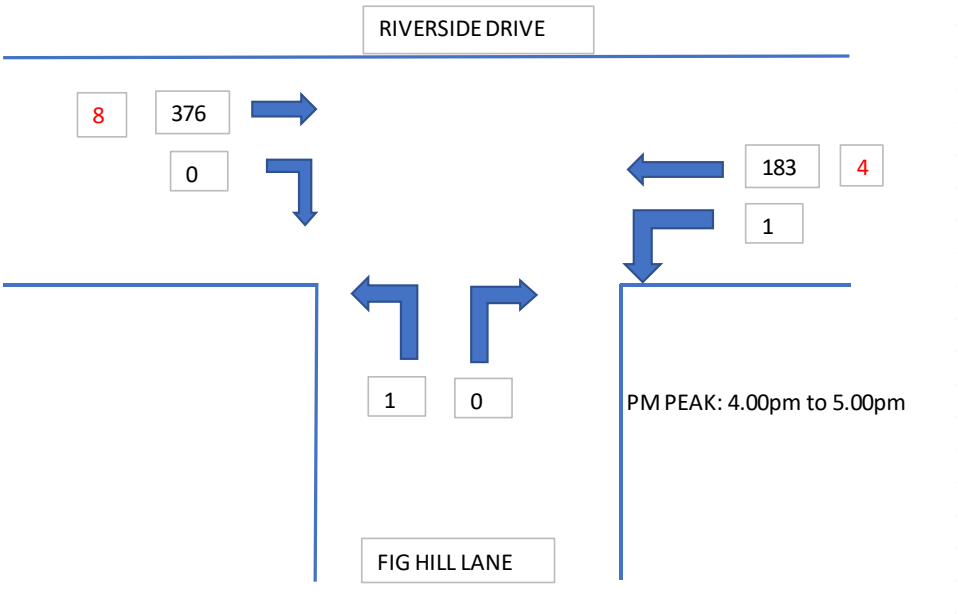

Figure 3: Riverside Dr / Fig Hill Lane – PM Peak

2.4 Public Transport

The closest railway station is Minamurra Station which is 3.7km south-west of the site. Regular train services are available between Minamurra and Central Station in Sydney.

Regular bus services are also available along Riverside Drive providing services to Shellharbour and Kiama.

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Regular bus services are also available along Riverside Drive providing services to Shellharbour and Kiama.

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2.5 Other Proposed Developments

Dunmore Sand and Soil Pty Ltd (DSS) operates an approved sand extraction facility located off Tabbita Road approximately 1km north of the Riverside Drive / Fig Hill Lane intersection.

DSS has been investigating a fine sand resource on 471 Riverside Drive, the property immediately north of the subject site. Investigative drilling has confirmed that there is sufficient sand resource to support three to four more years of extraction from two areas identified as Stage 5A and 5B of the current sand mining operations.

To access these sand resources DSS is seeking to modify the current project approval (DA 195-8-2004). However, the proposed modification will involve the generation of additional heavy vehicles associated with the importation of up to 325,000 tonnes per annum of Virgin Excavated Natural Material (VENM) to the site.

The importation of VENM is required to:

- fill the Stage 5A extraction area to natural ground; and
- stabilise the edges of the Stage 5B dredge pond and the upper portions of the natural batters that form underwater, to allow safe access for vehicles, plant and equipment around the ponds perimeter.

VENM will be transported to the site by road truck / truck and dog and will be tipped directly into the pit(s) and spread with a dozer.

Fig Hill Lane provides the existing access to the Stage 5 extraction areas. However, as this existing access is considered to be too close to the Princes Highway / Riverside Drive intersection for the purpose of accommodating trucks delivering VENM to the site, a new access road is proposed to be constructed at the intersection of Riverside Drive and the entrance to the Kiama Waste Recycling Centre. This new access would be utilised by all heavy vehicle movements entering and exiting the Stage 5 site. It is noted that the existing driveway at Fig Hill Lane will be retained for emergency and ad hoc access by light vehicles. Similarly access to the private driveway adjacent to Fig Hill Lane will be retained and provide unaffected access to Dunmore House.

It is noted that the proposed site access arrangements would be temporary for the duration of Stage 5 works. The access would be removed upon completion of the Stage 5 works.

It is estimated that the proposed Stage 5 modification will generate a peak of 5 additional inbound and 5 outbound truck movements per hour associated with the importation of VENM to the Stage 5 site.

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3 Proposed Development

3.1 Development

The proposal is for the demolition of most of the existing house and the construction of an Eco-Tourist Resort consisting of 33 rooms and ancillary facilities including a reception area, a lounge / bar area, a restaurant with seating capacity for 50 people, outdoor terraces and guest facilities such as a gym, beauty spar and swimming pool. The Resort will be built in a series of buildings, and the ancillary facilities will be partially housed in the residual basement and garage structure.

It is also proposed to provide 50 on-site parking spaces, including one accessible space and a separate unloading dock / waste collection area.

The project team has provided the following operating parameters for the site:

- The restaurant and bar will not be open to the public and will have a maximum capacity of 50 persons per meal.
- The gym, beauty spa and the pool would be only for the use of the resort guests and would not be open to public.
- 11 staff members per day on average. This is based on 15 staff during Friday-Sunday and 8 staff for Monday-Thursday.
- The site will have a resident manager / caretaker.

3.2 Access

Access to and from the site is available along Fig Hill Lane which is shown on The Shellharbour LEP 2013 as a "private access road" rather than a public road. From Riverside Drive it runs through two adjacent properties; 471 Riverside Drive and 69 Fig Hill Lane and connects with the western boundary of the subject property about 30 metres south of the north-western corner.

A geotechnical inspection of Fig Hill Lane was conducted by EI Australia Pty Ltd in September 2020 to report on the surface conditions of the shoulders along both sides of this road.

The conclusions drawn from the geotechnical investigation indicate that Fig Hill Lane would be capable of bearing loads by vehicles up to a medium rigid vehicle (MRV). This would include a 25 seat mini-bus for transporting groups to and from the site and an 8.8 metre service vehicle for waste collection.

In regard to access by emergency vehicles, Fig Hill Lane would provide suitable access for a standard ambulance which is classified as a small rigid vehicle (SRV) 6.3 metres long.

In relation to access for NSW Rural Fire Service vehicles, Fig Hill Lane would be classified as a property access which is defined as "any access from private land onto the public road system" in the publication "Planning for Bushfire Protection", November 2019.

The main criteria for a property access is that it should provide a safe, all-weather access to structures within the property and provide safe access and egress for firefighting vehicles while residents are evacuating.

The nature and width of the existing pavement and shoulders along Fig Hill Lane will generally comply with these requirements, providing appropriate access for NSW Rural Fire Service vehicles when required for attending to bushfire emergencies.

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3.3 Internal Circulation

Within the site an internal access road is proposed to run from the entry point at the western boundary through the main parking area to a drop off area adjacent the reception building. The drop-off area will consist of a turning area large enough for an Austroads B99 vehicle (large passenger vehicle) to perform a U-turn and return to the parking area.

A service vehicle access road will commence from the entry point at the western boundary towards the northern site boundary then turn 90 degrees and run parallel with the northern boundary to an unloading / waste collection area adjacent to a proposed office / storage area. It is proposed to provide a turntable at this location to facilitate the turning of heavy vehicles to allow them to exit the site in a forward direction.

The service road to the loading dock is 6 metres wide which will accommodate one-way movements of service vehicles up to a Medium Rigid Vehicle (MRV). This is considered to be acceptable as it is not expected that there will be opposing heavy vehicle movements along the service road.

A swept path analysis has been conducted to demonstrate that the service road and loading dock area will operate satisfactorily for an MRV.

3.4 Parking Assessment

The Shellharbour Development Control Plan 2013 requires off-street car parking to be provided for Guest Houses / Holiday Cabins at the following rates:

- 1 space per accommodation unit;
- 1 space for any resident manager / caretaker (applicable); and
- 1 space per employee.

In summary, the DCP parking requirements that would apply to the subject site are:

- 1 space per accommodation unit = 33 spaces;
- 1 space for any resident manager / caretaker = 1 space;
- 1 space per staff = maximum of 15 spaces;
- Provision for service / delivery vehicles; and
- Provision for taxi / bus / coach set down / pickup facilities.

The application of these rates equates to a total of 49 spaces allocated as follows:

- Accommodation – 33 spaces;
- Resident Manager – 1 space.
- Staff – 15 spaces.

The proposed provision of 50 spaces thus meets the requirements of the Shellharbour Development Control Plan 2013.

The proposed parking facilities have been designed in accordance with the requirements AS2890.1 – Off Street Car Parking and AS2890.6 Off Street Car Parking for People with Disabilities.

For a hotel development parking bays and aisles are required to be User Class 2 which requires:

- Parking bays – 2.5 metres x 5.4 metres
- Aisle width – 5.8 metres

The Accessible parking space has dimensions of 2.4 metres x 5.4 metres with an adjacent shared space of 2.4 metres x 5.4 metres.

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4 Traffic Assessment

4.1 Traffic Generation

The RMS *Guide to Traffic Generating Developments* provides trip generation rates or various land use categories. The closest category for trip generation for the subject development is the rate for motels which is 0.4 peak hour trips per unit.

For 33 accommodation units the trip generation would be 14 trips per hour. These will include trips by visitors, staff and service vehicles.

The traffic surveys conducted as part of this assessment recorded only 2 trips generated along Fig Hill Lane during the PM Peak. Assuming that these trips also generally occur during the AM peak, the expected number of post development peak hour trips will be 16.

Other assumptions adopted for this assessment are:

- During the morning peak 70% of trips (11) will be into the site and 30% (5) will be out.
- During the afternoon peak, 30% of trips (5) will be into the site and 70% (11) will be out.
- 70% of trips will be from and to the north and 30% will be from and to the south.

The post development peak hour trips are shown below in Figures 4 and 5.

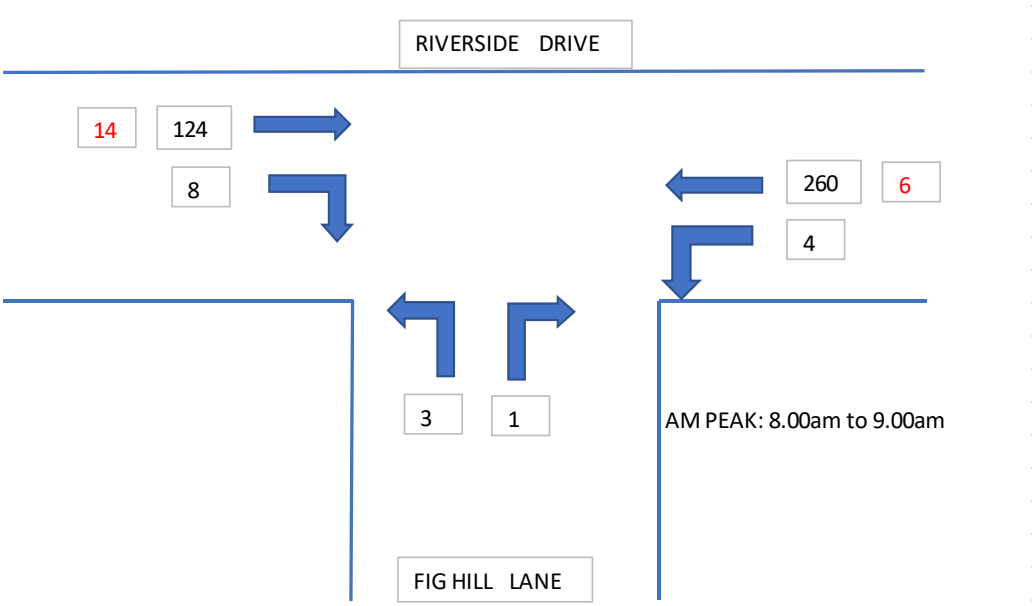

Figure 4: Riverside Dr / Fig Hill Lane AM Peak Post-Development

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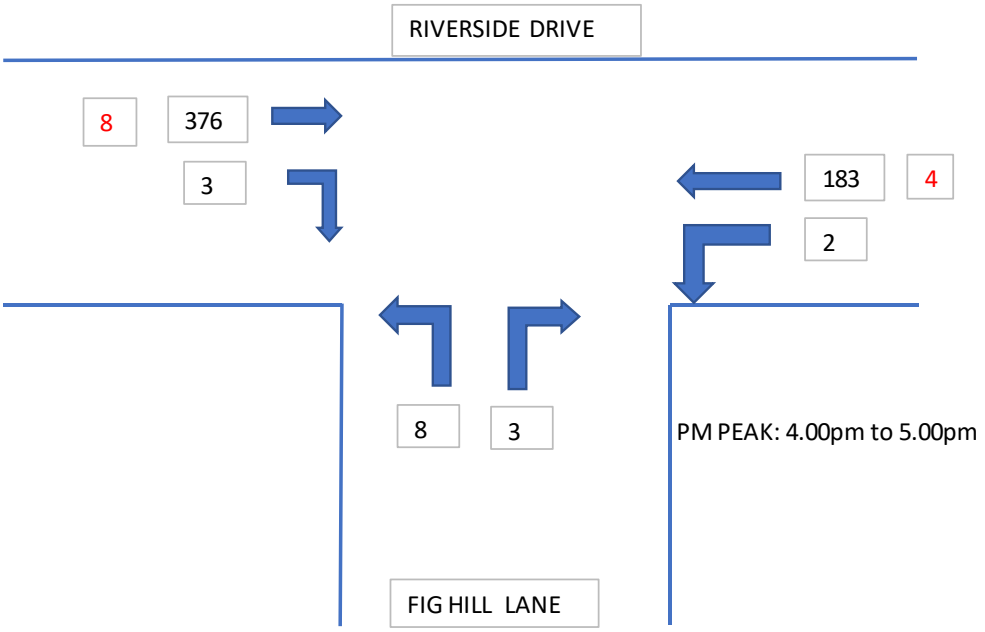


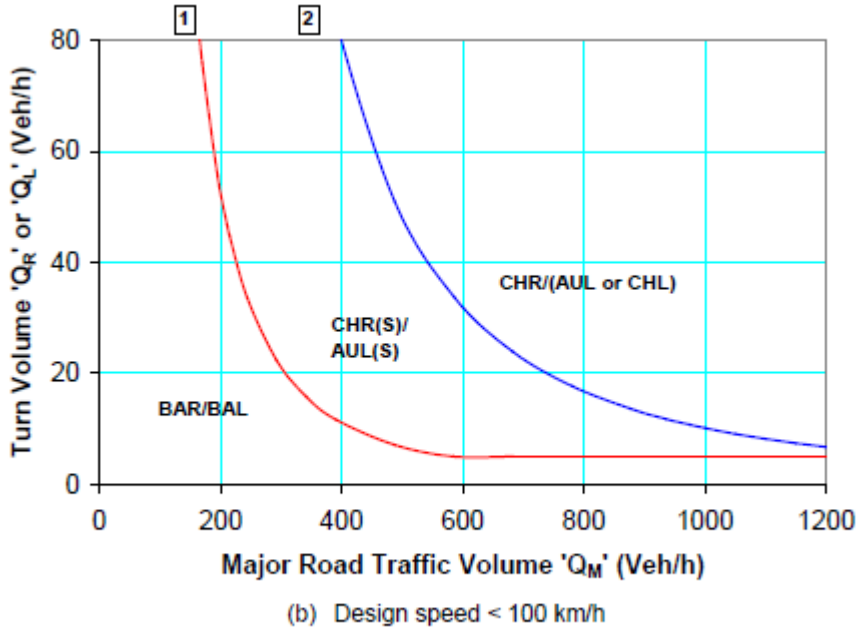
Figure 5: Riverside Dr / Fig Hill Lane PM Peak Post-Development

4.2 Impact of Generated Traffic

The traffic that will be generated by the proposed development will impact primarily on the Riverside Drive / Fig Hill Lane intersection.

To assess the impact of the additional traffic that will be generated, reference is made to the graph shown below from Figure A10 in Austroads *Guide to Road Design Part 4*.

The graph is used to identify, in general terms, the type of intersection that is required based on two-way peak hour volumes on the major road and turning volumes from the major road to the minor road.



(b) Design speed < 100 km/h

Source: Arndt and Troutbeck (2006).

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Based on the traffic volumes shown in Figures 4 and 5 the following assessment has been made:

AM Peak
Riverside Drive two-way volume = 395 vehicles
Left turn = 4 vehicles
Right turn = 8 vehicles.
Intersection Type = BAR / BAL.*

PM Peak
Riverside Drive two-way volume = 572 vehicles
Left Turn = 2 vehicles
Right Turn = 3 vehicles
Intersection Type = BAR / BAL.*

*BAR and BAL refer to basic turn treatments where turning vehicles may share the lane with through traffic movements. The existing Riverside Drive / Fig Hill Lane intersection is a BAR / BAL intersection as described in Section 2.2 of this report.

Consequently, the existing intersection arrangement is considered to be satisfactory for the post-development traffic volumes and no upgrading works are required. It is also not expected that any upgrading of Fig Hill Lane will be required to cater for the traffic that will be generated by the proposal.

4.3 Impact of Traffic from Other Developments

As outlined in Section .4 of this report, Dunmore Sand and Soil Pty Ltd is proposing to expand the current sand extraction operations into the property immediately north of the subject site. The importation of fill following the extraction of sand from the site will generate an additional 10 truck movements along Riverside Drive during peak periods. However, these additional truck movements will not have any impact on the safety and efficiency of Riverside Drive or the Riverside Drive / Fig Hill lane intersection.

4.4 Impact on Road Safety

The main road safety issues identified in this assessment are related to the proximity of the Riverside Drive / Fig Hill Lane intersection to the Princes Highway off-ramp and the curved alignment of Riverside Drive.

Vehicles accessing the site from the north will exit the Princes Highway via the southbound off-ramp, merge onto Riverside Drive over a distance of 150 metres then turn right into Fig Hill Lane. The southbound lane at the Fig Hill Lane intersection is at least 3.5 metres wide and the shoulder is 3 metres wide, providing ample width for a southbound vehicle to pass a vehicle waiting the turn right into Fig Hill Lane.

In addition, the probability of a right turning vehicle queuing at this location is extremely low as the highest hourly volume of right turns is estimated to be 8 vehicles with the opposing northbound volume of 266 vehicles. This has been confirmed by an analysis of average delay and queue lengths using Sidra software.

As discussed in Section 2.3.1 of this report, the required sight distance for an 80km/hour speed limit is 170 metres, but there is only 110 metres sight distance available to the north from Fig Hill Lane. However, the limited sight distance only impacts on vehicles turning right out of Fig Hill Lane and the estimated trip distribution indicates that only one vehicle in the AM peak and 3 vehicles in the PM peak will make this turn.

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4.5 Recommended Works

To address any concerns regarding road safety due to the small increase in turning movements at this intersection, it is recommended that Advance Intersection Warning signs be installed in both directions on Riverside Drive similar to the example below commonly used along the Princes Highway at many locations where sight distance to intersections is restricted.

These signs are an effective way of raising driver awareness of the presence of side roads particularly for visitors who may be unfamiliar with the local road network.

Example of Advance Intersection Warning Sign

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5 Conclusion

This report has been prepared to provide preliminary advice regarding the traffic and parking requirements for a proposed Eco-Tourist Resort Facility consisting of 33 rooms, gymnasium and spa, restaurant, lounge bar, panoramic terrace and pool, and roof top bar at 71 Fig Hill Lane, Dunmore. These requirements have been assess based on the Shellharbour City Council DCP and LEP.

Access to and from the site is available along Fig Hill Lane which is shown on The Shellharbour LEP 2013 as a "private access road" rather than a public road. From Riverside Drive it runs through two adjacent properties; 471 Riverside Drive and 69 Fig Hill Lane and connects with the western boundary of the subject property about 30 metres south of the north-western corner.

Internal access roads and parking areas and service area will need to be designed in accordance with the requirements AS2890.1 – Off Street Car Parking and AS2896.6 – Off Street Car Parking for People with Disabilities.

It is proposed to provide 50 parking spaces on site, including one accessible space. The assessment of parking requirements based on the Shellharbour DCP 2013 indicates that at least 49 parking spaces will be required. The proposed parking provision therefore meets the DCP requirement.

Traffic that will be generated by the development and a proposed expansion of current sand extraction operations is not expected to have any significant impact on the performance of the surrounding intersections or the local road network. It is not expected that any upgrading of Fig Hill Lane will be required to cater for the traffic that will be generated by the proposal.

To improve driver awareness of the Fig Hill Lane intersection and to address any concerns regarding road safety due to the small increase in turning movements at this intersection, it is recommended that Advance Intersection Warning signs be installed in both directions on Riverside Drive.

From the information provided by the project team, the subject site is considered to be suitable for the proposed development in relation to parking, traffic impact, access and safety considerations.

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APPENDIX A
SITE PLANS

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69 FIG HILL LANE
DUNMORE

1 **Basement**
1 : 350

DA PLANS

NOT For Construction

PROPOSED ECO - DEVELOPMENT . LOT 3 DP 71776 DUNMORE

Rev	Description	Date
C	Draft for Review	19.08.09
D	Draft for Review	19.09.16
E	DA Additional information	20.02.22
F	Coordination	20.07.07
G	Additional Information	20.09.07

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TITLE

BASEMENT CLIFFTOP LODGES

JOB No.	CON00116
DATE	22.02.2019
SCALE	A1 @ 1 : 350
DWG No.	DA.100 G

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ARCHITECTS

LEVEL 4, 111-117 DEVONSHIRE STREET, SURRY HILLS, NSW 2010 T.02 9318 8400 F.02 9318 8480
STEPHEN J. NORDON Registration No. NSW - 4704 GRAHAM P. JAGO Registration No. NSW - 4926

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Version: 1, Version Date: 22/10/2020

69 FIG HILL LANE
DUNMORE

431 RIVERSIDE DRIVE
DUNMORE

1 **Ground Floor**
1 : 350

DA PLANS

NOT For Construction

PROPOSED ECO - DEVELOPMENT . LOT 3 DP 71776 DUNMORE

Rev	Description	Date
C	Draft for Review	19.08.09
D	Draft for Review	19.09.16
E	DA Additional information	20.02.22
F	Coordination	20.07.07
G	Coordination	20.07.13
H	Additional Information	20.09.07

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TITLE

GROUND FLOOR

JOB No.	CON00116
DATE	22.02.2019
SCALE	A1 @ 1 : 350
DWG No.	DA.101 H

Document Set ID: 11554662
Version: 1, Version Date: 22/10/2020

69 FIG HILL LANE
DUNMORE

1 First Floor
1 : 350

DA PLANS

NOT For Construction

PROPOSED ECO - DEVELOPMENT . LOT 3 DP 71776 DUNMORE

Rev	Description	Date
C	Draft for Review	19.08.09
D	Draft for Review	19.09.16
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TITLE

FIRST FLOOR PLAN

JOB No.	CON00116
DATE	22.02.2019
SCALE	A1 @ 1 : 350
DWG No.	DA.102 G

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APPENDIX B
RAIL NETWORK

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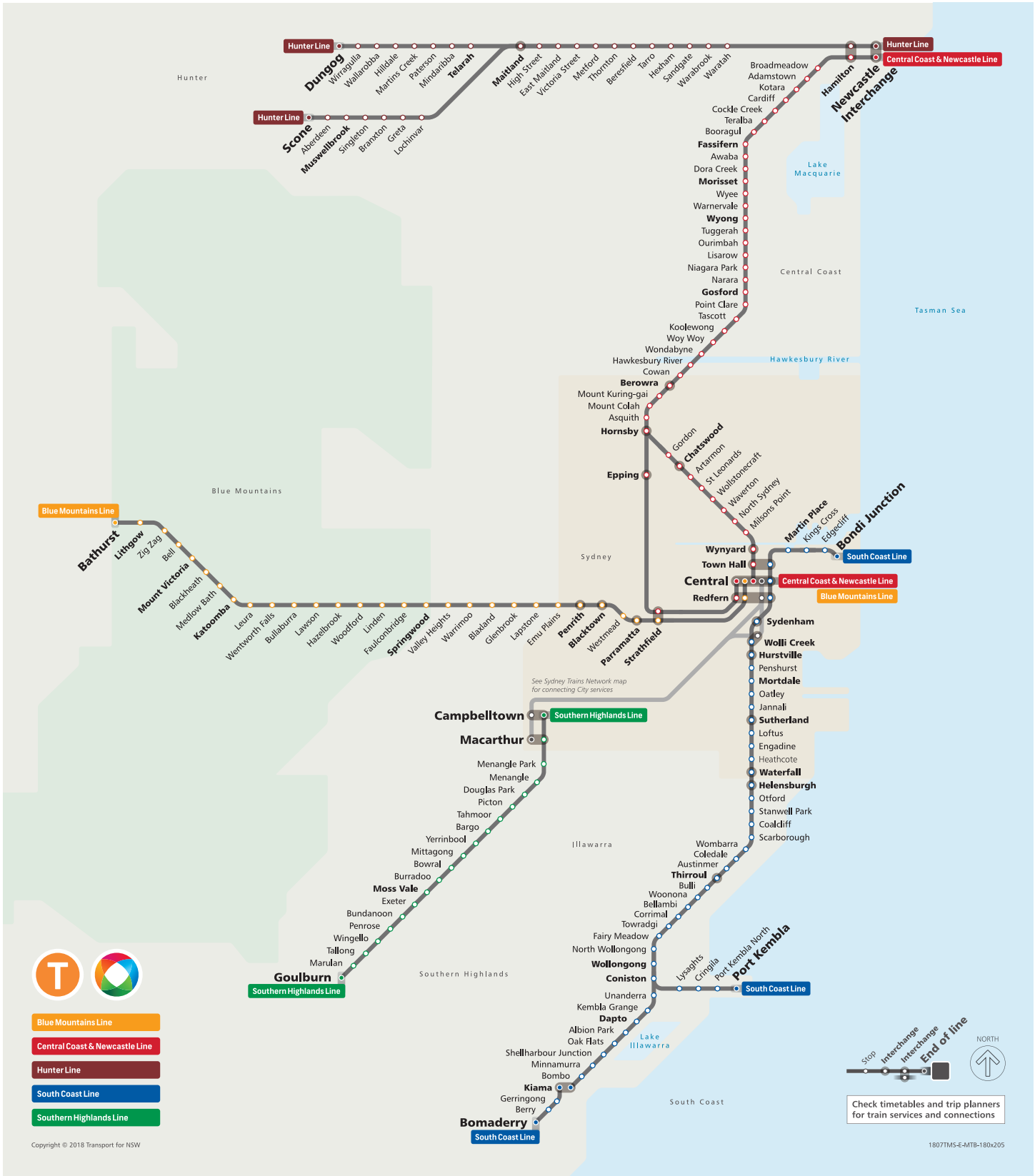
Intercity Trains Network



NSW GOVERNMENT Transport

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APPENDIX C
BUS TIMETABLE

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	Monday to Friday	♿		♿	♿	♿	♿		♿
map ref	Route Number	71	71	71	71	71	71	71	71
A	**Stockland Shellharbour**	...	09:10	10:40	12:10	13:40	14:40	16:25	**G**17:35
B	Riverside Drive at The Village	...	09:20	10:50	12:20	13:50	14:50	16:35	17:45
C	McBrien Drive near Barton Drive	08:26	09:26	10:56	12:26	13:56	14:56	16:41	17:51
D	**Minnamurra Public School** Links Street	08:34	09:34	11:04	12:34	14:04	15:04	16:49	17:59
E	North Kiama Drive at Flinders Avenue	08:43	09:43	11:13	12:43	14:13	15:13	16:58	18:07
F	**Kiama Leisure Centre** Havilah Place	08:50	09:50	11:20	12:50	14:20	15:20	17:05	18:13
G	Bonaira Street near Reid Street	08:56	09:56	11:26	12:56	14:26	15:26	17:11	18:18

	Saturday	♿	♿	♿	♿
map ref	Route Number	71	71	71	71
A	**Stockland Shellharbour**	...	10:10	13:10	15:10
B	Riverside Drive at The Village	...	10:20	13:20	15:20
C	McBrien Drive near Barton Drive	08:24	10:26	13:26	15:26
D	**Minnamurra Public School** Links Street	08:32	10:34	13:34	15:34
E	North Kiama Drive at Flinders Avenue	08:41	10:43	13:43	15:43
F	**Kiama Leisure Centre** Havilah Place	08:48	10:50	13:50	15:50
G	Bonaira Street near Reid Street	08:54	10:56	13:56	15:56

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	Monday to Friday	♿	♿		♿	♿	♿			
map ref	Route Number	71	71	71	71	71	71	71	71	71
G	Bonaira Street near Reid Street	06:55	09:00	10:00	11:30	13:00	14:30	16:15	17:15	18:20
F	Kiama Leisure Centre Havilah Place	07:01	09:07	10:07	11:37	13:07	14:37	16:22	17:22	18:27
E	North Kiama Drive at Flinders Avenue	07:05	09:12	10:12	11:42	13:12	14:42	16:27	17:27	18:32
D	Minnamurra Public School Links Street	07:13	09:20	10:20	11:50	13:20	14:50	16:35	17:35	18:40
C	McBrien Drive near Barton Drive	07:21	09:28	10:28	11:58	13:28	14:58	16:43	17:43	18:48
B	Riverside Drive opposite The Village	07:28	09:35	10:35	12:05	13:35	15:05	16:50	17:50	18:55
A	Stockland Shellharbour	07:38	09:45	10:45	12:15	13:45	H15:15	17:00	18:00	19:05

	Saturday	♿	♿	♿	♿
map ref	Route Number	71	71	71	71
G	Bonaira Street near Reid Street	09:00	11:00	14:00	16:00
F	Kiama Leisure Centre Havilah Place	09:07	11:07	14:07	16:07
E	North Kiama Drive at Flinders Avenue	09:12	11:12	14:12	16:12
D	Minnamurra Public School Links Street	09:20	11:20	14:20	16:20
C	McBrien Drive near Barton Drive	09:28	11:28	14:28	16:28
B	Riverside Drive opposite The Village	09:35	11:35	14:35	16:35
A	Stockland Shellharbour	09:45	11:45	14:45	16:45

APPENDIX D
SWEPT PATHS

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REV	AMENDMENT	ISSUED	DATE
A	FIRST ISSUE	JB	13/10/2020

BARKER RYAN STEWART
TOTAL PROJECT SOLUTIONS
ENGINEERING | PLANNING | PROJECT MANAGEMENT | SURVEYING | CERTIFICATION

SYDNEY
P: 02 9659 0005
CENTRAL COAST
P: 02 4325 5255
HUNTER
P: 02 4966 8388
S.E. QLD
P: 07 5582 6555

www.brs.com.au
mail@brs.com.au
ABN: 26 134 067 842

Client:

Nordon Jago Architects Pty Ltd

71 FIG HILL LANE, DUNMORE
PROPOSED DEVELOPMENT

MRV TURNING PATH

Designed: NJA
Drawn: JB
Checked: RD
Datum: A.H.D.

Plan No.
CC19065-01-101
File Ref. CC19065
REV. A

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