TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

TRAFFIC IMPACT ASSESSMENT (TIA)

Proposed Waste Management facility
2-4 Hale Street, Botany

Reference: 23.464r01v09
Date: June 2024

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TRAFFIX

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Appendices

1. INTRODUCTION

TRAFFIX has been commissioned by EME Advisory to undertake a Traffic Impact Assessment for a State Significant Development Application (SSDA) involving a proposed Construction and Demolition (C & D) waste management facility at 2-4 Hale Street, Botany.

The proposal involves demolition of existing structures to facilitate the construction of a facility that would operate as a waste transfer station for the receipt, basic sorting and recycling with aggregation of material for bulk transport to an advanced resource recovery facility within the KLF Group (KLF) where more advanced sorting and recycling would be undertaken.

The proposed development is located within the Bayside Local Government Area (LGA) and has been assessed under that Council's controls.

This report documents the findings of our investigations and should be read in the context of the Environmental Impact Statement, prepared separately. As per the Planning Secretary's Environmental Assessment Requirements, the SSDA requires consultation with Bayside Council and Transport for NSW (TfNSW).

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents SEARs and Council Requirements
- Section 4: Documents existing traffic conditions
- Section 5: Describes the proposed development
- Section 6: Discusses site operations
- Section 7: Assesses the parking requirements
- Section 8: Assesses traffic impacts
- Section 9: Discusses access and internal design aspects
- Section 10: Presents the overall study conclusions

2. LOCATION AND SITE

The subject site is known as 2-4 Hale Street, Botany (Lot 1 of DP562374) and is located on the northern side of Hale Street, about 140 metres east of Foreshore Road. It is also located adjacent Sydney Airport, and 8.6 kilometres south of the Sydney CBD.

The site has a total site area of approximately 7,439m^2 and has a southern frontage of 150 metres to Hale Street. It is bounded to the north and west by vacant land, and industrial developments to the east.

At present the site is leased by multiple tenants including, Frontline Fabrications, Ripe Providores, Powder Coaters, a mechanic, Meat Storage, Smash Repairs a timber workshop and storage units.

Vehicular access to the site is currently provided via Hale Street.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**.

Figure 1: Location Plan

Figure 2: Site Plan

3. ASSESSMENT REQUIREMENTS

3.1 SEARs Requirements

The Planning Secretary's Environmental Assessment Requirements (SEARs) outlines the transport and accessibility requirements for the SSD as stated below in **Table 1**.

Table 1: SEARs Requirements and References

SEARs Requirements	Reference
Transport and Accessibility (Construction and Operation)	
Details of all daily and peak traffic volumes likely to be generated during all key stages of construction and operation, including a description of key access / haul routes, vehicle types and potential queuing impacts	**Refer to Section 6 & 8**
An assessment of the predicted impacts of this traffic on road safety and the capacity of the road network, including consideration of cumulative traffic impacts on existing performance levels at key intersections, using a calibrated SIDRA (or similar) traffic model	**Refer to Section 8**
Details of road upgrades, infrastructure works or new roads or access points required for the development	**Refer to Section 8**
Plans demonstrating how all vehicles likely to be generated during construction and operation and awaiting loading, unloading or servicing can be accommodated on the site to avoid queuing in the street network	**Refer to Section 6 & 8**
Details and plans of the site access, internal road network, on-site parking, and sufficient pedestrian and cyclist facilities, in accordance with the relevant Australian Standards	**Refer to Section 7 & 9**
Details of the largest vehicle anticipated to access and move within the site, including swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site.	**Refer to Section 9**

3.2 Council Requirements

The Bayside Council has reviewed the above SEARs and provides the comments outlined in **Table 2** below.

Table 2: Council Requirements and References

Council Requirements	Reference
3. The Bayside DCP 2022 Section 3.5 specifies parking requirements for development of this type. General Industrial uses are required to provide the following car parking rates: 2 spaces; or 1 space/80 m2 GFA (whichever greater); plus 1 space/40 m2 of ancillary office.	**Refer to Section 7.1**
4. A Traffic and Parking Impact Assessment Report is required for waste and resource management facilities applications and must include: a. Full details of the proposed operation (including maximum number of vehicles to be stored on-site and frequency of movements), b. Proposed vehicular access, off-street parking, vehicle storing area, pickup/drop off zones, movements and manoeuvrability of all vehicles, c. Truck routes to and from the site (for the transport of vehicles), d. Details of any potential impacts on traffic and the road network system (including intersection performance analysis), e. Details of site access, road signs, pedestrian safety etc, f. Signal/warning system and passing bay requirement at vehicle intersection areas, g. Parking & manoeuvring of vehicles. The report should address adequacy of site and parking layout for the largest vehicle to be accessing the site, h. Traffic engineer shall certify the parking layout, access and visibility requirement for the proposed parking facility in accordance with AS/NZS 2890.1:2004, AS2890.2:2018, AS2890.3:2015 & AS/NZS 2890.6:2009, i. Construction traffic management concept plan, j. Details of the Traffic consultant and author of the report must be included.	**Addressed throughout the report, noting a Construction Traffic Management Concept Plan is to be prepared at Construction Certificate (CC) stage after development approval.**
5. Swept path analysis (using Autoturn software or similar) shall be provided (for B85 vehicle) for all parking spaces and demonstrate area required to manoeuvre vehicle in and out from the site and parking spaces in forward direction. A 300mm clearance shall be provided either side of the turning path.	**Refer to Section 9.2.3**
6. Swept path analysis (using Autoturn software or similar) shall be provided for the largest service vehicle accessing the site and demonstrate the area required to manoeuvre vehicle around the site and exit in a forward direction	**Refer to Appendix D**

7. An assessment and certificate from a qualified traffic engineer shall be provided demonstrating compliance with Australian Standards 2890 series for parking facility design, layout and access to the site.	**Refer to Section 9, a design certificate is to be prepared addressing relevant conditions of consent relating to AS2890 compliance after development approval.**
8. A longitudinal profile of the driveway shall be provided incorporating the driveway ramp crest level protecting the basement from flooding as per any flood advice letter. Also a longitudinal profile is to be provided for the loading dock and internal ramps demonstrating compliance with the relevant Australian Standard.	**Not applicable, the proposed development does not propose internal ramps, recessed docks or basement levels.**
9. A Traffic Study is required to be undertaken for the development by a qualified and experienced traffic engineer to assess the traffic impacts of the development. The study shall be undertaken in accordance with the RTA Guide to Traffic Generating Developments and shall include, but not be limited to, the following topics: a. Existing site conditions, b. Route assignment, traffic flows and traffic generation (existing & future), c. Intersection performance and levels of service (existing and future), d. Traffic safety, e. Access requirements – details shall be provided for existing access and proposed access for maximum safety of pedestrian and vehicles, and f. Traffic and parking survey shall be done on peak period (not in school holidays) – two/three typical days	**Addressed throughout the report.**

4. EXISTING TRAFFIC CONDITIONS

4.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- General Holmes Drive: a TfNSW Main Road (MR 194) that traverses in an east-west direction between Joyce Drive in the east and The Grand Parade in the west. In the vicinity of the site, General Holmes Drive generally accommodates three (3) lanes of traffic in westbound and four (4) lanes eastbound with opposing traffic flows separated by a central median island and is subject to a 70km/h speed zoning. Parking is not permitted along General Holmes Drive.
- Foreshore Road: a TfNSW Main Road (MR 617) that traverse in a north-south direction between Botany Road in the south and General Holmes Drive in the north. In the vicinity of the site, Foreshore Road accommodates two (2) lanes of traffic in each direction with opposing traffic flows separated by a central median island and is subject to an 80km/h speed zoning. Kerbside parking is prohibited along Foreshore Drive.
- Botany Road: a TfNSW Main Road (MR 170) that traverses in a north-south direction between Regent Street in the north and Bunnerong Road in the south. In the vicinity of the site, Botany Road accommodates a single lane of traffic in each direction and is subject to a 50km/h speed zoning. Kerbside parking is generally permitted in both directions, with restrictions.
- Hale Street: a local road that generally traverses in an east-west direction between Botany Road in the east and Foreshore Road in the west. In the vicinity of the site, Hale Street accommodates single lane of traffic in both directions and is subject to a 50km/h speed zoning. Kerbside parking is generally permitted in both directions.

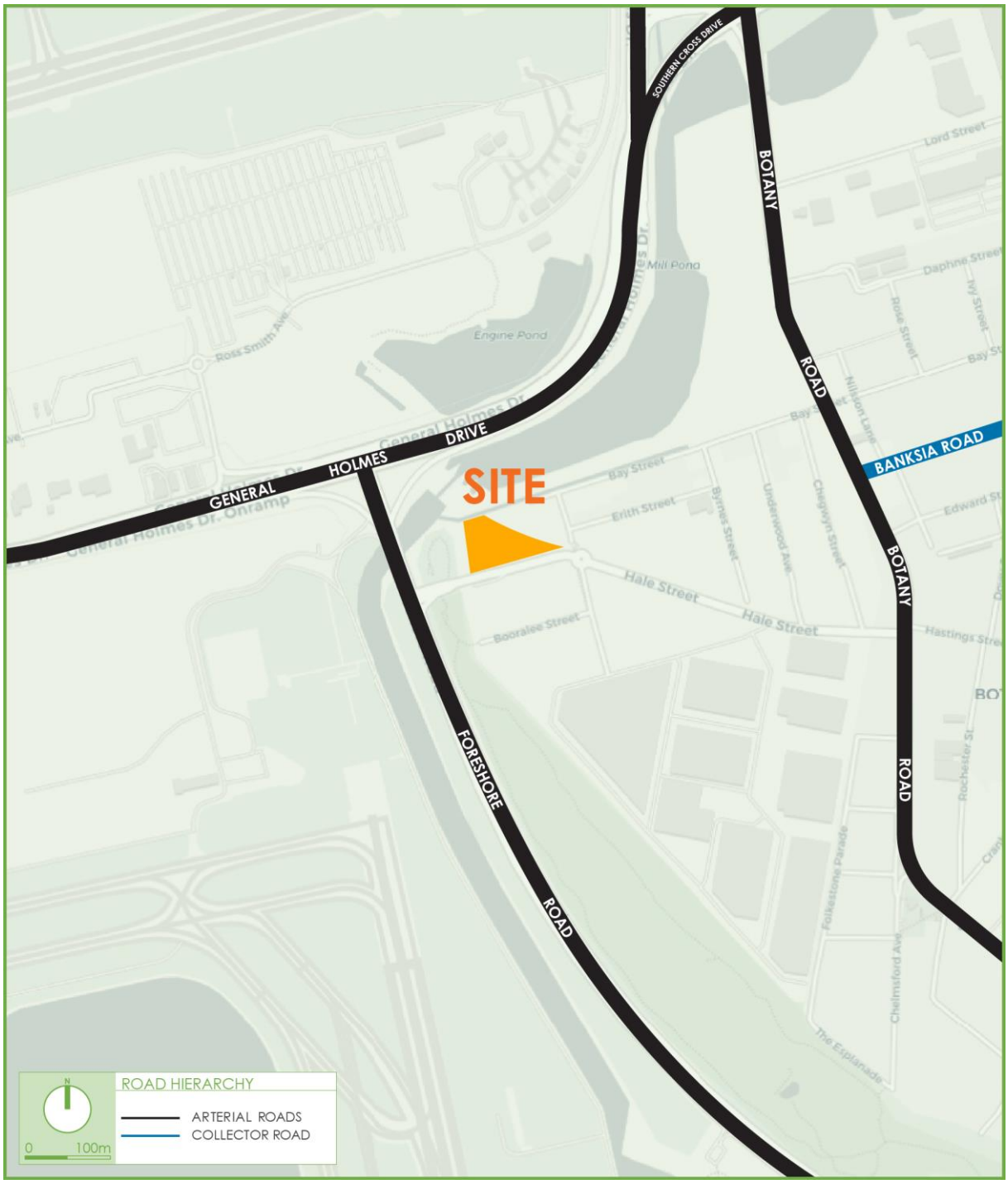

Figure 3: Road Hierarchy

4.2 Key Intersection

The key intersection in the vicinity of the site is shown below and provide an understanding of the existing road geometry and alignment. It can be seen from **Figure 4** that Hale Street / Foreshore Road intersection is a signal-controlled T-intersection without any pedestrian crossing facilities.

Figure 4: Intersection of Hale Street and Foreshore Road

The main attributes of each approach are outlined as follows:

- Hale Street (east)
  - The eastern leg provides a total of three (3) approach lanes, comprising one (1) continuous right turn lane, one (1) short right turn lane, and one (1) left turn slip lane.
- Foreshore Drive (north-south)
  - The northern leg provides a total of three (3) approach lanes, comprising two (2) through lanes, and one (1) short left turn lane.
  - The southern leg provides a total of three (3) approach lanes, comprising two (2) through lanes, and one (1) short right turn lane.

4.3 Public Transport

The existing bus services that operate in the locality are shown in **Figure 5**. It is evident that the development benefits from good bus services with five (5) bus stops within a 600m radius. These services provide connections to such centres as Mascot, Eastgardens, Rosebury, Waterloo, Port Botany and Central. These bus routes provide frequent services during the weekday peak hour periods.

It is also noted that Mascot Railway Station is located approximately 2.5 kilometres from site and can be conveniently accessed via the surrounding bus network. This station provides services on the T8 line, connecting the site to the City and the wider rail network.

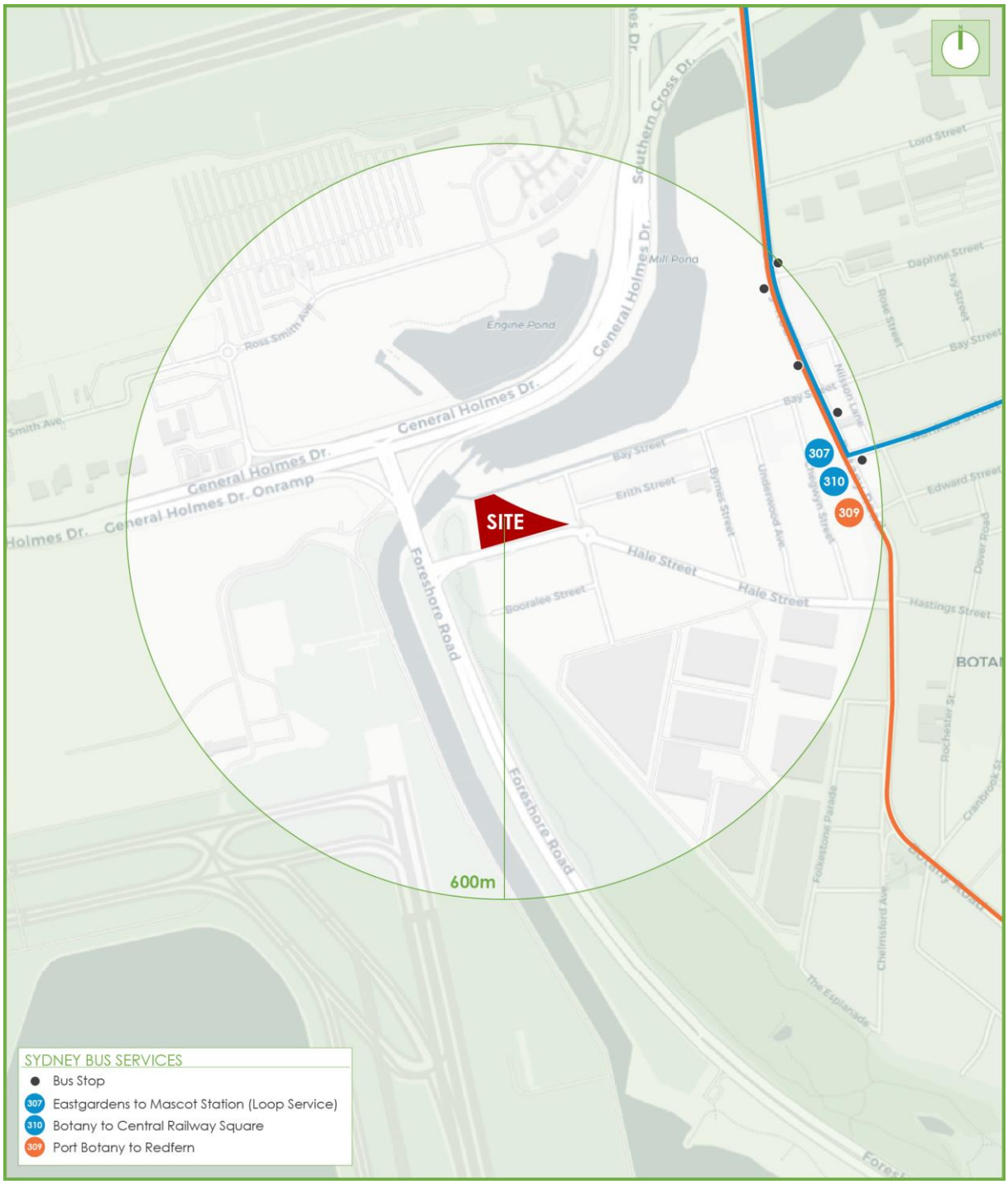

Figure 5: Public Transport

5. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the proposed development is provided in the Environmental Impact Statement prepared separately. In summary, the State Significant Development Application (SSDA) seeks approval to develop a Construction and Waste (C & D) waste management facility. The associated works include:

- Demolition of existing structures;
- Construction of new purpose-built warehouse of 3,647m2 for the receipt, basic sorting and recycling with aggregation of material;
- Construction of a site office of 260m2 including amenities;
- Construction of a new at-grade hardstand area including;
  - Two (2) in-ground weighbridges.
  - Fourteen (13) parking spaces.
- Construction of two (2) separate vehicular access driveways off Hale Street facilitating separate light and heavy vehicle movements which will result in a net loss of five (5) on-street parking spaces when assessed under AS 2890.5 (2020) dimensional requirements.

The parking and traffic impacts of the proposed development are discussed in **Section 8** and **Section 9**. Reference should be made to the plans submitted separately to Council which are presented at reduced scale in **Appendix A**.

6. SITE OPERATIONS

6.1 On-Site Activities

The C & D waste management facility has the capacity to process up to 300,000 tonnes per annum of waste. These types of waste include recyclable, non-recyclable, organic, metal, and demolition waste. The proposed waste transfer centre will be capable of receipt, basic sorting, and aggregation of basic material. The facility will primarily sort construction and demolition waste, preparing it for dispatch to other facilities for further treatment.

6.2 Stages of On-Site Activities

Specifically, the proposed development will operate as a construction and demolition waste facility, with the following staging:

- Delivery: Trucks will deliver segregated heavy waste and co-mingled and other reclassified waste.
- Waste Acceptance/Rejection: Truck pass over the weighbridge and are visually inspected. Visibly unacceptable loads are rejected, logged and are transported offsite by the customer.

  Where entry to the site is permitted and trucks drive to the off-load inspection area – tip zone, in the waste transfer building where the waste (including co-mingled waste) is tipped, spread, turned, and inspected. Unacceptable loads are rejected and reloaded into the vehicle, logged on a register available to the EPA and directed to leave the facility. The customer is charged for the reload.
- Stockpiling: Accepted loads are stockpiled for sorting.

- Sorting: Waste is pre-sorted via a front-end loader/zero swing excavators within the incoming waste area. Following pre-sorting the waste is sorted by a front-end loader/excavator into four categories; Plant feed, clean concrete and brick, metal, and Light mixed waste.
- Stockpiling: Material are stockpiled into designated bays including, light waste, heavy waste, and metals.
- Dispatch: Plant feed and light mixed waste would be dispatched to other KLF advanced resource recovery facilities. Clean concrete, brick and metal is dispatched to recycling partners.

6.3 Hours of Operations

The facility has been designed to operate 24 hours a day, 7 days a week.

6.4 Waste Material Volumes

The facility has been designed for the following material volumes:

- Daily incoming volumes: approx. 1,150 tonnes per day;
- On-site waste storage: 6,000 to 10,000 tonnes.

6.5 Vehicular Access

The development proposes two (2) driveway crossings, including:

- A driveway crossing to Hale Street (west). This driveway will be exclusively for light vehicles used by staff and visitors, generally at the end/beginning of each shift.
- A driveway crossing to Hale Street (east). This driveway will permit truck entries/exits only.

6.6 Car Parking

The proposed development makes provision for a total of 13 at-grade parking spaces for staff and visitors which will satisfactorily accommodate the nominal parking demands generated by the proposed development which is discussed further in **Section 7.1** of this report. The carparking areas including access/egress has been separated from heavy vehicle manoeuvring areas to ensure safety of onsite pedestrians.

6.7 Truck Types

The development has been designed to accommodate the following commercial vehicles:

- Articulated vehicles up to and including 26 metre B-doubles;
- Truck and dog trailers up to19.6 metres long; and
- Single rigid trucks up to and including 12.5m Heavy Rigid Vehicles (HRV).

6.8 Weigh Bridges and Vehicle Control

The development provides two (2) in-ground weighbridges. Vehicles will first be weighed upon entry to the site, and after loading/unloading they will be weighed again preparing for exit. The critical entry weighbridge (eastern most weighbridge) provides sufficient queuing space for two (2) 26m B-doubles, which is significant more than the expected arrival rate for vehicles utilising this weighbridge. More details relating to this queuing is discussed below.

6.9 Loading/Unloading Areas

All sized vehicles will be loaded/unloaded within the purpose-built enclosed warehouse area. The Tip Zone has been designed to accommodate commercial vehicles up to and including 26m B-doubles, allowing them to drive in and out of the warehouse in a forward direction at all times.

6.10 Truck Frequencies

The anticipated truck volumes for the development are as follows:

- Articulated Vehicles up to 26m B-doubles and Truck and Dogs up to 19.6m:
  - 94 vehicle trips per day(47 in, 47 out).
- Rigid Vehicles up to 12.5m:
  - 318 vehicle trips per day (159 in, 159 out).
- Combined:
  - 412 vehicle trips per day (206 in, 206 out).

Heavy vehicle movement are split between the day/nighttime periods with 80% of trucks arriving between 7am-6pm and 20% between 6pm-7am, with the following truck volumes expected during road network peak periods:

- Articulated Vehicles up to 26m B-doubles and Truck and Dogs up to 19.6m:
  - 8 vehicle trips per hour (4 in, 4 out).
- Rigid Vehicles up to 12.5m:
  - 24 vehicle trips per hour (12 in, 12 out).
- Combined:
  - 32 vehicle trips per hour (16 in, 16 out).

6.11 Light Vehicle Frequencies

If it was conservatively assumed that all nine (9) staff spaces will be used by staff over three × 8-hour shift. The anticipated daily light vehicle volumes for the development are as follows:

- 54 vehicle trips per day (27 in, 27 out); and
- 54 vehicle trips per day (27 in, 27 out).

6.12 Queuing

The site has been designed to accommodate up to five (5) × 26m B-doubles at the same time. Notwithstanding, It is understood the worst-case scenario for vehicles on site in a 15-minute period will comprise the following scenarios:

- Scenario 1
  - Inbound: 1 × B-double and 3 × rigid trucks.
  - Outbound: 1 × B-double and 3 × rigid trucks.
- Scenario 2
  - Inbound: 5 × rigid trucks.
  - Outbound: 5 × rigid trucks.

All the above queueing scenarios will be satisfactorily accommodate on site as shown in the diagram provided in **Appendix B**.

It is noteworthy that the weighbridges are located well within the site providing ample space for on-site queuing, noting the modest hourly vehicle arrivals outlined above.

In addition, all drivers will be inducted to ensure they are aware of weighbridge protocols and on-site staff will be trained to re-direct trucks should vehicle queues extend near the site access on Hale Street.

Queuing areas will be designed to allow large vehicles to manoeuvre around adjacent queued vehicles if on-site staff consider queues are becoming too long. These vehicles will be directed to circulate around the site before getting weighed in. These movements can be managed internally by staff.

6.13 Truck Routes

The following truck routes aim to avoid residential areas and direct trucks to and from the M1, minimising impacts in the area. The truck routes to and from the site is presented in **Figure 6**, with the route summarised as follows:

Arriving/Departing east on the M1

- Routes to the subject site (IN):
  1. Trucks will arrive on the General Holmes Drive westbound.
  2. Trucks will use the Foreshore Road off lane then turn left, southbound.
  3. Trucks will travel southbound on Foreshore Road.
  4. Turn left onto Hale Street, eastbound.
  5. Turn left into site.
- Route from the subject site (OUT)
  1. Trucks will turn right onto Hale Street, westbound.
  2. Trucks will turn right onto Foreshore Road, northbound.
  3. Trucks will turn right onto General Holmes Drive, eastbound.

Arriving/Departing west on the M1

- Routes to the subject site (IN):
  1. Trucks will arrive on the M1 eastbound.
  2. Trucks will turn right onto Foreshore Road, southbound.
  3. Trucks will turn left onto Hale Street, eastbound.
  4. Trucks will turn left to enter site.

- Route from the subject site (OUT)

1. Trucks turn right out of site onto Hale Street, westbound.
2. Turn right onto Foreshore Road, northbound.
3. Trucks will turn left onto the General Holmes Drive onramp.
4. Trucks will merge with traffic on General Holmes Drive, westbound.

It is noted that the above roads are located within an approved 25/26m B-double route area and no concerns are raised in relation to vehicle manoeuvrability at public intersections.

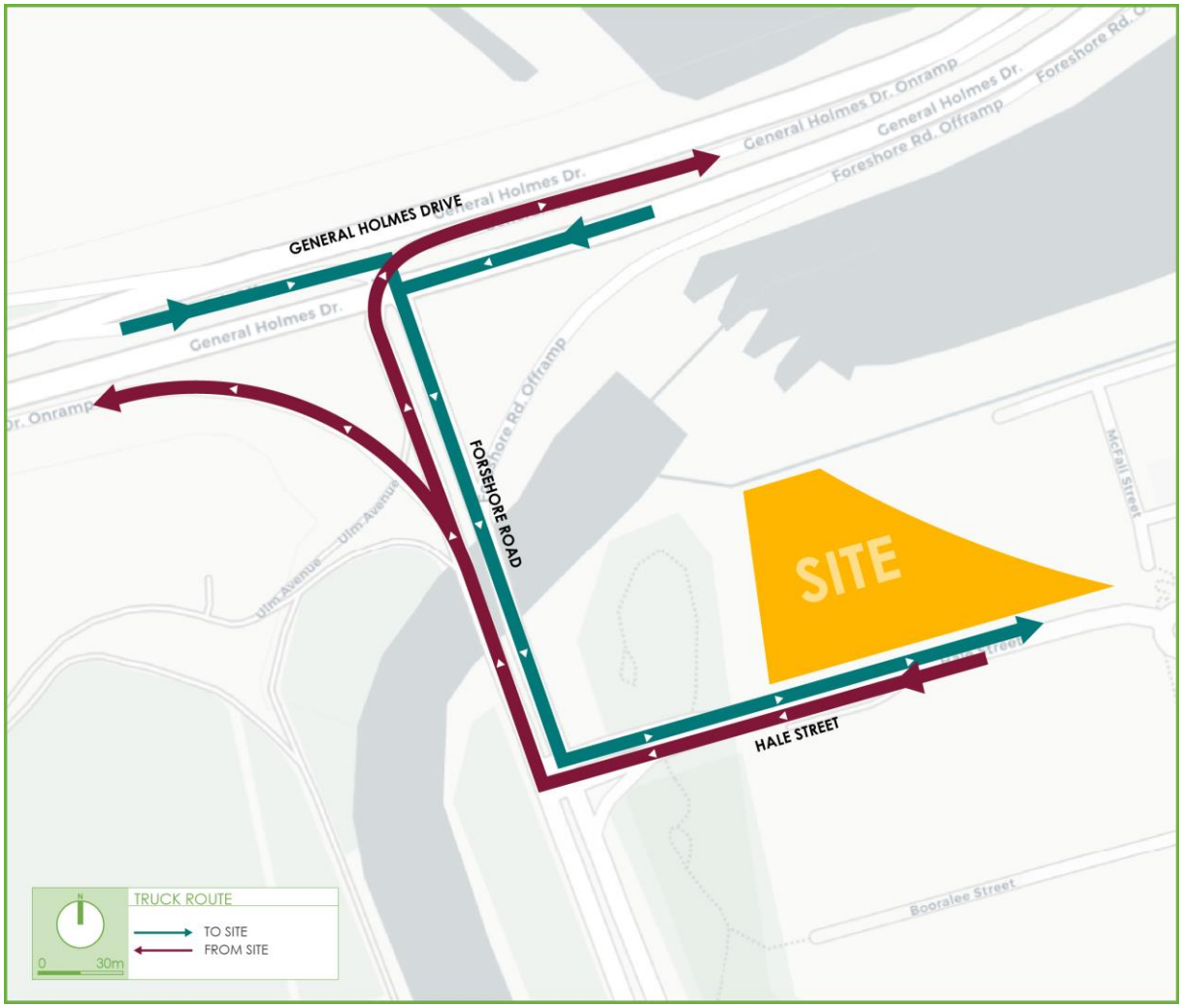

Figure 6: Truck Routes

6.14 Internal Speed Limits

The following speed limits will be enforced within the site:

- 10km/h for vehicle traffic areas;
- Walking pace in loading/unloading areas;
- Walking pace in pedestrian designated areas; and
- 5km/h in vehicle parking areas.

6.15 Driver Facilities

Noting that the proposed facility is a waste management facility, the proposed development will not provide amenities for truck drivers such as rest areas. It is expected that the majority of drivers will not be required to leave their vehicles. Facilities will however be provided within the ancillary office for on-site staff.

7. PARKING REQUIREMENTS

7.1 Car Parking

7.1.1 Council Controls

The Bayside Development Control Plan (DCP) 2022, Section 3.5 prescribes minimum parking requirements for general industrial uses which are summarised in **Table 3**.

Table 3: Council Car Parking Rates and Provision

Type	Area / Units	Car Parking Rate	Car Parking Requirement
General Industry	Warehouse: 3,647m^2 Ancillary Office: 260m^2	2 spaces; or 1 space / 80m^2 GFA, whichever is greater; plus 1 space / 40m^2 GFA of ancillary office	52 spaces
		Totals	**52 spaces**

It is evident from **Table 1** that a general industry development is nominally required to provide 52 car spaces under Council's DCP.

Notwithstanding, adoption of the generic industry parking rate is not considered appropriate in the circumstance, which does not reflect the daily operations and actual parking demands of the proposed C & D waste facility – noting the small number of operational staff on-site at any one time, as well as substantial warehouse floor area being used to accommodate the receipt, basic sorting and recycling with aggregation of material as well as manoeuvring requirements for trucks up to 26-metres-long B-Doubles (26m B-Double).

On the above basis, it is reasonable in the circumstance that the car parking demands of the site is determined using a first principles method as detailed in the section below.

7.1.2 First Principles Parking Assessment

Operational data provided by the C & D waste facility operator KLF informs that there will be a maximum of 11Full Time Equivalent (FTE) staff on-site at any one time.

Further reference is made to the Journey to Work data published by the Australian Bureau of Statistics (ABS) for the Botany (SA2) which revealed that 78.5% of staff drive to work. A breakdown of the method of travel to work is provided in **Table 4** below.

Table 4: Journey to Work Data – SA2 Area: Botany

Method of Travel to Work	Percentage (%)
Car, as driver	78.5%
Car, as passenger	3.9%
Train	7.3%
Truck	1.7%
Bus	4.0%
Walked only	2.3%
Motorbike/scooter	1.0%
Other Mode	0.5%
Taxi	0.1%
Bicycle	0.6%
Ferry	0%
Tram	0%

*Travel mode categories 'Not Stated',' Not Applicable', 'Did not go to work', and 'Worked from home' have been excluded from this analysis.

Application of this to the 11 FTE staff on-site at any one-time results in an off-street car parking demand of nine (9) space. It is further noted that this is considered a conservative assessment as it does not take into account any sustainable transport initiatives such as carpooling.

In response, the proposed development provides a total of 13 car parking spaces comprising nine (9) staff spaces and four (4) visitor spaces and will satisfactorily accommodate the actual nominal parking demands of the proposed development.

7.2 Accessible Parking

Council's DCP requires that all parking areas provide for accessible parking in accordance with the provisions of the Building Code of Australia (BCA). The BCA requires one (1) accessible space for every 100 car parking spaces or part thereof. In response, a single accessible parking space is proposed, meeting the BCA requirement.

7.3 Bicycle Parking

The Bayside DCP 2022, Section 3.5 prescribes minimum bicycle parking requirements for all new developments greater than 600m^2 GFA in the following terms:

- 1 space per 600m^2 GFA

Accordingly, applying this rate to the cumulative warehouse/office floor area of 3907m^2 results in a requirement of seven (7) bicycle spaces.

In response, the proposed development makes provision for a total of 10 bicycle spaces satisfying the requirements of the DCP, promoting alternative modes of transport in line with Council and state government objectives.

7.4 Motorcycle Parking

The Bayside DCP 2022, Section 3.5 prescribes minimum motorcycle parking requirements for all new developments greater than 600m^2 GFA in the following terms:

- 1 space per 15 car spaces

Accordingly, applying this rate to the proposed provision of 13 car spaces results in a requirement of one (1) motorcycle space.

In response, the proposed development makes provision for a total of one (1) motorcycle space satisfying the requirements of the DCP, promoting alternative modes of transport in line with Council and state government objectives.

7.5 Refuse Collection and Servicing

The site has been designed to accommodate 26-metres-long B-Double vehicles circulating around the site. Therefore, all waste collection vehicles (whether private or Council) can be accommodated within the site. Reference should be made to the waste consultant's report in this regard.

8. TRAFFIC AND TRANSPORT IMPACTS

8.1 Existing Site Generation

At present the site is leased by multiple tenants including, Frontline Fabrications, Ripe Providores, Powder Coaters, a mechanic, Meat Storage, Smash Repairs a timber workshop and storage units.

Those current uses of the site would therefore contribute traffic to the existing road network during commuter peak periods and would have been captured in the traffic surveys undertaken as part of this traffic study.

Notwithstanding, that traffic generated by the proposed development assessed in the following sections of the report has been assumed to be a net additional over and above the existing traffic conditions for the purposes of a conservative traffic assessment.

8.2 Development Trip Generation

The impacts of the proposed development on the external road network have been assessed having regard for the proposed site operations as summarised in **Section 6**.

The TfNSW Guide to Traffic Generating Developments (GTTGD) 2002 and TfNSW Technical Direction (TDT 2013) do not specify a trip generation for a materials recycling facility. Accordingly, a first principles approach has been used to assess the traffic generation of the site.

8.2.1 Staff

It has been conservatively assumed that all nine (9) staff spaces will be accessed in a one-hour period during commuter peak periods. Application of these assumptions and adopting an 80:20 directional split results in the following traffic generation:

- 9 vehicle trips per hour during the AM peak period (7 in, 2 out); and
- 9 vehicle trips per hour during the PM peak period (2 in, 7 out).

8.2.2 Heavy Vehicles

As mentioned previously, the anticipated truck volumes for the development are as follows:

- Articulated Vehicles up to 26m B-doubles and Truck and Dogs up to 19.6m:

  94 vehicle trips per day (47 in, 47 out).

- Rigid Vehicles up to 12.5m:

  318 vehicle trips per day (159 in, 159 out).

It is again noted that heavy vehicle movement are split between the day/nighttime periods with 80% of trucks arriving between 7am-6pm and 20% between 6pm-7am.

Application of the above assumptions and adopting a 50:50 directional split results in the following traffic generation:

- Articulated Vehicles up to 26m B-doubles and Truck and Dogs up to 19.6m:
  - 8 vehicle trips per hour in the morning peak period (4 in, 4 out); and
  - 8 vehicle trips per hour in the evening peak period (4 in, 4 out).
- Rigid Vehicles up to 12.5m:
  - 24 vehicle trips per hour in the morning peak period (12 in, 12 out); and
  - 24 vehicle trips in the evening peak period (12 in, 12 out).
- Combined Heavy Vehicle Trips:
  - 32 vehicle trips per hour in the morning peak period (16 in, 16 out); and
  - 32 vehicle trips per hour in the evening peak period (16 in, 16 out).

8.2.3 Combined Generation

The combined staff and heavy vehicle generation of the proposed development can be summarised as follows:

- 41 vehicle trips per hour during the AM peak period (23 in, 18 out); and
- 41 vehicle trips per hour during the PM peak period (18 in, 23 out).

8.3 Traffic Distribution

8.3.1 Staff Trip Distribution

An analysis of the existing turning movements has been used to determine the future distribution of staff traffic to and from the proposed development.

In this regard the localised distribution of staff traffic at the key intersection in the vicinity of the site is summarised in **Figure 7**.

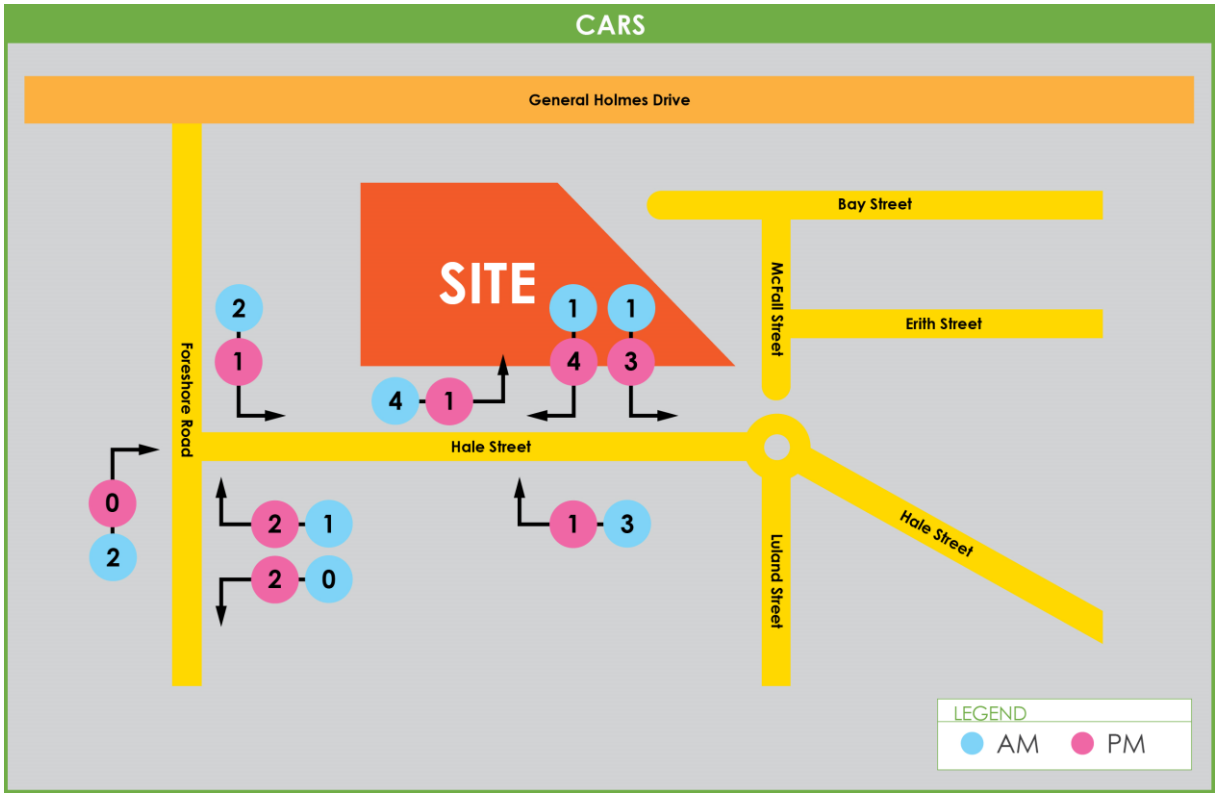

Figure 7: Staff AM and PM Peak Hour Traffic Distribution

8.3.2 Heavy Vehicle Distribution

The trip distribution of trucks arriving and departing during the peak hours has been determined by the proposed truck route which provides a connection to and from the M1. The traffic distribution has been split evenly between the westbound and eastbound route to the M1.

In this regard the localised distribution of heavy vehicle traffic at the key intersection in the vicinity of the site is summarised in **Figure 8**.

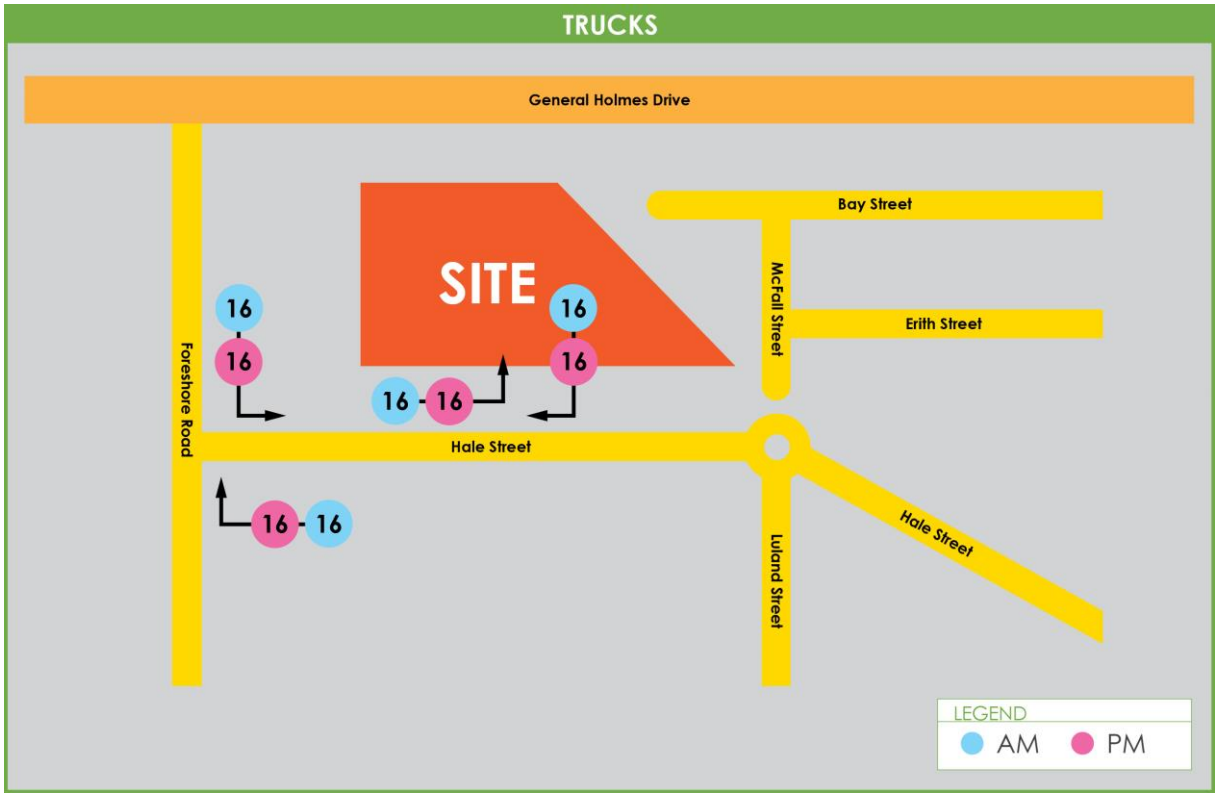

Figure 8: Heavy Vehicle AM and PM Peak Hour Traffic Distribution

8.4 Peak Period Intersection Performance

8.4.1 Critical Intersection

Reference is made to TfNSW's letter dated 14 October 2023 (TfNSW Reference: SYD23/01098/01) which states that:

> *"TfNSW is of the view that modelling on the classified road network is not required as the anticipated traffic generation of the proposed development is unlikely to be of sufficient scale to warrant this requirement."*

It is noted in this regard that the proposed development is expected to generate 35 vehicle trips per hour during both the morning and afternoon peak periods which is unlikely to result in any negative road capacity implications on the classified road network M1.

Accordingly, the intersection between Foreshore Road (classified road) and Hale Street (local road) has been identified as the critical intersection for the purposes of assessing the traffic impacts of the proposed development.

8.4.2 Traffic Surveys

Traffic surveys were obtained at the critical intersection of Hale Street and Foreshore Road. This survey was conducted on Tuesday the 24th of October 2023, during network peak periods between 7:00am to 9:00am and 4:30pm to 6:30pm.

The traffic volumes in these surveys formed the base case for modelling purposes to assess intersection performance characteristics under existing traffic conditions.

8.4.3 Scenarios

In order to assess the potential traffic impacts of a proposed development, the following scenarios were identified:

- 2023 Base Case; and
- 2023 Base Case + Development.

8.4.4 SIDRA INTERSECTION Analysis

The SIDRA INTERSECTION model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations:

DoS the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way / stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS this is a comparative measure which provides an indication of the operating performance of an intersection as shown in **Table 5**.

Table 5: Intersection Performance Indicators (TfNSW)

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

A summary of the modelled results is provided in **Table 6**, reference should also be made to the SIDRA outputs provided in **Appendix C** which provide detailed results for each movement.

Table 6: SIDRA INTERSECTION Modelling Results

Intersection	Control Type	Scenario	Peak Period	DoS	AVD	LoS
Hale Street and Foreshore Road	Signalised	Base Case (2023)	AM	0.854	6.5	A
			PM	0.714	7.8	A
		Base Case + Development	AM	0.862	7.8	A
			PM	0.747	8.5	A

It can be seen from **Table 6** that the intersection of Hale Street and Foreshore Road is expected to operate satisfactorily under both the Base Case (2023) and Base Case plus Development scenarios and the latter is the scenario that reflects the criteria for assessing impacts under RMS Guidelines, That is , the EP&A Act as well as the TfNSW Guidelines require that a development need only be assessed for improvements that are required to support the development itself. This is a consequence of the need to identify a nexus between the development and any measures required to manage associated impacts.

As such, no external infrastructure improvements (intersection upgrades etc.) are required to accommodate the proposed development.

8.5 Cumulative Impacts

The NSW Department of Planning, Housing and Infrastructure (DPHI) published the Cumulative Impact Assessment Guidelines for State Significant Projects in July 2021. The Guidelines require the cumulative assessment of relevant projects to determine their combined cumulative impacts on the operation of the nearby transport network and recommend suitable mitigation measures to address any impacts.

The Guideline sets out criteria for the identification of relevant projects. Applying these criteria a review of the NSW Planning Portal has identified multiple State Significant Developments in the vicinity of the subject site. These projects are detailed in **Table 4**.

Table 4: Nearby Major Projects

Application No.	Type	Address	Proposal	Status
SSD-59024711	SSD Application	350 King Street, Mascot	Construction of multilevel warehouse and distribution centre	Prepare EIS
SSD-11508731	SSD Application	121 Robey Street, Mascot	Mixed use developing comprising a hotel, office space, and other uses	Preparing EIS
SSD-5855-Mod-2	SSD Application	34 & 36 McPherson Street, Banksmeadow	Road transport of putrescible waste to the Woodlawn Eco Precinct and/or Lucas Heights Resource Recovery Park during railway shutdowns and road transport of Food, Organics and Garden Organics (FOGO) waste to a processing facility in Forbes, NSW	Approved
SSD-48411467	SSD Application	2-8 Baker Street, Banksmeadow	Construction and operation of a multi-level warehouse and distribution facility.	Approved
SSD-49734709	SSD Application	297 King Street, Mascot	Construction and operation of a multi-level warehouse and distribution centre, with ancillary office spaces, car parking and landscaping.	Response to Submission

A review of the impacts of the above projects has been undertaken and the following has been found:

- **SSD-59024771** is an SSD project for the construction and operation of a multi-level warehouse facility which received SEARS in July 2023. No Transport Impact Assessment is available for review, however, the proposed development would not directly impact the development as the site is accessed via roads some 3.5-kilometres away from the site and the likelihood of crossover trips in the immediate vicinity of the site is very unlikely.
- **SSD-11508731** is an SSD project for the construction of a mixed-use development which received SEARS in December 2023. No Transport Impact Assessment is available for review; however, the proposed development would not directly impact the development as the site is accessed via roads some 3-kilometres away from the site and the likelihood of crossover trips in the immediate vicinity of the site is very unlikely.
- **SSD-5855-Mod-2** is an approved development for a waste transfer centre at 34-36 McPherson Street and 14 Beauchamp Road, Banksmeadow. The development when during construction would utilise the Foreshore Road/Botany Road for site access. A review of the Traffic Impact Assessment submitted with the proposal identifies that approximately 6 additional truck and dogs will travel past the intersection of Hale Street and Foreshore Road. Given that the future level of service has been revealed to operate at LOS A, the minor increase in through traffic volumes on the major approach of the road could not be expected to result in any negative implications in terms of road network capacity.
- **SSD-48411467** is an approved SSD project for the construction and operation of a multilevel warehouse and distribution facility which received approval in December 2023. A review of the proposed development indicates that it would not directly impact the development as vehicular traffic associated with the site will access/egress via Wentworth Avenue, it is reasonable to conclude that the likelihood of crossover trips in the immediate vicinity of the site is very unlikely.

- **SSD-48411467** is an SSD project for the construction and operation of a multilevel warehouse and distribution facility which is currently at the response to submissions stage. A review of the proposed development indicates that it would not directly impact the development as vehicular traffic associated with the site will access/egress via roads that are approximately 4-kilometres away from the site, it is reasonable to conclude that the likelihood of crossover trips in the immediate vicinity of the site is very unlikely.

Based on the above assessment, it is considered that the cumulative traffic impacts of the proposal would result in minimal and acceptable impacts on the surrounding road network.

9. ACCESS AND INTERNAL DESIGN ASPECTS

9.1 Site Vehicular Access

9.1.1 Carpark Access

The development proposes a total of 13 parking spaces with access to Hale Street, a local access road. It will therefore require a Category 1 driveway under AS2890.1 (2004), being a combined entry and exit width of 3.0 to 5.5 metres. In response, a minimum 5.5 metre driveway has been provided for the light vehicle entry to site.

9.1.2 Truck Access

A new approximate 29 metres wide access driveway at the property boundary is proposed for heavy vehicles. This access driveway will be restricted to truck entry/exit movements only.

Swept path analysis has been included in **Appendix D** demonstrating satisfactory vehicle movements at the proposed access in accordance with AS2890.2 (2018).

9.1.3 Loss of On-Street Parking

The proposed driveways to delineate light and heavy vehicle movements and accommodate the design vehicle required to service the C&D Waste Transfer Facility will result in a net loss of five (5) on-street parking spaces on the northern side of Hale Street when assessed under AS 2890.5 (2020) dimensional requirements which specifies the following requirements:

- On-street parking at this location is to be provided with minimum 2.3m width; and,
- On-street parking at this location is to be provided with minimum 8m length as vehicles reversing into parking spaces at this location in our view cannot be readily tolerated.

9.2 Internal Design

The internal car park complies with the requirements of AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2022), and the following characteristics are noteworthy:

9.2.1 Parking Modules

- All standard car parking spaces have been designed in accordance with User Class 2. These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.5m and a minimum aisle width of 5.8m.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1 (2004).
- All accessible parking spaces have been designed in accordance with AS 2890.6 (2009), being 2.4m wide, 5.4m long and situated immediately adjacent to a dedicated shared area of the same dimension. Dedicated shared area bollard is to be located 750mm-1750mm from end of the shared area.
- Wheel stops is to be positioned 820mm from front of parking space in accordance with Figure 2.6 of AS2890.1.

9.2.2 Loading

- Service and manoeuvring areas have been designed in accordance with AS2890.2 (2018) for articulated vehicles up to and including 26m B-doubles.
- A minimum clear head height of 4.5 metres is to be provided for all trafficable areas of the service vehicles, as required under AS2890.2 (2018).

9.2.3 Other Considerations

- Visual splay has been provided at the access driveway in accordance with Figure 3.3 of AS 2890.1 (2004).

- Whilst TRAFFIX can appreciate the request from Council to undertake swept path analysis for each and every car space, it is unnecessary in the circumstance where the proposed car parking layout is in full compliance with AS2890.1 (2004) dimensional requirements, also noting Clause B4.4 of AS2890.1 (2004) specifically acknowledges that drivers can manoeuvre vehicles within smaller spaces than swept turning paths would suggest.

9.3 Summary

In summary, the internal configuration of the car park has been designed in accordance with AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2022). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

10. CONCLUSIONS

In summary:

- The proposal seeks approval for a C&D waste transfer facility at 2-4 Hale Street, Botany. The waste transfer facility will process up to a total 300,000 tonnes of waste per annum and is proposed to operate 24 hours, seven (7) days a week.
- The proposed development provides 13 car parking spaces within an at-grade carpark. Demand based on a first principles parking assessment as outlined in **Section 7.1.2**, results in a requirement for nine (9) staff car parking spaces. Of the 13 proposed car parking spaces on site, nine (9) spaces are to be allocated to staff parking with the remaining four (4) spaces allocated for visitors. This quantum meets the actual operational parking demands.
- The proposed development provides 10 bicycle spaces and one (1) motorcycle space on site, in accordance with Bayside DCP 2022 requirements.
- The proposed development provides two in-ground weighbridges. The weighbridges are located well within the site providing ample space for on-site queuing, noting the modest hourly truck arrivals.
- Traffic generation arising from the proposal has been assessed having regard for the proposed site operations as discussed in **Section 8.2**. In terms of the overall network performance arising from the proposed development, all intersections operate satisfactorily at LoS A with spare capacity under both the Base Case (2023) and Base Case + Development scenarios. No external infrastructure improvements (intersection upgrades etc.) are required are required in this regard.
- The cumulative traffic impacts of nearby SSDs have been considered which concluded that the traffic impacts of the proposal would result in minimal and acceptable impacts on the surrounding road network.
- The car park is designed to comply with the requirements of AS2890.1 (2004) and AS2890.6 (2009) in order to ensure safe and efficient operation.
- The loading bays are designed to accommodate the largest design vehicle up to and including a 26m B-double in accordance with AS2890.2 (2018).

- Swept path analysis has been undertaken the largest design vehicle being a 26m B-double, demonstrating satisfactory access/egress in accordance with AS2890.2 (2018).

This traffic impact assessment therefore demonstrates that the subject application is supportable on traffic planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

APPENDIX A

Reduced Plans

Notes

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-Contractor to verify all dimensions on site before commencing work.
-Report all discrepancies to project manager prior to construction.
-Figured dimensions to be taken in preference to scaled drawings.
-All work is to conform to relevant Australian Standards and other Codes as applicable, together with other Authorities' requirements and regulations.

Michael Morony NSWARB No. 8218, QLD Reg. No. 5852, ARBV No. VIC00002, APBSA No. s3931, WA00026

Issue	Description	Date	By	QA
A	Issue for Information	05.01.2024	RCI	LA
B	Issue for Information	16.02.2024	RCI	SW
C	Development Application Updates	01.03.2024	CL	MF
D	Development Application Updates	07.03.2024	CL	MF
E	Development Application Updates	13.03.2024	CL	MF
F	Development Application	15.03.2024	CL	MF

REID CAMPBELL

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North Sydney NSW 2060 Australia

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Fax: 61 02 9954 4946
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Website: www.reidcampbell.com

DEVELOPMENT APPLICATION

CLIENT

COOMBES PROPERTY GROUP

PROJECT MANAGER

PROJECT
WASTE MANAGEMENT FACILITY
2-4 HALE ST, BOTANY

Drawn DT Checked LA

PRINT DATE
15/03/2024 5:27:11 PM

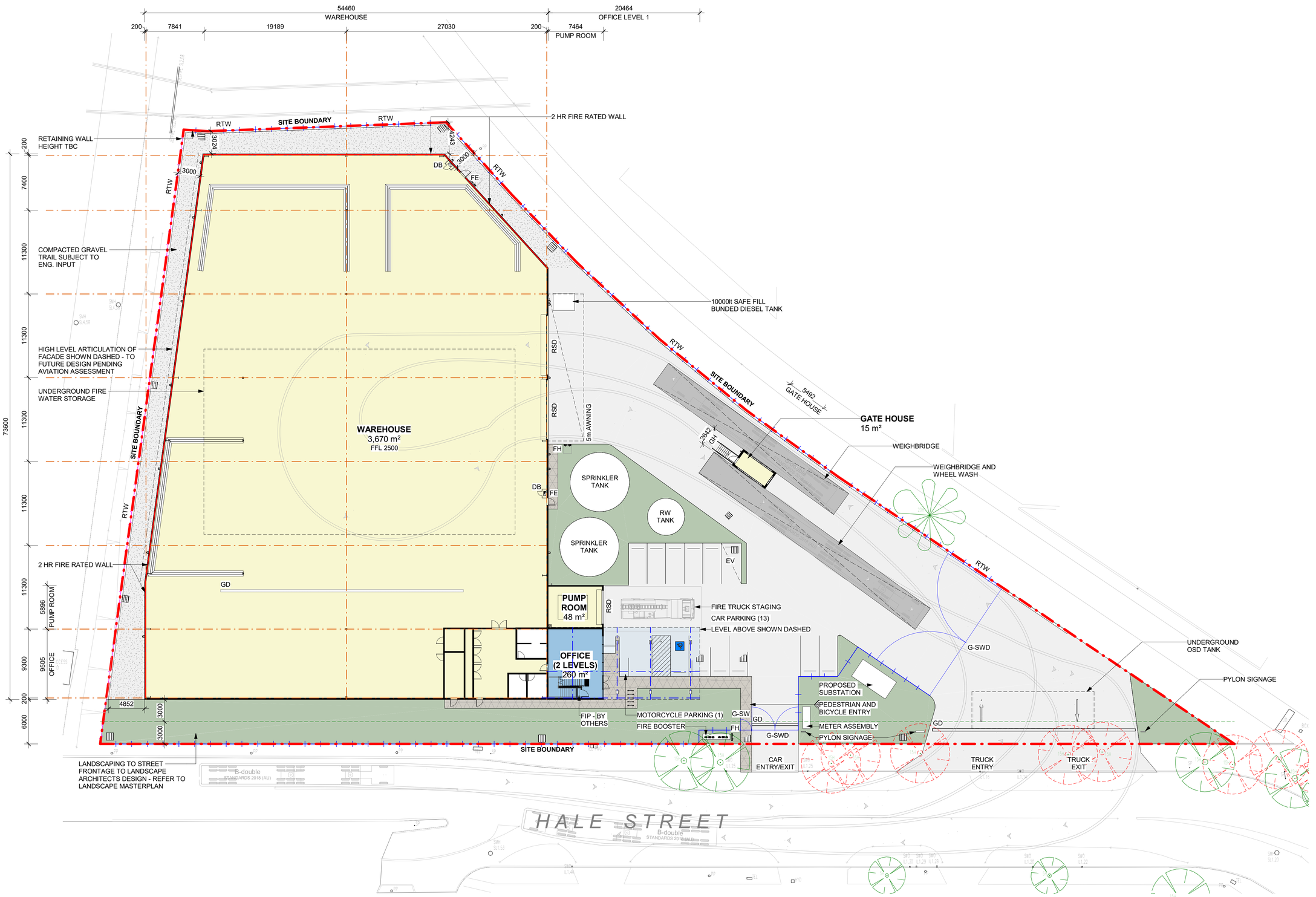
NORTH POINT
N/A

Drawing Title
PERSPECTIVE

SHEET NUMBER
1220011_ A004

ISSUE
F

Autodesk Docs://1220011_Coombes_Hale St Botany/1220011_Coombes_2 - 4 Hale St, Botany_R23_DD.rvt



DEVELOPMENT AREA SCHEDULE

SITE AREA	**7,439 m²**
WAREHOUSE	3,670 m²
OFFICE - GROUND FLOOR - FIRST FLOOR	260 m² (60 m²) (200 m²)
GATEHOUSE	15 m²
PUMP ROOM	48 m²
TOTAL BUILDING AREA	**4,193 m²**
TOTAL PARKING PROVIDED	13 SPACES

LEGEND

- SITE BOUNDARY
- LANDSCAPE SETBACK
- FNC-1: 2.1 M PALISADE FENCE
- FNC-2: 2.1 M CHAINLINK FENCE
- WAREHOUSE
- LOADING ZONE
- OFFICE
- HEAVY DUTY PAVEMENT
- LIGHT DUTY PAVEMENT
- COMPACTED GRAVEL TRAIL
- PEDESTRIAN PAVEMENT
- LANDSCAPING

ABBREVIATION

DB	DISTRIBUTION BOARD
EV	ELECTRIC VEHICLE PARKING
FE	FIRE EXIT DOOR
FH	FIRE HYDRANT
G-SW	GATE SINGLE (SWING)
G-SWD	GATE DOUBLE (SWING)
RSD	ROLLER SHUTTER DOOR
GD	GRATED DRAIN

NOTES

1. ALL LEVELS AND EXTENTS ARE INDICATIVE & SHOULD BE READ IN CONJUNCTION WITH CIVIL ENG. DWGS FOR FINAL LEVELS OF ALL EARTH WORKS AND EXCAVATION.
2. ALL LANDSCAPING TO LANDSCAPE ARCHITECT'S DETAILS.
3. ALL INFORMATION SUBJECT TO DETAILED DESIGN AND ENGINEERING INPUT.
4. HYD, MECH, ELECTRICAL, AND FIRE ELEMENTS ARE INDICATIVE ONLY.
5. ALL MEASUREMENTS OF EXISTING STRUCTURES ARE APPROXIMATE ONLY, AND TO BE CONFIRMED ON SITE.
6. TENANT FITOUT ITEMS SHOWN BLUE

0m 5m 10m 15m 20m 25m

SCALE BAR 1:250 @ A1 ; 1: 500 @ A3

Notes

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Michael Morony NSWARB No. 8218, QLD Reg. No. 5852, ARBV No. VIC00002, APBSA No. s3931, WA00026

Issue	Description	Date	By	QA
A	Issue for Information	########		
B	Issue for Information	05.01.2024	RCI	LA
C	Issue for Information	16.02.2024	RCI	SW
D	Development Application	23.02.2024	CL	MF
E	Development Application Updates	01.03.2024	CL	MF
F	Development Application Updates	07.03.2024	CL	MF
G	Development Application Updates	13.03.2024	CL	MF
H	Development Application	15.03.2024	CL	MF
J	Development Application	22.03.2024	CL	MF
K	Development Application - Tree Updates	03.04.2024		

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STRATEGY | DESIGN | DELIVERY
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North Sydney NSW 2060 Australia
Tel: 61 02 9954 5011
Fax: 61 02 9954 4946
Email: sydney@reidcampbell.com
Website: www.reidcampbell.com

DEVELOPMENT APPLICATION

CLIENT: COOMBES PROPERTY GROUP

PROJECT MANAGER:

PROJECT: WASTE MANAGEMENT FACILITY
2-4 HALE ST, BOTANY

Drawn: DT Checked: LA PRINT DATE: 3/04/2024 6:31:22 PM

NORTH POINT

Drawing Title: SITE PLAN

SHEET NUMBER: 1220011_ A005 ISSUE: K

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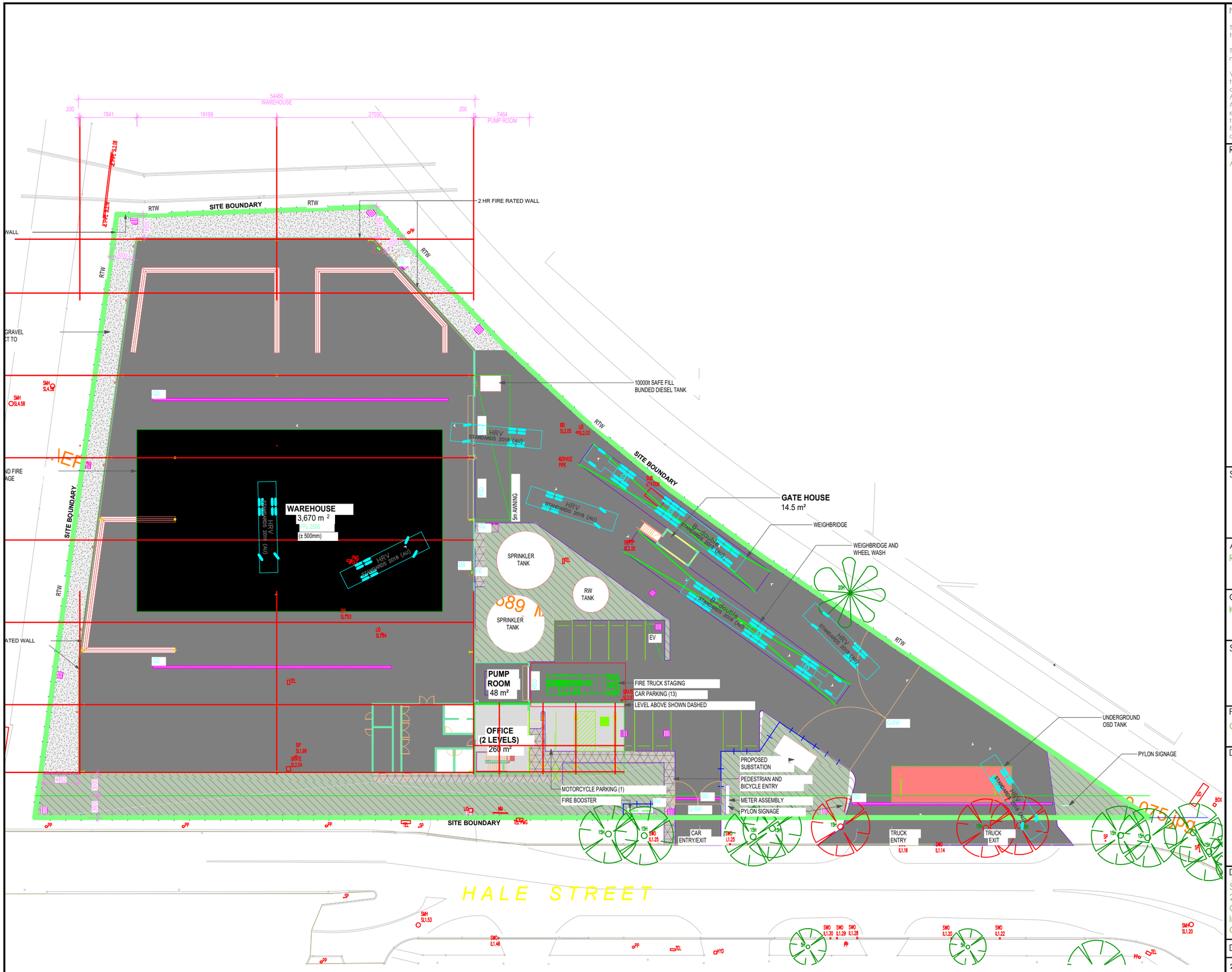
APPENDIX B

Queuing Diagrams



Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

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Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Initial Design Review	AB	30-05-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Reid Campbell

Client
KLF Group

Scale / Plan Orientation

0 2 4 6 8m

1:500 @ A3

Project Description
C&D Waste Transfer Station, Botany

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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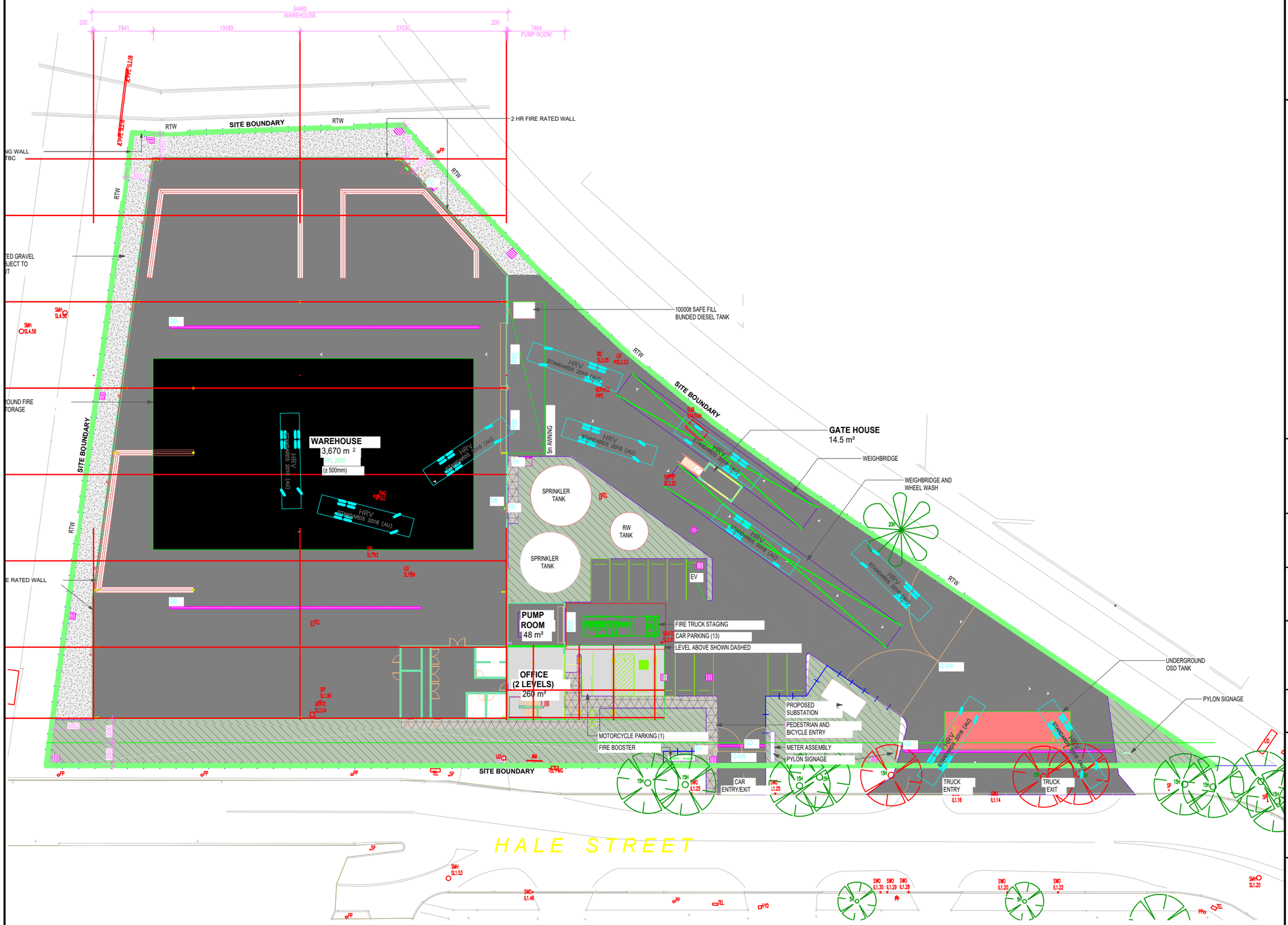
Drawing Title
Swept Path Analysis
26m B-Double and 12.5m HRV
On-site Queuing
Incoming: One (1) B-double & Three (3) HRVs
Outgoing: One (1) B-double & Three (3) HRVs

Drawn:	Checked:	Date:
AB	TY	30-05-24

23.464d01v05 TRAFFIX [240226 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
23.464	DA	TX.05	A



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Rev.	Revision Note	By.	Date
A	Initial Design Review	AB	30-05-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Reid Campbell

Client
KLF Group

Scale / Plan Orientation

0 2 4 6 8m
1:500 @ A3

Project Description
C&D Waste Transfer Station, Botany

Drawing Prepared By

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Drawing Title
Swept Path Analysis
26m B-Double and 12.5m HRV
On-site Queuing
Incoming: Five (5) HRVs
Outgoing: Five (5) HRVs

Drawn:	Checked:	Date:
AB	TY	30-05-24

23.464d01v05 TRAFFIX [240226 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
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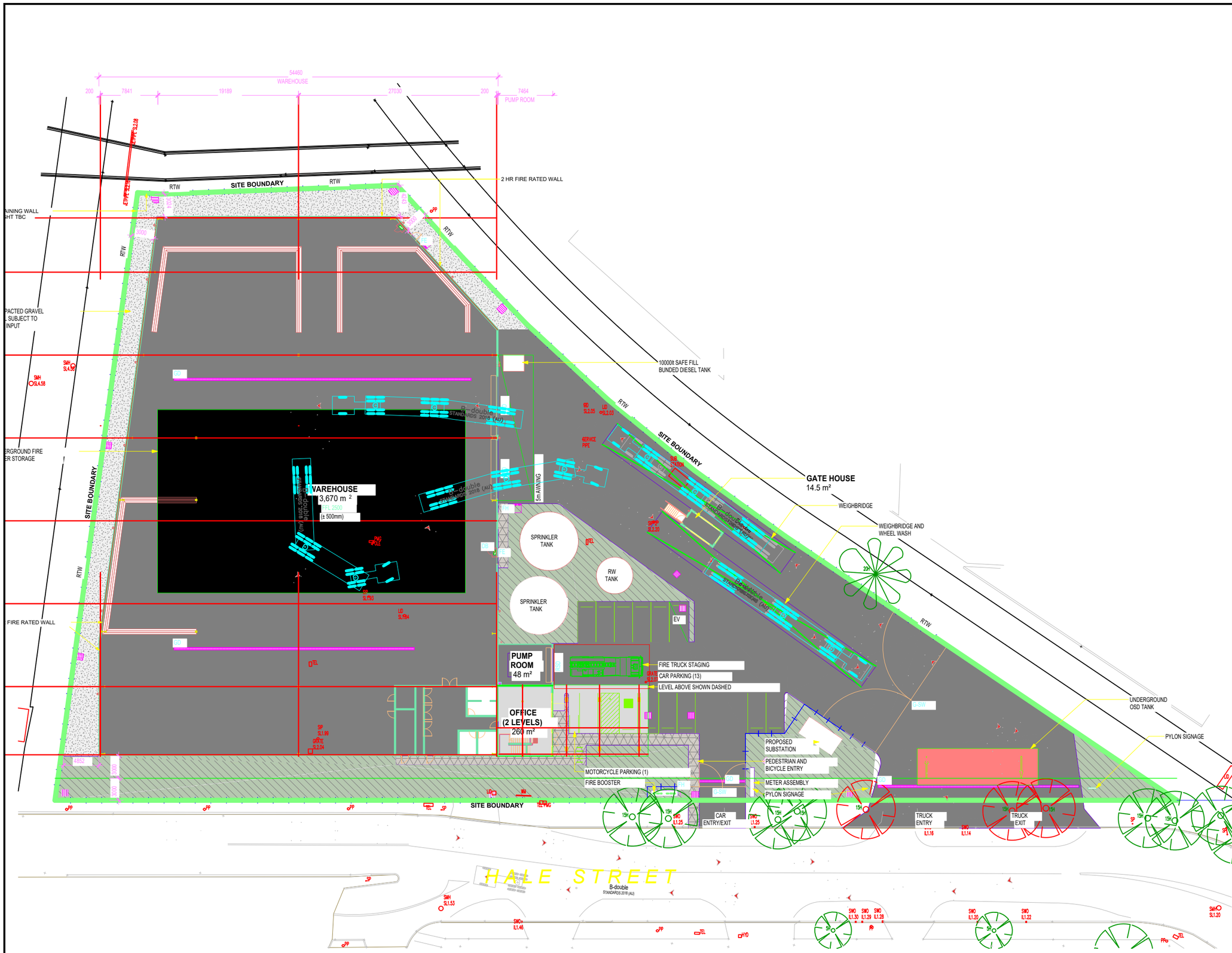

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Rev.	Revision Note	By.	Date
A	Initial Design Review	AB	16-05-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Reid Campbell

Client
KLF Group

Scale / Plan Orientation

0 2 4 6 8m

1:500 @ A3

Project Description
C&D Waste Transfer Station, Botany

Drawing Prepared By

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Strawberry Hills, NSW 2012
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f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Design Review
Swept Path Analysis
26m B-Double
On-site Queuing
Five (5) B-doubles queued on site

Drawn:	Checked:	Date:
AB	TY	16-05-24

23.464d01v04 TRAFFIX [240226 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
23.464	DA	TX.04	A

APPENDIX C

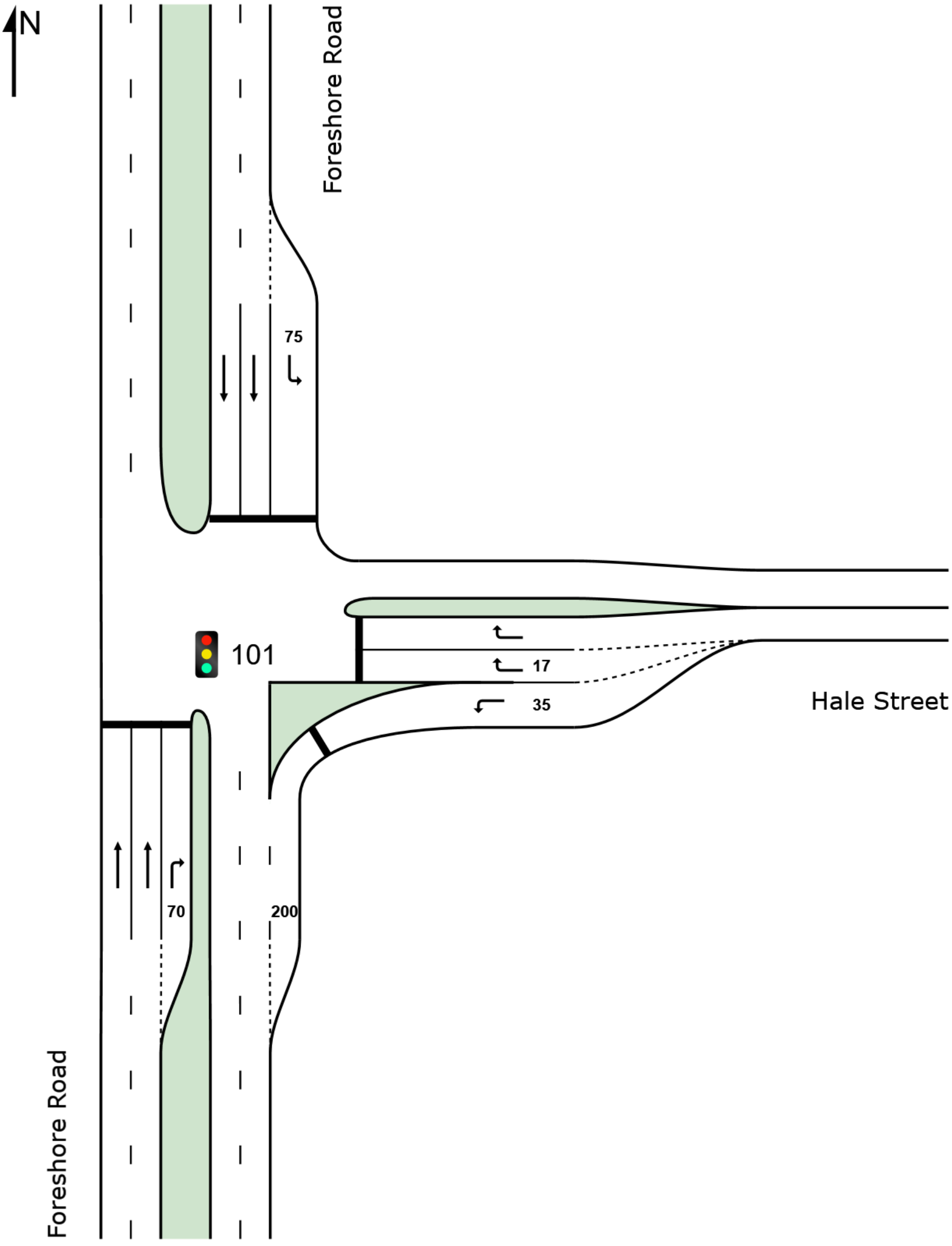
SIDRA Movement Summaries

SITE LAYOUT

Site: 101 [101 AM EX Hale St x Foreshore Rd (Site Folder: General)]

Intersection: Hale St x Foreshore
Period: AM Peak Hour
Scenario: Exisitng
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated

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



PHASING SUMMARY

Site: 101 [101 AM EX Hale St x Foreshore Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection: Hale St x Foreshore
Period: AM Peak Hour
Scenario: Exisitng
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 95 seconds (Site Optimum Cycle Time - Minimum Delay)

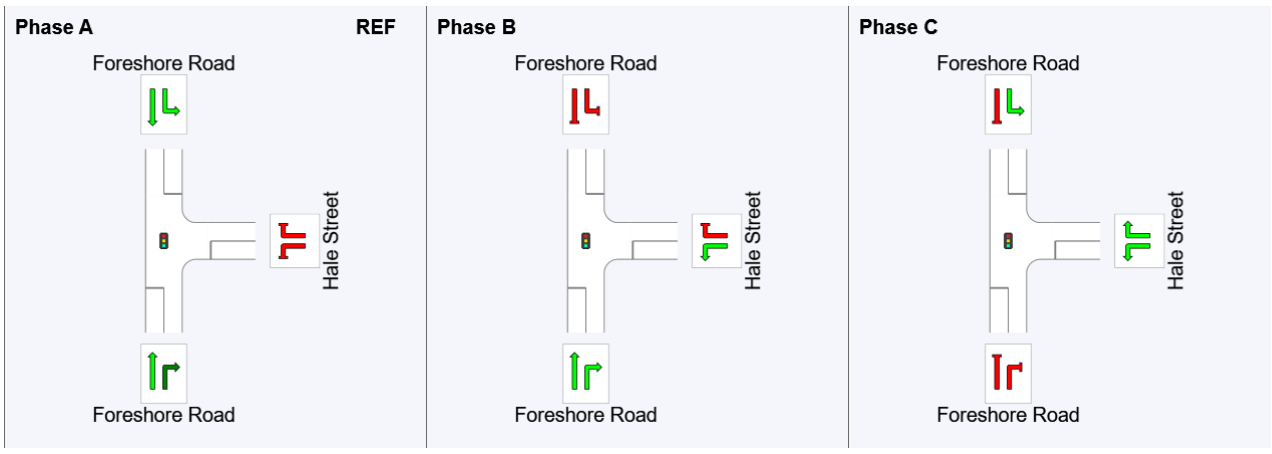
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Phase Sequence: TCS Plan
Input Phase Sequence: A, B, C
Output Phase Sequence: A, B, C
Reference Phase: Phase A

Phase Timing Summary

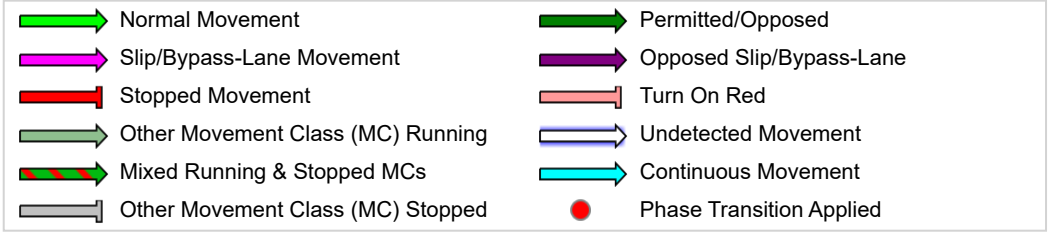
Phase	A	B	C
Phase Change Time (sec)	0	67	79
Green Time (sec)	61	6	10
Phase Time (sec)	67	12	16
Phase Split	71%	13%	17%
Phase Frequency (%)	100.0	100.0	100.0

See the Timing Analysis report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Minor Phase Actuation and Phase Frequency values (user-specified or implied) less than 100%.

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase



MOVEMENT SUMMARY

Site: 101 [101 AM EX Hale St x Foreshore Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection: Hale St x Foreshore
Period: AM Peak Hour
Scenario: Exisitng
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 95 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Foreshore Road															
2	T1	All MCs	963	32.3	963	32.3	0.428	0.2	LOS A	0.8	6.8	0.04	0.03	0.04	79.3
3	R2	All MCs	46	40.9	46	40.9	* 0.279	8.4	LOS A	0.1	0.6	0.03	0.60	0.03	54.3
Approach			1009	32.7	1009	32.7	0.428	0.6	LOS A	0.8	6.8	0.04	0.06	0.04	77.4
East: Hale Street															
4	L2	All MCs	24	52.2	24	52.2	0.078	40.8	LOS C	0.9	8.9	0.80	0.68	0.80	29.4
6	R2	All MCs	225	18.7	225	18.7	* 0.800	66.7	LOS E	5.8	46.7	1.00	0.96	1.31	16.3
Approach			249	21.9	249	21.9	0.800	64.2	LOS E	5.8	46.7	0.98	0.94	1.26	17.7
North: Foreshore Road															
7	L2	All MCs	559	11.9	559	11.9	0.385	6.2	LOS A	0.8	6.3	0.03	0.63	0.03	42.7
8	T1	All MCs	1812	17.5	1812	17.5	* 0.854	2.0	LOS A	6.3	51.1	0.13	0.14	0.15	74.8
Approach			2371	16.2	2371	16.2	0.854	3.0	LOS A	6.3	51.1	0.11	0.25	0.13	67.1
All Vehicles			3629	21.2	3629	21.2	0.854	6.5	LOS A	6.3	51.1	0.15	0.25	0.18	61.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 102 [102 PM EX Hale St x Foreshore Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection: Hale St x Foreshore
Period: PM Peak Hour
Scenario: Exisitng
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Foreshore Road															
2	T1	All MCs	1568	11.9	1568	11.9	* 0.714	0.4	LOS A	2.3	17.6	0.07	0.07	0.07	79.0
3	R2	All MCs	40	42.1	40	42.1	0.172	10.1	LOS A	0.2	1.7	0.11	0.62	0.11	52.5
Approach			1608	12.6	1608	12.6	0.714	0.6	LOS A	2.3	17.6	0.07	0.08	0.07	77.8
East: Hale Street															
4	L2	All MCs	26	20.0	26	20.0	0.043	24.7	LOS B	0.7	5.9	0.66	0.64	0.66	37.4
6	R2	All MCs	406	5.2	406	5.2	* 0.705	54.9	LOS D	8.6	63.2	0.97	0.87	1.06	20.1
Approach			433	6.1	433	6.1	0.705	53.1	LOS D	8.6	63.2	0.95	0.86	1.04	21.2
North: Foreshore Road															
7	L2	All MCs	365	7.5	365	7.5	0.244	6.2	LOS A	0.4	3.1	0.03	0.62	0.03	42.8
8	T1	All MCs	1016	14.0	1016	14.0	0.597	0.5	LOS A	1.1	8.4	0.05	0.05	0.05	78.6
Approach			1381	12.3	1381	12.3	0.597	2.0	LOS A	1.1	8.4	0.05	0.20	0.05	68.7
All Vehicles			3422	11.7	3422	11.7	0.714	7.8	LOS A	8.6	63.2	0.17	0.23	0.18	60.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 201 [201 AM DEV Hale St x Foreshore Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection: Hale St x Foreshore
Period: AM Peak Hour
Scenario: Exisitng + Development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Foreshore Road															
2	T1	All MCs	963	32.3	963	32.3	0.441	0.3	LOS A	0.9	8.0	0.04	0.03	0.04	79.1
3	R2	All MCs	48	39.1	48	39.1	* 0.329	8.5	LOS A	0.1	0.9	0.04	0.61	0.04	54.2
Approach			1012	32.7	1012	32.7	0.441	0.7	LOS A	0.9	8.0	0.04	0.06	0.04	77.1
East: Hale Street															
4	L2	All MCs	24	52.2	24	52.2	0.072	43.3	LOS D	1.0	10.0	0.78	0.68	0.78	28.6
6	R2	All MCs	243	24.2	243	24.2	* 0.810	80.5	LOS F	7.1	60.4	1.00	0.98	1.29	15.2
Approach			267	26.8	267	26.8	0.810	77.1	LOS F	7.1	60.4	0.98	0.95	1.24	16.5
North: Foreshore Road															
7	L2	All MCs	578	14.4	578	14.4	0.405	6.2	LOS A	1.0	7.9	0.04	0.63	0.04	42.6
8	T1	All MCs	1812	17.5	1812	17.5	* 0.862	2.0	LOS A	7.4	59.4	0.14	0.14	0.16	74.8
Approach			2389	16.7	2389	16.7	0.862	3.0	LOS A	7.4	59.4	0.11	0.26	0.13	66.9
All Vehicles			3668	21.9	3668	21.9	0.862	7.8	LOS A	7.4	60.4	0.16	0.26	0.18	59.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 202 [202 PM DEV Hale St x Foreshore Rd (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.1.200

Intersection: Hale St x Foreshore
Period: PM Peak Hour
Scenario: Exisitng + Development
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Foreshore Road															
2	T1	All MCs	1568	11.9	1568	11.9	* 0.740	0.4	LOS A	2.5	19.3	0.08	0.07	0.08	78.9
3	R2	All MCs	40	42.1	40	42.1	0.177	11.4	LOS A	0.3	2.6	0.17	0.63	0.17	51.3
Approach			1608	12.6	1608	12.6	0.740	0.7	LOS A	2.5	19.3	0.08	0.09	0.08	77.6
East: Hale Street															
4	L2	All MCs	28	18.5	28	18.5	0.043	23.4	LOS B	0.8	6.1	0.64	0.64	0.64	38.3
6	R2	All MCs	425	8.9	425	8.9	* 0.747	56.3	LOS D	9.3	70.3	0.97	0.90	1.11	19.9
Approach			454	9.5	454	9.5	0.747	54.2	LOS D	9.3	70.3	0.95	0.89	1.08	21.1
North: Foreshore Road															
7	L2	All MCs	383	11.5	383	11.5	0.277	6.2	LOS A	0.5	3.5	0.03	0.62	0.03	42.7
8	T1	All MCs	1016	14.0	1016	14.0	0.625	1.2	LOS A	2.5	19.3	0.12	0.11	0.12	76.8
Approach			1399	13.3	1399	13.3	0.625	2.6	LOS A	2.5	19.3	0.09	0.25	0.09	67.1
All Vehicles			3461	12.5	3461	12.5	0.747	8.5	LOS A	9.3	70.3	0.20	0.26	0.22	59.3

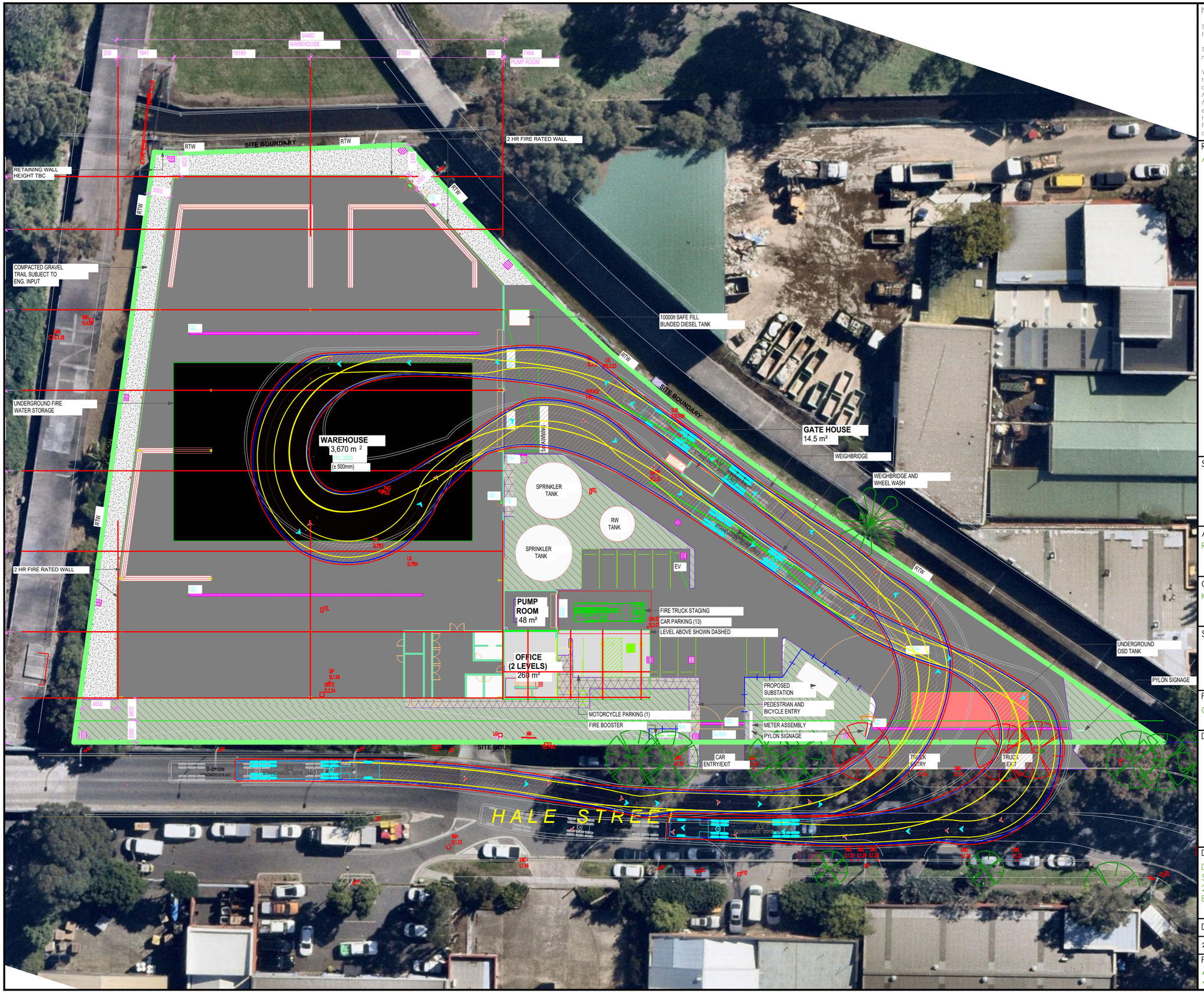
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Organisation: TRAFFIX PTY LTD | Licence: NETWORK / 1PC | Processed: Friday, 1 December 2023 9:10:42 AM
Project: T:\Synergy\Projects\23\23.464\Modelling\TCS Plans\23.464m01v02 TRAFFIX C&D Waste Transfer Station Botany.sip9

APPENDIX D

Swept Path Analysis



Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Initial Design Review	AB	26-02-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Reid Campbell

Client
KLF Group

Scale / Plan Orientation

0 2 4 6 8m
1:500 @ A3

Project Description
C&D Waste Transfer Station, Botany

Drawing Prepared By

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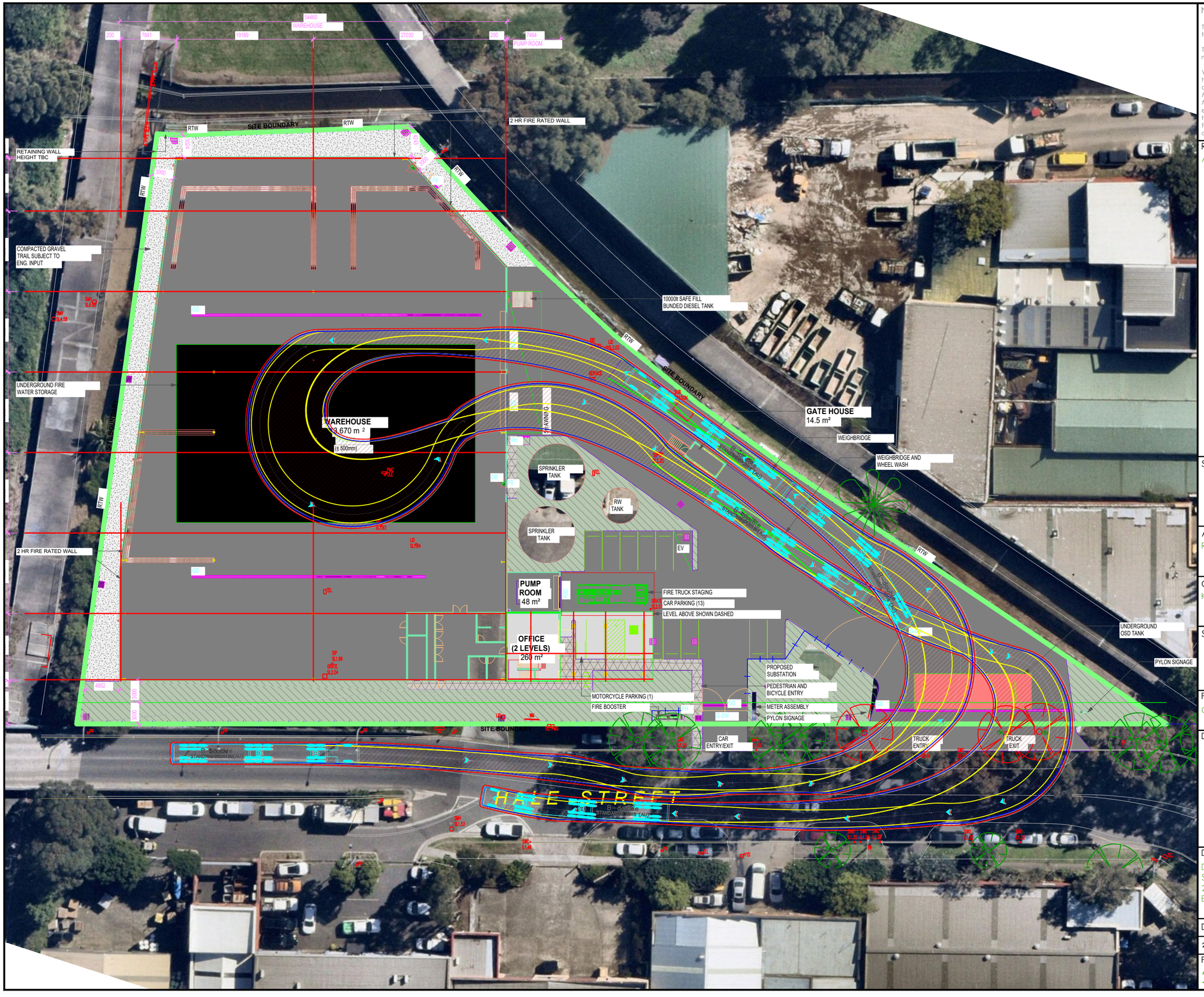
Drawing Title
Design Review
Swept Path Analysis
20m AV
Entry and Egress

Drawn:	Checked:	Date:
AB	TY	26-02-24

23.464d01v03 TRAFFIX [240226 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
23.464	DA	TX.02	A



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Rev.	Revision Note	By.	Date
A	Initial Design Review	AB	26-02-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Reid Campbell

Client
KLF Group

Scale / Plan Orientation

0 2 4 6 8m

1:500 @ A3

Project Description
C&D Waste Transfer Station, Botany

Drawing Prepared By

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Drawing Title
Design Review
Swept Path Analysis
26m B-Double
Entry and Egress

Drawn:	Checked:	Date:
AB	TY	26-02-24

23.464d01v03 TRAFFIX [240226 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
23.464	DA	TX.03	A