Appendix F – Traffic Impact Assessment

David Pavey Pty Ltd trading as
Pavey Consulting Services
Specialising in
Traffic Impact Assessments and Transportation Planning
Road Safety, Traffic Management Plans and Traffic Control Plans
Civil and Structural Design
Project Management and Contract Administration
Mediation and Government Relations

Integrated Transport Assessment

Proposed Quarry

39 Razorback Road Running Stream NSW

22 July 2022 Rev 1

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1. INTRODUCTION

Pavey Consulting Services (PCS) has been commissioned by SpaceUrban Pty. Ltd. On behalf of Plantation Pine Products Australia Pty Ltd (PPPA) to provide an Integrated Transport Assessment (ITA) to support an application for a proposed quarry at 39 Razorback Road, Running Stream, NSW.

PPPA proposes to develop and operate a sand and gravel quarry on the 'Turonfels' property at 39 Razorback Road, Running Stream, approximately 8km south of Ilford within the Mid-Western Regional Council Local Government Area (LGA). The site is located approximately 1km west of the Castlereagh Highway.

Figure 1 shows the location of the quarry.

The quarry would extract up to 200,000 tonnes per annum over a period of up to 30 years and will include access roads, a site office, workshop and weighbridge. The quarry will be progressively rehabilitated to pasture and pine plantation with potential future use of the facilities area for forestry related activities.

This report includes consideration of issued raised in Letter Requirements of SEARS No 1523 dated 2/3/21 and additional requirements set out in Transport for NSW (TfNSW) letter of 1 June 2021.

1 Limits of Report

This report considers the instructions and requirements of our client. Pavey Consulting Services (PCS) has taken care in the preparation of this report, however it neither accepts liability nor responsibility whatsoever in respect of:

- Any use of this report by any third party,
- Any third party whose interests may be affected by any decision made regarding the contents of this report, and/or
- Any conclusion drawn resulting from omission or lack of full disclosure by the client, or the clients' consultants.

2 Basis of Integrated Transport Assessment

This Integrated Transport Assessment (ITA) has been prepared in accordance with the relevant governmental assessment requirements, guidelines and policies, and in consultation with the relevant Government Agencies.

The ITA has been developed in accordance with:

- Austroads Guide to Traffic Management Part 3 Traffic Studies and Analysis.
- Austroads Guide to Traffic Management Part 12 Traffic Impacts of Developments; and
- NSW Roads and Maritime Services (RMS) Guide to Traffic Generating Developments (2002).

The assessment is based on the following general scope for matters to consider in a ITA which is defined by the NSW Roads and Maritime Services (RMS) Guide to Traffic Generating Developments (RTA 2002):

- The existing locality and surrounding land uses,
- The existing road networks,
- Traffic generation characteristics,
- Traffic impacts, and
- A summary of assessed traffic impacts and any traffic mitigation measures proposed.

3 SEARS REQUIREMENTS

As outlined in the SEARs and TfNSW requirements the following aspects are address in this report as they relate to Traffic &Transport issues.

SEARS requirements.

- **Traffic &Transport**:
  - accurate predictions of the road traffic generated by the construction and operation of the development, including a description of the types of vehicles likely to be used for transportation of quarry products,
  - an assessment of potential traffic impacts on the capacity, condition, safety and efficiency of the local and State Road networks, detailing the nature of the traffic generated, transport routes, traffic volumes and potential impacts on local and regional roads,
  - a description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road network (particularly the proposed transport routes) over the life of the development, and
  - evidence of any consultation with relevant roads authorities, regarding the establishment of agreed contributions towards road upgrades or maintenance; and
  - a description of access roads, specifically in relation to nearby Crown roads and firetrails.

Issues raised by TfNSW:

- **Project schedule:**
  - Hours and days of work, number of shifts and start and end times, and
  - Transport considerations at each phase and stage of the project, including construction, operation and decommissioning.
- **Traffic volumes:**
  - Existing background traffic,
  - Project-related traffic for each phase or stage of the project, and
  - Projected cumulative traffic at commencement of operation, and a 10-year horizon post-commencement.
- **Traffic characteristics:**
  - Number and ratio of heavy vehicles to light vehicles,
  - Peak times for existing traffic,
  - Peak times for project-related traffic including commuter periods,
  - Proposed hours for transportation and haulage,
  - Interactions between existing and project-related traffic, and
  - A description of all over size and over mass vehicles and the materials to be transported.
- **The origins, destinations and routes**:
  - Commuter (employee and contractor) light vehicles and pool vehicles,
  - Heavy (haulage) vehicles, and
  - Over size and over mass vehicles,
- The impact of traffic generation on the public road network and measures employed to ensure traffic efficiency and road safety during construction, operation and decommissioning of the project,
- The need for improvements to the road network, and the improvements proposed such as road widening and intersection treatments, to cater for and mitigate the impact of project related traffic,
- Proposed road facilities, access and intersection treatments are to be identified and be in accordance with Austroads Guide to Road Design including provision of Safe Intersection Sight Distance (SISD),
- Local climate conditions that may affect road safety during the life of the project (e.g. fog, wet and dry weather, icy road conditions),

- Impact on public transport (public and school bus routes),
- Propose a Traffic Management Plan (TMP) to be developed following approval of the EIS, in consultation with relevant Councils and TfNSW. The TMP would need to identify strategies to manage the impacts of project related traffic, including any community consultation measures for peak haulage periods, and
- Propose a Driver Code of Conduct for haulage operations which could include, but not be limited to:
  - Safety initiatives for haulage through residential areas and/or school zones.
  - An induction process for vehicle operators and regular toolbox meetings.
  - A public complaint resolution and disciplinary procedure.

4 Existing Site Conditions Condition

Site Location

The location of the site is shown as Figure 1 and 2 below

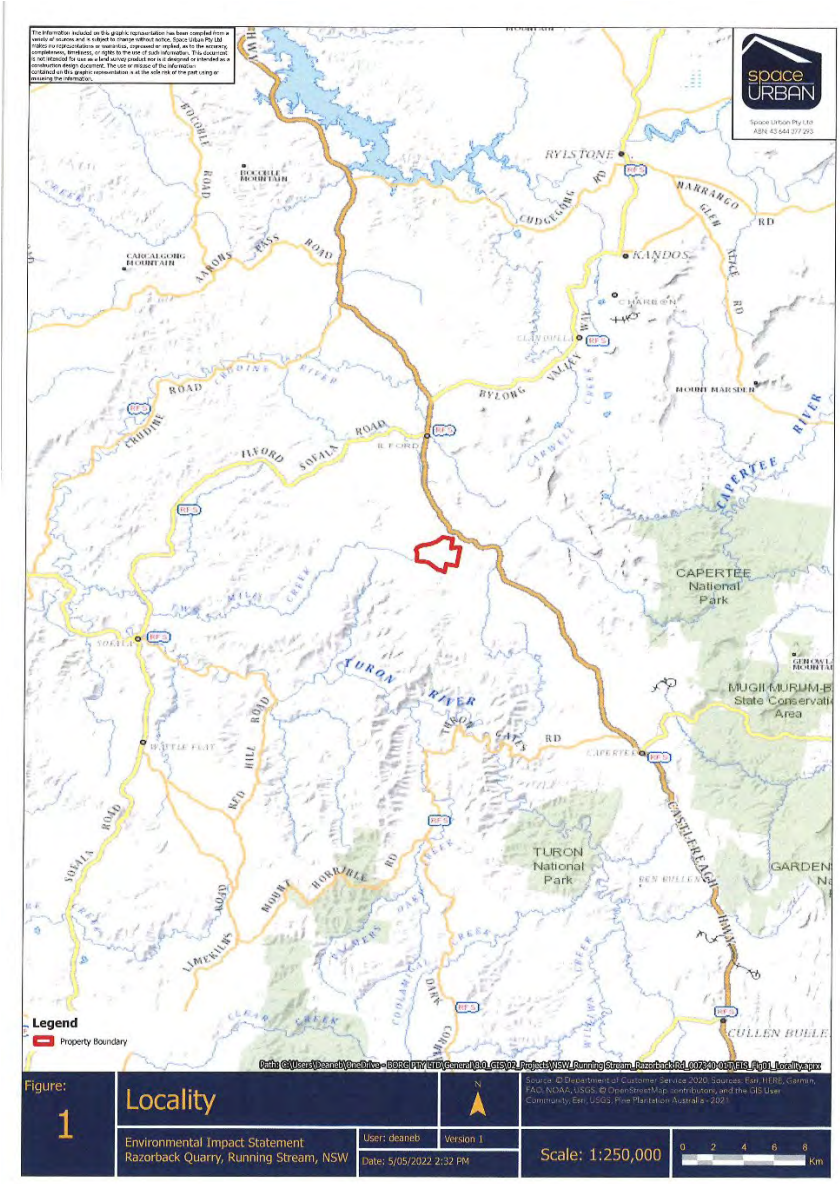


Figure 1 Site Location

Figure 2 Site location

Existing Approved Development

The majority of the subject land is used for pine plantations.

Surrounding lands are primarily larger agricultural holdings practising mixed grazing, along with a scattering of pine plantations and other uses.

Site Access

Access to the proposed quarry is off Razorback Road.

Razorback Road joins the Castlereagh Highway at a “T junction” which has been upgrade in the past to a standard CHR and BAL. Deceleration lengths and storage areas are consistent with current standards and traffic volumes.

The intersection with Razorback Road and the Castlereagh Highway consists of a left-turn deceleration lane for northbound vehicles on the highway and a protected right-turn for southbound vehicles turning into Razorback Road. There is no dedicated acceleration lane for vehicles turning south onto the Castlereagh Highway, however, an overtaking lane continues for south bound traffic for approximately 150m south of the intersection

Castlereagh Highway is a 100 km/h highway connecting Lithgow in the south with Mudgee in the north.

Razorback Road is a local road connecting the Castlereagh Highway with Turon Road, but primarily services local properties. The road is sealed for approximately 20m from the intersection with the Castlereagh Highway, beyond the sealed section the road is of gravel construction approximately 6 m in width.

Access into the proposed quarry site will be via an upgrade to an existing gravel entry road within private property.

Photograph 1: Looking west on Razorback Road toward the site entrance.

Photograph 2 - Looking east on Razorback Road at the intersection with the siteentrance.

Photograph 3 - Intersection of Razorback Road and Castlereagh Highway.

5 Proposed Development

Proposed Development

It is proposed to develop and operate a sand and gravel quarry on the 'Turonfels' property at 39 Razorback Road, Running Stream as shown in Figure 3 (below).

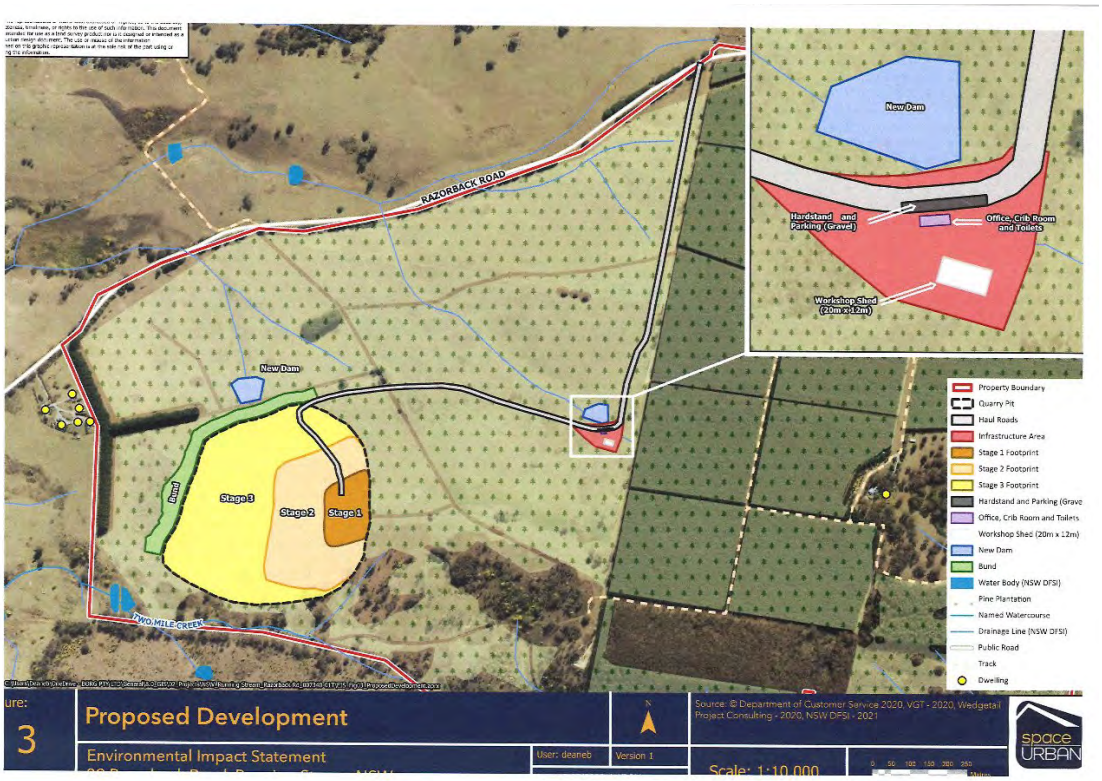


Figure 3 Proposed Site Layout

The proposed quarry will produce a maximum of 200,000 tonnes per annum (200 ktpa) of gravel and sand products, with two full time equivalent staff and a total site area of 24.7 ha including workshop, office and weighbridge facilities.

It is noted that the quarry material is loosely consolidated and will be extracted and processed without use of explosives, rock breakers or onsite crushers.

The quarry will be progressively rehabilitated to pasture and pine plantation with potential future use of the facilities area for forestry related activities.

Transport of products by road is proposed to be limited to 1,500 tonnes per day, or up to 5 truckloads per hour (10 movements in and out combined).

Hours of Operation

It is likely that the quarry will initially operate on a campaign basis to meet specific demands moving toward a potential full-time quarry pending product demand.

When operating, it is intended to operate the quarry under the following hours:

- Extraction and haulage:
  - Monday to Friday 7 am to 6 pm.
  - Saturday 8 am to 1 pm.
- No extraction or haulage activities on Sundays or public holidays.
- Incidental maintenance activities may occur outside the above times, but only where activities can be conducted and not be audible at neighbouring dwellings.

6 Traffic Generation

Trip Generation

Construction

All movements of people and materials will be via the road network.

Construction will occur over an estimated 12-week period during will include the following works:

- Bitumen sealing of Razorback Road to western property boundary,
- Construction of private haul road,
- Construction of workshop and crib hut,
- Construction of the weigh bridge, and
- Initial topsoil stripping and placement and planting of topsoil stockpiles as a noise bund along the western boundary of the quarry.

Quarry operations will commence once the above actions are completed.

Traffic movements during construction are anticipated to be:

- Light vehicle movements for construction workers 6 (i.e. 3 movements into and out of the site each day) movements generally in the morning and afternoon as construction workers arrive and leave the site,
- Delivery of construction materials for the site office, workshop, and weighbridge.
- Delivery of temporary construction worker toilets, lunchrooms, and site office,
- Mobilisation and de-mobilisation of heavy plant and equipment, and
- Delivery of concrete where required.

It is anticipated that heavy vehicles peak at 4 (i.e. 2 movements into and out of the site each day) vehicles arriving at the site to unload components).

Operations:

The proposed quarry operations are assumed to generate:

- Up to 5 laden trucks per hour exiting the Razorback Road intersection during operating hours (7:00 am to 6 pm Monday to Saturday).
- Up to 5 unladen trucks per hour entering the Razorback Road intersection during operating hours (7:00 am to 6 pm Monday to Saturday).

- Up to 4 vehicles of employees entering Razorback Road from approximately 7:00 am
- Up to 4 vehicles of employees leaving Razorback Road from approximately 5:00 pm

Decommissioning

At the end of quarries operational life of 30 years the development area will be decommissioned. During decommissioning, all above ground infrastructure would be removed and the land rehabilitated with vegetation consisting of pasture grasses initially to improve soil stability and then planted with pine consistent the adjacent pine plantation.

It is anticipated that similar vehicle movements as is in operational phase will continue in this decommissioning phase.

Traffic Distribution

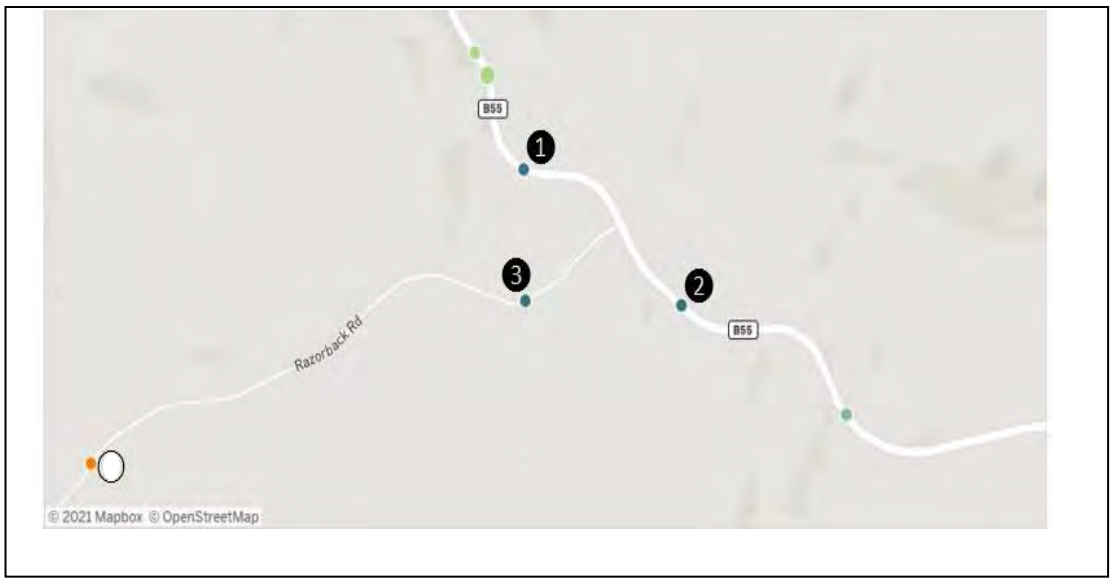
It is anticipated that for all phases of this development the distribution of traffic will be as follows:

- 50 / 50 split to the north and south for heavy vehicles, and
- 100% from the north for employees.

7 Traffic Impact at Intersections

Crash Data

Crash data from the NSW Centre for Road Safety Crash and Casualty Statistics Maps (2015-2019) shows no crashes at the intersection between 2015 and 2019. Two serious crashes recorded on the Castlereagh Highway and 1 serious crash and 1 injury/fatality crash recorded on Razorback Road are at a distance from the intersection.



	Crash ID	Degree of crash	RUM Code & Description	Road type	Lighting	Killed	Injured
❶	1129642	Serious injury	80: Off left/right bend	2-way undivided	Dusk	-	3
❷	1181491	Serious injury	74: On road, out of control	2-way undivided	Daylight	-	1
❸	1183615	Serious injury	86: Off left/left bend	2-way undivided	Daylight	-	1
❹	1092479	Fatal	20: Head on	2-way undivided	Daylight	1	6

Figure 4: NSW Centre for road Safety Crash and Casualty Statistics Map 2015 - 2019

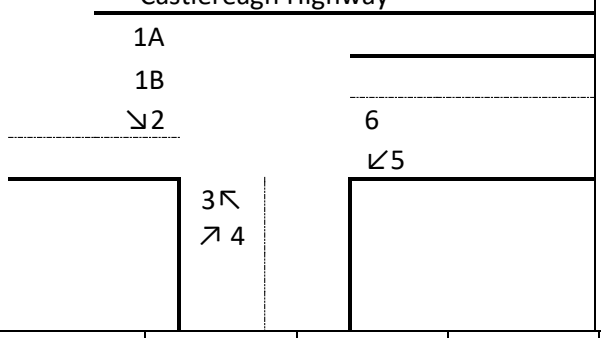
Effect on Intersection Performance

Establishment of current traffic volumes

A traffic count was carried out on the 9 November 2021 between the hours of 8:00 am and 4:00 pm am to determine all traffic movements at the intersection. Results of the count are indicated below in Table 1.

Table 1 Criteria for Evaluating Capacity of Intersection

Date 9/11/2021
Day of Week Tuesday



	8:00		9:00		10:00		11:00		12:00		13:00		14:00		15:00	
Path	0 to 30	31 to 59	0 to 30	31 to 59	0 to 30	31 to 59	0 to 30	31 to 59	0 to 30	31 to 59	0 to 30	31 to 59	0 to 30	31 to 59	0 to 30	31 to 59
1A - LV	20	22	17	19	30	36	29	21	30	20	26	29	22	21	25	24
1A - HV	6	4	6	4	6	8	2	8	5	9	4	4	6	4	6	5
2 - LV	0	0	0	0	0	2	1	0	1	0	4	2	0	0	1	1
2 - HV	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
3 - LV	1	1	1	1	1	0	2	2	1	2	3	0	1	1	2	2
3 - HV	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
4 - LV	0	1	0	1	0	0	2	1	1	0	2	1	1	2	1	1
4 - HV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5 - LV	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0
5 - HV	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 - LV	17	18	17	18	21	27	25	24	24	20	25	21	16	20	26	25
6 - HV	6	5	6	5	6	3	6	2	5	3	0	3	2	7	3	3

In summary the following Peak hour movements were determined as shown table 2 below

Table 2 Maximum hourly traffic movements

	10 to 11 am	11 to 12 am
Path	140	143
1A - LV	66	65
1A - HV	14	10
2 - LV	2	3
2 - HV	0	0
3 - LV	1	2
3 - HV	0	0
4 - LV	0	2
4 - HV	0	0
5 - LV	0	0
5 - HV	0	0
6 - LV	48	52
6 - HV	9	9

Intersection Operation

How adequate the capacity of an intersection is judged by whether it can physically and operationally cater for the traffic using it.

The performances of the intersections relevant to the proposal have been assessed using the intersection modelling SIDRA software. The model provides parameters of the performance of an intersection including the degree of saturation (DoS) and the average delay per vehicle. It provides an accurate and consistent guide to the performance of an intersection under the different traffic flow scenarios. The recommended criteria for evaluating capacity of intersections are shown in Table 3

Table 3 Criteria for Evaluating Capacity of Intersection

Level of Service	Degree of Saturation (DoS)	Ave. Delay/ Veh. (Secs)
A/B good operation	less than 0.80	Less than 28
C satisfactory	0.80 to 0.85	29-42
D poor but manageable	0.85 to 0.90	43-56
E at capacity	0.90 to 1.0	57-70
F unsatisfactory, extra capacity required	Over 1.0	Over 70

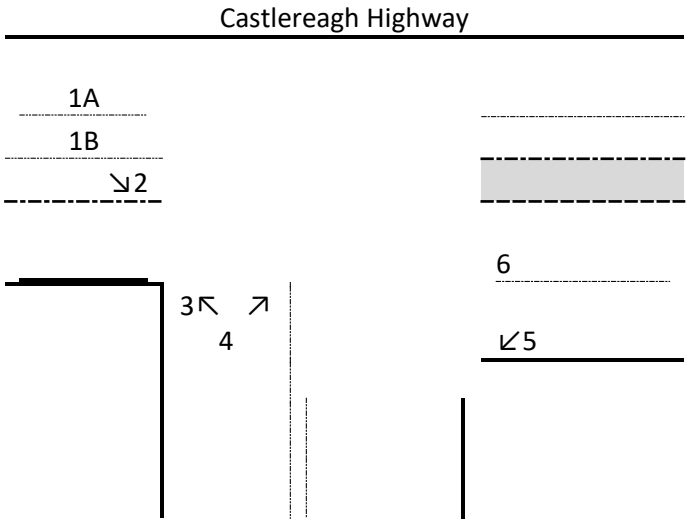
In the absence of historical growth figures, a conservative 3% traffic growth rate was applied. to the 2021 traffic counts to determine a 10-year forecast.

To determine if the proposed movements would have an effect on the operations of the existing intersection a SIDRA analysis was carried out.

The analysis has been carried out for the following scenarios:

- Existing 2021,
- Existing 2021 with proposed development,
- 10-year planning horizon (with above assumed growth rate), and
- 10-year planning horizon with proposed development.

Table 4 Criteria for Evaluating Capacity of Intersection



Path	Existing Movements	Post development	Existing plus post	10 years growth	Post Development 10 years growth
1A - LV	66	0	66	86	86
1A - HV	14	0	14	18	18
2 - LV	2	4	6	3	7
2 - HV	0	3	3	0	3
3 - LV	1	0	1	1	1
3 - HV	0	3	3	0	3
4 - LV	0	0	0	0	0
4 - HV	0	2	2	0	2
5 - LV	0	0	0	0	0
5 - HV	0	2	2	0	2
6 - LV	48	0	48	62	62
6 - HV	9	0	9	12	12

Traffic Modelling Assumption

- Analysis was carried out for the maximum hour flow as shown in Table 2 only as worst case scenario for traffic,
- Existing intersection geometry, including lane lengths and widths were measured using engineering survey,
- SIDRA default values were adopted,
- Level of Services Method is set to RTA NSW,
- Speed environment 100 km/hr on Castlereagh Highway and 50 km/hr on Razorback Rd,
- Length of right turn 2 is 90 plus deacceleration lane,
- Length of left turn 5 is 50 m plus deacceleration lane, and
- Heavy Vehicles (HV) 90% in lane 1A and 10% in lane 1B

Full details of the outputs are found in Appendix B. however a summary of this analysis is provided below

Table 5 Intersection Performance (AM Peak) South Bound Castlereagh Highway

Criteria	Base	Base with Development	Base with 10 years growth	10 Years with Development
Av. Delay (sec)	0.0	0.0	0.0	0.0
Level of Service	A	A	A	A

Table 6 Intersection Performance (AM Peak) North Bound Castlereagh Highway.

Criteria	Base	Base with Development	Base with 10 years growth	10 Years with Development
Av. Delay (sec)	0.0	0.0	0.0	0.0
Level of Service	A	A	A	A

Table 7 Intersection Performance (AM Peak Right Turn into Razorback Rd)

Criteria	Base	Base with Development	Base with 10 years growth	10 Years with Development
Av. Delay (sec)	7.7	8.7	7.8	8.7
Level of Service	A	A	A	A
Q. Length- (m)	0	0	0	0

Table 8 Intersection Performance (AM peak Right turn out of Razorback Rd)

Criteria	Base	Base with Development	Base with 10 years growth	10 Years with Development
Av. Delay (sec)	8.6	14.4	9	15.6
Level of Service	A	A	A	A
Q. Length- (m)	0	0	0	0

Table 9 Intersection Performance (AM peak Left turn out of Razorback Rd)

Criteria	Base	Base with Development	Base with 10 years growth	10 Years with Development
Av. Delay (sec)	7.7	10.8	9	11
Level of Service	A	A	A	A
Q. Length- (m)	0	0	0	0

Table 10 Intersection Performance (AM peak Left turn into Razorback Road)

Criteria	Base	Base with Development	Base with 10 years growth	10 Years with Development
Av. Delay (sec)	7.8	10.4	7.8	9.6

Level of Service	A	A	A	A
Q. Length- (m)	0	0	0	0

The modelling outputs as shown in Table 5 through 10 illustrate that there is no deterioration of Av Delay, Level of Service, or Que length when development traffic is added to either of the 2021 or 2031 simulations of the intersection.

In 2031 (in either scenario) the intersection operates at Level of Service of A on all legs and turn movements in the morning peak hour.

Further the no que length for the right turn into Razorback Rd under the development scenario in 10 years is evident indicating that the 90 m of available for storage of the current road layout is more than adequate.

Sight Distance and Visibility Issues

Austroads guidelines provide general parameter values, which they refer to as the Normal Design Domain (NDD).

This report discusses the existing intersection in terms of Normal Design Domain criteria only

As illustrated in Figure 4, Safe Intersection Sight Distance (SISD) is measured from a driver eye height of 1.1 m above the road to a point 1.25 m above the road, which represents the upper part of a car. It is measured along the carriageway from the approaching vehicle to a conflict point.

Austroads SISD allows the use of a 1.5 seconds' or 2.0 seconds observation time for T-intersections on single carriageway roads that have a traffic volume less than 4,000 vehicles per day with the minor road having a traffic volume of less than 400 vehicles per day.

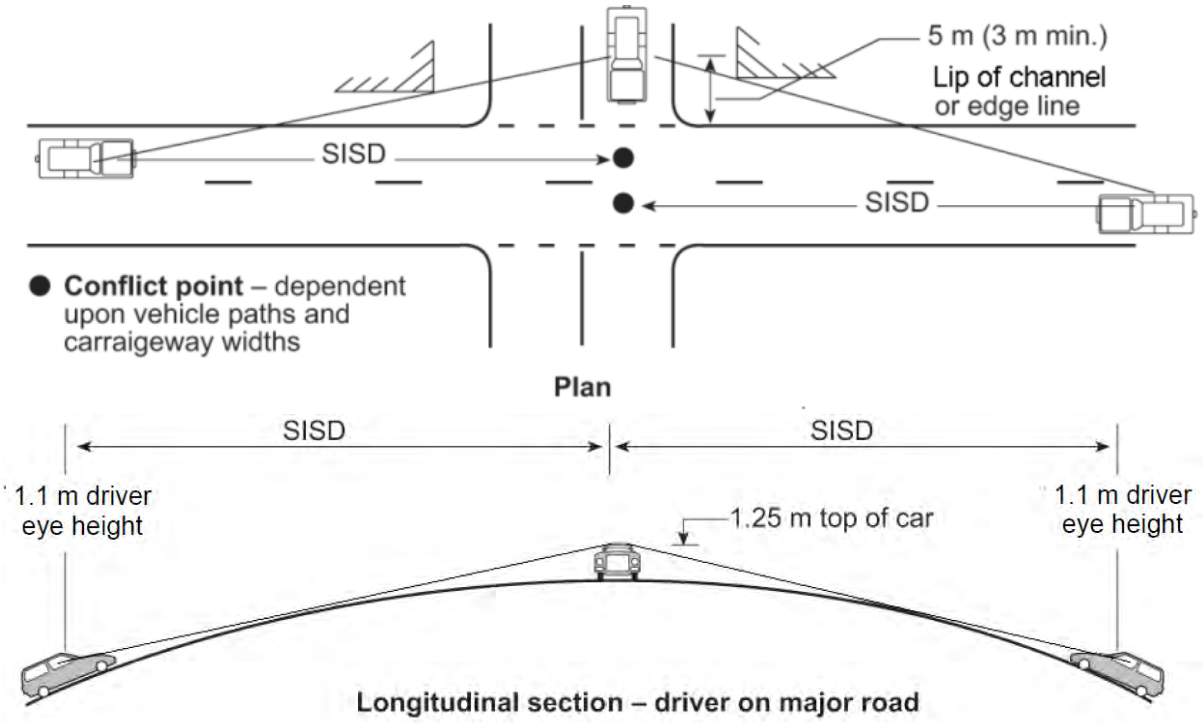


Figure 5: SISD diagrams from Austroads, Figure 3.2

Table 11 Intersection Performance (AM peak Left turn into Razorback Road)

Safe Intersection Sight Distance values are: Design speed (km/h)	Reaction time (seconds)	SISD (m)	Correction for 8% grade (m)	Resultant SISD (m)
100	1.5	234	-20	214
100	2.0	248	-20	228

Exiting Safe Intersection Sight Distance to the South

Available SISD to and from the south of Razorback Road was measured at greater 250 m from engineering survey and as such meets the Austroads guidelines for both reaction time of 1.5 and 2 seconds. Full details including long sections are shown on Arkhill Engineers drawing on SK4153-012 sight line 2 in Appendix B.

Photograph 4: Looking south from Razorback Road to an approaching vehicle

Existing Intersection Safe Sight Distance to the north.

Available SISD to and from the north from Razorback Road was measured at 135 m to 140 m, from engineering survey. This does not meet the requirements in Austroads for this speed environment.

As shown in Photograph 5 and 6, sight distance north to the highway is restricted by a vegetated embankment on the northern side of Razorback Road.

Signage and vegetation at the toe of the embankment batter further obscure the sight line.

Photograph 5 and 6: Looking north from Razorback Road to an approaching vehicle

Due to the reduced site distance and the impact of vegetation and embankment to the north it is proposed to cut back this embankment to achieve the desired site distances detailed in table 11. The concept for these proposed earthworks is discussed in section 9 below.

8 Impact on public transport

There is no impact on public transport as traffic movements are minimal.

9 Proposed Road Works and Intersection Works

To address the increase traffic movements, highlighted above it is proposed to carry out the following works:

Bitumen sealing of Razorback Road

The applicant proposes to bitumen seal, to Council requirements, that section of Razorback Road from the existing seal near Castlereagh Highway to 15m west of the entrance to the quarry. Such sealing will ensure that the minor increase in vehicle movements will not have an adverse effect on road safety or the amenity of adjacent properties.

Improved intersection warning signage.

The current Castlereagh Highway “side road intersection” sign on approach from the north is installed alongside CAMs and may not be obvious to drivers, reducing driver awareness of the Razorback Road intersection.

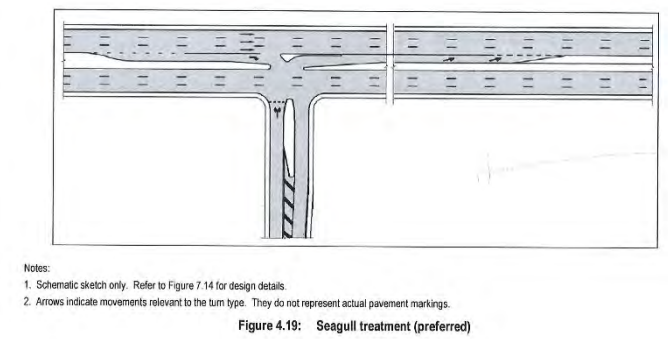
Installing a larger sized sign, repositioned to be clear of the CAMs and supplemented with a *TRUCKS CROSSING OR ENTERING* sign would reinforce to drivers that they are approaching an intersection where heavy vehicles may be entering the highway, assisting with driver awareness.

Improvement of sight distance to the north.

In light of the comments provide in Section 7 two alternatives were examined to determine if and how an improved sight distance could be achieve, namely provision of an acceleration lane to the south or improving sight distance to the north by removing some of the embankment and vegetation.

Acceleration Lane

Austroads and TfNSW standards sets out criteria for minimum length of acceleration lanes on the departure side of intersections. Section 5.5 Austroads Guide to Road Design Part 4A 2010 - Intersections provides details of acceptable design lengths for heavy vehicle acceleration lanes as shown in figure 6 below.



Notes:
1. Schematic sketch only. Refer to Figure 7.14 for design details.
2. Arrows indicate movements relevant to the turn type. They do not represent actual pavement markings.

Figure 4.19: Seagull treatment (preferred)

Figure 6 – Acceleration lane on Departure side of seagul Intesection treatment

This guide (Austroads) provides a range of lengths for acceleration lanes for different road environments and speeds based on a heavy vehicle achieving a speed 20km/hr below the mean free speed of the through traffic when it merges.

Based on current TfNSW comments the mean free speed would be the speed limit at this location (ie 100km/h.) Hence a heavy vehicle will need to accelerate to 80 km/hr prior to merging.

In this location the down hill grade of up to 4 % will assist in reducing the length but in the absence of accurate survey data an acceleration lane in the order of 400m to 500m may be required for a heavy vehicle to come up to speed.

Table 5.7: Acceleration lane lengths (m) for semi-trailers to accelerate from rest to a specified speed on a level or downgrade

Downgrade (%)	Truck speed (km/h)				
	100	90	80	70	60
0	2400	1500	910	550	320
1	1400	940	640	410	250
2	970	700	500	330	210
3	760	560	400	280	180

Figure 7 Extract form Austroads

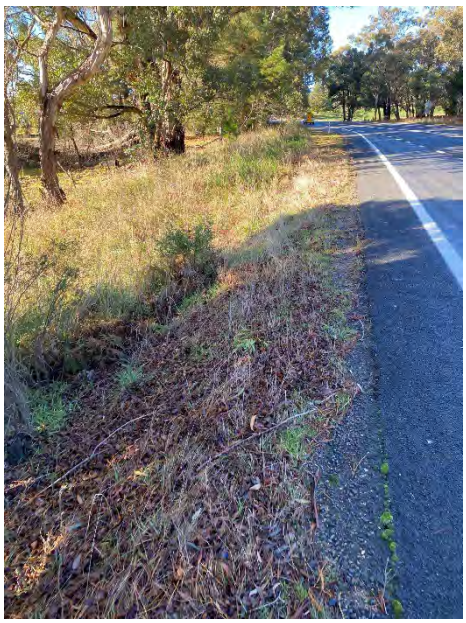
Based on the above table and free speed of 100km/hr, figure 8 below indicates the possible extent of an acceleration lane meeting the criteria set out above.

Figure 8 Extent of Accelaraion lane

A site inspection identified the following issues that will need to be accommodated in the development of a concept design of the proposed improvement.

- Interaction of the merge of the two traveling lanes into one at the same location as the merge of the acceleration lane into the through lane.
- The road geometry (curvature) has the risk of reducing sight lines due to vegetation on the inside of the curve (including in private property) that might need to be removed.
- To meet the TfNSW requirement the existing CHS may need to be converted into a seagull intersection to ensure that vehicles entering the acceleration lane are protected from through traffic, and
- As shown in photographs 7 and 8 below there appears to be a steep drop off from the existing pavement and it may be difficult to contain the road batter with the additional pavement widening required within the road reserve.

Photograph 7 Embankment inside of curve southbound Castlereagh Highway



Photograph 8 Embankment inside of curve southbound Castlereagh Highway

Improving site lines to the north

As mentioned above, sight distance north to the highway is restricted by a vegetated embankment on the northern side of Razorback Road. Signage and vegetation at the toe of the embankment batter further obscure the sight line.

An alternative option to avoid a long acceleration lane would be to trim the embankment on the northern side of the intersection to improve the site lines

Figures 7 and 8 below indicates that clearin and excavation od embankment to achieve the desired sire distance of 205 m.

Discussion are underway to purchase the land required for this activity/

Figure 9 Extent of embankment works

Figure 10 Extent of embankment works

As shown in photographs 9, 10 and 11 the embankment appears to be suitable to bench back and stand at a steep slope without the need for a retaining wall. A slope stability investigation would need to be carried out to determine the appropriate batter slope.

An earth catch drain at the top of the batter and a rock lined dish drain at the bottom of the batter has been provided to protect the batter and road pavement from surface water shedding from the area above the batter.

Photgragh 9 Embankment to north of Intesection

Photgragh 10 Embankment to north of Intesection

Photgragh 11 Embankment to north of Intesection

No other pavement widening works would be required for this option.

As indicated in Section 9 it is clear that the most engineering feasible solution would be to improve sight distance to the north and it is proposed to layback the existing embankment and remove vegetation to ensure that the required Austroads sight distance is achieved.

Arkhill Engineers have completed a concept design (see Appendix B) which proves details of the extent of work required and the final landform.

Arkhill Engineers Concept Design detailed in Appendix B provides the following details:

- SK 4153-001 Site plan showing sight lines and proposed earthworks,
- SK 41530-002 Proposed upgrading to line marking,
- SK 4153-005 details of prosed earthworks,
- SK 4153-001 existing long section along centre line of Castlereagh Highway to the north,
- SK4153-012 detailing long-sections along each of the 4 nominates sight lines showing clearance above existing pavement for sight lines 1 to 3 and the obstruction caused by the embankment to sight line 4,
- SK1553-021 to 023 Details of existing sections through the embankment, and
- SK4153-015 and SK4153-025 to 027 details the proposed excavation required to achieve a clear sightline 4.

This design clearly demonstrates that such an excise of modifying the existing embankment will ensure satisfactory sight lines are achieved to the north in a cost-effective method. It should be noted that the applicant is in discussions to acquire the land required to be excavated. Materials from the excavation will be used in the development of the quarry, hul roads and noise bunds.

10 Traffic Management Plan and Driver Code of Conduct

A draft Operational Traffic Management Plan (TMP) is provided in Appendix A, together with a Draft Driver Code of Conduct. This will be finalised upon approval of the development and after consultation with Mid Western Council and TfNSW.

11 Summary

The traffic impacts from the combined development have been assessed and the key findings are as follows:

- The available sight distance of Razorback Road to the south along Castlereagh Highway is adequate for the speed environment.
- The available sight distance of Razorback Road to the north along Castlereagh Highway is inadequate for the speed environment. However, a proposed concept design has been development to trim back the embank to the north and this design provides a clear sight distance meeting Austroads guidelines.
- Total traffic generation remains low and has no impact on the intersection performance and demonstrates that the current protected right run storage and left turn de acceleration lane is adequate and no other intersection improvements are necessary.
- Minor signage upgrades are warranted to improve the awareness of the approaching intersections.
- Sealing of Razorback Road to 15m west of the quarry access will ensure that the minor increase in vehicle movements will not have an adverse effect on road safety or amenity of adjacent properties.

Based on the findings of this report, Pavey Consulting Services is of the opinion that there are no traffic engineering related matters that should preclude approval of this Development Application.

Prepared by:
David Pavey
B.E (Civil) Grad Dip LGE. LGE Cert MAICD, MAIPM
Director,
Pavey Consulting Services

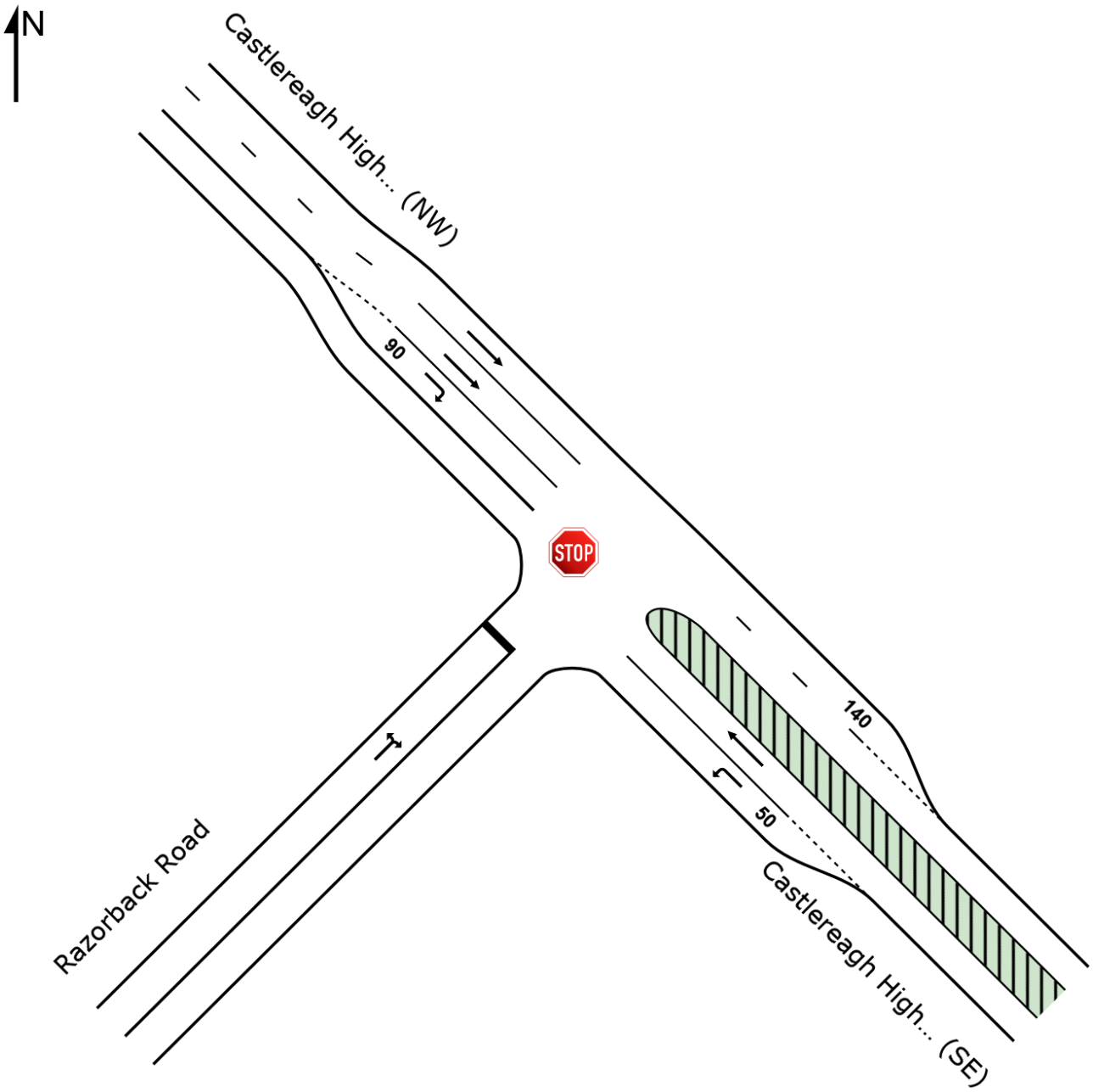
Appendix A – SIDRA OUTPUTS

SITE LAYOUT

Site: [2021_CastlereaghHwy-RazorbackRd_BY_PeakHour_v01 (Site Folder: General)]

Castlereagh Highway and Razorback Road Intersection
Base Year (2021, existing)
Peak Hour
Site Category: (None)
Stop (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [2021_CastlereaghHwy-RazorbackRd_BY_PeakHour_v01 (Site Folder: General)]

Castlereagh Highway and Razorback Road Intersection
Base Year (2021, existing)
Peak Hour
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Castlereagh Highway (SE)														
21	L2	1	0	1	0.0	0.001	7.8	LOS A	0.0	0.0	0.00	0.66	0.00	75.3
22	T1	57	9	60	15.8	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		58	9	61	15.5	0.034	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.4
NorthWest: Castlereagh Highway (NW)														
28	T1	80	14	84	17.5	0.028	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
29	R2	2	0	2	0.0	0.002	7.7	LOS A	0.0	0.0	0.15	0.61	0.15	57.1
Approach		82	14	86	17.1	0.028	0.2	NA	0.0	0.0	0.00	0.01	0.00	98.2
SouthWest: Razorback Road														
30	L2	1	0	1	0.0	0.002	7.7	LOS A	0.0	0.1	0.19	0.88	0.19	54.6
32	R2	1	0	1	0.0	0.002	8.6	LOS A	0.0	0.1	0.19	0.88	0.19	54.5
Approach		2	0	2	0.0	0.002	8.1	LOS A	0.0	0.1	0.19	0.88	0.19	54.5
All Vehicles		142	23	149	16.2	0.034	0.3	NA	0.0	0.1	0.00	0.03	0.00	97.6

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [2021_CastlereaghHwy-RazorbackRd_BC_PeakHour_v01 (Site Folder: General)]

Castlereagh Highway and Razorback Road Intersection
Base Case (existing + development)
Peak Hour
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Castlereagh Highway (SE)														
21	L2	2	2	2	100.0	0.002	10.4	LOS A	0.0	0.0	0.00	0.67	0.00	52.3
22	T1	57	9	60	15.8	0.034	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		59	11	62	18.6	0.034	0.4	NA	0.0	0.0	0.00	0.02	0.00	97.0
NorthWest: Castlereagh Highway (NW)														
28	T1	80	14	84	17.5	0.028	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
29	R2	9	3	9	33.3	0.008	8.7	LOS A	0.0	0.3	0.17	0.62	0.17	56.2
Approach		89	17	94	19.1	0.028	0.9	NA	0.0	0.3	0.02	0.06	0.02	92.7
SouthWest: Razorback Road														
30	L2	4	3	4	75.0	0.010	10.8	LOS A	0.0	0.4	0.22	0.99	0.22	41.0
32	R2	2	2	2	100.0	0.010	14.4	LOS A	0.0	0.4	0.22	0.99	0.22	41.1
Approach		6	5	6	83.3	0.010	12.0	LOS A	0.0	0.4	0.22	0.99	0.22	41.0
All Vehicles		154	33	162	21.4	0.034	1.1	NA	0.0	0.4	0.02	0.08	0.02	89.8

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [2021_CastlereaghHwy-RazorbackRd_FY_PeakHour_v01 (Site Folder: General)]

Castlereagh Highway and Razorback Road Intersection
Future Year (10 years projection)
Peak Hour
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Castlereagh Highway (SE)														
21	L2	1	0	1	0.0	0.001	7.8	LOS A	0.0	0.0	0.00	0.66	0.00	75.3
22	T1	74	12	78	16.2	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		75	12	79	16.0	0.044	0.1	NA	0.0	0.0	0.00	0.01	0.00	99.5
NorthWest: Castlereagh Highway (NW)														
28	T1	104	18	109	17.3	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
29	R2	3	0	3	0.0	0.002	7.8	LOS A	0.0	0.1	0.18	0.60	0.18	57.0
Approach		107	18	113	16.8	0.036	0.3	NA	0.0	0.1	0.00	0.02	0.00	97.9
SouthWest: Razorback Road														
30	L2	1	0	1	0.0	0.003	7.8	LOS A	0.0	0.1	0.23	0.86	0.23	54.4
32	R2	1	0	1	0.0	0.003	9.0	LOS A	0.0	0.1	0.23	0.86	0.23	54.3
Approach		2	0	2	0.0	0.003	8.4	LOS A	0.0	0.1	0.23	0.86	0.23	54.4
All Vehicles		184	30	194	16.3	0.044	0.3	NA	0.0	0.1	0.01	0.02	0.01	97.7

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: [2021_CastlereaghHwy-RazorbackRd_FC_PeakHour_v01 (Site Folder: General)]

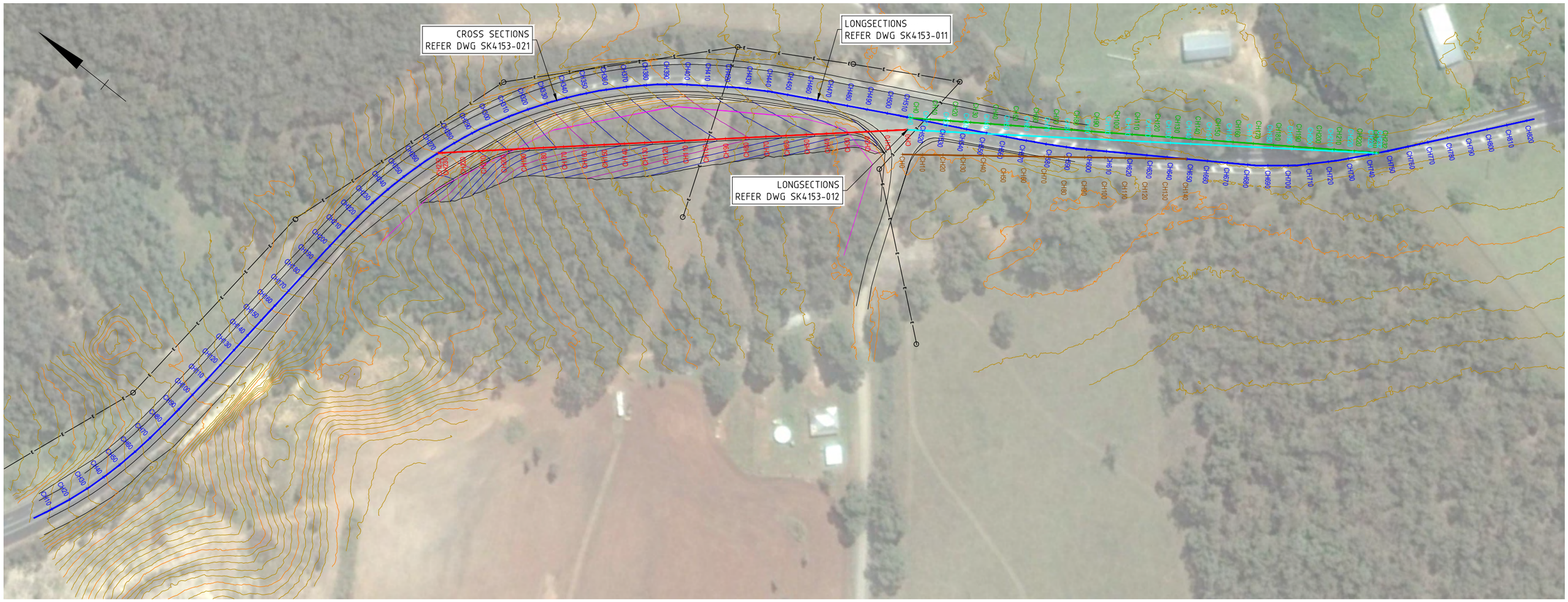
Castlereagh Highway and Razorback Road Intersection
Future Case (10 years projection with development)
Peak Hour
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
SouthEast: Castlereagh Highway (SE)														
21	L2	3	2	3	66.7	0.003	9.6	LOS A	0.0	0.0	0.00	0.66	0.00	55.6
22	T1	74	12	78	16.2	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
Approach		77	14	81	18.2	0.044	0.4	NA	0.0	0.0	0.00	0.03	0.00	97.0
NorthWest: Castlereagh Highway (NW)														
28	T1	104	18	109	17.3	0.036	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	100.0
29	R2	10	3	11	30.0	0.009	8.7	LOS A	0.0	0.3	0.20	0.61	0.20	56.2
Approach		114	21	120	18.4	0.036	0.8	NA	0.0	0.3	0.02	0.05	0.02	93.6
SouthWest: Razorback Road														
30	L2	4	3	4	75.0	0.011	11.0	LOS A	0.0	0.5	0.26	0.98	0.26	40.8
32	R2	2	2	2	100.0	0.011	15.6	LOS B	0.0	0.5	0.26	0.98	0.26	40.9
Approach		6	5	6	83.3	0.011	12.5	LOS A	0.0	0.5	0.26	0.98	0.26	40.9
All Vehicles		197	40	207	20.3	0.044	1.0	NA	0.0	0.5	0.02	0.07	0.02	91.2

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix B – Arkhill Engineers Concept Design



PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

LEGEND:

- WEST SIGHT
- EAST SIGHT 1
- EAST SIGHT 2
- EAST SIGHT 3
- CASTLEREAGH HIGHWAY CENTRELINE
- POWERLINE
- PHIL ORR BDY LINE

1:1000 0 10 20 30 40 50 60 70 80 90 100 m

DESIGNED:	A.M.
DRAWN:	A.M.
APPROVED:	-

ARKHILL ENGINEERS
53 BONVILLE AVENUE
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PO BOX 29
MAITLAND NSW 2320
ABN: 54 003 867 374
Phone: (02) 4088 0700
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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
SIGHT DISTANCE - SITE PLAN

SCALE	SIZE	SKETCH No.	REVISION	DATE
1:1,000	A1	SK4153-001	0	13-01-22

PC FILE: SK4153-001-0.DWG PLOTTING SCALE: 1:1 JN: 4153

1:250 0 5 10 15 20 25 m

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

DESIGNED:	A.M.
DRAWN:	B.S.
APPROVED:	-

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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
SIGHT DISTANCE - LINEMARKING PLAN

SCALE	SIZE	SKETCH No.	REVISION	DATE
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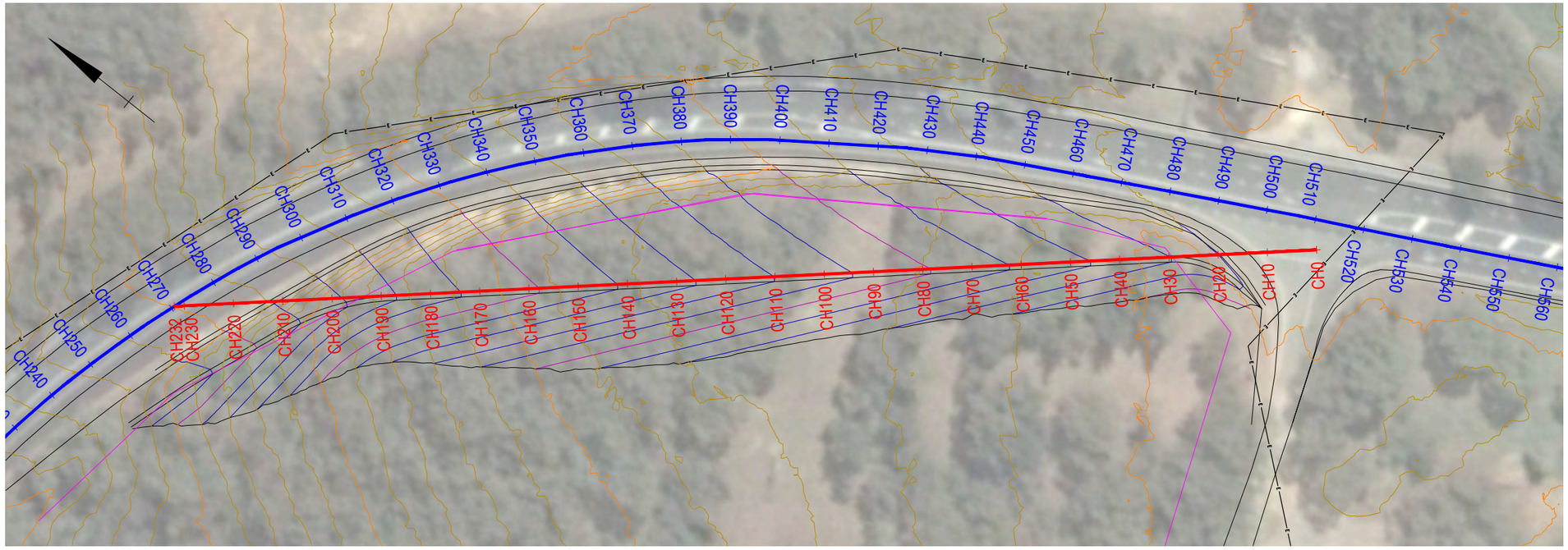
PC FILE: SK4153-001-0.DWG PLOTTING SCALE: 1:1 JN: 4153



0 10 20 30 40 50m
1:500

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

DESIGNED:	A.M.
DRAWN:	B.S.
APPROVED:	-

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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
EARTHWORKS WEST SIGHT LINE - SITE PLAN

SCALE	SIZE	SKETCH No.	REVISION	DATE
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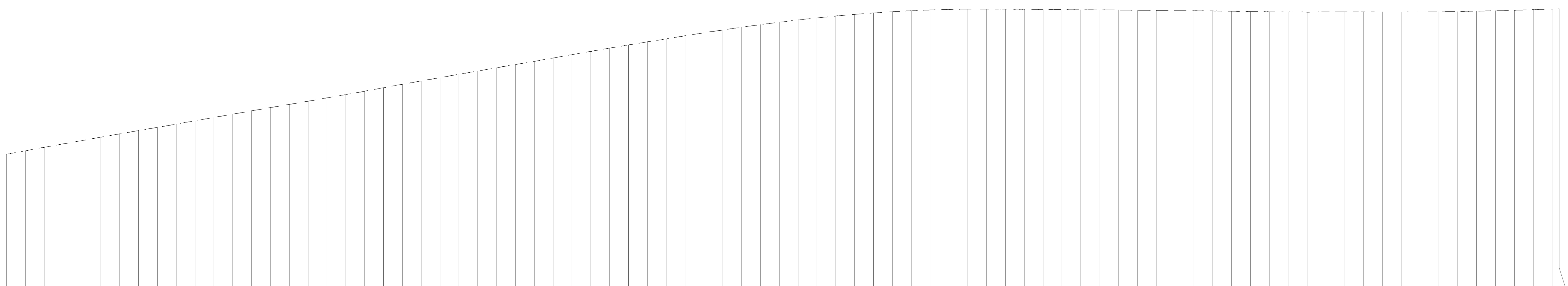
PC FILE: SK4153-001-0.DWG PLOTTING SCALE: 1:1 JN: 4153



DATUM RL = 996.000

CHAINAGE	NATURAL
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20.000	1033.004
30.000	1033.926
40.000	1034.792
50.000	1035.730
60.000	1036.574
70.000	1037.444
80.000	1038.316
90.000	1039.167
100.000	1040.049
110.000	1040.928
120.000	1041.831
130.000	1042.688
140.000	1043.553
150.000	1044.394
160.000	1045.254
170.000	1046.134
180.000	1046.981
190.000	1047.899
200.000	1048.819
210.000	1049.728
220.000	1050.609
230.000	1051.470
240.000	1052.390
250.000	1053.251
260.000	1054.120
270.000	1054.965
280.000	1055.828
290.000	1056.701
300.000	1057.582
310.000	1058.465
320.000	1059.329
330.000	1060.165
340.000	1061.007
350.000	1061.772
360.000	1062.607
370.000	1063.413
380.000	1064.150
390.000	1064.856
400.000	1065.583
410.000	1066.191
420.000	1066.812
430.000	1067.336
440.000	1067.839
450.000	1068.270
460.000	1068.660
470.000	1068.972
480.000	1069.227
490.000	1069.454
500.000	1069.595
510.000	1069.690
520.000	1069.682
530.000	1069.681
540.000	1069.647
550.000	1069.616
560.000	1069.546
570.000	1069.515
580.000	1069.481
590.000	1069.448
600.000	1069.378
610.000	1069.345
620.000	1069.263
630.000	1069.247
640.000	1069.194
650.000	1069.121
660.000	1069.025
670.000	1068.964
680.000	1068.917
690.000	1068.874
700.000	1068.954
710.000	1068.944
720.000	1068.959
730.000	1068.942
740.000	1068.913
750.000	1068.917
760.000	1069.003
770.000	1069.004
780.000	1069.146
790.000	1069.237
800.000	1069.359
810.000	1069.537
820.000	1069.690
823.804	1069.782

CASTLEREAGH HIGHWAY CENTRELINE - LONGSECTION

HORIZONTAL SCALE 1:1000 0 10 20 30 40 50 60 70 80 90 100 m

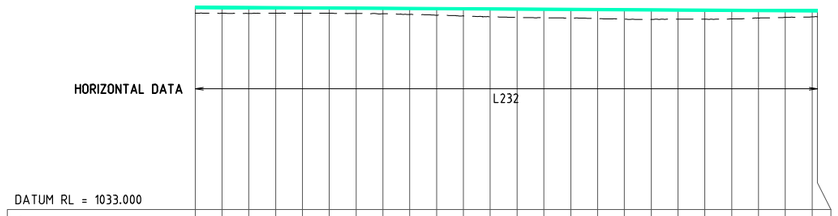
VERTICAL SCALE 1:500 0 10 20 30 40 50m

PRELIMINARY ISSUE NOT FOR CONSTRUCTION

ARKHILL ENGINEERS
53 BONVILLE AVENUE THORNTON NSW 2322 PO BOX 29 MAITLAND NSW 2320
ABN: 54 003 867 374 Phone: (02) 4088 0700 FAX: (02) 4964 2104 Email: arkhill@arkhill.com.au

DESIGNED:	A.M.	TITLE	BORG RUNNING CREEK - RAZORBACK RD INTERSECTION LONGSECTION SHEET 1 OF 2
DRAWN:	A.M.	SCALE: AS SHOWN	SIZE: B1
APPROVED:		SKETCH No.: SK4153-011	REVISION: 0 DATE: 13-01-22

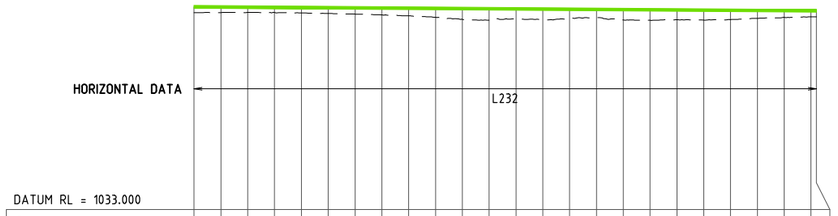
PC FILE: SK4153-011-0.DWG PLOTTING SCALE: 1:1 JN 4153



DATUM RL = 1033.000

CHAINAGE	SIGHT CLEARANCE TO NATURAL	SIGHT LEVELS	NATURAL
0.000	1.100	1070.710	1069.610
10.000	1.102	1070.680	1069.578
20.000	1.084	1070.650	1069.566
30.000	1.006	1070.620	1069.614
40.000	0.999	1070.591	1069.592
50.000	0.980	1070.561	1069.581
60.000	0.988	1070.531	1069.544
70.000	1.002	1070.502	1069.499
80.000	1.102	1070.472	1069.370
90.000	1.230	1070.442	1069.212
100.000	1.327	1070.413	1069.086
110.000	1.465	1070.383	1068.918
120.000	1.535	1070.353	1068.819
130.000	1.601	1070.323	1068.723
140.000	1.604	1070.294	1068.689
150.000	1.669	1070.264	1068.595
160.000	1.731	1070.234	1068.503
170.000	1.772	1070.205	1068.433
180.000	1.696	1070.175	1068.479
190.000	1.676	1070.145	1068.470
200.000	1.578	1070.116	1068.537
210.000	1.388	1070.086	1068.698
220.000	1.231	1070.056	1068.825
230.000	1.114	1070.026	1068.913
232.000	1.100	1070.021	1068.920

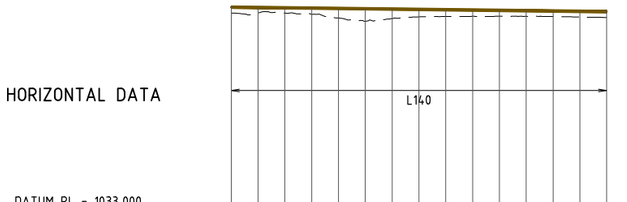
EAST SIGHT 1 - LONGSECTION



DATUM RL = 1033.000

CHAINAGE	SIGHT CLEARANCE TO NATURAL	SIGHT LEVELS	NATURAL
0.000	1.100	1070.772	1069.672
10.000	1.030	1070.739	1069.709
20.000	0.988	1070.707	1069.719
30.000	0.970	1070.674	1069.704
40.000	1.002	1070.642	1069.640
50.000	1.059	1070.609	1069.550
60.000	1.160	1070.577	1069.416
70.000	1.283	1070.544	1069.261
80.000	1.385	1070.512	1069.127
90.000	1.668	1070.479	1068.812
100.000	1.986	1070.447	1068.461
110.000	2.126	1070.415	1068.289
120.000	1.888	1070.382	1068.495
130.000	1.918	1070.350	1068.431
140.000	1.657	1070.317	1068.660
150.000	1.551	1070.285	1068.733
160.000	1.921	1070.252	1068.331
170.000	1.932	1070.220	1068.288
180.000	1.799	1070.187	1068.388
190.000	1.842	1070.155	1068.313
200.000	1.741	1070.123	1068.381
210.000	1.461	1070.090	1068.629
220.000	1.262	1070.058	1068.795
230.000	1.113	1070.025	1068.912
232.000	1.100	1070.019	1068.919

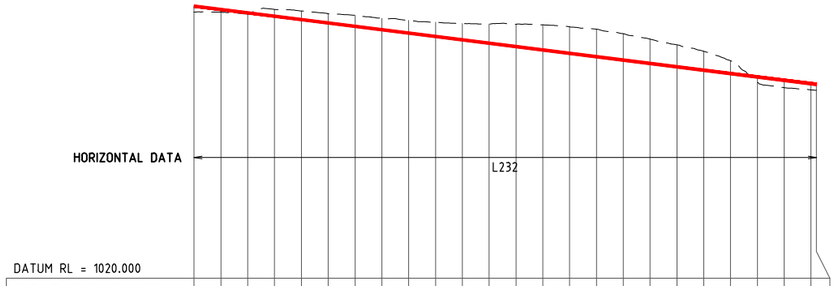
EAST SIGHT 2 - LONGSECTION



DATUM RL = 1033.000

CHAINAGE	SIGHT CLEARANCE TO NATURAL	SIGHT LEVELS	NATURAL
0.000	1.100	1071.046	1069.946
10.000	1.071	1070.986	1069.915
20.000	1.004	1070.925	1069.921
30.000	1.160	1070.865	1069.704
40.000	1.760	1070.804	1069.044
50.000	2.357	1070.744	1068.387
60.000	1.758	1070.683	1068.926
70.000	1.392	1070.623	1069.230
80.000	1.273	1070.562	1069.289
90.000	1.174	1070.502	1069.327
100.000	1.098	1070.441	1069.343
110.000	1.049	1070.381	1069.332
120.000	1.030	1070.320	1069.290
130.000	1.055	1070.260	1069.205
140.000	1.100	1070.199	1069.099

EAST SIGHT 3 - LONG SECTION



DATUM RL = 1020.000

CHAINAGE	SIGHT CLEARANCE TO NATURAL	SIGHT LEVELS	NATURAL
0.000	1.100	1070.710	1069.610
10.000	0.514	1070.081	1069.567
20.000	0.217	1069.453	1069.235
30.000	-1.283	1068.824	1070.107
40.000	-1.608	1068.196	1069.803
50.000	-1.746	1067.567	1069.313
60.000	-2.089	1066.939	1069.028
70.000	-2.147	1066.310	1068.457
80.000	-2.354	1065.682	1068.036
90.000	-2.644	1065.053	1067.698
100.000	-3.036	1064.425	1067.460
110.000	-3.605	1063.796	1067.402
120.000	-4.179	1063.168	1067.347
130.000	-4.679	1062.539	1067.218
140.000	-4.950	1061.911	1066.860
150.000	-5.132	1061.282	1066.414
160.000	-4.915	1060.654	1065.569
170.000	-4.557	1060.025	1064.582
180.000	-4.084	1059.397	1063.481
190.000	-3.528	1058.768	1062.296
200.000	-2.404	1058.140	1060.544
210.000	1.018	1057.511	1056.493
220.000	1.361	1056.883	1055.522
230.000	1.146	1056.254	1055.109
232.000	1.100	1056.129	1055.029

WEST SIGHT - LONGSECTION

HORIZONTAL SCALE 1:1000 0 10 20 30 40 50 60 70 80 90 100 m

VERTICAL SCALE 1:500 0 10 20 30 40 50m

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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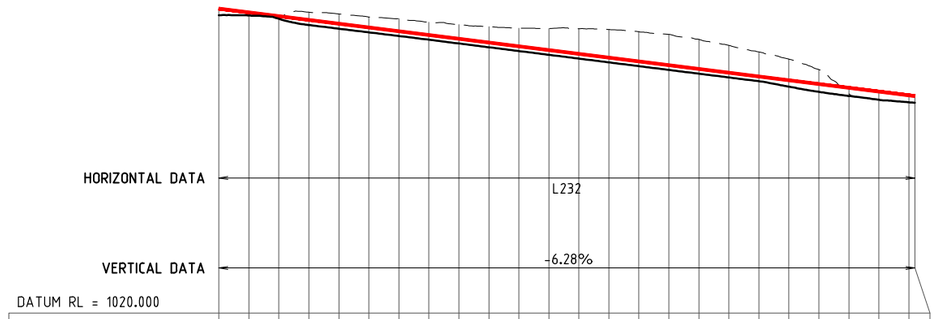
DESIGNED:	A.M.
DRAWN:	A.M.
APPROVED:	

TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
LONGSECTION SHEET 2 OF 2

SCALE	SIZE	SKETCH No.	REVISION	DATE
AS SHOWN	B1	SK4153-012	0	3-01-22

PC FILE: SK4153-011-0.DWG PLOTTING SCALE: 1:1 JN: 4153



DATUM RL = 1020.000

SIGHT CLEARANCE TO NATURAL	1.100	0.514	0.217	-1.283	-1.608	-1.746	-2.089	-2.147	-2.354	-2.644	-3.036	-3.605	-4.179	-4.679	-4.950	-5.132	-4.915	-4.557	-4.084	-3.528	-2.404	1.018	1.361	1.146	1.100
SIGHT LEVELS	1070.710	1070.081	1069.453	1068.824	1068.196	1067.567	1066.939	1066.310	1065.682	1065.053	1064.425	1063.796	1063.168	1062.539	1061.911	1061.282	1060.654	1060.025	1059.397	1058.768	1058.140	1057.511	1056.883	1056.254	1056.129
DESIGN FSL	1069.610	1069.567	1069.007	1067.970	1067.362	1066.754	1066.146	1065.528	1064.900	1064.271	1063.642	1063.013	1062.384	1061.756	1061.127	1060.498	1059.869	1059.240	1058.611	1057.705	1056.845	1056.155	1055.522	1055.109	1055.029
NATURAL	1069.610	1069.567	1069.235	1070.107	1069.803	1069.313	1069.028	1068.457	1068.036	1067.698	1067.460	1067.402	1067.347	1067.218	1066.860	1066.414	1065.569	1064.582	1063.481	1062.296	1060.544	1056.493	1055.522	1055.109	1055.029
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	200.000	210.000	220.000	230.000	232.000

WEST SIGHT - LONGSECTION

HORIZONTAL SCALE 1:1000 0 10 20 30 40 50 60 70 80 90 100 m

VERTICAL SCALE 1:500 0 10 20 30 40 50m

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

DESIGNED:	A.M.
DRAWN:	B.S.
APPROVED:	-

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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
EARTHWORKS WEST SIGHT LINE - LONGSECTION

SCALE	SIZE	SKETCH No.	REVISION	DATE
AS SHOWN	A1	SK4153-015	0	17-01-22

PC FILE: SK4153-015-0.DWG PLOTTING SCALE: 1:1 JN: 4153

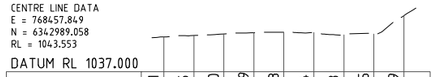
CENTRE LINE DATA
E = 768378.264
N = 6342996.876
RL = 1036.574

DATUM RL 1027.500

DESIGN	1033.603	1033.990	1035.762	1036.251	1036.574	1036.824	1036.544	1038.411	1039.212		
EXISTING	1033.603	1033.990	1035.762	1036.251	1036.574	1036.824	1036.544	1038.411	1039.212		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 60

CENTRE LINE DATA
E = 768457.849
N = 6342989.058
RL = 1043.553



DATUM RL 1037.000

DESIGN	1042.761	1043.015	1043.270	1043.489	1043.553	1043.514	1043.138	1043.255	1046.309		
EXISTING	1042.761	1043.015	1043.270	1043.489	1043.553	1043.514	1043.138	1043.255	1046.309		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 140

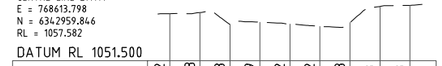
CENTRE LINE DATA
E = 768537.593
N = 6342982.743
RL = 1050.609

DATUM RL 1041.000

DESIGN	1046.919	1047.926	1050.704	1050.736	1050.609	1050.435	1050.310	1049.719	1050.900		
EXISTING	1046.919	1047.926	1050.704	1050.736	1050.609	1050.435	1050.310	1049.719	1050.900		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 220

CENTRE LINE DATA
E = 768613.798
N = 6342959.846
RL = 1057.582



DATUM RL 1051.500

DESIGN	1059.332	1059.498	1057.528	1057.899	1057.582	1057.202	1057.823	1060.518	1060.713		
EXISTING	1059.332	1059.498	1057.528	1057.899	1057.582	1057.202	1057.823	1060.518	1060.713		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 300

CENTRE LINE DATA
E = 768358.761
N = 6343001.265
RL = 1034.792

DATUM RL 1024.500

DESIGN	1030.390	1031.750	1033.876	1034.440	1034.792	1035.020	1034.937	1036.439	1039.223		
EXISTING	1030.390	1031.750	1033.876	1034.440	1034.792	1035.020	1034.937	1036.439	1039.223		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 40

CENTRE LINE DATA
E = 768437.903
N = 6342990.529
RL = 1041.831

DATUM RL 1035.000

DESIGN	1040.913	1041.204	1041.333	1041.710	1041.831	1041.648	1041.370	1041.812	1045.428		
EXISTING	1040.913	1041.204	1041.333	1041.710	1041.831	1041.648	1041.370	1041.812	1045.428		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 120

CENTRE LINE DATA
E = 768517.688
N = 6342984.676
RL = 1048.819

DATUM RL 1040.000

DESIGN	1046.228	1047.069	1048.690	1048.978	1048.819	1048.643	1049.016	1048.782	1050.098		
EXISTING	1046.228	1047.069	1048.690	1048.978	1048.819	1048.643	1049.016	1048.782	1050.098		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 200

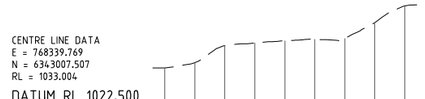
CENTRE LINE DATA
E = 768595.609
N = 6342968.113
RL = 1055.828

DATUM RL 1049.500

DESIGN	1056.305	1056.281	1055.952	1056.136	1055.828	1055.436	1055.403	1058.043	1058.497		
EXISTING	1056.305	1056.281	1055.952	1056.136	1055.828	1055.436	1055.403	1058.043	1058.497		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 280

CENTRE LINE DATA
E = 768339.769
N = 6343007.507
RL = 1033.004



DATUM RL 1022.500

DESIGN	1028.528	1029.389	1032.242	1032.686	1033.004	1033.279	1033.410	1036.054	1038.836		
EXISTING	1028.528	1029.389	1032.242	1032.686	1033.004	1033.279	1033.410	1036.054	1038.836		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 20

CENTRE LINE DATA
E = 768417.966
N = 6342992.111
RL = 1040.049

DATUM RL 1033.500

DESIGN	1039.754	1039.527	1039.554	1039.868	1040.049	1040.025	1039.782	1040.305	1045.534		
EXISTING	1039.754	1039.527	1039.554	1039.868	1040.049	1040.025	1039.782	1040.305	1045.534		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 100

CENTRE LINE DATA
E = 768497.742
N = 6342986.138
RL = 1046.981

DATUM RL 1039.000

DESIGN	1045.040	1045.889	1046.752	1047.079	1046.981	1046.769	1047.161	1047.523	1048.493		
EXISTING	1045.040	1045.889	1046.752	1047.079	1046.981	1046.769	1047.161	1047.523	1048.493		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 180

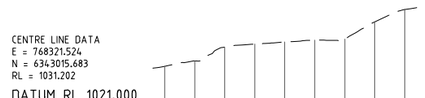
CENTRE LINE DATA
E = 768576.704
N = 6342974.620
RL = 1054.120

DATUM RL 1047.500

DESIGN	1053.414	1053.822	1054.300	1054.451	1054.120	1053.771	1053.825	1055.300	1055.580		
EXISTING	1053.414	1053.822	1054.300	1054.451	1054.120	1053.771	1053.825	1055.300	1055.580		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 260

CENTRE LINE DATA
E = 768321.524
N = 6343015.683
RL = 1031.202



DATUM RL 1021.000

DESIGN	1027.155	1028.045	1030.347	1030.863	1031.202	1031.520	1031.697	1034.570	1036.623		
EXISTING	1027.155	1028.045	1030.347	1030.863	1031.202	1031.520	1031.697	1034.570	1036.623		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 0

CENTRE LINE DATA
E = 768398.062
N = 6342994.057
RL = 1038.316

DATUM RL 1031.500

DESIGN	1037.458	1037.587	1037.714	1038.110	1038.316	1038.459	1038.293	1039.564	1043.212		
EXISTING	1037.458	1037.587	1037.714	1038.110	1038.316	1038.459	1038.293	1039.564	1043.212		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 80

CENTRE LINE DATA
E = 768477.796
N = 6342987.608
RL = 1045.254

DATUM RL 1038.000

DESIGN	1044.112	1044.490	1045.014	1045.292	1045.254	1045.070	1045.224	1045.261	1045.883		
EXISTING	1044.112	1044.490	1045.014	1045.292	1045.254	1045.070	1045.224	1045.261	1045.883		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 160

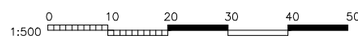
CENTRE LINE DATA
E = 768557.333
N = 6342979.571
RL = 1052.390

DATUM RL 1044.500

DESIGN	1050.234	1050.483	1052.222	1052.583	1052.390	1052.051	1051.865	1051.873	1052.096		
EXISTING	1050.234	1050.483	1052.222	1052.583	1052.390	1052.051	1051.865	1051.873	1052.096		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 240

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION



DESIGNED:	A.M.
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APPROVED:	-

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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
SECTIONS - SHEET 1 OF 3

SCALE	SIZE	SKETCH No.	REVISION	DATE
AS SHOWN	A1	SK4153-021	0	13-01-22

PC FILE: SK4153-021-0.DWG PLOTTING SCALE: 1:1 JN: 4153

CENTRE LINE DATA
E = 768677.018
N = 6342911.541
RL = 1064.150

DATUM RL 1058.000

DESIGN	1065.614	1065.833	1064.801	1064.570	1064.150	1063.714	1066.265	1067.117	1067.249		
EXISTING	1065.614	1065.833	1064.801	1064.570	1064.150	1063.714	1066.265	1067.117	1067.249		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 380

CENTRE LINE DATA
E = 768721.323
N = 6342845.183
RL = 1068.660

DATUM RL 1062.500

DESIGN	1068.850	1069.775	1068.838	1068.873	1068.660	1068.294	1069.206	1069.196	1069.225		
EXISTING	1068.850	1069.775	1068.838	1068.873	1068.660	1068.294	1069.206	1069.196	1069.225		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 460

CENTRE LINE DATA
E = 768758.232
N = 6342774.209
RL = 1069.647

DATUM RL 1063.500

DESIGN	1069.237	1069.220	1069.509	1069.690	1069.647	1069.448	1069.342	1069.986	1070.283		
EXISTING	1069.237	1069.220	1069.509	1069.690	1069.647	1069.448	1069.342	1069.986	1070.283		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 540

CENTRE LINE DATA
E = 768798.025
N = 6342704.883
RL = 1069.263

DATUM RL 1061.500

DESIGN	1067.209	1067.870	1068.228	1069.053	1069.263	1069.303	1069.201	1068.918	1068.942		
EXISTING	1067.209	1067.870	1068.228	1069.053	1069.263	1069.303	1069.201	1068.918	1068.942		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 620

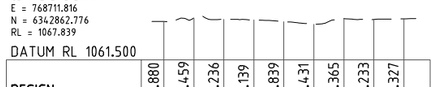
CENTRE LINE DATA
E = 768662.894
N = 6342925.692
RL = 1062.607

DATUM RL 1056.500

DESIGN	1064.850	1065.062	1063.374	1063.061	1062.607	1062.189	1064.808	1066.598	1066.707		
EXISTING	1064.850	1065.062	1063.374	1063.061	1062.607	1062.189	1064.808	1066.598	1066.707		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 360

CENTRE LINE DATA
E = 768711.816
N = 6342862.776
RL = 1067.839

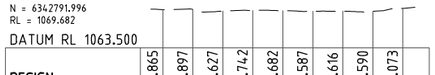


DATUM RL 1061.500

DESIGN	1067.880	1068.459	1068.236	1068.139	1067.839	1067.431	1068.365	1068.233	1068.327		
EXISTING	1067.880	1068.459	1068.236	1068.139	1067.839	1067.431	1068.365	1068.233	1068.327		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 440

CENTRE LINE DATA
E = 768749.087
N = 6342791.996
RL = 1069.682



DATUM RL 1063.500

DESIGN	1069.865	1069.897	1069.627	1069.742	1069.682	1069.587	1069.616	1069.590	1070.073		
EXISTING	1069.865	1069.897	1069.627	1069.742	1069.682	1069.587	1069.616	1069.590	1070.073		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 520

CENTRE LINE DATA
E = 768787.130
N = 6342721.655
RL = 1069.378

DATUM RL 1061.000

DESIGN	1066.857	1067.182	1068.638	1069.264	1069.378	1069.288	1068.520	1069.387	1069.987		
EXISTING	1066.857	1067.182	1068.638	1069.264	1069.378	1069.288	1068.520	1069.387	1069.987		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 600

CENTRE LINE DATA
E = 768647.618
N = 6342938.585
RL = 1061.007

DATUM RL 1055.000

DESIGN	1063.715	1063.945	1061.460	1061.371	1061.007	1060.629	1062.996	1065.100	1065.348		
EXISTING	1063.715	1063.945	1061.460	1061.371	1061.007	1060.629	1062.996	1065.100	1065.348		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 340

CENTRE LINE DATA
E = 768701.101
N = 6342879.653
RL = 1066.812

DATUM RL 1060.500

DESIGN	1066.638	1067.483	1067.331	1067.162	1066.812	1066.374	1067.460	1067.440	1067.552		
EXISTING	1066.638	1067.483	1067.331	1067.162	1066.812	1066.374	1067.460	1067.440	1067.552		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 420

CENTRE LINE DATA
E = 768739.999
N = 6342809.811
RL = 1069.595

DATUM RL 1063.500

DESIGN	1069.784	1069.533	1069.524	1069.704	1069.595	1069.500	1069.537	1069.496	1069.950		
EXISTING	1069.784	1069.533	1069.524	1069.704	1069.595	1069.500	1069.537	1069.496	1069.950		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 500

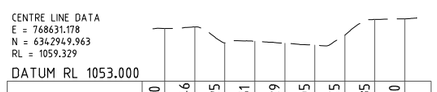
CENTRE LINE DATA
E = 768776.924
N = 6342738.847
RL = 1069.481

DATUM RL 1061.500

DESIGN	1067.335	1067.699	1069.152	1069.439	1069.481	1069.318	1067.585	1069.061	1069.824		
EXISTING	1067.335	1067.699	1069.152	1069.439	1069.481	1069.318	1067.585	1069.061	1069.824		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 580

CENTRE LINE DATA
E = 768631.178
N = 6342949.963
RL = 1059.329

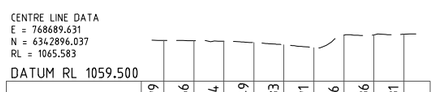


DATUM RL 1053.000

DESIGN	1061.790	1062.046	1059.395	1059.651	1059.329	1059.005	1060.675	1063.285	1063.410		
EXISTING	1061.790	1062.046	1059.395	1059.651	1059.329	1059.005	1060.675	1063.285	1063.410		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 320

CENTRE LINE DATA
E = 768689.631
N = 6342896.037
RL = 1065.583

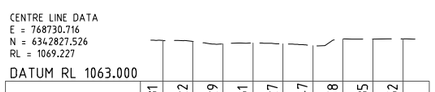


DATUM RL 1059.500

DESIGN	1066.299	1066.266	1066.184	1065.949	1065.583	1065.091	1067.176	1067.236	1067.331		
EXISTING	1066.299	1066.266	1066.184	1065.949	1065.583	1065.091	1067.176	1067.236	1067.331		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 400

CENTRE LINE DATA
E = 768730.716
N = 6342827.526
RL = 1069.227

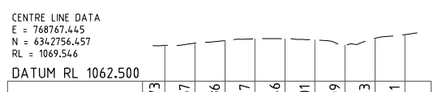


DATUM RL 1063.000

DESIGN	1069.781	1069.622	1069.229	1069.361	1069.227	1068.947	1070.078	1070.035	1070.052		
EXISTING	1069.781	1069.622	1069.229	1069.361	1069.227	1068.947	1070.078	1070.035	1070.052		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 480

CENTRE LINE DATA
E = 768767.445
N = 6342756.457
RL = 1069.546



DATUM RL 1062.500

DESIGN	1068.473	1068.857	1069.286	1069.577	1069.546	1069.401	1068.509	1069.673	1070.271		
EXISTING	1068.473	1068.857	1069.286	1069.577	1069.546	1069.401	1068.509	1069.673	1070.271		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 560

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

1:500 0 10 20 30 40 50m

DESIGNED:	A.M.
DRAWN:	A.M.
APPROVED:	-

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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION SECTIONS - SHEET 2 OF 3

SCALE	SIZE	SKETCH No.	REVISION	DATE
AS SHOWN	A1	SK4153-022	0	13-01-22

PC FILE: SK4153-021-0.DWG PLOTTING SCALE: 1:1 JN: 4153

CENTRE LINE DATA
E = 768842.831
N = 6342638.674
RL = 1068.954

DATUM RL 1062.000

DESIGN	1067.852	1068.117	1068.279	1068.725	1068.954	1069.216	1069.108	1069.020	1069.170		
EXISTING	1067.852	1068.117	1068.279	1068.725	1068.954	1069.216	1069.108	1069.020	1069.170		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 700

CENTRE LINE DATA
E = 768902.431
N = 6342585.487
RL = 1069.146

-5.09%

DATUM RL 1061.500

DESIGN	1067.116	1067.370	1067.851	1068.910	1069.146	1069.204	1068.730	1068.280	1068.386		
EXISTING	1067.116	1067.370	1067.851	1068.910	1069.146	1069.204	1068.730	1068.280	1068.386		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 780

CENTRE LINE DATA
E = 768830.711
N = 6342654.567
RL = 1068.917

DATUM RL 1061.500

DESIGN	1067.340	1067.956	1068.352	1068.663	1068.917	1069.224	1069.071	1069.490	1069.639		
EXISTING	1067.340	1067.956	1068.352	1068.663	1068.917	1069.224	1069.071	1069.490	1069.639		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 680

CENTRE LINE DATA
E = 768886.963
N = 6342598.164
RL = 1069.003

-10.16%

DATUM RL 1061.000

DESIGN	1066.618	1067.002	1067.510	1068.744	1069.003	1069.090	1068.479	1068.215	1068.396		
EXISTING	1066.618	1067.002	1067.510	1068.744	1069.003	1069.090	1068.479	1068.215	1068.396		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 760

CENTRE LINE DATA
E = 768819.815
N = 6342671.339
RL = 1069.025

DATUM RL 1062.000

DESIGN	1068.243	1068.928	1068.703	1068.734	1069.025	1069.233	1069.081	1069.905	1069.970		
EXISTING	1068.243	1068.928	1068.703	1068.734	1069.025	1069.233	1069.081	1069.905	1069.970		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 660

CENTRE LINE DATA
E = 768871.586
N = 6342610.951
RL = 1068.913

DATUM RL 1061.000

DESIGN	1066.776	1066.701	1067.357	1068.669	1068.913	1069.103	1068.199	1067.986	1068.215		
EXISTING	1066.776	1066.701	1067.357	1068.669	1068.913	1069.103	1068.199	1067.986	1068.215		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 740

CENTRE LINE DATA
E = 768933.368
N = 6342560.131
RL = 1069.690

DATUM RL 1063.000

DESIGN	1068.988	1069.072	1069.000	1069.577	1069.690	1069.728	1069.159	1068.540	1068.595		
EXISTING	1068.988	1069.072	1069.000	1069.577	1069.690	1069.728	1069.159	1068.540	1068.595		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 820

CENTRE LINE DATA
E = 768808.920
N = 6342688.111
RL = 1069.194

DATUM RL 1062.500

DESIGN	1068.326	1068.339	1068.433	1068.927	1069.194	1069.317	1069.271	1069.605	1069.949		
EXISTING	1068.326	1068.339	1068.433	1068.927	1069.194	1069.317	1069.271	1069.605	1069.949		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 640

CENTRE LINE DATA
E = 768856.675
N = 6342624.270
RL = 1068.959

DATUM RL 1061.000

DESIGN	1067.133	1067.504	1067.754	1068.663	1068.959	1069.201	1068.412	1068.492	1068.640		
EXISTING	1067.133	1067.504	1067.754	1068.663	1068.959	1069.201	1068.412	1068.492	1068.640		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 720

CENTRE LINE DATA
E = 768917.900
N = 6342572.809
RL = 1069.359

DATUM RL 1062.500

DESIGN	1068.315	1068.215	1068.507	1069.219	1069.359	1069.414	1068.939	1068.312	1068.428		
EXISTING	1068.315	1068.215	1068.507	1069.219	1069.359	1069.414	1068.939	1068.312	1068.428		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 800

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

1:500 0 10 20 30 40 50m

DESIGNED:	A.M.
DRAWN:	A.M.
APPROVED:	-

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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
SECTIONS - SHEET 3 OF 3

SCALE	SIZE	SKETCH No.	REVISION	DATE
AS SHOWN	A1	SK4153-023	0	13-01-22

PC FILE: SK4153-021-0.DWG PLOTTING SCALE: 1:1 JN: 4153

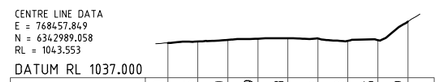
CENTRE LINE DATA
E = 768378.264
N = 6342996.876
RL = 1036.574

DATUM RL 1027.500

DESIGN FSL	1033.603	1033.990	1035.762	1036.251	1036.574	1036.824	1036.544	1038.411	1039.212	
EXISTING	1033.603	1033.990	1035.762	1036.251	1036.574	1036.824	1036.544	1038.411	1039.212	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 60

CENTRE LINE DATA
E = 768657.849
N = 6342989.058
RL = 1043.553

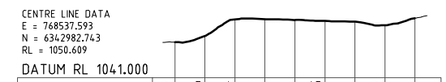


DATUM RL 1037.000

DESIGN FSL	1042.761	1043.015	1043.270	1043.489	1043.553	1043.514	1043.138	1043.255	1046.309	
EXISTING	1042.761	1043.015	1043.270	1043.489	1043.553	1043.514	1043.138	1043.255	1046.309	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 140

CENTRE LINE DATA
E = 768537.593
N = 6342982.743
RL = 1050.609



DATUM RL 1041.000

DESIGN FSL	1046.919	1047.926	1050.704	1050.736	1050.609	1050.435	1050.310	1049.719	1050.900	
EXISTING	1046.919	1047.926	1050.704	1050.736	1050.609	1050.435	1050.310	1049.719	1050.900	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 220

CENTRE LINE DATA
E = 768613.798
N = 6342959.846
RL = 1057.582

DATUM RL 1051.000

DESIGN FSL	1059.332	1059.498	1057.528	1057.899	1057.582	1057.202	1056.952	1056.692	1057.988	1059.709	1061.038	1061.118	1061.116	1061.281
EXISTING	1059.332	1059.498	1057.528	1057.899	1057.582	1057.202	1057.823	1060.518	1060.713	1060.509	1061.038	1061.118	1061.116	1061.281
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000

CH 300

CENTRE LINE DATA
E = 768358.761
N = 6343001.265
RL = 1034.792

DATUM RL 1024.500

DESIGN FSL	1030.390	1031.750	1033.876	1034.440	1034.792	1035.020	1034.937	1036.439	1039.223	
EXISTING	1030.390	1031.750	1033.876	1034.440	1034.792	1035.020	1034.937	1036.439	1039.223	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 40

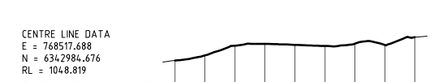
CENTRE LINE DATA
E = 768437.903
N = 6342990.529
RL = 1041.831

DATUM RL 1035.000

DESIGN FSL	1040.913	1041.204	1041.333	1041.710	1041.831	1041.648	1041.370	1041.812	1045.428	
EXISTING	1040.913	1041.204	1041.333	1041.710	1041.831	1041.648	1041.370	1041.812	1045.428	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 120

CENTRE LINE DATA
E = 768517.688
N = 6342984.676
RL = 1048.819

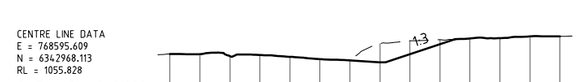


DATUM RL 1040.000

DESIGN FSL	1046.228	1047.069	1048.690	1048.978	1048.819	1048.643	1049.016	1048.782	1050.098	
EXISTING	1046.228	1047.069	1048.690	1048.978	1048.819	1048.643	1049.016	1048.782	1050.098	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 200

CENTRE LINE DATA
E = 768595.609
N = 6342968.113
RL = 1055.828



DATUM RL 1049.000

DESIGN FSL	1056.305	1056.281	1055.952	1056.136	1055.828	1055.436	1055.252	1054.914	1056.270	1057.937	1058.906	1058.951	1059.239	1059.224
EXISTING	1056.305	1056.281	1055.952	1056.136	1055.828	1055.436	1055.403	1058.043	1058.497	1058.665	1058.906	1058.951	1059.239	1059.224
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000

CH 280

CENTRE LINE DATA
E = 768339.769
N = 6343007.507
RL = 1033.004

DATUM RL 1022.500

DESIGN FSL	1028.528	1029.389	1032.242	1032.686	1033.004	1033.279	1033.410	1036.054	1038.836	
EXISTING	1028.528	1029.389	1032.242	1032.686	1033.004	1033.279	1033.410	1036.054	1038.836	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 20

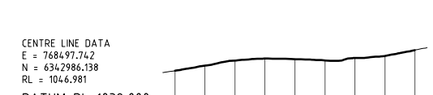
CENTRE LINE DATA
E = 768417.966
N = 6342992.111
RL = 1040.049

DATUM RL 1033.500

DESIGN FSL	1039.754	1039.527	1039.554	1039.868	1040.049	1040.025	1039.782	1040.305	1045.534	
EXISTING	1039.754	1039.527	1039.554	1039.868	1040.049	1040.025	1039.782	1040.305	1045.534	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 100

CENTRE LINE DATA
E = 768497.742
N = 6342986.138
RL = 1046.981

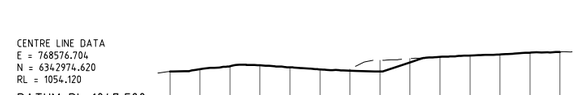


DATUM RL 1039.000

DESIGN FSL	1045.040	1045.889	1046.752	1047.079	1046.981	1046.769	1047.161	1047.523	1048.493	
EXISTING	1045.040	1045.889	1046.752	1047.079	1046.981	1046.769	1047.161	1047.523	1048.493	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 180

CENTRE LINE DATA
E = 768576.704
N = 6342974.620
RL = 1054.120



DATUM RL 1047.500

DESIGN FSL	1053.414	1053.822	1054.300	1054.451	1054.120	1053.771	1053.567	1053.417	1054.935	1055.872	1056.078	1056.253	1056.560	1056.681
EXISTING	1053.414	1053.822	1054.300	1054.451	1054.120	1053.771	1053.825	1055.300	1055.580	1055.872	1056.078	1056.253	1056.560	1056.681
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000

CH 260

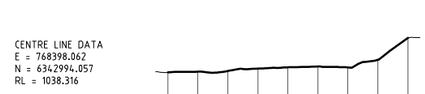
CENTRE LINE DATA
E = 768321.524
N = 6343015.683
RL = 1031.202

DATUM RL 1021.000

DESIGN FSL	1027.155	1028.045	1030.347	1030.863	1031.202	1031.520	1031.697	1034.570	1036.623	
EXISTING	1027.155	1028.045	1030.347	1030.863	1031.202	1031.520	1031.697	1034.570	1036.623	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 0

CENTRE LINE DATA
E = 768398.062
N = 6342994.057
RL = 1038.316

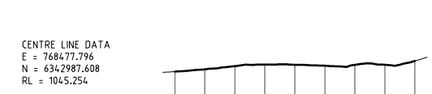


DATUM RL 1031.500

DESIGN FSL	1037.458	1037.587	1037.714	1038.110	1038.316	1038.459	1038.293	1039.564	1043.212	
EXISTING	1037.458	1037.587	1037.714	1038.110	1038.316	1038.459	1038.293	1039.564	1043.212	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 80

CENTRE LINE DATA
E = 768477.796
N = 6342987.608
RL = 1045.254



DATUM RL 1038.000

DESIGN FSL	1044.112	1044.490	1045.014	1045.292	1045.254	1045.070	1045.224	1045.261	1045.883	
EXISTING	1044.112	1044.490	1045.014	1045.292	1045.254	1045.070	1045.224	1045.261	1045.883	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	

CH 160

CENTRE LINE DATA
E = 768557.333
N = 6342979.571
RL = 1052.390

DATUM RL 1044.500

DESIGN FSL	1050.234	1050.483	1052.222	1052.583	1052.390	1052.051	1051.865	1051.873	1052.096	1052.886	1053.701	1054.139	1054.468	1054.626
EXISTING	1050.234	1050.483	1052.222	1052.583	1052.390	1052.051	1051.865	1051.873	1052.096	1052.886	1053.701	1054.139	1054.468	1054.626
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000

CH 240

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

DESIGNED:	A.M.
DRAWN:	B.S.
APPROVED:	-

1:500 0 10 20 30 40 50m

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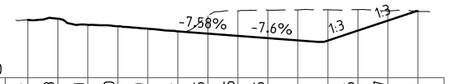
TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
EARTHWORKS WEST SIGHT LINE - SECTIONS - SHEET 1 OF 3

SCALE	SIZE	SKETCH No.	REVISION	DATE
AS SHOWN	A1	SK4153-025	0	17-01-22

PC FILE: SK4153-025-0.DWG PLOTTING SCALE: 1:1 JN: 4153

CENTRE LINE DATA
E = 768677.018
N = 6342911.541
RL = 1064.150

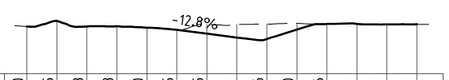


DATUM RL 1056.000

DESIGN FSL	1065.614	1065.833	1064.801	1064.570	1064.150	1063.714	1063.325	1062.945	1062.565	1062.185	1062.155	1063.826	1065.497	1067.061	
EXISTING	1065.614	1065.833	1064.801	1064.570	1064.150	1063.714	1066.265	1067.117	1067.249	1067.278	1067.293	1067.319	1067.124	1067.061	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 380

CENTRE LINE DATA
E = 768721.323
N = 6342845.183
RL = 1068.660

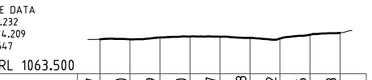


DATUM RL 1061.000

DESIGN FSL	1068.850	1069.775	1068.838	1068.873	1068.660	1068.295	1067.655	1067.017	1066.766	1068.320	1069.266	1069.271	1069.186	1069.231	
EXISTING	1068.850	1069.775	1068.838	1068.873	1068.660	1068.294	1069.206	1069.196	1069.225	1069.390	1069.266	1069.271	1069.186	1069.231	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 460

CENTRE LINE DATA
E = 768758.232
N = 6342774.209
RL = 1069.647

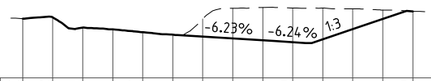


DATUM RL 1063.500

DESIGN FSL	1069.237	1069.220	1069.509	1069.690	1069.647	1069.448	1069.342	1069.986	1070.283						
EXISTING	1069.237	1069.220	1069.509	1069.690	1069.647	1069.448	1069.342	1069.986	1070.283						
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000						

CH 540

CENTRE LINE DATA
E = 768662.894
N = 6342925.692
RL = 1062.607

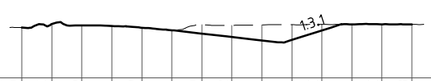


DATUM RL 1055.000

DESIGN FSL	1064.850	1065.062	1063.374	1063.061	1062.607	1062.189	1061.866	1061.554	1061.242	1060.930	1061.426	1063.114	1064.801	1066.080	
EXISTING	1064.850	1065.062	1063.374	1063.061	1062.607	1062.189	1064.808	1066.598	1066.707	1066.634	1066.617	1066.484	1066.278	1066.080	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 360

CENTRE LINE DATA
E = 768711.816
N = 6342862.776
RL = 1067.839

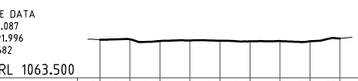


DATUM RL 1059.500

DESIGN FSL	1067.880	1068.459	1068.236	1068.139	1067.839	1067.431	1068.365	1068.233	1068.327	1068.348	1068.409	1068.421	1068.400	1068.383	
EXISTING	1067.880	1068.459	1068.236	1068.139	1067.839	1067.431	1068.365	1068.233	1068.327	1068.348	1068.409	1068.421	1068.400	1068.383	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 440

CENTRE LINE DATA
E = 768749.087
N = 6342791.996
RL = 1069.682

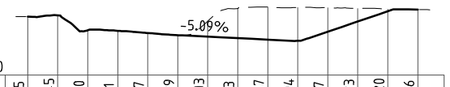


DATUM RL 1063.500

DESIGN FSL	1069.865	1069.897	1069.627	1069.742	1069.682	1069.587	1069.616	1069.590	1070.073						
EXISTING	1069.865	1069.897	1069.627	1069.742	1069.682	1069.587	1069.616	1069.590	1070.073						
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000						

CH 520

CENTRE LINE DATA
E = 768647.618
N = 6342938.585
RL = 1061.007

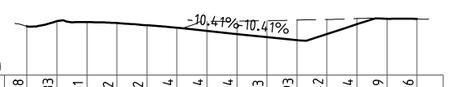


DATUM RL 1054.000

DESIGN FSL	1063.715	1063.945	1061.460	1061.371	1061.007	1060.629	1060.403	1060.153	1059.907	1059.694	1061.227	1062.923	1064.620	1064.916	
EXISTING	1063.715	1063.945	1061.460	1061.371	1061.007	1060.629	1062.996	1065.100	1065.348	1065.243	1065.192	1065.089	1064.953	1064.916	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 340

CENTRE LINE DATA
E = 768701.101
N = 6342879.653
RL = 1066.812



DATUM RL 1058.500

DESIGN FSL	1066.638	1067.483	1067.331	1067.162	1066.812	1066.374	1067.460	1067.440	1067.552	1067.692	1067.754	1067.916	1067.879	1067.836	
EXISTING	1066.638	1067.483	1067.331	1067.162	1066.812	1066.374	1065.854	1065.334	1064.813	1064.293	1065.342	1066.964	1067.879	1067.836	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 420

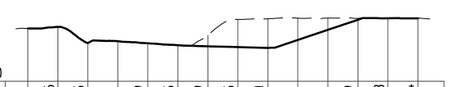
CENTRE LINE DATA
E = 768739.999
N = 6342809.811
RL = 1069.595

DATUM RL 1063.500

DESIGN FSL	1069.784	1069.533	1069.524	1069.704	1069.595	1069.500	1069.537	1069.496	1069.906	1070.406	1070.407	1070.431	1070.564	1070.455	
EXISTING	1069.784	1069.533	1069.524	1069.704	1069.595	1069.500	1069.537	1069.496	1069.950	1070.406	1070.407	1070.431	1070.564	1070.455	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 500

CENTRE LINE DATA
E = 768631.178
N = 6342949.963
RL = 1059.329

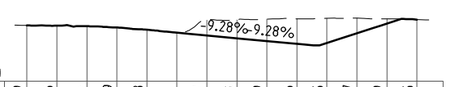


DATUM RL 1053.000

DESIGN FSL	1061.790	1062.046	1059.395	1059.651	1059.329	1059.005	1058.829	1058.705	1058.570	1058.871	1061.555	1063.239	1063.478	1063.494	
EXISTING	1061.790	1062.046	1059.395	1059.651	1059.329	1059.005	1060.675	1063.285	1063.410	1063.522	1063.514	1063.461	1063.478	1063.494	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 320

CENTRE LINE DATA
E = 768689.631
N = 6342896.037
RL = 1065.583



DATUM RL 1057.000

DESIGN FSL	1066.299	1066.266	1066.184	1065.949	1065.583	1065.091	1064.617	1064.153	1063.689	1063.226	1063.365	1064.987	1066.609	1067.265	
EXISTING	1066.299	1066.266	1066.184	1065.949	1065.583	1065.091	1067.176	1067.236	1067.331	1067.389	1067.487	1067.514	1067.387	1067.265	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 400

CENTRE LINE DATA
E = 768730.716
N = 6342827.526
RL = 1069.227

DATUM RL 1062.000

DESIGN FSL	1069.781	1069.622	1069.229	1069.361	1069.227	1068.947	1068.312	1067.910	1069.460	1070.037	1070.005	1069.962	1069.917	1069.946	
EXISTING	1069.781	1069.622	1069.229	1069.361	1069.227	1068.947	1070.078	1070.035	1070.052	1070.037	1070.005	1069.962	1069.917	1069.946	
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	40.000	45.000	

CH 480

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

1:500 0 10 20 30 40 50m

DESIGNED:	A.M.
DRAWN:	B.S.
APPROVED:	-

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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
EARTHWORKS WEST SIGHT LINE - SECTIONS - SHEET 2 OF 3

SCALE	SIZE	SKETCH No.	REVISION	DATE
AS SHOWN	A1	SK4153-026	0	17-01-22

PC FILE: SK4153-025-0.DWG PLOTTING SCALE: 1:1 JN: 4153

CENTRE LINE DATA
E = 768798.025
N = 6342704.883
RL = 1069.263

DATUM RL 1061.500

DESIGN FSL	1067.209	1067.870	1068.228	1069.053	1069.263	1069.303	1069.201	1068.918	1068.942		
EXISTING	1067.209	1067.870	1068.228	1069.053	1069.263	1069.303	1069.201	1068.918	1068.942		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 620

CENTRE LINE DATA
E = 768842.831
N = 6342638.674
RL = 1068.954

DATUM RL 1062.000

DESIGN FSL	1067.852	1068.117	1068.279	1068.725	1068.954	1069.216	1069.108	1069.020	1069.170		
EXISTING	1067.852	1068.117	1068.279	1068.725	1068.954	1069.216	1069.108	1069.020	1069.170		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 700

CENTRE LINE DATA
E = 768902.431
N = 6342585.487
RL = 1069.146

DATUM RL 1061.500

DESIGN FSL	1067.116	1067.370	1067.851	1068.910	1069.146	1069.204	1068.730	1068.280	1068.386		
EXISTING	1067.116	1067.370	1067.851	1068.910	1069.146	1069.204	1068.730	1068.280	1068.386		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 780

CENTRE LINE DATA
E = 768787.130
N = 6342721.655
RL = 1069.378

DATUM RL 1061.000

DESIGN FSL	1066.857	1067.182	1068.638	1069.264	1069.378	1069.288	1068.520	1069.387	1069.987		
EXISTING	1066.857	1067.182	1068.638	1069.264	1069.378	1069.288	1068.520	1069.387	1069.987		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 600

CENTRE LINE DATA
E = 768830.711
N = 6342654.567
RL = 1068.917

DATUM RL 1061.500

DESIGN FSL	1067.340	1067.956	1068.352	1068.663	1068.917	1069.224	1069.071	1069.490	1069.639		
EXISTING	1067.340	1067.956	1068.352	1068.663	1068.917	1069.224	1069.071	1069.490	1069.639		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 680

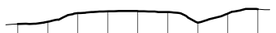
CENTRE LINE DATA
E = 768886.963
N = 6342598.164
RL = 1069.003

DATUM RL 1061.000

DESIGN FSL	1066.618	1067.002	1067.510	1068.744	1069.003	1069.090	1068.479	1068.215	1068.396		
EXISTING	1066.618	1067.002	1067.510	1068.744	1069.003	1069.090	1068.479	1068.215	1068.396		
OFFSET	-20.000	-15.000	-10.000	-5.000	0.000	5.000	10.000	15.000	20.000		

CH 760

CENTRE LINE DATA
E = 768776.924
N = 6342738.847
RL = 1069.481



DATUM RL 1061.500

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DATUM RL 1062.000

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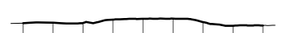

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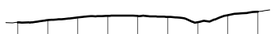

DATUM RL 1062.500

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DATUM RL 1062.500

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CH 800

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

DESIGNED:	A.M.
DRAWN:	B.S.
APPROVED:	-

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TITLE
BORG RUNNING CREEK - RAZORBACK RD INTERSECTION
EARTHWORKS WEST SIGHT LINE - SECTIONS - SHEET 3 OF 3

SCALE	SIZE	SKETCH No.	REVISION	DATE
AS SHOWN	A1	SK4153-027	0	17-01-22

PC FILE: SK4153-025-0.DWG PLOTTING SCALE: 1:1 JN: 4153

Appendix C - Draft Operational Traffic Management Plan

David Pavey Pty Ltd trading as
Pavey Consulting Services
Specialising in
Traffic Impact Assessments and Transportation Planning
Road Safety, Traffic Management Plans and Traffic Control Plans
Civil and Structural Design
Project Management and Contract Administration
Mediation and Government Relations

Operational Traffic Management Plan

Quarry Running Stream

Prepared By

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1.0 INTRODUCTION

This document provides an Operational Traffic Management Plan (OTMP) proposed quarry at Running Stream NSW.

2.0 REFERENCES

- Work Health & Safety Act (NSW) 2011
- Work Health & Safety Regulations (NSW) 201
- Work Health & Safety (National Uniform Legislation) Act 2011
- Work Health & Safety (National Uniform Legislation) Regulations 2011
- Safe Work Australia: Construction Work - Code of Practice (2013)
- Safe Work Australia: General Guide for Workplace Traffic Management (2014)
- Safe Work Australia: Traffic Management: Guide for Construction Work (2014)

3.0 WAYS TO CONTROL TRAFFIC RISKS

Keeping people and vehicles apart

The best way to protect pedestrians is to make sure people and vehicles cannot interact. Where powered mobile plant is used at a workplace, you must ensure it does not collide with pedestrians or other powered mobile plant.

This can be achieved by not allowing vehicles in pedestrian spaces or not allowing pedestrians in vehicle operating areas, for example using overhead walkways.

However, this may not be reasonably practicable in all workplaces. If people and vehicles cannot be separated you should consider using:

- barriers or guardrails at building entrances and exits to stop pedestrians walking in front of vehicles,
- high impact traffic control barriers,
- temporary physical barriers, or
- separate, clearly marked footpaths or walkways e.g. using lines painted on the ground or different coloured surfacing.

Vehicle routes

Vehicle routes at the workplace should have a firm and even surface, be wide and high enough for the largest vehicle using them and be well maintained and free from obstructions. They should be clearly sign-posted to indicate speed limits, traffic calming measures like speed humps and parking areas.

Reducing speed is very important where administrative control measures are the only reasonably practicable approach. Speed limits should be implemented and enforced and traffic calming devices like speed humps considered.

Pedestrian crossings

Pedestrian crossings should be clearly marked with ground markings, lights or signs. If the vehicle route to be crossed is a road or railway consider control measures that will work with those already established by the relevant authority, for example a local council or rail authority.

Both pedestrians and vehicles should have good visibility, for example pallet goods should not be stored in a way that would obscure vision.

Procedures indicating who has right of way at crossings should also be established.

Parking areas

Parking may be needed for workers, visitors, trucks and other vehicles used in the workplace. Consider setting out the workplace so parking areas:

- are located away from busy work areas and traffic routes,
- have walkways leading to and from parking areas which are separated from vehicles or vehicle routes e.g. use physical controls like barriers or bollards to prevent vehicles from crossing into walking areas, and
- are clearly marked and sign-posted, well-lit and unobstructed.

Reversing vehicles

If reasonably practicable eliminate the need for reversing by using drive-through loading and unloading systems, multi-directional mobile plant or rotating cabins. Where this is not possible consider:

- using devices like reversing sensors, reversing cameras, mirrors, rotating lights or audible reversing alarms,
- using a person to direct the reversing vehicle if they cannot see clearly behind—this person should be in visible contact with the driver at all times and wear high-visibility clothing,
- providing designated clearly marked, signposted and well-lit reversing areas, and
- excluding non-essential workers from the area.

Loading and unloading vehicles

It is important to make sure visitors including visiting drivers are aware of the workplace layout, the route they should take and safe working procedures for the workplace. Provide drivers with safe access to amenities away from loading areas or other vehicular traffic.

Provide effective ways to warn of loading in progress to other plant operators, drivers and pedestrians. Warning devices can include signage, cones, lights, alarms and horns.

Signs and road markings

Clear road markings like reflective paint and signs should be used to alert pedestrians and vehicle operators to traffic hazards in the workplace.

Signs should be provided to indicate exclusion and safety zones, parking areas, speed limits, vehicle crossings and hazards like blind corners, steep gradients and where forklifts are in use.

Lighting

Traffic routes, manoeuvring areas and yards should be well lit with particular attention given to junctions, buildings, walkways and vehicles routes. Where possible they should be designed to avoid extreme light variation, for example drivers moving from bright into dull light or vice versa.

4.0 COUNCIL CONSULTATION

TBC after Council Consultation

5.0 SITE LOCATION

TBC after Development Approval has been obtained.

6.0 TRAFFIC MANAGEMENT PLAN

Introduction

The purpose of this document is to minimise the impacts of the heavy vehicle traffic on Davis Rd, the surrounding properties and on the community and to manage the movement of heavy vehicles using best industry practice.

Objectives

The objectives of this Traffic Management Plan and Driver Code of Conduct are to:

a) Ensure compliance with the conditions,
b) Encourage compliance and acceptance of the Truck Driver Code of Conduct by all heavy vehicle drivers,
c) Minimise the heavy vehicle impacts on the community,
d) Foster an understanding and awareness within the company of community expectations and legislative requirements in regard to heavy vehicle movements,
e) Protect and enhance public safety through compliance with relevant road rules, and
f) Increase OH&S understanding in relation to fatigue, vehicle operation in public areas and obligation to the general public.

Project Description

TBC after Development Approval has been obtained.

Site Access and Internal Operations

Access Arrangements

Access to the site is controlled by Borg Resources staff. A programmable swipe card/tag will be provided to all employees and regular contractors to activate boom gates and access the weighbridge.

The site speed limit is 15 km/h and this will be enforced.

Passenger Vehicles

The suitability of the proposed access driveway with respect to accommodating passenger vehicles is assessed based on guidelines provided within the Australian Standard for Off-Street Car parking (AS2890.1-2004). This publication provides driveway design recommendations based on several site characteristics such as the number and classification of vehicles to be accommodated on-site and the functional role of the frontage road.

It is evident that the proposed combined ingress/egress driveway suitably accords with the design criteria specified within AS2890.1-2004 and is therefore considered to be satisfactory in terms of servicing passenger vehicles.

Passenger Vehicles

Upon entry to the subject site, passenger vehicles will access the at-grade passenger vehicle parking areas.

The parking bays and internal circulation of the parking areas has been designed to accord with the relevant requirements of AS2890.1 and AS2890.6.

The above compliance with the relevant AS2890.1 and AS2890.6- specifications is anticipated to result in safe and efficient internal manoeuvring and parking space

accessibility.

Marked pedestrian paths are provided to guide pedestrians from carparks to reception and office locations.

Signage has been erected to direct all visitors to report to office prior to moving around the site.

Heavy Vehicles

Traffic movements for a range of heavy vehicles has been examined by preparing several swept path plans, which have been overlaid on the site.

This sweep analysis indicates that all heavy vehicles proposed to service the facility are capable of manoeuvring within the site in a safe and efficient manner without any unreasonable encroachment on internal passenger vehicle parking areas or structures. Accordingly, the internal heavy vehicle manoeuvring arrangements are satisfactory**.**

Hours of Operation

The current approved development is approved to process materials during the following hours:

- 7am to 5pm Monday to Friday,
- 8am to 1pm Saturdays, and
- No work on Sundays or Public Holidays.

Minimising Vehicle Movements

Traffic movement around the workplace should be minimised as much as possible. This will be achieved where practicable by:

- Controlling entry/exit to the work area by planning or engineering processes (e.g. gates, signage, speed control),
- Developing storage areas so delivery vehicles do not have to cross the site,
- Scheduling work processes to minimise the number of vehicles operating at the same time, and
- Scheduling work processes to minimise the number of vehicles operating while people are moving through an area (e.g. start and finish of shifts).

Haul Roads

TBC after Development Approval has been obtained.

Monitoring of Product Transport

The Proponent shall keep accurate records of:

- The amount of quarry products transported from the site (per calendar month and year),
- The number of laden vehicle movements from the site (per hour, day, week, calendar month and year), and
- Monitor complaints with respect to the usage of Davis Rd and other haul roads.

7.0 DRIVER CODE OF CONDUCT

A driver code of conduct has been development for the site and is included in Appendix C.

This document includes:

Heavy vehicle drivers

- Have undertaken a site induction carried out by an approved member of staff,
- Hold a valid driver's licence for the class of vehicle that they operate,
- Operate the vehicle in a safe manner within and external to the site, and
- Comply with the direction of authorised site personnel when within the site.

Heavy Vehicle Speed

Heavy vehicle drivers need to comply with:

- signposted speed limits on haul routes,
- internally within the site, and
- Drivers and truck operators are to be aware of the "Three Strikes Scheme" introduced by the Roads and Maritime Services which applies to all vehicles over 4.5 tonnes. When a heavy vehicle is detected travelling at 15 km/h or more over the posted or relevant heavy vehicle speed limit by a mobile Police unit or fixed speed camera, the Roads and Maritime Services will record a strike against that vehicle. If three strikes are recorded within a three-year period, the Transport for NSW will act to suspend the registration of that vehicle (up to three months).

Heavy Vehicles Driver Fatigue

Fatigue is one of the biggest causes of accidents for heavy vehicle drivers. The Heavy Vehicle Driver Fatigue Reform was therefore developed by the National Transport Commission (NTC) and approved by Ministers from all States and Territories in February 2007.

The heavy vehicle driver fatigue law commenced in NSW on 28 September 2008 and applies to trucks and truck combinations over 12 tonne GVM.

Heavy Vehicle Compression Braking

Compression braking by heavy vehicles is a source of irritation to the community generating many complaints especially at night when residents are especially sensitive to noise.

In some instances, compression braking is required for safety reasons however when passing through or adjacent to residential areas or isolated farmsteads a reduction in the speed of the vehicle is recommended to reduce the instances and severity of compression braking.

Load Covering

Loose material on the road surface has the potential to cause road crashes and vehicle damage.

All trucks arriving at or departing the site whether loaded with material or not are required to have an effective cover over their load for the duration of the trip.

All care is to be taken to ensure that all loose debris from the vehicle body and wheels is removed prior to leaving the site.

Drivers must ensure that following tipping that the tailgate is locked before leaving the site.

Vehicle Departure and Arrival

Trucks should only be scheduled to arrive during operating hours to minimise the need for on street parking.

8.0 COMPLIANCE MONITORING

Commencement of Traffic Management Plan & Driver Code of Conduct

It is proposed that this Traffic Management Plan will be initiated when the project becomes operational and reviewed after 12 months of operation.

The Driver Code of Conduct is to be signed by individual drivers and authorised representative of Borg Resources at the time when drivers attend their site induction or shortly thereafter.

Monitoring Measures

A formal observation of compliance at three monthly intervals will be undertaken to document any remedial actions with employees, heavy vehicle drivers or haulage companies that may be necessary as a result of these observations.

Appendix D - Draft Driver Code of Conduct

Borg Resources Drivers Code of Conduct

This document sets out the truck driver requirements for all employees and contractors to Borg Resources.

DECLARATION

I, the undersigned, hereby agree to abide by Borg Resources' Driver Code of Conduct forthe transportation of timber resources to/ from the sites in Oberon in a safe manner.

I have read and understand the requirements outlined in the Code and will, to the best ofmy ability, comply and assist with their implementation, requirements and ongoing compliance.

Truck Driver

Full Name: _____

Signature: _____

Date: _____

General Requirements

The Drivers Code of Conduct is distributed to all employee drivers and sub-contractors transporting quarry products to and from Running Stream Quarry.

The Code would be provided to each driver to read and sign to confirm they have understood and pledge to follow the haulage instructions.

Heavy vehicle drivers hauling to and from the subject site must:

- Have read and signed the Drivers Code of Conduct (this document) prior as a condition of their employment;
- Hold a valid driver's license for the class of vehicle that is being operated;
- Operate the vehicle in a safe manner while on site and public road network;
- Comply with the directions of Borg Resources supervision, safety and operational requirements and nominated Haulage Routes;
- All drivers are to use seat belts when driving;
- All drivers are to drive to the sign posted speed limit, both on public roads, private roads and within the site.

Site Access

Access to the site is controlled by Borg Resources staff. A programmable swipe card/tag will be provided to all employees and regular contractors to activate boom gates and access the weighbridge.

The site speed limit is 15 km/h and this will be enforced.

Heavy Vehicle Haul Routes

All heavy vehicle drivers must adhere to the designated truck routes to/from the site as follows:

- Approach routes:
  - Travel on Castlereagh Highway and Razorback Road in westerly direction, turn left into Running Stream Quarry.
  - Or as determined by the Haulage Plan as provided
- Departure routes:
  - Turn right onto Razorback Road and then proceed to Castlereagh Highway .
  - Or as determined by the Haulage Plan as provided

Heavy Vehicle Speed

Truck drivers must comply with the Australian Road Rules with travelling along public roads.

Drivers are to observe the posted speed limits and adjust speed appropriately to suit theroad and weather conditions at the time.

Speed limits on route to the site can between 40km/hr (school zones) up to 100km/hr. The maximum speed that a vehicle must travel is the signposted speed. Warning signs indicating a reduction in speed ahead must also be obeyed. These signs are shown below.

Typical NSW Road Speed Limit Signs

Speed Reduction Ahead Warning Sign

The speed limit within the site is 15km/hr (unless sign posted otherwise in an area) which is to bestrictly maintained.

Heavy Vehicles Driver Fatigue

The heavy vehicle driver fatigues law commenced in NSW in 2008 and applies to trucks and truck combinations over 8 tonnes GVM (however, Ministerial Exemption Notices may apply).

Under the law, industry has the choice of operating under three fatigue management schemes, namely:

1. Standard Hours of Operation – Borg Resources limited to 13 hours per day
2. Basic Fatigue Management (BFM)
3. Advanced Fatigue management (AFM).

All heavy vehicle drivers associated with the Resources team are to be aware of their adopted fatigue management scheme and operate within its requirements.

Heavy Vehicle Compression Braking

Compression braking on route to or hauling away from site should only be used when required and for safety reasons. It is not to be used in areas where prohibited.

Heavy Vehicle Noise

Impulsive and Tonal noise generating activities shall not be undertaken at site outside normal operating hours.

Load Covering (where applicable)

All loaded trucks arriving at and departing from the site are required to have an effective cover over their load for the duration of the journey. The loadcover may be removed only upon arrival at the destination (ie. at the site).

Care must be taken to ensure that all loose debris from vehicles and wheels is removed prior to exiting the site.

Site management is to monitor loose material on the side of the haul route and take appropriate action regularly.

Other Safety Considerations along the Haul Route

Heavy vehicle drivers should be aware of the following:

- Load restraint remains the responsibility of every driver and failure torestrain a load will result in personal fines.
- Concealed driveways – drivers are to drive with caution around any signed concealed driveways
- Adverse weather safety – drivers should adjust their driving speed to suit weather conditions at the time. Be particularly aware of hazardous driving conditions for all road users in these conditions.
- Do not cross water courses when the water depth is above 100mm, report the situation to your manager to make alternative route arrangements.
- Remember, some of our trucks have signs on the rear trailer advising motorists of our safe driver practices, plus contact details and all have a registration number and your driving behaviour, good or poor, can be reported to Borg management.