



Fire Protection Strategy

13 Bellfrog St, Greenacre NSW 2190

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Date: 30 Jul 2025
Reference # 3396
Revision: E

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Date: 30 July 2025

Report Type: Fire Protection Strategy
Report Commissioned by: James Hammond
Property Address: 13 Bellfrog Street, Greenacre
Lot/DP: 15/-/DP1133214

Revision History

DATE	REVISION	COMMENT
04.02.25	A	Issued Version
17.3.25	B	Updated to include total hydraulic demand
25.6.25	C	Minor amendments to wording and formatting
06.7.25	D	Updated Table and additional detail regarding total hydraulic demand
30.7.25	E	Updates to proposed site plan and inclusion of Stockpile Plans

Report by:

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BEng, MEng, GradDipFireEng,
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GradDipPM

Signature:



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Executive Summary

Ekror has been appointed by 4Pillars to undertake a Fire Protection Strategy of the proposed development at 13 Bellfrog Street, Greenacre. The objective is to ensure the compliance of the proposed Waste Management Facility per the Building Codes of Australia and the Fire and Rescue NSW – Fire Safety Guidelines.

The following fire protection measures will need to be implemented as a minimum to achieve compliance:

1. Alarm Signally Equipment
2. Automatic Fire Detection and Alarm Systems
3. Automatic Fire Suppression Systems – Sprinklers
4. Building Occupant Warning System Activated by the Sprinkler Alarm
5. Emergency Lighting
6. Exit Signs
7. Fire Doors
8. Fire Hose Reels
9. Fire Hydrant Systems
10. Fire Water Monitors
11. Portable Fire Extinguishers
12. Smoke Hazard Management Systems

Performance Solutions

The initial review has identified the following items that will likely require a Performance Solution:

1. Fire hydrant – it is assumed that the hydrant locations will have coverage issues due to the vehicle movements and the need to protect the hydrant landing valves from damage.
2. Fire hose reels – 50m FHR will be needed to achieve coverage.
3. Extended travel distances to point of choice of Exit.
4. Fire brigade access – Solution will be developed in consultation with the fire brigade

Report Overview

Scope of Report

This report will highlight the fire protection required for the proposed upgrade to the Aussie Recycling Facility in Greenacre. The facility proposes an expansion to include building and construction waste streams in addition to soil waste. The facility will be licensed to store at a maximum of 4,000 Ton of waste, of which 2,900 Ton will be combustibles.

This report will treat the waste facility as a special hazard as the building and demolition waste presents an unknown factor in terms of materials being stored. The B&D waste also represents 38% of the total combustible storage.

Location & Characteristics

Building Identification and Location:

The site, located within an industrial precinct, will comprise of a waste receival building, a waste processing building, an enclosed conveyor connecting the receival building to the processing building and open yard.





Figure 1 – Existing Site Layout



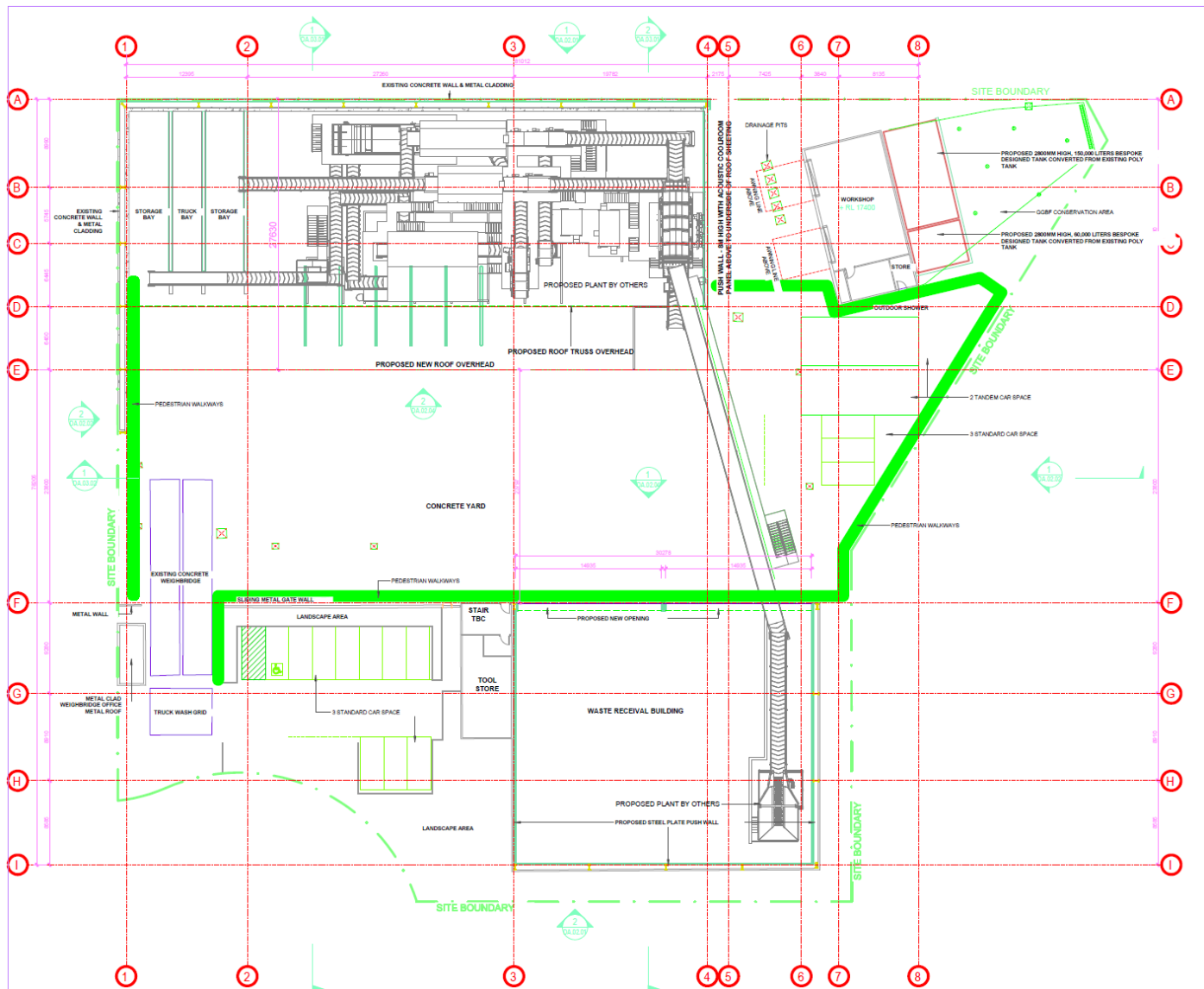


Figure 2 - Proposed Site Layout



Proposed Development Operational Overview

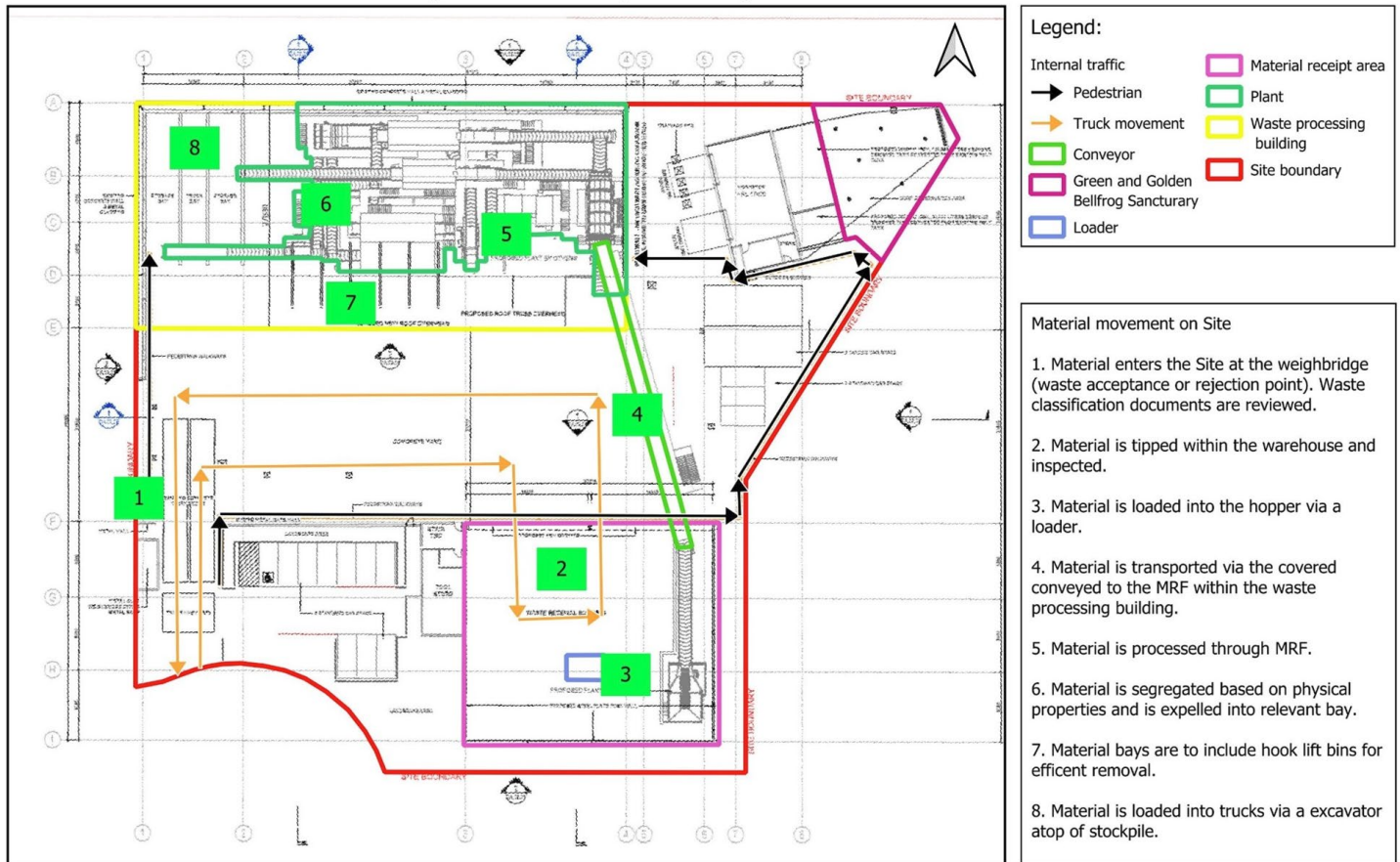


Figure 3 - Proposed Operational Management Movement of Site

BCA Criteria

BCA ITEM	CRITERIA
BCA CLASSIFICATION	Class 7b (Warehouse) Class 8 (Recycling/Sorting Centre)
RISE IN STOREYS	2
EFFECTIVE HEIGHT	<25m
TYPE OF CONSTRUCTION	Type C

Distance from Fire Source Features

DP	Side/Rear Boundary	Far Boundary of Road	Building on Same Allotment
15/-/DP1133214	<3m	>6m	>10m



Commodities Being Stored

Material	Storage location	Storage quantity (max) (m3)	Estimated Density (t/m3)	Storage quantity (max) (t)	Combustible?
Mixed Building and Demolition waste (skip bin waste)	Waste Receival Building	1,500	1.10	1,650.0	YES
Soils	Waste Receival Building	150	1.80	270.0	NO
Concrete, brick and asphalt	Waste Receival Building	100	1.50	150.0	NO
Recovered fines	Bay within Waste Processing Building	200	2.10	420.0	YES
Ferrous metal	Bay within Waste Processing Building	75	2.00	150.0	NO
Non-ferrous metal	Bay within Waste Processing Building	75	2.00	150.0	NO
Residual waste (heavies)	Bay within Waste Processing Building	75	1.50	112.5	YES
Picked material TBC	Bay within Waste Processing Building	75	0.75	56.3	YES
Clean picked material TBC	Bay within Waste Processing Building	75	1.10	82.5	YES
Clean timber	Bay within Waste Processing Building	75	0.75	56.3	YES
Residual light waste	Bay within Waste Processing Building	500	1.10	550.0	YES
Mixed woods (or similar)	Bay within Waste Processing Building	500	0.70	350.0	YES
	TOTAL	2,800		3,998	

Table 1 - Total Storage of Commodities

Material	Storage location	Storage quantity (max) (m3)	Storage quantity (max) (t)	Combustible?
Mixed Building and Demolition waste (skip bin waste)	Warehouse/shed	1,000	1,100	YES
Recovered fines	Bay under plant	200	400	YES
Residual waste (heavies)	Bay under plant	75	112.5	YES
Picked material TBC	Bay under plant	75	52.5	YES
Clean picked material TBC	Bay under plant	75	82.5	YES
Clean timber	Bay under plant	75	52.5	YES



Material	Storage location	Storage quantity (max) (m3)	Storage quantity (max) (t)	Combustible?
Residual light waste	Bay under plant	500	550	YES
Mixed woods (or similar)	Bay under plant	500	550	YES
	TOTAL	2,500	2,900	

Table 2 - Total Storage of Combustibles

Combustible Stockpile Configuration and Layouts

ID	Material	Storage location	Storage quantity (max) (m3)	Estimated Density (t/m3)	Storage quantity (max) (t)	Combustible
1	Mixed waste (skip bin waste)	Waste Receival Building (2 stockpiles)	1,500	1.10	1,650.0	YES
2	Soils	Waste Receival Building	150	1.80	270.0	NO
3	Concrete, brick and asphalt	Waste Receival Building	100	1.50	150.0	NO
4	Recovered fines	Bay within Waste Processing Building	200	2.10	420.0	YES
5	Ferrous metal	Bay within Waste Processing Building	75	2.00	150.0	NO
6	Non-ferrous metal	Bay within Waste Processing Building	75	2.00	150.0	NO
7	Residual waste (heavies)	Bay within Waste Processing Building	75	1.50	112.5	YES
8	Picked material TBC	Bay within Waste Processing Building	75	0.75	56.3	YES
9	Clean picked material TBC	Bay within Waste Processing Building	75	1.10	82.5	YES
10	Clean timber	Bay within Waste Processing Building	75	0.75	56.3	YES
11	Residual light waste	Bay within Waste Processing Building	500	1.10	550.0	YES
12	Mixed woods (or similar)	Bay within Waste Processing Building	500	0.70	350.0	YES
		TOTAL	2,800	16.4	3,998	

Table 3 - Combustible Stock Pile Density





Fire Safety Measures

Fire Sprinklers:

Hazard Classification	Design Density	Design Area (m ²)	Tank Capacity	Reduced Tank Capacity ¹
High Hazard	12mm/min	260	374,400 L	54,000 L

Note 1 – Reduced capacity with automatic inflow water supply

Protection to the enclosed Conveyor:

Protection to the conveyor can be achieved by one of two methods:

1. Concealed sprinkler heads to avoid accidental collision
2. Performance Solution to omit sprinkler protection from the conveyor

This item will need to be engineered at Construction Certificate stage.

Tank Storage Capacity

The total tank capacity can be reduced in total capacity in accordance with AS2118.1-2017 Clause 4.2.7. Based on the Sydney Water Statement of available flows and pressures (dated 5 February 2025) the tank can be reduced to 54,000 L of effective capacity from the required capacity of 374,400 Litres.

Fire Hydrants:

External & internal attack hydrants are required to achieve the following performance criteria in accordance with AS2419.1-2021 Table 2.2.S(B)

Minium flow rate (L/Sec)	Total number of outlets required to flow	Total Flow Rate (L/Sec)	Pressure (kPa)
10	2	20	700

As this site is recognised as a Special Hazard Area under AS 2419.1 – 2021, the fire hydrant system will have further considerations surrounding the following design elements to ensure the performance solution addresses the performance requirement EP1.3:

- Pressure, flow rates and duration of water supply
- Protection of pipework and equipment from possible explosion or corrosion
- Protection of pipework against corrosion
- Access of firefighters to the fire risk
- Availability of hardstand area for firefighting appliances
- Provisions of equipment such as monitors, water spray systems, fog systems and foams systems
- Location of isolating valves
- Location of hydrants



Compliance will be achieved by satisfying the Performance Requirement of EP1.3 can rely upon the following Performance Solutions:

- 2x hydrant flowing simultaneously
- Sprinkler protection to all buildings
- Hydrants to be located 10m away from awning as fall backs
- System is to have a minimum water supply and capacity providing the maximum hydraulic demand (i.e. flow rate) for not less than four hours.

Based on the site configuration and requirements fire hydrant compliance can be achieved without any significant modifications.

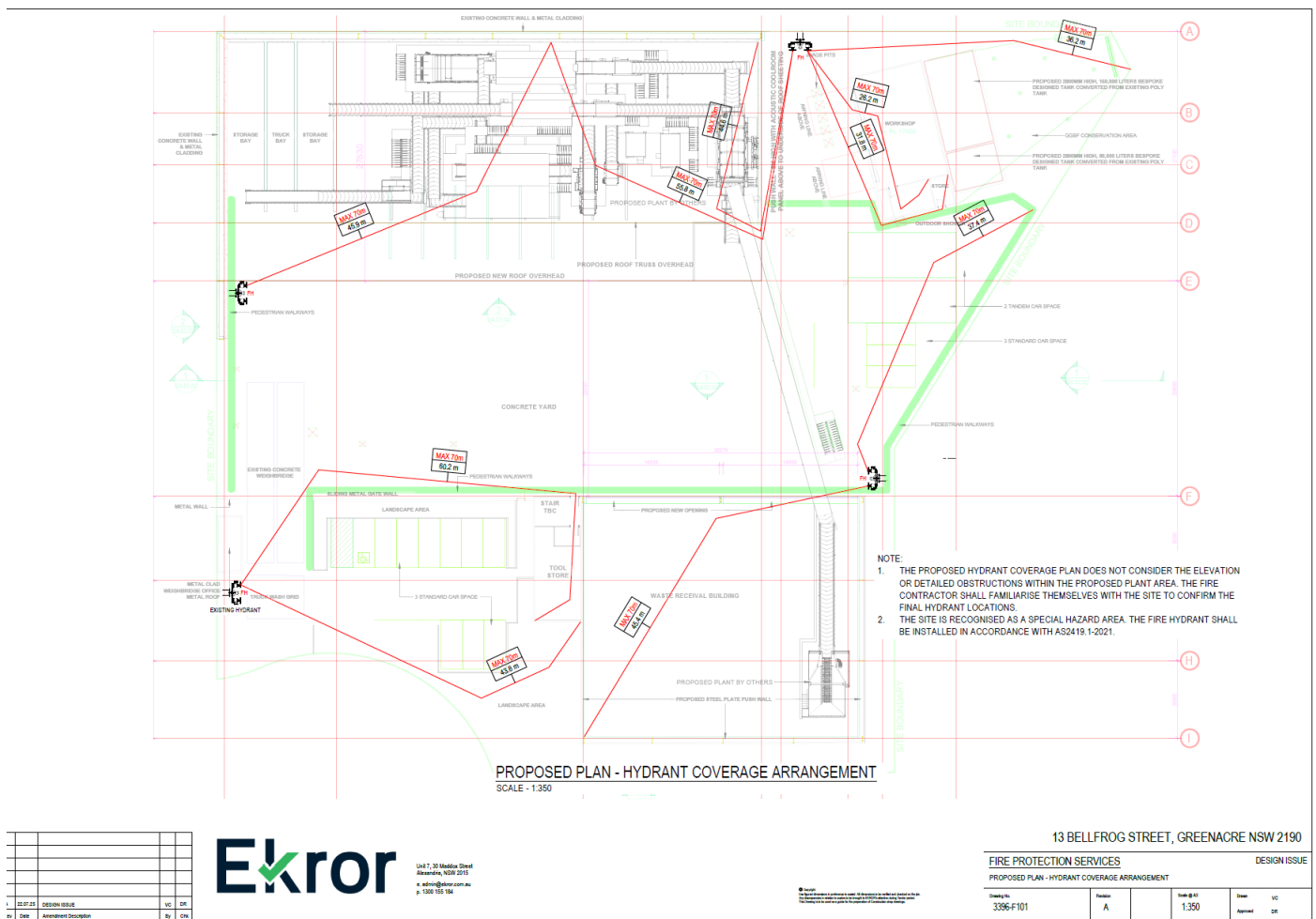


Figure 5 - Fire Attack Plan

Fire Hose Reels

Per the FRNSW Guidelines fire hose reel system will be installed to AS 2441, ensuring coverage for all combustible stockpiles.

Compliance can be achieved by way of performance solution that will incorporate and allow for 50m FHR to achieve coverage as 36m will be difficult to achieve. Possible solutions to ensure E1P1 is achieved include:

- Sprinkler protection throughout the internal storage



- Staff occupants are trained in using 50m FHR
- 50m FHR will be designed for no more than 2 bends
- Installation of fire monitors to assist within initial fire attack by trained staff

Total Hydraulic Demand

Based on requirements of minimum water supply rates for Fire Sprinkler and Fire Hydrant systems the total hydraulic demand is:

Item	Australian Standard	Flow rate (L/min)	Duration of flow (Mins)	Total Water Volume (L)
Sprinklers	AS2118.1-2017	3,120	120	374,400
Hydrant	AS2419.1-2021	1,200	240	288,000
Total		4,320	-	662,400

Automatic Fire Detection and Alarm

Automatic fire detection and alarm system will be installed to AS1670.1:2018, DtS specification 20 and clause 7.7 of the FRNSW Guidelines.

Key items to note:

- A standard spacing of a 10 x 10 grid will be designed
- Standard occupant warning system installed but designed to allow the sound of heavy machinery and vehicles
- A strobe light system to be installed

Per the FRNSW Guidelines, even though flame detection is required, an exemption will be sought due to the increased sprinkler coverage therefore dispensation should be readily achieved.



Fire Safety Audit

Fire Safety Measure	Reason for Requirement / MoP	Comment	Description of provision and clause guideline
Alarm Signalling Equipment	FRNSW Fire Safety Guideline - "Fire Safety in waste facilities" Clauses 7.7 AS 1670.3-2018	Emergency manual alarm points should be installed throughout the site for staff to initiate alarm in the event of a fire. Contributes to achieving BCA Clause EP2.2	7.7.4 - Manual alarm points should be provided in clearly visible locations as appropriate to the environment so that staff can initiate early alarm of fire
Automatic Fail-Safe Devices	FRNSW Fire Safety Guideline - "Fire Safety in waste facilities" Clause 7.7 BCA Clause D2.26	The conveyor will also be on a fail-safe device - ensuring the conveyor stops in the event of a fire alarm activation to prevent the fire spreading into further areas	7.7.3 - Upon positive detection of fire, the system is to activate any required alarm, fire suppression system, passive measure (e.g. fire door, fire shutter) or plant/machinery override (e.g. shutdown of conveyor, shredder) as appropriate to the detector
Automatic Fire Detection and Alarm System	FRNSW Fire Safety Guideline - "Fire Safety in waste facilities" Clauses 7.7 BCA Spec S21C1 AS 1670.1 - 2018	Per table S21C2 - the Class 8 building, fire load for a sprinklered building is 5MW. A fire detection and alarm system will be installed to AS 1670.1 and include: - Visual flame detectors - Infrared detectors - Heat probes	7.7.1 - The waste facility is to have a fire detection and alarm system installed appropriate to the risks and hazards identified for each area of a building
Automatic Smoke Detection System	BCA Clauses E2.3, AS 1670.1 NSW Fire Safety Guideline - "Fire Safety in waste facilities" Clause 7.7	Must be designed for the fire scenarios and environment e.g. visual flame detectors, infrared detectors, heat detectors/probes. Warehouse may require VESDA type detectors located per AS 1670.1 - assist with early detection.	7.7.1 - The waste facility is to have a fire detection and alarm system installed appropriate to the risks and hazards identified for each area of a building
Automatic fire suppression systems - Sprinklers	BCA E1D13 AS 2118.1 - 2017 NSW Fire Safety Guideline - "Fire Safety in waste facilities"	Sprinklers must be designed by qualified expert for special hazard. Sprinklers will be high hazard sprinklers. Sprinklers will be installed throughout the entire site.	7.6.1 - An automatic fire sprinkler system is installed to AS 2118.1 and designed for special hazard (e.g. high hazard class) 7.6.5 - A fire brigade booster connection is installed for the automatic fire sprinkler system and is co-located with the hydrant system booster 7.6.6 - The sprinkler system delivers not less than the total hydraulic demand for a minimum of two hours duration.
Building Occupant Warning System Activated by the Sprinkler System	BCA Spec. 17 Clause 8 AS 1670.1 - 2024	Activation of the sprinkler shall automatically operate the building occupant warning system	7.7.1 - The waste facility is to have a fire detection and alarm system installed appropriate to the risks and hazards identified for each area of a building
Emergency Lighting	BCA Clause E4.2 and E4.4 / AS 2293.1 - 2018	Applicable to the site and is required to installed	
Exit Signs	BCA Clause E4.4, E4.5, E4.6, E4.8 AS 2293.1 - 2018	Exit signs and directional signs must be clearly visible	



Fire Safety Measure	Reason for Requirement / MoP	Comment	Description of provision and clause guideline
Fire Doors	BCA Clauses C4D5, C4D6 AS 1905.1 NSW Fire Safety Guideline - "Fire Safety in waste facilities" Clause 7.4	Fire doors are required to be installed. This will be dealt with a Construction Certificate stage.	7.4.7 - Adequate firefighter access is provided to the building, fire safety systems and equipment
Fire Hose Reels	NSW Fire Safety Guideline - "Fire Safety in waste facilities" Clause 7.5 BCA Clause E1.3 AS 2441	Fire Hose Reels must provide coverage to all areas of the compartments	7.5.8 - Fire hose reel system is installed to AS 2441 and provides coverage for both internal and external stockpiles
Fire Hydrant Systems	NSW Fire Safety Guideline - "Fire Safety in waste facilities" Clause 7.5 BCA Clause E1.2 - (E1P3 - performance solution will to applied) , AS 2419.1	Compliant hydrant system can be achieved. Detailed design to be addressed at Construction Certificate stage	7.5.1 - A fire hydrant system is installed to AS 2419.1 and provides coverage for both internal and external stockpiles; 7.5.3 - The fire hydrant system incorporates enhanced standard of performance for external stockpiles - e.g. one additional hydrant to flow, 7.5.4 - Fire hydrant are not located within 10m of any stockpile storage, whether internal or external 7.5.7 - The fire hydrant system delivers the required number of fire hydrants to flow simultaneously for a minimum of four hours duration 7.5.6 - A fire brigade booster connection is installed within sight of the designated site entry point
Fire Water Monitors	NSW Fire Safety Guideline - "Fire Safety in waste facilities" Clause 7.5	Fire Water Monitors are proposed as additional fire protection measure. This will assist with achieving BCA Clause EP2.2 as required under the FRNSW Fire Safety Guideline - "Fire Safety in waste facilities".	7.5.1 - A fire hydrant system is installed to AS 2419.1 and provides coverage for both internal and external stockpiles
Masonry Bunkers	FRNSW Fire Safety Guideline - "Fire Safety in waste facilities" - Clause 8.2	Masonry walls shall extend at least 1m above the stockpile height of 4m and at least 2m beyond the outermost stockpile edge	8.2.6 - Any separating masonry wall, revetment or pen is to extend at least 1m above and at least 2m beyond the stockpile
Paths of Travels	D2.5 (D1P6 - In class 8, travel distances commonly exceed DtS there a Performance Solution will be required)	Based on proposed plans, extended travel distances to an will exceed the permitted 40m, with distances measuring approximately 48m. Compliance will be achieved by utilising a Performance Solution	
Perimeter Vehicle Access	FRNSW Fire Safety Guideline - "Fire Safety in waste facilities" - Clause 7.4.1 BCA Clause C3D5 (Alt. CP9)	This has been satisfied in the layout design.	7.4.1- "Specialist fire appliance" access is provided to satisfy performance requirement CP9 of the NCC and FRNSW guideline 8.4.11 - Fire brigade access is provided between external stockpiles
Portable Fire extinguishers	BCA Clause E1D14 AS 2444 - 2001	Compliance achieved	Compliance achieved



Fire Safety Measure	Reason for Requirement / MoP	Comment	Description of provision and clause guideline
Smoke Hazard Management Systems	FRNSW Fire Safety Guideline - "Fire Safety in waste facilities" - Clause 7.8 BCA Clause E2.21	The design of the building provides natural low level openings (Clause 7.8.3) therefore assisting with venting of smoke to assist visibility during the fire. As the site will be sprinkler controlled, to comply with 7.8.4 the smoke exhaust system must be capable of continuous operation for not less than 2 hours in a fire scenario	7.8.1 - Buildings containing combustible waste material are to have an automatic smoke hazard management system appropriate to the potential fire load and smoke production rate installed within the building 7.8.3 - Low level openings (e.g. roller door) on two or more walls to assist with venting de-stratified smoke 7.8.4 - The automatic smoke hazard management system is capable of continuous operation for a minimum of two hours duration



Annexure A – Sydney Water Pressure and Flow Statement



Statement of Available Pressure and Flow

Daniel Rorke
702/35B Arncliffe Street
Wolli Creek, 2205

Attention: Daniel Rorke

Date:

05/02/2025

Pressure & Flow Application Number: 2058269

Your Pressure Inquiry Dated: 2025-01-28

Property Address: 13 Bellfrog Street, Greenacre 2190

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Bellfrog Street	Side of Street: East
Distance & Direction from Nearest Cross Street	475 metres South from Wentworth Street
Approximate Ground Level (AHD):	9 metres
Nominal Size of Water Main (DN):	150 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	88 metre head
Minimum Pressure	63 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	63
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	10	66
	15	64
	20	63
	25	61
	30	59
	40	54
	50	48
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	10	61
	15	60
	20	58
	25	56
	30	54
	40	49
	50	42
Maximum Permissible Flow	55	38

(Please refer to reverse side for Notes)

