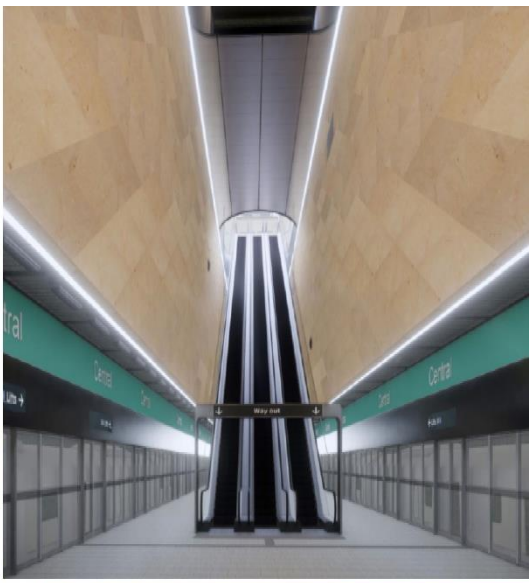
WARRINGTONFIRE
AUSTRALIA
A Jensen Hughes Company





# Concept fire safety strategy

## GenTech Narromine, 323 The McGrane Way, Narromine, NSW

Client: Philip Yates Family Holdings

Job number: FSE240011

Date: 11 October 2024  Revision: CFSS1.0

# Quality management

| Version | Date | Information about the report | | | |
|---|---|---|---|---|---|
| CFSS1.0 | 11 Oct 2024 | Description | Report issued to for review and comment. | | |
| | | | **Prepared by** | **Reviewed by** | **Authorised by** |
| | | **Name** | Nick Jays | Henry Brammer | Henry Brammer |
| | | **Signature** |  |  |  |

Warringtonfire* Australia Pty Ltd
ABN 81 050 241 524

# Contents

# 1. Introduction

Philip Yates Family Holdings C/- Engine Room VM has requested Warringtonfire to undertake a fire safety engineering assessment for the alterations and upgrade works at the facility located at 323 The McGrane Way, Narromine, NSW. The purpose of this report is to identify and document the fire safety measures that are likely to be required for the building to comply with the performance requirements of the National Construction Code Volume One – Building Code of Australia (NCC) 2022[1].

If the detailed fire safety engineering assessment shows that the proposed systems do not satisfy the identified performance requirements of the NCC, additional fire safety systems or modifications to the fire safety strategy may be required. This may also require further assessment.

# 2. Description of the building and performance solutions

## 2.1 Building description

GenTech Seeds Narromine is an existing canola and corn seed processing facility. There are several existing buildings on the site, however this project relates to the main building to the west of the site. The main building (shed 1,3 and 4) contains storage (class 7b), processing (class 8) and office (class 5) uses.

Shed 1 is understood to have been first constructed in the late 1980's to early 1990's. Extensions to the building for shed 2 occurred circa early to mid 1990's and further extensions occurred in 2000 for shed and 2005 for shed 4. It has been identified that the appropriate approvals for the building extensions may not have been obtained at the time of construction and no Certificate of Occupancy for the works was able to be sourced from council records.

The existing cluster of buildings are located in close proximity and are interconnected by covered awnings. Due to the compartment area and volume, it is proposed to consider the admin building, shed 1, shed 2, shed 3 and shed 4 as a single large isolated building.

The project involves the following:

- Building modifications to accommodate new seed processing equipment in shed 3.
- Upgrading the fire safety systems and provisions to the cluster of buildings on the west of the site.

Sheds 1 and 3 are primarily used to process, pack and treat seeds. Sheds 2 and 4 are used for storage and distribution of the seeds, which included palletised storage of seeds in bags.

Other than fire safety upgrades for compliance, building works are only proposed in shed 3. The other existing buildings on the site are outside the scope of these works.

The site is shown by Figure 1. The fire hydrant booster assembly, pump shed, and sprinkler tanks will be located adjacent to the main site entry from The McGrane Way. The proposed works to shed 3 are shown by Figure 2.

The existing building is primarily single storey, with some mezzanines located throughout the existing buildings. There is an existing equipment tower located above shed 1 but is understood not to contribute to the rise in storeys.

As part of the new works to shed 3, a new equipment tower will be constructed, which is shown by Figure 3. The tower will contain three levels, which increases the rise in storeys of the building to three.

[1] National Construction Code Volume One – Building Code of Australia 2022, Australian Building Codes Board, Australia


**Figure 1 Site plan**

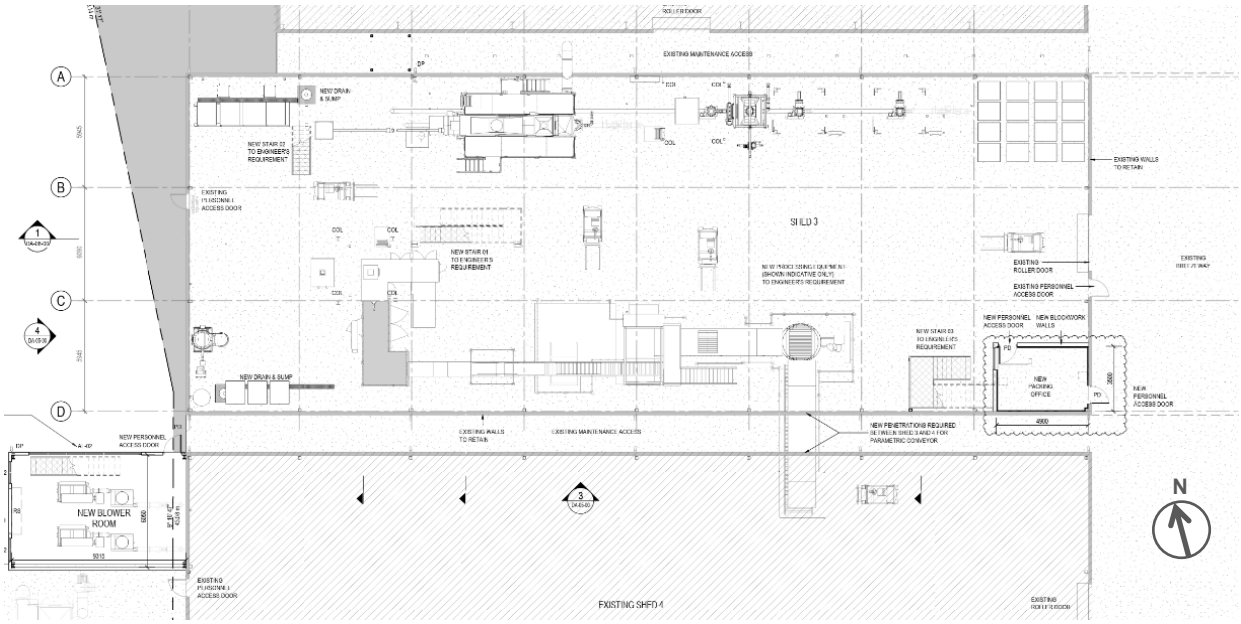



**Figure 2 Layout of proposed works to shed 3**

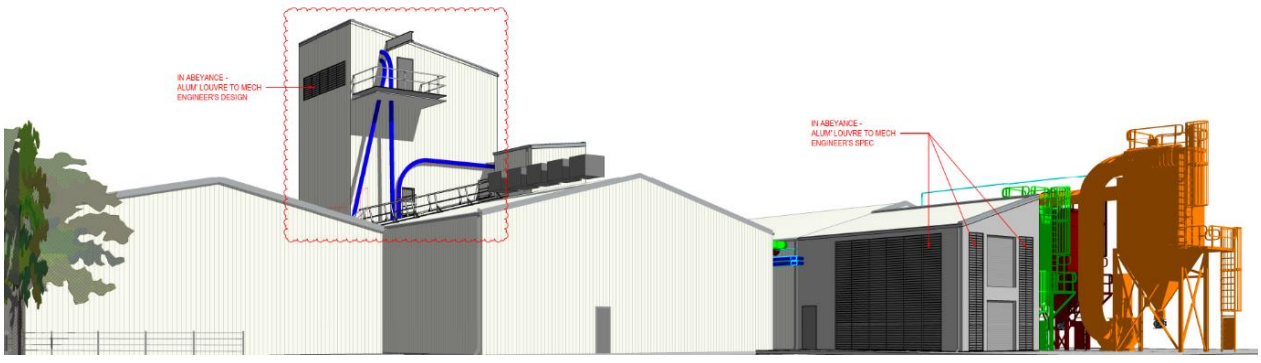



**Figure 3 Building perspective**

Table 1 shows the main characteristics of the building for determining compliance with the NCC. Table 2 shows the proposed use and classification of the building in accordance with part A6 of the NCC.

**Table 1 Main building characteristics**

| Characteristic | NCC provision | Description |
|---|---|---|
| Effective height | Schedule 1 | Less than 25 m<br>~10.4 m |
| Type of construction required | C2D2 | Type B and large isolated |
| Rise in storeys | C2D3 | 3 |
| Levels contained | - | 3 |

**Table 2 Use and classification**

| Part of building | Use | Classification (A6) |
|---|---|---|
| Main building | Administration, storage and processing | Class 5, class 7b and class 8 |

## 2.2 Preventive and protective measures

The building will have the following major fire safety measures required by the DTS provisions of the NCC. A comprehensive list of fire safety measures is to be provided by the certifier as part of the building approval process. Additional fire safety measures required as part of the performance solution are listed in section 4.

- Automatic sprinkler system
- Building occupant warning system
- Emergency evacuation plan
- Emergency lighting
- Exit signs
- Fire hose reel system
- Fire hydrant system (ring main)
- Perimeter access for emergency vehicles (performance solution)
- Portable fire extinguishers

## 2.3 Occupant characteristics

The characteristics of the occupants expected to be in the building are listed in Table 3.

**Table 3 Occupant characteristics**

| Characteristic | Description |
|---|---|
| Familiarity | Occupants are expected to be staff who are familiar with the layout of the building and trained in emergency situations. Visitors may also be present, but they are expected to be accompanied by staff. |
| Awareness | Occupants are expected to be awake and alert to a potential emergency event such as a fire in the building. |
| Mobility | Occupants are assumed to have the same level of mobility as the general population. This may include a limited proportion of mobility impaired occupants. These occupants may need crutches, a wheelchair or similar to evacuate on their own or need assistance from other occupants. |
| Age | Occupants of all ages may be present within the building. The majority of the occupants are between 15-65 years of age. |
| Language | Although occupants may have English as their second language, they are expected to understand signs and verbal instructions in English enough to not adversely affect evacuation. |

| Characteristic | Description |
|---|---|
| Occupant load | It is understood that the maximum population that would be expected within the building during peak times would be approximately 38 people (10 office staff and 28 other staff) . The processing of the seeds is understood to be seasonal and the population will vary throughout the year. |

## 2.4 Performance solutions

The design of the building includes areas that do not comply with the DTS provisions of the NCC. We intend to use performance solutions to meet relevant performance requirements of the NCC.

Table 4 shows the NCC requirements associated with the performance solutions.

**Table 4 NCC requirements associated with the performance solutions**

| No | Description of performance solutions | DTS provision | Performance requirements | Method of meeting performance requirements | Assessment method |
|---|---|---|---|---|---|
| 1. | It is proposed to rationalise the fire rating to columns in the external wall located within 18 m of a fire source feature – ie the side and rear allotment boundary or adjacent buildings on the same allotment. | Clause C2D2 and specification 5 | C1P1 | Complies with performance requirements A2G2(1)(a) | Verification method A2G2(2)(b)(ii) |
| 2. | Combustible materials are present within the external walls of the existing building and are proposed to be retained. The following materials have been identified:<br>• Timber framing within the administration building.<br>• Internal feature lining board of the external wall in the western elevation of the admin building.<br>• Small localised window cutouts containing clear polycarbonate sheeting around the building. | Clause C2D10 | C1P2 | Complies with performance requirements A2G2(1)(a) | Verification method A2G2(2)(b)(ii) |
| 3. | Vehicular perimeter access is not continuous with access provided to three sides of the existing large-isolated building.<br>The perimeter access route to the east of the building requires fire brigade to pass underneath high level conveyor belts.<br>**Note:** This item is subject to acceptance by Fire and Rescue NSW. | Clause C3D4 | C1P9 | Complies with performance requirements A2G2(1)(a) | Verification method A2G2(2)(b)(ii) |

| No | Description of performance solutions | DTS provision | Performance requirements | Method of meeting performance requirements | Assessment method |
|---|---|---|---|---|---|
| 4. | A portion of the existing western elevation is within 3 m of the boundary allotment. It is proposed to rationalise the extent of fire protection required to be provided. | Clause C4D3 | C1P2 | Complies with performance requirements A2G2(1)(a) | Verification method A2G2(2)(b)(ii) |

# 3. Scope and assumptions

## 3.1 Scope

- The scope of this report is limited to the performance solutions described in section 2.4. We have not confirmed that every aspect of the building complies with the building code and/or relevant Australian standards. It is the responsibility of other parties to ensure full compliance with the code and standards is achieved.
- The scope of our work does not include assessing the level of performance and/or compliance of external walls and associated materials, unless specifically agreed in writing with Warringtonfire.
- Matters such as property protection (other than the protection of adjoining property), business interruption, public perception, environmental impacts and broader community issues – such as loss of a major employer and impact on tourism – have not been considered as they are outside the scope of the NCC.
- This report considers fires involving a single ignition point. Our assessment does not cover arson or destructive acts involving:
  - large amounts of accelerants which significantly change the expected burning behaviour of materials
  - Large stores of dangerous goods
  - Dust explosion for the processing of seeds.
  - multiple ignition sources
  - terrorism.
- The scope of our work is limited to considering evacuation and fire safety issues for people with disabilities to the same degree as the DTS provisions of the NCC. The evacuation of people with disabilities under the provisions of the Disability Discrimination Act 1992 is specifically excluded.
- If there are building alterations or additions, a change in use or changes to the fire safety systems in the future, a reassessment will be needed to verify consistency with the assessment in this report.
- The information in this report specifically relates to the building and must not be used for any other purpose.
- The documentation that forms the basis for this report is listed in Appendix A.
- The figures included in this report are provided for illustrative purposes only and may not reflect the latest design drawings. They should be read together with the latest drawings and other documentation prepared by the project team.
- This report has been prepared based on information provided by others. Warringtonfire has not verified the accuracy and/or completeness of this information and will not be responsible for any errors or omissions that may be incorporated into this report as a result.

## 3.2 Assumptions

- The design complies with the DTS provisions of NCC 2022 relating to fire safety, except for the specific performance solutions described in section 2.4.
- All the fire safety systems are to be designed, installed, operated and maintained in accordance with the appropriate Australian standards, other design codes, legislation and regulations relevant to the project unless specifically stated otherwise.

# 4. Fire safety measures

The following fire safety measures are proposed for the building as a starting point for the fire safety engineering assessment to comply with the relevant performance requirements of the NCC.

## 4.1 General

1. The design must comply with the DTS provisions of NCC 2022 relating to fire safety unless specifically stated. This section does not provide a comprehensive list of fire safety measures required by the DTS provisions of the NCC. The fire safety measures listed here only relate to the performance solutions and must be read together with the DTS provisions.

2. The fire safety measures in this section must be incorporated into the design of the building and maintained and certified in accordance with the Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021 and relevant Australian standards. These fire safety measures and this report must be listed on the fire safety schedule for the building.

3. We recommend that all fire safety measures should be periodically inspected, tested and maintained in accordance with AS 1851:2012.

## 4.2 Fire resistance

### 4.2.1 Fire resistance and stability

4. The fire resistance levels (FRLs) of the building elements associated with the building must be designed in accordance with the requirements of specification 5 of the NCC for a large isolated building of type B construction, except for items 5 and 6.

5. Loadbearing columns forming part of the external wall or load bearing external columns which are located within 18 m of the allotment boundary and only directly supporting the roof are not required to be provided with fire protection– refer to Figure 4.

   **Draft note:** The limiting steel temperature of the columns within 18 m of the allotment boundary – determined in accordance with section 12 of AS 4100-2020 must be confirmed by the structural engineer.

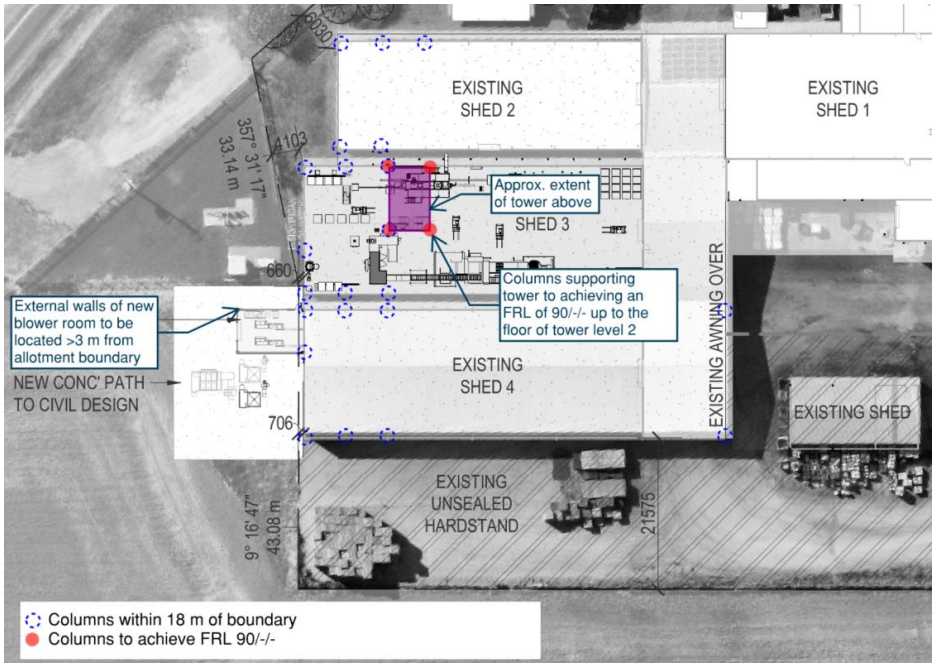



**Figure 4 Location of columns within 18 m of allotment boundary**

6. The loadbearing columns supporting the new tower must achieve an FRL of 90/-/- up to tower level 2, instead of achieving an FRL of 240/-/-. The approximate location of the columns supporting the tower are shown by Figure 4 and Figure 5.

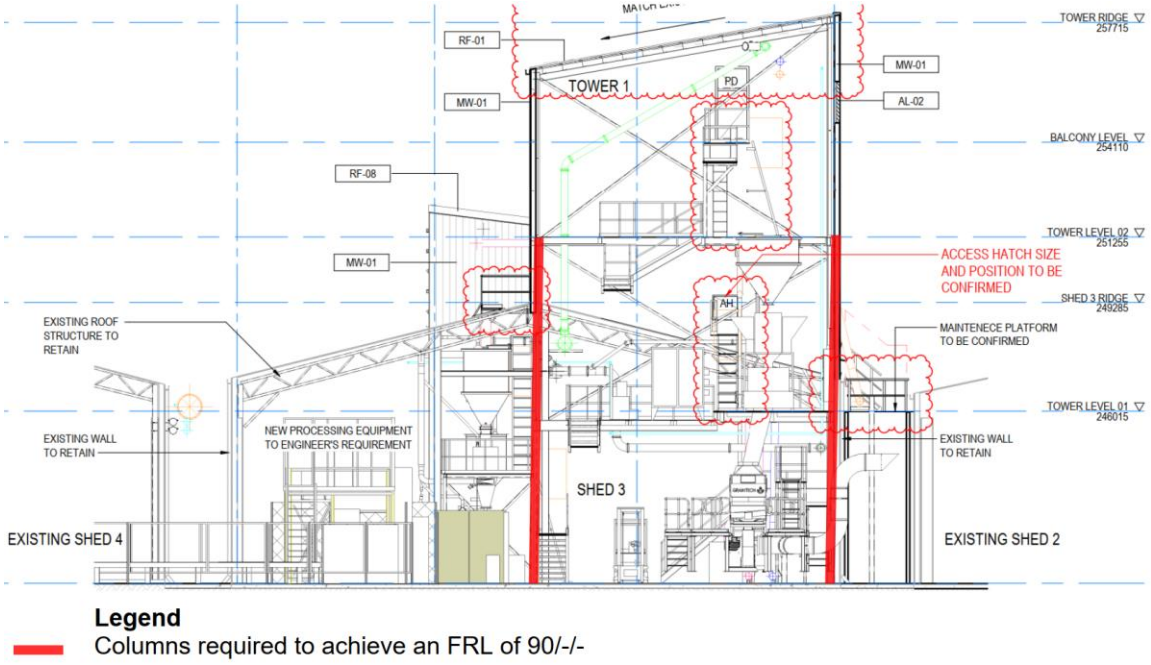



**Figure 5 Columns to new tower required to achieve a fire rating**

### 4.2.2 Protection of openings

7. Openings within 3 m of the allotment boundary must be protected in accordance with clause C4D5 of the NCC, except that unprotected openings may be located within 3 m of the internal allotment boundary – ie the openings in shed 4 to the west. This adjacent allotment is also owned by GenTech. The unprotected openings are shown by Figure 6.

   **Draft note:** A plan identifying the allotments (eg plan type / number) will be required. Confirmation that both allotments are owned by GenTech will also be required.

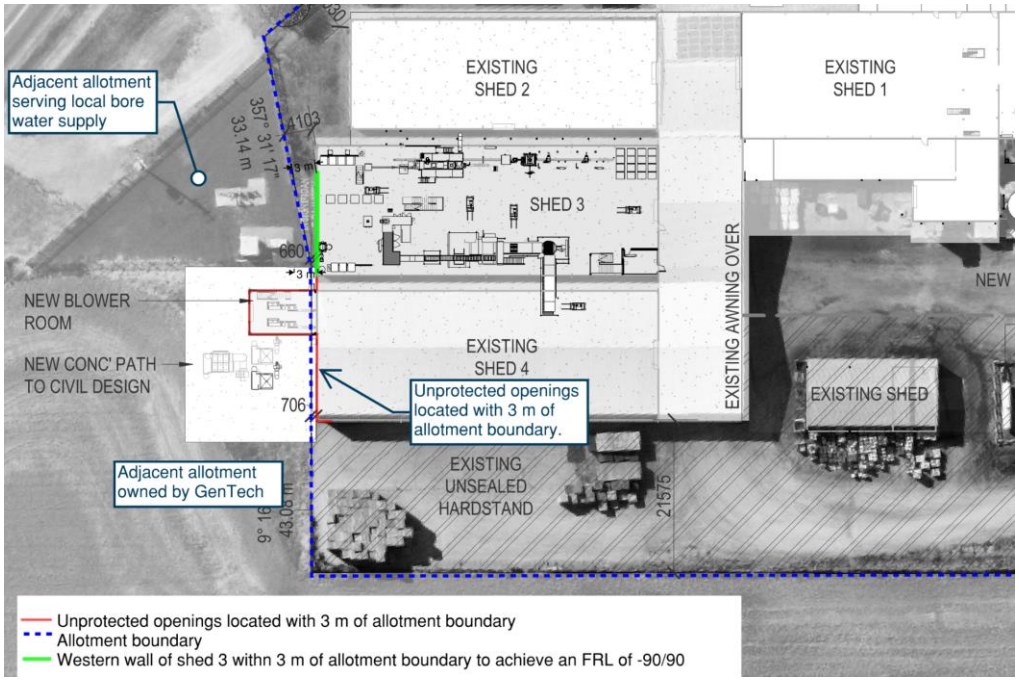



**Figure 6 Unprotected openings along the western elevation**

8. The non-load bearing western wall of shed 3 that is within 3 m of the allotment to the west (contain the water bore) must be designed to achieve an FRL of -/90/90, instead of -/240/240, as shown by Figure 6.

   **Note**: The existing insulation to this wall must be removed, as required by item 10.

### 4.2.3 Combustible materials in external walls

9. The external walls of the building must be constructed in accordance with clause C2D10 of the NCC, with the exception that the following existing combustible materials may be retained:

   a. Timber framed construction within the administration.

   b. An internal feature lining to the western external wall of the administration building, assumed to be a composite wood material.

   c. Small localised window cutouts containing clear polycarbonate sheeting around the building, including to the existing tower.

   **Draft notes:**

   – Further site investigation will be required to determine the extent and material composition of the combustible materials. This is likely to involve laboratory testing of samples.

   – The retention of combustible elements in the external wall represents an approvals risk with Fire and Rescue NSW.

**Figure 7 Example of polycarbonate windows**

**Figure 8 Example of combustible internal lining of external wall**

10. The combustible insulation – assumed to be an expandable foam type material – located within the western external wall of shed 3 must be removed and replaced with materials that comply with clause C2D10 of the NCC. The extent of insulation is shown by Figure 9.

    **Draft notes:**

    a. We recommend that the composition of the insulation is confirmed via material characterisation testing, to confirm the material beyond reasonable doubt.

    b. Advice on material sampling locations can be provided if required.

    c. We understand that the roof of shed 3 is also lined with the combustible insulation. The certifying authority has confirmed that the roof is not required to be non-combustible. We recommend seeking clarification on whether the material would comply with the fire hazard properties for ceiling linings required under clause C2D11 of the NCC.

**Figure 9 Combustible insulation to be removed**

### 4.2.4 Vehicular perimeter access

11. The building must comply with the requirements of clause C3D4 of the NCC for a large isolated building, except that:

    a. Continuous perimeter vehicular access is not provided to the western side of the building required by clause C3D5(2) of the NCC.

    b. Two elevated walkways / conveyors are located greater than 6 m above the vehicular access.

    The vehicular access must have:

    c. A minimum unobstructed width of 6 m.

    d. A load bearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles.

    Refer to Fire and Rescue NSW Fire Safety Guideline Access for Fire Brigade Vehicles and Fire Fighters[2] for guidance on the design of the vehicular access carriageway.

    The indicative perimeter vehicular access provided is highlighted in Figure 10.

    **Draft notes:**

    – Available vehicular access to be confirmed by the design team.

    – Height of walkways / conveyors above the vehicular perimeter access to be confirmed by the design team.

    – Any localised restrictions in width to be confirmed by the design team.

[2] Fire and Rescue NSW, Fire Safety Guideline, 2020 Access for Fire Brigade Vehicles and Fire Fighters, accessed 13 September 2024, <https://www.fire.nsw.gov.au/gallery/files/pdf/guidelines/guidelines_access_for_emergency_vehicles.pdf>.

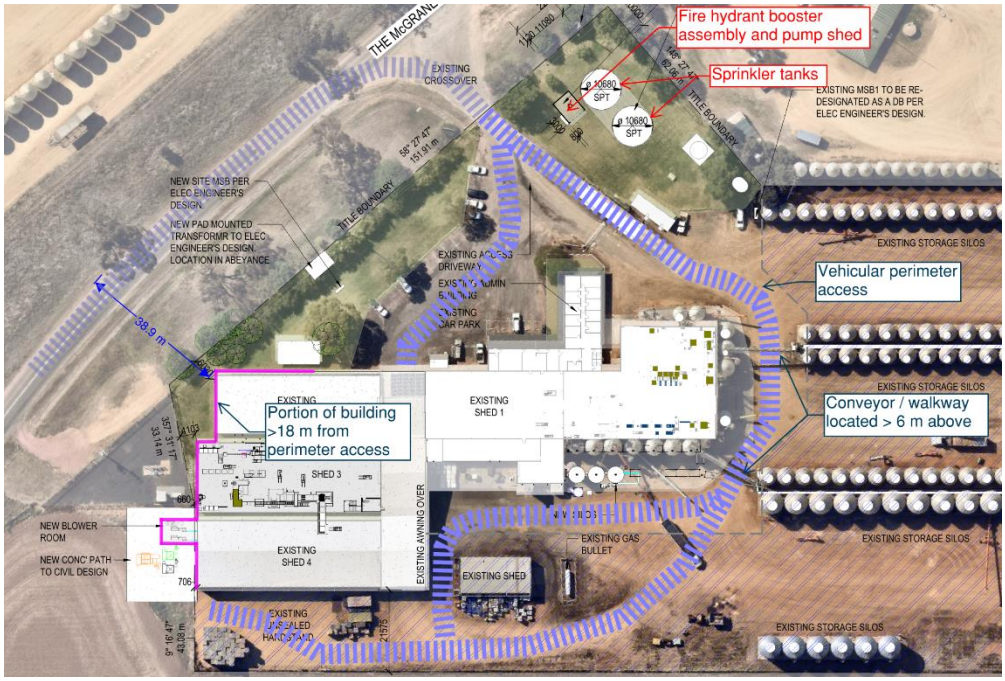



**Figure 10 Perimeter vehicular access provided to the building**

## 4.3 Services and equipment

### 4.3.1 Firefighting equipment

12. A fire hydrant system must be installed throughout the building in accordance with clause E1D2 of the NCC and AS 2419.1:2021.

    All of the hose connections in the system are to be fitted in accordance with FRNSW technical information sheet – FRNSW compatible hose connections, available at www.fire.nsw.gov.au. These couplings must be tested as part of the system when the commissioning tests are undertaken.

13. The hydrant system must be provided with a ring main in accordance with AS 2419.1:2021.

14. A fire hose reel system must be installed throughout the building in accordance with clause E1D3 of the NCC and AS 2441:2005.

15. A sprinkler system must be installed throughout the building in accordance with specification 17 of the NCC and AS 2118.1:2017.

### 4.3.2 Emergency lighting, exit signs and warning systems

16. An emergency lighting system must be installed throughout the building in accordance with clauses E4D2 and E4D4 of the NCC and AS/NZS 2293.1:2018.

17. Exit signs and direction signs must be installed throughout the building in accordance with clauses E4D5, E4D6 and E4D8 of the NCC and AS/NZS 2293.1:2018.

18. A building occupant warning system must be provided in accordance with clause S20C7 of the NCC and complying with clause 3.22 of AS 1670.1:2018 with a pre-recorded verbal evacuation message. The building occupant warning system must be audible throughout the building, including potential external areas where evacuation back into the building is required. Visual warning device may be required in areas with increased ambient noise due to the plant and equipment.

## 4.4 Fire safety management and training

19. If a class 1 to 9 building as defined by part A6 of the NCC is ever constructed within 18 m of the building – either on the same allotment or on the adjoining allotment, reassessment of the fire engineering strategy may be required and/or compliance with the NCC for fire protection of columns and openings will be required.

20. The subject site allotment and the adjoining allotment to the south – on which the blower room will be constructed – must be owned by the same entity. If the adjoining allotment is proposed to be sold or altered in the future, a reassessment will be required and/or realignment of the allotment boundaries.

21. A fire safety management plan (FSMP) must be developed for the building. A FSMP is an overview of the fire safety systems installed throughout the building, with additional information relating to maintenance, housekeeping and procedures. This document must include the following information as a minimum:

    a. Identification of the building owner / manager responsible for implementation of the FSMP.

    b. Maintenance requirements for the fire safety measures in the building in accordance with the relevant Australian standards and applicable legislation.

    c. Identification of any performance solutions and associated fire safety measures.

    d. Identification for an emergency evacuation plan to be developed, implemented and maintained for the building in accordance with AS 3745:2010.

    e. General housekeeping procedures to minimise the fire risks within the building.

    The FSMP is to be reviewed on an annual basis or whenever alteration and additions, changes in use, population or fire safety measures occur.

22. The fire safety management plan must include fire risk management procedures for maintenance and building works, including:

    a. Isolation of any of the fire safety measures for the building should be the subject of a risk assessment and approval process controlled by the owners / management.

    b. Maintenance works requiring shutdown or isolation of the sprinkler system should be undertaken outside of normal trading hours when possible.

    c. If the sprinkler system is isolated or turned off for an extended period – eg more than two days – the relevant area must be temporarily fire separated from the remainder of the building by fire-rated construction. A risk assessment should be undertaken to determine the appropriate fire rating and identify whether other fire safety measures are necessary during the period of isolation. The insurers and fire brigade are also to be notified in the event of extended sprinkler shutdown.

    d. Procedures for all ‘hot work’ such as welding, oxyacetylene cutting, paint stripping, vinyl laying etc. Where conducted outside the confines of a dedicated workshop, these works should be the subject of a hot works approval process controlled by the building owner / manager.

# 5. Safety in design

Our scope of work is to assess the level of fire safety and demonstrate that the design complies with the relevant performance requirements of the NCC. A preliminary safety in design review considered whether the recommended fire safety measures in section 4 could reasonably be expected to introduce unique or unusual hazards that would not otherwise be present in the construction, installation and/or maintenance of the building. The fire safety measures in section 4 are performance specifications for other consultants to incorporate into their designs. The detailed designers retain discretion over where and how systems and structures are installed and are therefore responsible for the safety in design for the detailed design. It is important to note that the outcomes of our review are limited to issues that could reasonably be foreseen by a fire safety engineer within our limited scope and involvement in the project. It is likely that other parties involved in detailed design, installation and/or maintenance will identify additional issues.

Our preliminary safety in design review has not identified any unique or unusual hazards for the performance solution that would not otherwise be present in the construction, installation and/or maintenance of the building.

Note: Residual risks are to be considered and addressed by appropriate people within the design, construction and maintenance teams who have duties under health and safety legislation.

# Appendix A Drawings and information

| Drawing title | Dwg no | Date | Drawn |
|---|---|---|---|
| Overall site plan | 1377-DA-01-00[H] | 20 Aug 2024 | Taylor Ellis |
| Overall floor plan – shed 3 | 1377-DA-02-00[G] | 20 Aug 2024 | |
| Shed 3 elevations | 1377-DA-05-00[G] | 20 Aug 2024 | |
| Building sections | 1377-DA-06-00[G] | 20 Aug 2024 | |