

Fire Safety Study
Resources recovery facility - Mortdale
20 Herne Street, Mortdale

Report Number 610.14692.00501-R01

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Fire Safety Study

Resources recovery facility - Mortdale

20 Herne Street, Mortdale

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DOCUMENT CONTROL

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Executive Summary

Summary of Main Findings and Recommendations

Facility	Mortdale Resources Recovery Facility
Location	Lot 102, DP585775. 20 Hearne Street, Mortdale
Site Size	7,659m ²
Operator	Operated by Mortdale Recycling Pty Ltd Owned by Hearne Street Pty Ltd.

The existing Mortdale resource recovery facility receives and separates suitable non-putrescible waste into different waste categories. Hearne Street Pty Ltd. plans to increase the maximum annual tonnage of general non-putrescible solid waste material from 30,000 tonnes to 300,000 tonnes per annum (tpa). Waste streams currently received by the facility will not alter, only the quantity received.

The development will involve the demolition and removal of the existing infrastructure (shed, truck bay, concrete ramps, speed humps, trees and office) and the construction of new infrastructure (shed and awning, nine material storage bays, two 20 metre weighbridges, a vehicle refuelling point and diesel fuel storage (28,000 litres) and a new office).

FRNSW have reviewed the development application and have raised a number of questions that they have recommended being answered as part of the approvals process. FRNSW have noted that due to the nature of the facility FRNSW personnel will have to pro-actively manage an incident of fire and the subsequent containment of polluted fire water runoff.

Specific questions raised by FRNSW include:

- An assessment of dangerous Goods being stored on site (specifically 30,000L of diesel being stored and managed in accordance with AS1940 – 2004).
- The increase in material to be stored and processed represents a realistic possibility of a high fire load and fire hazard. Currently no information provided to FRNSW includes details on the hydrant system. FRNSW have recommended that the development complies with Clause E1.10 of the National Construction Code.
- The sites surface and stormwater management system should be designed with the ability to contain contaminated fire water runoff

Main FSS findings

Building construction details	<ul style="list-style-type: none">- The proposed development will have a maximum height of 10.4 metres to the ceiling and 14.5 metres to the pitch of the roof from the existing ground level- The main external wall of the processing shed will be reinforced concrete panels designed to achieve a FRL of 240/240/240.- The roof to the main processing shed will be a metal framed roof with powder coated Colorbond sheeting (no FRL will be achieved)
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Material stored on site	<ul style="list-style-type: none"> - Wood Waste; - Non Chemical manufacturing waste (metal, timber, paper, ceramics, plastics, thermosets and composites); - Asphalt waste; - Soils; - Paper and cardboard; - Glass, plastic, rubber, plasterboard, ceramics, bricks, concrete or metal; - Household waste from municipal clean-up that does not contain food waste; - Office and packaging waste that is not contaminated or mixed with any other type of waste; - Building and demolition waste; and - Virgin excavated natural material.
Surrounding Residences and Land use	<ul style="list-style-type: none"> - The site is located within an established industrial precinct - Surrounding development is typified by a mix of industrial developments including manufacturing and repair industries, automotive services industries, printing facilities, hardware and general supplies and warehousing. - The nearest residential receivers are found approximately 200 metres to the south east of the site, along Barry Avenue.
Identified hazards	<ul style="list-style-type: none"> - Diesel (C1) 28,000L tank (required 5m to onsite protected place and 3m to other chemical stores) - LPG (Class 2.1) 216L (4 x 15kg full cylinders + 2 x 15kg empty cylinders) (requires 0m to onsite protected place and 3m to the nearest other chemical store) - Unprocessed combustible mixed waste stockpile (up to 600 tonnes) - Wood Waste (up to 200 tonnes) stored in waste bays - Paper and Cardboard (up to 100 tonnes) stored in waste bins - Plastic waste (up to 200 tonnes) stored in waste bays - Processed Mixed Waste for landfill (up to 100 tonnes) stored in waste bays
LPG Prevention/ Detection/ Protection Required	<ul style="list-style-type: none"> - All installations to be compliant with AS/NZS 1596:2014. Section 4.5 for cylinder storage requirements. - Maintaining separation distances. - Having emergency fire equipment - The use of LPG in forklifts must comply with the requirements of AS4982.
Diesel Prevention/ Detection/ Protection Required	<ul style="list-style-type: none"> - All installations to be compliant with AS1940-2004. Section 5 for storage in tanks. Section 7 for fuel dispensing. Section 9.8 for construction and maintenance. - Maintaining separation distances. (No ignition sources within 3m of storage and decanting facilities. The locations of other chemical stores are greater than 3m from the diesel tank.) - Having emergency fire equipment. - The use of appropriate placards and signage. - Additional caution is needed around the diesel tanks when ambient temperatures exceed 40°C where diesel can act similar to that of Flammable liquids.

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Fire in main processing shed Prevention/ Detection/ Protection Required	<ul style="list-style-type: none">- Dust suppression system is used; this will maintain a moist environment reducing the potential for ignition.- Maintaining good inspections of material entering the site (as per site procedures). Prompt removal of material that could spark or generate an ignition source.- Building compliant with the national construction code (volume one)- Maintain a good maintenance program and inspect equipment and plant on a regular basis and repair any faulty equipment as soon as it is identified to be faulty (or tag out and do not use until fixed).- Having emergency fire equipment.- Fire protection system will be installed.
Fire prevention measures	<ul style="list-style-type: none">- The buildings have been designed and will be installed compliant with the requirements of the Building Code of Australia (BCA).- Electrical installations will be installed and maintained compliant with relevant Australian Standards, including AS 3000:2007 - Electrical Wiring Rules.- Fire extinguishers, hose reels, fire hydrant system and sprinkler system will be installed at designated locations compliant with relevant Australian Standards and BCA.- Appropriate warning/identification signs will be installed for fuels and fire protection equipment.- Certified diesel tanks will be installed.- Diesel fuel tank bund design will include minimum capacities for the applicable storage size of the fuel tank(s).- The diesel and LPG storage (i.e. dissimilar fuels) will be separated from each other by greater distances than specified.- Annual maintenance and testing will be undertaken.- General housekeeping procedures will be regularly undertaken and the areas are kept clear of any combustible materials.- Site-specific training for employees and contractors in the use of fire extinguishing/protection equipment.
Fire Detection Systems	<ul style="list-style-type: none">- A smoke detection system in accordance with Clause 4 of Specification E2.2a is required.- A building occupant warning system complying with Clause 6 of Specification E2.2a is required
Firefighting LPG	<ul style="list-style-type: none">- Section 13.4.1 and Table 13.1 AS/NZS 1596:2014 indicate that there are no specific requirements for the storage of cylinders of this volume outside.
Firefighting Diesel	<ul style="list-style-type: none">- At least one powder-type extinguisher shall be provided and will have a rating of at least 2A 60B(E) (AS/NZS 1841.5) and a capacity of 9kg.
Fire Protection Systems for the processing shed	<ul style="list-style-type: none">- Section E1.3 Fire Hydrants national building code volume one 2015 requires a fire hydrant system to be installed- Section E1.4 Fire hose reels national building code volume one 2015 requires a fire hose reel system to be provided- Section E1.5 national building code volume one 2015 requires a sprinkler system to be installed

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|-----------------------------------|--|
| Water demand calculations | <ul style="list-style-type: none"> - source water for fire hydrant installations shall not be less than 2 x 10 L/s for a duration of not less than 4 hours (20 L/s x four hours = 288,000 L) - supply water to the fire hose reel assembly shall be sufficient to enable the hose reel to deliver a minimum demand of 0.41L/s for a 25mm hose (Section 6.1 AS2441), for the two most hydraulically disadvantaged fire hose reels operating simultaneously, plus any probable simultaneous flow. (0.41L/s x 3 x 4 hours = 17,712L) - Water demand calculations for the sprinkler will need to be calculated in accordance with AS 2118. - Water supply will be from the local town water supplier through mains water. |
| Containment of firefighting water | <ul style="list-style-type: none"> - Installation of Rocla water level controller with raised turret for use when blocking fire water runoff; - Installation of a water tight pit lid to the stormwater pit found downstream of Rocla First Defense unit; - The firefighting water can be collected and managed by either disposal to mains sewer (if appropriate to do so) at a rate suitable for the design capacity of the sewerage system or collection for appropriate offsite disposal. - Bunding works associated with the on-site 28 000L fuel tank. - Bunding associated with the storage bins |
| First aid and emergency planning | <ul style="list-style-type: none"> - As part of the site commissioning an emergency plan will be developed by the site. - In the event of a fire emergency, the emergency services must be contacted immediately by telephoning "000" if the incident presents an immediate threat to human health or property. - The Site Office can act as an Emergency Control Centre if required. - An Emergency Resource Pack containing up-to-date copies of: <ul style="list-style-type: none"> o The quantity and location of LPG being stored o The quantity and location of Diesel being stored o The Emergency Plan, including the upfront Emergency Services Information Package |

Recommended works

Work No.	Description	Required by date	Completion date	Signed Completion
1	Complete the fire hydrant design and water capacity Complete the sprinkler design and water capacity Completed the fire hose reel design and water capacity Calculate the total water required for firefighting and confirm in writing that the local town supply will cope with the water requirements	Finalisation of detailed design		
2	Develop the fire hose reel and fire extinguisher protection requirements	Finalisation of detailed design		
3	Develop an emergency plan	As part of the site commissioning		

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GLOSSARY AND ABBREVIATIONS

Abbreviation/ Acronym	Description
AS & AS/NZS	Australian Standards / New Zealand Standards
ADGC	Australian Dangerous Goods Code
BCA	Building Code Australia
DA	Design Application
DG	Dangerous Goods
DP	Deposited Plan
DP&E	NSW Department of Planning and Environment
DoP	Department of Planning
DUAP	Department of Urban Affairs and Planning
EIS	Environmental Impact Statement
EPL	Environment Protect Licence
FRNSW	Fire and Rescue NSW (formally NSW Fire Brigades)
FRL	Fire Resistance Level
FSS	Fire Safety Study
HIPAP	Hazardous Industry Planning Advisory Paper
LEP	Local Environment Plan
LGA	Local Government Area
LPG	Liquid petroleum gas
L/s	Litres per second
NCC	National Construction Code
NSW	New South Wales
OEMP	Operational Environmental Management Plan
PCA	Principal Certifying Authority
PHA	Preliminary Hazard Analysis
POEO Act	Protection of Environmental Operations Act 1997
PPE	Personal Protective Equipment
PRS	Preliminary Risk Screening
SEPP	State Environmental Planning Policy
SLR	SLR Consulting Australia Pty Ltd
SDS	Safety Data Sheets
SSD	State Significant Development
TBC	To Be Confirmed
tpa	Tonnes per annum

1 INTRODUCTION

1.1 Proposed development

An Environmental Impact Statement (EIS) was submitted to the Department of Planning and Environment (the DPE) in support of a State Significant Development Application (SSD) to increase the capacity of an established “waste or resource management facility” at 20 Hearne Street, Mortdale (hereafter referred to as the site). Demolition and building works formed part of the proposal and are required to support the proposed increase in capacity.

The Site plans to increase its maximum annual tonnage of general non-putrescible solid waste material from 30 000 tonnes to 300 000 tonnes per annum (tpa). Waste streams currently received by the facility will not alter, only the quantity received.

1.2 Fire and Rescue NSW

Fire and Rescue NSW (FRNSW) have reviewed the development application and have raised a number of question that they have recommended being answered as part of the approvals process. FRNSW have noted that due to the nature of the facility FRNSW personnel will have to pro-actively manage an incident of fire and the subsequent containment of polluted fire water runoff.

Specific questions raised by FRNSW include:

- An assessment of dangerous Goods being stored on site (specifically 30,000L of diesel being stored and managed in accordance with AS1940 – 2004).
- The increase in material to be stored and processed represents a realistic possibility of a high fire load and fire hazard. Currently no information provided to FRNSW includes details on the hydrant system. FRNSW have recommended that the development complies with Clause E1.10 of the National Construction Code.
- The sites surface and stormwater management system should be designed with the ability to contain contaminated fire water runoff

In order to properly address the above questions on one single report, FRNSW have recommended the development of a FSS in accordance with Hazard Industry Planning Advisory Paper (HIPAP) No 2.

1.3 Site details

Summary details of the Development subject to this *Fire Safety Study* are presented in **Table 1**. A site location plan is provided as **Figure 1** with a site layout plan provided as **Figure 2**.

Table 1 Facility Subject to this Fire Safety Study

Facility	Mortdale Resources Recovery Facility
Location	Lot 102, DP585775. 20 Hearne Street, Mortdale
Site Size	7,659m ²
Operator	Operated by Mortdale Recycling Pty Ltd Owned by Hearne Street Pty Ltd.

2 SCOPE OF REPORT

2.1 Aims and Objectives

This *Fire Safety Study* aims to establish the adequacy and requirements of fire safety proposals for the Development to ensure the fire prevention, detection, protection and fighting measures are appropriate for the specific fire hazard at the Development. The key objectives of the *Fire Safety Study* are:

- To identify the fire hazards and consequences of possible fire incidents;
- To identify the proposed fire prevention strategies and measures;
- To analyse the requirements for fire detection and protection and identify the specific measures to be implemented;
- To calculate the firefighting water supply and demand;
- Containment of firefighting water; and
- First aid fire protection requirements.

2.2 Regulatory Requirements

This *Fire Safety Study* has been prepared to satisfy the requirements of FRNSW. The general format and content of this *FSS* is in accordance with the requirements of the *HIPAP No.2 – Fire Safety Study Guidelines* (Department of Planning [DoP] 2011) to a level of detail commensurate with the nature of the Development and level of risk for an emergency situation.

Table 2 lists the key features of emergency plans in accordance with HIPAP 2 and where each of these requirements have been addressed in this document.

Table 2 HIPAP 2 Key Information Requirements

Detail Required	FSS Section
Formal document control procedures;	Page ii
A clear summary of findings and recommendations;	Executive Summary
A description of the facility, including its processes, layout and location drawings;	Section 3, Appendix A
Identification of flammable materials, fire scenarios that can arise and their consequences;	Sections 6 and 7
A description of the fire prevention and mitigation strategies;	Section 8
Details of the fire system and demonstration of its adequacy to cope with the identified fire scenarios; and	Section 9
Arrangements for containing contaminated fire water.	Section 12

2.3 Other Relevant Studies

This *Fire Safety Study* should be read in conjunction with a number of relevant studies including:

- The *Environmental Impact Statement* (EIS) (APP 2016) and the appendices contained within; and
- *Preliminary Risk Screening and Hazard Assessment* (SLR 2016);
- Architectural plans (Various) (insight 2016); and
- *Soil and Water assessment* (SLR 2015)
- Barker Ryan Stewart storm water concept plan (2016).

3 DESCRIPTION OF THE FACILITY

3.1 Current site setting

The existing facility is to be operated by Mortdale Recycling Pty Ltd and owned by Hearne Street Pty Ltd. The existing waste transfer facility was approved on 8 June, 2011.

In accordance with the DA approval and the EPL, the existing facility receives and separates suitable non-putrescible waste into different waste categories. Products are then transferred to other facilities for reuse, further resource recovery or to a licensed landfill.

The site is irregular in shape and serviced by a 6.5 metre wide access handle which connects with Hearne Street. A small portion of the site is visible from Hearne Street, however the majority is obscured by building and other improvements situated on adjoining allotments. The site is mostly developed and does not contain any remnant vegetation or attributes that indicate any ecological value.

The Environmental Protection License (EPL20622) describes the types of waste which may be received at the facility and what activities can be undertaken in relation to each waste type permitted to be held on site. The EPL also limits the amount of waste permitted on the premises at any one time to 5,000 tonnes and limits the overall quantity to be received and processed to 30,000 tonnes per annum. The EPL requires all waste processing, including loading and unloading to be undertaken within the shed. Waste material may only be stored in the open bins fitted with waterproof covers.

Any residual non-conforming waste, or recyclable material without a viable market, is transferred to a licensed landfill.

3.2 Proposed works

The development will involve:

- The removal of an existing shed, truck bay, concrete ramps, speed humps, trees and office;
- Replacing an existing weighbridge with two larger weighbridges;
- Construction of new shed and awning with a combined area of 2,534m² and a ridge height of 14.5 metres from the existing ground level. The shed and awning will house all processing operations including:
 - Plant and processing areas;
 - Nine (9) material storage bays
 - Metals;
 - Concrete;
 - Wood Products;
 - Plastics;
 - Paper;
 - Cardboards;
 - Soils (VENM);
 - Glass; and
 - Non recoverable / recyclable materials.
- Installation of two new 20 metre weighbridges;
- Provision of dedicated bin storage areas along the south western property boundary;

- Installation of a refuelling point and diesel fuel storage (28,000 litres);
- Construction of an ancillary office building and staff amenities;
- Construction of concrete ramps and associated retaining walls;
- Construction of a 45,000 litre rainwater tank;
- Reinstatement of landscaped areas, as detailed on the landscape concept plan
- Installation of pollution control equipment and measures to mitigate stormwater and dust impacts including:
 - The cool fog dust suppression system within the processing building;
 - External sprinklers to suppress dust on external surfaces;
 - 1200mm Gross Pollutant and Sediment Trap / Vortex Separator (Rocla First Defense© Trap);
 - 1200mm Water Level Controller for containment of site runoff in the event of incident or emergency;
 - Impermeable bunds around fuel store and material holding areas; and
 - Leachate collection sumps.
- Provision of designated stockpile areas;

The facility is to accept and process non-putrescible wastes including:

- Wood Waste;
- Non Chemical manufacturing waste (metal, timber, paper, ceramics, plastics, thermosets and composites);
- Asphalt waste;
- Soils;
- Paper and cardboard;
- Glass, plastic, rubber, plasterboard, ceramics, bricks, concrete or metal;
- Household waste from municipal clean-up that does not contain food waste;
- Office and packaging waste that is not contaminated or mixed with any other type of waste;
- Building and demolition waste; and
- Virgin excavated natural material.

A plan of the proposed site layout detailing the above mentioned improvements is included in **Figure 2**.

The anticipated breakdown of waste streams received is provided in **Table 3**.

Table 3 Predicted Waste Streams (annual)

Material	Volume (TPA)*	Percentage*
Wood Waste	3,000	1%
Non Chemical Manufacturing waste	3,000	1%
Asphalt Waste	1,500	0.5%
Soils	60,000	20%
Paper and Cardboard	1,500	0.5%
Household Waste (Municipal Clean Up	1,500	0.5%

Material	Volume (TPA)*	Percentage*
Office and Packaging Waste	3,000	1%
Building and Demolition Waste	225,000	75%
VENM	1,500	0.5%
TOTAL	300,000	100%

* Figures obtained from APP EIS report

The above figures have been derived from current throughput at the existing Mortdale Facility and other similar resource recovery facilities.

Once deemed acceptable, unprocessed waste will be contained within the processing building in stockpiles prior to processing, or held within covered bins in the designated bin storage area. Processed waste (separated and sorted) will be stockpiled in the designated material bins. It is expected that no more than 20,000 tonnes of waste will be held on site at any one time. **Table 4** provides predicated waste quantities held on site at any one time.

Table 4 Predicted Waste Streams (any one time)

Material	Volume (T)
Wood Waste	200
Non Chemical Manufacturing waste	200
Asphalt Waste	100
Soils	4,000
Paper and Cardboard	100
Household Waste (Municipal Clean Up)	100
Office and Packaging Waste	200
Building and Demolition Waste	15,000
VENM	100
TOTAL	20,000

Any waste streams not permitted to be kept on site will either be rejected at the southern weighbridge or within the processing area and subsequently reloaded before leaving the site. The following waste streams will not be accepted on site:

- Asbestos;
- Liquid Wastes;
- Putrescible Wastes;
- Flammable Materials;
- Hazardous Wastes; and
- Radioactive Wastes.

3.3 Plant, Equipment and Technology

The proposed plant, equipment and machinery to be used on site include the following:

- Volvo ECR145C Excavator;
- Volvo EC140C Excavator with Magnet Plant;
- Volvo L110F Wheel Loader;
- Mortdale 20m AWE Weighbridge (x 2);

- ASC Model 120 Diesel Industrial Sweeper;
- Fuel Fix 30KL Self Bunded Tank;
- Liebherr LH22M Hydraulic Excavator;
- Komatsu 3.5 tonne Forklift Model FD35AT-17; and
- In line processing / separating plant incorporating:
 - Finger Screen
 - Magnet
 - Picking Station
 - De Stoner

Approximately **28,000 litres of diesel** is to be stored on site and a **maximum of 100kg of LPG** (normally as 4 x 15kg gas bottles with provision for an additional 2 empty bottles waiting for replacement) as fuel to operate plant and equipment such as forklifts.

The diesel fuel store is to be contained in a bunded area separate from other flammable liquids. The designated fuel store area is illustrated on the proposed Site Plan (**Figure 2**).

In addition to plant and equipment required to enable processing, the following equipment / technology will be deployed to mitigate impacts associated with waste processing operations:

- 'Cool Fog' Misting System within the processing building;
- Sprinkler systems to cover manoeuvring areas within the yard;
- Rocla 'First Defence' Gross Pollutant Trap;
- Rocla Water Level Controller; and
- Leachate capture sumps.

3.4 Construction details

The existing buildings have a height of 14.5 metres from the existing ground level. The proposed development will seek to replicate this built form and will have a maximum height of 10.4 metres to the ceiling and 14.5 metres to the pitch of the roof from the existing ground level. The maximum height of the buildings is illustrated in **Figure 3**. Construction details of the site office are provided in **Figure 4**.

3.4.1 External walls main shed

The main external wall of the processing shed will be reinforced concrete panels designed to achieve a FRL of 240/240/240. On the front of the building a short section of the wall will be powder coated Colorbond cladding (this will have no FRL).

3.4.2 Roof main shed

The roof to the main processing shed will be a metal framed roof with powder coated Colorbond sheeting (again no FRL will be achieved)

3.4.3 Accessories

Roller Doors at the front of the shed will also be powder coated Colorbond sheeting.

3.5 Staff

A total of 12 full time staff will be employed on site with one (1) office staff, two (2) weigh bridge staff, two (2) yard staff and seven (7) processing and sorting staff.

3.6 Water Catchment

The site is located within the Peakhurst Industrial Area surface water catchment which drains through the Hurstville Golf Course to the south prior to discharging into Lime Kiln Bay.

4 SURROUNDING LAND USES AND ZONING

4.1 Site location

The site is located within an established industrial precinct bound by Forest Road to the north, Roberts Road to the south, Boundary Road to the east and Lorraine Street to the west.

The site is bound by other light industrial and warehousing developments, in all directions. The site is accessed off Hearne Street in the South-eastern corner of the site.

Surrounding development is typified by a mix of industrial developments including manufacturing and repair industries, automotive services industries, printing facilities, hardware and general supplies and warehousing. **Figure 5** shows the land use mix, road layout and built form representative of the broader locality.

The nearest residential receivers are found approximately 200 metres to the south east of the site, along Barry Avenue.

Under the provision of the Hurstville Local Environmental Plan (LEP) 2012, the Development Site is zoned IN2 Light Industrial as is the land surrounding the site (see **Figure 5**).

4.2 Uses permissible with consent in the Light Industrial zone include:

Depots; Drainage; Earthworks; Freight transport facilities; Landscape and garden supplies; Light industries; Neighbourhood shops; Roads; Take away food and drink premises; Timber and building supplies; Vehicle body repair workshops; Vehicle repair stations; Warehouse or distribution centres; Any other development not specified.

4.3 Land uses prohibited in the Light industrial zone are:

Agriculture; Air transport facilities; Amusement centres; Animal boarding or training establishments; Boat sheds; Camping grounds; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Eco-tourist facilities; Educational establishments; Electricity generating works; Entertainment facilities; Exhibition homes; Extractive industries; Forestry; Function centres; Hazardous storage establishments; Health services facilities; Industries; Information and education facilities; Offensive storage establishments; Public administration buildings; Recreation facilities (major); Recreation facilities (outdoor); Registered clubs; Research stations; Residential accommodation; Restricted premises; Rural industries; Sewerage systems; Sex services premises; Tourist and visitor accommodation; Water recreation structures; Wharf or boating facilities.

4.4 Neighbouring Premises

The surroundings are 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 industrial nature of the surrounding developments means they would not be considered as sensitive in the way that an office, school or hospital would be.

The nearest residential receivers are located 200m to the south-east along Barry Street and 250m to the east, on the opposite side of Boundary Road.

Table 5 Neighboring Premises

Direction	Distance (approx)	Company/Operations	Use of Premises	Land Use Category
North	300 m	Residential Housing (low density)	Residential	Residential
North East	Up to 300m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2
North East	300 m	Residential Housing (low density)	Residential	Residential
East	Up to 360m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2
East	360m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2
South East	Up to 300m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2
South East	300 m	Residential Housing (low density)	Residential	Residential
South	Up to 450m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2
South	450 m	Residential Housing (low density)	Residential	Residential
South West	Up to 500m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2
West	Up to 470m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2
North West	Up to 450m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2
North West	Up to 470m	Light Industrial estate, multiple small tenants	Light industry	Light Industrial 1N2

5 HAZARD ASSESSMENT

This section provides a summary of the PRS and PHA undertaken by SLR consulting Australia Pty Ltd. A preliminary risk screening assessment of the proposed storage quantities and delivery frequencies of dangerous goods proposed to be used on site was undertaken by SLR (SLR 2016).

5.1 Dangerous Goods Storage

The proposed inventory of Dangerous Goods (DG) in accordance with the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code) is provided in **Table 6** below.

The information contained in the table compares the total storage quantity of the required dangerous goods classes against the storage screening threshold applying SEPP 33 (DUAP 1994, and updated guidelines, NSW Planning, 2011).

The dangerous goods to be stored on the site were grouped into their respective ADGC classes. If more than one packaging group was present in an DG class it was assumed that the total amount for that class was the more hazardous packing group.

Table 6 Inventory of Dangerous Goods

Substance	Dangerous Goods Class	Packing Group	Total Storage on Site	Threshold Quantity	SEPP 33 Threshold Level Findings
LPG	2.1	N/A	< 10 tonne#	10 tonne (above ground storage)	Below
Diesel	C1	N/A	28,000 litres	Not applicable	Not applicable

Diesel is a class C1 combustible liquid and, as described in applying SEPP 33, is not considered to be potentially hazardous when stored in a separate bund or within a storage area where it is the only combustible liquid present. As it is proposed to locate the 28,000 litre diesel storage tank within a bund area isolated from any other flammable liquids the storage of diesel on site is not considered to be potentially hazardous.

The proposed bund area will have a capacity of 37,500 litres and will be roofed to ensure capacity is not affected by rainwater. As outlined on the Barker Ryan Stewart stormwater concept plan, the diesel storage tank area and bund will be designed and constructed to satisfy the requirements of AS1940-2004 - The storage and handling of flammable and combustible liquids. This standard contains the minimum acceptable safety requirements for storage facilities, operating procedures, emergency planning and fire protection.

The proposed dangerous goods planned to be stored on site are below the screening thresholds and therefore not considered to be potentially hazardous.

5.2 Transportation of Dangerous Goods

The levels of maximum proposed movements at the site per week are substantially below the SEPP 33 thresholds in terms of load quantity and weekly movement thresholds for LPG. On this basis no specific restrictions or mitigating measures are required with respect to the transportation of dangerous goods to and from the site.

5.3 Preliminary risk screening conclusion

The report reviewed and applied the requirements of SEPP 33 in order to determine whether the policy applies to the Project.

The SEPP33 screenings for storage of dangerous goods indicate that the development would not be classified as a hazardous or offensive industry due to the limited amount of chemicals stored on site.

5.4 Mitigation and Management Measures

To ensure the risks associated with the storage of potentially dangerous goods are not increased, the following measures are proposed as part of APPs EIS:

- Storage of diesel fuel and LPG will be limited to the quantities contained in this EIS and the SLR Preliminary Hazard Assessment;
- Diesel fuel will be stored within a bunded area with sufficient capacity in isolation of any other flammable liquids, dangerous goods and / or hazardous chemicals;

- The diesel storage tank area and bund will be designed and constructed to satisfy the requirements of AS1940-2004 - The storage and handling of flammable and combustible liquids;
- Storage requirements in accordance with AS1940-2004 will be incorporated into the OEMP and submitted to the PCA prior to the release of a certificate issued under section 109C of the Act.
- Certification addressing the design, construction and installation of the aboveground diesel storage tank in the context of any relevant Australian Standards will be submitted to the PCA prior to the release of a final occupation certificate issued under section 109C of the Act.
- The site is an existing operation and has Emergency and Pollution Incident Response Management Plans, which will be updated to reflect the development and proposed operations.

6 IDENTIFICATION OF FIRE HAZARDS

Table 7 provides a summary of the storage quantities and requirements of LPG and diesel. All other chemicals stored on site are considered small quantities (oils and greases for servicing) and unlikely to present a hazard. Storage of small quantities of chemicals are considered in **Section 8.4**.

Table 7 Chemical storage assessment

Substance (DG Class)	Total Volume applicable	Storage Requirements	Specified Distance requirements		Separation distances and tank groups (same substance)
			On-site protected place	Other Chemical Stores	
Diesel (C1)	28,000L	Above Placard Quantity AS1940)	5m (Table 5.4 AS1940)	Diameter of the tank or 7.5m, whichever is less, but at least 3m (Table 5.3 AS1940)	600mm (section 5.7.6 (b) AS1940)
LPG (Class 2.1)	216L (4 x 15kg full cylinders + 2 x 15kg empty cylinders)	Above minor storage quantities (AS/NZS 1596:2014) below placard quantities.	0m (Table 4.1 AS/NZS 1596:2014)	3m (Section 4.5.3 (b) AS/NZS1596:2014)	Groups of 2,500 L water capacity separated by 3m (Section 4.4.5 (b) AS/NZS 1596:2014

Non dangerous goods combustible substances that are present on site and may present a fire risk relevant to this FSS are presented in **Table 8**.

Table 8 Non DG combustible substances

Substance	Volume at any one time (tonnes)	Storage
Potential combustible material as unprocessed mixed waste	600	Unprocessed mixed waste stockpiles (note that 9,400 tonnes of waste is non-combustible)
Wood Waste	200	Waste bays located in a material specific storage bays (note that 9,400 tonnes of waste is non-combustible)
Plastic	200	
Paper	50	
Cardboard	50	
Processed mixed waste (for landfill)	100	
Total	1,200	

Quantities taken from **Tables 3 and 4**, noting that the majority of material will be demolition waste (concrete, brick, soil etc.).
 Stockpiled waste vs processed waste will be approximately 50/50 split.

7 CONSEQUENCE OF INCIDENTS

Table 9 provides an assessment of the fire hazards, possible consequences and prevention, detection, and protection systems considered appropriate for the site.

Table 9 Fire Hazard Assessment

Facility/ Event	Cause/ Comment	Possible results/ Consequences	Prevention/ Detection/ Protection Required
Rupture of gas Cylinder	Puncture of cylinder while in storage	Leak/release of LPG to atmosphere resulting in ignition	<p>All installations to be compliant with AS/NZS 1596:2014. Section 4.5 for cylinder storage requirements.</p> <p>Maintaining separation distances as identified in Table 7.</p> <p>Having emergency fire equipment as defined in Section 8.</p> <p>The use of LPG in forklifts must comply with the requirements of AS4982.</p>
Leak of diesel into bund and subsequent ignition	<p>Overfilling tank</p> <p>Corrosion of tank</p> <p>Pressure vent fails</p> <p>External ignition sources</p>	<p>Leak or rupture of tank</p> <p>Ignition of diesel and resulting fire</p> <p>Damage to plant, equipment, buildings etc.</p> <p>Loss of production/ operation</p>	<p>All installations to be compliant with AS1940-2004. Section 5 for storage in tanks. Section 7 for fuel dispensing. Section 9.8 for construction and maintenance.</p> <p>Maintaining separation distances as identified in Table 7. (No ignition sources within 3m of storage and decanting facilities. The locations of other chemical stores are greater than 3m from the diesel tank.)</p> <p>Having emergency fire equipment as defined in Section 8.</p> <p>The use of appropriate placards and signage.</p> <p>Additional caution is needed around the diesel tanks when ambient temperatures exceed 40°C where diesel can act similar to that of Flammable liquids.</p>
Fire in main processing shed	<p>Ignition due to friction / impact</p> <p>Ignition due to unknown substances in delivery load</p> <p>Ignition of faulty equipment/plant</p>	<p>Fire starting in unprocessed mixed waste stockpile (in the main processing shed) can migrate into the waste bays increasing the complexity for fighting the fire.</p> <p>Damage to plant, equipment, buildings etc.</p> <p>Loss of production/ operation</p>	<p>Dust suppression system is used; this will maintain a moist environment reducing the potential for ignition due to friction.</p> <p>Maintaining good inspections of material entering the site (as per site procedures). Prompt removal of material that could spark or generate an ignition source.</p> <p>Building compliant with the national construction code (volume one)</p> <p>Have a prestart check process for all mobile and fixed plant.</p> <p>Maintain a good maintenance program and inspect equipment and plant on a regular basis and repair any faulty equipment as soon as it is identified to be faulty (or tag out and do not use until fixed).</p> <p>Having emergency fire equipment as defined in Section 8.</p> <p>Fire protection system will be installed as detailed in Section 9.</p>
Fire in storage bays (in waste)	Trespassers/ Arson	The fire could spread into the main	Dust suppression system is used; this will maintain a moist environment reducing the potential for ignition

Facility/ Event	Cause/ Comment	Possible results/ Consequences	Prevention/ Detection/ Protection Required
bins)	Ignition from the spread of fire on site	processing area. Damage to plant, equipment, buildings etc. Loss of operation	due to friction. Building compliant with the national construction code (volume one) Maintain a good maintenance program and inspect equipment and plant on a regular basis and repair any faulty equipment as soon as it is identified to be faulty (or tag out and do not use until fixed). Having emergency fire equipment as defined in Having emergency fire equipment as defined in Section 8. Fire protection system will be installed as detailed in Section 9.
Small fires associated with maintenance works	Ignition of combustible/ flammable material arising from hot works (welding, grinding etc.) being undertaken	Localised fires inside workshop Localised fires could spread to outside areas Damage to plant, equipment, buildings etc. Loss of operation	Hot works to be undertaken under a permit to work system and properly risk assessed. Good housekeeping removing refuse and/or other combustible material for working areas. Provision of firefighting equipment and appropriate training for staff. Having emergency fire equipment as defined in Section 8. Fire protection system will be installed as detailed in Section 9.

8 FIRE PREVENTION STRATEGIES / MEASURES

The following sub-sections outline some of the key pre-emptive actions (i.e. mitigation measures and management strategies) that Mortdale Recycling Pty Ltd has committed to implementing in order to minimise the risk for fire situations.

8.1 LPG Management

The requirements of AS/NZS 1596:2014 regarding the handling of a fire emergency involving LP Gas storages are based on the following elements:

- I. Rapid evaluation of the nature of the fire is imperative.
- II. If it is an adjacent fire in some other structure or material, then the problem is whether the heat radiation to the cylinders are sufficient to require remedial action.
- III. If gas is escaping the priority tasks are to prevent escalation, to stabilize, then to terminate.
- IV. If stability can be achieved, there is nothing wrong with letting the gas burn if it is doing no harm, even to the extent of burning off all the stored gas if this is the safest thing to do.
- V. If the situation appears to be escalating, evacuation needs to be considered.
- VI. Spray systems can protect against incident radiation, but should not be relied upon to cope with a concentrated flame impingement.

As outlined in **Section 5**, SLR undertook a *Preliminary Risk Screening* (SLR 2015c) in accordance with SEPP 33 and also a *Preliminary Hazard Analysis* (SLR 2015c) in accordance with HIPAP 6 as part of the EIS (SLR 2015a).

The SEPP33 screenings for storage of dangerous goods indicate that the development would not be classified as a hazardous or offensive industry due to the limited amount of LPG stored on site and the transportation of the LPG to site.

8.2 Diesel Management

The site is proposed to hold a single 28,000L diesel tank to supply site vehicles with fuel. The tank will be located outside within a bunded area capable of holding 110% of the tanks capacity. Construction and storage requirements for the tanks will comply with the requirements of Section 5 AS1940 – 2004.

Fuel is likely to be dispensed via gravity feed into site vehicles, Section 7 AS1940 – 2004 provides details on the requirements for dispensing. Fuel delivery requirements must be in line with Section 8 AS1940. The site must develop a maintenance program to ensure that the tank and dispensing equipment is in good working condition. Details on the maintenance requirements are provided in Section 9.8 AS1940 – 2004.

The diesel tank needs to be 5m from an onsite protected place and the diameter of the tank or 7.5m, whichever is less, but at least 3m from any other chemical storage areas and/or LPG storage.

Due to the volume of Diesel being stored being above 10,000L the storage tank must comply with placard requirements and signage (see **Section 8.6**).

Additional caution is needed around the diesel tanks when ambient temperatures exceed 40°C where diesel can act similar to that of Flammable liquids. Precautions include covering the tank preventing direct sunlight hitting the tank, having the provision of a water supply that can cool the tank down. Excluding all ignition sources within 3m and not issuing any hot works permits (within 3m of the tank) during days that are above 40°C.

8.3 Fire Prevention Strategies

In addition to the above, the following fire prevention strategies will be implemented in order to minimise the likelihood of a fire and/or reduce a fire's sensitivity or extent:

- The buildings have been designed and will be installed compliant with the requirements of the Building Code of Australia (BCA).
- Electrical installations will be installed and maintained compliant with relevant Australian Standards, including AS 3000:2007 - Electrical Wiring Rules.
- Fire extinguishers and hose reels will be installed at designated locations compliant with relevant Australian Standards (refer **Section 9**).
- Appropriate warning/identification signs will be installed for fuels and fire protection equipment.
- Diesel tanks will meet relevant Australian standard requirements.
- Diesel fuel tank bund design will include minimum capacities for the applicable storage size of the fuel tank(s).
- The diesel and LPG storage (i.e. dissimilar fuels) will be separated from each other by greater distances than specified in **Table 7**.
- Required maintenance and testing will be undertaken for all relevant equipment.
- General housekeeping procedures will be regularly undertaken and the areas are kept clear of any combustible materials.

- Site-specific training for employees and contractors in the use of fire extinguishing/protection equipment.

8.4 Small quantities of chemicals

Some small quantities of chemicals associated with minor maintenance requirements may be stored on site. These chemicals will be stored in a designated dangerous goods storage cabinet not exceeding 250L. The cabinet will be located in close proximity to where the maintenance work is undertaken. The cabinet will be located at a greater distance from LPG and diesel than those specified in Table 7 and will have no ignition sources within 3m.

8.5 Emergency Planning

The Emergency Plan should be designed to cover fire emergencies and aim to:

- Enable a quick and efficient response to any emergency or pollution incident to limit the potential impacts;
- Support emergency services and regulatory authorities with key information and knowledge; and
- Maintain a high level of preparedness.

The Emergency Plan should contain details on hazards, types and levels of emergency, resources and responsibilities and training and testing requirements.

8.6 Signage

8.6.1 Outer warning placards

The site must be marked by a HAZCHEM outer warning placard.

These outer warning placards must be displayed at all road entrances to the site where FRNSW may gain entry. Usually this will be at the main road entrance.

A HAZCHEM outer warning placard for dangerous goods (**Diagram 1**) must:

- a. be at least 120 mm high; and
- b. display the word 'HAZCHEM' as shown below:
 - I. in red capital letters at least 100 mm high; and
 - II. in lettering of the kind shown below; and
 - III. on a white or silver background.



Diagram 1 Template HAZCHEM Sign

8.6.2 Packaged dangerous goods

Placards must be displayed on or near the storage location of bulk dangerous goods (the Diesel Tank).

1. A placard for bulk dangerous goods (**Diagrams 2 and 3**) must:

-

SLR Consulting Australia Pty Ltd



Diagram 3 Example a placard for bulk dangerous goods

The class label (including mixed class labels) should be grouped. Grouping need not be in a horizontal line — it can be vertical or diagonal. If there is regular variation in the type of dangerous goods, it may be convenient to use frames for slip-in-and-out labels, such as the type commonly used on vehicles. Vehicles and loads marked in accordance with the ADG Code placards are acceptable.

A placard for packaged dangerous goods must:

- display the class label for each of the dangerous goods to which the placard relates; and
- Comply with the form and colouring specified in Chapter 7 of the ADG Code (See AS1216).

Each class label must have sides of at least 100 mm.

9 DETAILS OF DETECTION AND PROTECTION

9.1 Fire Detection Systems

A smoke detection system in accordance with Clause 4 of Specification E2.2a is required. The smoke detection system must comply with AS1670.1 and would activate the occupant warning system.

A building occupant warning system complying with Clause 6 of Specification E2.2a is required for buildings with a sprinkler system. The occupant warning system should not only alarm in the processing shed but should be designed to alert occupants in the office that there is an issue. This will then allow the office staff to action the emergency plan.

9.2 Protection and firefighting LPG

The location and construction of the storage area for LPG needs to comply with the requirements of AS/NZS1596:2014. In summary the following needs consideration:

- Cylinders shall not be stored in direct sunlight
- Cylinders shall be protected against impacts from vehicle movements
- The storage area shall be level hard standing (concrete) and free draining of water
- There shall be no combustible material within 3m of the storage area
- Cylinders shall be secured while stored
- Cylinders shall be protected from tampering

- If storage is adjacent to a building Cylinders shall be at least 1m from any opening (window or door) air intake, ventilation point etc.
- Hazardous areas shall comply with AS/NZS 1596:2014 (0.5m laterally and vertically above the top of the cylinder down to 1.5m from the base of the cylinder).

Section 13.4.1 and Table 13.1 AS/NZS 1596:2014 indicate that there are no specific requirements for the storage of cylinders of this volume outside.

Some consideration should be given to the potential for emergency situations off site. Such consideration should be a secondary emergency location for storage if the site is affected by a fire off site. Additional precautions could involve being able to spray cylinders with water

9.3 Protection and firefighting Diesel

Fire protection systems shall be appropriate to the hazard and include consideration of adjoining activities and materials, so as not only to deal with incidents within the storage but also to reduce the potential for the liquids to become involved through the escalation of another incident.

In accordance with the requirements of Section 11.11.3 AS1940 – 2004 any outdoor tank storage shall be provided with fire protection in accordance with:

(b) Where Class C1 liquid is stored without flammable liquid, but with or without Class C2 liquid, at least one powder-type extinguisher shall be provided if a single tank installation.

The powder type fire extinguisher will have a rating of at least 2A 60B(E) (AS/NZS 1841.5) and a capacity of 9kg. The extinguisher shall be located within 10 m of the tank and shall be positioned outside of any bund.

The requirements for dispensing are the same as above with the location being chosen to optimise access in an emergency.

Fire protection equipment shall be maintained in accordance with Section 11.3.10 AS1940:2004 or the specific standards that applies to that equipment.

9.4 Requirements for Fire Protection Systems

9.4.1 Fire Hydrant System

Section E1.3 Fire Hydrants national building code volume one 2015 requires a fire hydrant system to be installed to serve a building having a total floor area greater than 500m² and where a fire brigade is available to attend a building fire.

For this site a fire hydrant system must be installed.

9.4.2 Fire hose reel system

Section E1.4 Fire hose reels national building code volume one 2015 requires a fire hose reel system to be provided to serve the whole building where one or more internal fire hydrants are installed or where internal fire hydrants are not installed, to serve any fire compartment with a floor area greater than 500 m².

For this site a fire hose reel system must be installed.

9.4.3 Sprinkler system

Section E1.5 national building code volume one 2015 requires a sprinkler system to be installed for occupancies of excessive hazards. Note 3 of Table E1.5 describes occupancies of excessive fire hazard comprise buildings which contain (b) combustible goods with an aggregate volume exceeding 1,000m³ and stored to a height greater than 4m. As identified in **Table 8**, 1,200 tonnes of potentially combustible material will be held on site at any one time. Unprocessed stockpiles are likely to exceed 4m in height.

Section E1.10 national building code volume one 2015 makes reference for the provision for special hazards *"Suitable additional provision must be made if special problems of firefighting could arise because of (a) the nature of quantity of material stored....."*

As this has been highlighted by FRNSW as being material being potentially problematic for firefighting in order to meet the requirements of Clause E1.10 a fire sprinkler system should be installed.

9.5 Design recommendations for Fire Protection Systems

9.5.1 Fire Hydrant System

The fire hydrant system must meet the requirements of AS2419.1 – 2005. The following requirements provide a summary of the hydrant system requirements for this site:

- The hydrant system should be located external to the building.
- A fire brigade booster assembly will be required
- The water flow velocity in pipework shall not exceed 4m/s
- Minimum required flow rate is 10 L/s
- Minimum residual pressure of 250 kPa for attack hydrants, 150kPa for feed hydrants and 700kPa when boosted by a fire brigade pumping appliance.
- The number of fire hydrant outlets required to flow simultaneously is 2 (Table 2.1 AS2419.1 – 2005).
- Hydrants shall be above ground, have two outlets each and be individually valve controlled (see **Diagram 4**)

The location of external fire hydrants shall be as follows:

- In a position that provides pedestrian access to the building for the fire brigade.
- Where installed as an attack fire hydrant, within 50 m of a hardstand such that when connected directly to the external attack fire hydrant—
 - all portions of the building shall be within reach of a 10 m hose stream, issuing from nozzle at the end of a 60 m length of hose laid on the ground; and
 - a minimum of 1 m of hose shall extend into any room served.
- In a position not less than 10 m from any high voltage main electrical distribution equipment such as transformers and distribution boards, and from liquefied petroleum gas and other combustible storage.
- In a position so that the fire hydrant is not obstructed or obscured by obstacles, stored goods, vehicles, vegetation etc.
- In a position so that the fire hydrant is protected from possible mechanical damage by vehicles.

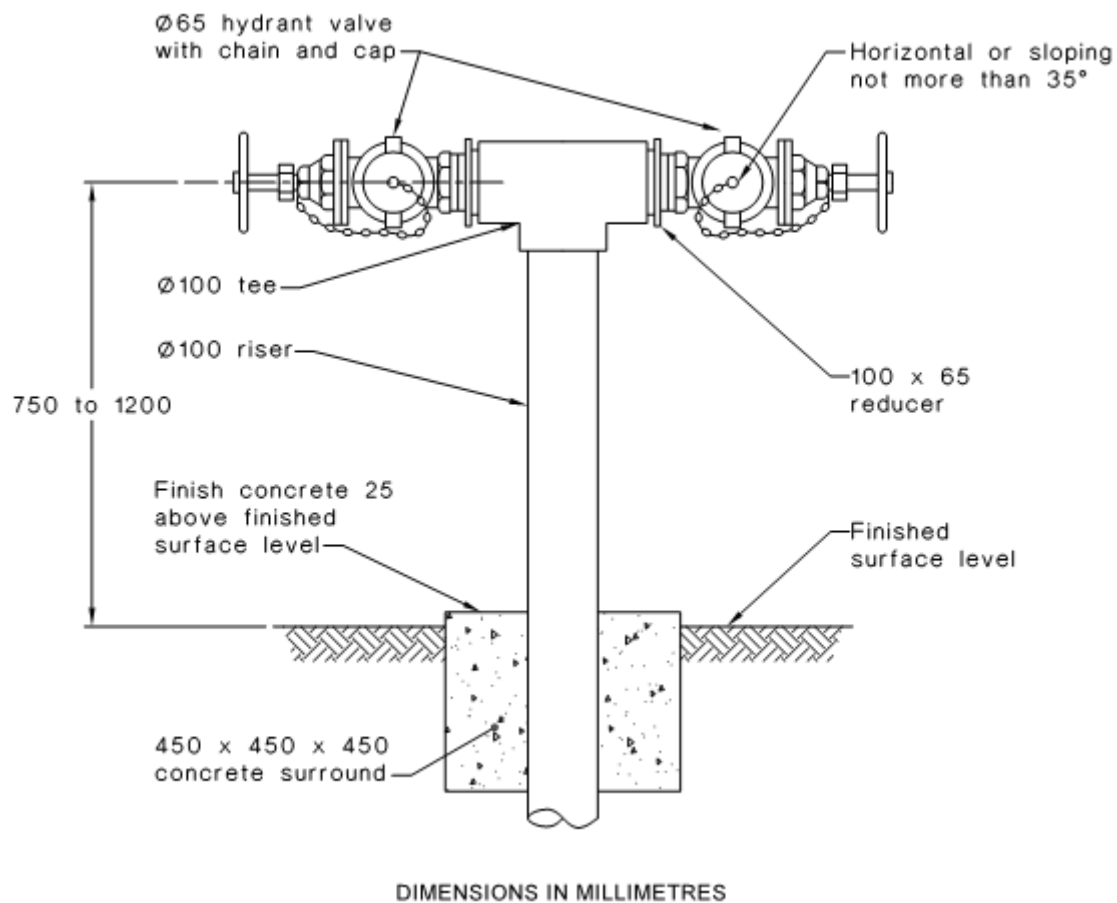


Diagram 4 Example of an external fire hydrant

The number of hydrants required for the site (considering the distance requirements) is 2 (1 attack hydrant and one feeder hydrant) (**Figure 6**). Note: if the feeder hydrant meets the requirements of an unassisted hydrant it could be used as an initial attack hydrant in accordance with Clause C3.2.2.2(d) without the need for a booster.

The location of the booster assembly shall be so that they meet the following requirements:

- a. They are readily accessible to firefighters.
- b. They are operable by fire brigade pumping appliances located within 8 m.
- c. If within, or affixed to, the external wall of the building, the booster shall be—
 - i. within sight of the main entrance to the building; and
 - ii. separated from the building by a construction with a fire resistance rating of not less than FRL 90/90/90 for a distance of not less than 2 m each side of and 3 m above the upper hose connections in the booster assembly

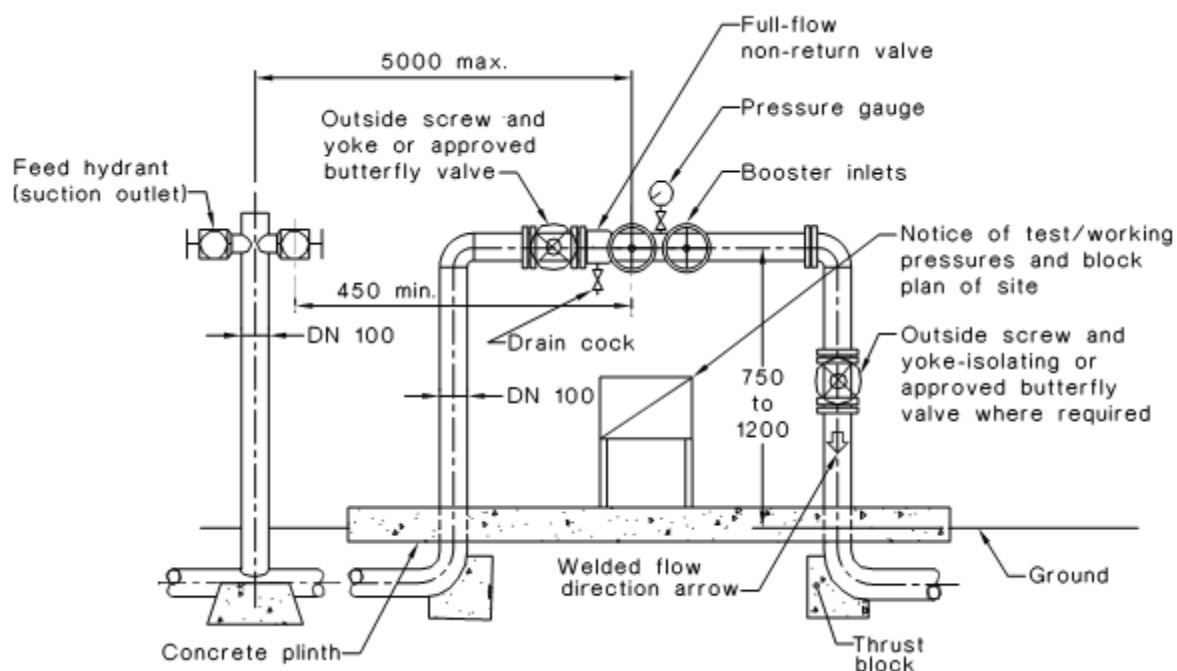


Diagram 5 Typical booster arrangement without closure

- d. If remote from the building, the booster shall be—
 - i. at the boundary of the site and be within sight of the main entrance of the building;
 - ii. adjacent to the principal vehicular access to the site; and
 - iii. located not less than 10 m from the external wall of any building served
- e. The booster enclosure shall only contain firefighting pipework and equipment.

9.5.2 Fire hose reel system

The hose reel system will comply with the requirements of AS2441 – 2005.

This site is considered to be a “High Hazard” class where the class of hazard wherein the amount and type of combustibles present are such that fires of large initial size may be expected.

The size of hose should be 25mm and have a minimum discharge capacity of 0.41 L/s at 220 ± 10 kPa inlet pressure. The supply water to the fire hose reel assembly shall be sufficient to enable the hose reel to deliver the minimum demand specified for the two most hydraulically disadvantaged fire hose reels operating simultaneously.

Each fire hose reel shall be located in a readily accessible position, in accordance with the requirements of the BCA. Fire hose reels shall not be located in positions where access could present a hazard to the potential user. Access to fire hose reels shall not be obstructed, e.g., from items such as furniture.

Where a fire hose reel is installed in an external situation or an aggressive environment (Exterior situations exposed to the sun, ultraviolet radiation, wind, rain or salt spray, abnormally dusty or moisture-laden atmospheres and environments that subject the hose reels to continuous or intense vibrations), it shall be protected by a cabinet or other suitable means. This will need to be considered in more detail as part of the final design for this development.

Access to fire hose reels shall not be obstructed, e.g., parked vehicles or unprocessed stockpiles.

The maximum coverage for a fire hose reel shall comply with the following requirements:

- a. All points on a floor shall be within reach of a 4 m hose stream issuing from a nozzle at the end of the hose laid on floor. The hose length shall not exceed 36 m.
- b. The distance from a hose reel to the nominated point shall be taken as the most direct laid-on-ground or floor route.
- c. The location of internal walls, partitions, doorways, storage racking, and any other fixed obstructions, which would restrict normal hose coverage throughout the building or area to be protected, shall be considered when determining the number and location of fire hose reels.

It is recommended that 3 hose reels be installed based on the distance requirements above. Each fire hose reel shall be located adjacent to each of the fire exits within the main processing shed with the third fire hose reel located adjacent to the storage bays external to the processing shed. This is to provide additional coverage of the bays (considered to be the higher risk areas) for an alternative angle (**Figure 6**).

A hose reel will need to be installed in the office.

9.5.3 Sprinkler system

The design and installation of the sprinkler system will comply with the requirements of AS 2118.

For the purpose of this study some assumptions have been made to develop an appropriate worst cases design scenario. During the design process these assumptions may be refined to better reflect the actual site conditions.

Based on the information available the hazard class of occupancy has been taken to be a **High Hazard Occupancy**. It is noted that a waste processing facility does not fit any occupancy descriptions presented in Appendix A of AS 2118.1, therefore a best fit solution has been selected.

Based on the criteria provided in Section 11 AS 2118.1 a 3m x 3m spacing of sprinklers (= 9m² coverage by each sprinkler) has been selected for this study. The building length is approximately 88m long and 33m wide giving a floor area of approximately 2,900m².

In order to achieve full floor coverage the building required 10 rows of 30 sprinklers, equating to approximately 300 sprinkler heads. It is also recommended that the storage bays be assessed to determine sprinkler coverage requirements which are likely to require an addition 13 sprinkler heads.

Additional consideration can also be given to the requirements of AS2118.3 and AS2118.6 depending on detailed design constraints and availability of water from the town supply.

A sprinkler system is not required for the office.

9.5.4 Fire extinguishers

1 x 2A 60B(E) 9kg powder type fire extinguisher located adjacent to the diesel tank

Main processing shed is capable of Class A Fires involving carbonaceous solids, such as wood, cloth, paper, rubber and plastics. As previously identified this site is considered to be a "High Hazard" class where the class of hazard wherein the amount and type of combustibles present are such that fires of large initial size may be expected.

In accordance with Table 4.1 AS2444 – 2001, 4 x 6A (or 3 x 10A) fire extinguishers should be located within the main processing shed.

Fire extinguishers should also be located in the office building. This should include:

- 2A 60B(E) powder type fire extinguisher, and
- A fire blanket in the kitchen/lunchroom

10 DETAILED DRAWINGS OF FIRE SERVICES LAYOUT

This section will be completed once the final service design layout has been completed by a hydraulic engineer. Hand marked drawings are provided to provide an indication of the proposed layout (**Figure 6**).

11 FIREFIGHTING WATER DEMAND AND SUPPLY

11.1 Water demand calculations

The minimum capacity of the source water for fire hydrant installations shall not be less than 2 x 10 L/s for a duration of not less than 4 hours (20 L/s x four hours = 288,000 L).

The supply water to the fire hose reel assembly shall be sufficient to enable the hose reel to deliver a minimum demand of 0.41L/s for a 25mm hose (Section 6.1 AS2441), for the two most hydraulically disadvantaged fire hose reels operating simultaneously, plus any probable simultaneous flow. (0.41L/s x 3 x 4 hours = 17,712L)

Full water demand calculations will need to be undertaken as part of the hydraulic design. For the purpose of this study sprinkler hydraulic characteristics have been calculated using Table 6.3 AS2118.1. Assuming a K factor of 10 (for a standard sprinkler) and minimum pressure of 50kPa the required flow rate for each sprinkler would be 70 L/min. For 313 sprinklers all running at the same time this would require a demand of 21,910 L/min.

11.2 Water Supply

Water supply will be from the local town water supplier through mains water. Confirmation (in writing) is required from the local town water supplier detailing they can provide this volume of water in an emergency.

A 45,000L rainwater tank will also be located on site. This tank will not be linked to provide water to the fire hydrants due to its limited capacity, however, it can be linked to supply water to the fire hose reels provided the tank remains at minimum ½ full at all times and is capable of being topped up by main supply in the event the tank levels fall below ½ full. It is also recommended that the tank be alarmed so site personnel are aware that the tank has reduced capacity.

12 CONTAINMENT OF FIREFIGHTING WATER

The proposed stormwater management plan for the site is shown in **Figure 7**. The plan details the required improvements / measures as part of an overall water cycle management strategy:

- Use of Rocla's First Defense unit;
- Installation of 45,000L rainwater tank and associated drainage to collect runoff from approximately half of the roofed area;
- Decommissioning of redundant drainage lines;
- Minor changes to the existing stormwater pits to tie into the proposed surface levels;

- Installation of a water tight pit lid to the stormwater pit found downstream of Rocla First Defense unit;
- Construction of bunds for the purpose of retaining runoff;
- Installation of Rocla water level controller with raised turret for use when blocking fire water runoff; and
- Bunding works associated with the on-site 28 000L fuel tank.

In addition to the proposed stormwater measures described above, Ecosol Litter Basket with 200µm filter bags will be retrofitted into all drainage pits onsite rather than standard inlet screens. Leachate collection sumps are also proposed within the processing shed to capture any runoff generated within the building and prevent leachate from running onto external hardstand areas and entering the external stormwater management system.

The stormwater drainage system has been designed so that the stormwater drain can be blocked to prevent firefighting water being discharged through the stormwater drain. The firefighting water can be collected and managed by either disposal to mains sewer (if appropriate to do so) at a rate suitable for the design capacity of the sewerage system or collection for appropriate offsite disposal.

13 EMERGENCY MANAGEMENT

As part of the site commissioning an emergency plan will be developed by the site.

In the event of a fire emergency, the emergency services must be contacted immediately by telephoning “000” if the incident presents an immediate threat to human health or property.


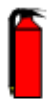













































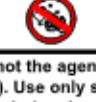
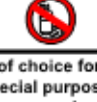
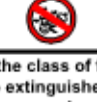
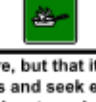


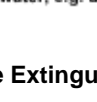

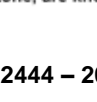
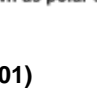


13.1 Emergency Equipment

Table 10 lists the key safety equipment to be maintained at the Development Site.

Table 10 Key Safety Equipment

Item	Location(s)	Maintenance Requirement
Hose reels	Designated locations compliant with relevant AS	Maintenance and testing every 6 months (or as required by Australian Standard)
Sprinkler system		
Fire hydrants		
Fire extinguishers	Adjacent to diesel tank Adjacent to LPG storage area Office building.	
SDSs	Chemical storage area and Site Office	Checked for currency every 12 months
First Aid Kits	Site Office	Checked for currency every 12 months
Spill Kits	Chemical storage areas and diesel tank	Checked for currency and compatibility every 2 years
Personal Protective Equipment (PPE)	Site Office	As required and needed

Diagram 6 illustrates the various types of fire extinguishers.

Type of extinguisher		Extinguishant	Type of Fire, Class and Suitability						Comments (Refer Appendix B)
			A	B	C	E	F	D**	
Colour scheme			Wood, paper, plastics, etc	Flammable liquids	Flammable gases	Energized electrical equipment	Cooking oils and fats	Metal fires	
AS/NZS1841-1997	AS1841-1992								
		Water							Dangerous if used on flammable liquid, energized electrical equipment and cooking oil/fat fires
		Wet Chemical							Dangerous if used on energized electrical equipment
		Foam***							Dangerous if used on energized electrical equipment.
		Powder	ABE						Special powders are available specifically for various types of metal fires (see **).
			BE						
		Carbon Dioxide							Generally not suitable for outdoor use. Suitable only for small fires.
		Vaporizing Liquid							Check the characteristics of the specific extinguishant.
		Fire Blanket							

* Limited indicates that the extinguishant is not the agent of choice for the class of fire, but that it will have a limited extinguishing capability.
 ** Class D fires (involving combustible metals). Use only special purpose extinguishers and seek expert advice.
 *** Solvents which may mix with water, e.g. alcohol and acetone, are known as polar solvents and require special foam. These solvents break down conventional AFFF.

Diagram 6 Types of Fire Extinguishers (AS 2444 – 2001)

Suggested locations of firefighting equipment at the site have been presented in **Figure 6**. Final locations will be determined subject to certification requirements.

13.2 Emergency Control Centre

The Site Office can act as an Emergency Control Centre if required. An *Emergency Resource Pack* containing up-to-date copies of the following information will be maintained at the Site Office as a resource to Site Management, the Site Warden and emergency service personnel as required:

- The quantity and location of LPG being stored
- The quantity and location of Diesel being stored
- The *Emergency Plan*, including the upfront *Emergency Services Information Package*.
- A separate one pager containing the site and regulatory authority contact details; and
- A manifest (e.g. ChemAlert printout) of chemicals and quantities being stored. The SDS for all chemicals and fuel on site (including a plan of where the chemicals are being stored).

13.3 Training and Testing

Site Management will ensure that all employees and contractors are suitably inducted and trained prior to commencing any work on site.

Details of emergency training requirements will be contained in the *Emergency Plan*.

13.4 Emergency Plan Testing and Review

The *Emergency Plan* for the Development will be reviewed and tested every 12 months as per the requirements of the POEO(G) Regulation. Testing will include various emergency scenarios including fire.

14 RECOMMENDED WORKS

SLR has made the following recommendations following the completion of this study:

Table 11 Recommended works

Work No.	Recommendation	Required by date	Completion date	Signed Completion
1	Complete the fire hydrant design and water capacity Complete the sprinkler design and water capacity Completed the fire hose reel design and water capacity Calculate the total water required for firefighting and confirm in writing that the local town supply will cope with the water requirements	Finalisation of detailed design		
2	Develop the fire hose reel and fire extinguisher protection requirements	Finalisation of detailed design		
3	Develop an emergency plan	As part of the site commissioning		

15 REFERENCES

APP (2016) *Mortdale Resource Recovery Facility Environmental Impact Statement*

AS 1940 – 2004, The storage and handling of flammable and combustible liquids

AS/NZS 1596: 2004, The storage and handling of LP Gas

AS 2118.1 – 2006 Automatic fire sprinkler systems Part 1: General systems

AS 2419.1 – 2005, Fire hydrant installations; Part 1: System design, installation and commissioning

AS 2441 – 2005, Installation of fire hose reels

AS 2444 – 2001 Portable fire extinguishers and fire blankets – Selection and location

Barker Ryan Stewart (2016) *Storm water concept plan*

Insight Architectural Plans (2016) *Mortdale Resource Recovery Facility*

NCC 2015 Building Code of Australia – Volume One

SLR Consulting Australia (2015) *Soil and water assessment*

SLR Consulting Australia (2016) *Preliminary risk screening and hazard assessment*

Appendix A

Report Number 610.14692.00501-R01

FIGURES

LEGEND

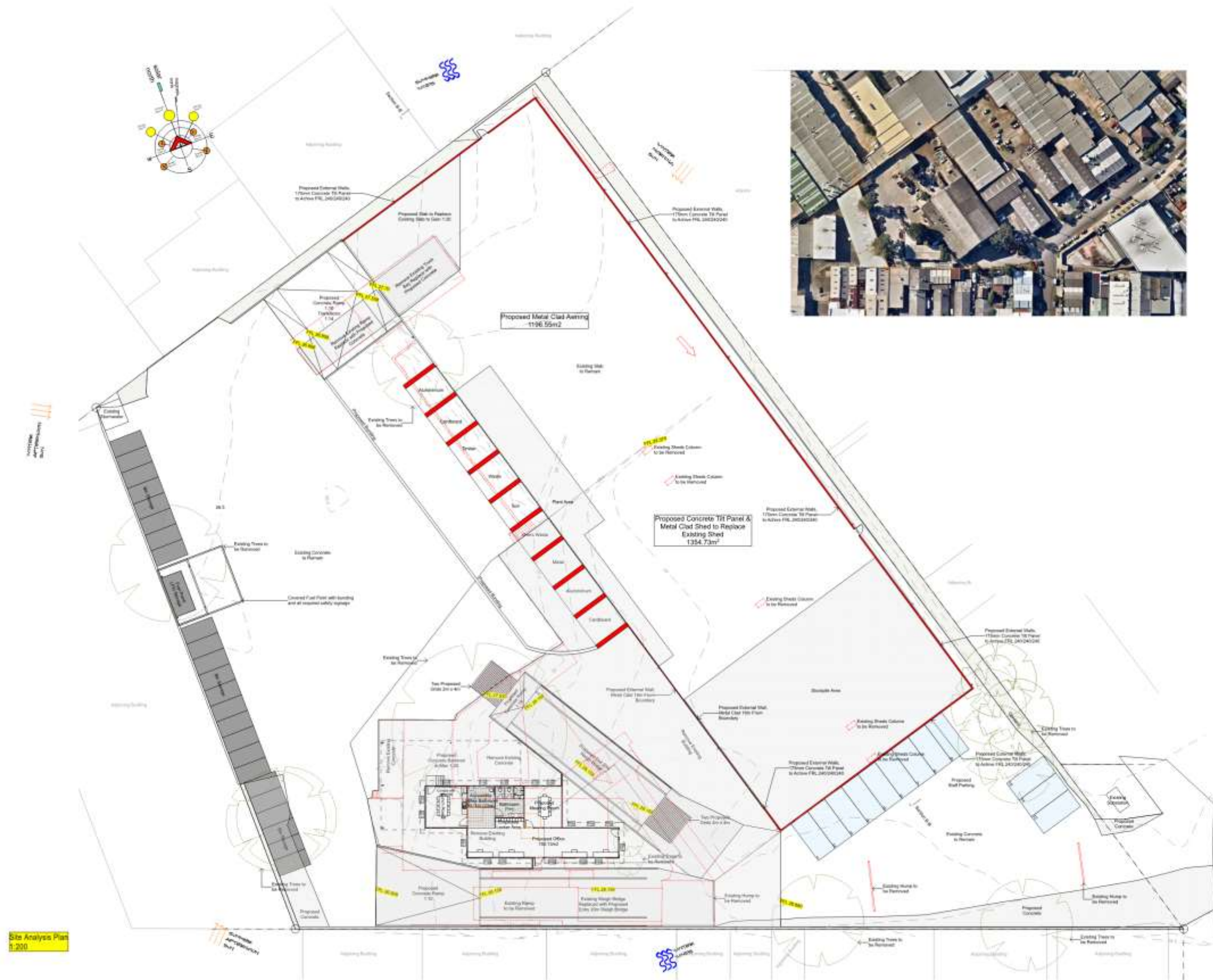
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Fire Safety Study
Resource Recovery Facility
Mortdale
Figure 1
Site Location Plan
610.14692.00501





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1	21-03-18	ISSUE - Approval Issue
2	11-03-18	ISSUE - Approval Issue
3	19-11-15	ISSUE - Approval Issue
4	30-07-15	ISSUE - Approval Issue
5	19-07-15	ISSUE - Approval Issue
6	19-07-15	ISSUE - Approval Issue
7	19-07-15	ISSUE - Approval Issue
8	19-07-15	ISSUE - Approval Issue
9	19-07-15	ISSUE - Approval Issue
10	19-07-15	ISSUE - Approval Issue

Proposed Development:
At 28 Hearno Street Mortdale
For: Wingo Group

Environmental Impact Statement
1:100 @ A1, 1:200 @ A2
111401 - 02.11.18



LEGEND

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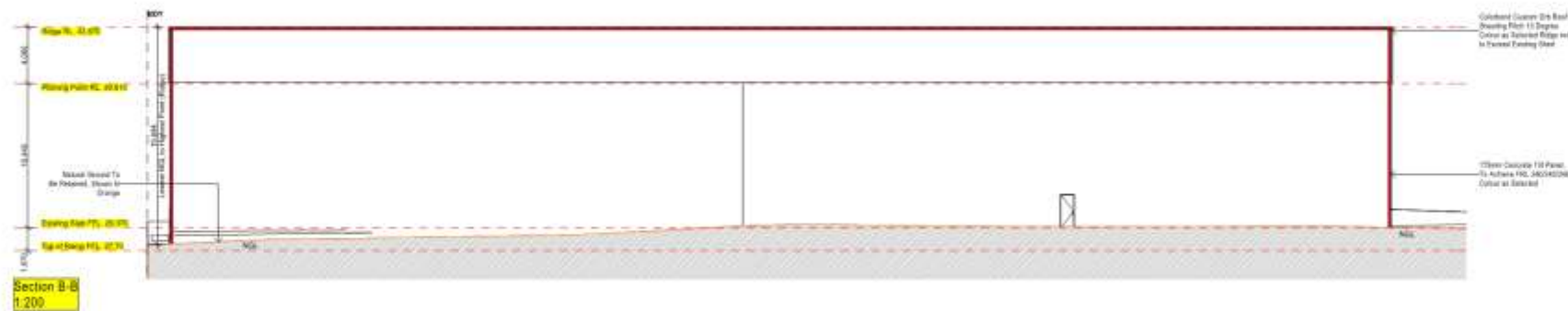
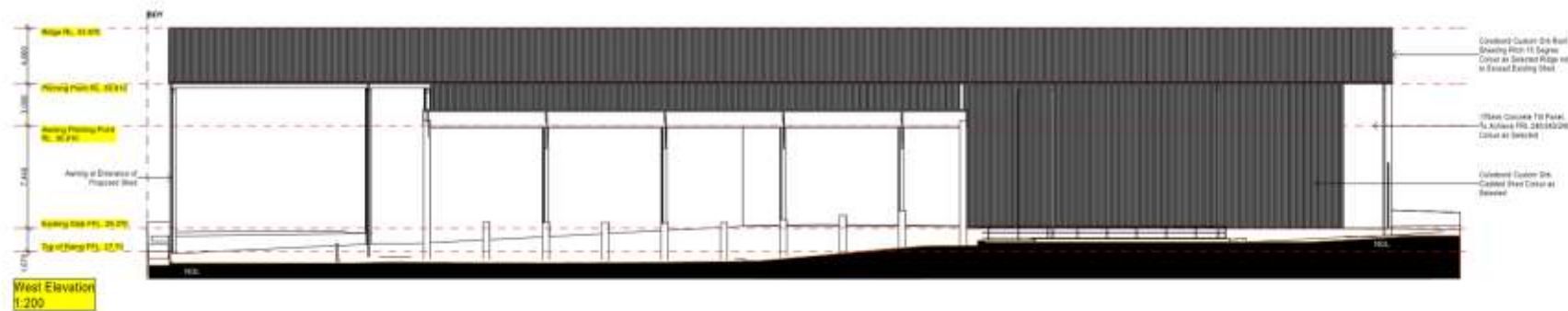
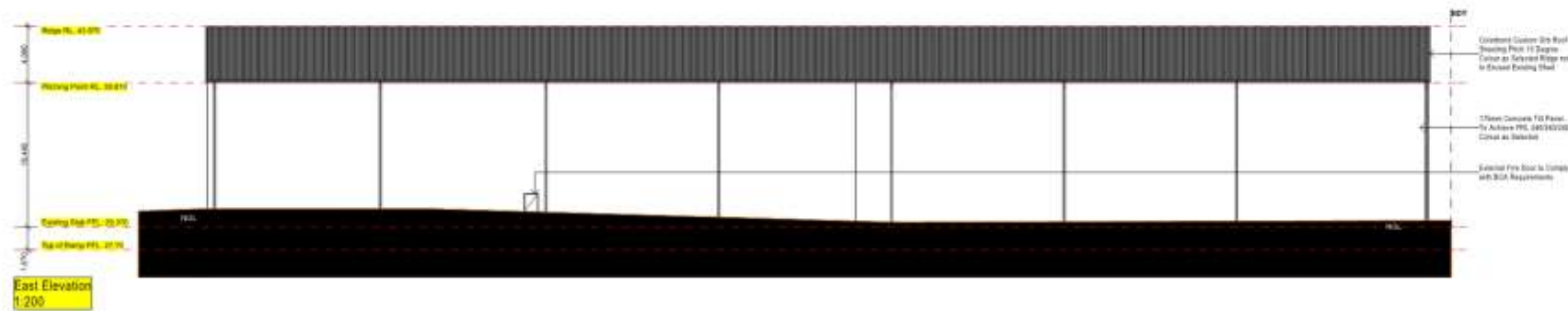
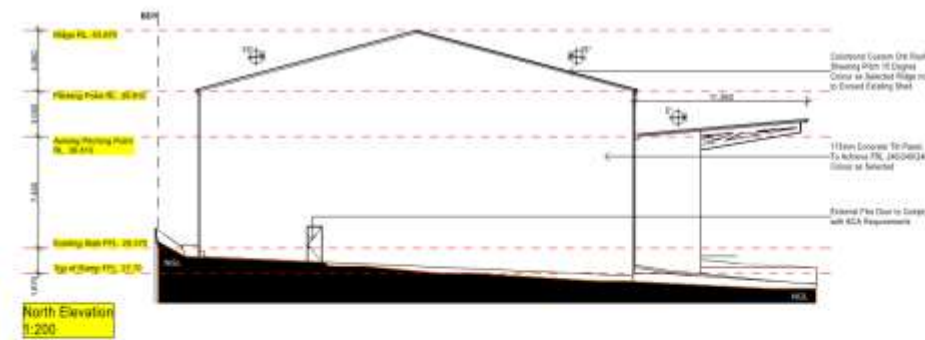
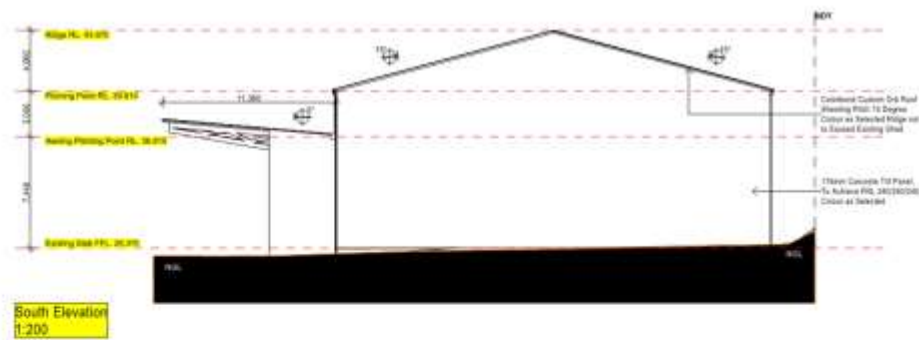
Fire Safety Study

Resource Recovery Facility
Mortdale

Figure 2

Site Plan

610.14692.00501



Notes:
External Walls Close Than 10m From Boundary Must Be 175mm Concrete Tilt Panel in Order To Achieve FRL (AS1530.3.1)

Proposed Shed Elevations 1:200



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1	21-05-18	ISS Amendment Issue
H	11-05-18	ISS Issue
D	18-11-18	DA Amendment Issue
P	08-07-18	DA Amendment Issue
E	18-07-18	DA Amendment Issue
D	15-05-18	DA Issue
C	06-06-18	Concept Issue
B	14-06-18	Concept Issue
A	28-02-18	ISS Issue

Proposed Development
At: 20 Pearce Street Mortdale
For: Binge Group

Project Number: 18-001-001

Environmental Impact Statement
Prepared by: Insight Architecture
Date: 18-05-18
Scale: 1:100 @ A1, 1:200 @ A3

18-05-18 001 1



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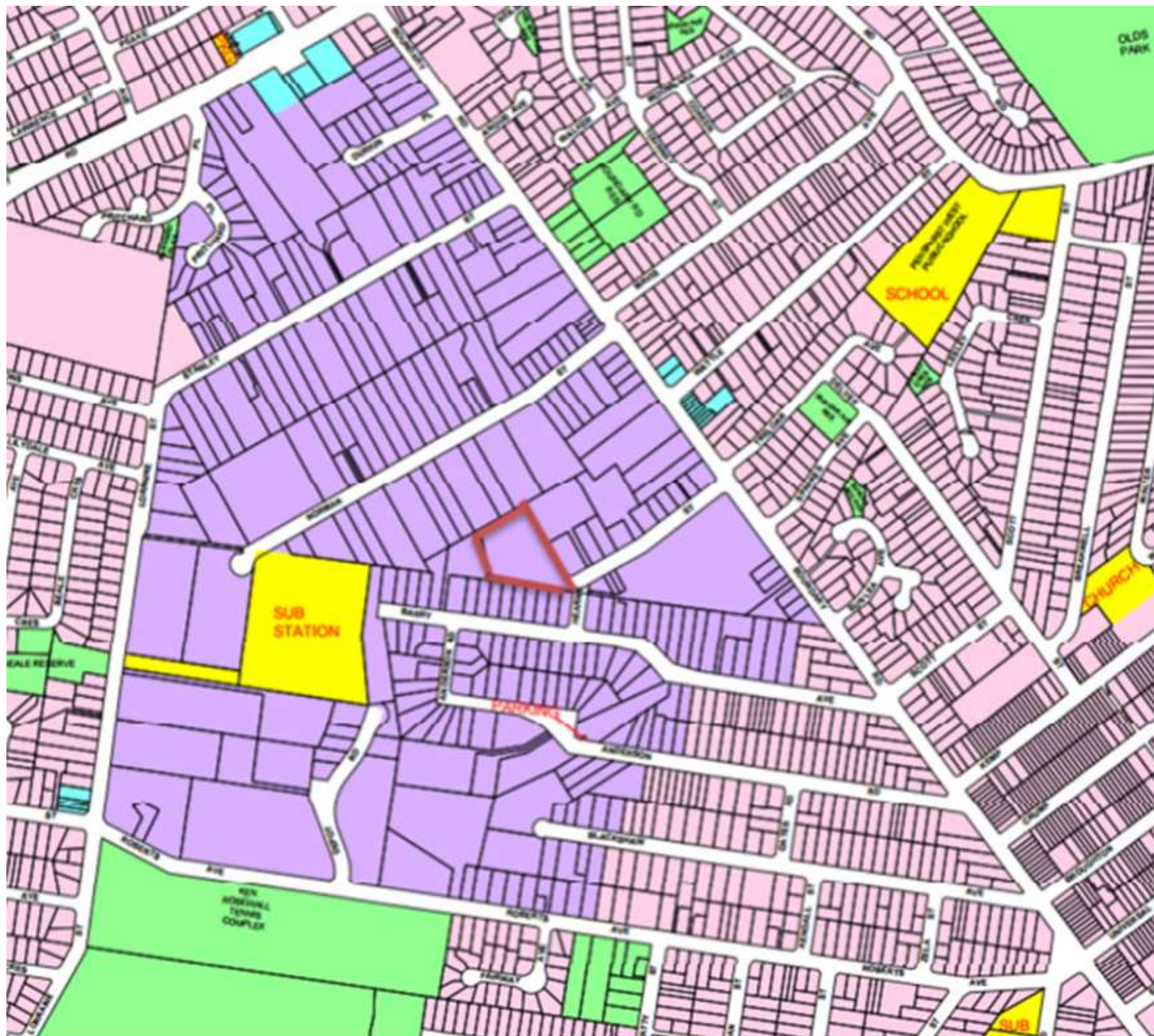
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Fire Safety Study
Resource Recovery Facility
Mortdale

Figure 3

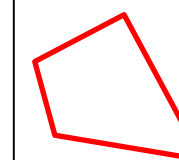
Shed Elevation Plan

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Site location



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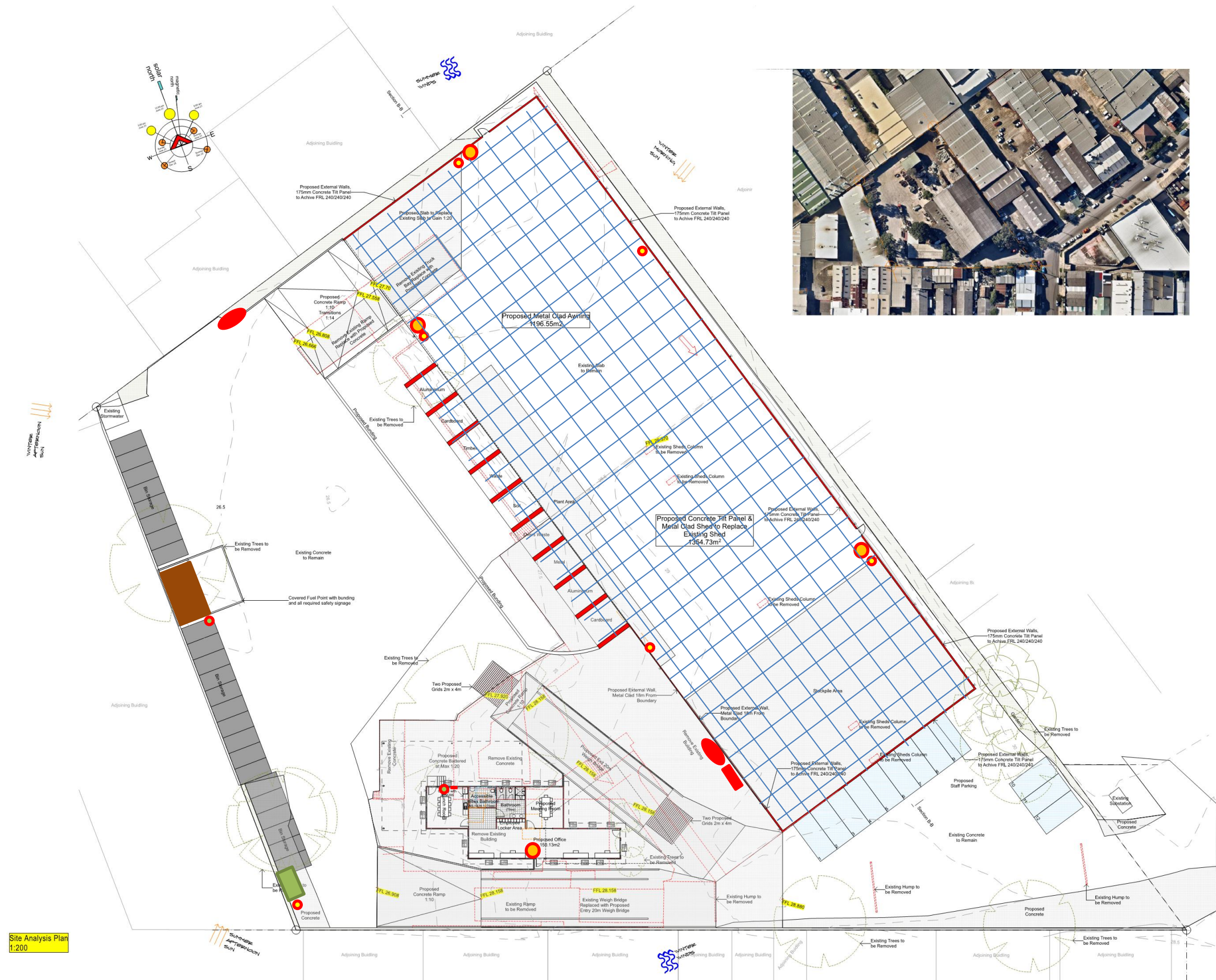
Fire Safety Study

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Figure 5

Surrounding land uses

610.14692.00501



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- Suggested Hydrant location
- Suggested location for fire booster
- Suggested Fire hose reel location
- 28,000L diesel tank
- LPG storage area
- 6A fire extinguishers
- 2A 60B(E) 9kg powder type fire extinguisher
- Approximate suggested 3m x 3m sprinkler grid
- Fire Blanket

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H	11-03-16	EIS Issue
G	16-11-15	DA Amendment Issue
F	30-07-15	DA Amendment Issue
E	14-07-15	DA Amendment Issue
D	15-05-15	DA Issue
C	29-04-15	Concept Issue
B	14-04-15	Concept Issue
A	25-03-15	EB Issue
Issue	Date	

Proposed Development
At: 20 Heame Street Mortdale
For: Bingo Group

Prep Date: Monday, 21 March 2016	
Environmental Impact Statement	
APR 15/16	15/16/17
1:100 @ A1, 1:200 @ A3	
151645 - 03.0 / 18	EIS I



Fire Safety Study

Resource Recovery Facility
Mortdale

Figure 6

Location of fire equipment

610.14692.00501

A1

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Fire Safety Study

Resource Recovery Facility
Mortdale

Figure 7

Stormwater Management
Plan

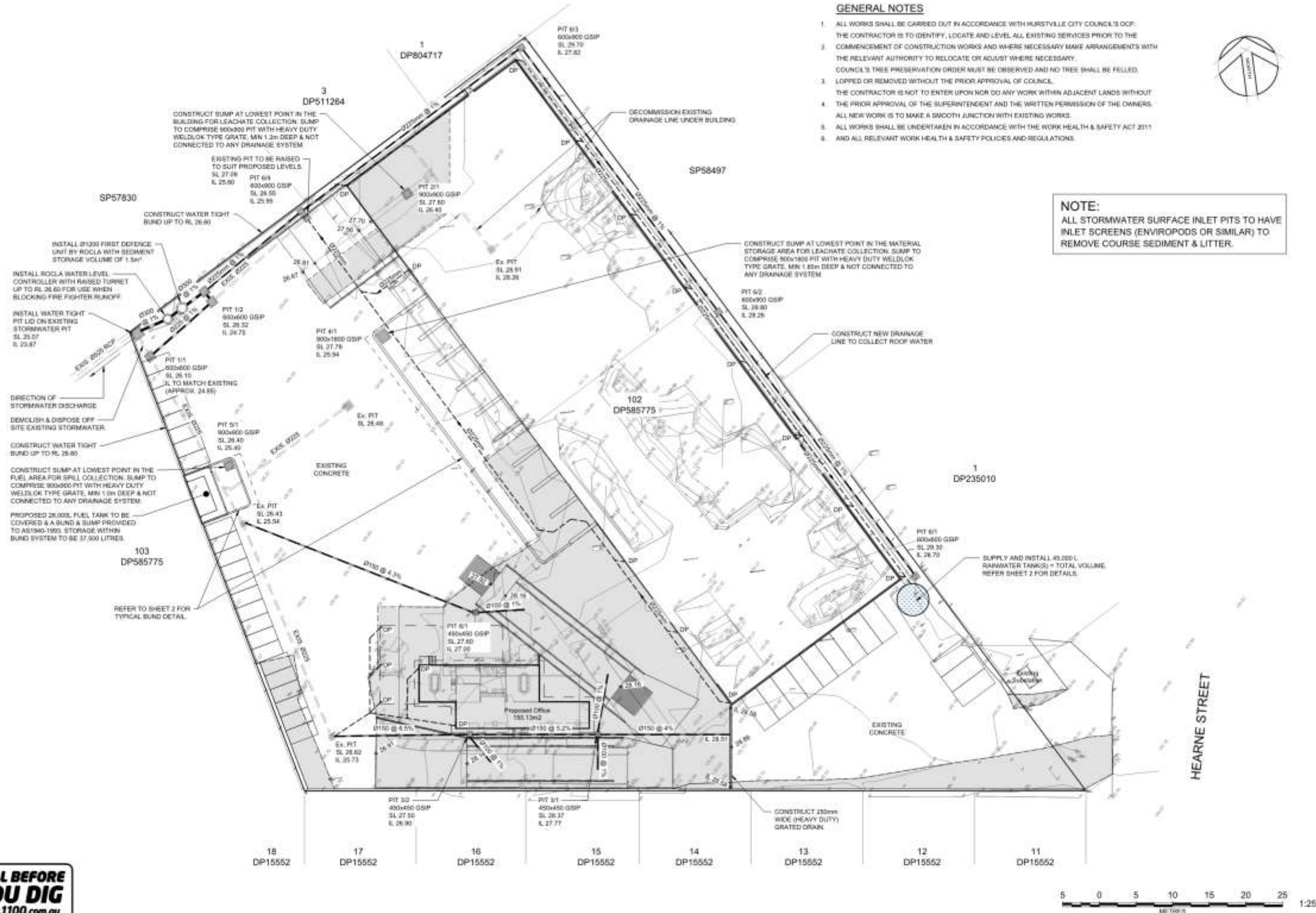
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GENERAL NOTES

1. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH MURSVILLE CITY COUNCIL'S OCP. THE CONTRACTOR IS TO IDENTIFY, LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION WORKS AND WHERE NECESSARY MAKE ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST WHERE NECESSARY.
2. COUNCIL'S TREE PRESERVATION ORDER MUST BE OBSERVED AND NO TREE SHALL BE FELLED, LOPPED OR REMOVED WITHOUT THE PRIOR APPROVAL OF COUNCIL.
3. THE CONTRACTOR IS NOT TO ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE PRIOR APPROVAL OF THE SUPERINTENDENT AND THE WRITTEN PERMISSION OF THE OWNERS.
4. ALL NEW WORK IS TO MAKE A SMOOTH JUNCTION WITH EXISTING WORKS.
5. ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE WORK HEALTH & SAFETY ACT 2011.
6. AND ALL RELEVANT WORK HEALTH & SAFETY POLICIES AND REGULATIONS.

NOTE:

ALL STORMWATER SURFACE INLET PITS TO HAVE INLET SCREENS (ENVIROPODS OR SIMILAR) TO REMOVE COARSE SEDIMENT & LITTER.



E	23/03/18	REISSUED FOR APPROVAL
D	16/03/18	REISSUED FOR APPROVAL
C	16/03/18	REISSUED FOR APPROVAL
B	17/03/18	ISSUED FOR APPROVAL
A	15/03/18	FIRST ISSUE - DRAFT
No	DATE	AMENDMENT

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Client:
BINGO GROUP

STORMWATER DESIGN SERVICES
20 HEARNE STREET, MORTDALE
STORMWATER PLAN

Designed: GJ
Drawn: CM
Checked: GJ
Scales: Plan 1:250
Horiz. X-Sept.
Datum: A.H.D.

Plan No.
SY16043C101
File Ref.
SY16043C_E.dwg
SHEET 1 OF 4 SHEETS
REV. **E**