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ADVICE

**Fire Engineering Strategy**

Austral Brickworks Plant #2 Refurbishment

780 Wallgrove Road, Horsley Park

Revision 2 | 14<sup>th</sup> December 2018

CORE

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Safety • Integrity • Trust

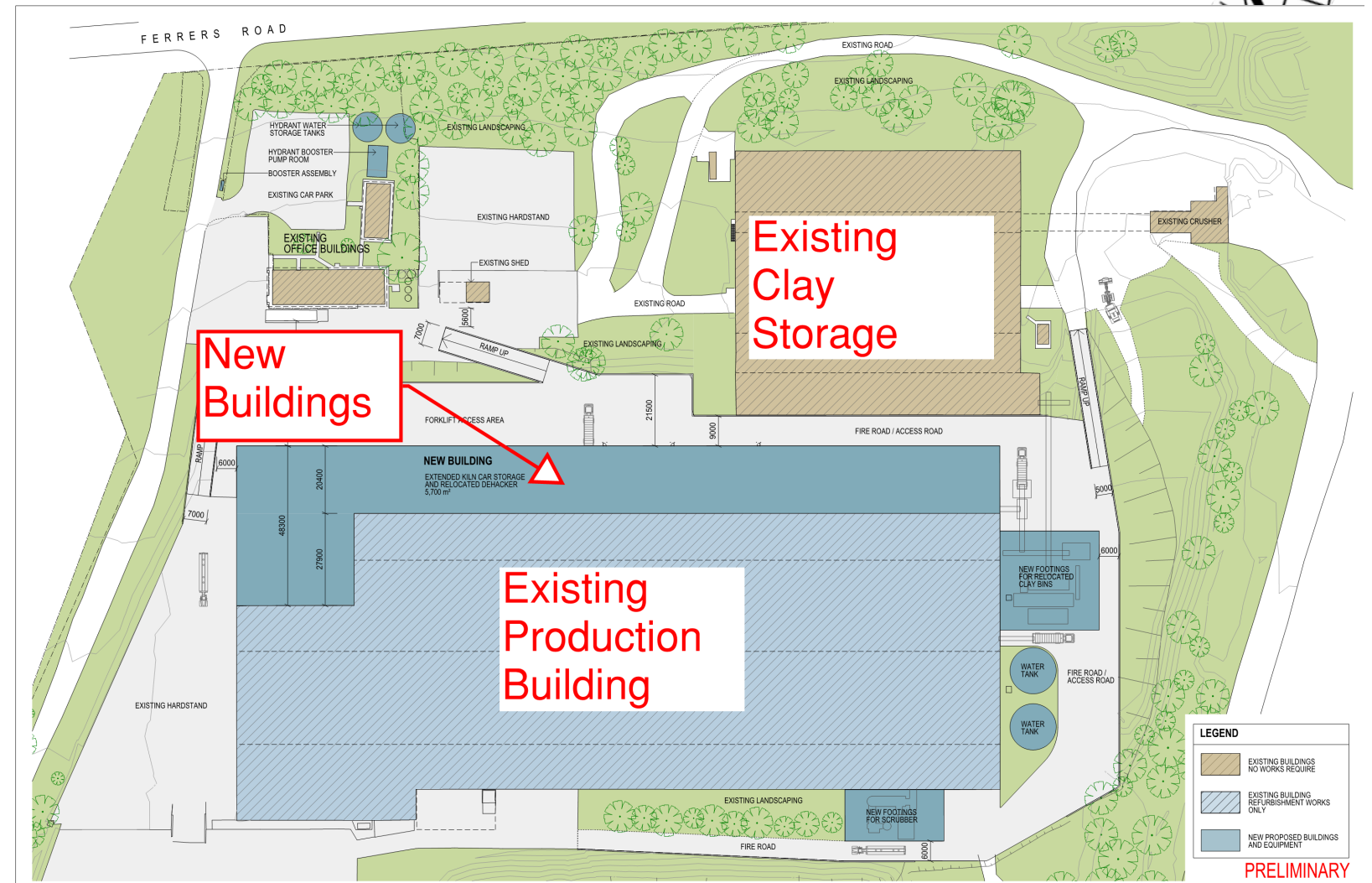
Fire • Risk • Emergency Management

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# The Development

**Brickworks Plant #2 is an existing facility with a 80 million per annum brick production capacity. The proposed development is comprised of:**

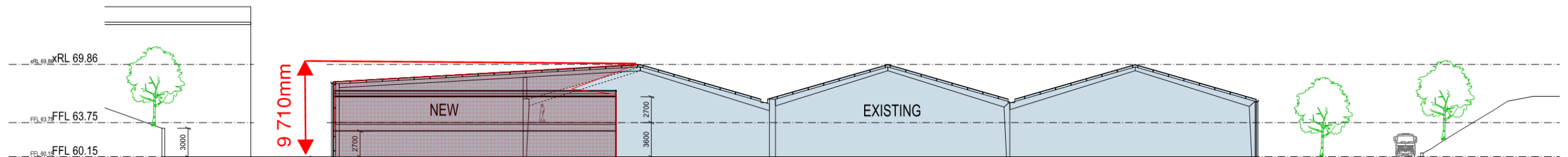
- A 5,700m<sup>2</sup> extension to the existing 18, 710m<sup>2</sup> Production Building, plus 600m<sup>2</sup> mezzanine office level. 25, 010 m<sup>2</sup> total
- A new sealed fire access road
- Re-roofing of the building.
- Civil works to improve access around the buildings for production activities



# The Development

## BCA Characteristics

- Production building - RIS of 2 (include 600m<sup>2</sup> mezzanine office)
- Effective Height < 12m
- Large Isolated Buildings
- Type C Construction
- Class 5 (Mezzanine office in Production building)
- Class 8 – (Production Building)



Production Building - Section



# Fire Resistance

- The building will form single fire compartments - Large Isolated Buildings (LIB)
- Production building exceeds 18 000m<sup>2</sup> in area and would likely exceed 108 000m<sup>3</sup> in volume
- No fire walls required (apart from specific areas housing essential services, etc)
- Production building prescriptively requires:
  - Fire Sprinklers throughout; AND
  - Perimeter Vehicular access to BCA C2.4 (b)

A fire strategy will provide BCA C2.4 (b) perimeter vehicular access only without fire sprinklers, due specifically to the low fire hazard contents and activities within the Production Building.

# Fire Resistance – Alternative Fire Strategy

An Alternative Fire Strategy shall be developed based on the following attributes of the development:

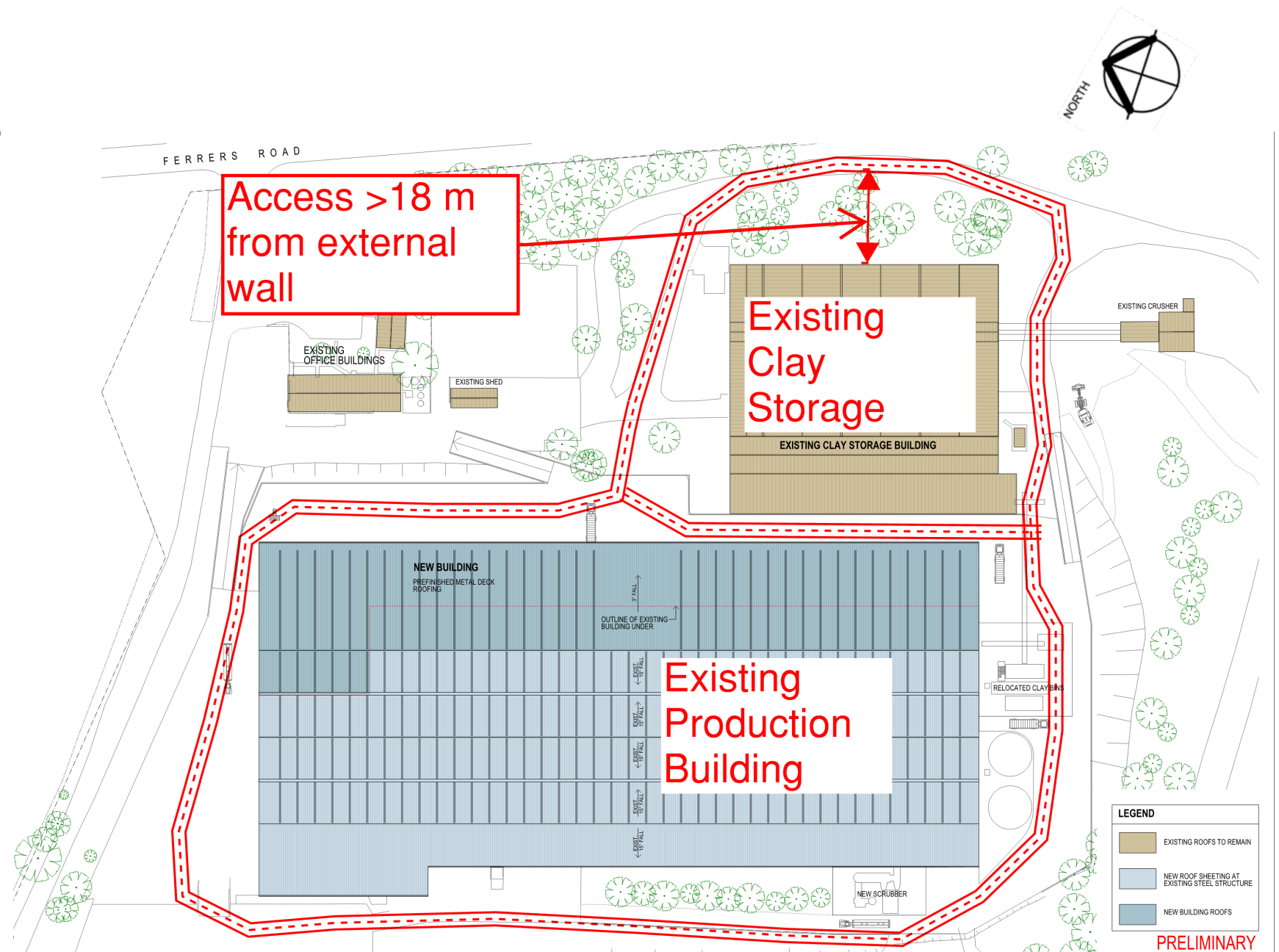
- The building is purpose built for the production of clay bricks. As such the levels of combustible materials will be significantly less than could be expected in an equivalently sized Class 8 manufacturing building. On that basis, fire growth and size is controlled by the minimal fuels, in lieu of the provision of fire sprinklers.
- The building is more than 18m clear of the allotment boundaries and the entire site is dedicated to the production of clay bricks.
- Fire brigade will be provided with perimeter access around the building, and an external fire hydrant system (which is not currently provided) to allow effective fire fighting operations.
- Low building population.
- The building owner (Brickworks Ltd) undertakes the business of clay brick manufacture in the two buildings and as Stakeholders in the re-development they and their insurers have considered the consequences of a fire within a building that is not provided with fire sprinklers and the risk of total loss.

NB: Any proposal to omit fire sprinklers from a building will require the support of FRNSW which will always present an approvals risk.

# Perimeter Access

## Proposed Requirements

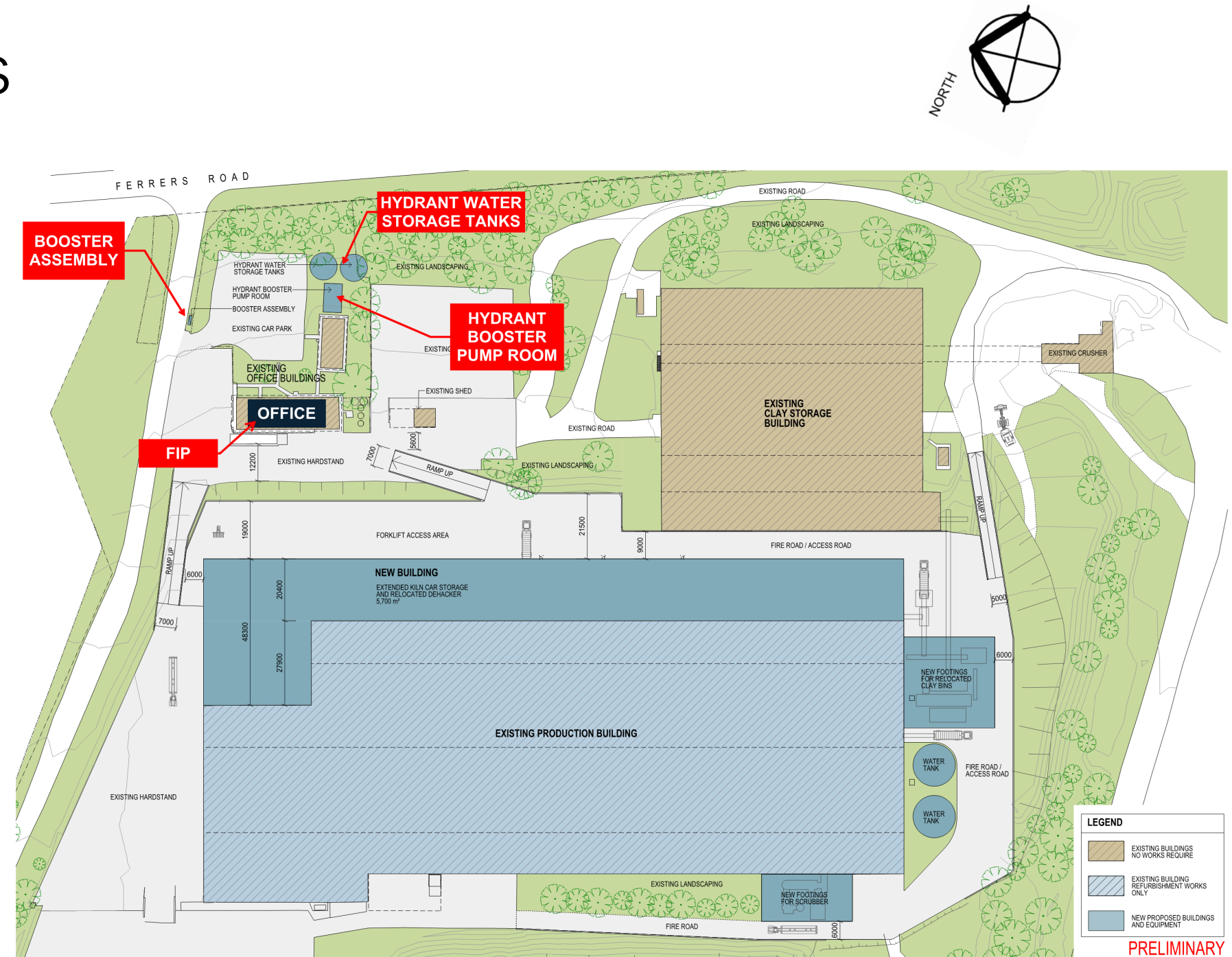
- Proposed path as indicated
- Load-bearing capacity to be in accordance with FRNSW Policy No 4.
- Swept paths and ramp gradients to accommodate aerial appliance as per FRNSW Policy No 4.
- Performance Solution for localised areas where perimeter is greater than 18m from the external wall of the building



# Site Fire Services

## Proposed Locations

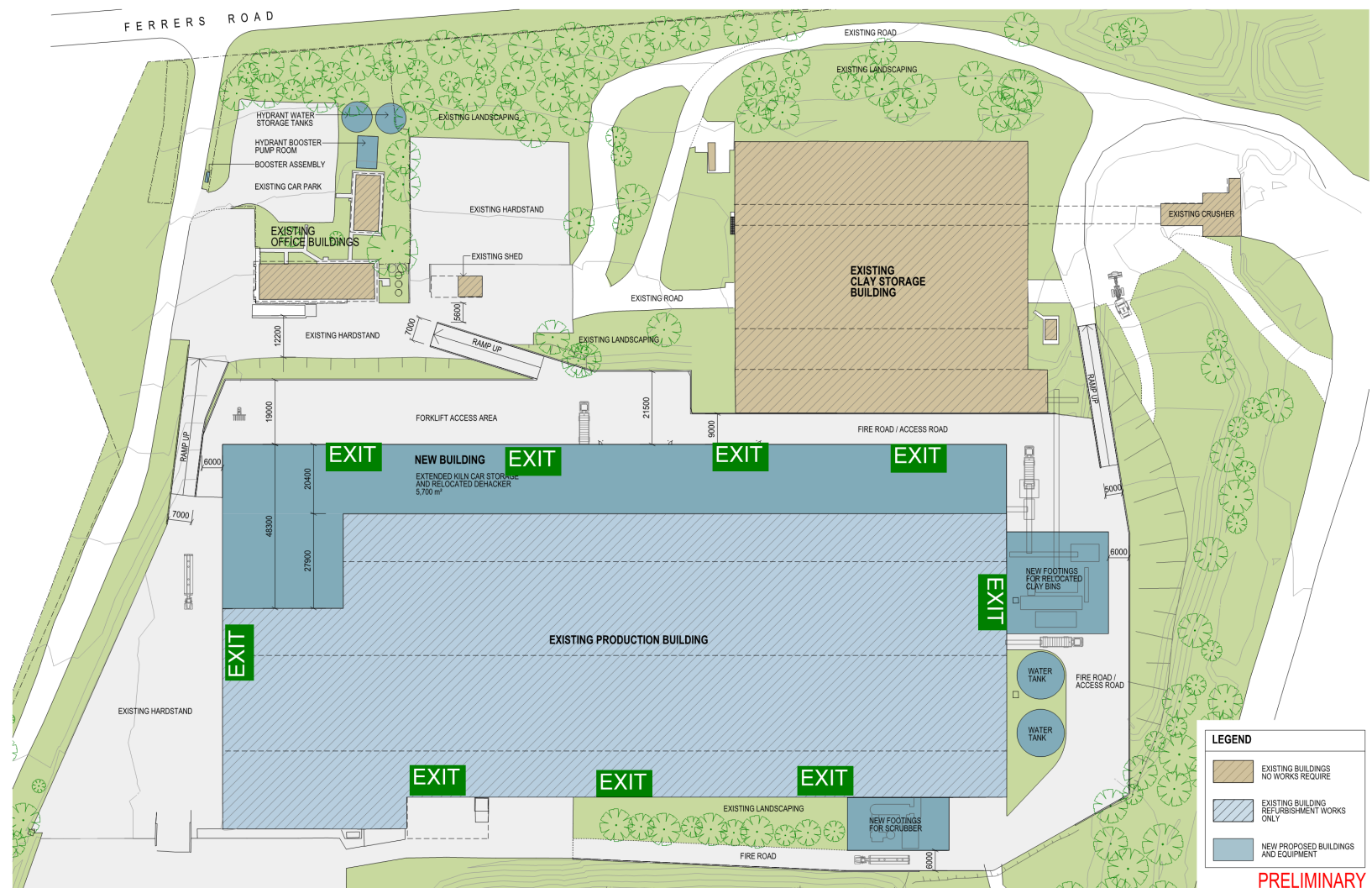
- Fire Indicator Panel within existing office at main entry located as per the requirements of a Fire Control Centre (required for LIB's with more than 18000m<sup>2</sup> floor area).
- Fire hydrant booster at main entry off Ferrers Road
- New hydrant system water storage tanks and booster pump location TBC.
- Sprinkler protection omitted – Performance Solution





# Egress Provisions

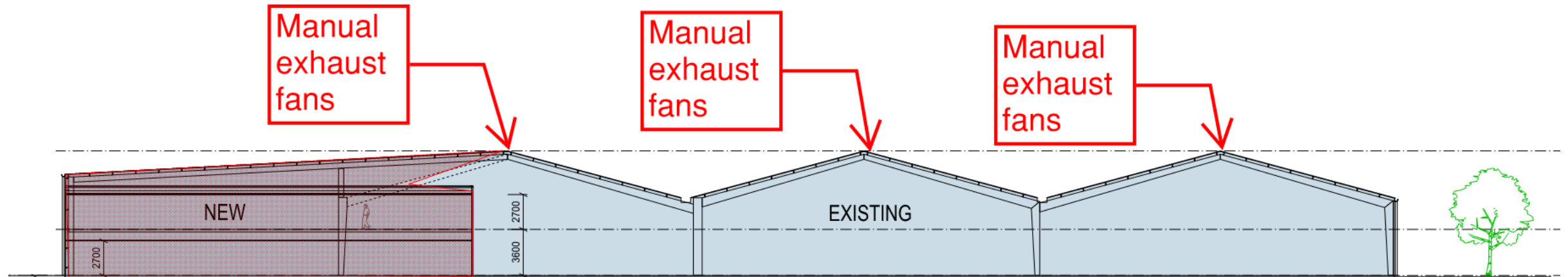
- Final exits distributed around the perimeter of the buildings, final locations to suit internal plant arrangements and external hydrant design
- Performance Solution to address extended travel to exits through:
  - Building height acts as smoke reservoir
  - Low fuel load and fire size resulting in low smoke production
  - Low occupant populations
  - Occupant warning initiated by thermal fire detection suitable for industrial applications





# Smoke Hazard Management

- The Production Building at approx. 25,000 m<sup>2</sup> area and 180,000 m<sup>3</sup> volume is prescriptively required to be provided with an automatic smoke exhaust system.
- With the low fuel load presented by the activities (manufacturer of kiln fire clay bricks) a full smoke exhaust system is not considered necessary.
- In lieu of a smoke exhaust system, a manually operated system of smoke clearance fans shall be provided to assist the brigade in post fire building ventilation.



**Production Building - Section**

# Fire Safety Systems

FIRE SAFETY MEASURE	DtS REQUIREMENT	PROPOSED DESIGN / PERFORMANCE SOLUTION
Fire hydrants	BCA E1.3, AS2419.1:2005, including the ring main requirements for large isolated buildings	<ul style="list-style-type: none"> <li>As per DtS requirements and where internal hydrants are required, FRNSW progressive coverage required (50m / 25m) to be incorporated</li> </ul>
Fire hose reels	BCA E1.5, AS2441:2005	To be provided
Fire / Smoke Detection	Production Building: AS1670.1:2015 for activation of smoke exhaust system	<ul style="list-style-type: none"> <li>Industrial “fit for purpose” thermal detection provided throughout both buildings to interface with occupant warning system</li> </ul>
Portable fire extinguishers	BCA E1.6, AS2444:2001	To be provided
Fire Control Centre	BCA E1.8, Specification E1.8	<ul style="list-style-type: none"> <li>To be provided within the existing office</li> </ul>

# Fire Safety Systems

FIRE SAFETY MEASURE	DtS REQUIREMENT	PROPOSED DESIGN / PERFORMANCE SOLUTION
Building occupant warning system	Shall be provided in conjunction with any required AS 1670.1:2015 fire alarm system or AS 2118.1:2016 fire sprinkler system.	An amplified sound system as per AS 1670.1:2015 Clause 3.22, activated by a thermal fire detection system
Smoke Hazard Management	Production Building: Automatic smoke exhaust in accordance with BCA Spec E2.2b	Production Building: Manually operated smoke clearance fan in lieu of smoke exhaust
Exit signage	AS2293.1:2005	To be provided
Emergency lighting	AS2293.1:2005	To be provided
Fire sprinklers	Production building: AS2118.1:2016 Fire sprinklers	No fire sprinkler system provided





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