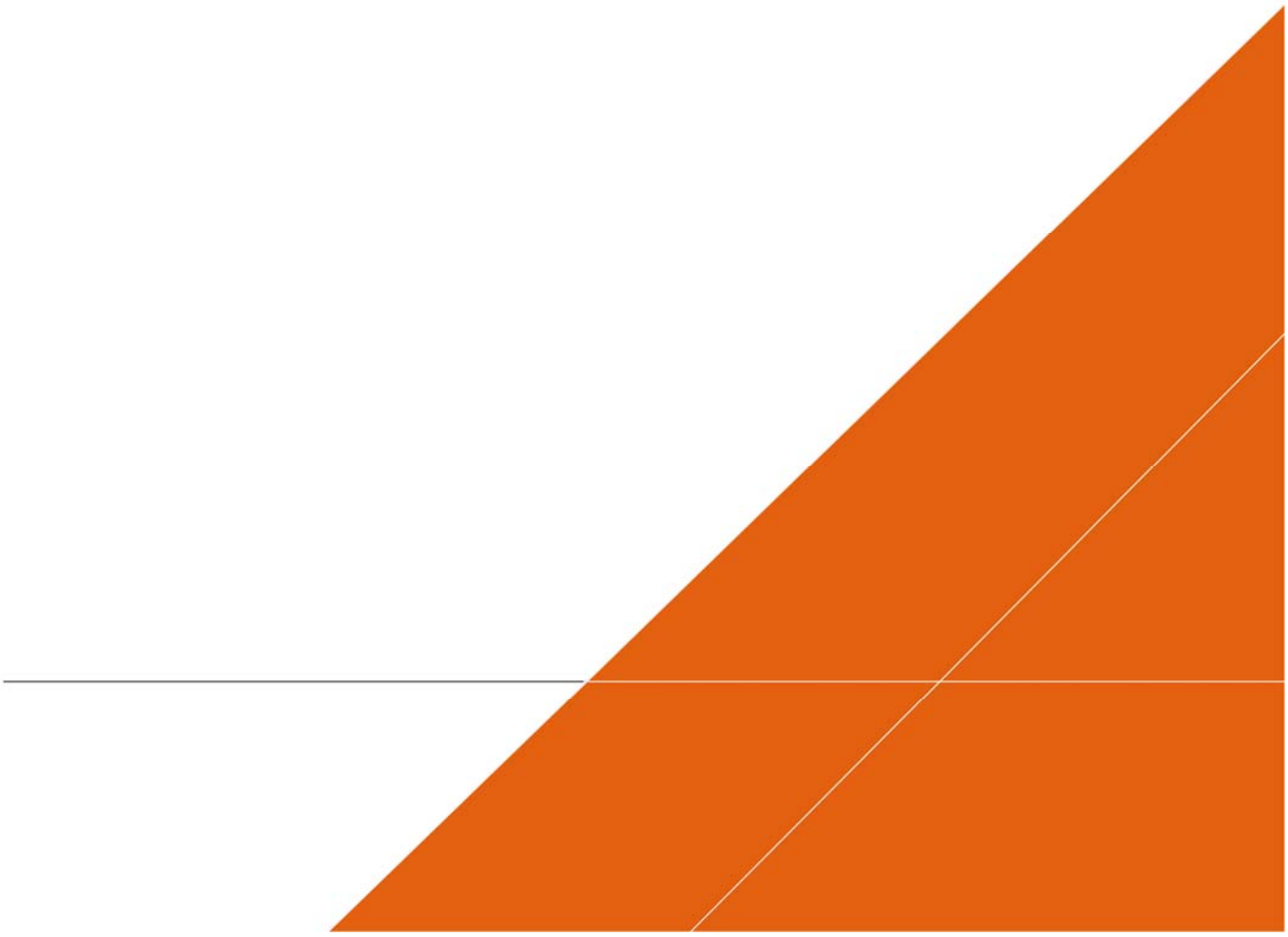
ARCADIS Design & Consultancy for natural and built assets

MORTDALE RESOURCE RECOVERY FACILITY

20 Hearne Street, Mortdale

Section 4.55(1A) Application (SSD 15_7421)

22 FEBRUARY 2019



CONTACT

SEAN FISHWICK
Environmental Consultant

T 8907 2689
E sean.fishwick@arcadis.com

Arcadis
Level 16, 580 George Street,
Sydney NSW 2000

BINGO INDUSTRIES PTY LTD MORTDALE RESOURCE RECOVERY FACILITY

20 Hearne Street, Mortdale

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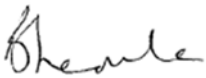
Author	Sean Fishwick	
Checker	Brad Searle	
Approver	Brad Searle	
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REVISIONS

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01		Draft	SF	BS
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CONTENTS

APPENDICES

1 INTRODUCTION

This modification application has been prepared on behalf of Bingo Industries and is seeking approval to modify the existing Mortdale Resource Recovery Facility (SSD 7421) which relates to an upgrade of an existing resource recovery facility on Hearne Street in Mortdale, NSW. This application has been prepared pursuant to Section 4.55 (1A) of the Environmental Planning and Assessment Act 1979 (EP&A Act).

1.1 Overview

Bingo Industries (the Applicant) currently own and operate the Resource Recovery Facility located at 20 Hearne Street, Mortdale (the Site). The Site currently operates under approval SSD 7421 (the Current Approval).

To optimise the efficiency of Bingo's broader resource recovery network and improve resource recovery outcomes, Bingo proposes to modify the Current Approval (the Modification Proposal). Modifications to the Current Approval as part of the Modification Proposal include:

- Reduced scale of processing and recycling equipment to produce two key streams of waste (<60mm and >60mm product) for further recycling at Bingo's advanced recycling centres.
- Changes to the layout of the recycling building and provision of a new entry and exit point to the recycling building
- Relocation of the outbound weighbridge
- Modification to site levels to accommodate processing changes
- Relocation of amenities and lunchroom
- Expansion of the incoming waste receival area
- Changes to parking arrangements
- Consolidation of external product storage bays
- Administrative changes

An assessment of the potential environmental impacts associated with these changes has been provided in Section 6.

The proposed changes are minor when considered in the overall context of the project. The modified project would therefore be substantially the same project as that for which consent was originally granted. The proposed changes are also considered in the context of Section 115 (1) (e) of the *Environmental Planning and Assessment Regulation 2000* (the EP&A Regulation), under which the proposed modifications are required to improve the efficiency of the overall site layout and operation of the development.

The proposed modifications would also enable Bingo to maximise resource recovery across their broader network. The modification would maintain the environmental management and mitigation measures committed through the EIS and conditions of approval.

1.2 Existing approvals

The Site currently operates under approval SSD 7421. Details of the recent approvals history at the Site are provided in Table 1-1.

Table 1-1 Existing approvals at 20 Hearne Street Mortdale

Approval	Details
10/DA555 8th June 2011 (Hurstville City Council)	Allows for the use of the existing site and equipment (at the time of approval) as a waste transfer facility.
s96 Modification - 10/DA555 4th November 2015 (Hurstville City Council)	Consolidated several conditions relating to the loading and sorting of waste on site. Also removed a condition which limited the amount of material that could be stored on site to 100 tonnes per day.
SSD 7421 20th December 2017 (Planning Assessment Commission)	Includes the demolition and buildings and construction and operation of a resource recovery facility with a processing capacity of up to 220,000 tpa of mixed non-putrescible waste. Due to the number of submissions received, the application was determined by the NSW Planning and Assessment Commission.

1.3 Consultation

A number of consultation activities have been undertaken throughout the preparation of this report. Consultation has been undertaken with the following stakeholders:

- Department of Planning and Environment (DP&E) - Meeting held on 8th January 2019 & 13th February 2019.
- Environment Protection Authority (EPA) – Meeting held on 13th February 2019.

A summary of the key feedback provided by each stakeholder is provided below.

Table 1-2 Consultation for the Modification Proposal

Comment	Where addressed in this report
Department of Planning and Environment	
Provide details on any improvements in site layout, including capacity for on-site waste storage	Section 4 Proposed Modifications
Updated traffic impact assessment addendum required to quantify any changes to on-site traffic movements as well as potential changes to overall vehicle numbers and vehicle mix	Section 6.8
Given proposed changes to openings in shed and simplification of processing an updated noise and air assessment would be required to support the modification	Section 6.2 Noise Section 6.3 Air quality, odour and GHG

Comment	Where addressed in this report
Would like to see details on non-confirming waste storage	Non-conforming waste would not be accepted at the site. See Section 4.2.1 Processing description
Would like to see evidence that proposed changes will result in neutral or reduced environmental impacts	Section 6 Environmental Assessment
Document how FRNSW guidelines will be met in light of revised changes	An updated Fire Engineering Report including changes associated with the Modification Proposal is currently under preparation and will be submitted to Fire and Rescue NSW for review.
Preference would be remove parking space closest to south western exit to facilitate more efficient vehicle movements	Section 4.3.7 Car Parking
Detail how WARR strategy objectives will continue to be achieved	Section 5.1.1 Relevant Legislation
Document process for non-conforming waste storage	Non-conforming waste would not be accepted at the site and as such would not be stored. See Section 4.2.1 Processing description
Environment Protection Authority	
Provide a detailed description of the changes associated with the Modification.	Section 4 Proposed Modifications
Provide justification for why further modelling of air quality impacts is not required for the Modification.	Section 6.3 Air quality, odour and GHG

1.4 Structure of this report

The structure of this report is as follows:

- Section 1 – Introduction: provides an overview of the applicant and previous approvals for SSD 7421 and a summary of consultation activities.
- Section 2 – Site description: provides a summary of the Site and its context and the area of impact for the Modification Proposal.
- Section 3 – Modification Proposal justification: provides a detailed justification for the modification proposal.
- Section 4 – Proposed modification: provides a detailed description of the Modification Proposal and the proposed modification to the SSD 7421 approval.
- Section 5 – Statutory planning assessment: provides an assessment of the Modification Proposal against the relevant statutory planning documents and considers whether the Modification Proposal is 'substantially the same development' as the existing Site under SSD 7421
- Section 6 – Environmental assessment: provides an environmental assessment of the Modification Proposal
- Section 7 – Summary of mitigation measures: provides a summary of all mitigation measures that have been proposed in the environmental assessment
- Section 8 – Conclusion: provides a summary and conclusion to this modification application report

The following appendices are included in this modification application report:

- Appendix A – Site Layout Plans
- Appendix B – Modified Site Plans
- Appendix C - Updated Operational Noise Impact Assessment
- Appendix D – Updated Air Quality Impact Assessment
- Appendix E – Updated Traffic Impact Assessment

2 SITE DESCRIPTION AND LOCAL CONTEXT

2.1 Site description

The Site comprises a 0.76-hectare block of land, located at 20 Hearne Street Mortdale (Lot 102, DP 585775) which is zoned as IN2 Light Industrial under the Hurstville LEP 2012. The site has been predominately cleared of vegetation and has been subject to cut and fill activities to assist with drainage and achieve a fall across the site downward from south east to north-west.

The site is currently approved for use as a resource recovery facility processing up to 220,000 tonnes per annum (tpa). The approved resource recovery facility comprises the following elements:

- A processing building with a fixed awning over storage bays of separated waste materials (total area of 2,534m^2)
- An office and staff amenities building with and awning over a workshop area
- Processing equipment for resource recovery within the processing building
- 10 materials storage bays
- Two weighbridges
- A diesel fuel storage tank and covered refuelling point
- 45,000L Rainwater tanks
- Dust suppression systems
- Water management systems
- 12 on-site parking spaces.

The facility is in the final stages of construction of changes as described in SSD 7421.

2.2 Local context

The location of the Site and local area is shown in Figure 2-1.

The site is located within the Georges River Council with the Peakhurst industrial area. Land use adjacent to the Site is industrial in nature and includes manufacturing, automotive services, printing businesses and supply services. Potentially sensitive receivers in the surrounding area include:

- Dairy Creek around 800 metres south-east of the Site (a tributary of the Georges River)
- A low density residential area 200 metres to the south-east on Barry Avenue, Mortdale.
- A low density residential area 270 metres to the north-east on Boundary Road Mortdale.
- A low density residential area 450 metres to the west on Lorraine Street, Peakhurst.
- Hurstville Golf Course and the Ken Rosewall Tennis Centre around 540 metres to the south west.

Access to the site is from Hearne Street, a two-lane road which connects to Barry Avenue in the south and Boundary Road in the north. Boundary Road provides the primary route for connection to the arterial road network, providing access to the M5 via, Forest Road and King Georges Road. In accordance with condition A11 in SSD7421 heavy vehicles associated with the development would not use Barry Avenue and would exit the site by left turn only.

LEGEND

- Mortdale RRF Site
- Cadastre
- Suburb boundary

ARCADIS AUSTRALIA PACIFIC PTY LTD
ABN 76 104 485 289
Level 5, 141 Walker St | North Sydney NSW 2060
P: +61 (0) 2 8907 9000 | F: +61 (0) 2 8907 9001

Coordinate System: GDA 1994 MGA Zone 56
Date issued: February 21, 2019

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Figure 2-1 Location of the site and local context

3 MODIFICATION JUSTIFICATION AND NEED

3.1 Objectives

A number of objectives have been identified to guide the proposed modifications based on the project need. These include:

- To improve the environmental performance of the site
- To maximise the efficiency of resource recovery activities at the site and further enhance Bingo's ability to meet the NSW Government's Waste and Resource Recovery Strategy through more efficient use of the broader Bingo network
- To further optimise and rationalise operational performance of the site

3.2 Justification and need

Bingo currently own and operate a number of facilities across the Sydney basin which broadly form a resource recovery network. Bingo have recently undertaken a detailed analysis of all infrastructure within this network to identify opportunities to improve efficiency, environmental performance and resource recovery outcomes and, to ensure alignment with current waste policies and strategies.

This analysis identified that by considering an individual facility within the broader network context, Bingo are able to considerably enhance total resource recovery. The Current Approval had proposed to process incoming waste to the greatest extent possible (within the limitations of the site - both in terms of processing equipment and space constraints). However, by simplifying the processing proposed at the Site, waste can undergo preliminary resource recovery activities producing a partly processed product that can then be directed for further processing at specialised facilities for advanced resource recovery. This preliminary processing would allow provision of a higher quality of product to these specialised facilities allowing them to operate more efficiently and consequently allowing the network to achieve higher resource recovery rates than would otherwise be possible.

Reduced scale of the resource recovery activities at the site would also reduce the active machinery at the site and would improve environmental performance outcomes.

4 PROPOSED MODIFICATIONS

Modifications to the Current Approval as part of the Modification Proposal include:

- Reduced scale of recycling and processing plant
- Changes to the layout of the recycling building and provision of a new entry and exit point to the recycling building
- Relocation of the outbound weighbridge
- Modification to site levels to accommodate processing changes
- Relocation of amenities and lunchroom
- Expansion of the incoming waste receival area
- Changes to parking arrangements
- Consolidation of external product storage bays
- Administrative changes

The proposed changes have been discussed in detail in this section and are shown in the Site Layout Plans (as amended) in Figure 4-1 and Appendix A. These plans are intended to replace the currently approved stamped plans included in Appendix A of development consent SSD 7421. The modifications are also shown on the modified site plans which shows the proposed changes compared to the approved project (Figure 4-2 & Appendix B).

Further environmental assessment to demonstrate the environmental performance improvements associated with the proposed modifications are documented in Section 6 of this Environmental Assessment report. The modifications have been categorised as follows:

- Modifications to the operation of the project
- Modifications to built form
- Administrative changes.

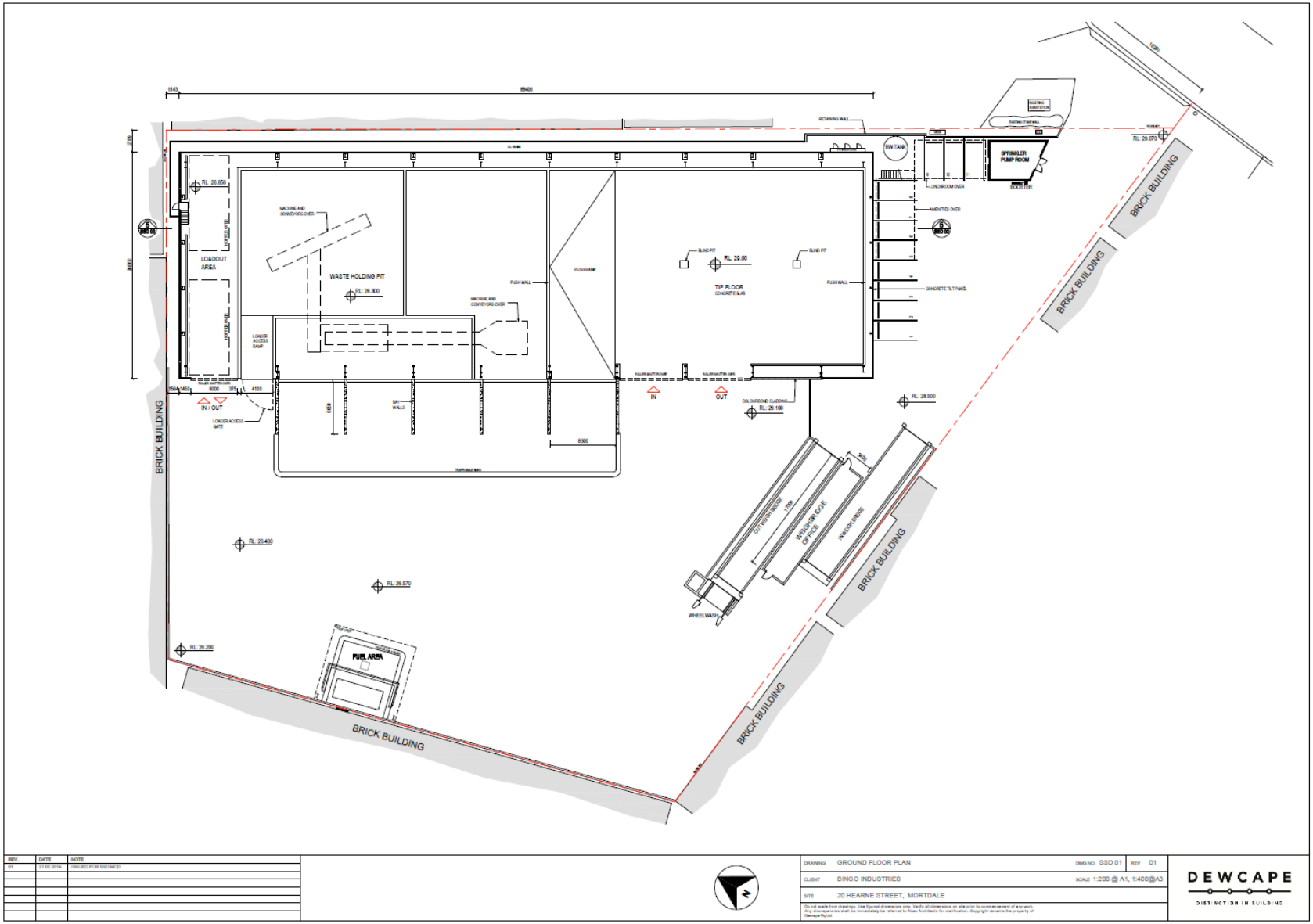


Figure 4-1 Site layout plan

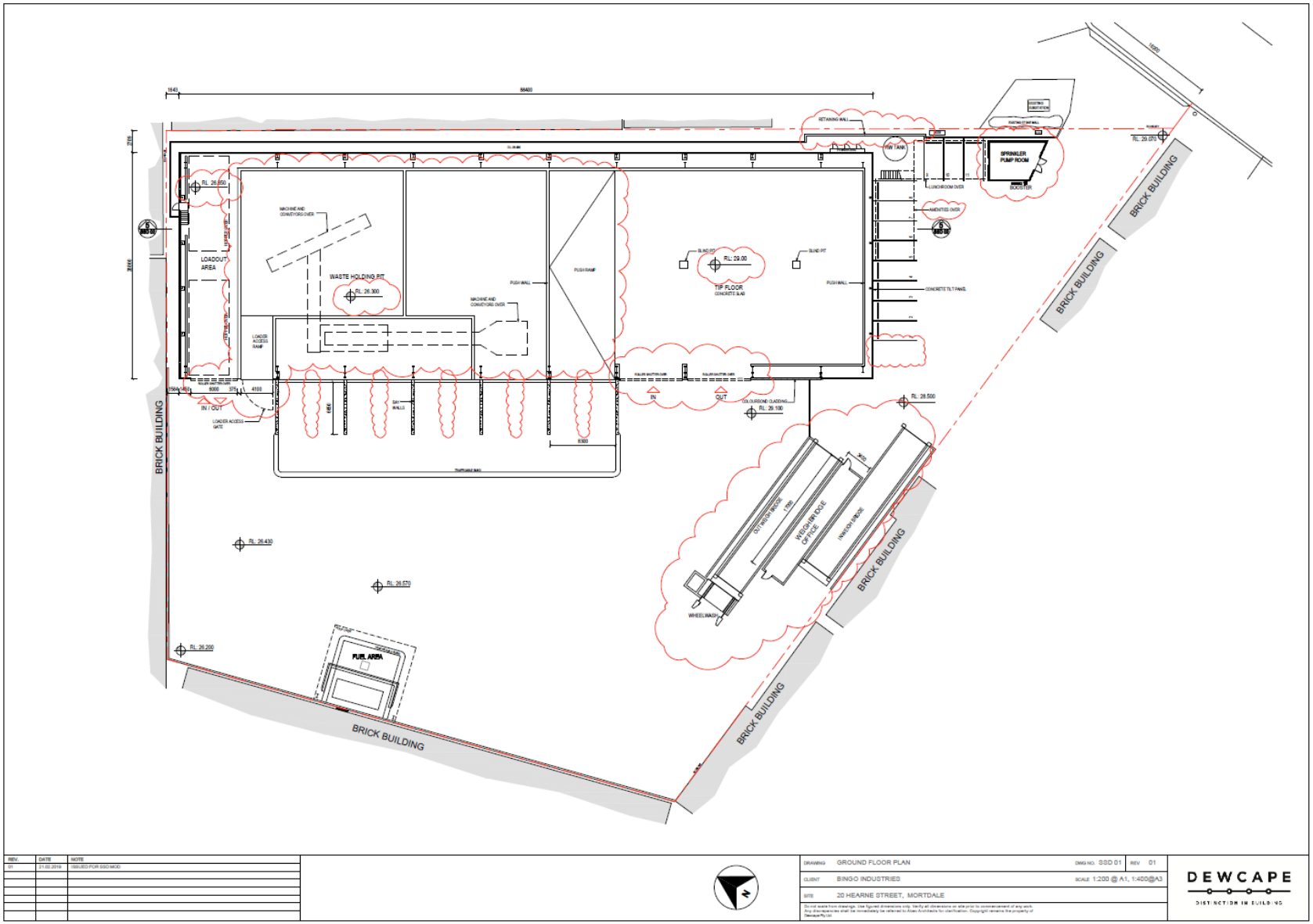


Figure 4-2 Modified site layout plan

4.1 Overview

An overview of the proposed modifications and comparison to the current approval (SSD7421) is provided in Table 4-1. The proposed modifications are discussed in detail in the following sections.

Table 4-1 Extent of proposed modifications

Component of approved project being modified	Modification proposed	Outcomes of modification
Modification to operation		
Resource recovery process	Reduce scale of the resource recovery process including: • Replacing large scale recovery plant with a finger screen. • Consolidation of outputs to two primary recovered product streams, >60mm and < 60mm. • Primary waste movement activities undertaken by overhead gantry crane.	• Would not affect the approved use of the development. • Improve efficiency and resource recovery rate across the Bingo network.
On-site vehicle movements	Change to the way vehicles move through the site by: • Providing an additional access point on the south western side of the recycling building. • Providing a bulk load out are in the north west of the recycling building. • Relocation of the outbound weigh bridge.	• Improve on-site traffic flows. • Allow for separation of vehicles tipping and loading. • Provide and additional loading area in the bulk load out. • Vehicle numbers and composition would not change
Queuing and stacking	• Changes to stacking arrangement to suit modifications to built form. • Reduced stacking spaces to reflect a reduction in vehicle dwell times.	• Improved internal efficiency and reduce truck dwell time. • Would not affect the approved use of the development.
Modifications to built form		
Layout of the recycling building	The recycling shed layout would be modified to: • Include a bulk load out area in the north west. • Expand the tip floor from 574m^2 to 1120m^2 • Include holding pits • Provide new entry / exit on the south western side of the building.	• To accommodate the simplified resource recovery process. • Improve the operational efficiency of the building and internal traffic flows.

Component of approved project being modified	Modification proposed	Outcomes of modification
Outbound weigh bridge.	• Change in orientation of outbound weighbridge and wheel wash to support more efficient vehicle movements.	• Changes would improve the internal vehicle flows
Site levels	• Site levels (elevations) changed to facilitate other built form change	-
Site amenities	• Reduction in footprint of administration/office building • Relocation of site amenities to be above car parking spaces	• Change would allow a greater area for vehicle movements within the site improving traffic flows and maximising onsite safety
Product storage bays	• Consolidation of nine product storage bays into five	• Would not alter the storage capacity of the bays • Would accommodate the reduction in recovered waste stream types from the simplified resource recovery process
Processing plant and equipment	• Installation of a feed hopper, screens and conveyors to process and separate the mixed waste. • Installation of an overhead gantry crane within the building to move waste between various areas of the building, including loading of feed hopper, overhead bulk loading chutes, and picking of oversize materials including steel and large concrete from the waste holding area. • Installation of an overhead bulk loadout hopper.	• Change reflect the reduced scale of processing equipment at the site, aimed at facilitating greater resource recovery across the broader Bingo infrastructure network. • Improve environmental performance at the facility
Car parking	• Reduction in car spaces from 12 to 11 reflecting reduced numbers of workforce on site	• Change would allow a greater area for vehicle movements within the site improving traffic flows and maximising onsite safety
Administrative modifications		
Schedule 2 Part A Condition A8	• Change in specified waste storage areas and maximum volumes allowed to be stored in each area.	• Reduced scale of processing plant provides increased storage capacity volume in waste receival area and change in the waste types stored in each bay.

4.2 Modification to the operation of the project

Bingo are seeking to maximise resource recovery across their entire infrastructure network. Any individual site has limitations to the degree of resource recovery that can be achieved. By considering an individual facility within the broader context Bingo can considerably enhance total resource recovery.

The approved project had previously proposed to process incoming waste to the greatest extent possible within the limitations of the site (i.e. both in terms of processing equipment and space constraints). However, by reducing the scale of processing equipment at the Site, waste can undergo preliminary resource recovery activities producing a partly processed product that can then be directed for further processing at specialised facilities for advanced resource recovery. This preliminary processing would allow provision of a higher quality of product to these specialised facilities allowing them to operate more efficiently and consequently allowing the network to achieve higher resource recovery rates than would otherwise be possible.

Instead of the proposed advanced resource recovery equipment that would separate incoming waste into final product streams, processing at the site is proposed to be simplified to maximise the processing efficiency of the site and produce the following recovered streams:

- Recovered <60mm soils and rubble
- Recovered >60mm soil, rubble, and other products
- Oversized concrete
- Other large recoverable products such as timber, steel etc

The modified project would continue to process up to 220,000 tonnes per annum (tpa) of waste and would continue to operate from 6am to 10pm Monday to Saturday, with no processing undertaken on Sundays or public holidays. As such, there will be no changes to approved throughput or operating hours.

4.2.1 Processing description

Waste would be processed through the recycling building in a south-east to north-west direction.

Mixed waste would be delivered by incoming vehicles into the recycling building through the newly created entry in the south western side of the building. Waste would then be tipped onto the expanded tipping floor and inspected for any non-compliant waste. If waste is deemed to be compliant, it would be pushed into the waste holding pit by a front-end loader. If there is non-compliant waste found, the load would be rejected and reloaded for removal from site and disposal at an authorised facility.

The Proposal site will not accept non-confirming waste. However, from time to time unexpected finds of materials may be encountered. These materials would be handled in accordance with a project specific Operational Environmental Management Plan (OEMP) procedures and appropriately stored for efficient disposal.

A separated area for storage of non-conforming waste including unexpected finds and dangerous goods would be demarcated within the one of the consolidated storage bays (likely the bay closest to the site entrance); incorporating an asbestos bin area, battery storage cage, fire extinguisher cage and gas bottle storage cage.

Once the mixed waste is in the waste holding area, an overhead gantry crane with a three cubic metre capacity grab will lift the mixed waste into a feed hopper. The feed hopper will regulate the flow of the mixed waste stream onto a screener, which will separate the mixed waste stream into the two recovered streams, >60mm and <60mm.

Material which is >60mm in size will be sent to the screened material pit via a conveyor to be loaded out for further processing at an advanced recycling facility within Bingo's network.

Material which is <60mm in size will be transported by conveyors to either a truck for direct loading (adjacent to the product storage bays), or to the product storage bays (if a truck is not present for loading).

The overhead gantry crane will lift the processed waste from the screened material pit to one of two overhead loadout bunkers in readiness for loading. These overhead loadout bunkers would sit above the bulk load out area. Trucks would enter the bulk load out area and park beneath one of the load out bunkers. These trucks would then be automatically loaded via bay doors in the base of the load out bunker.

The overhead gantry crane is a critical component in the operations of the facility, and therefore a second crane will be provided for redundancy as well as to maximise operational efficiency and provide the ability to reload trucks that have unauthorised waste identified. A second crane also allows for redundancy and the ability to carry out maintenance to either crane.

The crane is automatically programmed to carry out a regular pattern of loading the feed hopper and loading the overhead loadout hopper but can also be manually operated to remove larger items of steel, timber, large concrete, and textiles from the incoming mixed waste stream for storage in the product storage bays.

4.2.2 On-site vehicle movements

The proposed modifications to built form (as described below) would result in changes to the internal traffic movements. However, the Modification proposal would not result in changes to the number or types of vehicles expected to arrive at the site.

An analysis of swept paths of vehicles accessing the site, demonstrating the efficacy of the modified site layout is provided in Section 6.8. This analysis demonstrates that the largest trucks approved to access the site, including truck and dogs and 19 m semi-trailers could tip at the pit without conflicting with the four stacked spaces.

The addition of the bulk load out bay in the north western end of the recycling building would minimise conflicts between loading vehicles. Allowing vehicle to load in the bulk load out area and adjacent to the product storage bay simultaneously.

4.2.3 Queuing and stacking

Based on an analysis of the vehicles types and numbers accessing the site and anticipated vehicle dwell times (presented in Section 6.8), a stacking plan designed to accommodate the peak number of vehicles during the peak hour of the day has been developed and is shown in Figure 6-2. The peak number of trucks could be accommodated across 6 spaces which is below the 15 stacking spaces proposed.

4.3 Modifications to built form

To optimise the site layout for the simplified resource recovery operations and to improve environmental performance outcomes, modifications to the built form as described in the current approval are proposed. These have been detailed below and are shown in Figure 4-1.

4.3.1 Changes to the layout of the recycling building

The layout of the recycling building is proposed to be modified to simplify operations and allow suitable vehicle access. The new layout would be split into three areas, a bulk load out area in the north-west, the tip floor in the south-east and the holding pits in between these areas.

Bulk load out area

A designated bulk load out area located at the north eastern end of the recycling building is proposed, allowing a physical separating of loading, processing and tipping activities. The bulk load out area would be used to load >60mm product only. Trucks would be able to enter this area either in a forward direction or via performing a turn in and reverse manoeuvre. Trucks would be automatically loaded from the overhead bunkers which would be pre-filled by the overhead gantry crane from the screened materials pit. This would allow for significantly faster loading of large trucks, in the order of 5 minutes.

Expanded tip floor

The tip floor in the south-east of the recycling building is proposed to be expanded from 574m^2 to 1,120m^2 to allow a greater tipping area. Expansion of the tip floor would assist in reducing the vehicle turnaround time by allowing the potential for dual truck tip operation which would be carried out under the supervision of site personnel. During dual truck tip operation, trucks up to 11m in size could tip concurrently. Expansion of the tip floor would also allow for the provision of four additional stacking spaces if required along the southern wall of the recycling building. As a result of the changes to the layout of the recycling building an additional entry and exit point would need to be provided on the south western side of recycling building for vehicles wishing to access the tip floor.

Holding pits

The new layout of the recycling building would allow for the creation a holding pits area between the tip floor and the bulk load out area. The floor of the holding pits would be 3.2 meters lower than the tip floor and would be segregated by a wall into two areas; the waste holding pit (for un-processed waste that has been push in from the tip floor) and the screened materials pit (for processed materials >60mm). Having the holding pits at a different level to the tip floor allows for physical separation of activities and allows waste to efficiently be ‘pushed’ by a front-end loader directly in the pit shortening the time it is on the tip floor and decreasing vehicle dwell times associated with tipping of waste.

New entry and exit point

Mixed waste would be delivered by incoming vehicles into the recycling building through the newly created entry in the south western side of the building. The proposed south west access to the recycling building is required due to the changes in site levels and also provides improved on-site efficiencies and reduces conflicting

movements by enabling a shorter distance to travel to the tip floor. An analysis of swept paths of vehicles accessing the site, demonstrating the efficacy of the modified site layout is provided in Section 6.8. This analysis demonstrates that the largest trucks approved to access the site, including truck and dogs and 19 m semi-trailers could tip at the pit without conflicting with the four stacked spaces.

4.3.2 Relocation of the outbound weighbridge

The orientation of the out-bound weighbridge and wheel wash would be changed as presented in the Site Layout Plan (Figure 4-1). This would enable trucks leaving the recycling building by the modified exit location at the south western end of the recycling building to proceed efficiently to the outbound weighbridge and wheel wash prior to leaving the site.

4.3.3 Modification to site levels

To allow for the simplified resource recovery operations including the provision of the waste holding pit and bulk load out area, site levels would need to be slightly modified from those proposed within the current approval. The site levels proposed in this modification are shown in Appendix A.

4.3.4 Relocation of amenities and lunchroom

The approved amenities and lunchroom would be relocated and suspended above the car spaces at located near the entry to the site, as presented in the Proposed Site Layout Plan. This would maximise the space for trucks and vehicles to move safely and efficiently within the site.

4.3.5 Product Storage Bays

Product storage bays along the western side of the recycling building would be consolidated from nine bays into five. This would reflect the changes in resource recovery operations. While the number of bays would be reduced, the total material storage capacity of the site would not be reduced. Product storage bays would be used to hold the process and recovered <60mm product as well as other items that have been recovered (via the overhead crane) directly from the incoming waste stockpile such as oversized concrete and other large recoverable products such as timber, steel, green waste etc.

4.3.6 Processing plant and equipment

Processing plant and equipment would be simplified to reflect the changes in processing. The existing proposed plant would be removed and replaced with a feed hopper, screens and conveyors to separate mixed waste. An advanced overhead gantry crane would also be installed. which would be the primary piece of equipment used to move waste around the site. The overhead gantry crane is a critical component in the operations of the facility, and therefore a second crane will be provided for redundancy, to be used either in peak times, or in the event that the primary crane is undergoing maintenance.

The crane is automatically programmed to carry out a regular pattern of loading the feed hopper and loading the overhead loadout hopper, but can also be manually operated to remove larger items of steel, timber, large concrete and textiles from the incoming mixed waste stream for storage in the product storage bays.

The primary resource recovery equipment utilised at the site would be a finger screen or similar. The screen would separate waste into two recovered products, >60mm and <60mm aggregate.

The modification would also include the removal of the picking stations and the addition of an overhead gantry and overhead bulk loadout to support the simplified operations and allow for faster loading of vehicles and therefore facilitating shorter on site dwell times.

4.3.7 Car parking

The number of car parking spaces provided for the workforce and visitors would be reduced from 12 spaces to 11 spaces. The reduce scale of the resource recovery process allows for the removal of manual picking stations and the use of the automated overhead gantry crane for the majority of waste movement on the site. The Modified Proposal would require reduced numbers of operational personnel and consequently less parking spaces would be required. The removal of one parking space also provides additional space for vehicles to manoeuvre on site improving safety and operational efficiency.

4.3.8 Fire infrastructure

An updated Fire Engineering Report including changes associated with the Modification Proposal is currently under preparation and will be submitted to Fire and Rescue NSW for review.

4.4 Administrative changes

Modification to approval SSD 7421 is sought to permit the proposed modifications and additions outlined in this section. The proposed modifications require an amendment to the SSD 7421 Conditions of Approval, which are identified below.

4.4.1 Schedule 2 Part A Condition A8

It is proposed to modify the maximum stockpile volumes presented in Schedule 2 Part A Condition A8 of SSD7421 (shown in Table 4-2) to:

- increase the total amount of waste stored due to the increased tip floor area resulting in an increase in the storage capacity volume in the waste receival area
- increase the maximum volume of each storage bay, to accommodate the consolidation of the storage bays and the reduced number of products recovered.

The proposed new maximum stockpile volumes are presented in Table 4-3 . This would enable the resource recovery operations to maximise the efficiency of recovery operations.

Table 4-2 Existing maximum stockpile volumes as per Schedule 2 Part A Condition A8 of SSD7421

Stockpile	Waste type	Maximum volume (m^3)
Incoming waste receival/ stockpile area	Unprocessed material	4,131
Storage bay	Residual waste	105
Storage bay	Residual waste	105
Storage bay	Residual waste	105
Storage bay	Soil	105
Storage bay	Plastic	105
Storage bay	Timber	105
Covered skip	Green waste	35
Storage bay	Brick and concrete	105
Storage bay	Paper and cardboard	105
Storage bay	Metal	105
Covered skip	Plasterboard	15

Table 4-3 Proposed maximum stockpile volumes

Stockpile	Waste type	Maximum volume (m^3)
Incoming waste receival/ stockpile area (includes waste on the tip floor and within the waste holding pit)	Unprocessed material	2500
Storage bays 1- 5 (total)	• Recovered <60mm soil and rubble • Oversized concrete and other large recoverable products such as timber, steel, green waste etc	945
Screened materials pit	Recovered >60mm soil, rubble and other products	2000

5 STRATEGIC AND STATUTORY PLANNING ASSESSMENT

Section 4.55 (1A) of the EP&A Act requires a consent authority to take into consideration matters referred to in s4.15, as they are of relevance to the development subject of the application. This includes consideration of any environmental planning instruments and legislation applicable to the land that is the subject of the proposed modification. The following sections consider the legislation and plans relevant to the Modification Proposal.

5.1 Statutory planning assessment

5.1.1 Relevant legislation

A summary of the Commonwealth, State and Local Government legislation which are relevant to the Modification Proposal are summarised in Table 5-1.

Table 5-1 Legislation applicable to the Modification Proposal

Legislation	Associated environmental concerns	Approval or assessment requirement
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Impacts to Matters of National Environmental Significance (MNES), particularly disturbance to listed threatened species, ecological communities and/or migratory species, and impact(s) on Commonwealth land.	The site is predominately hardstand with very little vegetation and no remnant vegetation. Given the very low ecological value of the site and the relatively minor nature of the Modification Proposal, it would not result in impacts to matters of MNES.
State		
EP&A Act *EP&A Regulation* *State Environmental Planning Policy (Infrastructure) 2007* *State and Regional Development SEPP*	Planning approval pathway determination and any potential impacts on the environment.	The Current Approval (SSD 7421) for the reconfiguration of the Mortdale Resource Recovery Facility was granted on 20 December 2017 by the Planning Assessment Commission (PAC). Modification to The Current Approval is sought under s 4.55(1A) of the EP&A Act. The modification Proposal is considered 'substantially the same development' as defined under s4.55(1A) of the EP&A Act. Assessment against Section 4.55(1A) of the EP&A Act is detailed in Section 5.1.2.

Legislation	Associated environmental concerns	Approval or assessment requirement
Protection of the Environment Operations Act 1997 (POEO Act)	Impacts of the operation of the Proposal relating to air quality, noise emissions and discharge of polluted water.	An Environmental Protection License (EPL number 20622) was issued for the premises 20 Hearne Street on the 5th of January 2016 under Section 55 of the *Protection of the Environment Operations Act 1997.* The EPL allows waste processing, resource recovery and waste storage activities to take place on site as a scheduled activity with no limit on the tonnes per annum. As there will be no alteration to the scheduled activity occurring on site, no amendment to the EPL is required at this stage.
Contaminated Land Management Act 1997 (CLM Act) *State Environmental Planning Policy No. 55-Remediation of Land* (SEPP 55)	Disturbance of contaminated land and potential for further soil contamination	The EIS for the Current Approval included a Phase 1 Contaminated Land Investigation for the Site. Assessment of the contamination potential of the Modification Proposal concluded that there would be no additional impacts to those identified in the EIS. Potential impacts during construction will be managed in with the existing Construction and Environment Management Plans for the developed for the activity.
National Parks and Wildlife Act 1974 (NPW Act)	Disturbance of any objects or places of Aboriginal heritage significance	Under Section 4.41 of the EP&A Act development applications assessed as SSD do not require an Aboriginal heritage impact permit (AHIP) (under section 90 of the NPW Act). Given the Site is already highly disturbed and the minor nature of the proposed modifications, it is highly unlikely that objects or places of Aboriginal heritage significance will be impacted by the Modification Proposal.
Biodiversity Act (2016)	Disturbance to listed threatened species and ecological communities	The EIS for the Current Approval determined that 'the development will not damage critical or other habitat and is not likely to have a significant effect on threatened species, populations, or ecological communities or their habitats. Given the minor nature of the proposed modifications and the limited ecological values of the site, the Modification Proposal would not result in a change to this assessment.
Noxious Weeds Act 1993 (NW Act)	Spread and impact of weeds	The Site is predominately unvegetated and it is not anticipated that the Modification Proposal would have any effect on the spread or impact of weeds.

Legislation	Associated environmental concerns	Approval or assessment requirement
Fisheries Management Act 1994 (FM Act)	Disturbance to aquatic flora and fauna	The Modification Proposal would not result in any disturbance to aquatic flora and fauna.
Water Act 1912 (Water Act) *Water Management Act 2000* (WM Act)	Disturbance of groundwater aquifers, impacts to flooding behaviour and/or water quality of surrounding water bodies	Under Section 4.41 of the EP&A Act, development applications assessed as SSD do not require a permit under section 89, 90 or 91 of the WM Act. The EIS developed for the Current Approval identified that the project would not impact on groundwater aquifers, flooding or the quality of surrounding water bodies. Given the minor nature of the proposed modifications, and that the site would retain the same level of imperviousness, the Modification Proposal would not result in a change to impacts to groundwater aquifers, flooding or the quality of surrounding water bodies.
Roads Act 1993 (Roads Act)	Impacts of the construction and/or operation of the Proposal on traffic flows and works to public and private roads.	The Modification Proposal would not result in any disturbance to traffic flows on the surrounding roads or on site. Vehicle numbers and composition would not be altered by the Modification Proposal.
Heritage Act 1977 (Heritage Act)	Disturbance to any object that is of state or local heritage significance	Under Section 4.41 of the EP&A Act, development applications assessed as SSD do not require a permit under section 139 of the Heritage Act. Given the Site is already highly disturbed and the minor nature of the proposed modifications, it is highly unlikely that items or places of non-Aboriginal heritage significance will be impacted by the Modification Proposal.

Legislation	Associated environmental concerns	Approval or assessment requirement
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) *Protection of the Environment Operations (Waste) regulation 2005*	Waste management and potential opportunities for diversion of waste from landfill	A waste management assessment was undertaken in the EIS for the Current Approval. The Modification Proposal does not include major demolition works or vegetation clearance. The proposed modifications would simplify waste processing at the facility. By simplifying the processing proposed at the Site, waste can undergo preliminary resource recovery activities producing a partly processed product that can then be directed for further processing at specialised facilities for advanced resource recovery. This preliminary processing would allow provision of a higher quality of product to these specialised facilities allowing them to operate more efficiently and consequently allowing the network to achieve higher resource recovery rates than would otherwise be possible. Consequently, the proposed modifications would improve waste management activities and increase land fill diversion rates by assisting the broader bingo network in achieving higher levels of resource recovery.
Rural Fires Act 1997 (Rural Fires Act)	Bushfire management/prevention and ensuring the site is suitably protected from the threat of bushfires	Under Section 4.41 of the EP&A Act development applications assessed as SSD do not require a bush fire safety authority (under section 100B of the Rural Fires Act). The Site is not within or near bushfire prone land.
State Environmental Planning Policy No. 33- Hazardous and Offensive Development (SEPP 33)	Management of hazardous and dangerous goods	A Hazard Assessment was prepared for the Project as part of the EIS for the Current Approval. The Modification Proposal would not result in a change to the approved land use for the Site and is consistent with the hazards and risks considered in the EIS for the Current Approval.
State Environmental Planning Policy No. 64- Advertising and Signage (SEPP 64)	Location and design of signage and impact on the surrounding visual environment	The Modification Proposal does not propose changes to signage at the site from that presented in the EIS for the Current Approval.
Local		
Hurstville Local	Impact on the environment and the built form of the Hurstville Local Government Area	The EIS for the Current Approval included consideration of matters within the Hurstville LEP. The external configuration of the approved development and site layout will not

Legislation	Associated environmental concerns	Approval or assessment requirement
Environment Plan 2012 (Hurstville LEP)	(now part of the George River LGA)	be significant altered by this application, and as such no new assessment matters are triggered under the Hurstville LEP.
Hurstville Development Control Plan No. 1 (Hurstville DCP)	Impact on the environment and the built form of the Hurstville Local Government Area (now part of the George River LGA)	As the project is SSD under Part 4, Division 4.1 of the EP&A Act, consideration of the Hurstville DCP is not required.

5.1.2 Environmental Planning and Assessment Act 1979

Section 4.55(1A) of the EP&A Act allows a consent authority to modify a development consent subject to a number of conditions. In determining an application for modification under Section 4.55, the consent authority must also take into consideration matters referred to in Section 4.15 of the EPA Act. An assessment of the permissibility of the modification against the requirements of the EP&A Act as described above is presented in Table 5-2.

Table 5-2 Assessment of the Modification against the requirements of the EP&A Act

Clause	Requirement	Applicability to the Modification Proposal
4.55 1(A)		
(a)	it is satisfied that the proposed modification is of minimal environmental impact	An assessment of the impacts of the Modification Proposal is presented in Section 6. The assessment identified that the Modification Proposal would not result in more than a minimal environmental impact.
(b)	it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all),	The nature of the proposed modifications to SSD 7421 will result in a development that is substantially the same to that approved under SSD 7421 and any subsequent modifications. The modifications are considered to be minor in nature and will not alter the quantity or type of waste that is to be processed by the facility.
(c)	it has notified the application in accordance with: • the regulations, if the regulations require • a development control plan, if the consent authority is a council that has	• At the conclusion of a notification period, the DP&E is required to consider any submissions received in accordance with this section. It is understood that DP&E will consider any planning issues raised in submissions as

Clause	Requirement	Applicability to the Modification Proposal
	made a development control plan that requires the notification or advertising of applications for modification of a development consent.	part of the assessment of the application
(d)	it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be	A discussion of consultation with relevant stakeholders is provided in Section 1.3
4.15 (1)		
(a)	The provision of:	-
(i)	any environmental planning instrument, and	Consideration of the Modification Proposal against environmental planning instruments is provided in this section.
(ii)	any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and	
(iii)	any development control plan, and	
(iiii)	any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and	The Site is not subject to any voluntary planning agreements
(iv)	the regulations	The regulations have been considered within the environmental assessment as required.
(b)	the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	The likely impacts of the Modification Proposal have been detailed in Section 6.
(c)	the suitability of the site for the development	The Site is considered suitable for the proposed development as it is located on land zoned IN2 Light Industrial which permits the resource recovery with consent. There are no environmental constraints that preclude the proposed modification.
(d)	any submissions made in accordance with this Act or the regulations	DP&E will consider any planning issues raised in submissions as

Clause	Requirement	Applicability to the Modification Proposal
		part of the assessment of the application,
(e)	the public interest	The Modification Proposal is considered to be in the public interest as it supports the ongoing and effective management of waste in and resource recovery NSW.

6 ENVIRONMENTAL ASSESSMENT

The potential environmental impacts of the Proposed Modification have been assessed in this section. The environmental aspects assessed are aligned with those presented within the Environmental Impact Statement (EIS) and the two Response to Submissions (RtS) reports prepared for the Current Approval.

The level of assessment for each environmental aspect has been determined based on the potential for change in impacts from the proposed modifications outlined in further detail in Section 4. Specialist reports have been prepared to assess key matters, including noise, air quality and, traffic access and parking.

6.1 Visual impacts and built form

6.1.1 Previous assessment

An assessment of visual and built form impacts of the project was provided as part of the EIS for the Current Approval. The assessment identified that the industrial buildings situated on adjoining properties would effectively screen most of the site with the exception of the driveway crossing on Hearne Street. As such, processing and storage areas would not be visible from the public domain or any adjoining properties, with the exception of a narrow view into the site from Hearne Street.

The Current Approval determined that there would be no discernible change to the height and scale of the development when compared to the previous development and that the project would be consistent with the established built form and visual character of the area.

To manage potential impacts landscaping was proposed along the northern and eastern boundaries and adjacent to the access driveway.

The assessment concluded that the visual impacts associated with the development are considered to be an improvement to the existing situation.

6.1.2 Impact assessment

The Modification Proposal would not result in a change to the height or width of the recycling building and would not increase the visibility of the building from the surrounding area. The proposed modifications to built form would be minor and would not result in impacts to visual amenity with the exception of the relocation of the amenities building. The amenities would be relocated from the existing location between the weigh bridges to the south of the recycling building to directly adjacent the south east end of the recycling building, within close proximity to the site entrance. Whilst the relocated amenities would alter the appearance of the site when observed from Hearne Street, the structure would be in keeping with the industrial nature of the surrounding area. The relocated amenities would be designed to be visually consistent with the remainder of the development.

Whilst the proposed modifications would result in minor changes to the appearance of the project the level of visual impact would generally be consistent with that assessed within the Current Approval.

There are no alterations to landscaping as proposed within the Original Approval.

6.1.3 Mitigation measures

The Modification Proposal is anticipated to have a similar level of impact on Visual amenity as that described in the Current Approval. The Current Approval proposed a number of mitigation measure to manage visual impacts which would continue to be implemented. However, to manage minor changes as a part of the Modification Proposal, the following additional mitigation measure is proposed:

- The relocated amenities building would be designed to be visually consistent with the remainder of the development.

6.2 Noise

6.2.1 Previous assessment

A Noise and Vibration Impact Assessment (NVIA) was prepared by SLR in June 2016 to support the Current Approval (2016 Noise Assessment). This report was subsequently updated in December 2016, March 2017 and November 2017 to provide further detail addressing comments from government agencies.

The assessment identified that during construction and operation the facility would comply with project specific noise criteria. Potential traffic noise associated with the operation of the facility was assessed as having an insignificant impact on nearby residential receivers and complies with the NSW Road Noise Policy (RNP). To ensure that the project was able to operate in compliance with the project specific noise criteria several mitigation measures were included in the assessment, being:

- The building layout and orientation is such that building openings will not direct noise towards sensitive receivers.
- 175 mm concrete reinforced tilt panel construction of processing shed wall on eastern, southern and western facades.
- Heavy vehicles access the facility via Boundary Road and Hearne Street and avoid using Barry Avenue.

6.2.2 Impact assessment

The facility as described and approved under SSD 7421 is currently in the final stages of construction. The proposed modifications (as described in Section 4) are minor, including:

- Reduced scale of the proposed processing infrastructure including removal of some elements such as the picking station reducing construction complexity and time
- Relocation of certain elements of the Current Approval with the processing shed such as the entry / exit requiring a similar level of construction activity
- Relocation of the proposed weighbridge requiring a similar level of construction activity
- Relocation of the site amenities and lunch room requiring a similar level of construction activity
- Consolidation of storage bays requiring a similar level of construction activity

The proposed modifications would generally require a similar or reduced level of construction activity and as such, an updated construction noise impact assessment is not required. Construction activities for the proposed modifications would continue to be managed through the CEMP developed for the Current Approval.

A detailed Operational Noise Impact Assessment has been prepared to support the Modification Proposal and has been included as Appendix C and is summarised here.

Methodology

To support the noise assessment provided within the Current Approval and to determine the potential impact from the proposed modifications, Wilkinson Murray were engaged to provide an operational noise and vibration impact assessment. The assessment has been produced, utilising the methodology and background information established within the NVIA prepared for the Current Approval.

The site is located within an established industrial area with many industrial facilities and associated activities taking place around the site. A review of the local area has been conducted and there has not been any changes in the land uses since the 2016 Noise Assessment. Therefore, for the purpose of consistency with the approved NVIA, the same receivers have been considered for this assessment

For the purpose of characterising the existing acoustical environment at sensitive receivers, background noise monitoring was conducted by SLR in February 2015. Measured ambient noise levels established through the monitoring were used to establish noise criteria as show in Table 6-1. These noise criteria were accepted by key stakeholders in the Current Approval.

Noise predictions associated with the revised operation of the site on the surrounding receivers were conducted using the CADNA A noise model using the CONCAWE prediction algorithm consistent with the 2016 Noise Assessment. Noise modelling was based on the following:

- Equipment sound level emissions (measured or assumed) and location
- screening effects from existing buildings
- receivers' locations
- meteorological conditions
- ground topography
- noise attenuation due to spherical spreading

Operational site noise was modelled based on three scenarios (unchanged from the 2016 Noise Assessment), Morning Shoulder (6am to 7am), Daytime (7am to 6pm) and Evening (6pm to 10pm). As processing and sorting of waste activities are proposed between the 6 am to 7 am morning shoulder period, assessment of sleep disturbance is also required. Resultant noise levels at residential receivers and industrial neighbours have been predicted based on metal impact noise sound power level of 116 dBA (within the shed), being the loudest noise source located at the site.

Sound power levels for equipment were identified from the 2015 Noise Assessment where available or from Wilkinson Murray's database (detailed in Appendix C). For the purposes of the assessment the gantry crane has been assumed to replace excavators within the shed that would otherwise be required to shift waste. The sound power level of the gantry crane is less than that of an excavator.

Potential impacts

The predicted noise levels at surrounding receivers due to site proposed operations and comparison to the established noise criteria are presented in Table 6-1. The table also includes a comparison to the noise levels as predicted within the 2016 Noise Assessment.

Table 6-1 Predicted noise levels from operation of the Modification Proposal

Receiver	Predicted Noise Levels, $L_{Aeq,15min}$												Compliance
	Morning shoulder L_{Aeq}			Day L_{Aeq}			Evening L_{Aeq}			Morning shoulder (Sleep disturbance) L_{Amax}			
	SLR Predicted Level	Modification Predicted Level	Criteria	SLR Predicted Level	Modification Predicted Level	Criteria	SLR Predicted Level	Modification Predicted Level	Criteria	SLR Predicted Level	Modification Predicted Level	Criteria	
R1	17	<10	44	27	21	47	42	15	43	19	<10	50	Yes
R2	32	<10	44	43	29	47	22	21	43	34	<10	50	Yes
R3	38	12	44	46	33	47	39	25	43	38	14	50	Yes
R4	39	14	44	45	34	47	42	28	43	39	16	50	Yes
R5	36	11	44	42	35	47	40	29	43	38	13	50	Yes
R6	41	15	44	46	36	47	35	31	43	42	18	50	Yes
R7	39	20	44	45	36	47	42	31	43	40	23	50	Yes
R8	34	20	44	43	32	47	39	27	43	35	24	50	Yes
R9	33	18	44	39	31	47	38	25	43	34	22	50	Yes
R10	21	20	44	33	30	47	33	24	43	21	23	50	Yes
R11	30	21	44	45	32	47	20	27	43	30	28	50	Yes
R12	25	25	44	40	37	47	38	31	43	26	31	50	Yes
R13	23	21	44	38	36	47	30	30	43	24	15	50	Yes
R14	22	21	44	36	33	47	27	27	43	24	14	50	Yes
R15	23	15	44	34	29	47	26	23	43	25	11	50	Yes
R16	18	11	44	27	25	47	27	19	43	20	<10	50	Yes
R17 (Com. Receiver)	41	15	65	46	35	65	35	30	65	N/A	N/A	N/A	Yes
R18 (Industrial receiver	69	34	70	64	49	70	53	43	70	N/A	N/A	N/A	Yes

Note: Red figures indicate that the noise prediction from the modification is higher than that the noise predictions in original EIS.

As identified in Table 6-1, compliance with all established criteria is predicted at all receivers during all time periods. With the exception of three receivers, the predicted noise levels from the Modification Proposal are lower than those presented within the assessment for the Current Approval. Higher predicted noise levels at these locations are likely due to a difference in noise modelling parameters or the noise models used and do not represent in an increase impact at those receivers. Notwithstanding this finding updated noise modelling for the project demonstrates that all sensitive receiver locations were below the adopted assessment criteria.

6.2.3 Mitigation measures

As the Modification Proposal is predicted to reduce the potential operational noise impacts at the majority of the surrounding receivers and would not exceed the established noise criteria, no additional noise mitigation measures are required beyond those already proposed in Current Approval.

6.3 Air quality, odour and GHG

6.3.1 Previous assessment

An Air Quality Impact Assessment (AQIA) was prepared by SLR in May 2016 (SLR Assessment) to support the Current Approval. Following this, to address submissions provided by key stakeholders as part of the RtS process, an additional Air Quality Memorandum was prepared by SLR in October 2016.

The SLR report identified several activities that may result in particulate emissions, including:

- loading/unloading and handling/processing of waste material;
- onsite vehicle movements; and
- wind erosion from waste stockpiles and exposed areas.

Based on an annual throughput of 300,000 tonnes per annum and the aforementioned emission sources, the initial AQIA identified that:

- Maximum 24-hour average cumulative (i.e. including background) $PM_{2.5}$ concentrations predicted at surrounding sensitive receptor locations are below the relevant ambient air quality criterion of 25 µg/m³.
- Annual average cumulative $PM_{2.5}$ concentrations predicted as a result of the proposed operation at surrounding sensitive receptor locations are well below the relevant ambient air quality criterion of 8 µg/m³.
- Maximum 24-hour average cumulative PM_{10} concentrations predicted at surrounding sensitive receptor locations are below the relevant ambient air quality criterion of 50 µg/m³.
- Annual average cumulative PM_{10} concentrations predicted as a result of the proposed operation are well below the relevant ambient air quality criterion of 30 µg/m³.
- Annual average cumulative dust deposition level predicted as a result of the proposed operation are well below the relevant ambient air quality criterion of 4 g/m²/month.
- Predicted TSP and dust deposition rates at neighbouring industrial sites which would indicate the potential for nuisance impacts are below the relevant criteria at the locations assessed. Annual average PM_{10} and maximum 24-hour and annual average $PM_{2.5}$ concentrations were also predicted to be below the relevant criteria.

- A slight exceedance of the 24-hour average criterion for PM_{10} (50 µg/m^3) was predicted at one of the industrial receptors assessed, receptor I3, where a maximum concentration of 57 µg/m^3 was predicted.

The Air Quality Memorandum provided as part of the RtS specifically addressed comments made by key stakeholders by updating the emissions inventory to include all control measures and re-modelling incremental and cumulative 24-hour average PM_{10} concentrations at surrounding sensitive/industrial receptors. During the RtS process the proposed throughput was reduced to 220,000 tpa. However, air quality modelling undertaken for the RtS continued to be based on 300,000 tpa.

With the revised emissions inventory and revised emission rates, cumulative 24-hour average PM_{10} concentrations at each receptor were calculated using the predicted increment from the Project and background 24-hour average PM_{10} concentrations outlined in the AQIA. When including the additional controls in the emission inventory, the maximum predicted 24-hour average PM_{10} concentrations at all receptors included in the model (including industrial sites) comply with the assessment criterion of 50 µg/m^3.

The results from the air quality assessments provided with the Current Approval are considered to be highly conservative as the assessment was undertaken for a throughput of 300,000 tpa instead of the 220,000 tpa proposed as part of the development approval.

6.3.2 Impact assessment

Wilkinson Murray have undertaken an air quality assessment to investigate the potential for air quality impacts from the Modification Proposal (Appendix D). The assessment provides a qualitative 'screening assessment' to determine the potential for air quality impacts from the proposed modifications and the need for further quantitative assessment.

The SLR Assessment was based on several inputs including a review of the existing environment and identification of sensitive receivers, an emissions inventory based on key activities at the site, identification of emission controls and the proposed annual throughput of 300,000. This assessment investigated the potential for a change to these inputs from the proposed modifications and the nature of the change (increased impact / decreased impact). In doing so, the need for further quantitative modelling can be identified.

The surrounding development of the Project Site is characterised by a mix of industrial developments including factories, automotive servicing, parts, panel beaters and painters, printing facilities, hardware and general supplies, manufacturing and warehousing. The closest residential receivers are located 200 m to the south-east along Barry Street and 250 m to the east, on the opposite side of Boundary Road. A review of the local area has been conducted and there has not been any significant changes in the land uses since the SLR Assessments.

The types of activities with the potential to generate emissions include:

- loading/unloading and handling/processing of waste material;
- onsite vehicle movements; and
- wind erosion from waste stockpiles and exposed areas.

These emission sources are consistent with the SLR Assessment and have not been altered by the Modification Proposal. To identify the potential impacts of the Modification Proposal on operational air quality, the effect of the modifications on each emission sources is provided below.

- Unloading materials from trucks:
  - Unloading of materials in the recycling shed is a relatively small dust emission. The proposed modification would not result in any change of the emissions inventory as the waste would be tipped within the shed at an activity rate consistent with the Current Approval.
- Material sorting/handling
  - The proposed modification would likely reduce the emissions as a proportion of the waste would now go directly to the truck for loading (adjacent to the product storage bays). Additionally, the number of product streams would be reduced, reducing the overall waste handling requirements.
- Loading product material to trucks
  - The proposed modification would not result in any change of the emissions inventory as the same amount of waste would be loaded into trucks.
- Onsite Hauling
  - The proposed modification would not result in any change of the emissions inventory as the 'vehicle kilometres travelled' on site remain the same.
- Wind erosion
  - The proposed modification would not result in any change of the emissions inventory as the site area is remaining the same.

The proposed modifications would have no impact on or would reduce emissions from emission sources as identified within the SLR Assessment. As such, it follows that the Modification Proposal would result in a similar or reduced level of impact compared to the Current Approval and further quantitative air quality assessment is not required.

Proposed throughput

The SLR Assessment for the EIS was based on a proposed throughput of 300,000 tpa. During the RtS process, it was agreed to reduce the proposed throughput to 220,000 tpa. However, updated air quality assessments produced for the RtS (as prepared by SLR) continued to be based on a 300,000 tpa throughput. Consequently, whilst the assessments demonstrated that the Current Approval would comply with all relevant assessment criteria, the results are highly conservative and significantly overestimate predicted air quality impacts. The estimated emissions from the project site when considering the reduction in throughput is presented in Table 6-2.

As the Modification Proposal would operate at an annual throughput of 220,000 and the proposed modifications would have no impact on or would reduce emissions from emission sources, the air quality impacts to surrounding receivers would be significantly less than those identified within the Current Approval. Consequently, additional quantitative modelling of air quality impacts from the Modification Proposal is not warranted.

Table 6-2 Comparison of estimated emissions from site at 300,000 tpa and 220,000 tpa

	Estimated Annual Emission Rate (Current Approval)			Estimated Annual Emission Rate (Modification Proposal)		
Activity	**TSP**	**PM10**	**PM2.5**	**TSP**	**PM10**	**PM2.5**
Unloading materials from truck	5.00	2.00	0.30	3.7	1.5	0.2
Material sorting/handling	9.00	4.00	0.60	6.6	2.9	0.4
Loading product material to truck	4.00	2.00	0.30	2.9	1.5	0.2
Onsite Hauling	168.00	32.00	7.80	123.1	23.5	5.7
Wind erosion	615.00	307.00	28.80	615.0	307.0	28.8
Total Site Emissions (kg/annum)	**801.00**	**347.00**	**37.80**	**751.3**	**336.3**	**35.4**

6.3.3 Mitigation measures

As the Modification Proposal is anticipated to have a reduced level of impact on air quality compared to the Current Approval, further mitigation measures beyond those already proposed in Current Approval are not required.

6.4 Hazards

6.4.1 Previous assessment

The EIS for the Current Approval included a screening assessment of the proposed storage quantities and delivery frequencies of dangerous good proposed to be used on site against the criteria as outlined in SEPP 33 – Hazardous and Offensive Development. The assessment identified:

- Two potentially hazardous goods were identified as requiring storage on site; LPG and Diesel. The proposed dangerous goods planned to be stored on site are below the screening thresholds and therefore not considered to be potentially hazardous.
- Maximum proposed movements at the site per week compared to the criteria in SEPP 33 identified that the estimated movements are substantially below the SEPP 33 thresholds in terms of load quantity and weekly movements.

As assessed the development is not considered to be a hazardous industry as defined in SEPP 33.

6.4.2 Impact assessment

The proposed modifications to the Current Approval would not change the types or quantities of dangerous goods to be transported to or stored on site. Storage locations for dangerous goods would also not by altered by the proposed modifications. As such, the Modification Proposal would not change the assessment as presented within the EIS for the Current Approval.

The Proposal site will not accept dangerous goods within waste. However, from time to time unexpected finds of materials such as asbestos, tyres, batteries, gas bottles, fire extinguishers and food may be encountered. These materials would be handled in accordance with a project specific Operational Environmental Management Plan (OEMP) procedures and appropriately stored for efficient disposal.

A separated area for storage of unexpected finds and materials, and dangerous goods would be demarcated within the one of the consolidated storage bays; incorporating an asbestos bin area, battery storage cage, fire extinguisher cage and gas bottle storage cage.

6.4.3 Mitigation measures

As the Modification Proposal would not result in a change to potential hazards as identified within the Current Approval, further mitigation measures beyond those already proposed in Current Approval are not required.

6.5 Waste management

6.5.1 Previous assessment

An assessment of the construction and operational waste management issues for the project was provided in the EIS for the Current Approval.

Construction waste for the project is expected to comprise materials typically associated with demolition and construction works. Asbestos based materials have been identified within the existing buildings and will need to be removed as the first stage of the demolition process.

Operational waste management at the site would consist of:

- Waste acceptance;
- Waste source control;
- On site storage requirements;
- Resource recovery requirements;
- Green waste management;
- Operational noise management;
- Dust and air quality management;
- Management and maintenance of stormwater infrastructure;
- Transport and Disposal (Waste Tracking);
- Stockpile Management;
- Special Waste Management (Asbestos and Tyres);
- Third party material sampling; and
- Weighbridge operation (including calibration);

During operation, waste would be managed through an Operations Environmental Management Plan (OEMP).

6.5.2 Impact assessment

Demolition works for the Current Approval have now been completed and the assessment of these impacts would not be altered by the Modification Proposal.

Construction of the project as described in the Current Approval commenced in July 2018. As the modification proposal does not significantly alter the type or scale of construction at the site, there would not be a change to construction impacts as described in the EIS for the Current Approval.

The Modification Proposal does not propose to alter the type or quantities of waste processed by the Project. Waste management activities at the site would generally be consistent with those identified within the Current Approval. The OEMP for the site as presented in the Current Approval would be updated to reflect changes to waste processing activities at the site.

6.5.3 Mitigation measures

As the Modification Proposal would not result in a change to the potential waste impacts identified within the Current Approval, further mitigation measures beyond those already proposed in Current Approval are not required.

6.6 Soil and water

6.6.1 Previous assessment

Water quantity and quality

A stormwater concept plan for the Current Approval was prepared in consideration of the water quality objectives contained within the Soil and Water Assessment report. Potential impacts of the Current Approval were assessed, in consideration of the sites water quality objectives to provide a quantitative assessment of stormwater runoff, pollutant load rates and predicted performance of the proposed stormwater management measures. The assessment identified that the mean annual runoff volume generated by the site would be 7.6ML/yr. The predicted performance of the pre-construction stormwater management system and the stormwater management system as proposed in Current Approval is outlined in Table 6-3.

Table 6-3 Pollutant load modelling results from the Current Approval

Parameter	Predicted pollutant removal rate %	
	Existing Stormwater management	Proposed Stormwater Management
Total suspended solids (kg/yr)	76	86
Total phosphorous (kg/yr)	29	57
Total Nitrogen (kg/yr)	0	21
Gross Pollutants (kg/yr)	5	84

The combination of the litter baskets, rainwater tank and the existing vortex separator will:

- Improve the quality of stormwater being discharged from the site;
- Provide adequate treatment in terms of reducing the key pollutants (i.e. gross pollutants, coarse sediment, suspended solids and free oils); but
- Provide limited yet sufficient treatment of other pollutants such as heavy metals and nutrients.

Erosion and sediment control

The predicted peak flow rates and runoff volumes for the Current Approval would be slightly reduced when compared to existing rates and volumes, the proposed development is not expected to result in increased erosion impacts in downstream waterways. During on-site construction works, erosion and sediment control will be established and maintained as per the erosion and sediment control plan.

Flooding

The site is unaffected by main stream flooding impacts. As minimal changes to the impervious surface area were proposed and existing stormwater easements and discharge points would be maintained, the Current Approval was not predicted to impact on local overland flooding or increase peak flow rates to the established stormwater network.

Leachate management

Runoff and leachate within the shed as proposed within the Current Approval would be captured within dedicated leachate sumps and would not have an impact on water quality.

6.6.2 Impact assessment

Water quantity and quality

The proposed modification would not alter estimated water quality and quantities as outlined in the Current Approval. As such changes to the management of stormwater at the project site as presented and approved as part of the Current Approval would not be required.

Erosion and sediment control

As the proposed modifications would not significantly alter catchments at the site and would not result in a change to the permeability they would not result in changes to erosion and sedimentation impacts as identified within the Current Approval.

Flooding

The proposed modifications would not significantly alter the site layout or stormwater infrastructure as proposed in the Current Approval. As such the proposed modifications would not result in a change to flooding impacts as identified in the EIS for the Current Approval.

Leachate management

The modification Proposal would not significantly change the management of leachate as described within the Current Approval. The fogging system and yard sprinklers as proposed within the Current Approval would be retained. Leachate would continue to be managed through dedicated leachate sumps which are separated from the stormwater management system.

6.6.3 Mitigation measures

As the Modification Proposal would not result in a change to the potential soil and water impacts identified within the Current Approval, further mitigation measures beyond those already proposed in Current Approval are not required.

6.7 Contamination

6.7.1 Previous assessment

A Phase 1 Contaminated Land Investigation was prepared to support the EIS as part of the Current Approval. The investigation identified that the subject site is suitable for ongoing use for industrial purposes.

As exiting site levels would be retained and ground disturbance would be minimal (limited to excavation for footings only) it is unlikely that groundwater will be encountered or contaminated by construction activities.

All operations will be conducted on sealed surfaces resulting in minimal impacts to on-site soil and groundwater contamination. The Construction Environmental

Management Plan (CEMP) developed for prior to commencement of construction of the Current Approval included protocols relating to the supervision, testing and handling of groundwater in the unlikely event that it is encountered during construction works.

6.7.2 Impact assessment

Construction for the Current Approval has been largely completed. The Modification Proposal does not propose to significantly alter site levels as described within the Current Approval. As the proposed modifications would require minimal additional excavation and are unlikely to encounter groundwater, potential contamination impacts associated with the Modification Proposal would not change from those presented within the EIS of the Current Approval.

A Construction Environmental Management Plan (CEMP) has been developed prior to commencement of construction of the Current Approval (and has been approved by DP&E). The CEMP includes protocols relating to the supervision, testing and handling of groundwater in the unlikely event that it is encountered during construction works.

All operations would continue to be conducted on sealed surfaces resulting in minimal potential contamination impacts to on-site soil and groundwater.

6.7.3 Mitigation measures

As the Modification Proposal would not result in a change to the potential soil and water impacts identified within the Current Approval, further mitigation measures beyond those already proposed in Current Approval are not required.

6.8 Access Traffic and Parking

6.8.1 Previous assessment

A Transport Impact Assessment (TIA) was prepared in June 2016 by GTA Consultants (GTA) to support the EIS for the Current Approval. To respond to issue raised by stakeholders during the submissions process an additional three separate Response to Submissions (RtS) letters were prepared by TTPP, providing additional information on traffic and parking issues.

2016 TIA

The 2016 TIA identified that the Current Approval would generate up to 430 (two way) vehicle movements per day, up to 27 per hour. The surrounding road network was assessed as having adequate capacity to cater for traffic generated by the development. A comparison of the existing and future intersection operating conditions showed that the impact of traffic generated by the development would not result in a significant change to the existing intersection Level of Service.

The assessment identified that the proposal would generate a statutory requirement of 9 parking spaces. However, 12 spaces would be required for the projected needs of the site.

RtS Update 1 (December 2016)

An additional TIA was prepared by TTPP as part of the initial RtS process undertaken in December 2016. The assessment investigated the distribution of traffic numbers over a 24 hour period (as the project was intended to operate 24 hours at this point in time). It was estimated that 2 to 6 trucks would arrive or depart at any hour over the night-time period. These traffic movements were assessed as having no impact on the surrounding road network.

The assessment included an on-site stacking and queuing plan intended to prevent queueing into Hearne Street and provided swept paths demonstrating that access could occur safely for a range of heavy vehicles without compromising road safety or efficiency.

RtS Update 2 (April 2017)

Following the initial RtS Stage, further concerns were raised by key stakeholders on a range of issues including traffic. To accommodate these concerns, several changes to the project were made and documented in a further update to the TIA which formed part of the RTS update Number 2 prepared in April 2017, including:

- Reduction of waste throughput of 220,000 tonnes per annum
- Change in hours of operation to be 6:00am – 10:00pm on Monday to Saturday
- Removal of the bin storage area on the lower deck to increase stacking spaces.

An additional assessment was produced by TTPP to address the changes to the project and the additional stakeholder concerns. This assessment found that:

- Additional measures should be implemented to improve on site road safety including the provision of traffic controllers at the site entrance and within the site, provision of road markings to clearly distinguish lane separation, installation of a ‘left turn only’ sign at the site exit.
- The number of vehicle movements at the site would substantially reduce as a result of the reduction in throughput to 220,000 tpa and the reduction of site operating hours. The number of trucks accessing the site would be around 182 on average.
- The proposed vehicle stacking arrangement could accommodate 31 vehicles stacked simultaneously.
- Reduced total vehicle numbers and the proposed stacking and traffic control arrangements would ensure trucks could be wholly accommodate within the site. (i.e. no queuing on Hearne Street.
- Swept paths of the largest vehicles could be accommodated on site without compromising stacking.
- Barry Avenue would not be used for any site related vehicle movements.

RtS Update 3 (July 2017)

In response to a request from key stakeholders for further information, an additional traffic response letter was produced by TTPP as part of RTS update 3 in April 2017. This further assessment found:

- During the peak traffic generating period between 11am and 2pm, it is estimated that 21 trucks are expected to arrive. Trucks have been assumed to have an average duration on site of 25 minutes. The 21 vehicles could be easily accommodated across nine (of 31) stacking spaces and queuing is not expected on Hearne Street.
- When including a 'worst-case' scenario in the stacking and queuing model (where the duration on site is doubled to 50 minutes), the vehicles within the peak traffic generating period could be accommodate across 18 (of 31) stacking spaces and queuing is not expected on Hearne Street.
- There will be sufficient stacking capacity onsite to accept trucks at the future RRF in typical and worst-case operating conditions without causing an impact on Hearne Street.
- Under the supervision and direction of Traffic Controllers and Weighbridge Operators, queuing of heavy vehicles would be managed completely within the site and would not queue back onto Hearne Street.

6.8.2 Impact assessment

An updated TIA has been prepared by TTPP (Appendix E) to assess potential traffic impacts from the Modification Proposal.

Traffic generation

The Modification Proposal does not propose to alter the throughput volume, vehicle numbers or vehicle mix at the site from those described in the Current Approval (detailed in RtS Update 2). Future daily traffic generation is estimated to be 364 vehicle movements generated by 182 vehicles (i.e. one vehicle generates two movements). The percentage split of vehicle types comprises:

- Delivery
  - Utes to HRVs - 93%
  - Articulate vehicles – 7%
- Collection
  - Articulate vehicles – 100%

The hourly profile for waste deliveries / collections for the Modification Proposal and a comparison to the Current Approval is shown in Table 6-4 and Figure 6-1.

Table 6-4 Comparison of the hourly profile from the Current Approval to the Modification Proposal

Starting hour	Current Approval Truck movements per hour	Modification Proposal Truck movements per hour
6:00	5	17
7:00	6	18
8:00	11	13
9:00 [1]	16	13
10:00	20	13
11:00	21	13
12:00	19	18
13:00	16	18
14:00	14	18
15:00	11	11
16:00 [2]	7	5
17:00	7	5
18:00	8	5
19:00	8	5
20:00	7	5
21:00	6	5
Total	**182**	**182**

1 Road network AM peak

2 Road network PM peak

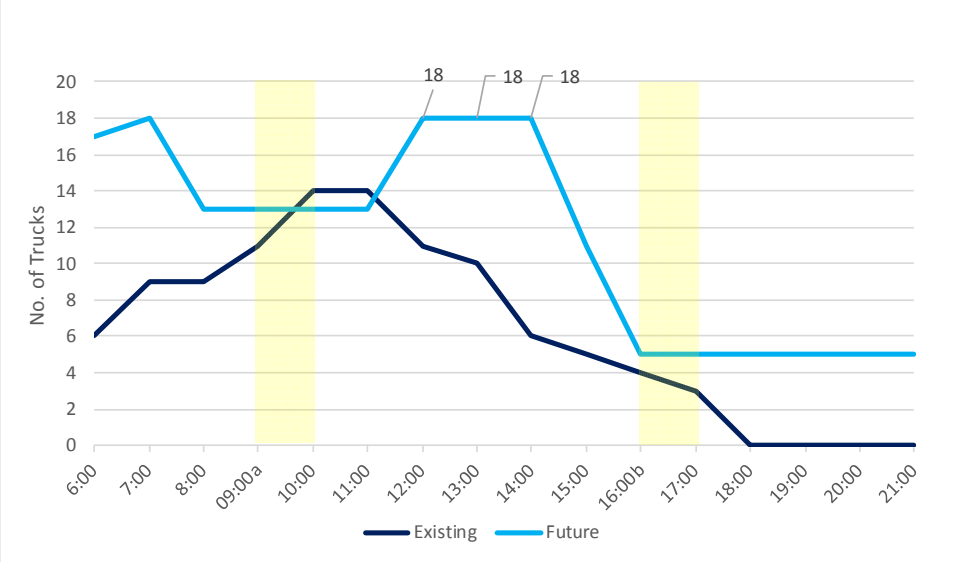


Figure 6-1 Anticipated hourly traffic profile

Whilst the total number of vehicles accessing the site would remain the same from the Current Approval to the Modification Proposal the number of vehicles during the 'busiest' hour and during the AM and PM peaks would reduce. As shown in Table 6-4, the Modification Proposal for the peak traffic generating period would result in 18 vehicles accessing the site per hour compared to 21 vehicles in the Current Approval. In the AM and PM road network peaks, the Amended Proposal would be expected to generate 13 trucks per hour and 5 trucks per hour, respectively. Hourly vehicle generation in both peak periods would be less than those estimated under the Approved Proposal operation (namely, 16 trucks and 7 trucks, respectively). For the Modification Proposal, vehicle numbers would increase slightly in the early morning.

These changes to the hourly profile are the result of increased site efficiencies in waste delivery and collection activities allowing greater control over the management of anticipated deliveries and collections. Delivery vehicles would be shifted to the early morning, to ensure there is sufficient waste for processing throughout the day and to minimise impacts on the surrounding road network during the AM and PM peaks. In addition to this, sites anticipated to receive the processed product would operate on similar hours to the Mortdale facility. As such, a shift in processing peak is required to allow the majority of waste to be processed and loaded in collection vehicles with sufficient time for these vehicles to reach the receival site prior to close.

Traffic modelling

Traffic modelling undertaken for the Current Approval indicates that the surrounding road network would operate at a Level of Service B or higher both with and without the approved development. As identified in Table 6-4, traffic generated by the Modification Proposal during the road network peak periods is expected to be lower than previously assessed. As such, the Modification Proposal would have comparatively less impact on level of service and the future road network would be expected to continue to perform at a level of service B or better.

Parking provisions

For the purpose of this assessment, the parking assessment methodology remains consistent with the TIA for the Current Approval. Parking provisions have been determined on a 'first principles' basis. This was deemed the most appropriate method as Hurstville City Council's Development Control Plan (DCP) does not provide parking rates for a 'resource recovery facility'. This methodology aligns with the DCP objective PC1.c which states that car parking is to be "provided according to projected needs".

Considering that there would be an average of eight workers on-site per day (and up to 10 workers per day) 11 car parking spaces would sufficiently accommodate the parking demand generated by employees and visitors associated with the Amended Proposal.

Swept path analysis

A swept path analysis of on-site vehicles movements has been undertaken using Vehicle Tracking software in AutoCAD. Turn paths of the largest trucks proposed to access the RRF have been reviewed, including a 19m semi-trailer, 19m truck-and-dog combination and 11m front-lift truck (HRV). Swept paths plans showing the proposed manoeuvrers for the largest trucks whilst on-site are contained in the TIA in Appendix E.

The assessment indicates that there is sufficient space on-site for vehicles of all types anticipated to access the site, to undertake the required turning movements in order to access the tip floor and both waste collection points (i.e. bulk loadout area and

waste storage bays). The assessment also indicates that there is sufficient space for vehicles to tip and the proceed directly to one of the two collection points.

Under the proposed site layout, all vehicle movements could be undertaken in a forward direction with the exception of a minor reverse manoeuvre require to tip waste and for vehicles exiting the bulk loadout area. This would minimise potential safety and vehicle conflict issues. Any reverse manoeuvres undertaken on-site would be done so under the supervision of on-site traffic controllers as identified in the Current Approval.

On-site stacking

Proposed modifications to the site layout including separated points for waste delivery and collection, two delivery (tipping) points and two collection points and the automated gantry crane would improve site operations, resulting in significant efficiencies. These changes (in particular, the ability to tip two trucks simultaneously) would result in reduced truck turnaround times on-site (i.e. duration a truck spends on-site between entry and exit) from 25 minutes to 17 minutes when compared to the Current Approval. This reduced turnaround time is supported by September 2017 survey data of trucks tipping at an RRF facility that operates similarly to how the Amended Proposal would operate in the future.

A 17 minute turn around time has therefore been used to assess stacking requirements for the Modification Proposal under a ‘typical’ scenario. In the unlikely event that an incident occurs that results in operational delay, the turnaround time could temporarily increase. This occurrence would be infrequent and would be considered to reflect a ‘worst-case’ stacking scenario. A turn around time of 25 minutes has been used to assess stacking requirements for the Modification Proposal under a ‘worst case’ scenario.

The proposed modifications to the Current Approval include a reduction in the number of available truck stacking spaces to accommodate modifications designed to increase site efficiency. The Modification Proposal would reduce available stacking spaces from 28 to 15.

Based on a turnaround time of 17 minutes on-site each stacking space could accommodate 3.5 trucks in one hour (60 minute / 17 minutes). Therefore, during any hour of operation across the day the proposed stacking arrangement could accommodate the turn-over of 52 trucks (3.5 trucks x 15 spaces). The availability of stacking spaces within the site would be able to adequately store the 18 trucks expected to arrive during the peak traffic generating period. These 18 trucks could be accommodated across six stacking spaces leaving 9 spaces vacant (see Figure 6-2).

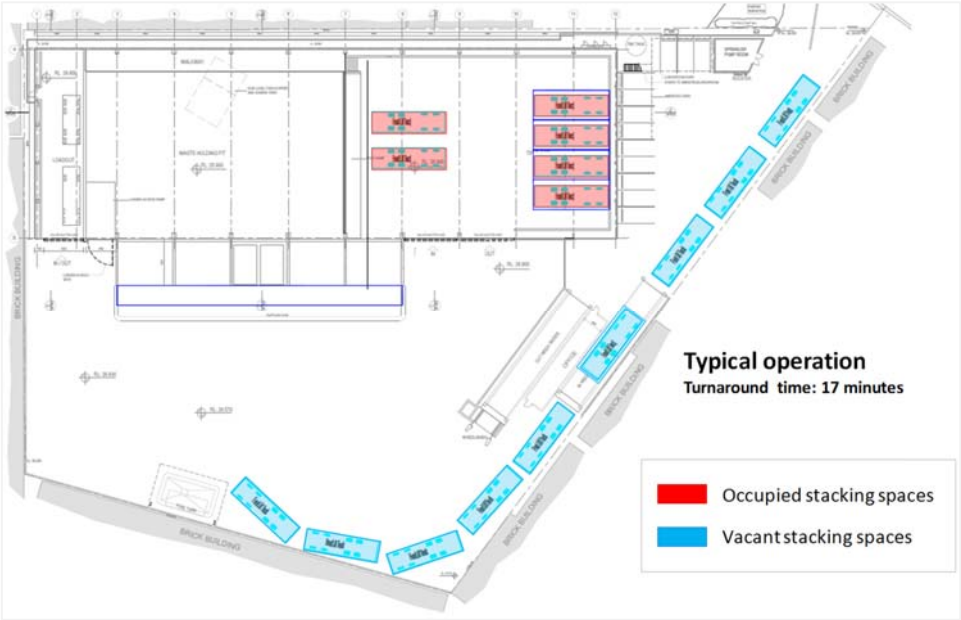


Figure 6-2 Stacking arrangements in the 'typical' operation scenario

In the worst-case scenario, the turnaround time could be up to 25 minutes and each stacking space to accommodate 2.4 trucks in one hour (60 minute / 25 minutes). In this scenario, the 18 trucks in the peak period would be adequately accommodated across eight stacking spaces. As a result, there would be seven vacant stacking spaces remaining which could accommodate a potential overflow of vehicles in the event of an incident occurring (see Figure 6-3).

The18 trucks expected to access the RRF in the busiest period of site operation would be sufficiently accommodated within the premises under the modified site layout. In the event of incident occurring, the proposed stacking plan would adequately accommodate these trucks without causing queuing into Hearne Street.

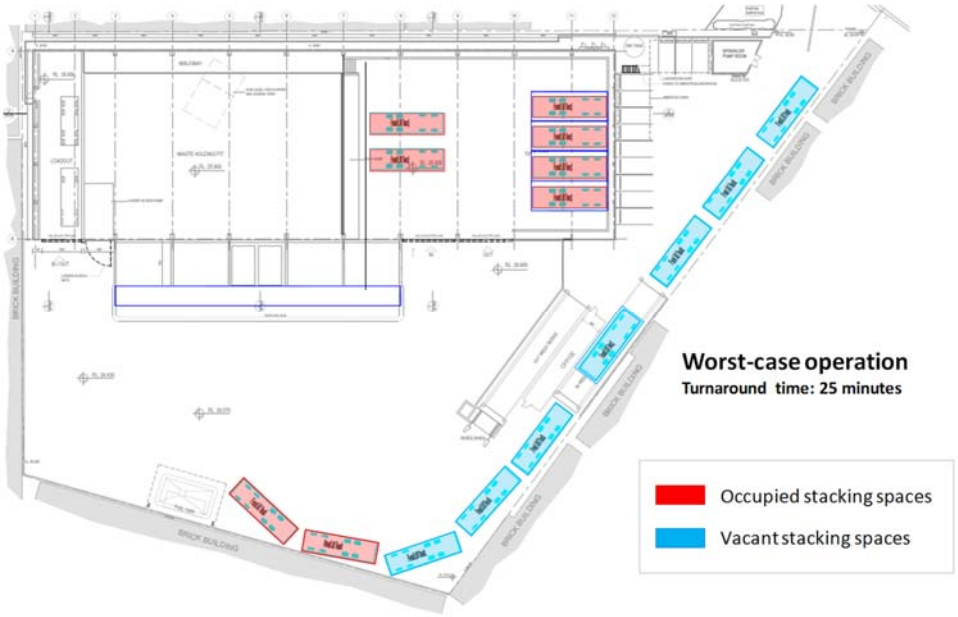


Figure 6-3 Stacking arrangements in the 'worst-case' operation scenario

Further detailed analysis of stacking under different vehicle mix scenarios across a 'typical' day is provided in Appendix E.

6.8.3 Mitigation measures

As the Modification Proposal would not result in a change to the potential access, traffic and parking impacts identified within the Current Approval, further mitigation measures beyond those already proposed in Current Approval are not required.

6.9 Cumulative

A cumulative assessment considers the potential cumulative impacts that may arise as a result of the project.

The cumulative impact assessment undertaken for the Current Approval summarised the assessment of cumulative impacts from within each of the individual technical studies provided for the EIS, specifically:

- Noise
- Air quality
- Traffic
- Water cycle management
- Socio-economic

The assessment found that there was no potential for significant cumulative impacts from the Current Approval. As the technical aspects of the Modification Proposal would have a similar or reduced level of impact when compared to the Current Approval it would similarly not result in a cumulative impact.

7 SUMMARY OF MITIGATION MEASURES

This Modification Proposal has identified a range of environmental impacts and recommended management and mitigation measures to avoid, remedy or mitigate these impacts.

In general, the existing mitigation measures are considered to be suitable to mitigation the impacts of the project as modified (through this and previous modification proposals). In addition to those already identified as part of the Current Approval a summary of the measure identified as relevant to the Modification Proposal is provided in Table 7-1.

Table 7-1 Mitigation measures in addition to those identified in the EIS

Aspect	Mitigation measure
Visual impacts and built form	• The relocated amenities building would be designed to be visually consistent with the remainder of the development.

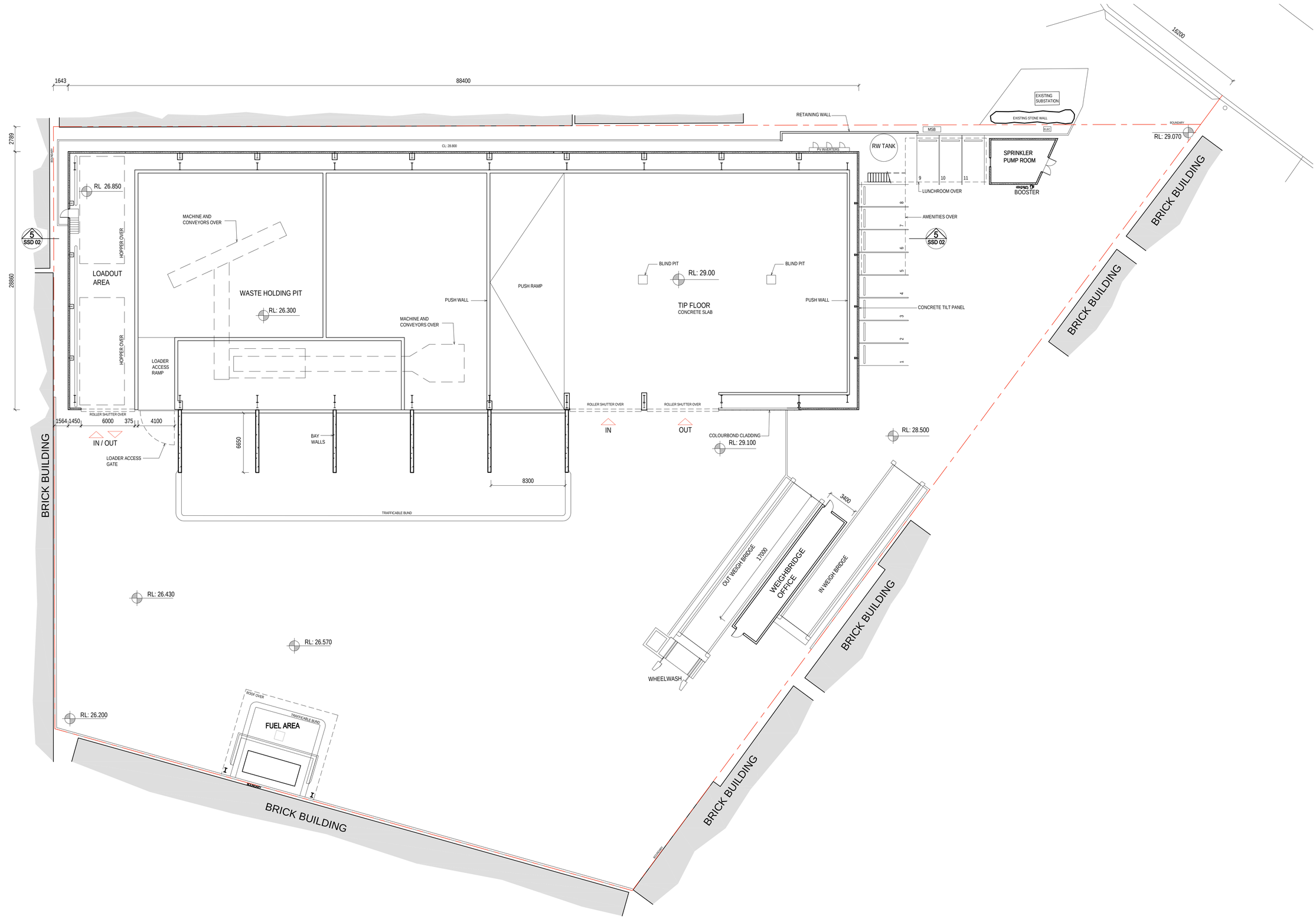
8 CONCLUSION

To optimise the efficiency of Bingo's broader resource recovery network and improve resource recovery outcomes, Bingo proposes to modify the Current Approval (the Modification Proposal). Modifications to the current approval as part of the Modification Proposal include:

- Reduced scale of processing and recycling equipment
- Changes to the layout of the recycling building and provision of a new entry and exit point to the recycling building
- Relocation of the outbound weighbridge
- Modification to site levels to accommodate processing changes
- Relocation of amenities and lunchroom
- Expansion of the incoming waste receival area
- Changes to parking arrangements
- Consolidation of external product storage bays
- Administrative changes

This modification report assess the potential impacts of the proposed modifications and concludes that with the implementation of the mitigations measures as proposed in Section 7, the Modification Proposal would result in a similar or reduce impact to that presented within the EIS for the Current Approval.

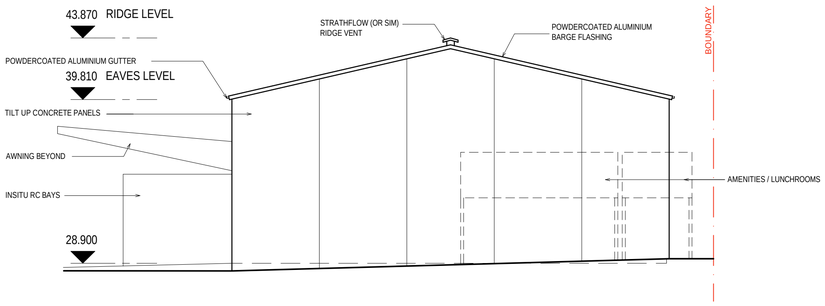
APPENDIX A SITE LAYOUT PLANS



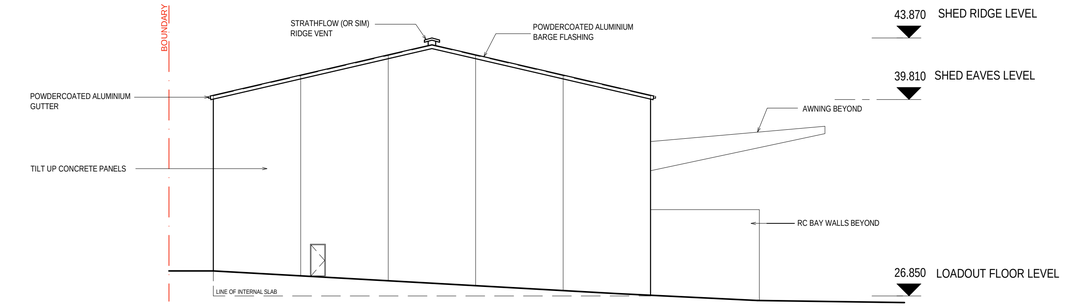
REV.	DATE	NOTE
01	21.02.2019	ISSUED FOR SSD MOD

DRAWING	GROUND FLOOR PLAN	DWG NO. SSD 01	REV 01
CLIENT	BINGO INDUSTRIES	SCALE 1:200 @ A1, 1:400@A3	
SITE	20 HEARNE STREET, MORTDALE		

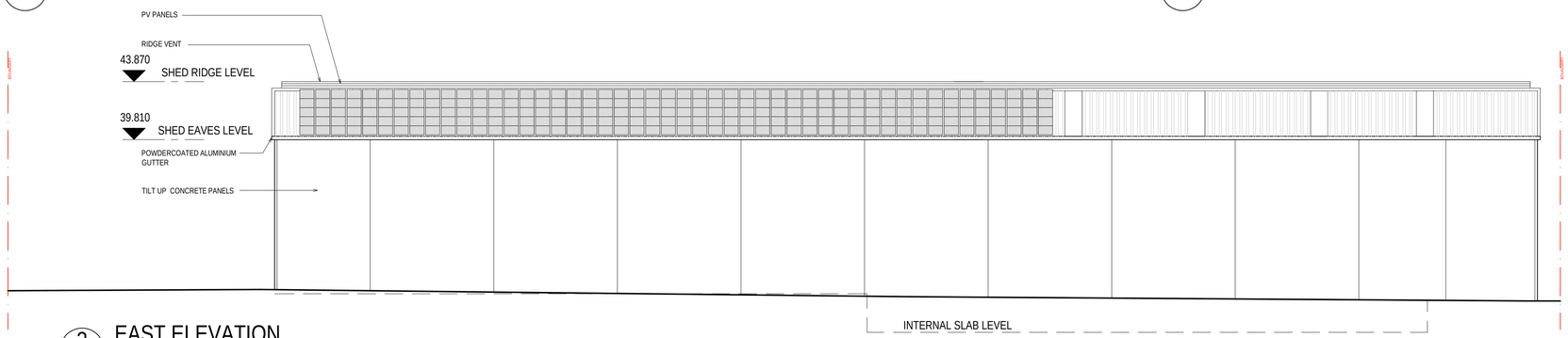
DEWCAPE
DISTINCTION IN BUILDING



1 SOUTH ELEVATION



2 NORTH ELEVATION



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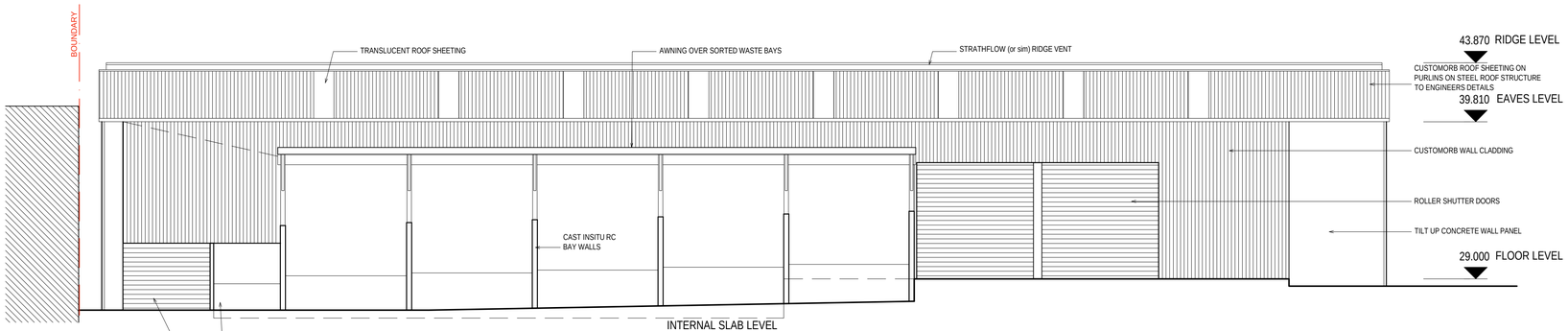

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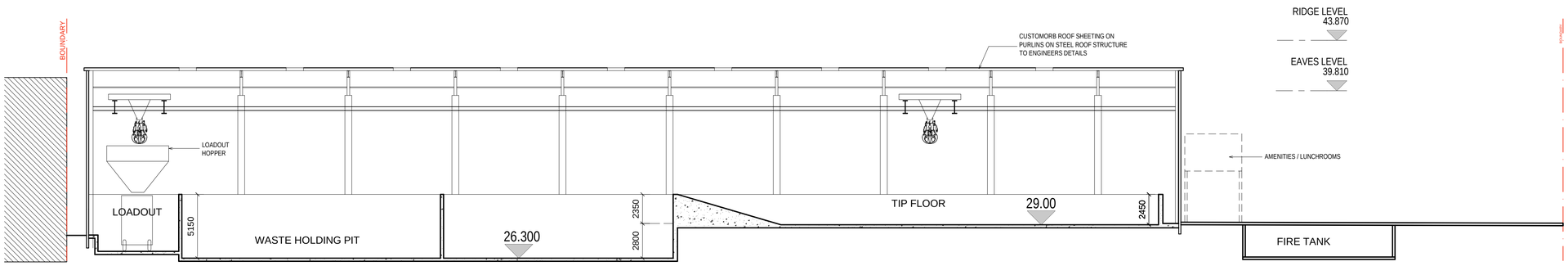


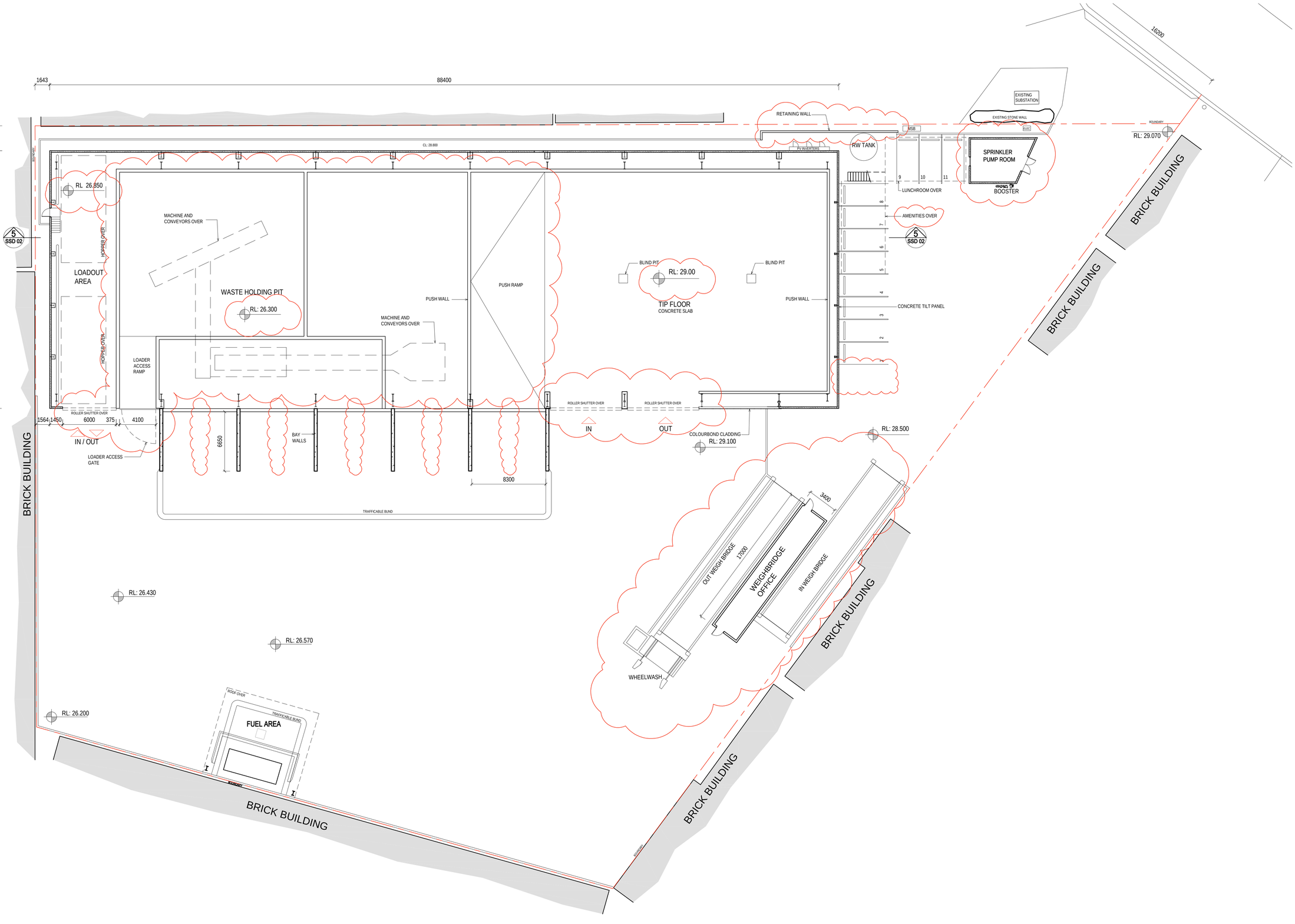
5 SECTION

REV.	DATE	NOTE
01	21.02.2019	ISSUED FOR SSD MOD

DRAWING	ELEVATIONS & SECTION	DWG NO. SSD 02	REV 01
CLIENT	BINGO INDUSTRIES	SCALE 1:200 @ A1, 1:400@A3	
SITE	20 HEARNE STREET, MORTDALE		

DEWCAPE
DISTINCTION IN BUILDING

APPENDIX B MODIFIED SITE PLANS



REV.	DATE	NOTE
01	21.02.2019	ISSUED FOR SSD MOD

DRAWING	GROUND FLOOR PLAN	DWG NO. SSD 01	REV 01
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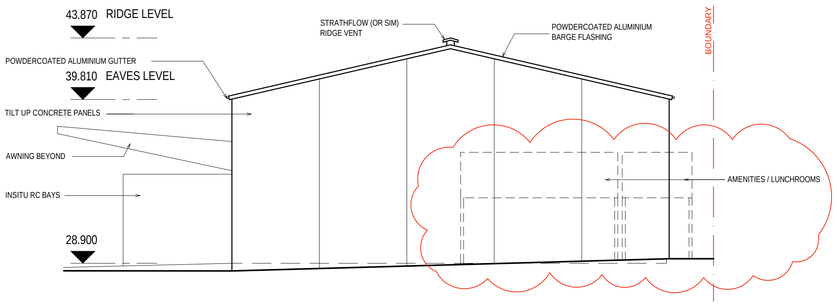
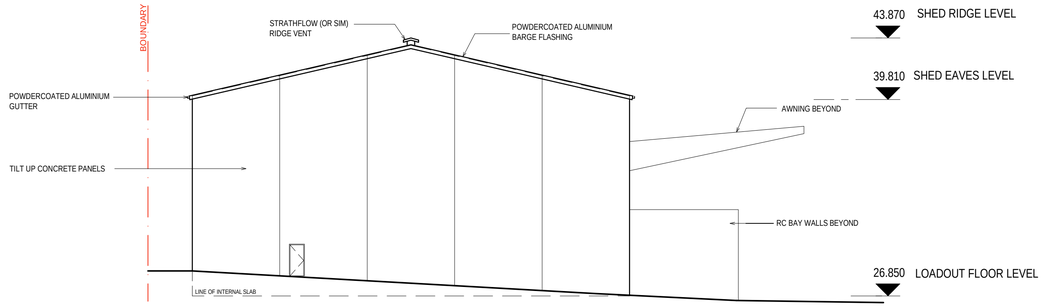
SITE	20 HEARNE STREET, MORTDALE		

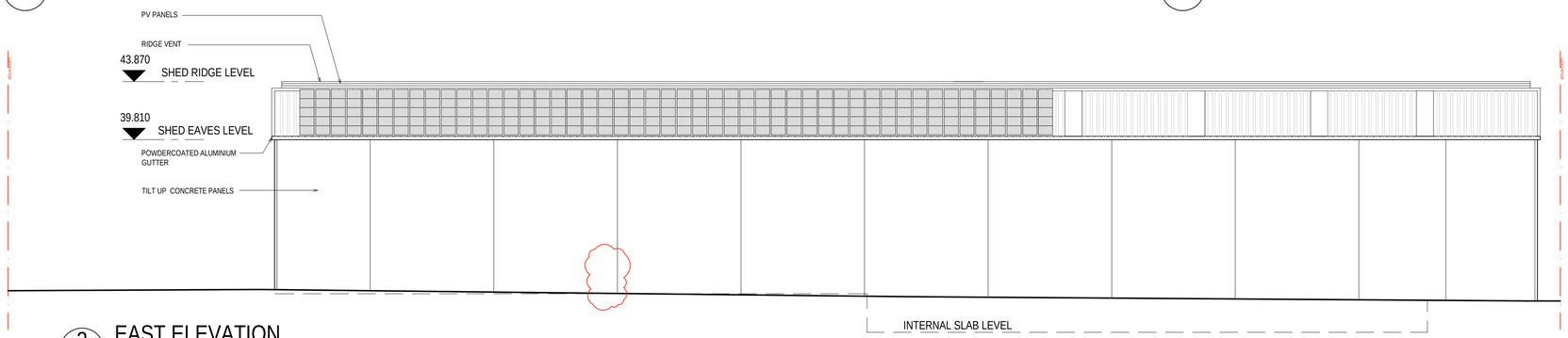
DEWCAPE
DISTINCTION IN BUILDING



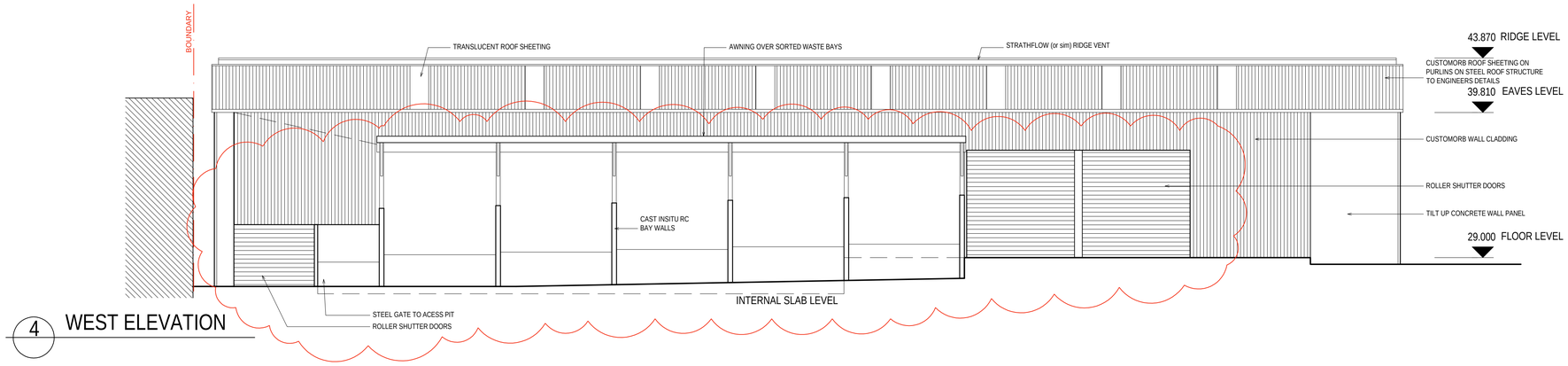
1 SOUTH ELEVATION



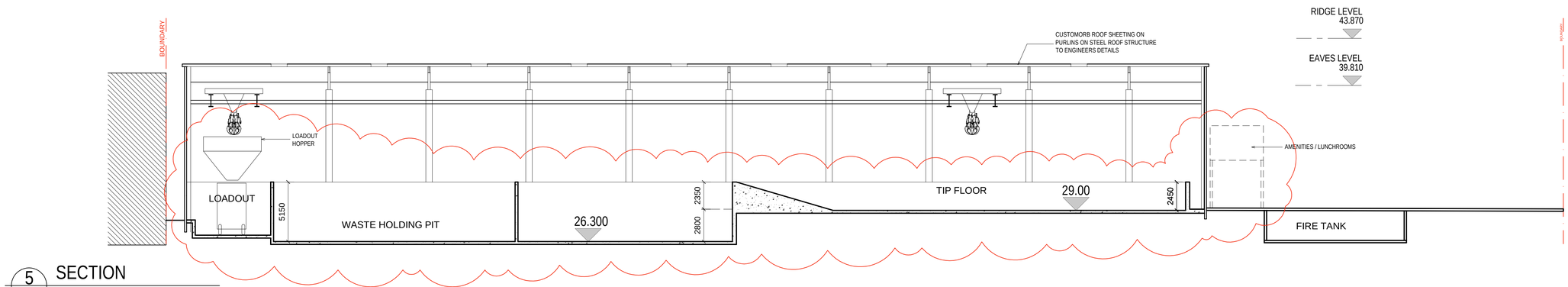
2 NORTH ELEVATION



3 EAST ELEVATION



4 WEST ELEVATION



5 SECTION

REV.	DATE	NOTE
01	21.02.2019	ISSUED FOR SSD MOD

DRAWING	ELEVATIONS & SECTION	DWG NO. SSD 02	REV 01
CLIENT	BINGO INDUSTRIES	SCALE 1:200 @ A1, 1:400@A3	
SITE	20 HEARNE STREET, MORTDALE		

DEWCAPE
DISTINCTION IN BUILDING

APPENDIX C UPDATED OPERATIONAL NOISE IMPACT ASSESMENT

ACOUSTICS AND AIR

MORTDALE RESOURCE RECOVERY FACILITY

20 HEARNE ST, MORTDALE

REPORT NO. 19036
VERSION B

FEBRUARY 2019

PREPARED FOR

ARCADIS AUSTRALIA PACIFIC PTY LTD
LEVEL 16, 580 GEORGE STREET
SYDNEY

WILKINSON MURRAY

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	4 February 2019	Remi Larmandieu	John Wassermann
B	Draft	7 February 2019	Remi Larmandieu	John Wassermann

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TABLE OF CONTENTS

GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

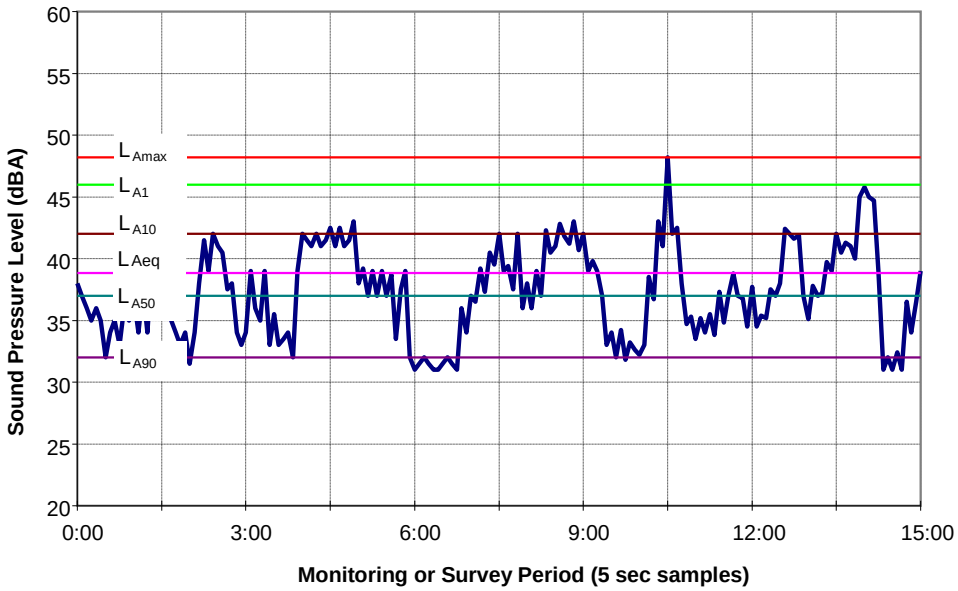
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



1 INTRODUCTION

Wilkinson Murray Pty Limited has been engaged by Arcadis on behalf of Bingo Industries to conduct a noise impact assessment of the Mortdale Resource Recovery Facility operations. This assessment intends to accompany the application for a number of minor changes to the approved plans for the existing site, approved under SSD7421, at 20 Hearne St, Mortdale.

A Noise and Vibration Impact Assessment prepared by SLR and dated 28 June 2016 was conducted to support the initial State Significant Development Application.

This assessment provides an updated assessment on the nearest residential receptors to the existing facility for future operations, taking into account the proposed modifications.

This assessment has been prepared based on monitoring results and criteria established in the approved SSD7421 assessment.

The scope of this noise impact assessment includes modified operational noise predictions (i.e. noise from the site and associated fixed and mobile equipment including; internal equipment, unloading and loading activities, etc.) impacting on nearby receivers.

The following sections of this assessment detail the noise assessment methodology, noise assessment criteria, and the noise predicted levels at the receivers.

2 SITE DESCRIPTION

The Mortdale Resource Recovery Facility site is located within an established industrial area with many industrial facilities and associated activities taking place around the site.

A review of the local area has been conducted and there has not been any changes in the land uses compared to the original SLR noise assessment. Therefore, for the purpose of consistency with the approved SLR Noise and Vibration Impact Assessment, the same receivers have been considered for this assessment as presented in Table 2-1.

Table 2-1 Noise Receivers Types and Locations

Receiver	Address	Type of Receiver
R1	147 Boundary Road	Residential
R2	128 Boundary Road	Residential
R3	106 Boundary Road	Residential
R4	55 Boundary Road	Residential
R5	27 Barry Avenue	Residential
R6	41 Anderson Avenue	Residential
R7	64 Roberts Avenue	Residential
R8	45 Roberts Avenue	Residential
R9	72 Lorraine Street	Residential
R10	46 Lorraine Street	Residential
R11	18 Lorraine Street	Residential
R12	27 Hannons Street	Residential
R13	12 Turpentine Avenue	Residential
R14	6 Pritchard Place	Residential
R15	824 Forest Road	Residential
R16	38 Anderson Road	Residential
R17	48 Barry Avenue	Childcare Centre
R18	128 Boundary Road	Industrial

Receivers locations are presented in Figure 2-1.

Figure 2-1 Existing Mortdale Resource Recovery Facility Site and Receivers

Image courtesy of Six Maps - Photographed 22 July 2018

3 PROPOSED MODIFICATION TO APPROVED OPERATIONS

3.1 Proposed Modifications Summary

This modification under Section 4.55 (1A) of the *Environmental Planning & Assessment Act 1979* (EP&A Act) seeks approval from the Department of Planning and Environment (DPE) for a number of minor changes to the approved plans for the existing Mortdale Resource Recovery Facility (RRF) (approved under SSD7421) at 20 Hearne St, Mortdale (the site).

The proposed modifications to the project are:

- Designation of a new bulk loadout area for separated waste to be further processed at a centralised advanced recycling facility at the north eastern end of the recycling building;
- Provision of a new entry and exit point to the recycling building at its south western extent. This has the most potential for additional noise impact;
- Relocation of the outbound weighbridge;
- Modification to the site administration/office layout;
- Modifications to site levels to accommodate new loadout area and entry and exit for trucks delivering waste;
- Relocation of the amenities and lunchroom to be located above car spaces in the eastern portion of the site;
- Modifications to processing plant resulting in simplification to processing. A gantry crane is proposed to be used to load trucks in lieu of a front end loader;
- Expansion of the incoming waste receival area;
- Removal of one car park space (from 12 to 11); and
- Consolidation of storage bays from 9 to 5.

Proposed modifications to the Approved Plans include the following elements:

- Car parking
- Office and weighbridges
- Truck loadout and access to recycling facility
- Site levels.

As per Section 115 (1) (e) of the *Environmental Planning & Assessment Act 1979* Regulation, the proposed modifications are required to improve the efficiency of the overall site layout and operation of the Development. The proposed modifications would also enable Bingo to maximise resource recovery across their broader network which has expanded. The modification would maintain the environmental management and mitigation measures committed through the EIS and conditions of approval.

3.2 Layout Changes to the Recycling Building

A new bulk loadout area located at the north eastern end of the recycling building, and a new entry and exit for trucks delivering waste to the site via the south western end of the building, are reflected on the Proposed Site Layout Plan. This would enable trucks to access the bulk loadout area in a forward direction or via performing a turn in and reverse manoeuvre. Other minor changes to the site layout plan include a reduction in the number of product storage bays but with maintenance of the same footprint to that authorised on the approved plans, re-orientation of the out weighbridge and wheel wash and reduction in office and administration building footprint and relocation of amenities to building to the eastern portion of the site.

A new entry and exit would be established for the RRF building to allow trucks delivering waste to the site to enter and exit via the south western end of the recycling building. This would enable trucks to access the waste pit by a more efficient route.

3.3 Process Description

Mixed waste would be tipped onto the tipping floor and inspected for any non-compliant waste. If there is no non-compliant waste, the waste would be pushed into the waste holding area by a front end loader. If there is non-compliant waste found in the waste, the load would be rejected and reloaded for removal from site and disposal at an authorised facility.

Once the mixed waste is in the waste holding area, an overhead gantry crane with a 3 cubic metre capacity grab will lift the mixed waste into a feed hopper. The feed hopper will regulate the flow of the mixed waste stream onto a screener, which will separate the mixed waste stream into two recovered streams. Material which is >60mm in size will return to the waste holding area via a conveyor to be loaded out for further processing at an advanced recycling facility within Bingo's network. The overhead gantry crane will then lift the processed waste from the waste holding area to the overhead loadout bunker in readiness for loading.

Material which is <60mm in size will be transported by conveyors to either a truck for direct loading (adjacent to the product storage bays), or to the product storage bays (if a truck is not present for loading).

The overhead gantry crane is a critical component in the operations of the facility, and therefore a second crane will be provided for redundancy, to be used either in peak times, or in the event that the primary crane is undergoing maintenance.

The crane is automatically programmed to carry out a regular pattern of loading the feed hopper and loading the overhead loadout hopper but can also be manually operated to remove larger items of steel, timber, large concrete and textiles from the incoming mixed waste stream for storage in the product storage bays.

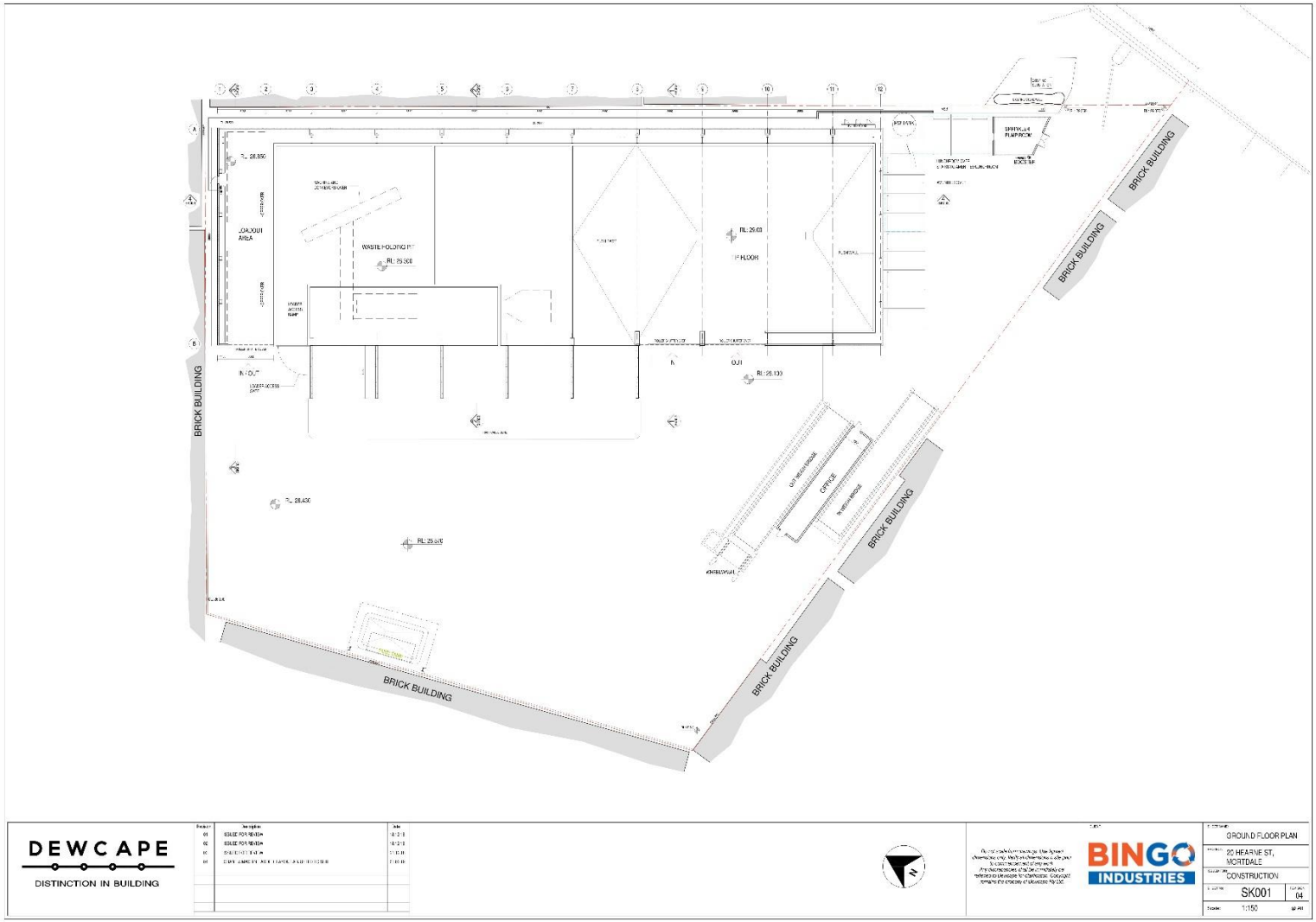
3.4 Hours of Operation

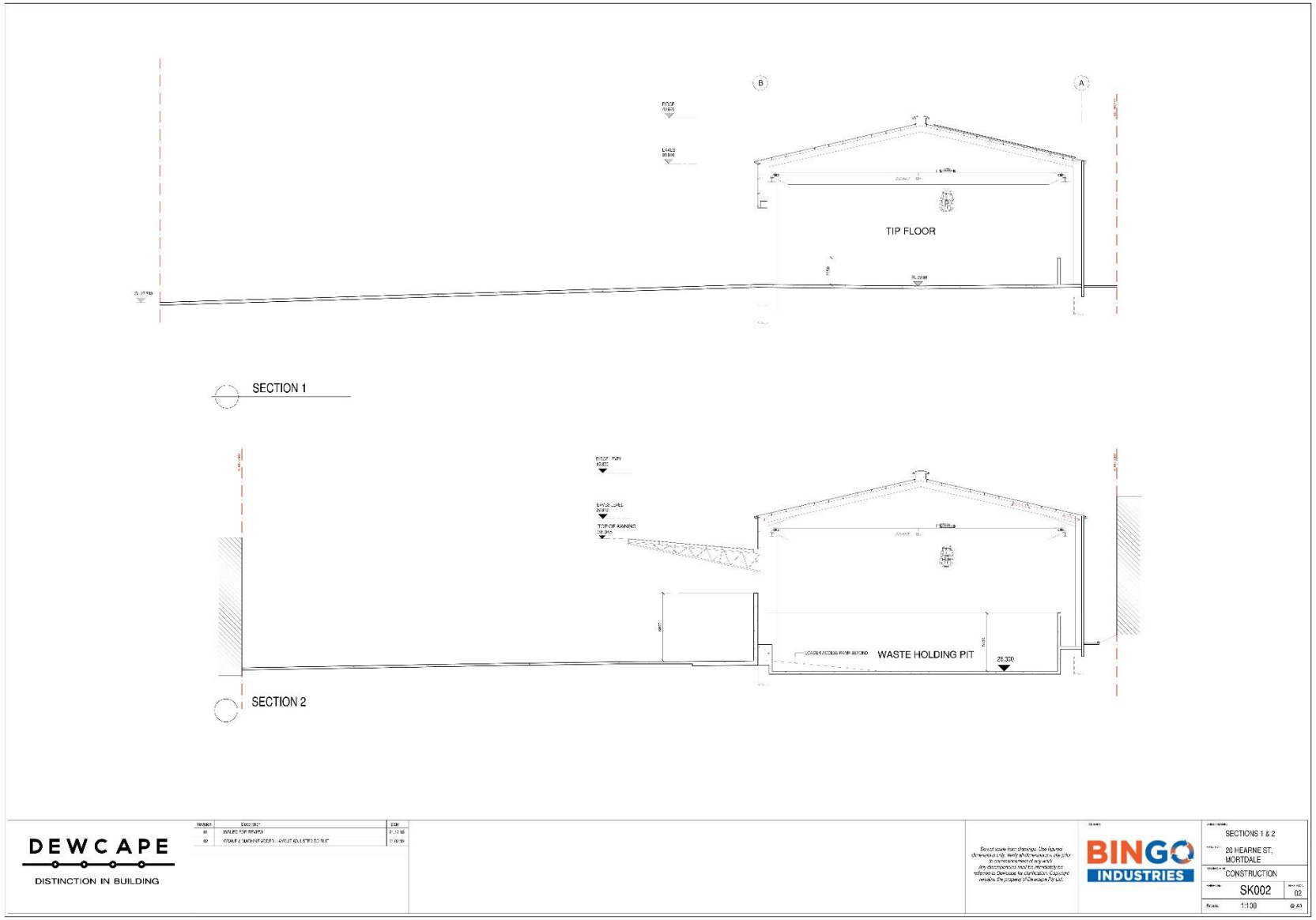
The site is to continue operating during the same approved hours of operation i.e. Monday to Saturday, 6am to 10pm, as per condition B25 of the development consent.

3.5 Proposed Layout

Figure 3-1 show the proposed layout changes and equipment at the Mortdale RRF.

Figure 3-1 Proposed layout changes and equipment at the Mortdale RRF

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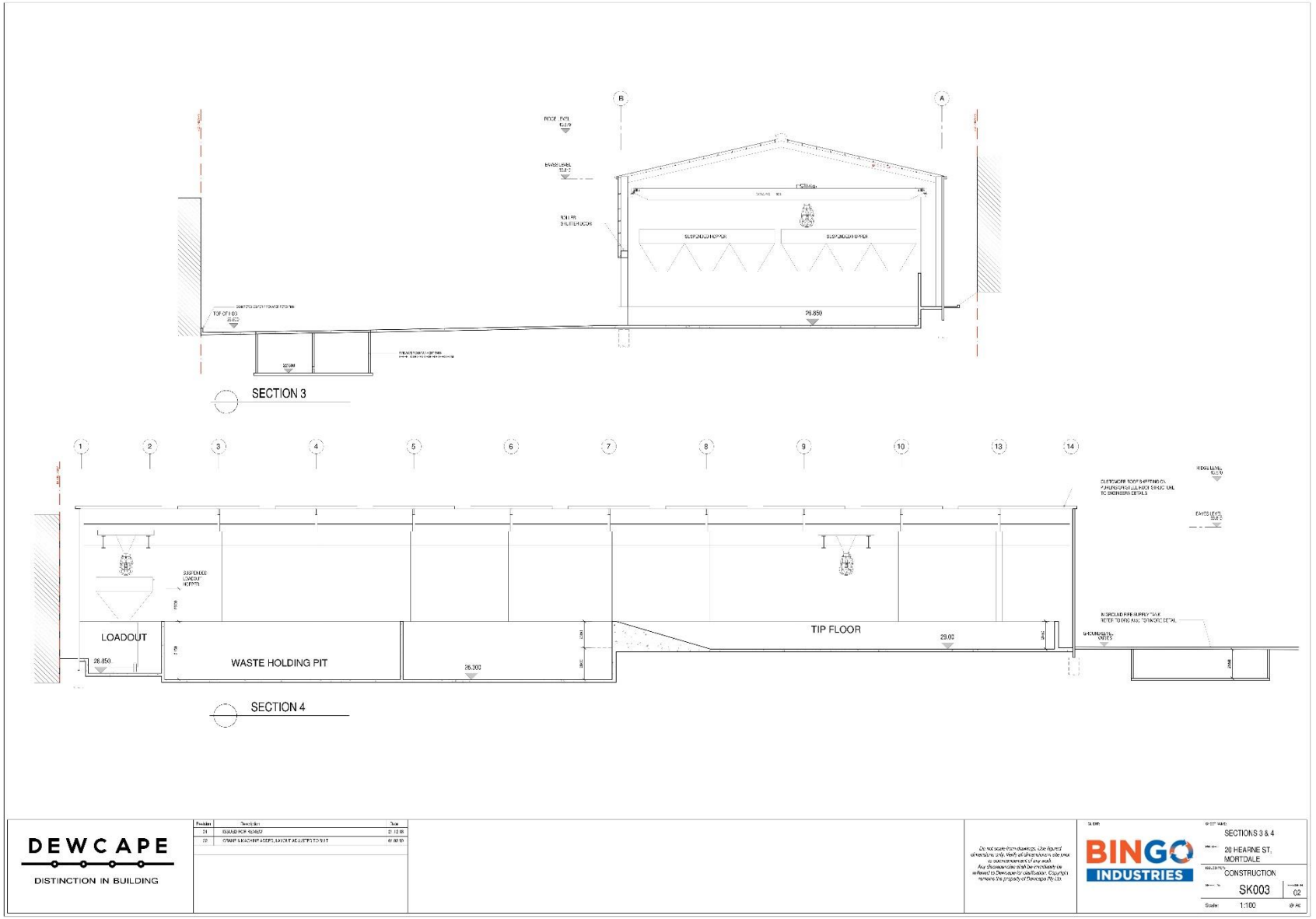
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SECTIONS 3 & 4
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MORTDALE
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Table 5-2 SLR Predicted Noise Levels and Criteria (from Approved EIS) and Expected Noise Increase as a result of proposed modifications

4 NOISE CRITERIA

4.1 Background Noise Monitoring

For the purpose of characterising the existing acoustical environment at sensitive receivers, background noise monitoring was conducted by SLR in February 2015. The monitor was located at Receiver R6 (41 Anderson Avenue) between Wednesday 11 February and Wednesday 18 February 2015.

Measured ambient noise levels are presented in Table 4-1.

Table 4-1 Measured Ambient Noise Levels (SLR Monitoring)

Measurement Descriptor	Noise Levels– (dBA)					
	Daytime 7.00am-6.00pm		Evening 6.00-10.00pm		Night Time 10.00pm-7.00am	
	$L_{Aeq,(period)}$	RBL (L_{A90} Background)	$L_{Aeq,(period)}$	RBL (L_{A90} Background)	$L_{Aeq,(period)}$	RBL (L_{A90} Background)
Receiver R6: 41 Anderson Avenue	57	42	55	38	54	34

4.2 Approved Noise Criteria

The noise criteria set out in the initial SLR report are summarised in Table 4-2.

Table 4-2 Noise Criteria for Receivers

Receiver type	Time of Day (4)	ANL $L_{Aeq,(period)}$ (1)	Measured RBL $L_{A90,15minute}$ (2)	Measured $L_{Aeq,(period)}$ Noise Level	Intrusive $L_{Aeq,15min}$ Criterion for New Sources	Amenity $L_{Aeq,(period)}$ Criterion for New Sources (3)	Sleep Disturbance Criteria
Residential	Morning Shoulder Period (6am–7am) (6)	-	39	55	**44**	45	INP 50 RNP 60-65 (5) and 75-80(6)
	Day	60	42	57	**47**	57	-
	Evening	50	38	55	**43**	45	-
	Night	45	34	54	**39**	44	INP 50 RNP 60-65(5) and 75-80(6)
Childcare Centre	When in use	Peak hour $L_{Aeq(1hour, internal)}$ (8) 40	-	-		$L_{Aeq(1hour, external)}$ (8) **65**	-
Industrial	When in use	Acceptable 70 Maximum 75	-	-	**-**	**70-75**	-

Notes:
1) ANL Acceptable Noise Level
2) RBL Rating Background Level
3) Assuming existing noise levels unlikely to decrease
4) Daytime 7.00am–6.00pm; Evening 6.00pm–10.00pm; Night time 10.00pm-7.00am
5) Assuming existing noise levels unlikely to decrease
6) One or two noise events per night are not likely to affect health and wellbeing significantly.
7) Shoulder period defined as per Section 3.3 of the INP
8) The internal criterion for school classrooms has been adopted for the childcare centre. The internal ANL has been set to $L_{Aeq(1hour,internal)}$ 40 dBA as determined that the premises is currently affected by noise from existing industrial noise sources. Accordingly, it is appropriate to adopt an external L_{Aeq} noise criterion of 65 dBA based on the assumption that windows would be closed

The noise criteria proposed by SLR were adopted by the Department of Planning in the SSD Approval.

5 PREDICTED OPERATIONAL NOISE LEVELS AND ASSESSMENT

Noise predictions associated with the revised operation of the site on the surrounding receivers have been conducted using the CADNA A noise model using the CONCAWE prediction algorithm consistent with the SLR assessment. Noise modelling was used to predict the resultant noise emission levels at nearby residential receivers.

Noise modelling is based on:

- equipment sound level emissions (measured or assumed) and location;
- screening effects from existing buildings;
- receivers' locations;
- meteorological conditions;
- ground topography, and;
- noise attenuation due to spherical spreading.

Noise levels have been assessed at all the receivers' locations as presented in Table 2-1.

5.1 Noise Scenario

Operational site noise has been modelled based on the following unchanged noise scenario:

- Morning shoulder period (6 am to 7 am): Processing and sorting of waste only, finger screen, gantry and waste processing vehicles operational (wheel loader and excavator in the shed);
- Daytime (7 am to 6 pm): Busiest operational period with finger screen and waste processing vehicles operational, wheel loader in shed, excavator loading truck at the bays, gantry operating, trucks dropping off / collecting waste, up to five trucks and fork lift on hardstand area;
- Evening (6 pm to 10 pm): Finger screen and gantry operational, trucks entering the site, loading and unloading.

5.2 Sound Power Levels of Proposed Plant and Equipment

Table 5-1 presents the sound power levels associated with the noise sources presented in the above scenario.

The sound power level of Loaded Finger and Finlay Screen has reduced because the new plant had five screens associated with the process, where it now only has one screen.

It should also be noted that the sound power level of the gantry crane is less than that of the excavators that would be required to operate less within the shed.

Table 5-1 Sound Power Levels of Equipment L_{Aeq} (dBA)

Source (3)	Sound Power Level
Loaded Finger and Finlay Screen (Single Screen) (within shed)	109 (2)
Gantry crane (within shed)	99 (2)
Volvo ECR145C Excavator	103 (1)
Volvo EC140C Excavator	103(1)
Volvo L110F Wheel Loader	108(1)
Liebherr LH22M Excavator	99(1)
Komatsu 3.5 tonne Forklift	101(1)
Trucks idling	100(1)
Round trip truck entry, dump and exit	108(1)

(1) Source SLR report.

(2) Wilkinson Murray Database.

(3) Due to the gantry crane it is likely that only one of the excavators would be used at anyone time.

5.3 Predicted Operational Noise Levels

Table 5-2 presents the predicted noise levels at surrounding receivers due to site proposed operations detailed above. The assessment is based on standard meteorological conditions. Additionally, Table 5-2**Error! Reference source not found.** presents the SLR predicted noise levels at surrounding receivers so that a comparison between the previous assessment and this assessment can be made. The assessment is based on standard meteorological conditions.

As processing and sorting of waste activities are proposed between the 6 am to 7 am morning shoulder period, assessment of sleep disturbance is required. Resultant noise levels at residential receivers and industrial neighbours have been predicted based on metal impact noise sound power level of 116 dBA, being the loudest noise source located at the site, within the shed. Predicted sleep disturbance noise levels are also presented in Table 5-2.

Table 5-2 SLR Predicted Noise Levels and Criteria (from Approved EIS) and Expected Noise Increase as a result of proposed modifications

Receiver	Predicted Noise Levels, $L_{Aeq,15min}$												Compliance
	Morning shoulder L_{Aeq}			Day L_{Aeq}			Evening L_{Aeq}			Morning shoulder (Sleep disturbance) L_{Amax}			
	SLR Predicted Level	Modification Predicted Level	Criteria	SLR Predicted Level	Modification Predicted Level	Criteria	SLR Predicted Level	Modification Predicted Level	Criteria	SLR Predicted Level	Modification Predicted Level	Criteria	
R1	17	<10	44	27	21	47	42	15	43	19	<10	50	**Yes**
R2	32	<10	44	43	29	47	22	21	43	34	<10	50	**Yes**
R3	38	12	44	46	33	47	39	25	43	38	14	50	**Yes**
R4	39	14	44	45	34	47	42	28	43	39	16	50	**Yes**
R5	36	11	44	42	35	47	40	29	43	38	13	50	**Yes**
R6	41	15	44	46	36	47	35	31	43	42	18	50	**Yes**
R7	39	20	44	45	36	47	42	31	43	40	23	50	**Yes**
R8	34	20	44	43	32	47	39	27	43	35	24	50	**Yes**
R9	33	18	44	39	31	47	38	25	43	34	22	50	**Yes**
R10	21	20	44	33	30	47	33	24	43	21	23	50	**Yes**
R11	30	21	44	45	32	47	20	27	43	30	28	50	**Yes**
R12	25	25	44	40	37	47	38	31	43	26	31	50	**Yes**
R13	23	21	44	38	36	47	30	30	43	24	15	50	**Yes**
R14	22	21	44	36	33	47	27	27	43	24	14	50	**Yes**
R15	23	15	44	34	29	47	26	23	43	25	11	50	**Yes**
R16	18	11	44	27	25	47	27	19	43	20	<10	50	**Yes**
R17 (Com. Receiver)	41	15	65	46	35	65	35	30	65	N/A	N/A	N/A	**Yes**
R18 (Industrial receiver	69	34	70	64	49	70	53	43	70	N/A	N/A	N/A	**Yes**

Note: Red figures indicate that the noise prediction from the modification is higher than that the noise predictions in original EIS.

As can be seen from Table 5-2, compliance with criteria will be achieved for all surrounding receivers during all time periods for the modified operations on site.

Additionally it can be seen, apart for three situation, the predicted noise levels from the proposed modifications are lower than that presented in the original SLR report and as such the proposed modifications would not result in a significant increase in impacts above those identified within the EIS. The three situations where higher levels were predicted are not due to the modifications rather a difference in the noise modelling or noise models used.

6 CONCLUSION

Wilkinson Murray Pty Ltd has conducted an acoustic assessment of the Mortdale Resource Recovery Facility, that are proposed be amended by Bingo Industries. Noise levels at surrounding receivers were predicted. The modelling results indicate that noise generated by the modified activities at the facility will fully comply with the noise criteria from the original SLR Noise and Vibration Impact Assessment and the sites SSD Approval noise limits.

It is also demonstrated that the proposed modifications do not result in a significant increase in impacts above those identified within the original EIS as typically the predicted noise levels from the proposed modifications are lower than that presented in the original SLR report.

It is noted that no additional noise controls, based on the proposed modification, are required for the Mortdale Resource Recovery Facility.

The previous mitigation measures and controls recommended in the approved SLR Noise and Vibration Impact Assessment will still apply.

APPENDIX D UPDATED AIR QUALITY IMPACT ASSESSMENT

WILKINSON MURRAY

11 February 2019

WM Project Number: 19036
Our Ref: a19036ltr090219JW
Email: sean.fishwick@arcadis.com

Sean Fishwick
Arcadis
Level 16, 580 George Street
SYDNEY NSW 2000

Dear Sean

Re: Mortdale Project - Resource Recovery Facility (RRF)

Wilkinson Murray Pty Limited has been engaged by Arcadis on behalf of Bingo Industries to conduct an air quality assessment for the modifications of the existing Mortdale Resource Recovery Facility (RRF). This assessment intends to accompany the application for a number of minor changes to the approved plans for the existing Mortdale Resource Recovery Facility (RRF), approved under SSD7421, at 20 Hearne St, Mortdale.

An Air Quality Impact Assessment was prepared by SLR (28 May 2016) to support the initial State Significant Development Application (SSD) in the Environmental Impact Statement (EIS). Additional information was requested by EPA to provide:

- a tabulated emission inventory outlining all input parameters utilised to estimate emissions; and
- where exceedances of the EPA's impact assessment criteria for particles are predicted, the modelling assessment should be revised to include proposed emission controls which will be adopted at the premises.

SLR in a Memorandum dated 28 October 2016 provided a response to submissions (RTS) with the additional information as requested by the EPA.

This assessment report aims to demonstrate qualitatively, that provided all recommended mitigation measures previously recommended remain in place, that the modification for a number of minor changes to the approved plans for the existing Mortdale Resource Recovery Facility would be similar or less compared to air quality impacts presented by SLR for the EIS and RTS.

The Mortdale Resource Recovery Facility site is located within an established industrial area with many industrial facilities and associated activities taking place around the site. The location of the Project Site is shown in Figure 1.

Figure 1 Existing Mortdale Resource Recovery Facility Site and Receivers

PROPOSED MODIFICATION TO APPROVED OPERATIONS

Proposed Modifications Summary

This modification under Section 4.55 (1A) of the *Environmental Planning & Assessment Act 1979* (EP&A Act) seeks approval from the Department of Planning and Environment (DPE) for a number of minor changes to the approved plans for the existing Mortdale Resource Recovery Facility (RRF) (approved under SSD7421) at 20 Hearne St, Mortdale (the site).

The proposed modifications to the project are:

- Designation of a new bulk loadout area for separated waste to be further processed at a centralised advanced recycling facility at the north eastern end of the recycling building;
- Provision of a new entry and exit point to the recycling building at its south western

extent. This has the most potential for additional noise impact;

- Relocation of the outbound weighbridge;
- Modification to the site administration/office layout;
- Modifications to site levels to accommodate new loadout area and entry and exit for trucks delivering waste;
- Relocation of the amenities and lunchroom to be located above car spaces in the eastern portion of the site;
- Modifications to processing plant resulting in simplification to processing. A gantry crane is proposed to be used to load trucks in lieu of a front end loader;
- Expansion of the incoming waste receival area;
- Removal of one car park space (from 12 to 11); and
- Consolidation of storage bays from 9 to 5.

Proposed modifications to the Approved Plans include the following elements:

- Car parking
- Office and weighbridges
- Truck loadout and access to recycling facility
- Site levels.

As per Section 115 (1) (e) of the *Environmental Planning & Assessment Act 1979* Regulation, the proposed modifications are required to improve the efficiency of the overall site layout and operation of the Development. The proposed modifications would also enable Bingo to maximise resource recovery across their broader network. The modification would maintain the environmental management and mitigation measures committed through the EIS and conditions of approval.

Layout Changes to the Recycling Building

A new bulk loadout area located at the north eastern end of the recycling building, and a new entry and exit for trucks delivering waste to the site via the south western end of the building, are reflected on the Proposed Site Layout Plan. This would enable trucks to access the bulk loadout area in a forward direction or via performing a turn in and reverse manoeuvre. Other minor changes to the site layout plan include a reduction in the number of product storage bays but with maintenance of the same footprint to that authorised on the approved plans, re-orientation of the out weighbridge and wheel wash and reduction in office and administration building footprint and relocation of amenities to building to the eastern portion of the site.

A new entry and exit would be established for the RRF building to allow trucks delivering waste to the site to enter and exit via the south western end of the recycling building. This would enable trucks to access the waste pit by a more efficient route.

Process Description

Mixed waste would be tipped onto the tipping floor and inspected for any non-compliant waste. If there is no non-compliant waste, the waste would be pushed into the waste holding area by a front end loader. If there is non-compliant waste found in the waste, the load would be rejected and reloaded for removal from site and disposal at an authorised facility.

Once the mixed waste is in the waste holding area, an overhead gantry crane with a 3 cubic metre capacity grab will lift the mixed waste into a feed hopper. The feed hopper will regulate the flow of the mixed waste stream onto a screener, which will separate the mixed waste stream into two recovered streams. Material which is >60mm in size will return to the waste holding area via a conveyor to be loaded out for further processing at an advanced recycling facility within Bingo's network. The overhead gantry crane will then lift the processed waste from the waste holding area to the overhead loadout bunker in readiness for loading.

Material which is <60mm in size will be transported by conveyors to either a truck for direct loading (adjacent to the product storage bays), or to the product storage bays (if a truck is not present for loading).

The overhead gantry crane is a critical component in the operations of the facility, and therefore a second crane will be provided for redundancy, to be used either in peak times, or in the event that the primary crane is undergoing maintenance.

The crane is automatically programmed to carry out a regular pattern of loading the feed hopper and loading the overhead loadout hopper but can also be manually operated to remove larger items of steel, timber, large concrete and textiles from the incoming mixed waste stream for storage in the product storage bays.

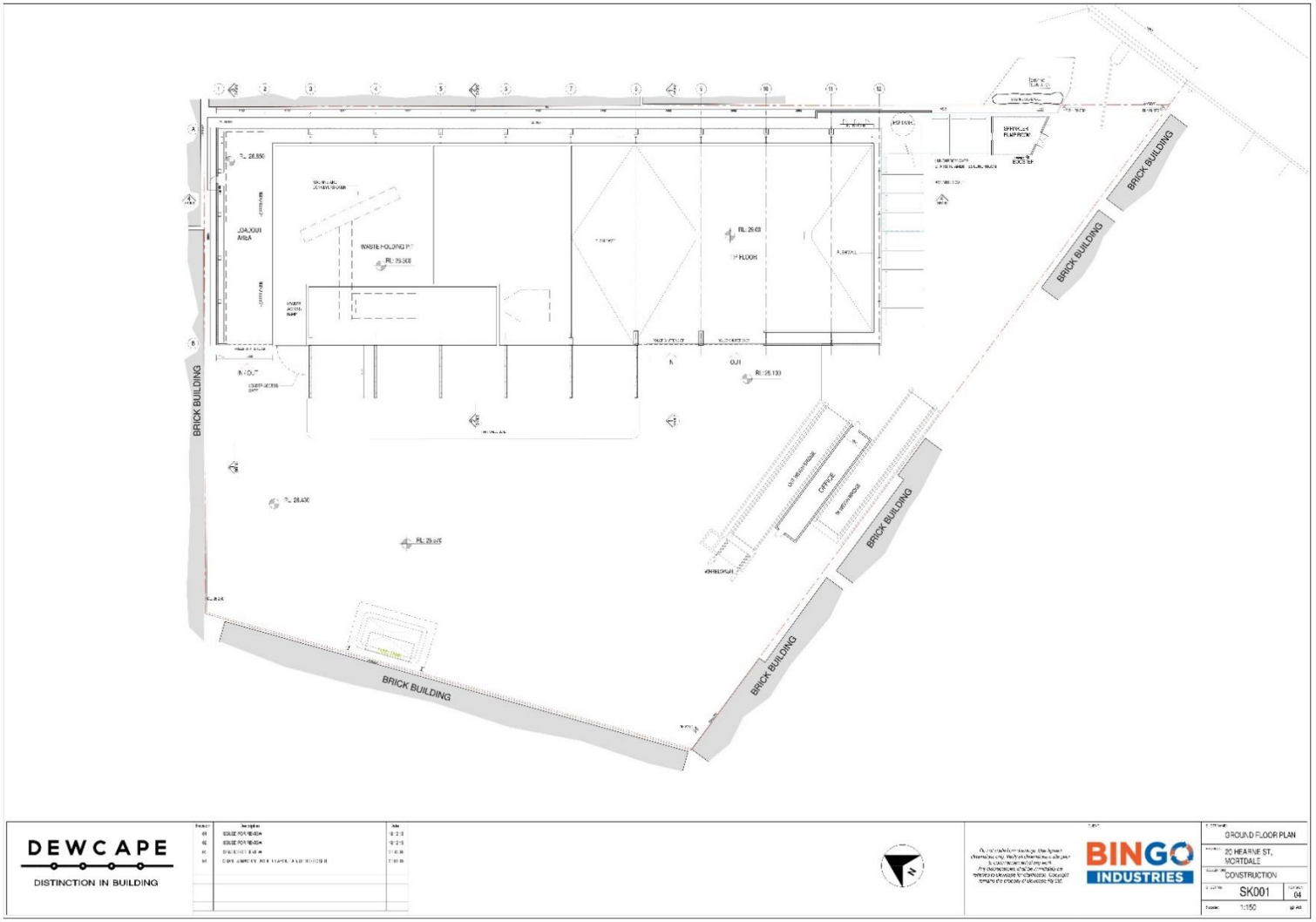
Hours of Operation

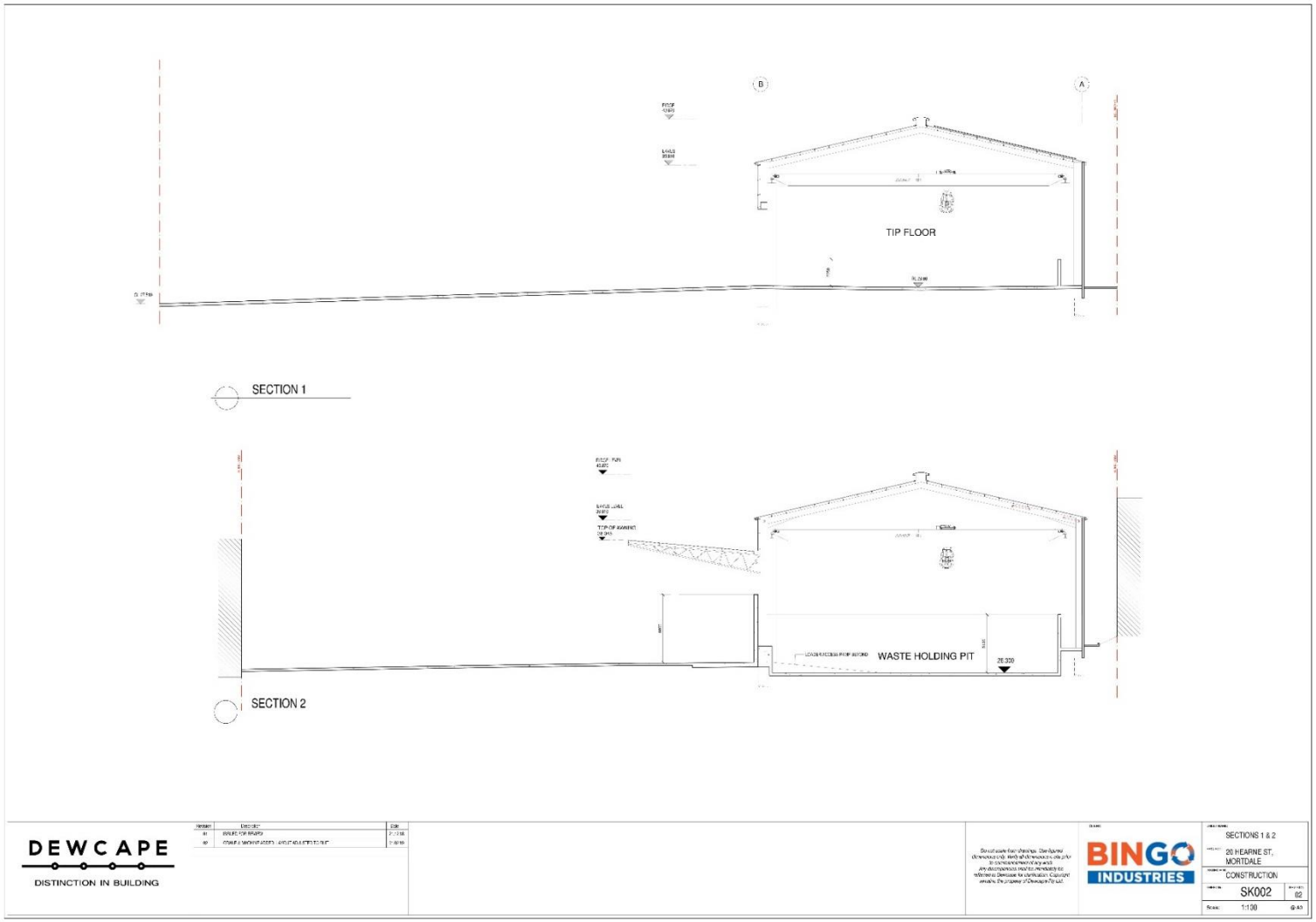
The site is to continue operating during the same approved hours of operation i.e. Monday to Saturday, 6am to 10pm, as per condition B25 of the Approval.

Proposed Layout

Figure 2 show the proposed layout changes and equipment at the Mortdale RRF.

Figure 2 Proposed layout changes and equipment at the Mortdale RRF

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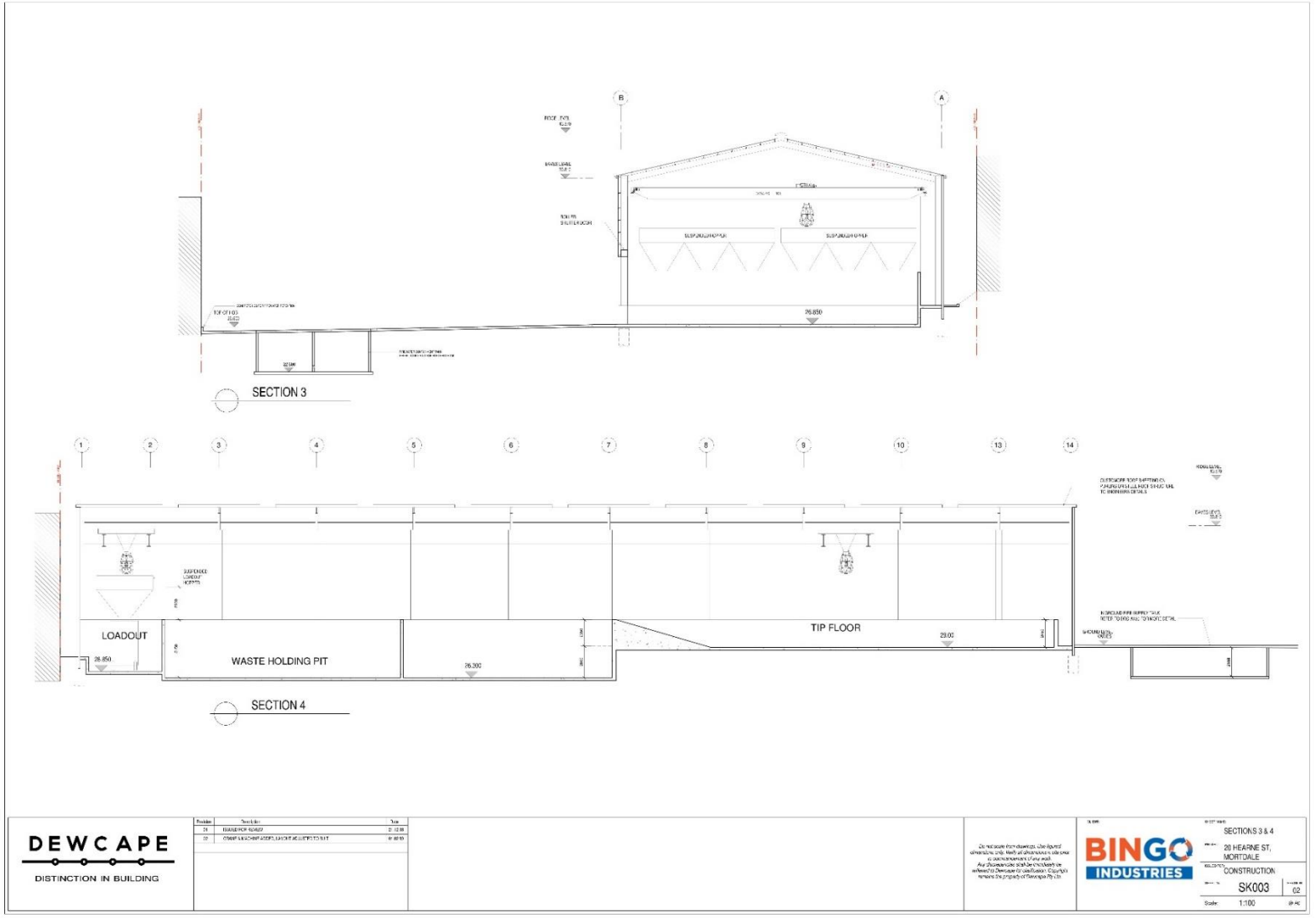
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ASSESSMENT OF MODIFICATIONS

An air quality assessment was undertaken within the original SSD by SLR and dated 28 May 2016 and with additional supporting information provided in an SLR in a Memorandum dated 28 October which demonstrated that RRF operations were able to be undertaken within acceptable air quality criteria.

As shown in Figure 1, the surrounding development of the Project Site is characterised by a mix of industrial developments including factories, automotive servicing, parts, panel beaters and painters, printing facilities, hardware and general supplies, manufacturing and warehousing. The closest residential receivers are located 200 m to the south-east along Barry Street and 250 m to the east, on the opposite side of Boundary Road. A review of the local area has been conducted and there has not been any changes in the land uses compared to the original SLR air quality assessment.

The SLR report estimated potential emissions of particulate matter during the operation of the Project. The activities which were identified that may give rise to particulate emissions into the ambient environment from the Project included:

- loading/unloading and handling/processing of waste material;
- onsite vehicle movements; and
- wind erosion from waste stockpiles and exposed areas.

The emissions estimate was based on a total through put of 300,000 tonnes/ year. The emissions estimate was based on the activity intensities presented in Table 1.

Table 1 Intensity of Each Activity

Activity	Intensity		Unit
	Annual	Peak	
Unloading materials from truck	300,000	7280000	tonnes/annum
Material sorting/handling	600,000	14560000	tonnes/annum
Loading product material to truck	240,000	5824000	tonnes/annum
Onsite Hauling	10,057	244058	vkt/annum
Wind erosion	0.5	0.50	ha

The control efficiencies used for the revised modelling were:

- 90% for activities in the shed and in the loading bays;
- 70% on haul roads through the application of water sprays and limiting the onsite vehicle speeds to 5 km/hr; and
- 65% through the application of water spray and wind barrier effect achieved due to the fence at the site boundary and buildings/infrastructure within the site.

Table 2 presents the emissions estimates for the project as presented in the SLR Memorandum report dated 28 October 2016. In order to present the implications of the of the proposed modifications a discussion presenting the implications of the modification is also presented in Table 2.

Table 2 Estimated Emissions from the Project Site (Presented in the SLR Memorandum report dated 28 October 2016)

	Estimated Annual Emission Rate			Estimated Peak Daily Emission Rate			Implications of the proposed modifications
Activity	TSP	PM10	PM2.5	TSP	PM10	PM2.5	
Unloading materials from truck	5.00	2.00	0.30	110.00	52.00	8.00	Unloading of materials in the shed is a small dust emission. The proposed modification would not result in any change of the emissions inventory as the waste would be dumped in the shed at an activity rate consistent with the modification.
Material sorting/handling	9.00	4.00	0.60	219.00	104.00	16.00	The waste from the tipping room floor would be push into the holding area. Once the mixed waste is in the waste holding area, an overhead gantry crane will lift the mixed waste into a feed hopper. The screen will separate the mixed waste stream into two recovered streams. Material which is >60mm in size will return to the waste holding area via a conveyor to be loaded. Material which is <60mm in size will be transported by conveyors to either a truck for direct loading (adjacent to the product storage bays), or to the product storage bays (if a truck is not present for loading). The proposed modification would likely reduce the emissions as the majority of the waste will go directly to the truck for direct loading. Reducing doubling handing of the sorted waste. The dust emissions would likely reduce as a result of the modification.
Loading product material to truck	4.00	2.00	0.30	88.00	41.00	6.00	The proposed modification would not result in any change of the emissions inventory as the same amount of waste would be loaded into trucks.
Onsite Hauling	168.00	32.00	7.80	4084.00	784.00	190.00	The proposed modification would not result in any change of the emissions inventory as the Vkts on site remain the same.
Wind erosion	615.00	307.00	28.80	615.00	307.00	29.00	The proposed modification would not result in any change of the emissions inventory as the site area is remaining.
Total Site Emissions (kg/annum)	801.00	347.00	37.80	5116.00	1288.00	249.00	The onsite hauling and wind erosion are the major contributors to the dust emissions from the site. Small emission gains would likely result from the project modification. Therefore, it can be concluded that the dust emissions are consistent with the approved project and would not result in any increase in dust emissions above those identified within the EIS and supporting documents.

tpd – Tonnes per day, tpa – Tonnes per annum

As sensitive receptors have not changed in proximity to the RRF and the proposed minor modifications have not increased dust emission than that originally modelled within the assessment and the emissions inventory is consistent it is concluded that impacts arising from dust generated from the proposed modification will be consistent with those arising from existing approved RRF operations, namely:

- Maximum 24-hour average cumulative (i.e. including background) PM2.5 concentrations predicted at surrounding sensitive receptor locations are below the relevant ambient air quality criterion of 25 µg/m³.
- Annual average cumulative PM2.5 concentrations predicted as a result of the proposed operation at surrounding sensitive receptor locations are also very low and well below the relevant ambient air quality criterion of 8 µg/m³.
- Maximum 24-hour average cumulative PM10 concentrations predicted at surrounding sensitive receptor locations are below the relevant ambient air quality criterion of 50 µg/m³.
- Annual average cumulative PM10 concentrations predicted as a result of the proposed operation are very low at all sensitive receptor locations and well below the relevant ambient air quality criterion of 30 µg/m³.
- Annual average cumulative dust deposition level predicted as a result of the proposed operation are also very low at all sensitive receptor locations downwind and well below the relevant ambient air quality criterion of 4 g/m²/month.

The dust control measures outlined within adopted Environmental Management will continue to be implemented. The following mitigation and management measures will be implemented at the site to minimise offsite air quality impacts, namely:

- A dust misting system will be installed in the shed. This system pressurises water through nozzles designed to produce fine water droplets that encapsulate and suppress dust particles present in the atmosphere, so that they settle out of the air.
- Water sprays will be used to dampen dusty materials as they are moved around the site and loaded into bins and also to minimise emissions from on-site stockpiles, supported by the use of hand-held hoses.
- Paved roadways, hard stand areas and driveways will be kept clean by use of the onsite sweeper and dampened using hoses as required to prevent dust from the vehicle movements.
- Hand held hoses will also be used in areas not controlled by the sprinkler system.
- The site supervisor has the authority to cease operations if weather conditions have a major negative impact on the operation.
- A general vehicle speed limit of 5 km/hr will be imposed across all areas of the site.
- All vehicles are checked for mud and soil on tyres prior to leaving site and where mud or soil is detected on the entrance road (i.e. "track out"), staff will be deployed to sweep the road.
- All on-site, fixed and mobile diesel powered plant (excluding road vehicles) will be maintained in accordance with the manufacturers' specifications.
- Trucks will remain covered until waste removal (unloading).
- A wind anemometer will be located on site to monitor wind strength and direction.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully
WILKINSON MURRAY

John Wassermann
Director

APPENDIX E UPDATED TRAFFIC IMPACT ASSESSMENT

20 Hearne Street, Mortdale
Transport Impact Assessment

Prepared for:

Arcadis Australia Pacific Pty Ltd

22 February 2019

The Transport Planning Partnership

20 Hearne Street, Mortdale

Transport Impact Assessment

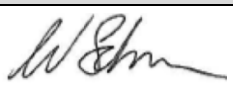
Client: Arcadis Australia Pacific Pty Ltd

Version: Final 01

Date: 22 February 2019

TTPP Reference: 16222

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
Final 01	22/02/2019	Clinton Cheung, Santi Botross	Santi Botross	Wayne Johnson	

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APPENDICES

1 Introduction

The Transport Planning Partnership (TTPP) has prepared a revised Transport Impact Assessment (TIA) report on behalf of Bingo Recycling Pty Ltd for the upgrade of the existing resource recovery facility (RRF) at 20 Hearne Street, Mortdale (the Proposal).

In June 2016, GTA Consultants (GTA) completed a TIA for the Proposal as part of an Environmental Impact Assessment (EIS). As part of the application, TTPP prepared two separate Response to Submissions (RTS) letters dated December 2016 and April 2017, which responded to concerns raised by the consenting authorities on the traffic and parking elements of the EIS. These documents have been referenced throughout this report.

On 20 December 2017, approval was granted by the Department of Planning for the Proposal. This Proposal has been referred to throughout this report as the "Approved Proposal".

Since then, modifications to the Approved Proposal have been proposed. Notwithstanding, these changes are minor when considered in the overall context of the project. Therefore, the Amended Proposal (which this TIA assesses) is considered substantially the same development.

At the request of the Department of Planning, this study has been undertaken to document the traffic and parking impacts associated with the Amended Proposal.

1.1 Proposal Overview

Bingo Industries (the Applicant) currently own and operate the Resource Recovery Facility located at 20 Hearne Street, Mortdale (the Site). The Site currently operates under approval SSD 7421 (the Current Approval).

To optimise the efficiency of Bingo's broader resource recovery network and improve resource recovery outcomes, Bingo proposes to modify the Current Approval (the Modification Proposal). Modifications to the Current Approval as part of the Modification Proposal include:

- Reduced scale of processing and recycling equipment to produce two key streams of waste (<60mm and >60mm product) for further recycling at Bingo's advanced recycling centres.
- Changes to the layout of the recycling building and provision of a new entry and exit point to the recycling building
- Relocation of the outbound weighbridge
- Modification to site levels to accommodate processing changes
- Relocation of amenities and lunchroom

- Expansion of the incoming waste receival area
- Changes to parking arrangements
- Consolidation of external product storage bays
- Administrative changes.

1.2 References

In preparing this report, reference has been made to the following:

- Transport Impact Assessment prepared by GTA Consultants, Issue D, dated June 2016
- Response to Submissions letter prepared by TTPP, dated 5 December 2016
- Response to Submissions letter prepared by TTPP, dated 3 April 2017
- Hurstville City Council Local Environmental Plan (LEP) 2012
- Hurstville City Council's Development Control Plan (DCP) 2018
- Other documents and data as reference in this report.

2 Existing Conditions

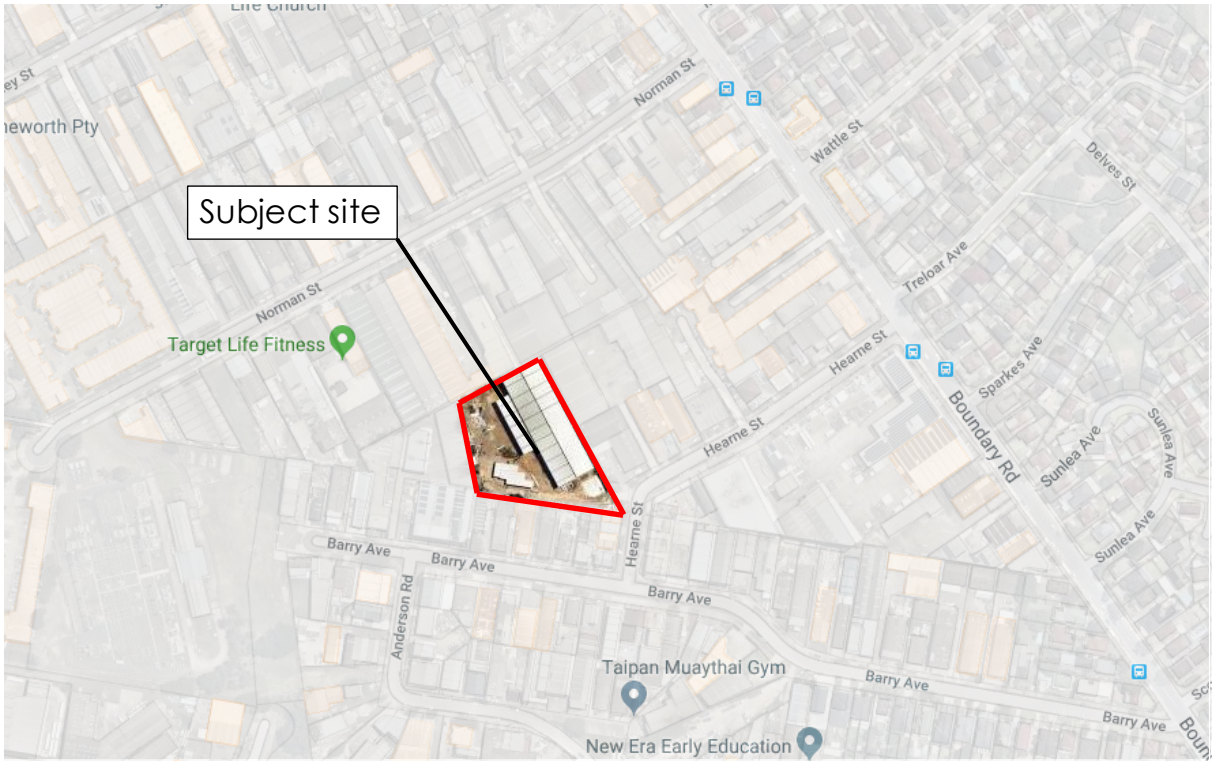
2.1 Site Location

The facility at No. 20 Hearne Street operates as a resource recovery facility (RRF) within the industrial precinct of the Georges River Local Government Area (LGA). Peakhurst is the largest industrial precinct in Georges River and contains 56.1 hectares of industrial land. The subject site and surrounding area are located within the Peakhurst industrial site and is zoned as a Light Industrial Zone (IN2) under the Hurstville City Council Local Environmental Plan (LEP) 2012.

Within the IN2 Light Industrial zone (IN2), development for the purpose of a 'resource recovery facility' is permissible with development consent. Nearby industries include storage businesses, mechanical repair services, plant and equipment hire facilities. The lands surrounding the industrial zone predominantly comprise residential uses.

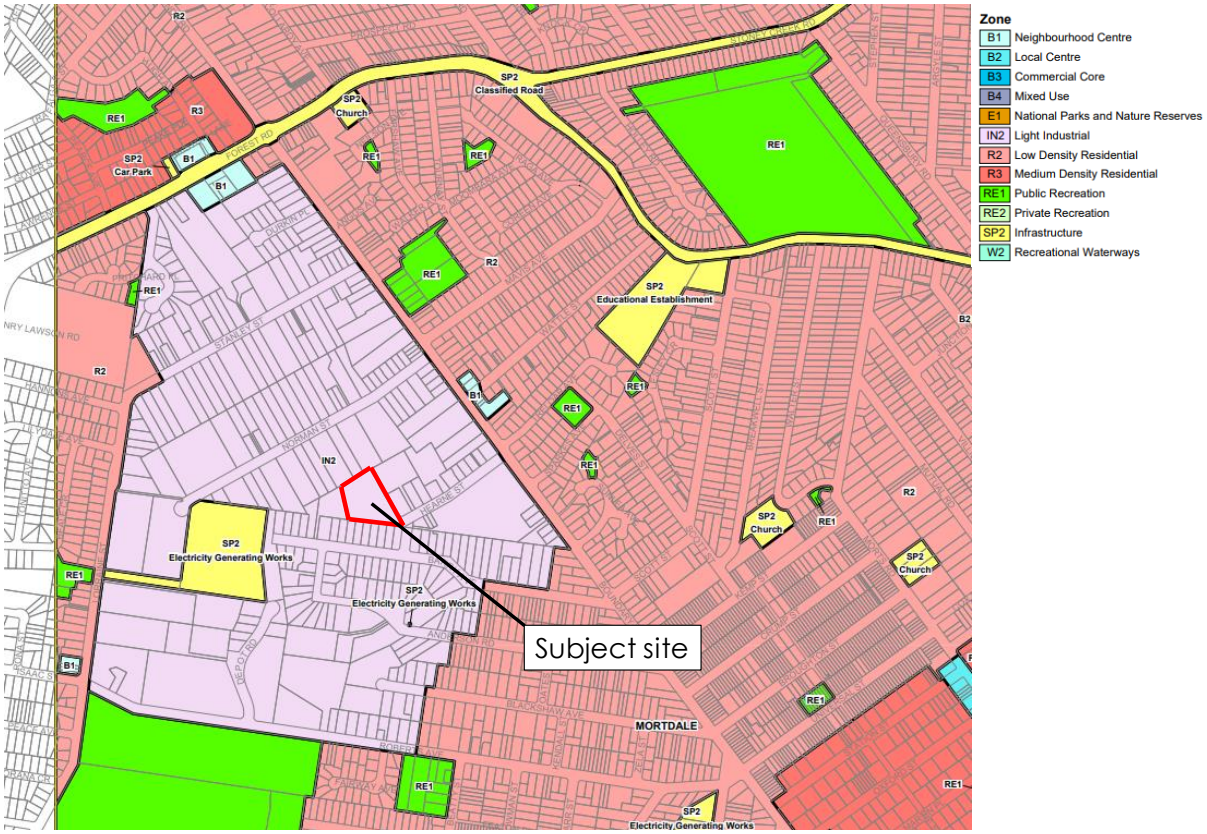
The location of the site and its surrounding land use zones are shown in Figure 2.1 and Figure 2.2, respectively.

Figure 2.1: Locality Map



Basemap source: Nearmap, accessed online on 30/01/2019

Figure 2.2: Proposal Site and Surrounding Land Use Zones



Basemap source: Hurstville Local Environmental Plan 2012, accessed online on 30/01/2019.

2.2 Local Road Network

Access to the subject site is provided via a single two-way driveway off **Hearne Street.** It functions as a local two-way road within the vicinity of the site and is generally aligned in the north-east to south-west direction. The street is configured as an unmarked two-lane carriageway of approximately 12m wide. There is unrestricted on-street parking permitted on both sides of the road. The posted speed limit is 50 km/h.

In the north, Hearne Street intersects with **Boundary Road** at a priority-control junction**.** Boundary Road is classified as a regional road which connects Riverwood to Oatley. It is configured as a two-lane two-way road. A mix of unrestricted and restricted on-street parking is provided along Boundary Road. A posted speed limit of 50 km/h exists on Boundary Road.

To the south, Hearne Street intersects with **Barry Avenue** at a priority-control junction**.** Barry Avenue is a two-way undivided street road generally aligned in an east-west direction, with a cul-de-sac at its western end. The intersection with Boundary Road is configured to permit left turn movements to and from Boundary Road. There is unrestricted on-street parking permitted on both sides of the street. The posted speed limit is 50 km/h.

Forest Road is a State road in the vicinity of the site and is aligned in the east-west direction. It is configured as a two-way road with three lanes in both directions. Forest Road intersects

with Boundary Road north of the subject site at a signalised junction. The posted speed limit on Forest Road is 60 km/h.

2.3 Traffic Volumes

As part of the TIA prepared by GTA, traffic turning data was gathered at key intersections surrounding the subject site. Traffic surveys were undertaken in December 2015 at the intersections of Boundary Road with Hearne Street and Barry Avenue.

Traffic flows in 2019 have been estimated by pro-rating historic traffic data according to growth estimates for the local road network. Growth estimates have been obtained from RMS' Sydney Strategic Travel Model (STM) which have been included in Appendix A of this report.

A summary of the peak hourly traffic volumes on the surrounding road network is provided in Table 2.1

Table 2.1 Existing Traffic Volumes – Boundary Road

Peak Period	Boundary Road between Mavis Avenue and Wattle Street		Boundary Road between Wattle Street and Kemp Street	
	Northbound	Southbound	Northbound	Southbound
AM Peak Hour	722	560	643	560
PM Peak Hour	605	738	494	743

Traffic flows on Hearne Street were captured in March 2015. Hearne Street is a local street that does not carry any through-traffic (i.e. carries local traffic only). Traffic flows on Hearne Street would not be largely influenced by growth due to major developments on the arterial road network. Therefore, current traffic flows on Hearne Street would be expected to be similar to those surveyed at the time of data collection in 2015. These traffic flows have been summarised in Table 2.1.

Table 2.2 Existing Traffic Volumes – Hearne Street

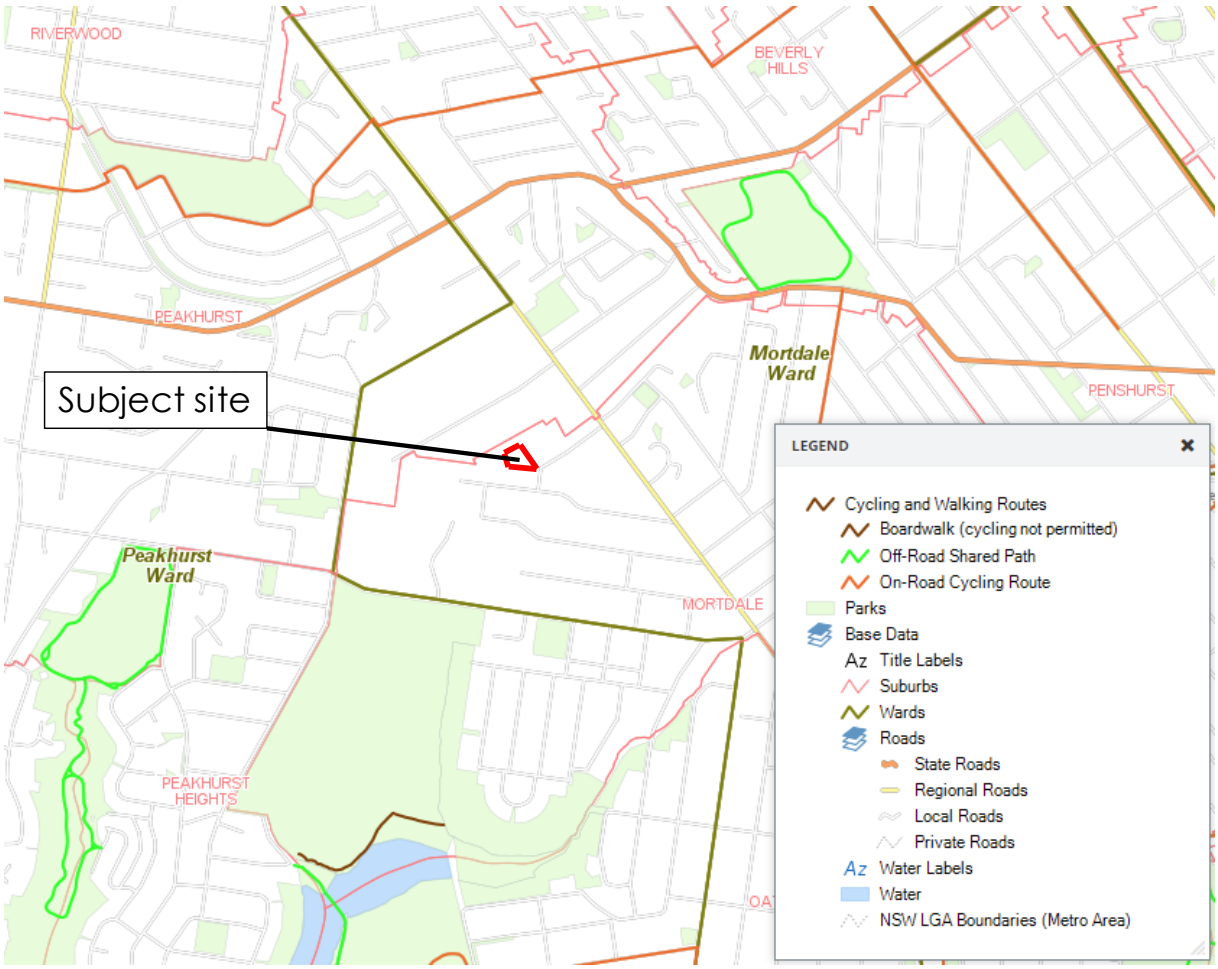
Peak Period	Hearne Street	
	Northbound	Southbound
Peak Hour	54	77

2.4 Pedestrian and Cyclist Facilities

The site is well serviced by pedestrian infrastructure with footpaths provided on all roads within the vicinity and at nearby intersections as referred to in Section 2.2. According to Georges River Council's Walking and Cycling Routes finder map there are some on-road and off-road

cycling routes in the surrounding area. However, there are no routes which run directly to/ from the site. Cycling routes within the vicinity of the site are shown in Figure 2.3.

Figure 2.3: Surrounding Cycleways



Basemap source: Georges River Council Walking and Cycling Routes, accessed online on 30/01/2019.

3 Proposed Development

3.1 Processing Description

Waste would be processed through the recycling building in a south-east to north-west direction.

Mixed waste would be delivered by incoming vehicles into the recycling building through the newly created entry in the south western side of the building. Waste would then be tipped onto the expanded tipping floor and inspected for any non-compliant waste. If waste is deemed to be compliant, it would be pushed into the waste holding pit by a front-end loader. If there is non-compliant waste found, the load would be rejected and reloaded for removal from site and disposal at an authorised facility.

The Proposal site will not accept non-confirming waste. However, from time to time unexpected finds of materials may be encountered. These materials would be handled in accordance with a project specific Operational Environmental Management Plan (OEMP) procedures and appropriately stored for efficient disposal.

Once the mixed waste is in the waste holding area, an overhead gantry crane with a three cubic metre capacity grab will lift the mixed waste into a feed hopper. The feed hopper will regulate the flow of the mixed waste stream onto a screener, which will separate the mixed waste stream into the two recovered streams, >60mm and <60mm.

Material which is >60mm in size will be sent to the screened material pit via a conveyor to be loaded out for further processing at an advanced recycling facility within Bingo's network.

Material which is <60mm in size will be transported by conveyors to either a truck for direct loading (adjacent to the product storage bays), or to the product storage bays (if a truck is not present for loading).

The overhead gantry crane will lift the processed waste from the screened material pit to one of two overhead loadout bunkers in readiness for loading. These overhead loadout bunkers would sit above the bulk loadout area. Trucks would enter the bulk loadout area and park beneath one of the load out bunkers. These trucks would then be automatically loaded via bay doors in the base of the load out bunker.

The overhead gantry crane is a critical component in the operations of the facility, and therefore a second crane will be provided for redundancy, to be used either in peak times, or in the event that the primary crane is undergoing maintenance.

The crane is automatically programmed to carry out a regular pattern of loading the feed hopper and loading the overhead loadout hopper, but can also be manually operated to remove larger items of steel, timber, large concrete and textiles from the incoming mixed waste stream for storage in the product storage bays.

3.2 On-Site Vehicle Movements

The proposed modifications would result in changes to the internal traffic movements. However, the Modification proposal would not result in changes to the number or types of vehicles expected to arrive at the site.

An analysis of swept paths of vehicles accessing the site, demonstrating the efficacy of the modified site layout is provided in Section 6.1. This analysis demonstrates that the largest trucks approved to access the site, including truck and dogs and 19 m semi-trailers could tip waste and collect waste without conflicting with stacked vehicles.

The addition of the bulk loadout area in the north western end of the recycling building would minimise conflicts between loading vehicles, permitting vehicles to load in the bulk loadout area and adjacent to the product storage bays simultaneously.

3.3 Queuing and Stacking

Based on an analysis of the vehicles types and numbers accessing the site and anticipated vehicle dwell times, a stacking plan designed to accommodate the peak number of vehicles has been developed and is presented in Section 6.2. The peak number of trucks could be accommodated across six spaces which is below the 15 stacking space threshold proposed.

3.4 Modifications to Built Form

The layout of the recycling building is proposed to be modified to simplify operations and allow suitable vehicle access. The new layout would be split into three areas, a bulk loadout area in the north-west, the tip floor in the south-east and the holding pits in between these areas as presented in Figure 3.1.

Bulk Loadout Area

A designated bulk loadout area located at the north eastern end of the recycling building is proposed, allowing a physical separating of loading, processing and tipping activities. The bulk loadout area would be used to load >60mm product only. Trucks would be able to enter this area either in a forward direction or reverse manoeuvre. Trucks would be automatically loaded from the overhead bunkers which would be pre-filled by the overhead gantry crane from the screened materials pit. This would allow for significantly faster loading of large trucks, in the order of 5 minutes.

Expanded Tip Floor

The tip floor in the south-east of the recycling building is proposed to be expanded from 574m^2 to 1,120m^2 to allow a greater tipping area. Expansion of the tip floor would assist in reducing the vehicle turnaround time by allowing dual truck tip operation which would be carried out under the supervision of site personnel. During dual truck tip operation, trucks up to 11m in length would tip concurrently. Expansion of the tip floor would also allow for the

provision of four additional stacking spaces if required along the southern wall of the recycling building. As a result of the changes to the layout of the recycling building an additional entry and exit point would need to be provided on the south western side of recycling building for vehicles wishing to access the tip floor.

Holding Pits

The new layout of the recycling building would allow for the creation a holding pits area between the tip floor and the bulk loadout area. The floor of the holding pits would be 3.2 meters lower than the tip floor and would be segregated by a wall into two areas; the waste holding pit (for un-processed waste that has been push in from the tip floor) and the screened materials pit (for processed materials >60mm). Having the holding pits at a different level to the tip floor allows for physical separation of activities and allows waste to efficiently be 'pushed' by a front-end loader directly in the pit shortening the time it is on the tip floor and decreasing vehicle dwell times associated with tipping of waste.

New Entry and Exit Points

Mixed waste would be delivered by incoming vehicles into the recycling building through the newly created entry in the south western side of the building. The proposed south west access to the recycling building is required due to the changes in site levels and also provides improved on-site efficiencies and reduces conflicting movements by enabling a shorter distance to travel to the tip floor. An analysis of swept paths of vehicles accessing the site, demonstrating the efficacy of the modified site layout is provided in Section 6.1. This analysis demonstrates that the largest trucks approved to access the site, including truck and dogs and 19 m semi-trailers could tip at the pit without conflicting with stacked vehicles.

3.5 Relocation of Outbound Weighbridge

The orientation of the outbound weighbridge and wheelwash would be changed as presented in Figure 3.1. This would enable trucks leaving the recycling building by the modified exit location at the south western end of the recycling building to proceed efficiently to the outbound weighbridge and wheelwash prior to leaving the site.

3.6 Modification to Site Levels

To allow for simplified resource recovery operations including the provision of the waste holding pit and bulk loadout area, site levels would need to be slightly modified from those proposed within the current approval.

The ramp grade to the new bulk loadout area would be 1:16 with a ramp length of 6.7m. The grade of the ingress and egress ramps to the recycling building would be 1:16 with a ramp length of 1.6m. According to Australian Standards, the proposed ramp grades are in-line with design requirements, and thus, are deemed acceptable.

3.7 Relocation of Amenities and Lunchroom

The approved amenities and lunchroom would be relocated and suspended above the car spaces at located near the entry to the site, as presented in Figure 3.1. This would maximise the space for trucks and vehicles to move safely and efficiently within the site.

3.8 Product Storage Bays

Product storage bays along the western side of the recycling building would be consolidated from nine bays into five. This would reflect the changes in resource recovery operations. While the number of bays would be reduced, the total material storage capacity of the site would not be reduced. Product storage bays would be used to hold the process and recovered <60mm product as well as other items that have been recovered (via the overhead crane) directly from the incoming waste stockpile such as oversized concrete and other large recoverable products such as timber, steel, green waste etc.

3.9 Processing Plant and Equipment

Processing plant and equipment would be simplified to reflect the changes in processing. The existing proposed plant would be removed and replaced with a feed hopper, screens and conveyors to separate mixed waste. An advanced overhead gantry crane would also be installed. which would be the primary piece of equipment used to move waste around the site. The overhead gantry crane is a critical component in the operations of the facility, and therefore a second crane will be provided for redundancy, to be used either in peak times, or in the event that the primary crane is undergoing maintenance.

The crane is automatically programmed to carry out a regular pattern of loading the feed hopper and loading the overhead loadout hopper, but can also be manually operated to remove larger items of steel, timber, large concrete and textiles from the incoming mixed waste stream for storage in the product storage bays.

The primary resource recovery equipment utilised at the site would be a finger screen or similar. The screen would separate waste into two recovered products, >60mm and <60mm aggregate.

The modification would also include the removal of the picking stations and the addition of an overhead gantry and overhead bulk loadout to support the simplified operations and allow for faster loading of vehicles and therefore facilitating shorter on-site dwell times.

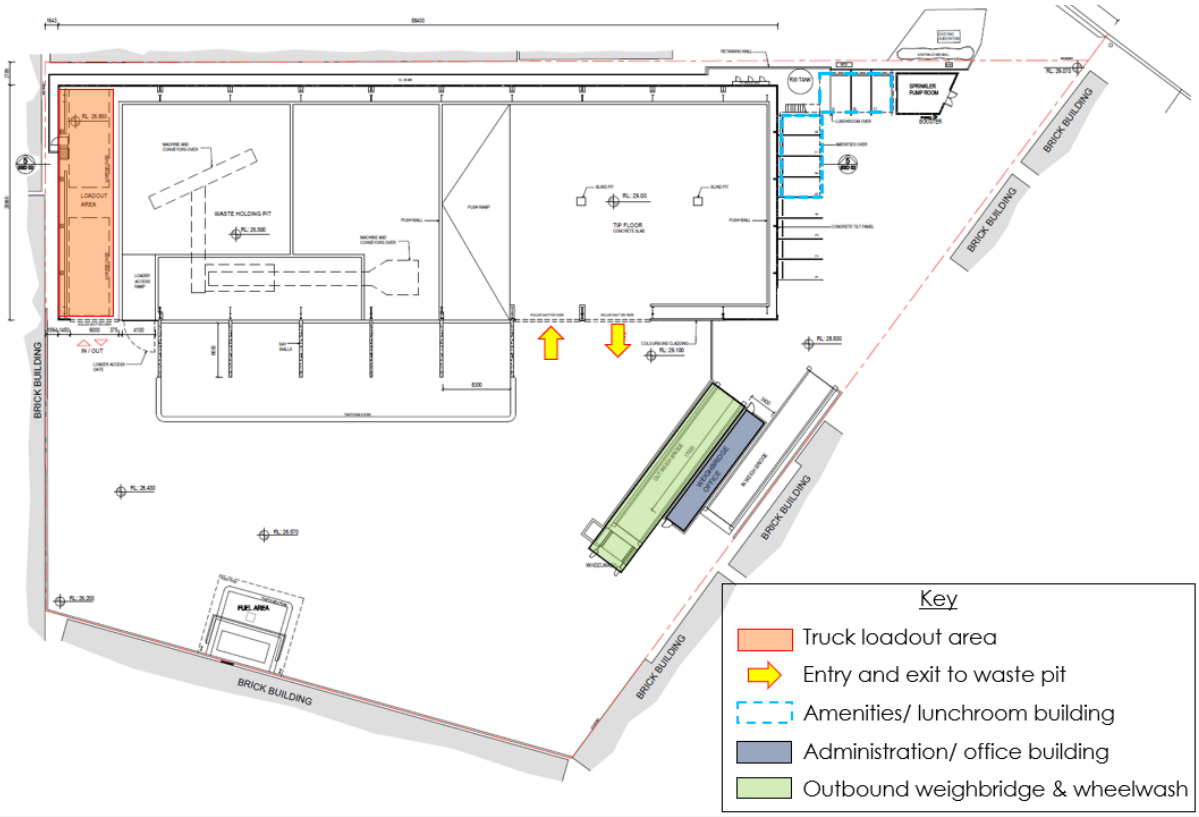
3.10 Car parking

The number of car parking spaces provided for the workforce and visitors would be reduced from 12 spaces to 11 spaces. The reduce scale of the resource recovery process allows for the removal of manual picking stations and the use of the automated overhead gantry crane for the majority of waste movement on the site. The Amended Proposal would require reduced numbers of operational personnel and consequently fewer parking spaces would

be required. The removal of one parking space also provides additional space for vehicles to manoeuvre on site improving safety and operational efficiency.

The suitability of the parking provision and layout is discussed in Section 4 of this report. The proposed on-site parking provision is illustrated in Figure 3.1.

Figure 3.1: Revised Site Layout



Base plan source: Dewcape, drawing dated 21/02/2019.

4 Parking Provision

4.1 Parking Requirements

Parking requirements for the Approved Proposal were assessed by GTA on a 'first principles' basis, that is, estimating parking requirements based on site demand. GTA's TIA report deemed this the most appropriate method for estimating on-site parking requirements in the absence of parking rates in Hurstville City Council's Development Control Plan (DCP) for a 'resource recovery facility'. Furthermore, this methodology aligns with the DCP objective PC1.c which states that car parking is to be "*provided according to projected needs*".

Having due regard to the DCP, the Amended Proposal has been reassessed in-line with Council's parking rates and similarly a parking estimate based on first principles has been carried out in this study.

Parking rates for a 'resource recovery facility' are not stipulated in the DCP yet rates for business/office and industrial land uses within an industrial zone are provided. Using parking rates for these land uses generate a parking requirement for 31 on-site parking spaces as presented in Table 4.1.

Table 4.1 Hurstville Development Control Plan Parking Rates

Development Type	Statutory Parking Rate	Proposed Area	Required Parking
Business and Office Premises	1 space per 60m^2	150 m^2	2.5
Industrial (except for Warehouse)	1 space per 100m^2	2,800 m^2	28
Total			**31 (rounded)**

As part of the Amended Proposal, there would be greater implementation of automated sorting equipment which would reduce the amount of waste manhandling. Therefore, the number of employees would reduce from 10 staff (as per the Approved Proposal) to eight staff and a maximum 10 staff per day.

Considering that there would be an average of eight workers on-site per day the provision of 31 parking spaces would be significantly in excess of the site-generated parking demand. As such, this affirms that a first principles approach would provide a more appropriate parking estimate for the Amended Proposal.

Based on the above, 11 car parking spaces would sufficiently accommodate the parking demand generated by employees and visitors associated with the Amended Proposal.

4.2 Parking Layout

The DCP does not specify parking dimensions for non-residential developments. As such, parking spaces are to be provided in-line with Australian Standards AS2890.1:2004. Dimensions for parking spaces classified as User Class 1 (employee and commuter parking) are to be provided as 2.4m wide and 5.4m long. Car parking spaces are to be provided in accordance with these dimensions, and thus, are satisfactory.

5 Traffic Generation

5.1 Site-Generated Traffic

Given that the annual waste throughput of the Amended Proposal is to remain as per the Approved Proposal, daily traffic generation would remain the same. TTPP's assessment of traffic flows likely to be generated by the future RRF operation was detailed in the Response to Submissions (RTS) letter to Department of Planning, dated 3 April 2017.

As per the RTS, future daily traffic generation was estimated to be 364 vehicle movements generated by 182 vehicles (i.e. one vehicle generates two movements). The types of vehicles transporting waste would also remain the same; namely:

Vehicles Delivering Waste to Site

- Small vans/ utes
- Medium Rigid Vehicles (MRV) (up to 8.8m)
- Heavy Rigid Vehicles (HRV) (up to 12.5m)
- 19.0m semi-trailer articulated vehicle (AV)
- 19m Truck-and-dog articulated vehicle (AV)

Vehicles Removing Waste from Site

- 19.0m semi-trailer articulated vehicle (AV)
- 19m Truck-and-dog articulated vehicle (AV)

Similarly, the percentage split of vehicle types would remain the same as previously assessed; that is:

Waste Transportation	Vehicle Type	Approximate Split
▪ Delivery	▪ Utes to HRVs	▪ 93%
	▪ Articulated vehicles	▪ 7%
▪ Collection	▪ Articulated vehicles	▪ 100%

The modified site layout of the Amended Proposal would allow for greater efficiencies in waste delivery and collection activities taking place at the RRF. Separated points for waste delivery and collection would permit waste processing activities to occur simultaneously. There would be double the number of waste tipping points and collection points therefore waste would be accepted and removed off-site more rapidly. Under the modified layout, two vehicles would be able tip waste simultaneously and two trucks would be able to collect waste simultaneously within the bulk loadout area and product storage bays.

Furthermore, automated sorting equipment would mean less waste manhandling which would further allow for greater efficiencies in processing operations between the time waste is received on-site to the time it is loaded out off-site.

Such efficiencies would enable greater control of waste processing operations allowing the site operator to better manage periods of anticipated deliveries and planned waste collections. Under the Amended Proposal, the site operator envisages an hourly profile for waste deliveries and collections as given in Table 5.1. The 182 trucks estimated to be generated by the future RRF is depicted on an average hourly basis in Figure 5.1.

As shown in Table 5.1 and Figure 5.1, the future RRF peak operation would result in 18 trucks accessing the site per hour. This would be less than the 21 trucks estimated that were generated by the Approved Proposal (as contained in the RTS). In the AM and PM road network peaks, the Amended Proposal would be expected to generate 13 trucks per hour and 5 trucks per hour, respectively. Hourly vehicle generation in both peak periods would be less than those estimated under the Approved Proposal operation (namely, 16 trucks and 7 trucks, respectively).

Table 5.1 Future Traffic Generation

Starting Hour	Truck Movements per hour [a]		Average No. of Trucks per Hour (Future)				
	Existing	Future	Deliveries		Collections		Total per hour (Amended Proposal)
			Utes to HRV	AVs	AVs in Bulk Loadout	AVs in Storage Bays	
6:00	11	10	12			5	17
7:00	17	12	13			5	18
8:00	18	22	13				13
09:00[b]	22	32 (i.e. 16 trucks)	13				13
10:00	27	40	13				13
11:00	29	42	13				13
12:00	21	38	12	1		5	18
13:00	20	32	12	1		5	18
14:00	13	28	12	1		5	18
15:00	13	22		1	5	5	11
16:00[c]	7	14 (i.e. 7 trucks)			5		5
17:00	6	14			5		5
18:00	0	16			5		5
19:00	0	16			5		5
20:00	0	14			5		5
21:00	0	12			5		5
Total	**204**	**364**	**113**	**4**	**35**	**30**	**182**

Notes:
a As per RTS prepared by TTPP, dated 3 April 2017
b Road network AM peak hour
c Road network PM peak hour

Figure 5.1: Anticipated Hourly Traffic Profile

Notes:
a Road network AM peak hour
b Road network PM peak hour

Waste delivery vehicles would be shifted to earlier periods in the morning to ensure there is sufficient waste for processing throughout the day and to minimise impacts on the surrounding road network during peak periods. In addition to this, sites anticipated to receive the processed product would operate during similar hours to the Mortdale RRF. As such, the majority of waste would be processed and loaded out of the RRF in vehicles with sufficient time for these vehicles to reach the receival site prior to close.

5.2 Traffic Modelling

As described above and as depicted in Table 5.1 and Figure 5.1, traffic generated by the Amended Proposal during the road network peak periods is expected to be lower than previously assessed. SIDRA traffic modelling analysis contained in GTA's TIA report indicates that the current and future local road network operates at an acceptable level of service B or better in the AM and PM peak periods.

Given that future peak traffic generation associated with the Amended Proposal is expected to be less than the Approved Proposal, the impact on the surrounding road network would be similarly reduced. The overall traffic impacts of the Amended Proposal would be minor and the future road network would be expected to continue to perform at a level of service B or better.

6 Site Layout Assessment

6.1 Swept Path Analysis

A swept path analysis of on-site vehicle movements has been undertaken using Vehicle Tracking software in AutoCAD. Turn paths of the largest trucks proposed to access the RRF have been reviewed, including a 19m semi-trailer, 19m truck-and-dog combination and 11m front-lift truck (HRV).

The assessment indicates that there is sufficient space on-site for articulated vehicles to undertake the required turning movements in order to access the waste pit and both waste collection points (i.e. bulk loadout area and product storage bays).

In addition, a 19m semi-trailer would be able to adequately travel from the waste pit to the bulk loadout area in order to collect waste prior to leaving the site.

All vehicle movements would be undertaken in a forward direction. A minor reverse manoeuvre would be required by trucks to access the waste pit (by delivery trucks) and bulk loadout area or product storage bays (by collection trucks). Any reverse manoeuvres undertaken on-site would be done so under the supervision of site personnel.

Swept paths plans showing the proposed manoeuvres for the largest trucks on-site are contained in Appendix C.

6.2 On-Site Stacking Assessment

6.2.1 Truck Turnaround Time

Proposed modifications to the site layout would improve site operations, resulting in significant efficiencies. One such improvement includes reduced truck turnaround times on-site (i.e. duration a truck spends on-site between entry and exit). The typical truck turnaround time would be reduced from 25 minutes to 17 minutes on-site.

The new turnaround time is based on September 2017 survey data of trucks tipping at an RRF facility which operates similarly to how the Amended Proposal is intended to operate in the future. A reduced turnaround time at the future RRF would be further reinforced by the modified site layout having more direct routes to waste delivery/ collection points, provision of dual waste tipping and collection points (i.e. bulk loadout area and product storage bays) and simultaneous waste delivery and collection activities.

In the unlikely event that an incident occurs that results in operational delay, the turnaround time could be up to 25 minutes per truck. This occurrence would be infrequent and would be considered to reflect a 'worst-case' stacking scenario.

Both typical and worst-case stacking scenarios have been assessed based on the new on-site stacking provision as detailed in the following sub-sections.

6.2.2 On-site Stacking Provision

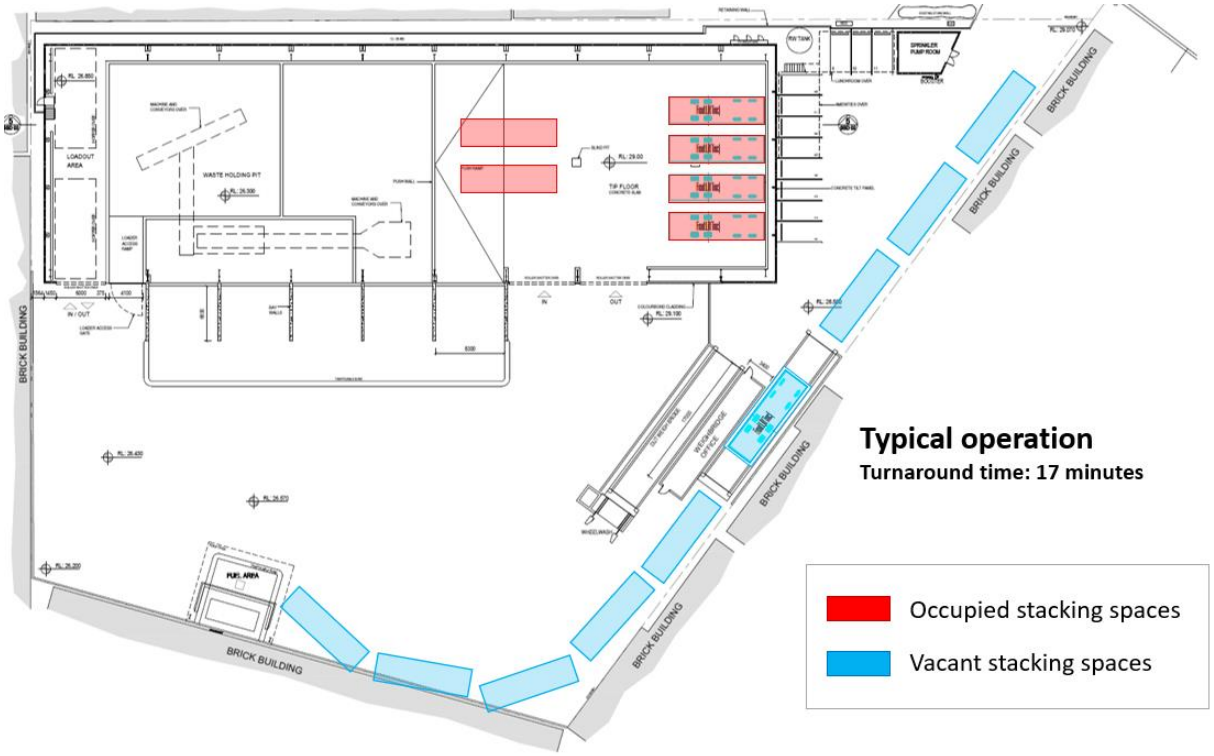
In light of the benefits achieved through modifying the site layout, there would be a reduction in the number of available truck stacking spaces on-site. As part of the Amended Proposal there would be a total of 15 stacking spaces down from 28 stacking spaces on the Approved Proposal. Notwithstanding, sufficient on-site stacking capacity would be available for the Amended Proposal as assessed herein.

6.2.3 General Scenario Stacking Calculation

Based on a turnaround time of 17 minutes on-site each stacking space could accommodate 3.5 trucks in one hour (60 minute / 17 minutes). Therefore, during any hour of operation across the day the proposed stacking arrangement could accommodate the turn-over of 52 trucks (3.5 trucks x 15 spaces).

The availability of stacking space within the site would be able to adequately store the 18 trucks expected to arrive during peak site operation (Table 5.1 and Figure 5.1). These 18 trucks could be accommodated across six stacking spaces, leaving nine stacking spaces vacant. This scenario is illustrated in Figure 6.1.

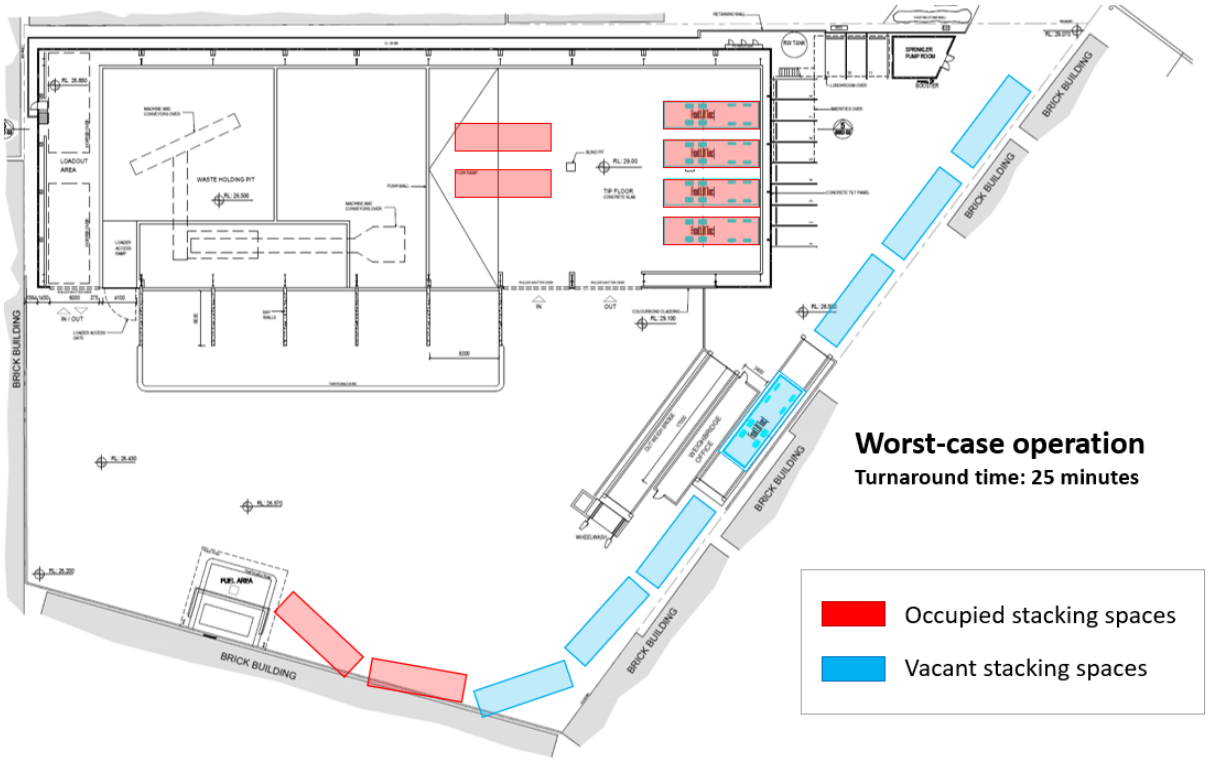
Figure 6.1: Utilisation of Stacking Spaces – Typical Operation



In the worst-case scenario, the turnaround time could be up to 25 minutes which would permit each stacking space to accommodate 2.4 trucks in one hour (60 minute / 25 minutes). Thus, the proposed stacking arrangement could accommodate the turn-over of 36 trucks in any hour throughout the day (2.4 trucks x 15 spaces).

In this scenario, the 18 trucks in the peak period would be adequately accommodated across eight stacking spaces. As a result, there would be seven vacant stacking spaces remaining which could accommodate a potential overflow of vehicles in the case of an incident occurring. The worst-case stacking scenario is illustrated in Figure 6.2

Figure 6.2: Utilisation of Stacking Spaces – Worst-Case Operation



Under typical and worst-case stacking scenarios, there would be more than sufficient space on-site to accommodate truck volumes in the peak periods. Peak operations represent only part of the full-day operation, therefore for the majority of the day, truck volumes would be less than assessed above.

6.2.4 Detailed Scenarios Stacking Estimates

As described in Section 5.1, greater control of waste processing operations under the Amended Proposal would allow the site operator to better manage periods of anticipated deliveries and planned waste collections. This would result in five typical stacking scenarios expected to occur at the site based on the future traffic generation (Table 5.1).

Given that there is a mixture of vehicles accessing different areas of the RRF in each scenario, a fine-grain stacking analysis of all scenarios has been undertaken herein. For the purpose of assessing stacking in each detailed scenario Table 5.1 has been reproduced as Table 6.1 with labels "A" to "E" representing each of the five scenarios. Scenarios are as follows:

Separate waste delivery and collection scenarios

Scenario	Traffic Composition
▪ A	Utes to HRVs delivering waste
▪ B	AVs collecting waste in bulk loadout

<u>Simultaneous</u> waste delivery and collection scenarios

Scenario	Traffic Composition
▪ C	Utes to HRVs delivering waste + AVs collecting product in storage bays
▪ D	Utes to HRVs delivering waste + AV delivering waste + AVs collecting product in storage bays
▪ E	AV delivering waste + AV collecting waste in bulk loadout + AV collecting product in storage bays

Table 6.1 Future Stacking Scenarios

Starting Hour	Truck Movements per hour [a]		Average No. of Trucks per Hour (Future)				
			Deliveries		Collections		Total per hour (Amended Proposal)
	Existing	Future	Utes to HRV	AVs	AVs in Bulk Loadout	AVs in Storage Bays	
6:00	11	10	12			5	17
7:00	17	12	13			5	18
8:00	18	22	13				13
09:00[b]	22	32	13				13
10:00	27	40	13				13
11:00	29	42	13				13
12:00	21	38	12	1		5	18
13:00	20	32	12	1		5	18
14:00	13	28	12	1		5	18
15:00	13	22		1	5	5	11
16:00[c]	7	14			5		5
17:00	6	14			5		5
18:00	0	16			5		5
19:00	0	16			5		5
20:00	0	14			5		5
21:00	0	12			5		5
Total	**204**	**364**	**113**	**4**	**35**	**30**	**182**

C
A
D
E
B

Notes:
a As per RTS prepared by TTPP, dated 3 April 2017
b Road network AM peak hour
c Road network PM peak hour

Applying the method of calculating stacking capacity used in Section 6.2.3, detailed scenarios and their associated stacking space requirements would be as follows:

Separate waste delivery and collection scenarios

Scenario	Hourly Traffic Generation	Stacking Spaces Required
▪ A	▪ Utes to HRVs delivering waste x 12-13/h	▪ 4 spaces
▪ B	▪ AVs collecting waste in bulk loadout x 5/h	▪ 2 spaces

Figure 6.3 and Figure 6.4 illustrate the on-site stacking capacity in scenarios A and B, respectively.

Figure 6.3: Utilisation of Stacking Spaces – Scenario A

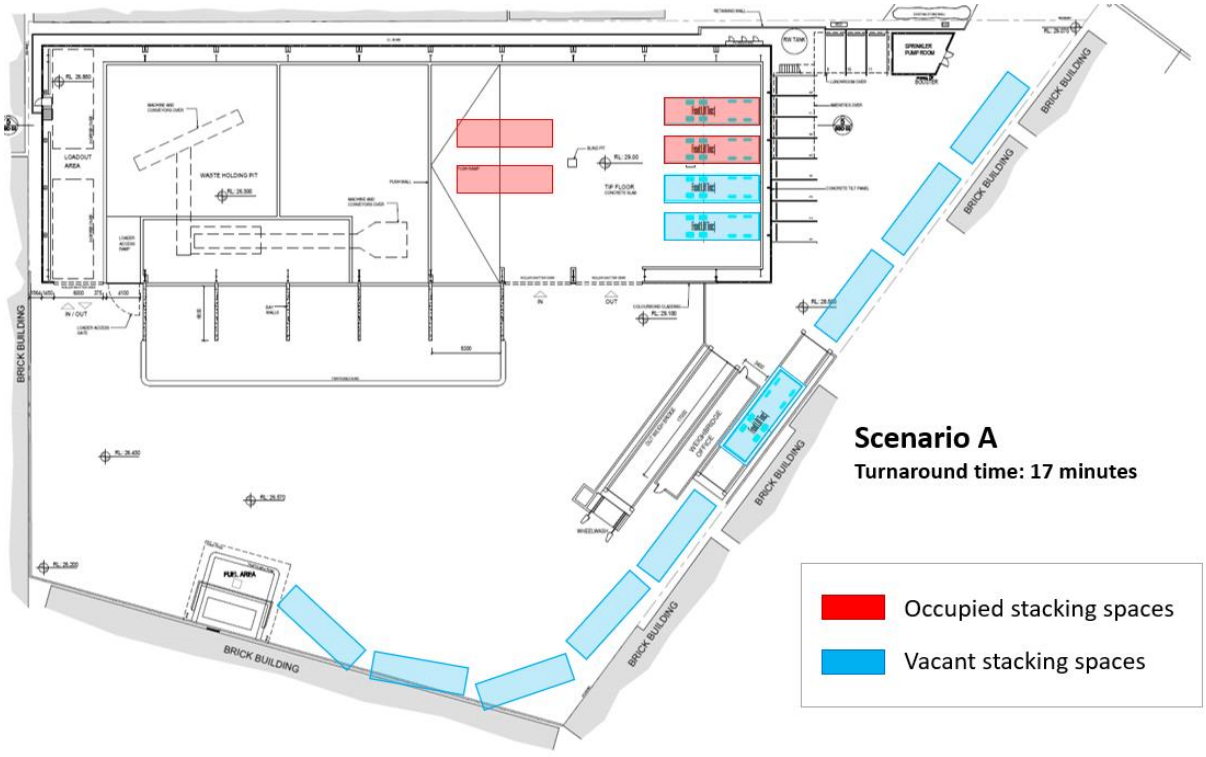
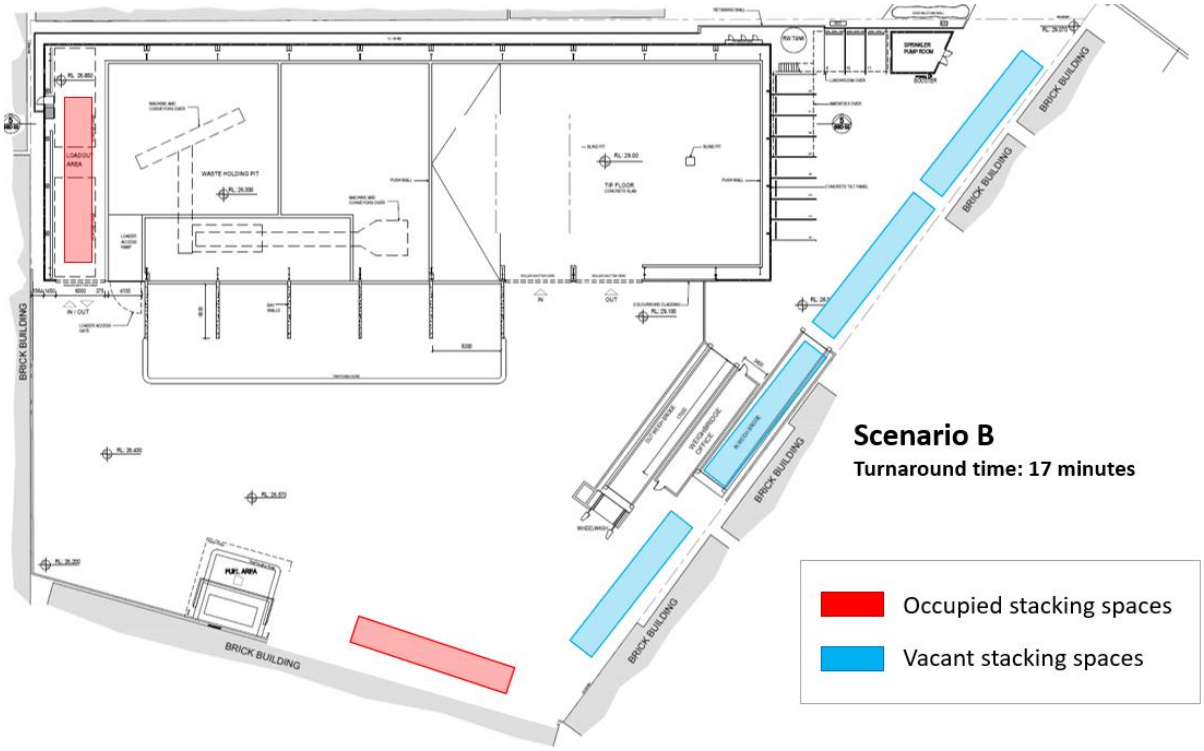


Figure 6.4: Utilisation of Stacking Spaces – Scenario B



<u>Simultaneous</u> waste delivery and collection scenarios

Scenario	Hourly Traffic Generation	Stacking Spaces Required
▪ C	▪ Utes to HRVs delivering waste x 13/h + AVs collecting product in storage bays x 5/h	▪ 4 + 2 = 6 spaces
▪ D	▪ Utes to HRVs delivering waste x 12/h + AV delivering waste x1/h + AVs collecting product in storage bays x 5/h	▪ 4 + 1 + 2 = 7 spaces
▪ E	▪ AV delivering waste x 1/h + AV collecting waste in bulk loadout x 5/h + AV collecting product in storage bays x 5/h	▪ 1 + 2 + 2 = 5 spaces

Figure 6.5 to Figure 6.7 depict the on-site stacking capacity in scenarios C to E, respectively.

Figure 6.5: Utilisation of Stacking Spaces – Scenario C

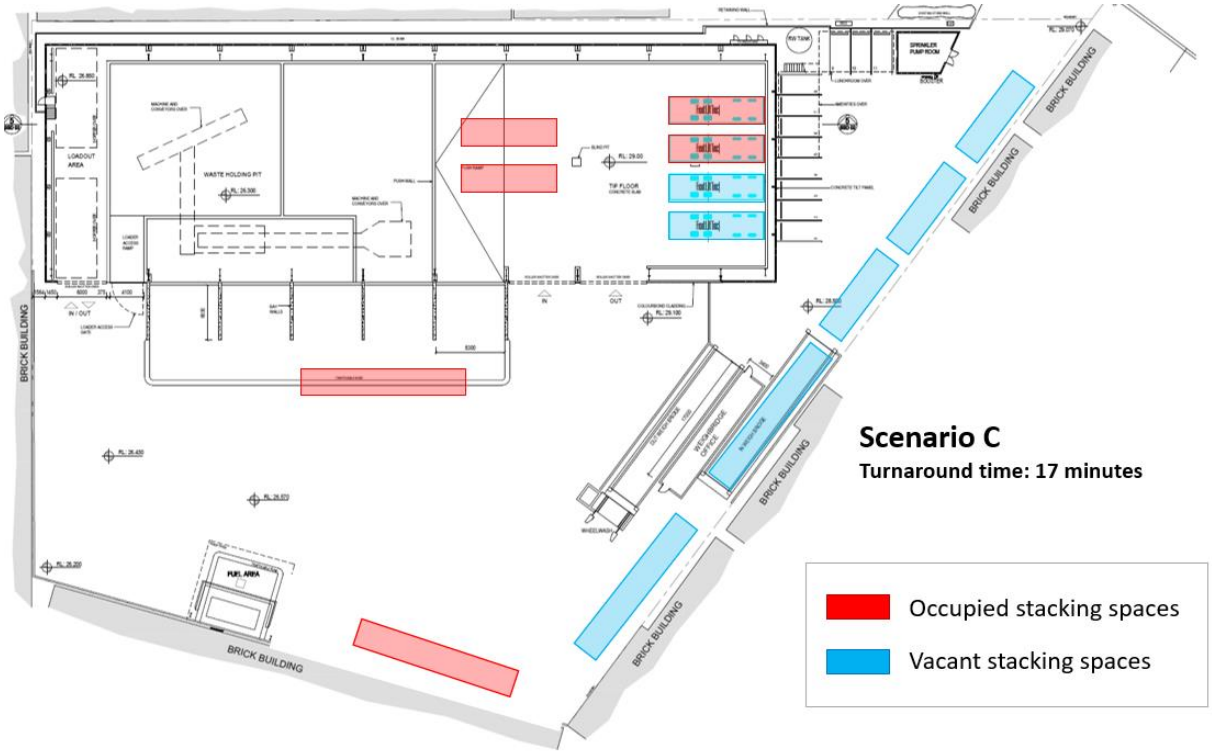


Figure 6.6: Utilisation of Stacking Spaces – Scenario D

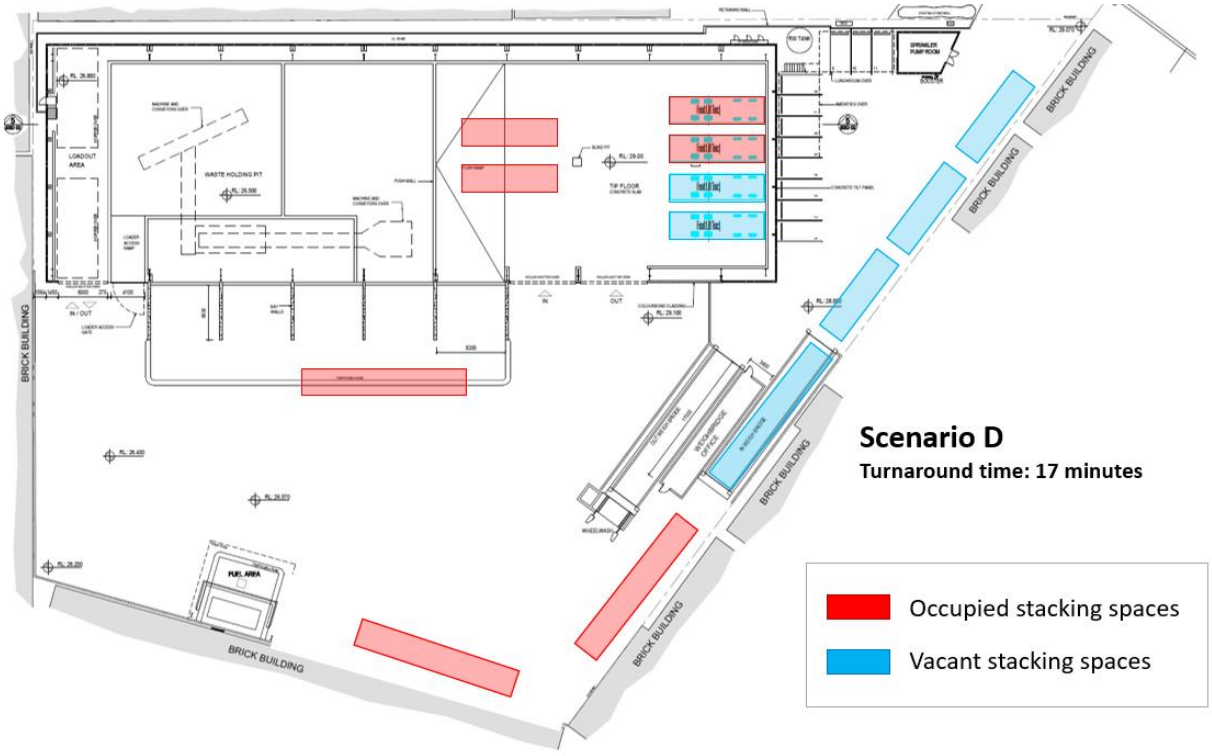
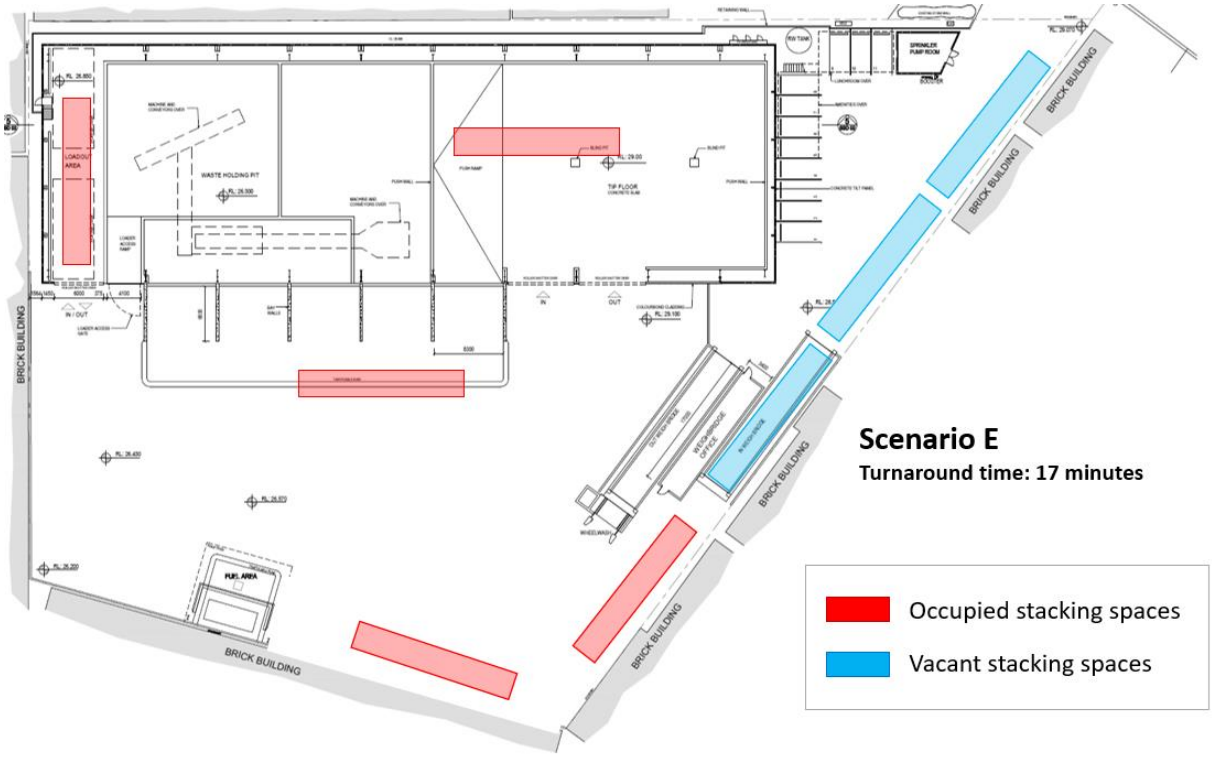


Figure 6.7: Utilisation of Stacking Spaces – Scenario E



In any of the above scenarios, the on-site stacking provision for trucks would sufficiently accommodate the expected number of vehicles across any hour of RRF operations. The greatest number of occupied stacking spaces would occur in scenario D where there would be a requirement for seven stacking spaces, resulting in six stacking spaces remaining available.

Scenario D represents the peak operational period (with 18 trucks expected per hour) and generally accords with the typical scenario as assessed in Section 6.2.3. The findings of the typical scenario analysis (Figure 6.1) indicate that six stacking spaces would be required to accommodate 18 trucks while Scenario D indicates seven stacking spaces would be needed. The discrepancy of one space is due to rounding of the sum of stacking spaces for the different vehicle groups in Scenario D (i.e. 4 + 1 + 2 spaces).

Overall, the 18 trucks expected to access the RRF in the busiest period of site operation would be sufficiently accommodated within the premises under the modified site layout. In the event of an incident occurring, the proposed stacking plan would adequately accommodate these trucks without causing queuing into Hearne Street.

7 Summary and Conclusion

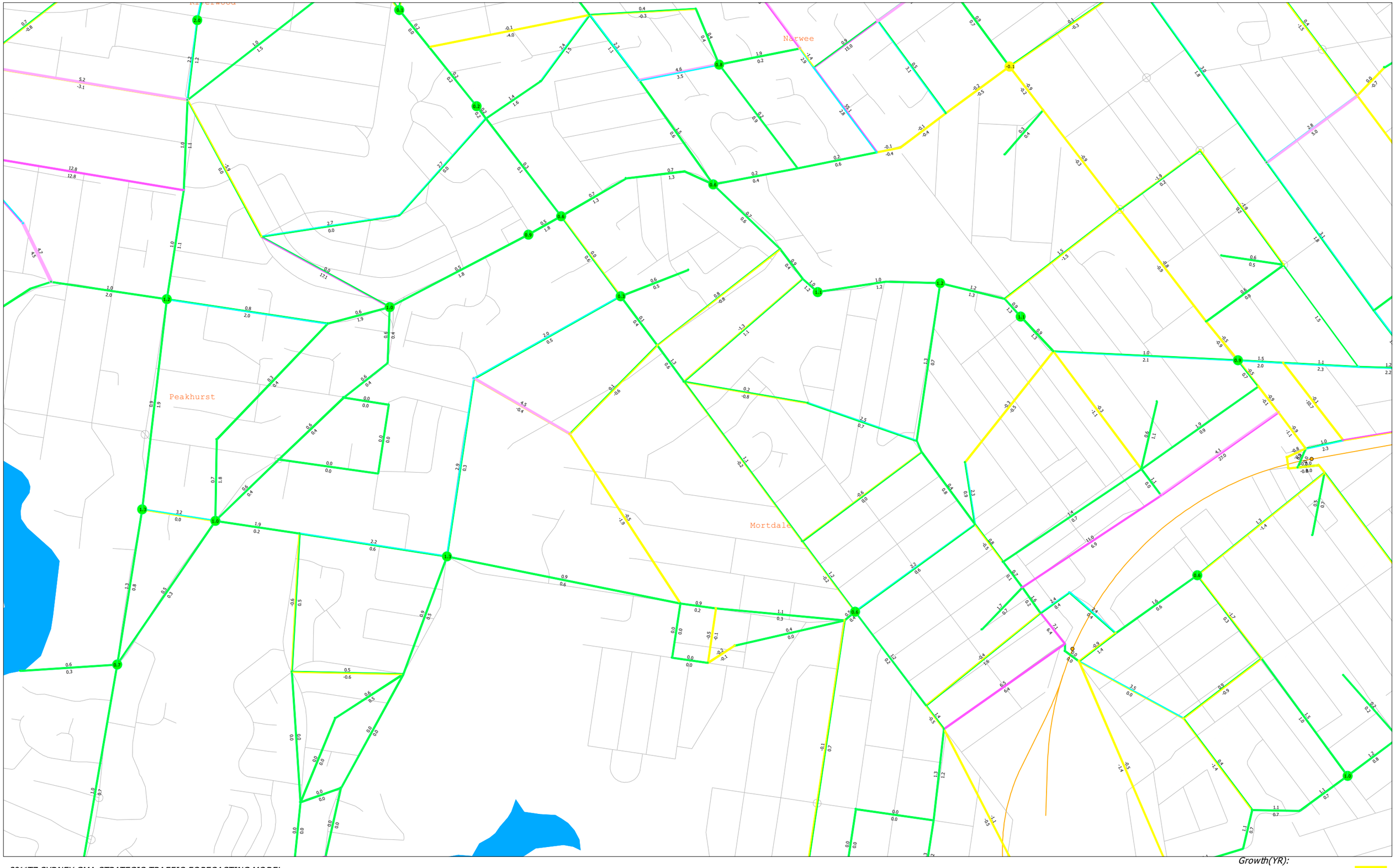
Based on the analysis and discussions presented within this revised TIA, the following summary and conclusions are made:

- Car parking provision for 11 spaces on-site would satisfactorily meet the parking demand expected to be generated by the 8-10 full-time employees and visitors to the site.
- Dimensions for car parking spaces would be in accordance with User Class 1 (employee and commuter parking) as per Australian Standards.
- Site-generated traffic volumes by the Amended Proposal are expected to be similar to those previously assessed; that is, 182 daily vehicles (or 364 daily vehicle movements).
- Peak site operations are expected to generate 18 trucks which is three less compared to the previous assessment (i.e. 21 trucks) Similarly, site-generated traffic volumes in the road network peak periods would be expected to be lower, and thus, would result in the same or better operating conditions.
- A swept path analysis shows that the required turning movements by articulated vehicles on-site can be satisfactorily accommodated.
- Proposed modifications to the site layout would improve operation at the RRF resulting in significant improvements, including reduced truck turnaround times from 25 minutes to 17 minutes.
- Under typical and worst-case scenarios, available on-site stacking spaces would sufficiently accommodate truck volumes expected to be generated by future RRF operations.
- Further detailed analysis of simultaneous waste delivery and collection scenarios indicate that throughout the day stacking of articulated vehicles, HRVs and smaller vehicles would be adequately accommodated on-site. A maximum of seven stacking spaces are required to accommodate the peak vehicle generation, resulting in six stacking spaces remaining available.

Appendix A

RMS Sydney Strategic Travel Model (STM) Data

ROAD TRAFFIC GROWTH (%YR, 2HRSPK) LINKS & INTERSECTIONS

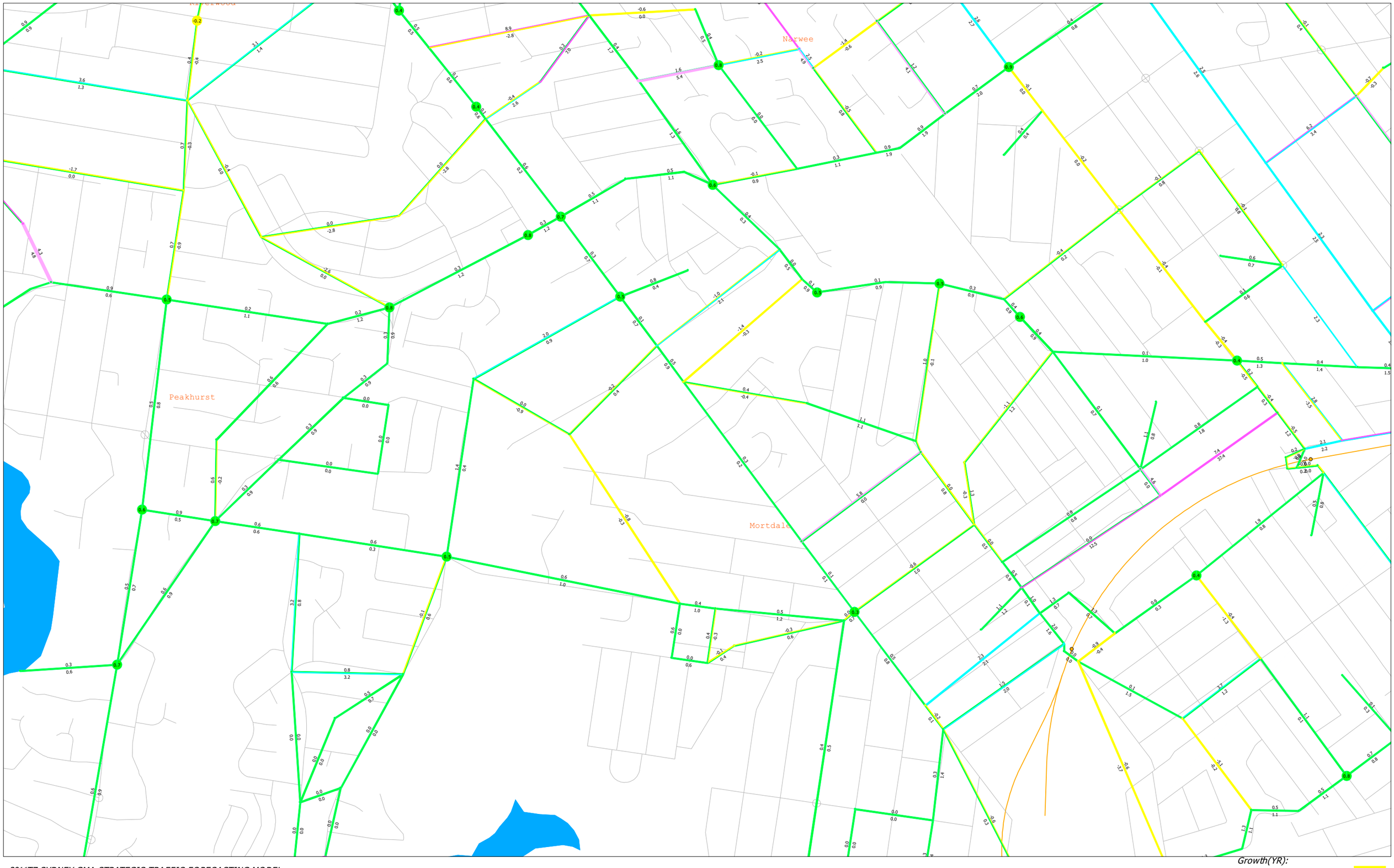


2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 2026: 2026 SYD TRAFFIC FORECASTING MODEL(TZ11LU16V1.3)7-9AM(mf34)
2019-01-21 09:10

Growth(YR):

<0
<2.00
2.01-4.00
4.01-6.00
>6.00
New Links=999

ROAD TRAFFIC GROWTH (%YR, 2HRSPK) LINKS & INTERSECTIONS



2011TZ SYDNEY GMA STRATEGIC TRAFFIC FORECASTING MODEL
Scenario 20260: 2026 SYD TRAFFIC FORECASTING MODEL(TZ11LU16V1.3)4-6PM(mf54)
2019-01-21 09:11

Growth(YR):

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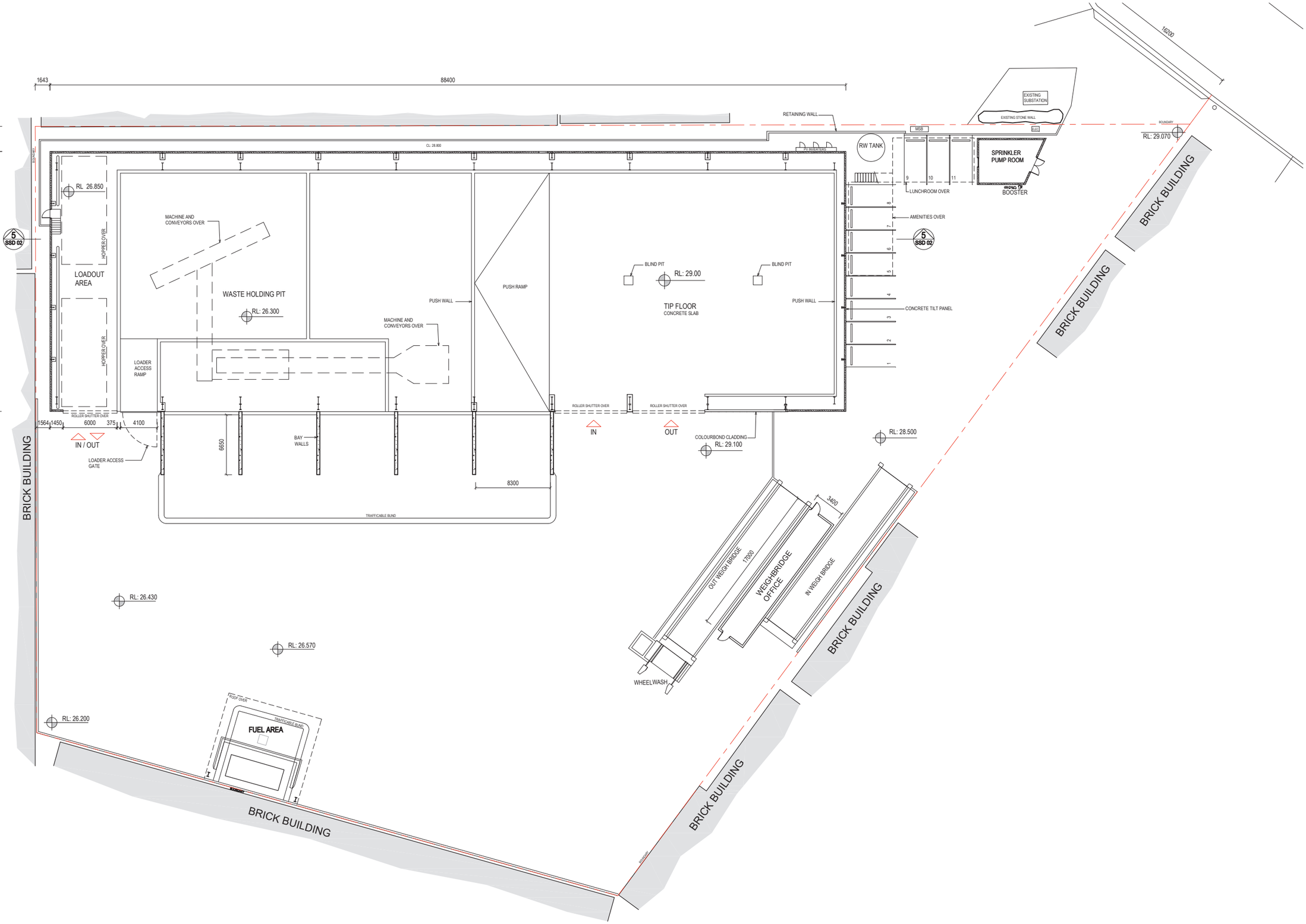
<2.00
2.01-4.00
4.01-6.00
>6.00
New Links=999

Appendix B

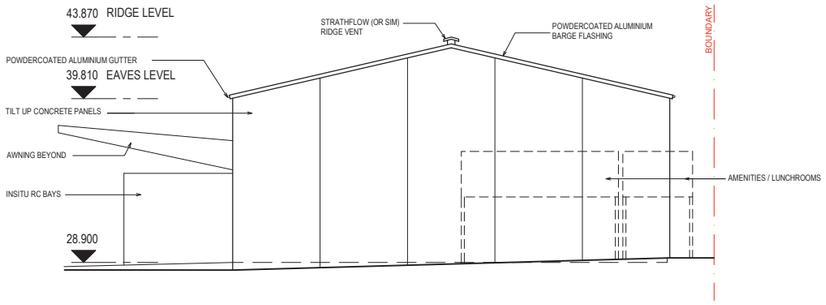
Site Plan of Revised Proposal



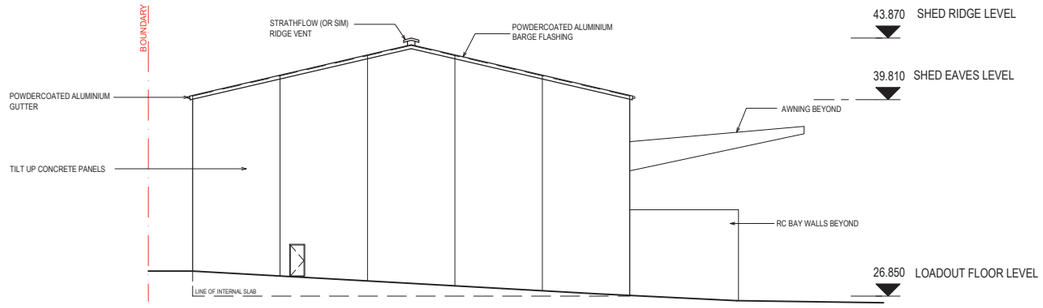
REV.	DATE	NOTE
01	21.02.2019	ISSUED FOR SSD MOD

DRAWING	GROUND FLOOR PLAN	DWG NO. SSD 01	REV 01
CLIENT	BINGO INDUSTRIES	SCALE 1:200 @ A1, 1:400@A3	
SITE	20 HEARNE STREET, MORTDALE		

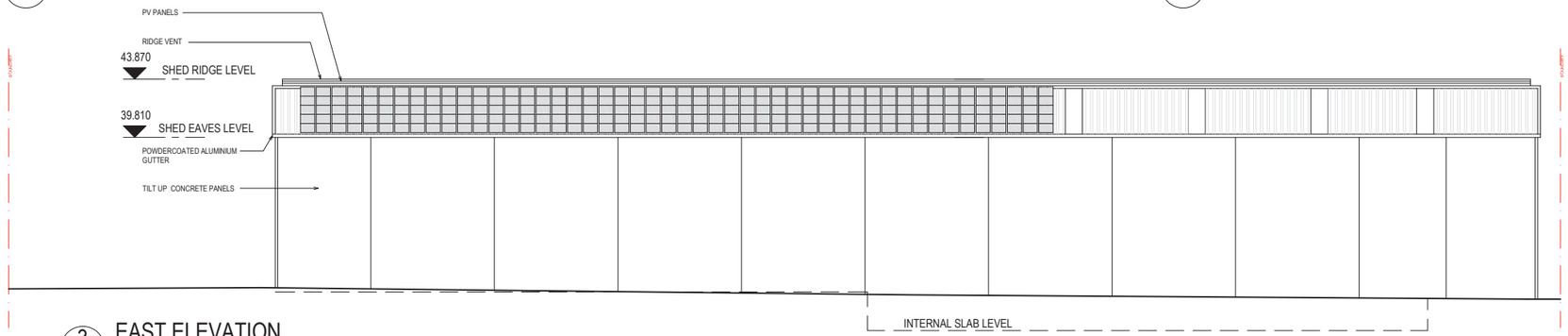
DEWCAPE
DISTINCTION IN BUILDING



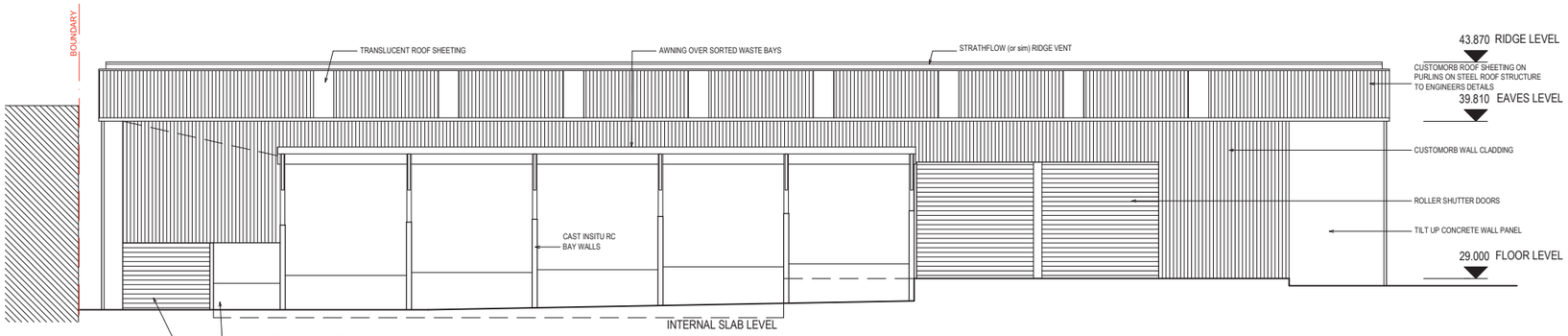
1 SOUTH ELEVATION



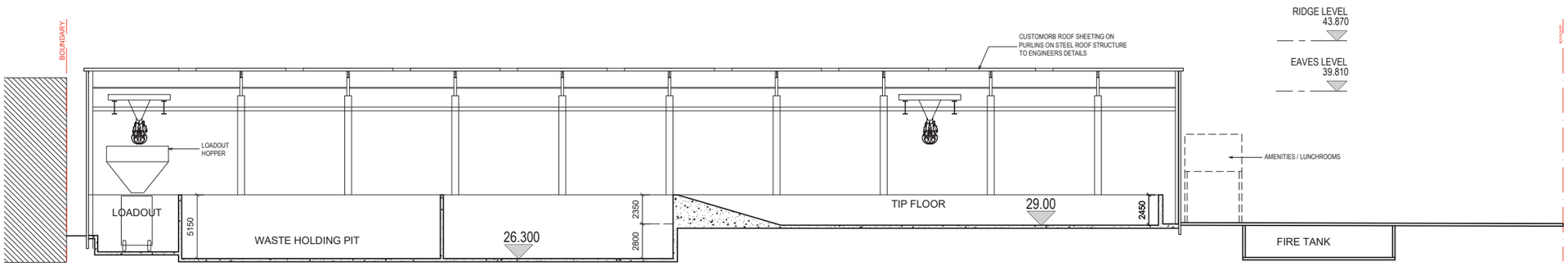
2 NORTH ELEVATION



3 EAST ELEVATION



4 WEST ELEVATION



5 SECTION

REV.	DATE	NOTE
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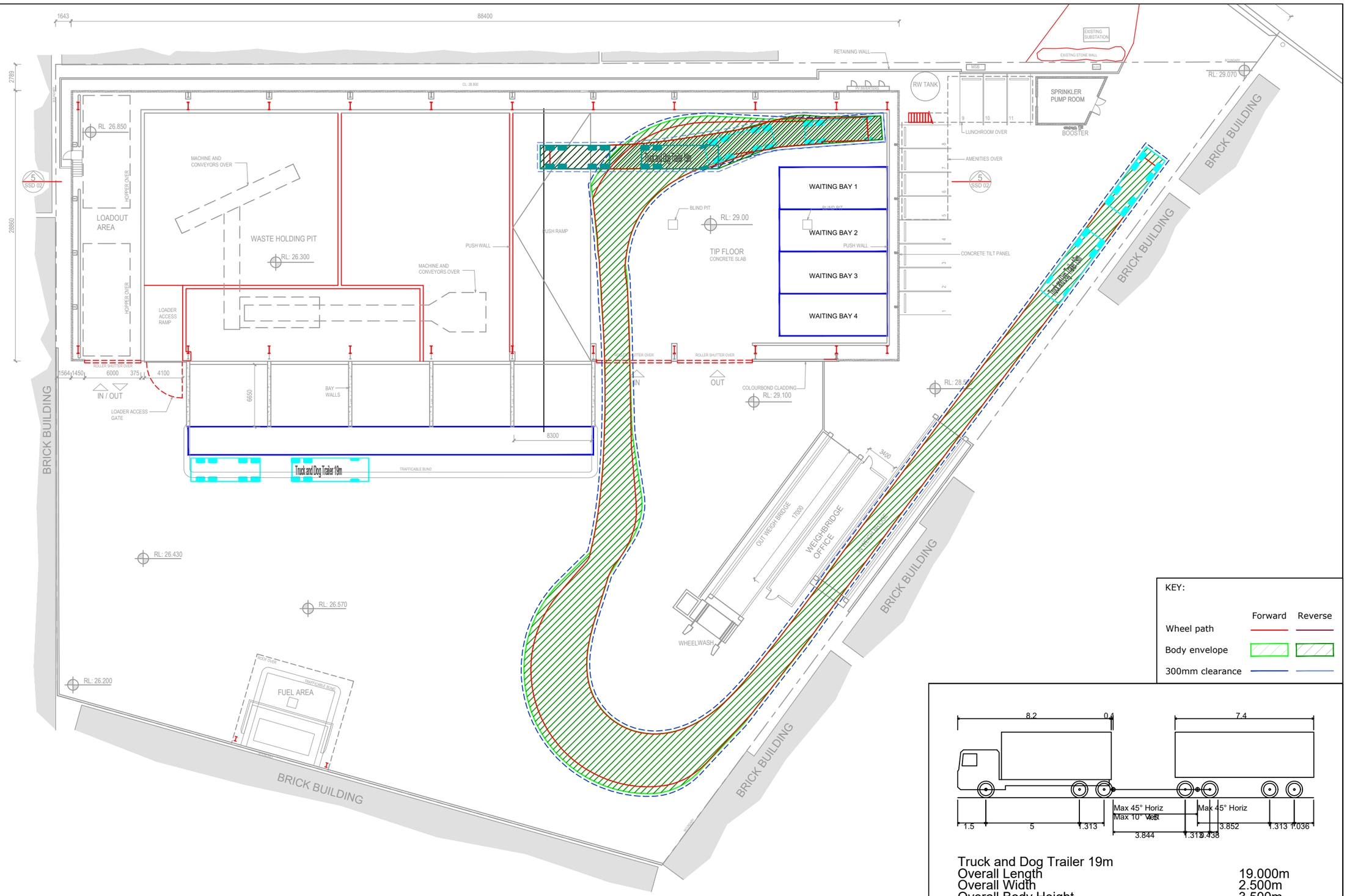
DRAWING	ELEVATIONS & SECTION	DWG NO. SSD 02	REV 01
CLIENT	BINGO INDUSTRIES	SCALE 1:200 @ A1, 1:400@A3	
SITE	20 HEARNE STREET, MORTDALE		

DEWCAPE
DISTINCTION IN BUILDING

Appendix C

Swept Path Analysis



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

Truck and Dog Trailer 19m

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	3.500m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.500m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	WJ	22/02/19

ttpp transport planning

PROJECT: BINGO MORTDALE

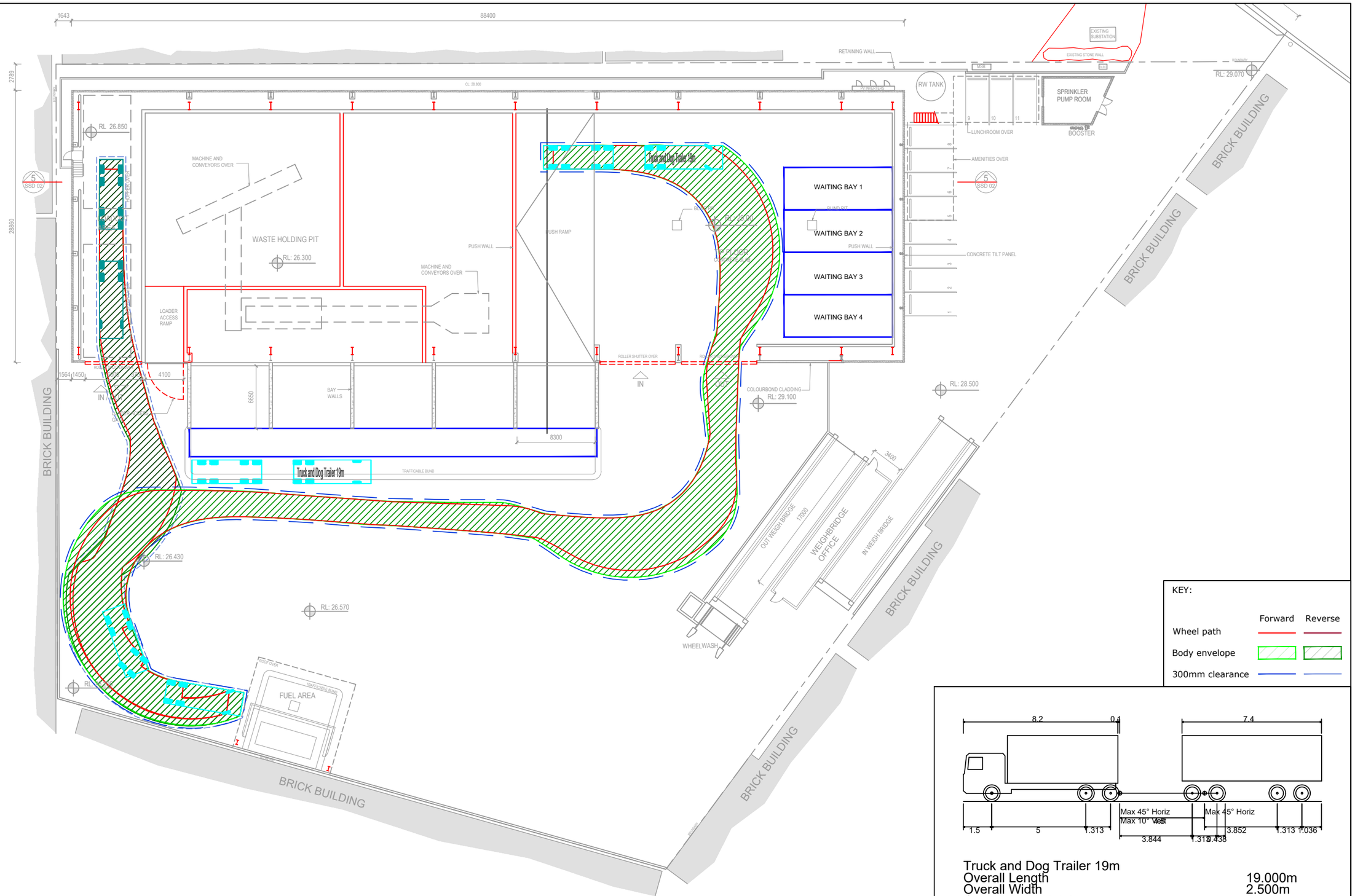
TITLE: 19m TRUCK & DOG TRAILER VEHICLE SWEPT PATH ANALYSIS
INBOUND WEIGHBRIDGE - DROP/ TIP AREA

DWG No. 16222CAD007
FIGURE 1

DATE STAMP: 22 FEBRUARY 2019

PROJECT No.	SCALE	REV.
16222	1:400 @ A3	A

Filename: 16222CAD007-SWEPT PATH-190222.dwg Date: 22 February 2019 By: Kiet.magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

Truck and Dog Trailer 19m

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	3.500m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.500m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	WJ	22/02/19

ttpp transport planning

PROJECT: BINGO MORTDALE

TITLE: 19m TRUCK & DOG TRAILER VEHICLE SWEPT PATH ANALYSIS
DROP/ TIP AREA - BUNKER AREA

DWG No. 16222CAD007 FIGURE 2

DATE STAMP 22 FEBRUARY 2019

PROJECT No.	SCALE	REV.
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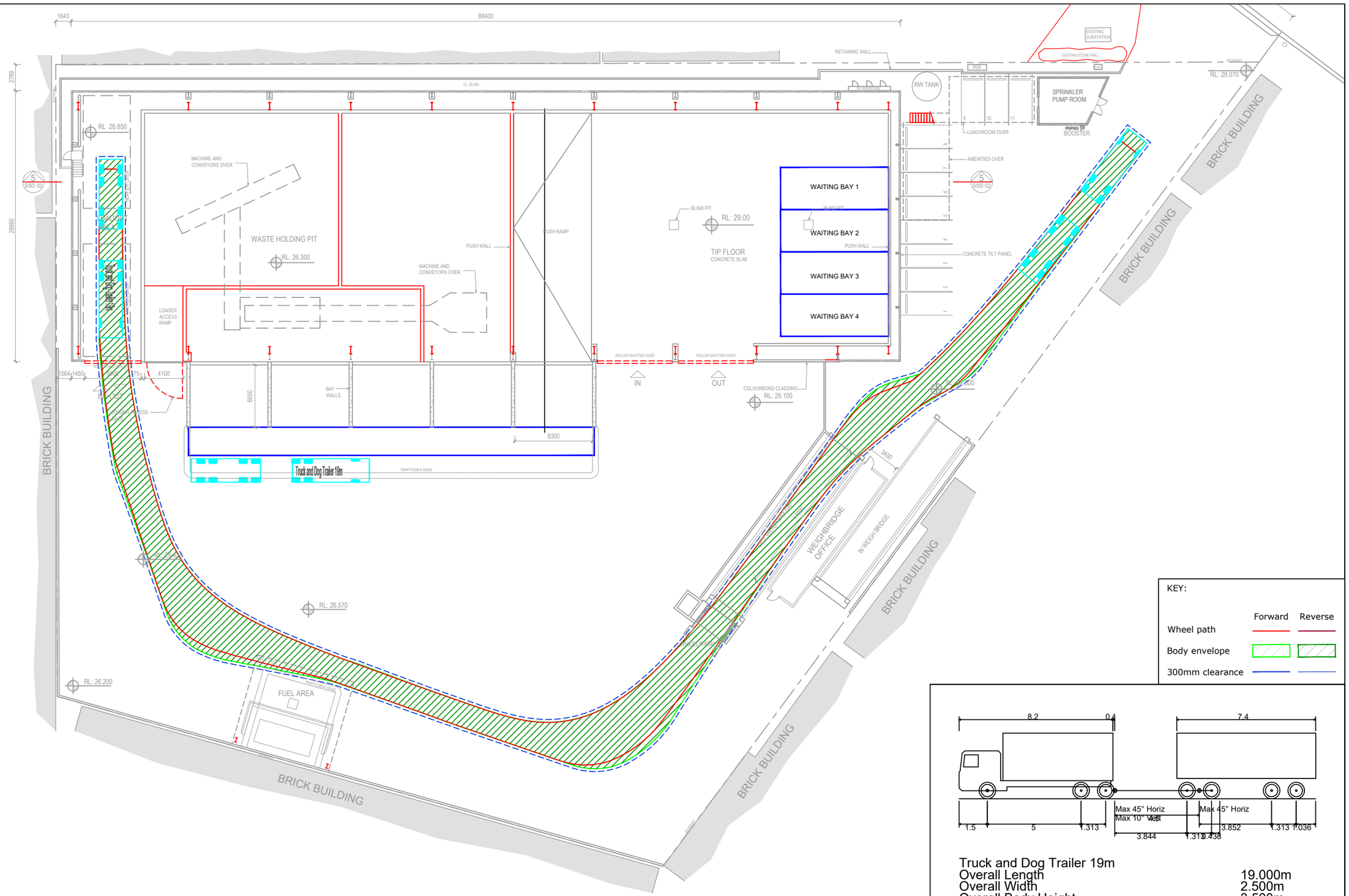
Filename: 16222CAD007-SWEPT PATH-190222.dwg Date: 22 February 2019 By: Karl magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

Truck and Dog Trailer 19m	
Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	3.500m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.500m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	WJ	22/02/19

ttpp transport planning

PROJECT: BINGO MORTDALE

TITLE: 19m TRUCK & DOG TRAILER VEHICLE SWEPT PATH ANALYSIS
BUNKER AREA - OUTBOUND WEIGHBRIDGE

DWG No. 16222CAD007
FIGURE 3

DATE STAMP: 22 FEBRUARY 2019

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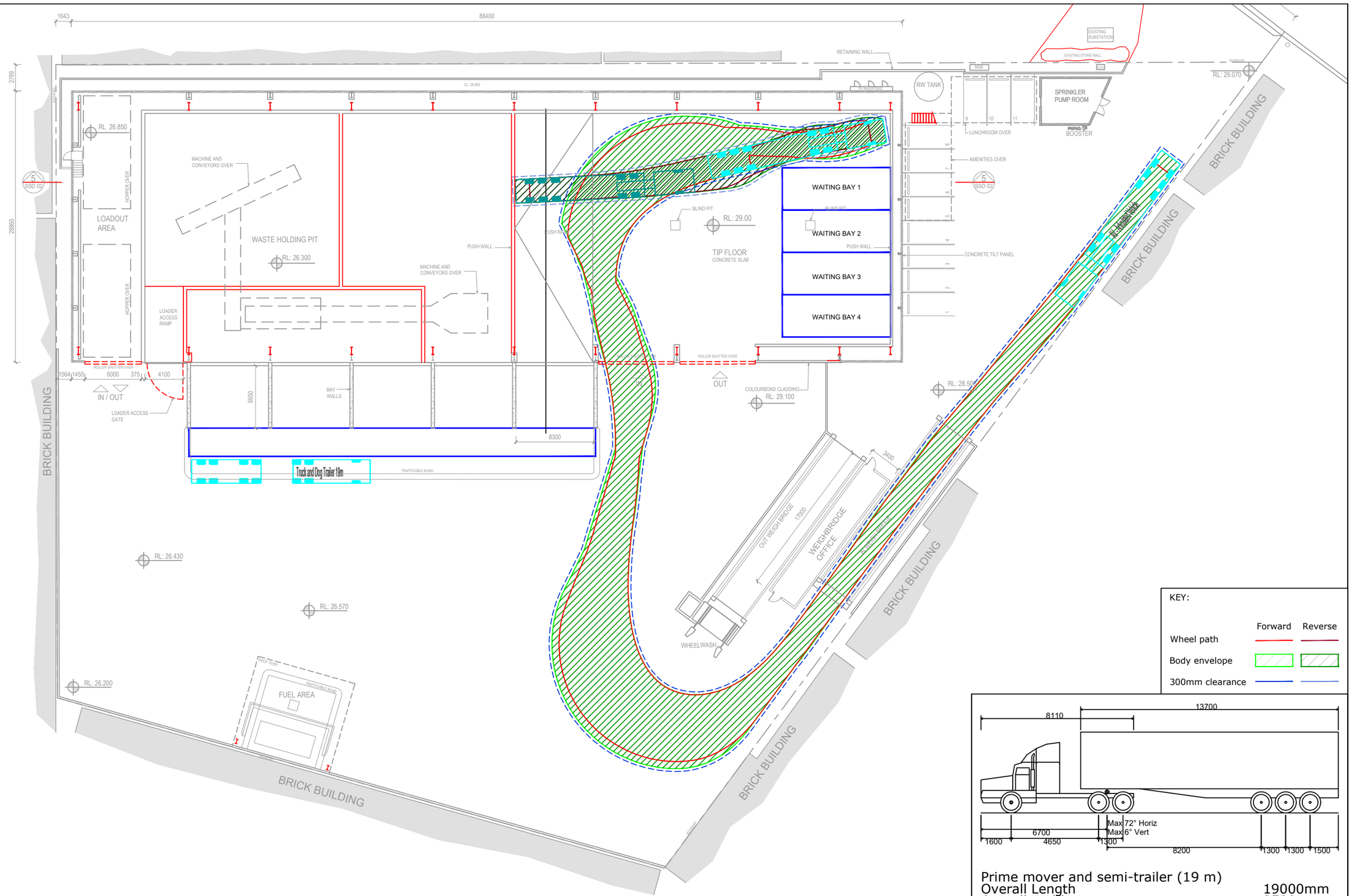
Filename: 16222CAD007-SWEPT PATH-190222.dwg
Date: 22 February 2019
By: Karl magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

Prime mover and semi-trailer (19 m)	
Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	WJ	22/02/19

ttpp transport planning

PROJECT: BINGO MORTDALE

TITLE: 19m PRIME MOVER & SEMI-TRAILER VEHICLE SWEPT PATH ANALYSIS
INBOUND WEIGHBRIDGE - DROP/ TIP AREA

DWG No. 16222CAD007
FIGURE 4

DATE STAMP 22 FEBRUARY 2019

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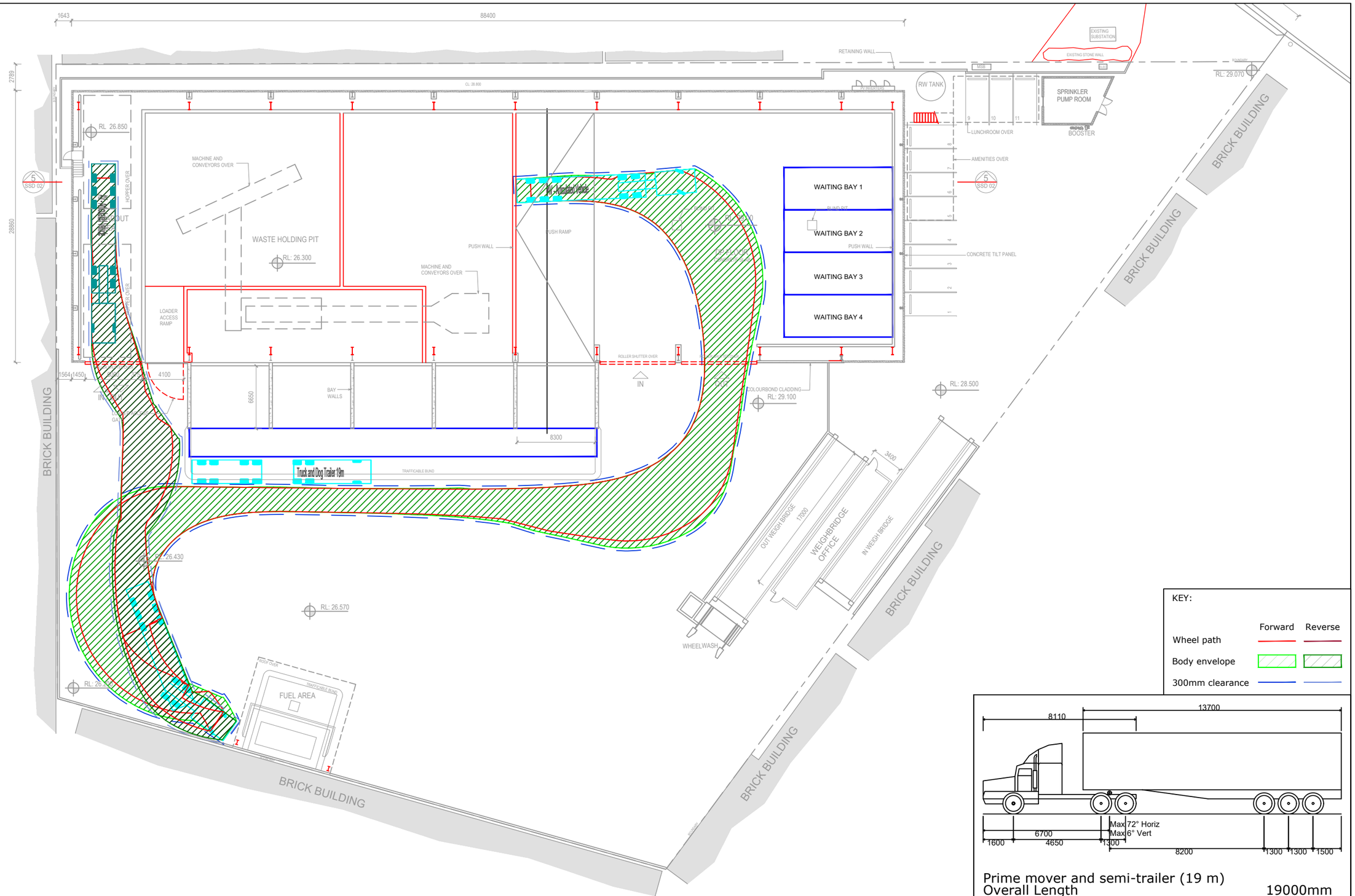
Filename: 16222CAD007-SWEPT PATH-190222.dwg
Date: 22 February 2019
By: Kiat magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	WJ	22/02/19

ttpp transport planning

PROJECT

BINGO MORTDALE

TITLE

19m PRIME MOVER & SEMI-TRAILER VEHICLE SWEPT PATH ANALYSIS
DROP/ TIP AREA - BUNKER AREA

DWG No. 16222CAD007 FIGURE 5

DATE STAMP 22 FEBRUARY 2019

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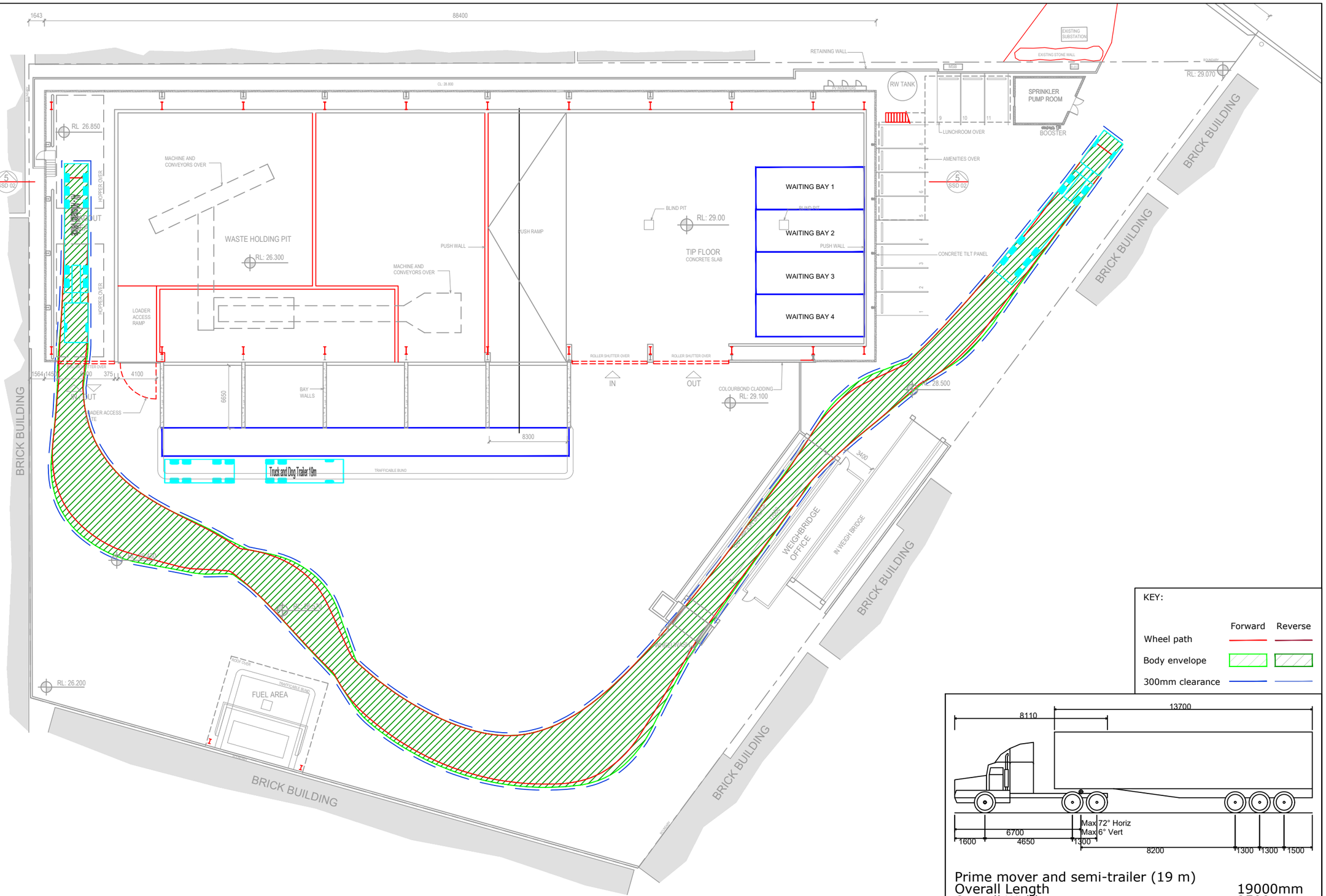
Filename: 16222CAD007-SWEPT PATH-190222.dwg Date: 22 February 2019 By: Karl magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

Prime mover and semi-trailer (19 m)

Overall Length	19000mm
Overall Width	2500mm
Overall Body Height	4300mm
Min Body Ground Clearance	540mm
Track Width	2500mm
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12500mm

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	WJ	22/02/19

ttpp transport planning

PROJECT: BINGO MORTDALE

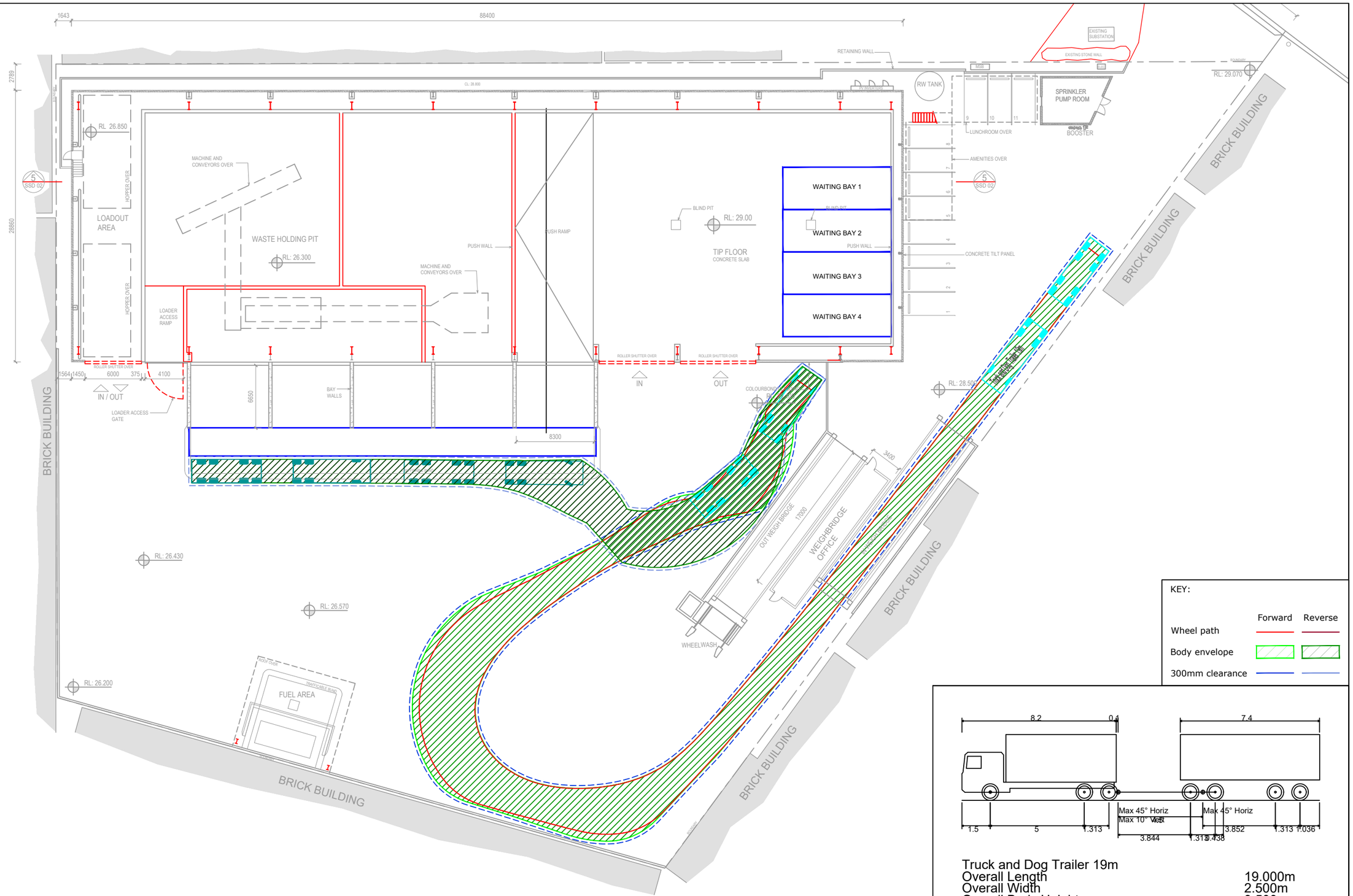
TITLE: 19m PRIME MOVER & SEMI-TRAILER VEHICLE SWEPT PATH ANALYSIS
BUNKER AREA - OUTBOUND WEIGHBRIDGE

DWG No. 16222CAD007 FIGURE 6

DATE STAMP 22 FEBRUARY 2019

PROJECT No.	SCALE	REV.
16222	1:400 @ A3	A

Filename: 16222CAD007-SWEPT PATH-190222.dwg Date: 22 February 2019 By: Kiat magistrado



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

Truck and Dog Trailer 19m	
Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	3.500m
Min Body Ground Clearance	0.427m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	12.500m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	WJ	22/02/19

ttpp transport planning

PROJECT: BINGO MORTDALE

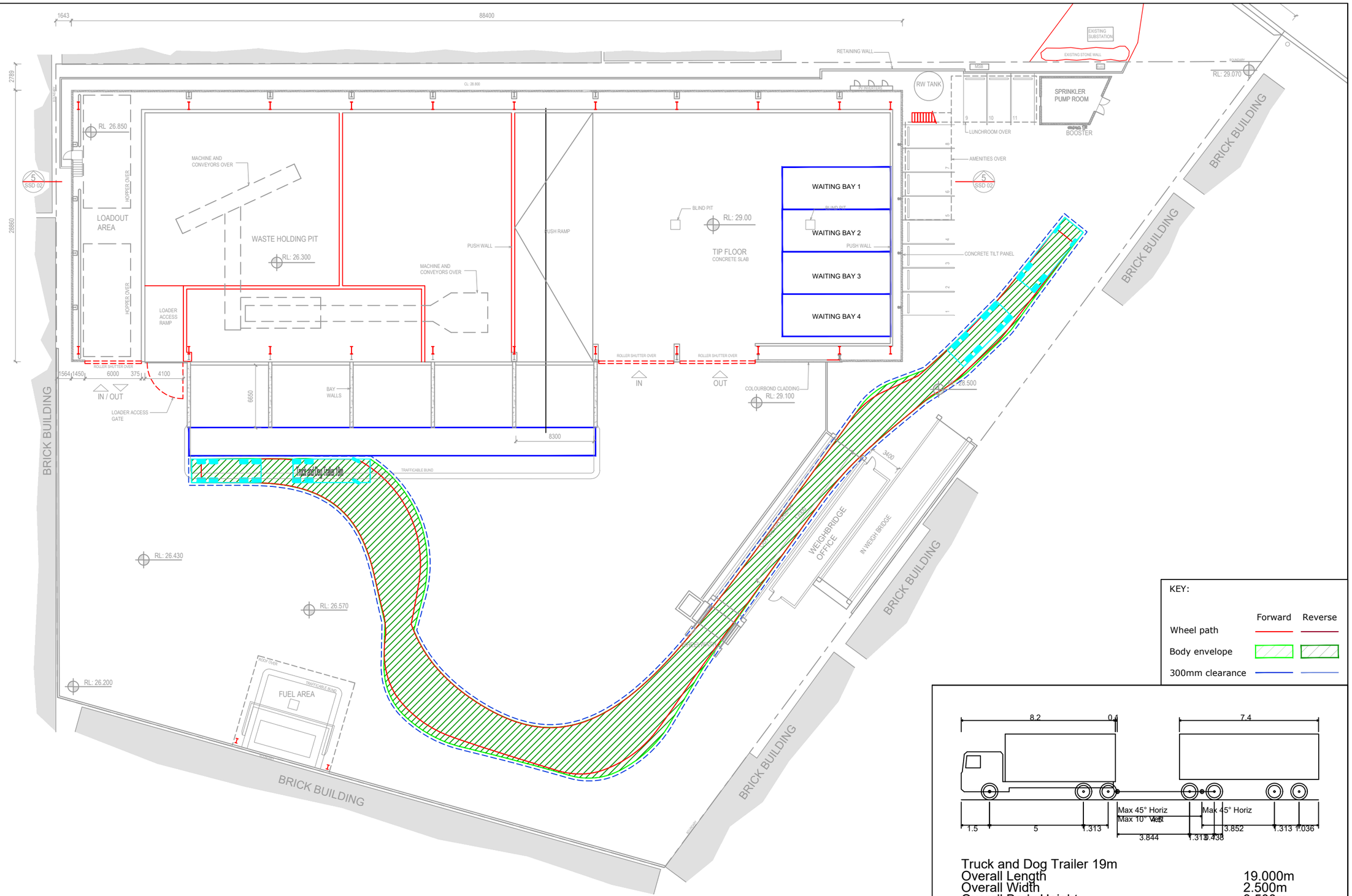
TITLE: 19m TRUCK & DOG TRAILER VEHICLE SWEPT PATH ANALYSIS
INBOUND WEIGHBRIDGE - BIN AREA

DWG No. 16222CAD007
FIGURE 7

DATE STAMP: 22 FEBRUARY 2019

PROJECT No. 16222 | SCALE 1:400 @ A3 | REV. A

Filename: 16222CAD007-SWEPT PATH-190222.dwg Date: 22 February 2019 By: Karl magistrado



KEY:

	Forward	Reverse
Wheel path		
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REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	KM	SB	WJ	22/02/19

ttpp transport planning

PROJECT: BINGO MORTDALE

TITLE: 19m TRUCK & DOG TRAILER VEHICLE SWEPT PATH ANALYSIS
BIN AREA - OUTBOUND WEIGHBRIDGE

DWG No. 16222CAD007
FIGURE 8

DATE STAMP: 22 FEBRUARY 2019

PROJECT No.	SCALE	REV.
16222	1:400 @ A3	A

Filename: 16222CAD007-SWEPT PATH-190222.dwg Date: 22 February 2019 By: Karl magistrado

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

www.ttpp.net.au

ARCADIS Design & Consultancy for natural and built assets