Traffix Group

Traffic Engineering Assessment

Regional Renewable Organics Network (RRON)

Black Rock Water Reclamation Plant, Connewarre

Prepared for
Barwon Water

September 2024

G33791R-01F

Level 28, 459 Collins St
Melbourne Victoria 3000

T: 03 9822 2888
admin@traffixgroup.com.au

Traffix Group Pty Ltd
ABN: 32 100 481 570

traffixgroup.com.au

Document Control

Our Reference: G33791R-01F

Issue No.	Type	Date	Prepared By	Approved By
A	Draft	18/10/23	A. Montgomerie / D. Torpey	N. Woolcock (RPE6892)
B	Final	1/12/23	A. Montgomerie / D. Torpey	N. Woolcock (RPE6892)
C	Updated Final	23/01/24	A. Montgomerie / D. Torpey	N. Woolcock (RPE6892)
D	Updated Final	3/09/24	D. Torpey	A. Montgomerie (RPE13499)
E	Updated Final	04/09/24	D. Torpey	A. Montgomerie (RPE13499)
F	Updated Final	11/09/24	D. Torpey	A. Montgomerie (RPE13499)

Table of Contents

1. Introduction 5

2. Proposal 5

3. Existing Conditions 6

3.1. Subject Site 6

3.2. Existing Barwon Water Operations 8

3.3. Road Network 8
3.3.1. Existing Traffic Volumes – Blackrock Road / Barwon Heads Road 10

3.4. Pedestrian and Cyclist Facilities 11

4. Traffic Engineering Assessment 12

4.1. Car Parking Considerations 12
4.1.1. Statutory Car Parking Requirement 12
4.1.2. Car Parking Demand Assessment 12

4.2. Car Parking Layout and Access Arrangements 13

4.3. Traffic Generation 14

4.4. Traffic Impact 15

4.5. Bicycle Considerations 15

5. Loading and Facility Operations 16

6. Conclusions 20

List of Figures

Figure 1: Locality Plan 6
Figure 2: Aerial Photograph 7
Figure 3: Southern Access Point 7
Figure 4: Central Access Point 7
Figure 5: Northern Access Point 8
Figure 6: Blackrock Road - View North 9
Figure 7: Blackrock Road - View South 9
Figure 8: Barwon Heads Road - View East 9
Figure 9: Barwon Heads Road - View East 9
Figure 10: Barwon Heads Rd/Blackrock Rd 10
Figure 11: Barwon Heads Rd/Blackrock Rd 10
Figure 12: No Truck Restriction 10
Figure 13: Peak Hour Turning Movement Volumes 11
Figure 14: BN03 access and egress 17
Figure 15: BN10 access and egress 18

Figure 16: Digestate Drying Area access and egress 19

List of Appendices

Appendix A **Development Plans**

Appendix B **Turning Movement Counts**

Appendix C **Swept Path Diagrams**

1. Introduction

Traffix Group has been engaged by Barwon Water to undertake a Traffic Engineering Assessment for the Regional Renewable Organics Network (RRON) at the Black Rock Water Reclamation Plant, Connewarre.

This report provides a detailed traffic engineering assessment of the parking and traffic arrangements associated with the proposed development.

2. Proposal

The proposal is for an organic waste processing facility to be located at the Black Rock Water Reclamation Plant in Connewarre. The proposal is to be an 'addition' to existing operations to the Black Rock Water Reclamation Plant.

The facility will involve the receival of organic waste from four (4) partner Councils as follows:

- Borough of Queenscliffe,
- City of Greater Geelong,
- Golden Plains Shire, and
- Surf Coast Shire,

Additional organic waste will also be accepted from commercial and industrial organisations across the Barwon region.

The organic waste will then be processed on site to produce a biochar and digestate (the end products), as well as renewable energy.

The use is expected to gradually increase its operations over a 10-year period to reach its peak capacity of 46,160 tonnes per annum of organic waste processing and 27,000 tonnes per annum of end products. This has been indicatively chosen as the design year 2033. It is expected that the end products will be exported from the site and distributed to retail partners / customers.

The use is expected to generate a number of heavy vehicle movements associated with the delivery of organic waste to the site as well as the export of the end products from the site. It is expected that 14 full time staff will be employed to support the on-site operations of the proposal.

The organic waste processing facility is proposed to include one (1) main building with an associated office and additional facilities. Both buildings are proposed to include internal loading bays, with a weighbridge to be located adjacent to BN03.

The site will utilise two (2) of the three (3) existing site access arrangements provided to Blackrock Road, with an additional internal road link to be constructed to facilitate access.

A car park with 10 car parking spaces (including one (1) accessible space) is proposed adjacent to the office.

The development plans, prepared by Hitatchi Zosen INOVA / NALG Envirotech, are attached at Appendix A.

3. Existing Conditions

3.1. Subject Site

The site is located on the west side of Blackrock Road, south of Thirteen Beach Road, in Connewarre. The subject site is currently occupied by Barwon Water's Black Rock Water Reclamation Plant, which processes sewage delivered by pipeline to produce recycled water.

A locality plan and aerial photograph of the subject site are provided at Figure 1 and Figure 2, respectively.

Three (3) existing vehicle access points are provided to Blackrock Road, with photographs of these access points provided at Figure 3 to Figure 5.

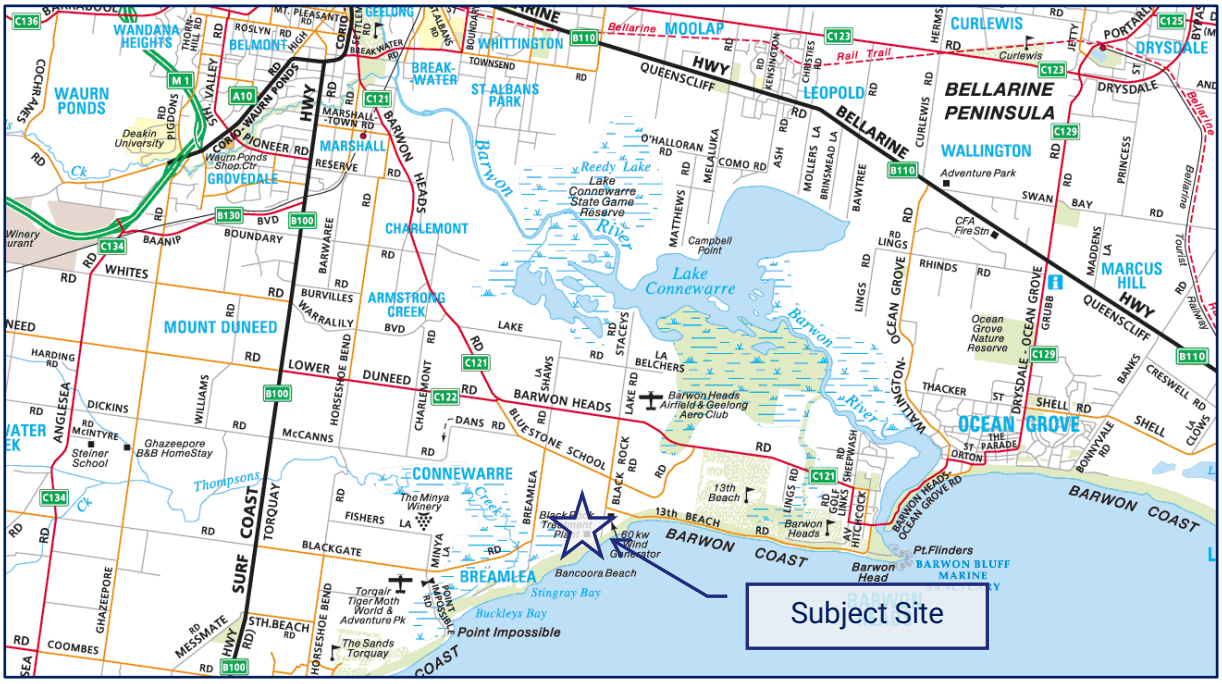


Figure 1: Locality Plan

Source: Melway

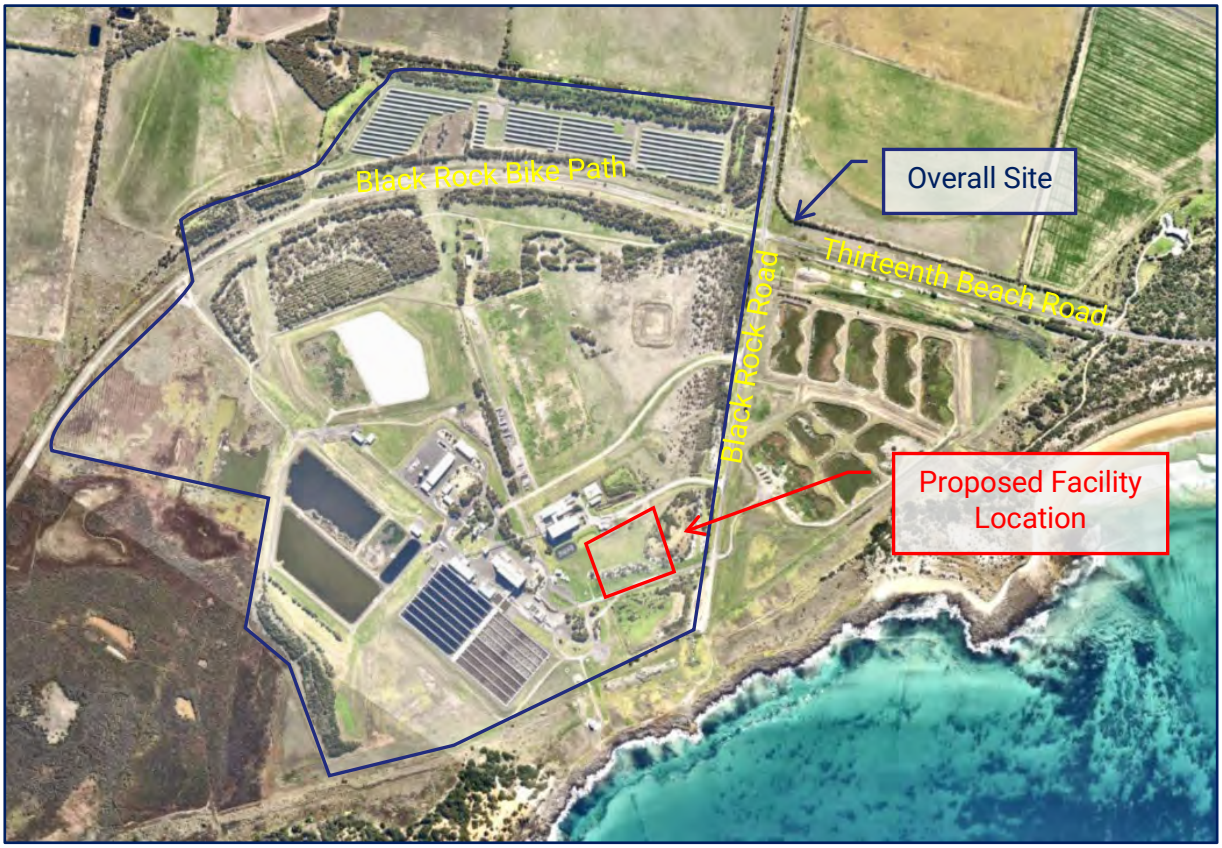


Figure 2: Aerial Photograph

Source: Nearmap (April 2024)

Figure 3: Southern Access Point

Figure 4: Central Access Point

Figure 5: Northern Access Point

3.2. Existing Barwon Water Operations

We have been informed that the existing Black Rock Water Reclamation Plant operations involve approximately 13 on site staff in addition to occasional visiting contractors. The site includes receival of septic waste, which is largely what contributes to the heavy vehicle movements that the site experiences each day. These trucks can be as large as a 45 tonne semi-trailer vacuum tanker.

Traffic movements currently generated by the facility can be summarised as follows:

- 20 to 40 daily heavy vehicle movements
- 13 staff (26 movements)
- Up to 10 contractors and 5 site visitors each day (30 movements)
- 1 or 2 site tours per week (2 to 4 bus movements)
- = Total 78-100 daily vehicle movements (22-44 heavy and 56 light vehicles)

3.3. Road Network

Blackrock Road is a Council collector road that extends in a north south direction between Barwon Heads Road and approximately 700m south of Thirteen Beach Road. In the vicinity of the site, Blackrock Road has a carriageway width of 7.3m which provides for a single lane of traffic in each direction.

A posted speed limit of 100km/h applies to Blackrock Road.

It is noted that Bluestone School Road and Thirteen Beach Road, which intersect with Blackrock Road, are subject to 3 tonne load limits and / or 'No Trucks' restrictions (refer to Figure 12).

Barwon Heads Road is a Department of Transport and Planning (DTP) arterial road that extends between Corio-Waurn Ponds Road in the northwest and Golf Links Road in the southeast. In the vicinity of Blackrock Road, Barwon Heads Road provides a carriageway

width of 9.8m, which accommodates a single lane of traffic in each direction and sealed shoulders.

A posted speed limit of 100km/h applies to Barwon Heads Road.

The DTP's database indicates that Barwon Heads Road has a daily traffic volume in the order of 11,000 vehicles.

The intersection of Barwon Heads Road / Blackrock Road / Staceys Road is an unsignalised cross intersection controlled by a 'stop' sign on the south approach and a 'give way' sign on the north approach. No turn lanes are provided at this intersection, however wide shoulders are provided along Barwon Heads Road. Bus stops are provided on either side of Barwon Heads Road to the immediate west.

We understand that Regional Roads Victoria has committed over $5 million to deliver a new roundabout at the intersection of Barwon Heads Road / Blackrock Road / Staceys Road, which will further increase the capacity of the intersection, as well as improving safety. Preliminary works have commenced at the intersection.

Photographs depicting the surrounding road network are presented at Figure 6 to Figure 12.

Figure 6: Blackrock Road - View North

Figure 7: Blackrock Road - View South

Figure 8: Barwon Heads Road - View East

Figure 9: Barwon Heads Road - View East

Figure 10: Barwon Heads Rd/Blackrock Rd

Figure 11: Barwon Heads Rd/Blackrock Rd

Figure 12: No Truck Restriction

3.3.1. Existing Traffic Volumes – Blackrock Road / Barwon Heads Road

Turning movement counts were conducted at the intersection of Blackrock Road / Barwon Heads Road / Staceys Road on Thursday, 24th August, 2023, between 6:00am-9:00am and 3:00pm-6:00pm.

The peak hours for traffic volumes at this intersection were observed to be:

- AM Peak – 7:45am-8:45am
- PM Peak – 3:45pm-4:45pm

A summary of the observed peak hour turning movement volumes is presented in Figure 13.

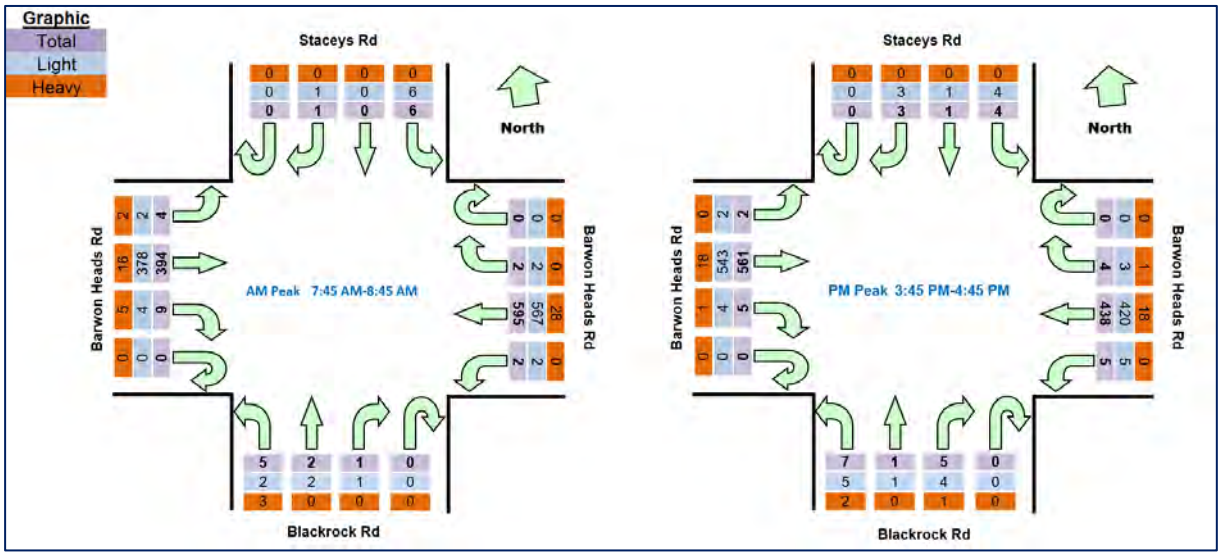


Figure 13: Peak Hour Turning Movement Volumes

As shown above, the majority of turning movements at the intersection are through movements along Barwon Heads Road, with a small number of turning movements to/from Blackrock Road and Staceys Road.

More detailed turning movement count data is provided at Appendix B.

3.4. Pedestrian and Cyclist Facilities

There is generally limited pedestrian and cyclist facilities in the vicinity of the site. Pedestrian footpaths are not provided along any road in the surrounding area, while the Black Rock Bike Path provides a cyclist connection between Blackrock Road and Breamlea Road to the west, passing through the northern section of the overall site.

4. Traffic Engineering Assessment

4.1. Car Parking Considerations

4.1.1. Statutory Car Parking Requirement

The proposed development is consistent with the land-use term 'materials recycling', which falls under the broader land use term of 'Industry' under Clause 73.03 of the Planning Scheme.

The Planning Scheme sets out the parking requirements for new developments under Clause 52.06.

The purpose of Clause 52.06 is:

- *To ensure that car parking is provided in accordance with the Municipal Planning Strategy and the Planning Policy Framework.*
- *To ensure the provision of an appropriate number of car parking spaces having regard to the demand likely to be generated, the activities on the land and the nature of the locality.*
- *To support sustainable transport alternatives to the motor car.*
- *To promote the efficient use of car parking spaces through the consolidation of car parking facilities.*
- *To ensure that car parking does not adversely affect the amenity of the locality.*
- *To ensure that the design and location of car parking is of a high standard, creates a safe environment for users and enables easy and efficient use.*

Table 1 under Clause 52.06 of the Planning Scheme outlines the following car parking rate for the 'materials recycling' land use:

- 10 per cent of store area

With an overall site area of approximately 15,000m^2, the proposed development has a statutory requirement to provide 1,500m^2 of area for car parking, or approximately 51 spaces.

The proposal is to provide 10 on-site car parking spaces, resulting in a statutory shortfall of approximately 41 spaces. Accordingly, an assessment of the adequacy of the proposed car parking provision is presented following.

4.1.2. Car Parking Demand Assessment

Clause 52.06-7 allows for the statutory car parking requirement to be reduced (including to zero). An application to reduce (including reduce to zero) the number of car spaces required under Clause 52.06-5 or in a schedule to the Parking Overlay must be accompanied by a Car Parking Demand Assessment.

Clause 52.06-7 sets out that a Car Parking Demand Assessment must have regard to a number of matters, including the following which is most relevant to the proposed development:

- Any empirical assessment or case study.

An assessment of this factor is presented following.

We understand that the development proposes to employ 14 full time equivalent (FTE) staff. We have been informed by the project team that employees will work in shifts with no more than nine (9) employees on site at any one time, including during shift change over. It is also expected that visitors will be on-site infrequently, possibly by appointment only. For the purposes of this assessment, we will assume that a maximum of one (1) visitor vehicle would be generated by the site at any one time. Conservatively assuming that every employee and visitor drives their own personal vehicle to the site, a maximum parking demand for 10 vehicles will be generated by the development.

With 10 car spaces provided, we anticipate that the development will meet the peak car parking demand.

We also note that discussions with the Black Rock Water Reclamation Plant operators indicate that there are further car parking vacancies within the existing facility's car parking resources to accommodate any additional demands in the rare event they should arise.

Based on the preceding, we are satisfied that the anticipated car parking demand can be accommodated entirely within the 10 space on-site car park, that there will not be any detriment to parking in the area as a result of the proposed development and that sufficient justification has been presented to warrant the issue of a permit to reduce the statutory parking requirement.

4.2. Car Parking Layout and Access Arrangements

As part of our involvement in this project, Traffix Group has provided design input into the development of the plans in order to ensure that the proposed facility achieves an acceptable car parking layout.

The proposed car parking layout and access arrangements have been assessed under the following guidelines:

- Clause 52.06 of the Planning Scheme,
- AS2890.1:2004 (Australian Standard for Off-Street car parking), and
- AS2890.6:2022 (Australian Standard for Off-Street Parking for People with Disabilities).

Key elements of the design are as follows:

Car Spaces

- Standard car parking spaces have been provided at a width of 2.6m and length of 5.4m, with an adjacent access aisle of 6.2m, in accordance with AS2890.1:2004 as an alternative to the Planning Scheme's Design Standard 2. Notably, this provides for an overall improved outcome when compared with the statutory requirement for 2.6m wide spaces to be only 4.9m long (0.5m shorter than proposed) and with an access aisle width of 6.4m (only 0.2m wider than proposed).
- The accessible car parking space is to be provided at a width of 2.4m and length of 5.4m with an adjacent shared area of the same dimensions, in accordance with the requirements of AS2890.6:2022 and Clause 52.06 of the Planning Scheme.

- No obstructions or columns are located adjacent the car parking spaces, and all spaces are expected to be provided at a generally flat gradient.

Access Arrangements

- A minimum accessway width of 5.5m is provided throughout the new facility's road network in accordance with Clause 52.06-9 of the Planning Scheme (Design Standard 1) for two-way vehicle movements.
- Separate 3m wide entry and exit accessways are proposed to provide access to/from the proposed on-site carpark from the existing internal road to the south of the proposed development. Internal radii of 4m are provided at all changes of direction in accordance with Clause 52.06-9 of the Planning Scheme (Design Standard 1).
- All vehicles are able to enter and exit the site in a forward direction.

Further detail around loading arrangements is provided in Section 5.

4.3. Traffic Generation

As established previously, the facility is proposed to reach a peak capacity of 46,160 tonnes per annum of organic waste processing, to produce 27,000 tonnes per annum of end products. The project team, in consultation with project partners who will be providing the organic waste, have estimated that an average of 32 trucks per day will access the site to deliver waste to the facility and export the end products, with trucks to be used including semi trailers and truck and dogs. It is noted that while each partner Council's delivery schedule is unknown, it is likely that there will be a 'peak' day when the number of trucks accessing the site will be slightly higher than other days of the week.

The operations of the RRON will also process approximately 6,500 tonnes per annum of dried biosolids produced by the existing Barwon Water facility which is currently trucked away from the site, with one (1) truck a day exporting the product. As a result of this the RRON will reduce traffic by one (1) truck per day given that the dried biosolids will be transported internally.

For the purposes of this assessment, an average value of 31 additional trucks per day has been adopted.

With 14 full time staff, and conservatively assuming that every employee drives their own personal vehicle to site, we anticipate that there will be approximately 28 staff vehicle trips per day associated with the site, noting that visitors will be on-site infrequently.

We understand that Barwon Water will seek to encourage practicing sustainable transport behaviours of its staff and visitors, which may include:

- Encouraging carpooling of staff
- Promoting cycling/walking as active travel modes where practicable, possibly in connection with public transport, and
- Encouraging the uptake of electric and other lower emissions vehicles.

In summary, a conservative estimate of the daily traffic generation associated with the proposed facility is as follows:

- 28 light vehicle movements (nine (9) staff movements per peak hour), and
- 62 heavy vehicle movements (generally spread across the day).

4.4. Traffic Impact

Based on the above, the proposal will generate in the order of 90 daily traffic movements, of which it is anticipated that approximately 15 movements will occur in the AM and PM peak hours. Blackrock Road is a Council collector road and we expect that it will be able to accommodate the relatively minor increase in traffic volume.

Based on existing vehicle movements, and the location of the site relative to the municipalities it will accept waste from, it is anticipated that the majority of trips to and from the site will be to/from the west along Barwon Heads Road, with a small number of trips associated with the Borough of Queenscliffe and townships in the easternmost extents of the City of Greater Geelong that will occur to/from the east.

Due to existing restrictions which prevent heavy vehicles from accessing Bluestone School Road and Thirteenth Beach Road, all truck movements to/from the site must use Blackrock Road to access the wider road network. For the proposes of this assessment, we will conservatively assume that all vehicles, including cars, access the site via the Barwon Heads Road / Blackrock Road intersection.

A preliminary SIDRA intersection analysis of the intersection performance of the Barwon Heads Road / Blackrock Road intersection during the AM and PM peak periods and incorporating the above predictions indicates that the intersection will continue to operate well, with a Degree of Saturation (DOS) of 0.32 to 0.33 during each AM and PM peak hour respectively. Therefore, the additional traffic generated by the proposal will not result in a material impact to the surrounding road network.

It is further noted that the future upgrade of the Barwon Heads Road / Blackrock Road intersection to a roundabout by Regional Roads Victoria would further increase the intersection's capacity.

4.5. Bicycle Considerations

Clause 52.34 of the Planning Scheme sets out the bicycle parking requirements for new developments.

Materials recycling falls under the 'Industry' land use. The statutory bicycle parking requirement for 'Industry' land uses is below:

- One (1) space to each 1,000m^2 of net floor area for employees, and
- No requirement for visitors.

With an approximate net floor area of 6,586m^2, the proposal has a statutory requirement to provide seven (7) bicycle spaces, and one shower and change room.

Given the nature and location of the site, it is our opinion that providing this level of bicycle parking is unnecessary. With only 14 full time employees based on site, and based on our experience with similar developments, we are of the view that it is unrealistic to expect 50% of employees would cycle to work.

With regards to this proposal, it is considered that any employee (or visitor) bicycle parking could satisfactorily occur informally within the site (potentially within the building itself). We are satisfied that these arrangements are suitable for the proposed development.

5. Loading and Facility Operations

Access to and from the site is proposed via two (2) existing connections to Blackrock Road as mentioned previously in Section 3.1. It is noted that these connections currently accommodate heavy vehicles of a size similar to that associated with this proposal. Three (3) separate accessways are proposed to provide vehicular access into the site's two main buildings, two (2) in association with 'BN03, and one (1) in association with 'BN10.

Vehicular access for BN03 is to occur with vehicles up to and including semi-trailers and truck and dogs driving via the route shown in Figure 14 in order to access the weighbridge, enter the building, reverse to the FOGO drop off zone to unload and then exit the building in a forward direction. We note that there is sufficient room within the site to accommodate any queue that may form in association with this process, although vehicle movements are expected to be spread out across the day and any resultant queue is unlikely to exceed more than two (2) vehicles. We have been informed that there will only be one (1) moving vehicle within the building at any one time.

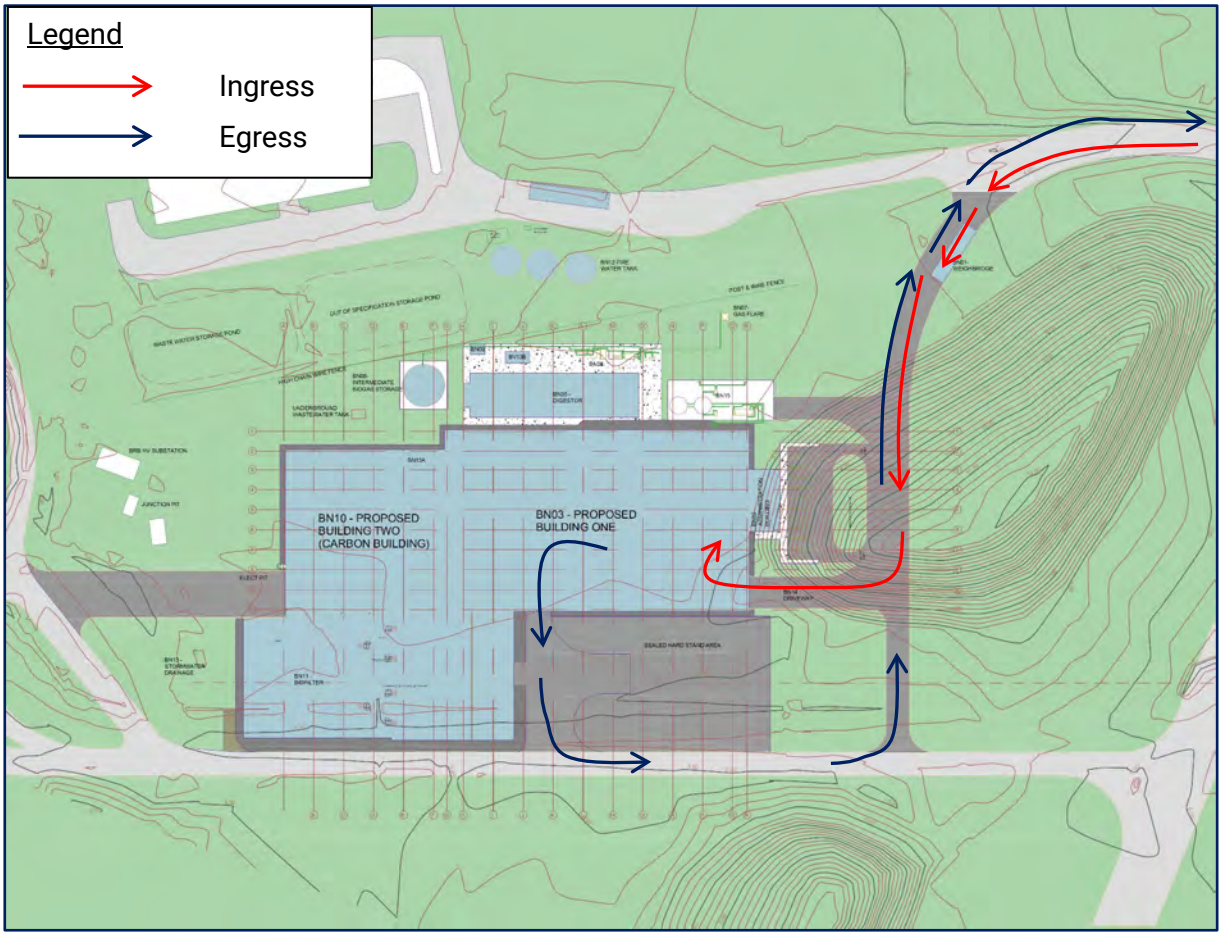


Figure 14: BN03 access and egress

Vehicular access for BN10 is to occur with semi trailers to reverse to the hardstand area at the front the building, before exiting in a forward direction as shown in Figure 15.

We understand that vehicle movements to / from BN10 are around 1 truck per day, and hence it is unlikely that two (2) trucks would ever access the facility at the same time.

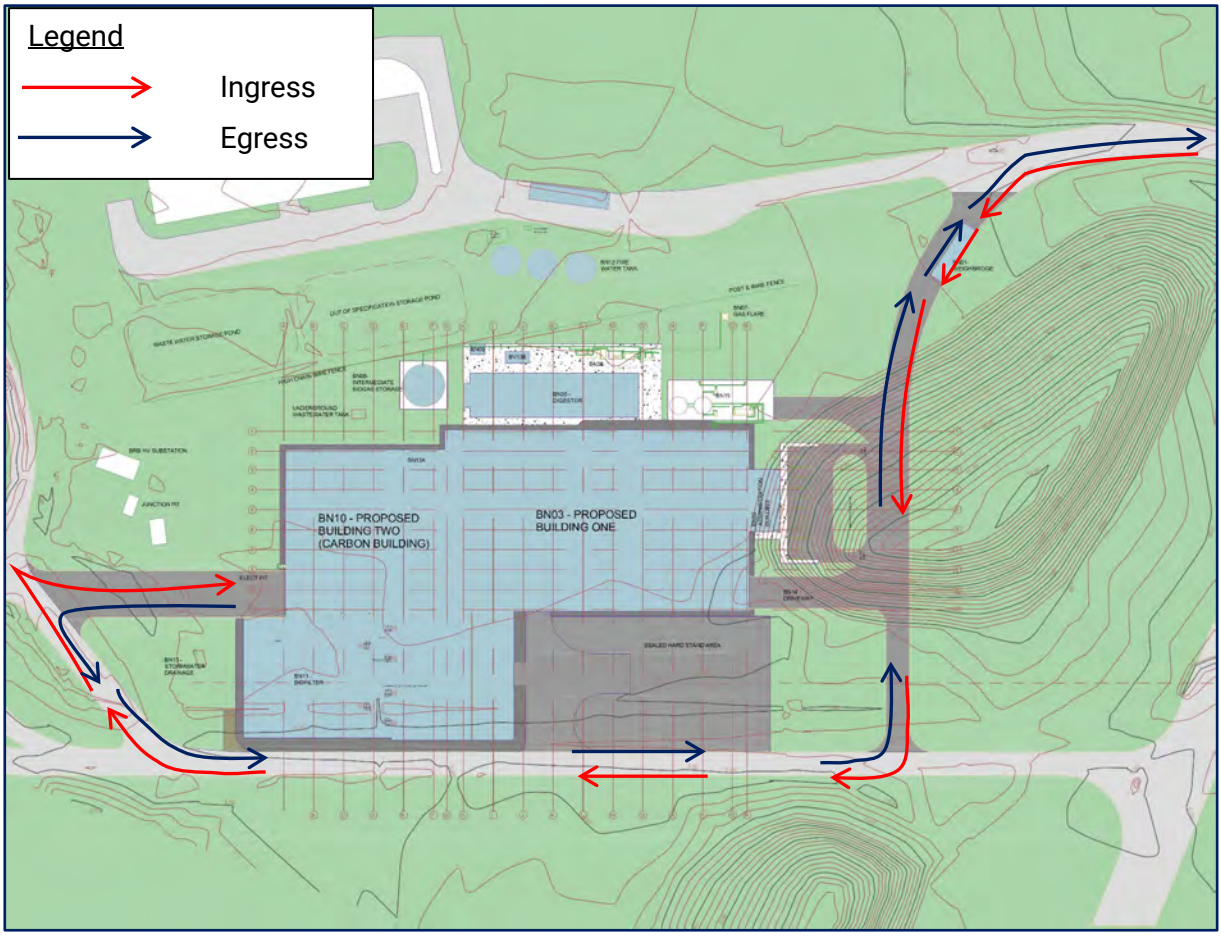


Figure 15: BN10 access and egress

Access to the digestate drying area will occur with a truck and dog to drive into the hardstand area to the east of the building. The truck and dog unit will detach the dog trailer and manoeuvre as required to ensure the dog trailer and truck body are loaded separately as there is a requirement for the roller door to be closed when loading occurs. We understand that this will occur infrequently (once every two weeks) and we are of the opinion that this arrangement is appropriate. Once loading is completed the truck and dog will exit in a forward direction, as shown at Figure 16.

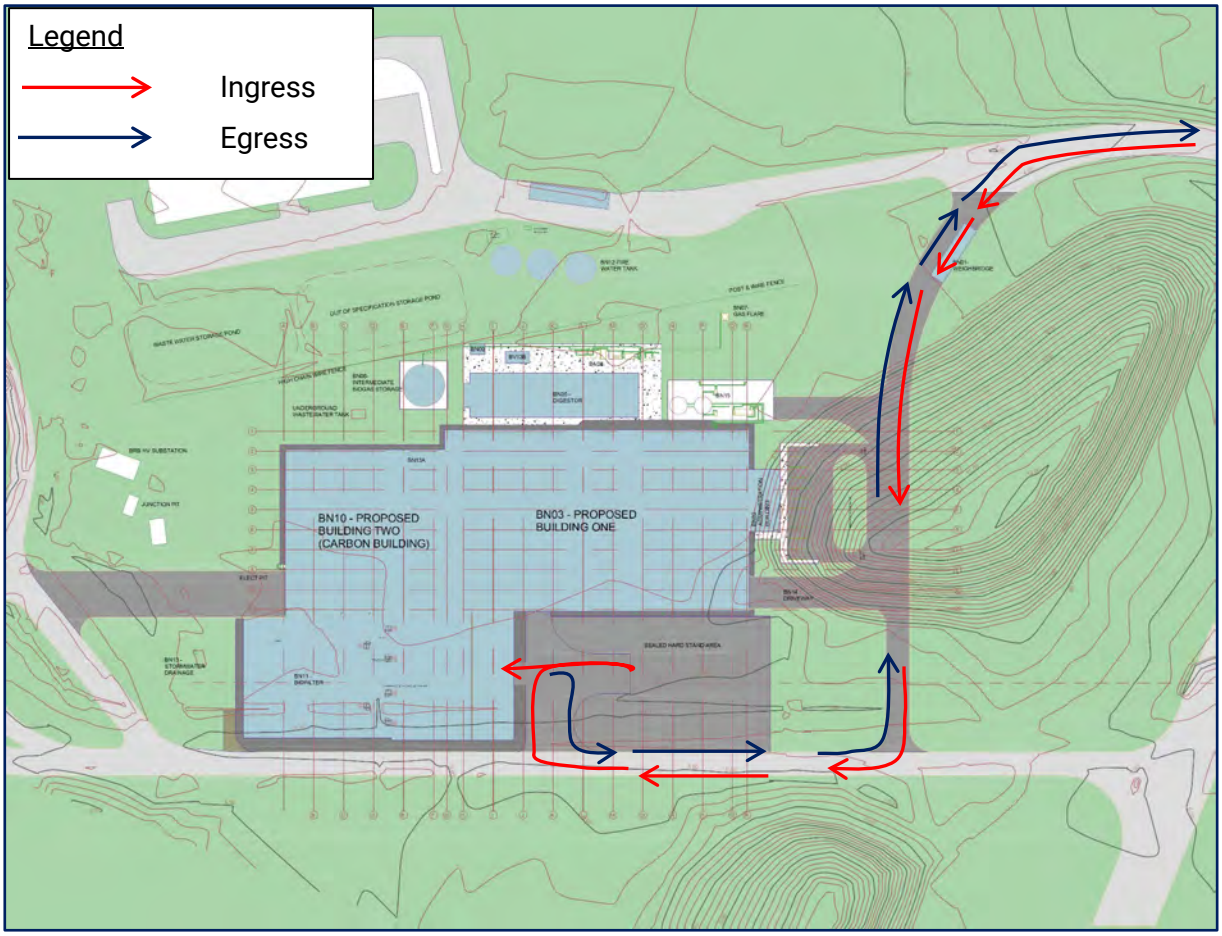


Figure 16: Digestate Drying Area access and egress

Swept path assessments are provided at Appendix C, showing that the relevant vehicle can complete all loading movements discussed above.

6. Conclusions

Having conducted a detailed traffic engineering assessment of the proposed organic waste processing facility at the Black Rock Water Reclamation Plant, Connewarre, we are of the opinion that:

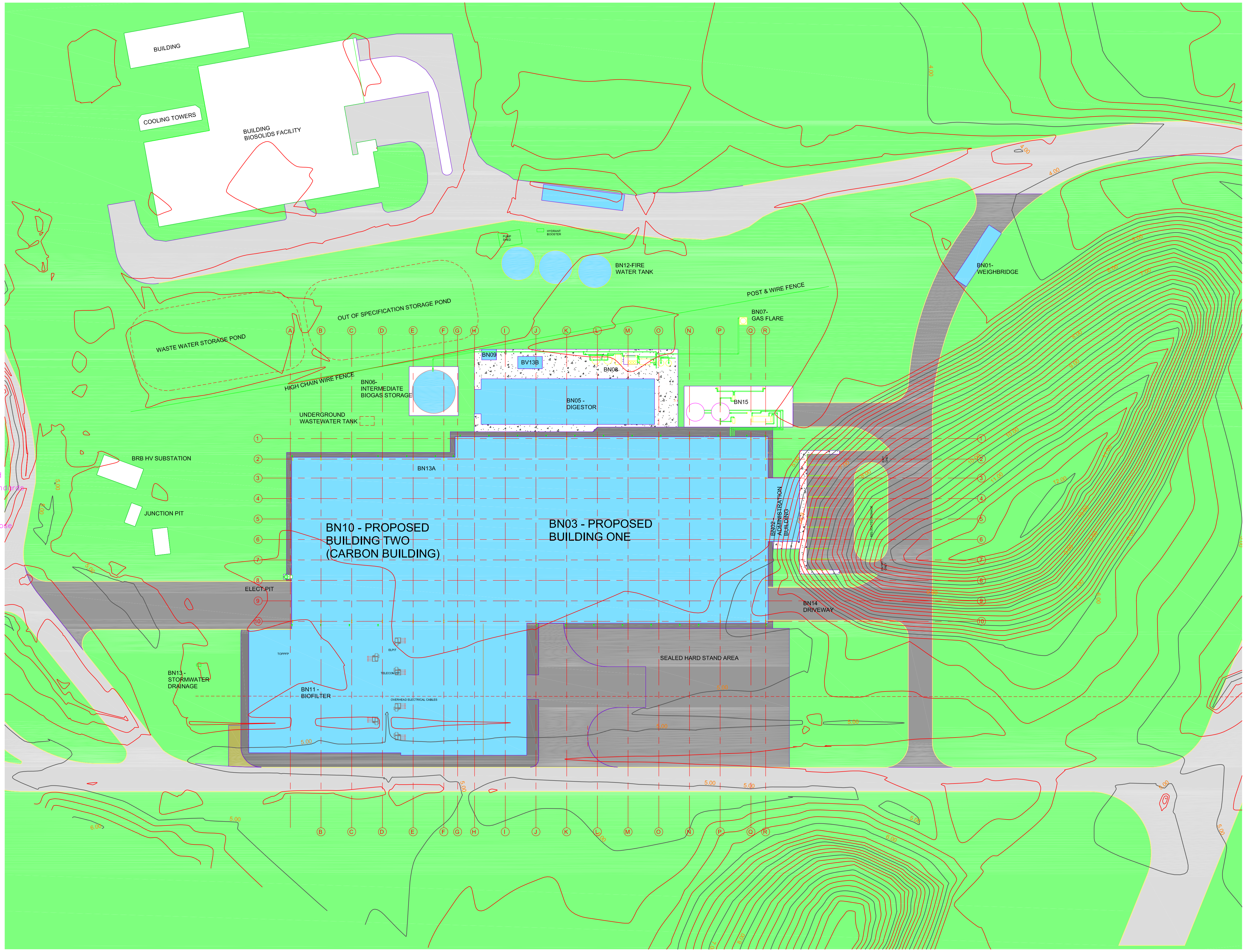
- The proposed on-site car parking provision of 10 spaces will be sufficient to accommodate the predicted peak parking demand generated by staff and any occasional visitors of the facility (up to 10 personal vehicles on-site at any one time are predicted) and sufficient justification has been presented to warrant the issue of a permit for a parking dispensation,
- The proposed parking layout and access arrangements accord with the requirements of the Planning Scheme, Australian Standards (where relevant) and good current practice (subject to updated plans being prepared),
- Bicycle parking can satisfactorily be accommodated in an informal arrangement within the site,
- The proposed loading / unloading arrangements are appropriate and in accordance with the requirements of the relevant standards,
- The level of traffic generated by the development will be relatively low and can be adequately accommodated by the surrounding road network and intersections, and
- There are no traffic engineering reasons why a planning permit for the organic waste processing facility at the Black Rock Water Reclamation Plant, Connewarre should be refused.

Appendix A

Development Plans

Bill N	of Bill Element	unit	BN 00
A	ROADS & PAVING		
	A1 Roadworks	m2	
	A2 Geotextile/vapour barrier	m2	
	A3 Curbstones	m1	
	A4 Road gullies and channel gutters	m1	
	A5 Pavements for personnel car parking and pedestrain walks	m2	
	A5 Street lighting	nos	
	A7 Exterior Fire Fighting Main Ring and Hydrants	m1	
B	SOFT LANDSCAPING		
	B1 Landscaping	m3	
	B2 Green areas planting and seeding	m2	
C	FENCING & GATES		
	C1 Fence	m1	
	C2 Gates and barriers	nos	

Notes:
- Applies for layout A
- The detailing and constructing provisions (concrete slab thickness, sand bedding thickness, gravel bed thickness....) must be adapted according to the conditions (soil, climate) and as per Australian standards and regulations.
- This design should be viewed along with the structural engineer specifications prior to construction.
- Water for cleaning hose reel provided by recycle water / rain water tank. - Water for fire fighting hose reel with in the building and fire hydrant provided by the fire water tank network.
- Location of processing equipment is subject to adjustment during detail engineering.



1 SITE PLAN
1 : 500

LEGEND

- Proposed Building Works
- Landscaped Areas – Turf
- Concrete Path Way
- Hard Stand Area – Paving
- Gravel
- New Paving

Project-No. BN722100	ProjectName BARWON WATER RRON	Description		
	AIC	Title	SITE PLAN	
	Weight			
	Scale: As indicated		Replaced for:	
	Status: Basic Design	Sheet 1/1	Doc Type	Supplier	Drawing-NO. BN00	Revision

Appendix B

Turning Movement Counts

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Barwon Heads Rd and Stacey Rd, Connewarre

GPS *-38.259446, 144.424507*

Date:	Thu 24/08/23
Weather:	Fine
Suburban:	Connewarre
Customer:	Traffix

North:	Stacey Rd
East:	Barwon Heads Rd
South:	Blackrock Rd
West:	Barwon Heads Rd

Survey Period	AM:	6:00 AM-9:00 AM
	PM:	3:00 PM-6:00 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	3:45 PM-4:45 PM

All Vehicles

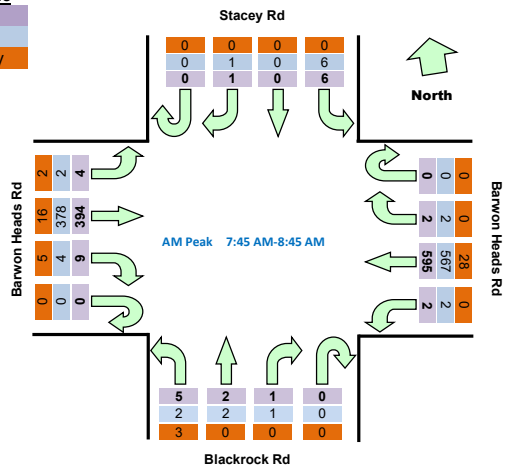
Time		North Approach Stacey Rd				East Approach Barwon Heads Rd				South Approach Blackrock Rd				West Approach Barwon Heads Rd				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
6:00	6:15	0	0	1	0	0	0	52	0	0	0	0	0	0	0	22	0	479	
6:15	6:30	0	0	0	0	0	0	67	0	0	0	0	0	0	0	34	0	558	
6:30	6:45	0	1	0	0	0	0	81	0	0	0	1	0	0	0	64	0	642	
6:45	7:00	0	2	0	0	0	0	77	0	0	0	0	0	0	0	77	0	718	
7:00	7:15	0	1	1	0	0	0	77	0	0	1	0	0	0	0	74	0	792	
7:15	7:30	0	0	0	0	0	0	94	0	0	0	0	0	0	2	89	0	895	
7:30	7:45	0	0	0	0	0	0	141	0	0	1	0	0	0	4	77	0	1005	
7:45	8:00	0	0	0	1	0	1	141	0	0	0	1	1	0	1	84	0	1021	Peak
8:00	8:15	0	1	0	1	0	0	153	1	0	0	0	3	0	1	96	1	1015	
8:15	8:30	0	0	0	3	0	1	160	0	0	1	1	0	0	4	124	1		
8:30	8:45	0	0	0	1	0	0	141	1	0	0	0	1	0	3	90	2		
8:45	9:00	0	1	1	0	0	3	106	1	0	0	0	1	0	0	106	5		
15:00	15:15	0	4	0	2	0	1	84	0	0	0	0	1	0	0	111	0	899	
15:15	15:30	0	0	0	4	0	0	103	1	0	1	0	2	0	0	112	0	948	
15:30	15:45	0	0	1	1	0	2	98	1	0	0	0	3	0	2	129	1	995	
15:45	16:00	0	0	0	0	0	0	105	2	0	1	0	2	0	3	122	0	1036	Peak
16:00	16:15	0	1	0	0	0	2	107	1	0	1	0	3	0	1	134	2	1031	
16:15	16:30	0	1	0	2	0	1	133	1	0	2	1	1	0	0	128	0	968	
16:30	16:45	0	1	1	2	0	1	93	1	0	1	0	1	0	1	177	0	934	
16:45	17:00	0	0	0	1	0	1	105	2	0	0	0	1	0	1	119	0	910	
17:00	17:15	0	3	1	1	0	0	73	1	0	0	0	2	0	1	105	2	890	
17:15	17:30	0	0	1	1	0	0	83	1	0	1	0	0	0	0	148	1		
17:30	17:45	0	0	1	2	0	1	92	0	0	0	1	1	0	0	155	2		
17:45	18:00	0	1	1	1	0	0	88	0	0	1	0	0	0	0	118	0		

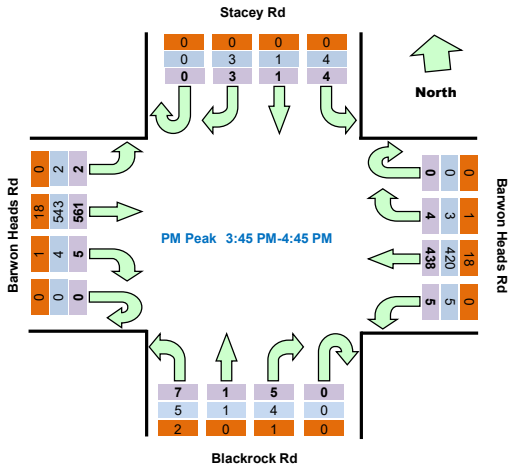
Peak Time		North Approach Stacey Rd				East Approach Barwon Heads Rd				South Approach Blackrock Rd				West Approach Barwon Heads Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	1	0	6	0	2	595	2	0	1	2	5	0	9	394	4	1021
15:45	16:45	0	3	1	4	0	4	438	5	0	5	1	7	0	5	561	2	1036

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





Light Vehicles

Time		North Approach Stacey Rd				East Approach Barwon Heads Rd				South Approach Blackrock Rd				West Approach Barwon Heads Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	0	1	0	0	0	50	0	0	0	0	0	0	0	20	0
6:15	6:30	0	0	0	0	0	0	65	0	0	0	0	0	0	0	34	0
6:30	6:45	0	0	0	0	0	0	77	0	0	0	1	0	0	0	61	0
6:45	7:00	0	1	0	0	0	0	77	0	0	0	0	0	0	0	72	0
7:00	7:15	0	1	1	0	0	0	75	0	0	1	0	0	0	0	70	0
7:15	7:30	0	0	0	0	0	0	90	0	0	0	0	0	0	1	78	0
7:30	7:45	0	0	0	0	0	0	140	0	0	1	0	0	0	3	73	0
7:45	8:00	0	0	0	1	0	1	134	0	0	0	1	1	0	0	80	0
8:00	8:15	0	1	0	1	0	0	143	1	0	0	0	1	0	1	94	1
8:15	8:30	0	0	0	3	0	1	154	0	0	1	1	0	0	2	118	0
8:30	8:45	0	0	0	1	0	0	136	1	0	0	0	0	0	1	86	1
8:45	9:00	0	1	1	0	0	3	103	1	0	0	0	1	0	0	101	5
15:00	15:15	0	4	0	2	0	1	82	0	0	0	0	1	0	0	110	0
15:15	15:30	0	0	0	4	0	0	99	0	0	1	0	2	0	0	110	0
15:30	15:45	0	0	1	1	0	1	91	1	0	0	0	2	0	2	127	1
15:45	16:00	0	0	0	0	0	0	98	2	0	1	0	2	0	2	119	0
16:00	16:15	0	1	0	0	0	1	101	1	0	1	0	2	0	1	129	2
16:15	16:30	0	1	0	2	0	1	128	1	0	1	1	0	0	0	120	0
16:30	16:45	0	1	1	2	0	1	93	1	0	1	0	1	0	1	175	0
16:45	17:00	0	0	0	1	0	1	101	2	0	0	0	1	0	1	119	0
17:00	17:15	0	3	1	1	0	0	72	1	0	0	0	2	0	1	105	2
17:15	17:30	0	0	1	1	0	0	81	1	0	1	0	0	0	0	147	1
17:30	17:45	0	0	1	2	0	1	91	0	0	0	1	1	0	0	155	1
17:45	18:00	0	1	1	1	0	0	87	0	0	1	0	0	0	0	117	0

Peak Time		North Approach Stacey Rd				East Approach Barwon Heads Rd				South Approach Blackrock Rd				West Approach Barwon Heads Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	1	0	6	0	2	567	2	0	1	2	2	0	4	378	2	967
15:45	16:45	0	3	1	4	0	3	420	5	0	4	1	5	0	4	543	2	995

Heavy Vehicles

Time		North Approach Stacey Rd				East Approach Barwon Heads Rd				South Approach Blackrock Rd				West Approach Barwon Heads Rd			
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L
6:00	6:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
6:15	6:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
6:30	6:45	0	1	0	0	0	0	4	0	0	0	0	0	0	0	3	0
6:45	7:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0
7:00	7:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0
7:15	7:30	0	0	0	0	0	0	4	0	0	0	0	0	0	1	11	0
7:30	7:45	0	0	0	0	0	0	1	0	0	0	0	0	0	1	4	0
7:45	8:00	0	0	0	0	0	0	7	0	0	0	0	0	0	1	4	0
8:00	8:15	0	0	0	0	0	0	10	0	0	0	0	2	0	0	2	0
8:15	8:30	0	0	0	0	0	0	6	0	0	0	0	0	0	2	6	1
8:30	8:45	0	0	0	0	0	0	5	0	0	0	0	1	0	2	4	1
8:45	9:00	0	0	0	0	0	0	3	0	0	0	0	0	0	0	5	0
15:00	15:15	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
15:15	15:30	0	0	0	0	0	0	4	1	0	0	0	0	0	0	2	0
15:30	15:45	0	0	0	0	0	1	7	0	0	0	0	1	0	0	2	0
15:45	16:00	0	0	0	0	0	0	7	0	0	0	0	0	0	1	3	0
16:00	16:15	0	0	0	0	0	1	6	0	0	0	0	1	0	0	5	0
16:15	16:30	0	0	0	0	0	0	5	0	0	1	0	1	0	0	8	0
16:30	16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
16:45	17:00	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0
17:30	17:45	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
17:45	18:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0

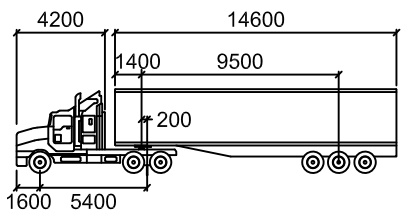
Peak Time		North Approach Stacey Rd				East Approach Barwon Heads Rd				South Approach Blackrock Rd				West Approach Barwon Heads Rd				Peak
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	total
7:45	8:45	0	0	0	0	0	0	28	0	0	0	0	3	0	5	16	2	54
15:45	16:45	0	0	0	0	0	1	18	0	0	1	0	2	0	1	18	0	41

Appendix C

Swept Path Diagrams

VEHICLE PROFILE

VEHICLE USED IN SIMULATION



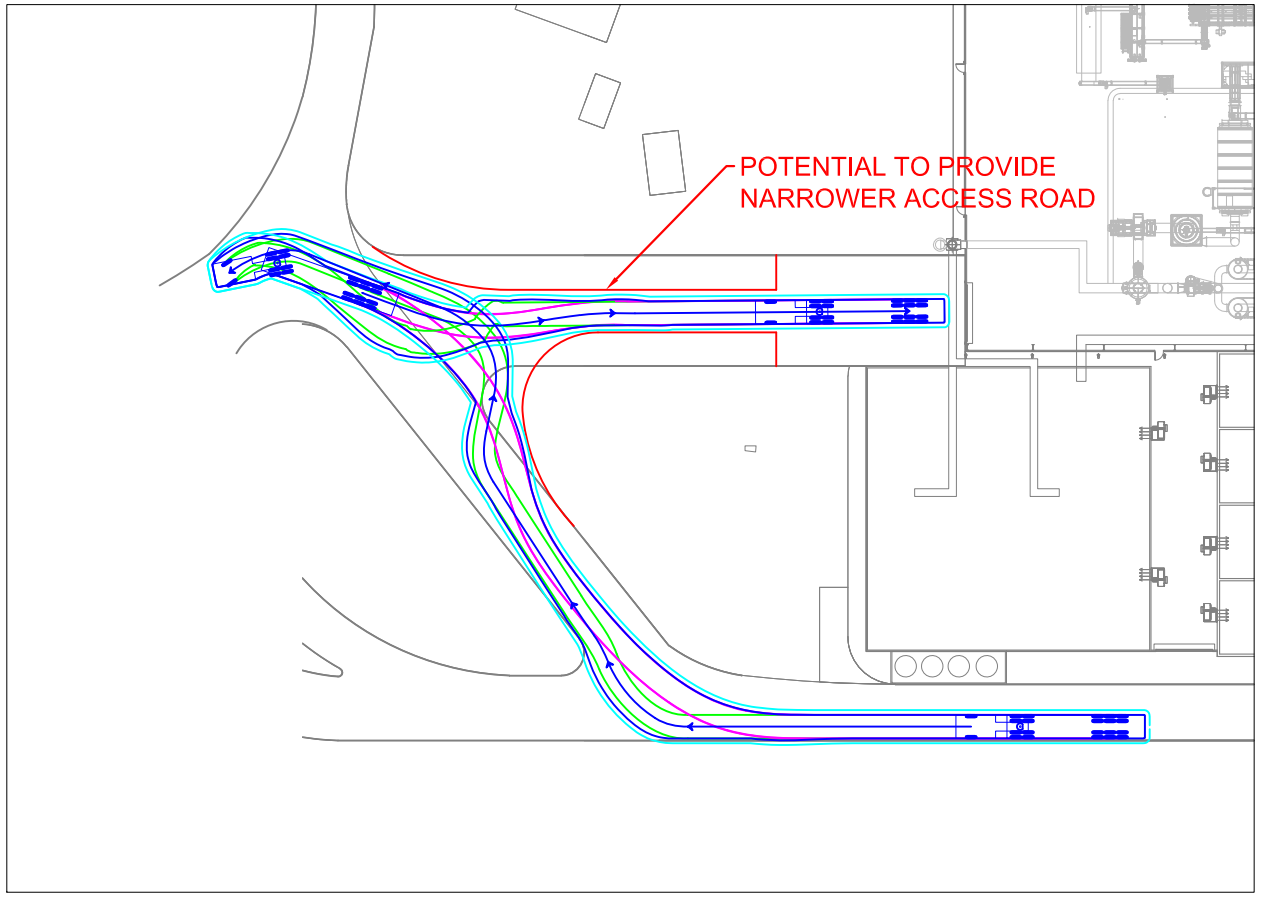
20m semi-trailer

	mm
Tractor Width	: 2500
Trailer Width	: 2500
Tractor Track	: 2500
Trailer Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 28.3
Articulating Angle	: 70.0

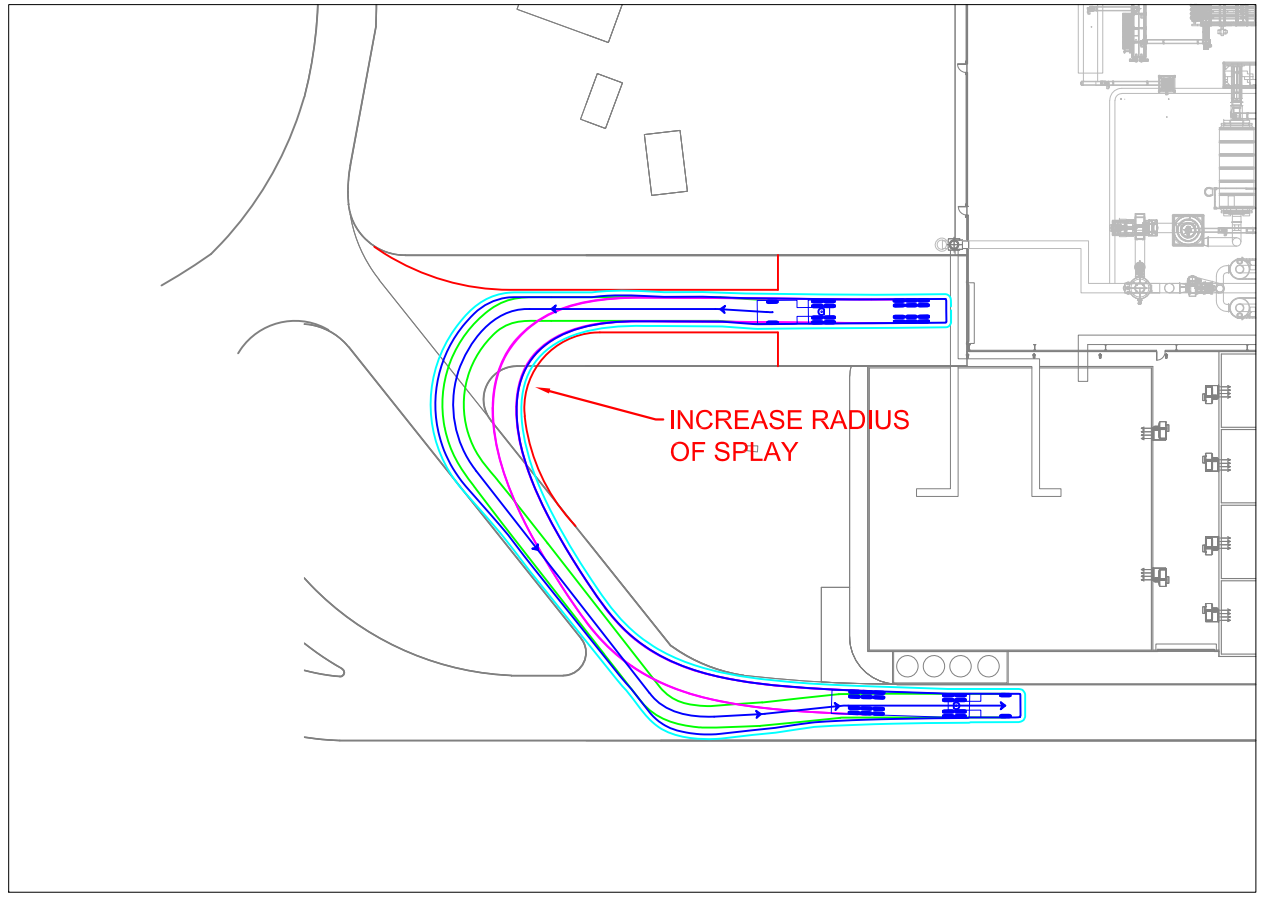
LEGEND

REAR WHEELS — VEHICLE BODY
FRONT WHEELS — BODY CLEARANCE

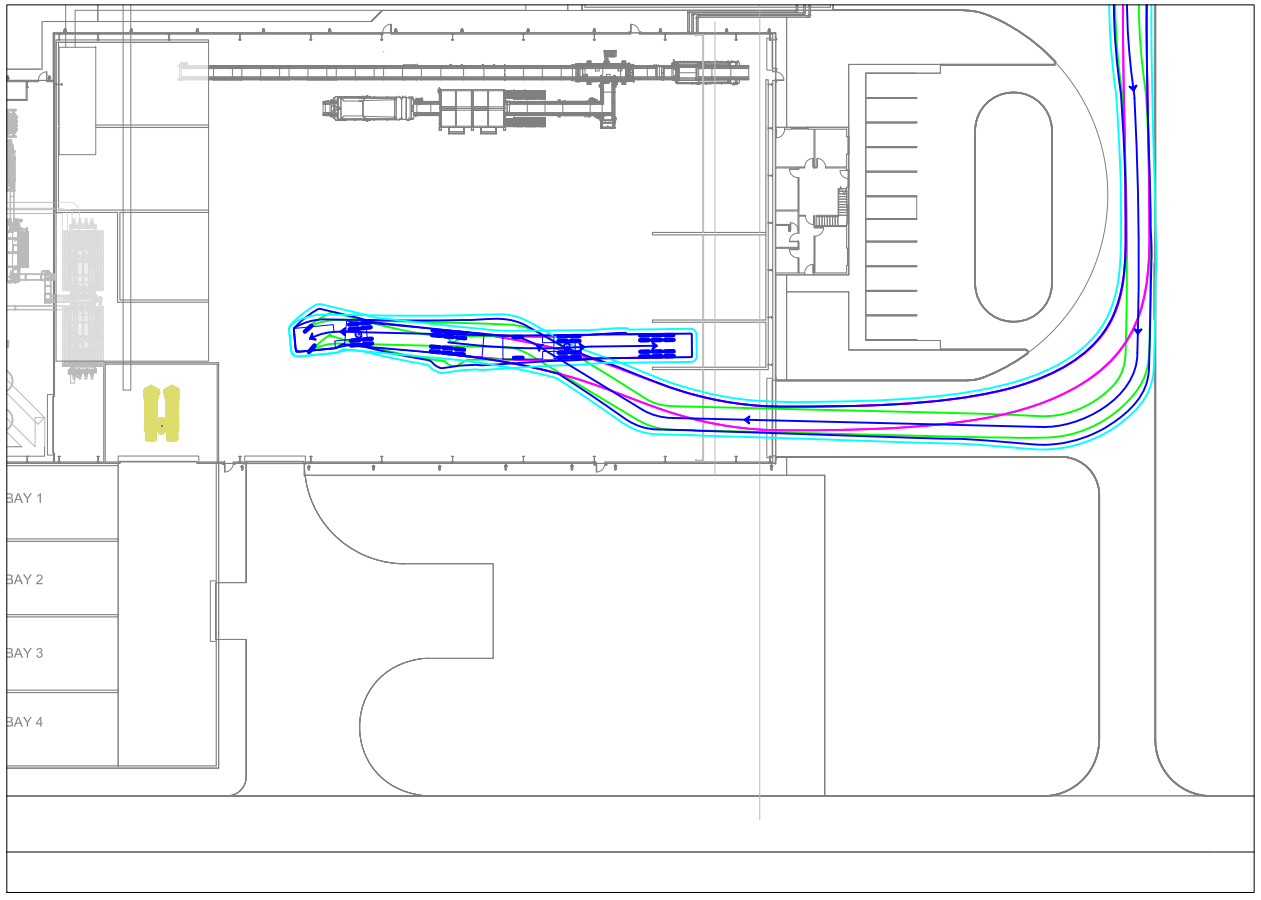
CARBON BUILDING - SEMI-TRAILER INGRESS



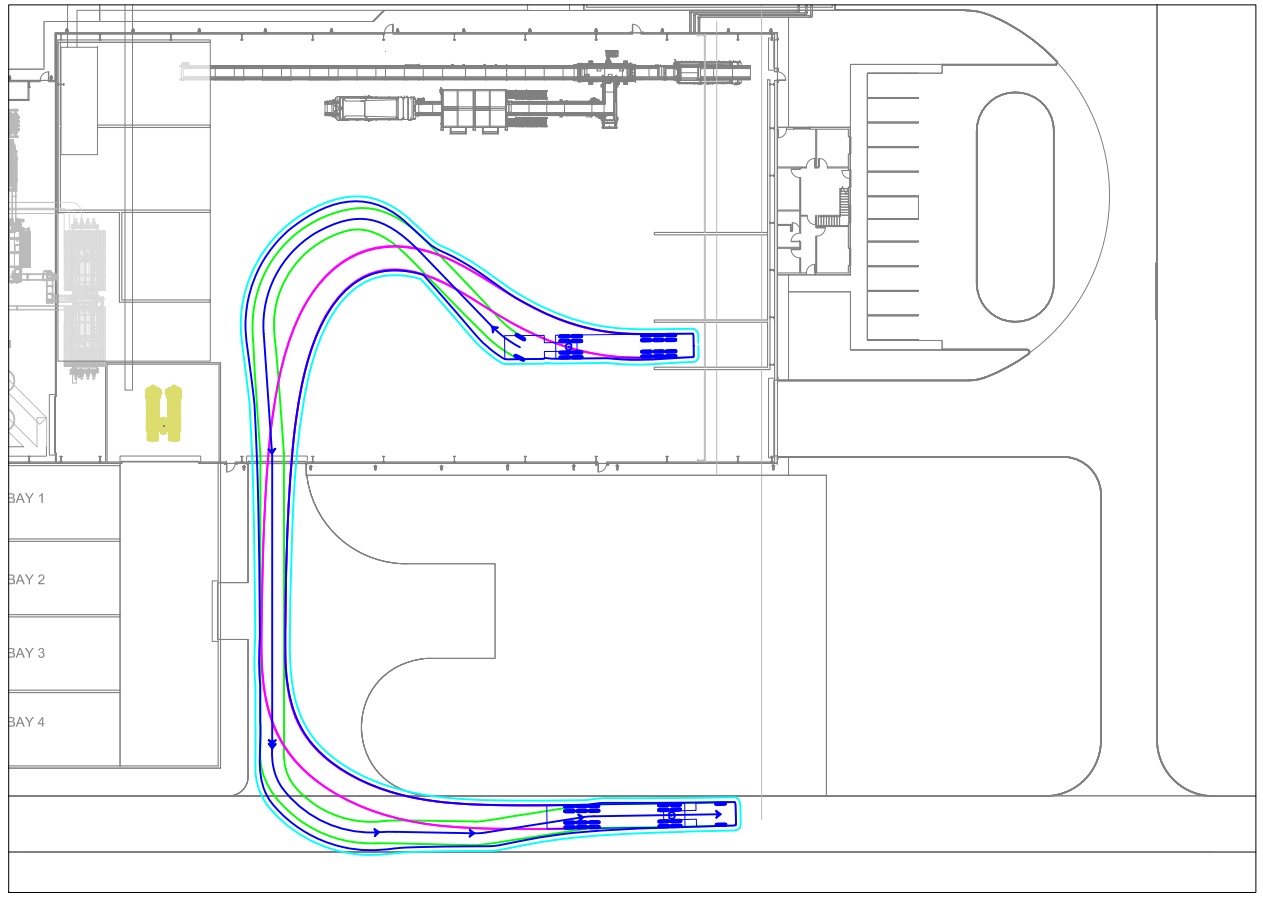
CARBON BUILDING - SEMI-TRAILER EGRESS



SOUTHEAST BUNKER - SEMI-TRAILER INGRESS



SOUTHEAST BUNKER - SEMI-TRAILER EGRESS



REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE
BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

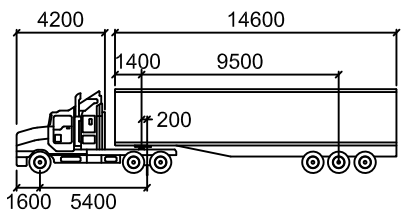
FILE NAME: G33791-02
SHEET NO.: 01

SCALE: 1:800 (A3)
0 8 16

Traffix Group
NALG | Hitachi Zosen INOVA

VEHICLE PROFILE

VEHICLE USED IN SIMULATION



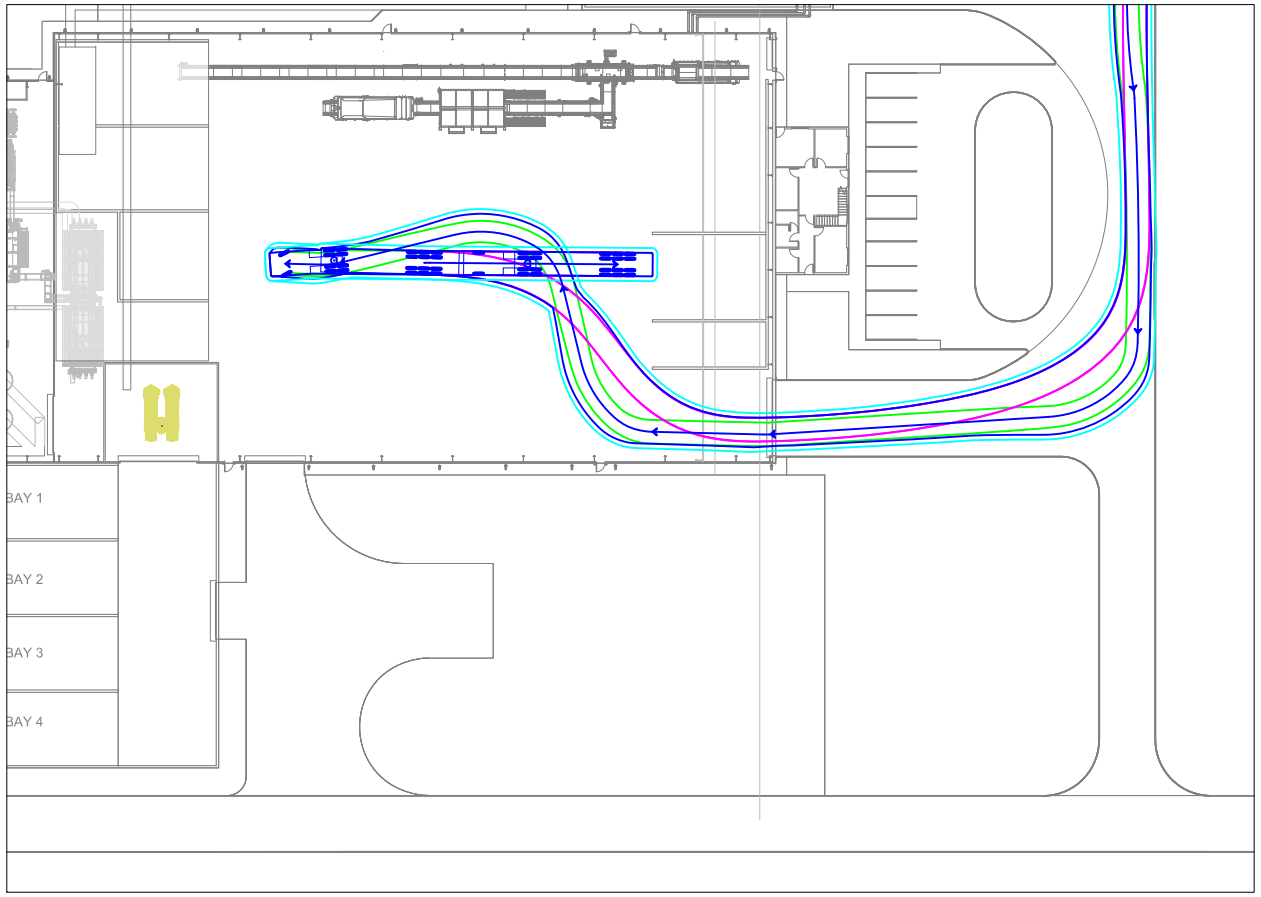
20m semi-trailer

	mm
Tractor Width	: 2500
Trailer Width	: 2500
Tractor Track	: 2500
Trailer Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 28.3
Articulating Angle	: 70.0

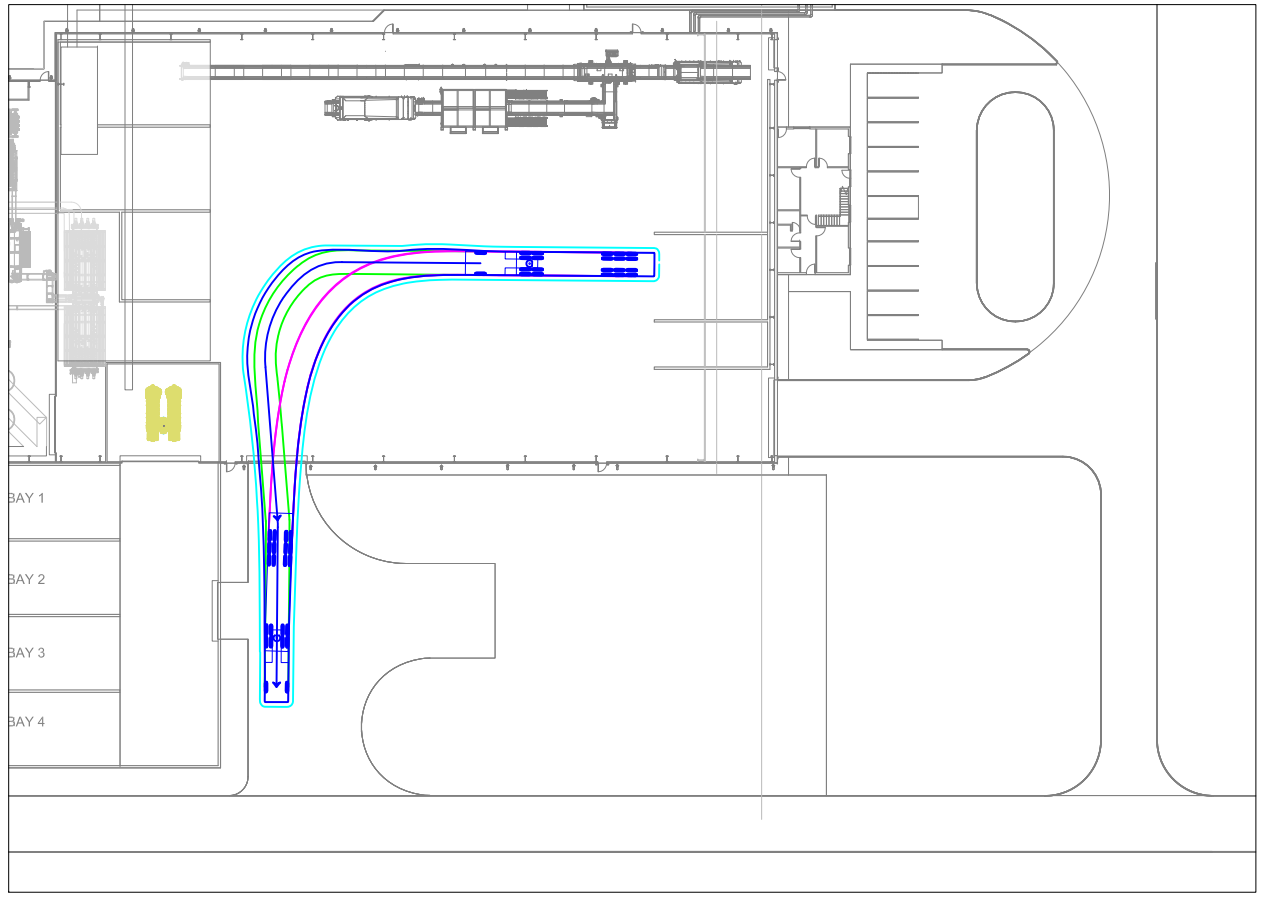
LEGEND

REAR WHEELS — VEHICLE BODY
FRONT WHEELS — BODY CLEARANCE

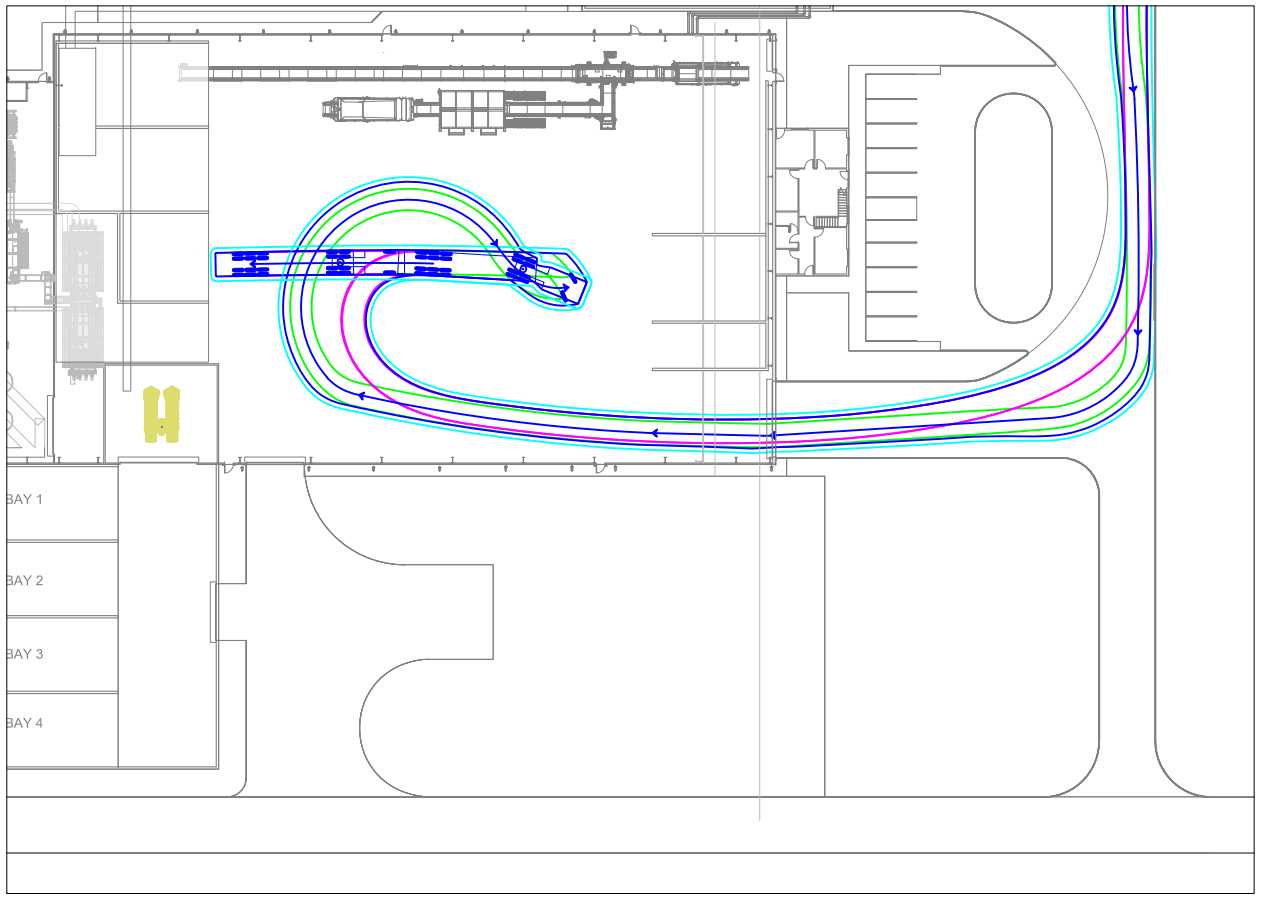
NORTHEAST BUNKER - SEMI-TRAILER INGRESS



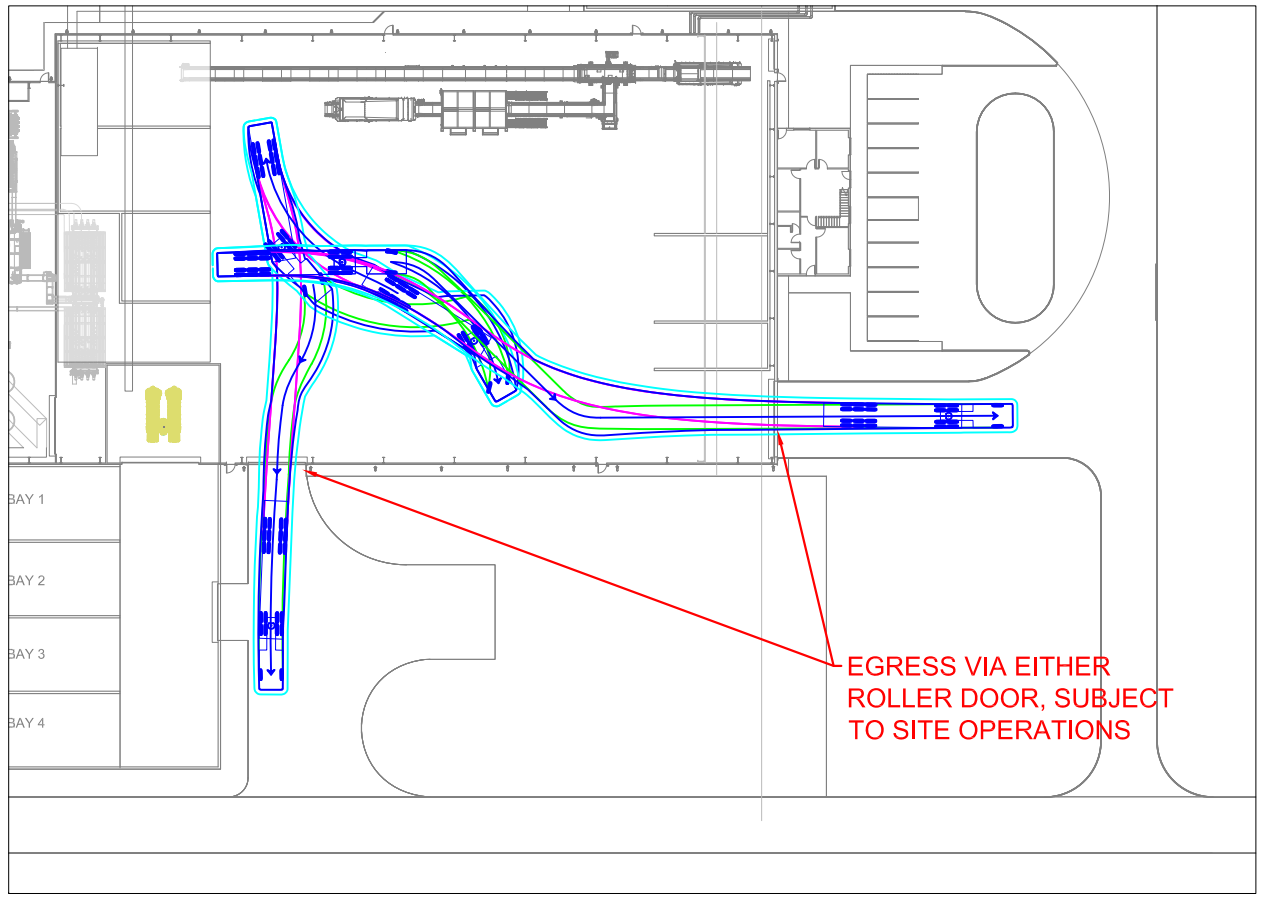
NORTHEAST BUNKER - SEMI-TRAILER EGRESS



WESTERN BUNKER - SEMI-TRAILER INGRESS



WESTERN BUNKER - SEMI-TRAILER EGRESS



REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE
BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

FILE NAME: G33791-02
SHEET NO.: 02

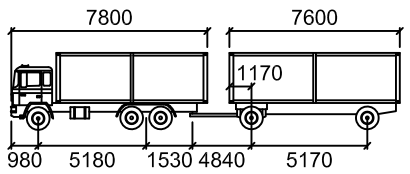
N

SCALE: 1:800 (A3)
0 8 16

Traffix Group
NALG | Hitachi Zosen INOVA

VEHICLE PROFILE

VEHICLE USED IN SIMULATION



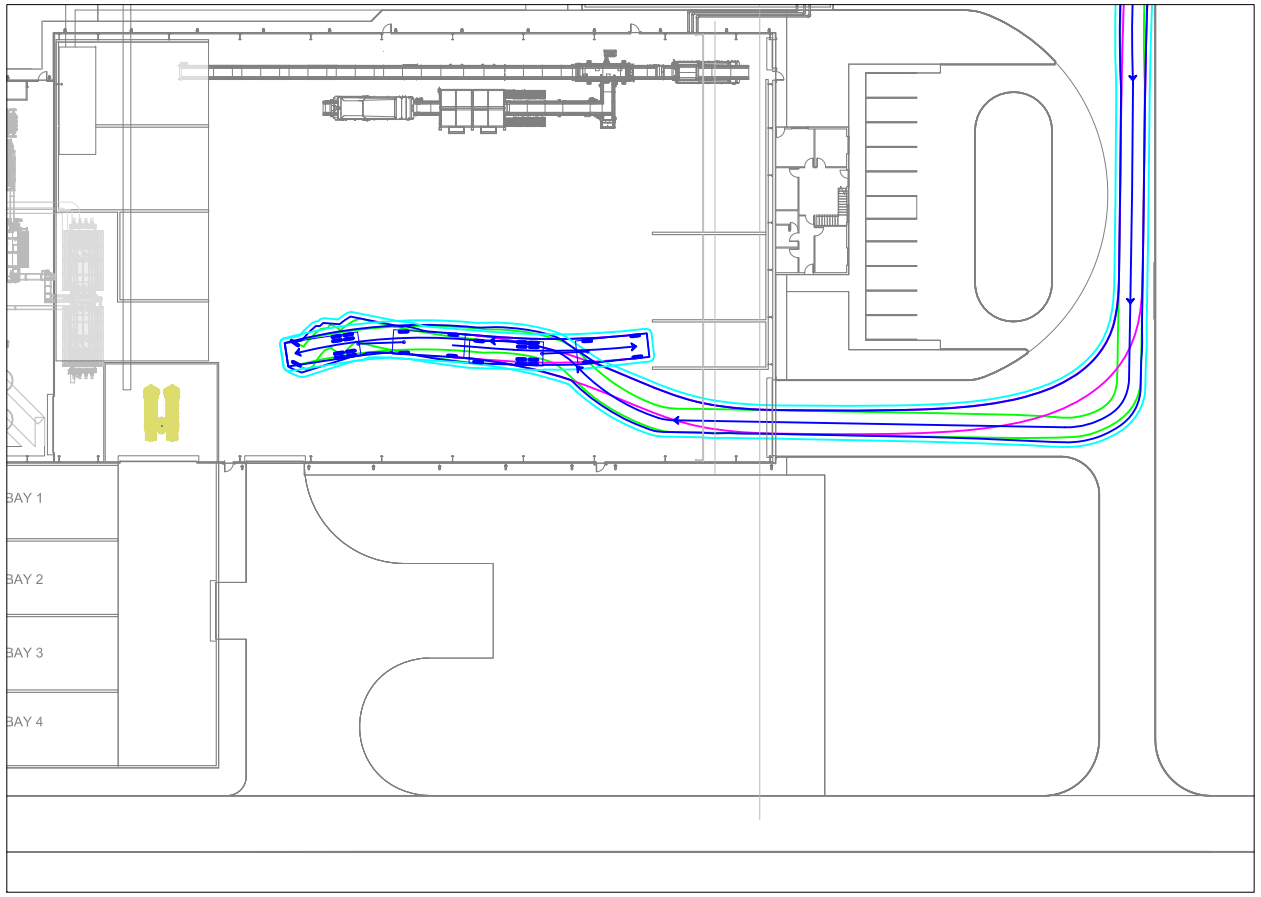
TRUCK AND DOG

	mm
First Unit Width	: 2500
Trailer Width	: 2500
First Unit Track	: 2500
Trailer Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 38.3
Articulating Angle	: 70.0

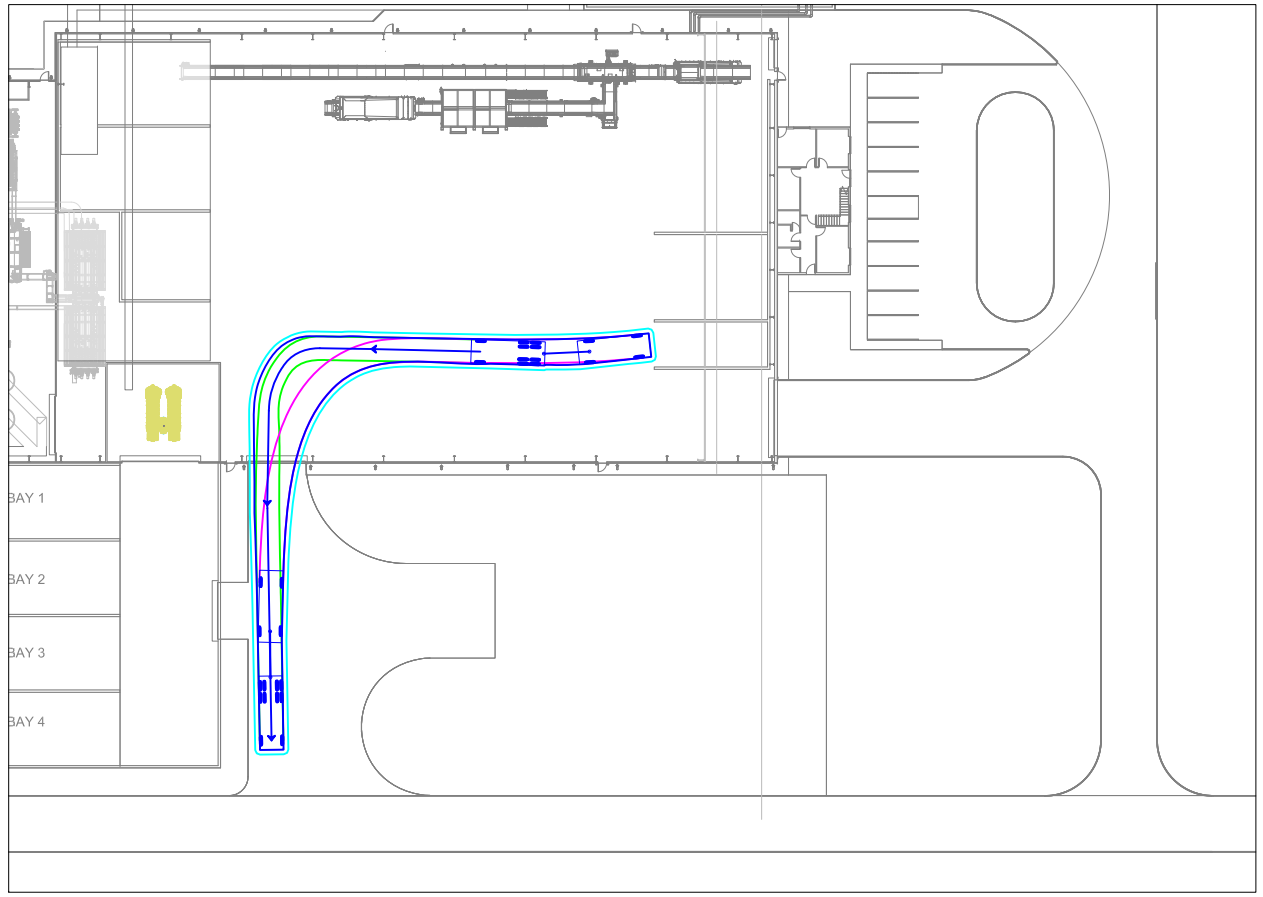
LEGEND

REAR WHEELS — VEHICLE BODY
FRONT WHEELS — BODY CLEARANCE

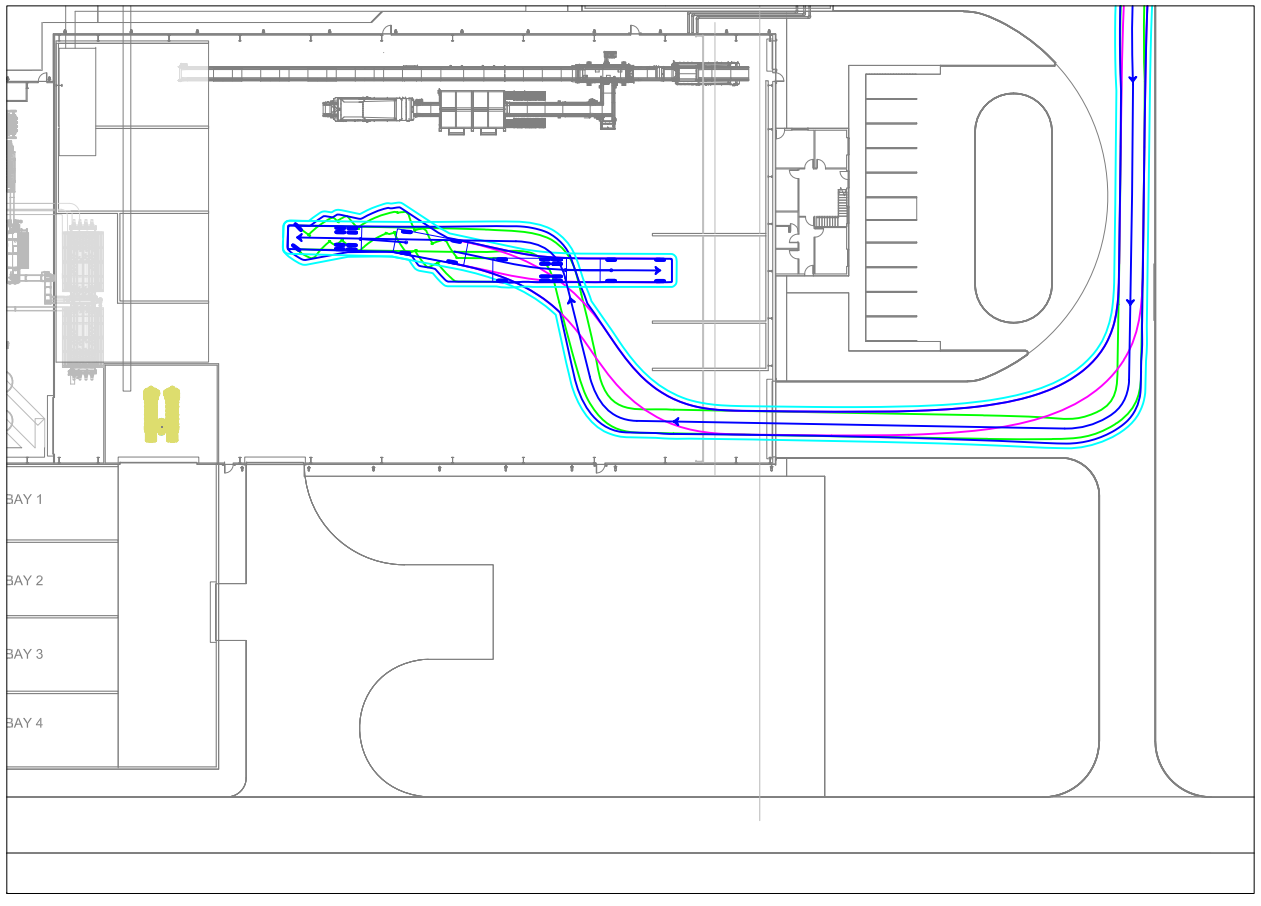
SOUTHEAST BUNKER - TRUCK AND DOG INGRESS



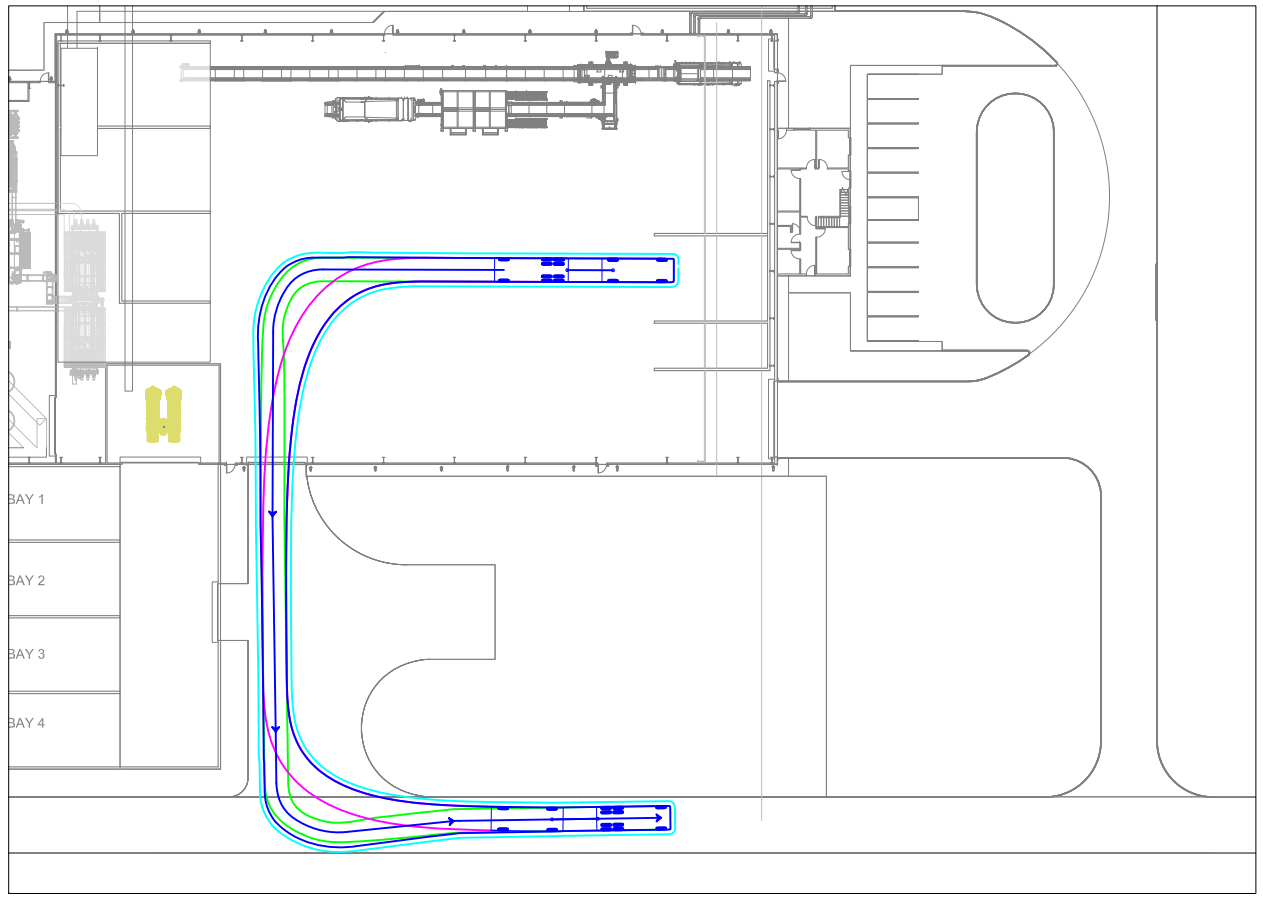
SOUTHEAST BUNKER - TRUCK AND DOG EGRESS



NORTHEAST BUNKER - TRUCK AND DOG INGRESS



NORTHEAST BUNKER - TRUCK AND DOG EGRESS



REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE
BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

FILE NAME: G33791-02
SHEET NO.: 03

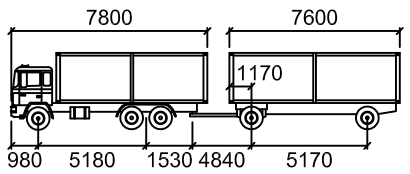
N

SCALE: 1:800 (A3)
0 8 16

Traffix Group
NALG | Hitachi Zosen INOVA

VEHICLE PROFILE

VEHICLE USED IN SIMULATION



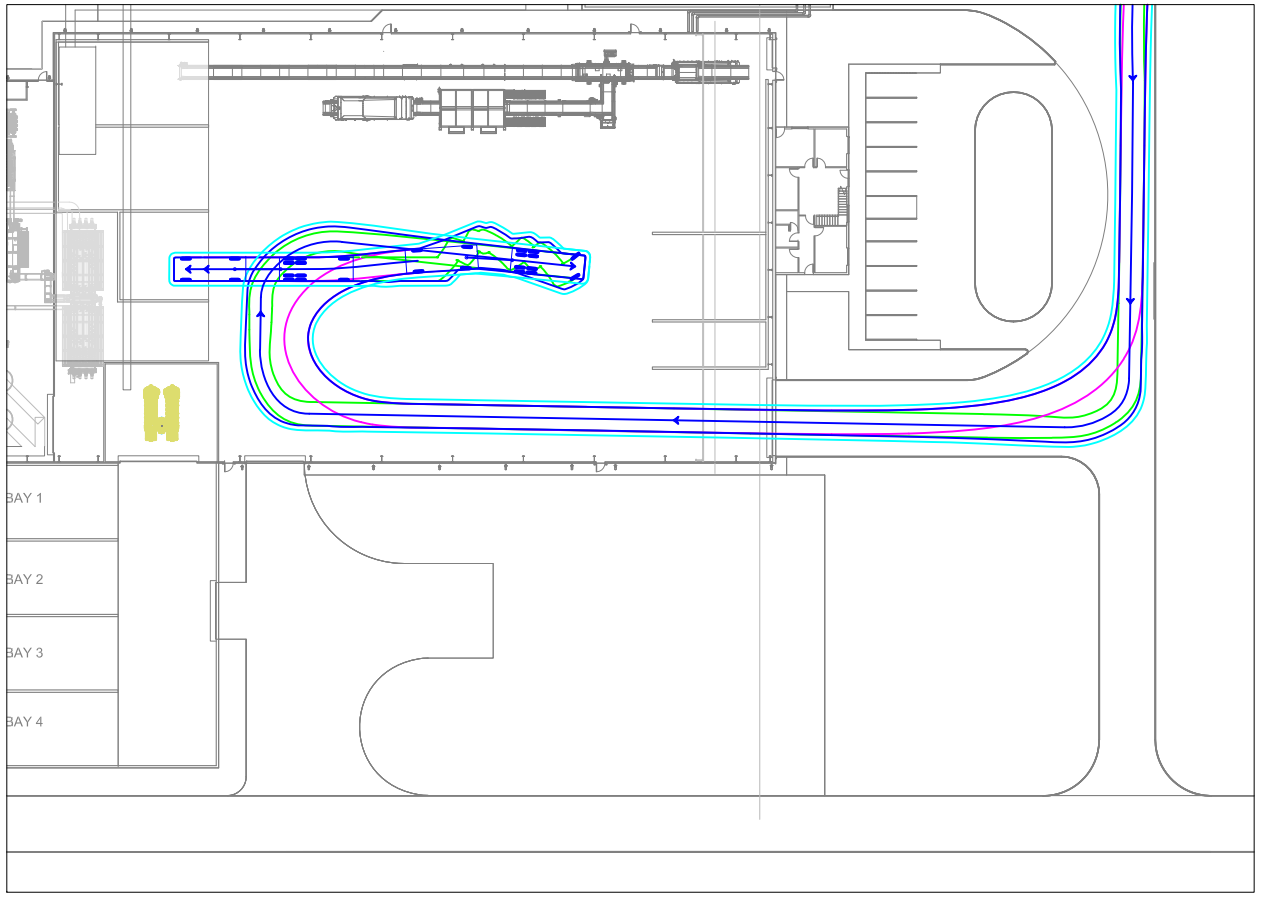
TRUCK AND DOG

	mm
First Unit Width	: 2500
Trailer Width	: 2500
First Unit Track	: 2500
Trailer Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 38.3
Articulating Angle	: 70.0

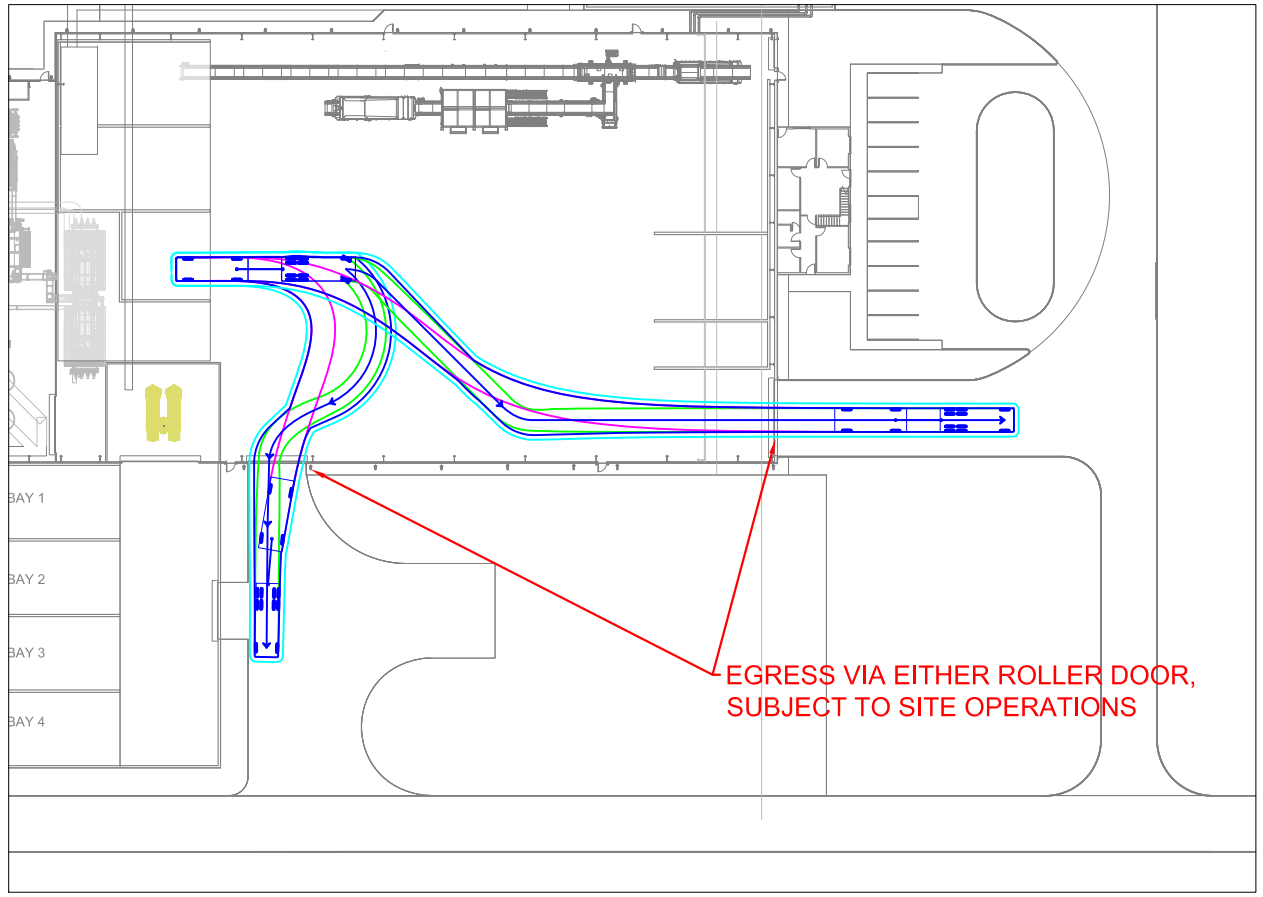
LEGEND

REAR WHEELS — VEHICLE BODY
FRONT WHEELS — BODY CLEARANCE

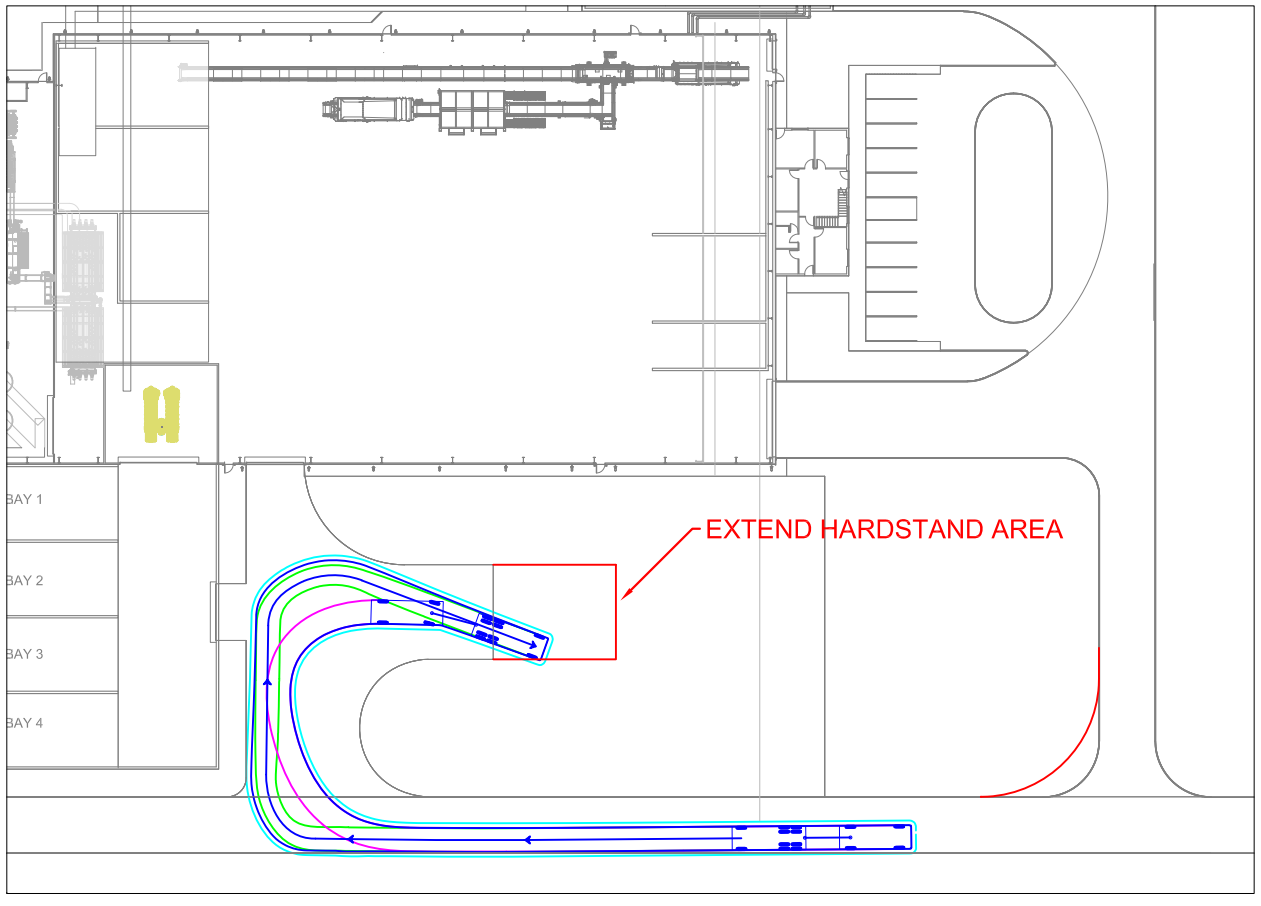
WESTERN BUNKER - TRUCK AND DOG INGRESS



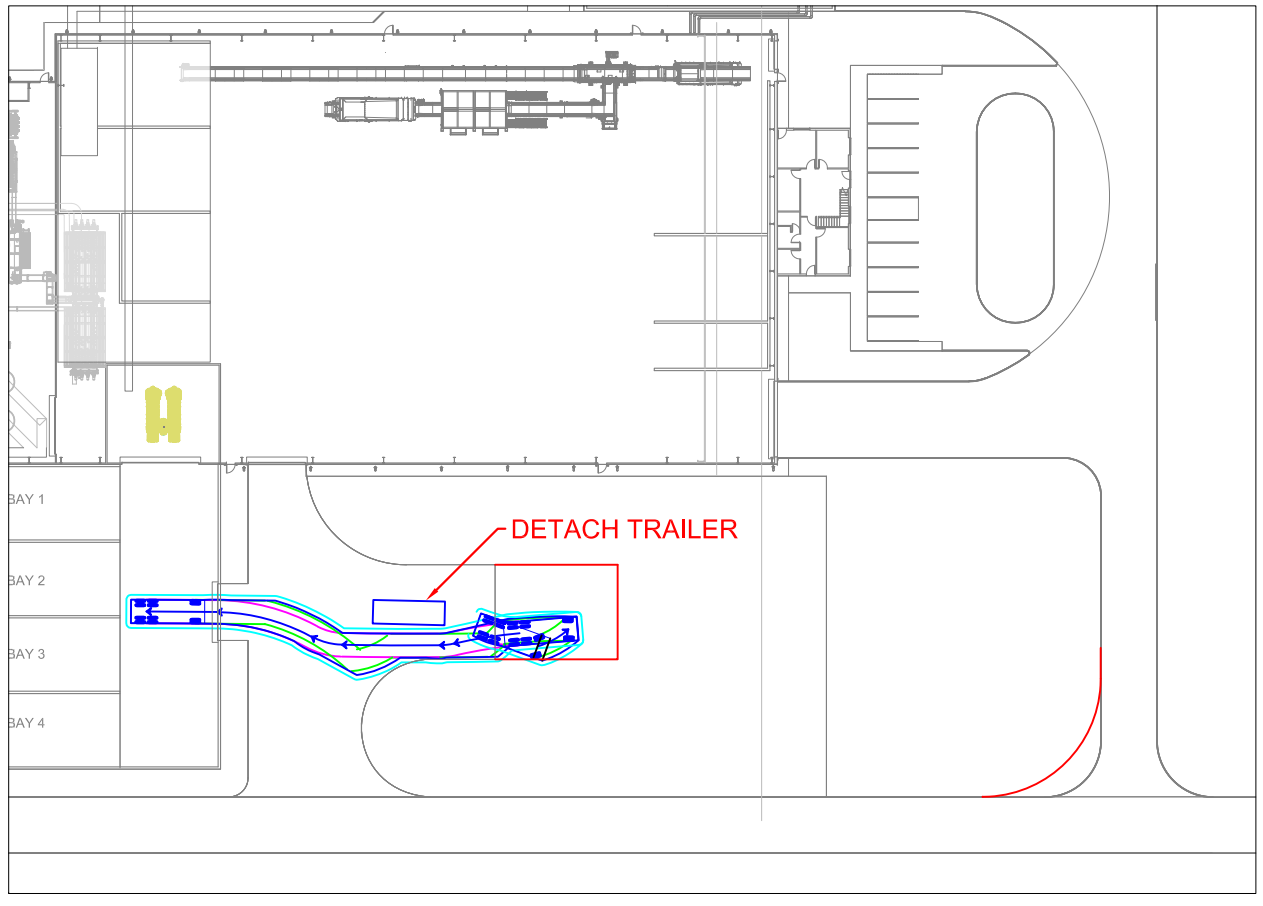
WESTERN BUNKER - TRUCK AND DOG EGRESS



DIGESTATE DRYING AREA - MOVEMENT 1 (INGRESS)



DIGESTATE DRYING AREA - MOVEMENT 2 (TRUCK LOADING)



REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE
BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

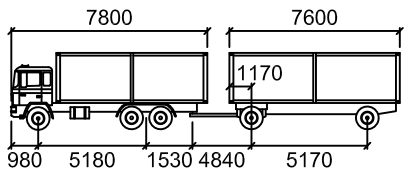
FILE NAME: G33791-02
SHEET NO.: 04

SCALE: 1:800 (A3)
0 8 16

Traffix Group
NALG | Hitachi Zosen INOVA

VEHICLE PROFILE

VEHICLE USED IN SIMULATION



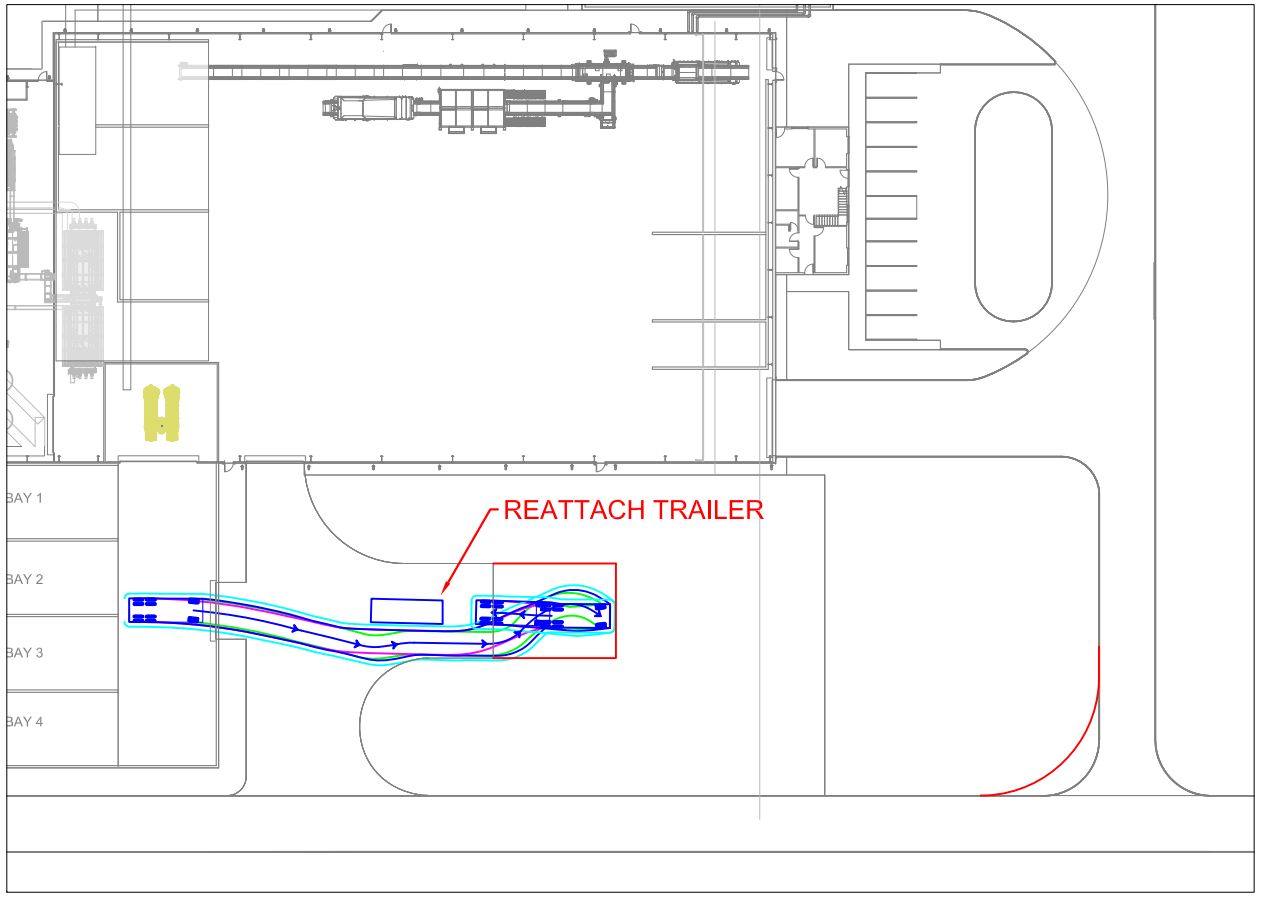
TRUCK AND DOG

	mm
First Unit Width	: 2500
Trailer Width	: 2500
First Unit Track	: 2500
Trailer Track	: 2500
Lock to Lock Time	: 6.0
Steering Angle	: 38.3
Articulating Angle	: 70.0

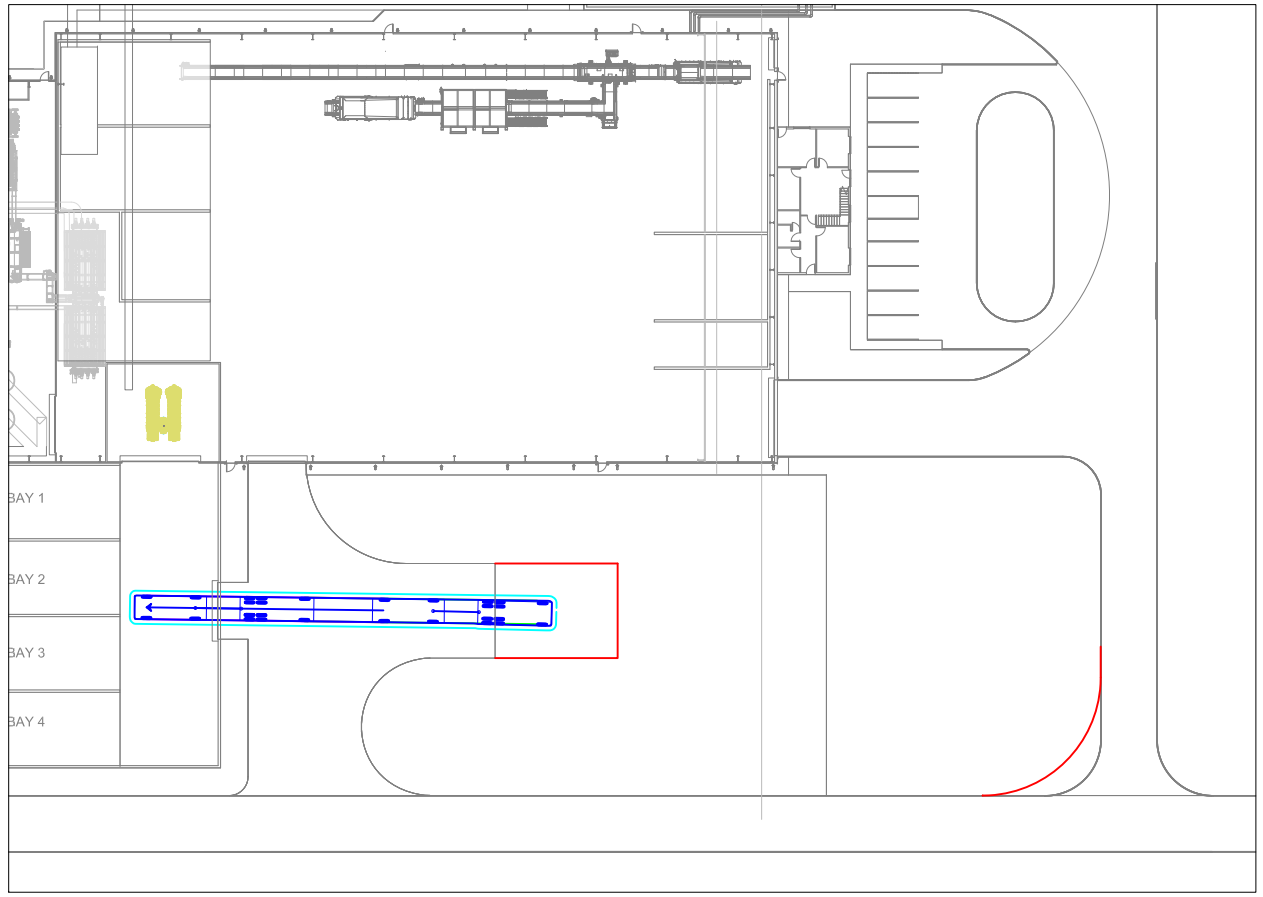
LEGEND

REAR WHEELS — VEHICLE BODY
FRONT WHEELS — BODY CLEARANCE

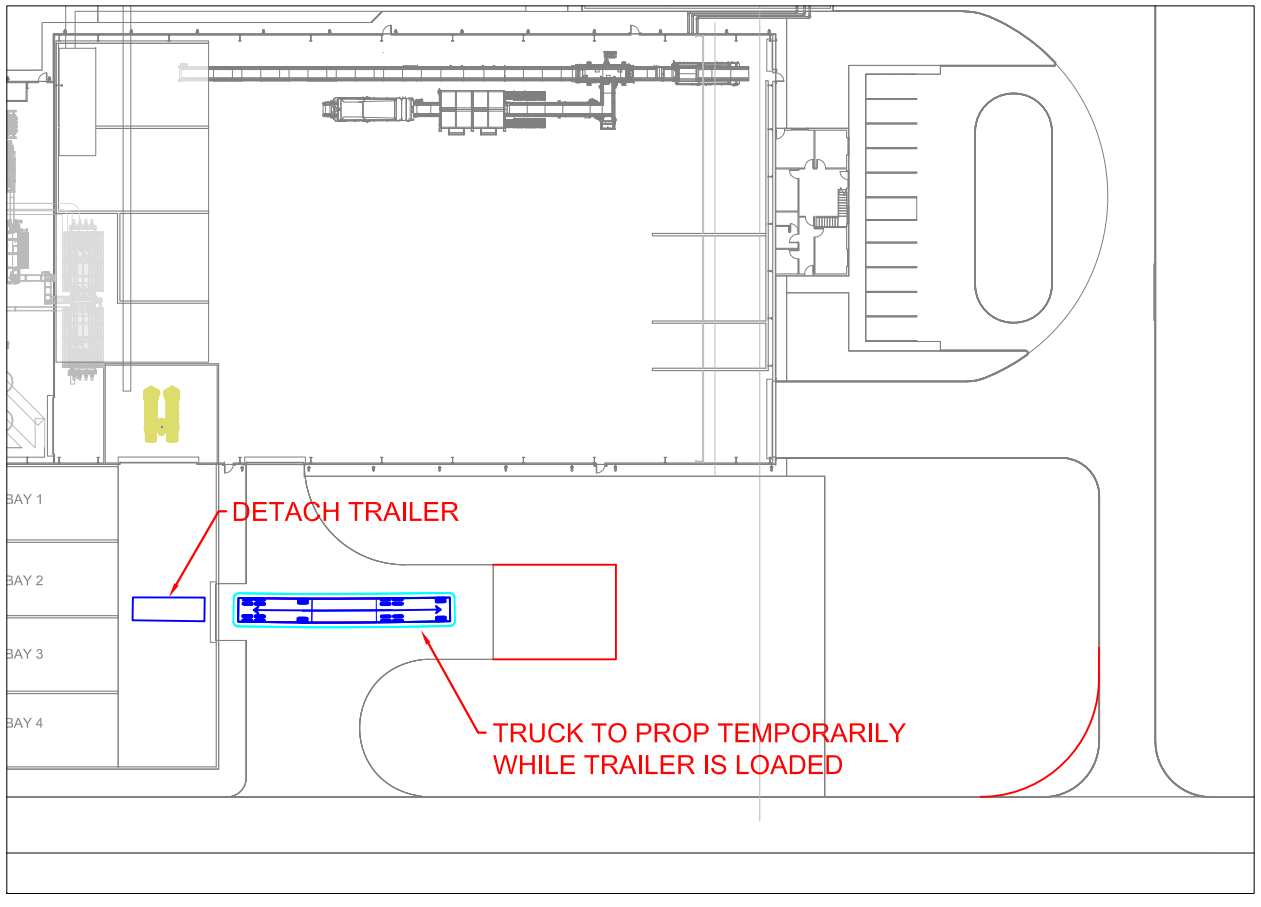
DIGESTATE DRYING AREA - MOVEMENT 3 (REATTACH TRAILER))



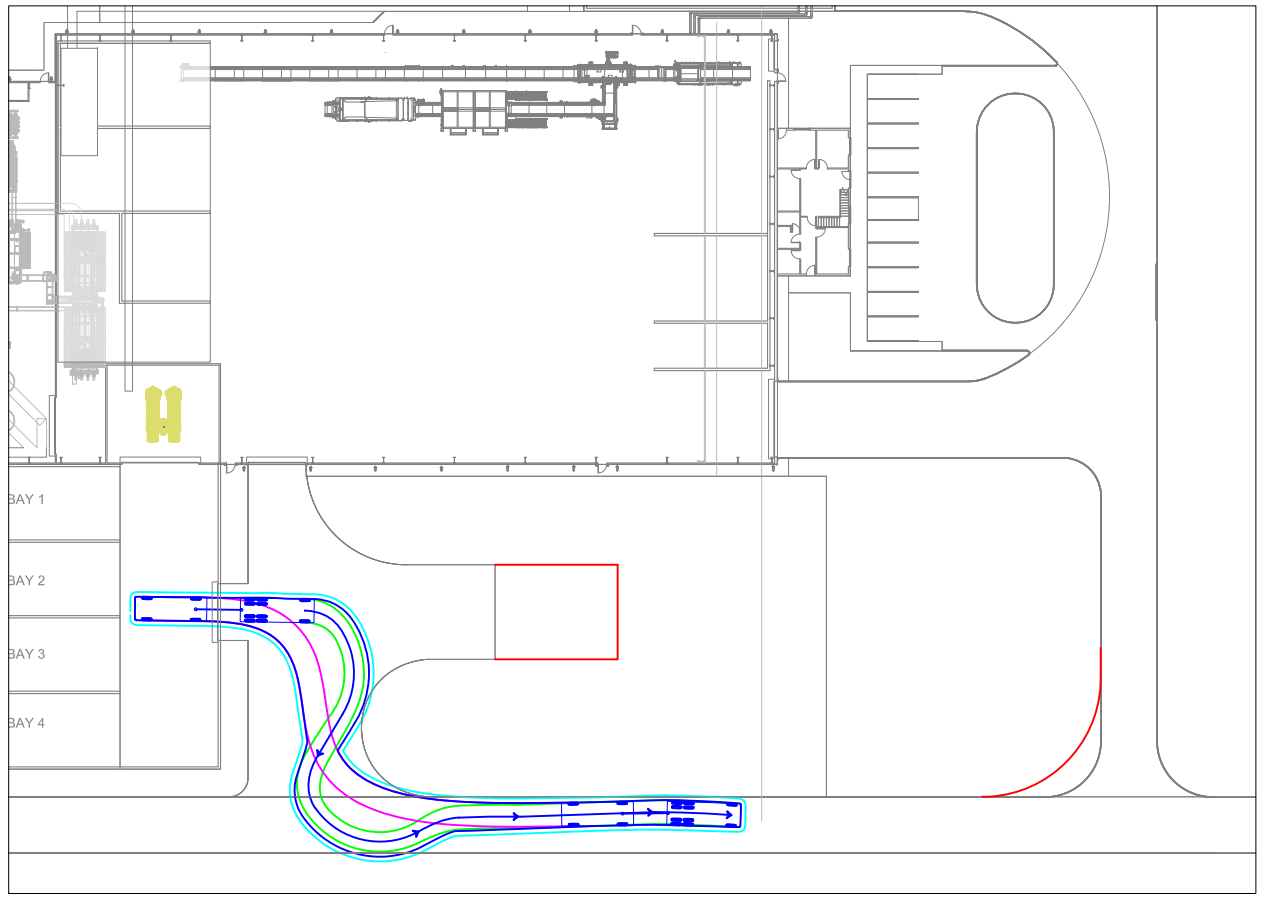
DIGESTATE DRYING AREA - MOVEMENT 4 (REVERSE TRAILER INTO LOADING AREA)



DIGESTATE DRYING AREA - MOVEMENT 5 (TRAILER LOADING)



DIGESTATE DRYING AREA - MOVEMENT 6 (EGRESS)



REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE
BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

FILE NAME: G33791-02
SHEET NO.: 05

N

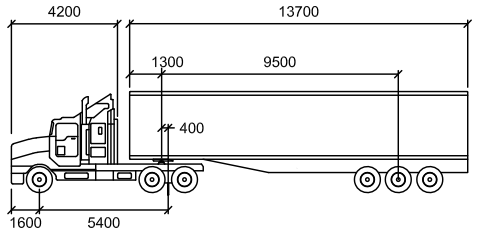
SCALE: 1:800 (A3)
0 8 16

Traffix Group
NALG | Hitachi Zosen INOVA

CRITICAL SEMI-TRAILER MOVEMENTS (INGRESS)

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)



AV (AS 2890.2)

	mm		mm
Tractor Width :	2500	Lock to Lock Time :	6.0
Trailer Width :	2500	Steering Angle :	28.3
Tractor Track :	2500	Articulating Angle :	70.0
Trailer Track :	2500		

LEGEND

REAR WHEELS
FRONT WHEELS
VEHICLE BODY
BODY CLEARANCE

WEIGHBRIDGE

BAY 1
BAY 2
BAY 3
BAY 4

INCREASE RADIUS
OF CORNER SPLAY

REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE

BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

FILE NAME: G33791-02

SHEET NO.: 06

N

SCALE: 1:800 (A3)

0 8 16

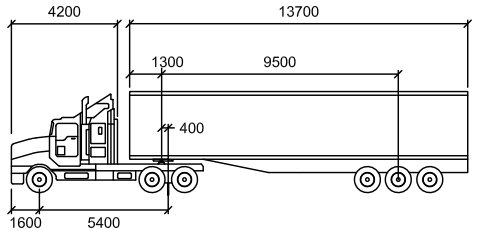
Traffix Group

NALG | Hitachi Zosen INOVA

CRITICAL SEMI-TRAILER MOVEMENTS (EGRESS)

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)



AV (AS 2890.2)

	mm		mm
Tractor Width :	2500	Lock to Lock Time :	6.0
Trailer Width :	2500	Steering Angle :	28.3
Tractor Track :	2500	Articulating Angle :	70.0
Trailer Track :	2500		

LEGEND

REAR WHEELS
FRONT WHEELS
VEHICLE BODY
BODY CLEARANCE

WEIGHBRIDGE

BAY 1
BAY 2
BAY 3
BAY 4

INCREASE RADIUS
OF CORNER SPLAY

REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE

BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

FILE NAME: G33791-02

SHEET NO.: 07

N

SCALE: 1:800 (A3)

0 8 16

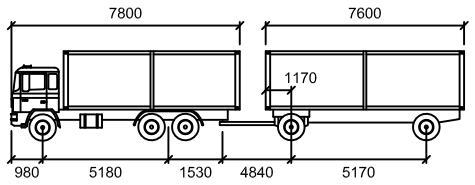
Traffix Group

NALG | Hitachi Zosen INOVA

CRITICAL TRUCK AND DOG MOVEMENTS (INGRESS)

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)



TRUCK AND DOG

mm

First Unit Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 38.3
First Unit Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

LEGEND

REAR WHEELS
FRONT WHEELS
VEHICLE BODY
BODY CLEARANCE

WEIGHBRIDGE

BAY 1
BAY 2
BAY 3
BAY 4

REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE

BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

FILE NAME: G33791-02

SHEET NO.: 08

N

SCALE: 1:800 (A3)

0 8 16

Traffix Group

NALG | Hitachi Zosen INOVA

CRITICAL TRUCK AND DOG MOVEMENTS (EGRESS)

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)

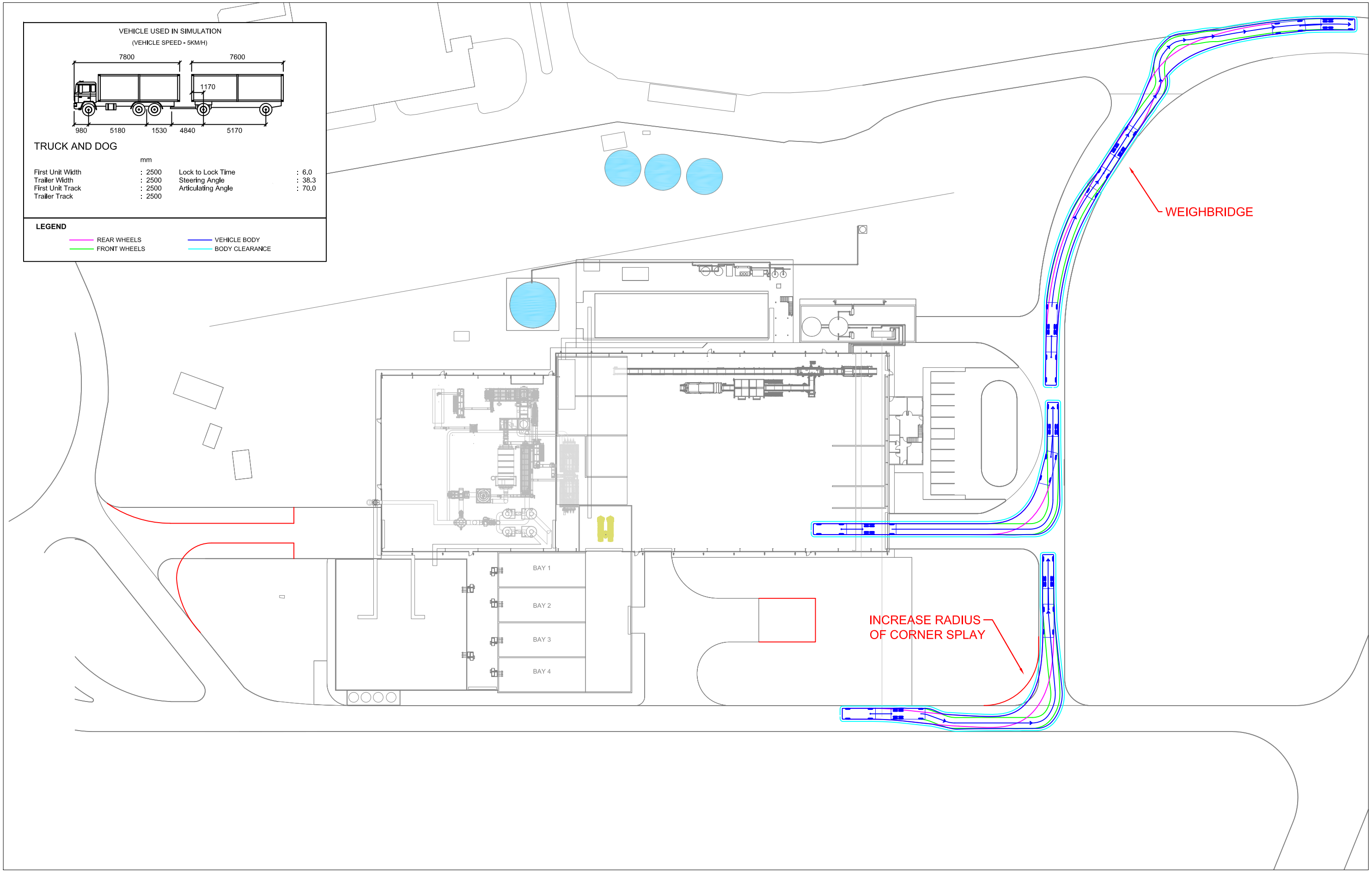
TRUCK AND DOG

mm

First Unit Width	: 2500	Lock to Lock Time	: 6.0
Trailer Width	: 2500	Steering Angle	: 38.3
First Unit Track	: 2500	Articulating Angle	: 70.0
Trailer Track	: 2500		

LEGEND

REAR WHEELS
FRONT WHEELS
VEHICLE BODY
BODY CLEARANCE



REV	DATE	NOTES	DESIGNED BY	CHECKED BY
A	16/08/2024	INITIAL ISSUE	DFT	AM (RPE13499)

BLACKROCK ROAD, CONNEWARRE

BARWON WATER RRON

GENERAL NOTES:

SWEPT PATH DIAGRAMS PREPARED USING 500MM VEHICLE BODY CLEARANCE.
BASE PLANS PREPARED BY NALG, RECEIVED 14/08/2024

FILE NAME: G33791-02

SHEET NO.: 09

N

SCALE: 1:800 (A3)

0 8 16

Traffix Group

NALG | Hitachi Zosen INOVA