CCA Preform Injection Moulding Plant
9 Rousell Road, Eastern Creek, NSW

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Fire Safety Strategy
CCA Preform Injection Moulding Plant
9 Rousell Road, Eastern Creek, NSW

razzi + weir FIRE SAFETY ENGINEERS

Report Details

Project: CCA Preform Injection Moulding Plant, 9 Rousell Road, Eastern Creek, NSW

Document: Fire Safety Strategy

Report No.: s100649_FSS_03

Report Revision History

REV	DATE ISSUED	COMMENT	PREPARED BY	REVIEWED BY	VERIFIED BY
01	11/08/10	Draft Issue for comment	**Adrian de Booy** BTech(Mechanical)	**Roderic Jones** MEng (Aerospace) AIFireE MIEAust	**Sandro Razzi** Accredited Fire Engineer BPB 0501 MIEAust CPEng 2180287 (Fire Safety)
02	16/09/10	Final Issue	**Adrian de Booy** BTech(Mechanical)	**Roderic Jones** MEng (Aerospace) AIFireE MIEAust	**Sandro Razzi** Accredited Fire Engineer BPB 0501 MIEAust CPEng 2180287 (Fire Safety)
03	24/11/10	Final issue with revision due to design changes	**Adrian de Booy** BTech(Mechanical)	**Roderic Jones** MEng (Aerospace) AIFireE MIEAust	**Sandro Razzi** Accredited Fire Engineer BPB 0501 MIEAust CPEng 2180287 (Fire Safety)

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1 INTRODUCTION

1.1 OVERVIEW

This Fire Safety Strategy has been undertaken to nominate proposed Alternative Solutions for assessing compliance with the nominated performance requirements of the BCA [1] in accordance with the methodologies defined in the IFEG [2].

In order to develop and assess the nominated non-compliances the following flowchart process is to be adopted.

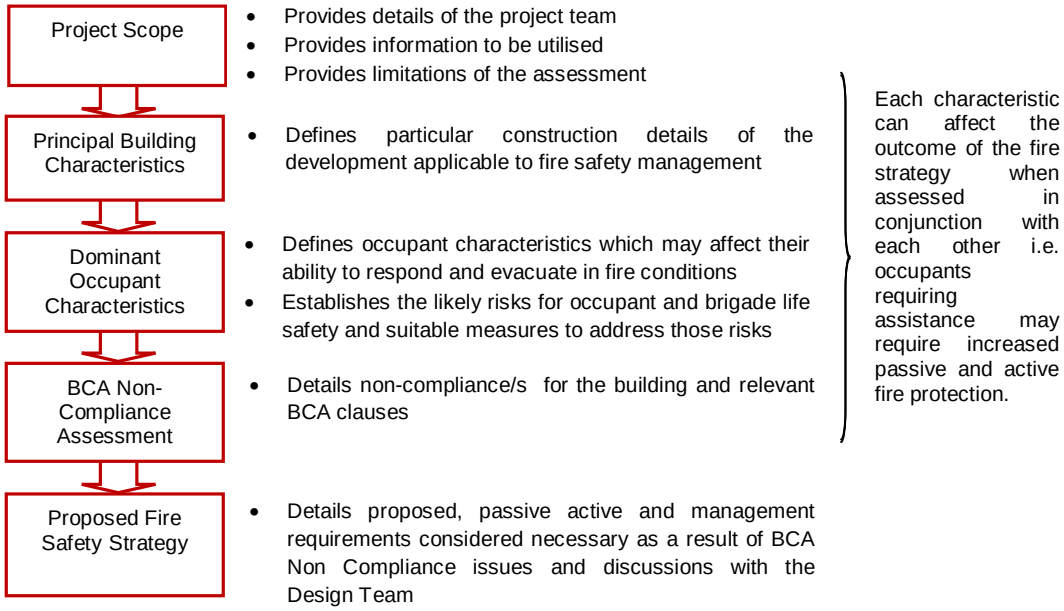


Figure 1-1: Fire Safety Strategy Process

The scope of the Fire Safety Strategy is to detail the nominated non-complying BCA DtS provisions with the performance requirements of the BCA and provide methodologies for establishing a workable and safe Fire Safety Strategy through a trial design.

1.2 FIRE SAFETY OBJECTIVES

The objective of a Fire Engineering Assessment is to develop a Fire Safety System, which satisfies the performance requirements of the BCA whilst maintaining an acceptable level of life safety, protection of adjacent property and adequate provisions for Fire Brigade intervention. At a community level, fire safety objectives are met if the relevant legislation and regulations are complied with. As stated in the BCA, “A Building Solution will comply with the BCA if it satisfies the Performance Requirements”. In addition to this certain non-regulatory objectives exist as detailed below.

1.2.1 Building regulatory objectives

The following items are a summary of the fire and life safety objectives of the BCA:

- **Life safety of occupants -** the occupants must be able to leave the building (or remain in a safe refuge) without being subject to hazardous or untenable conditions. The objective of the Fire Engineering Assessment is to demonstrate that the proposed building design and fire safety systems would minimise the risk of exposing building occupants to hazardous or untenable conditions in an event of a fire.
- **Life safety of fire fighters -** fire fighters must be given a reasonable time to rescue any remaining occupants before hazardous conditions or building collapse occurs. The objective of the Fire Engineering Assessment is to demonstrate that the proposed building design and fire

safety systems would facilitate fire brigade intervention and minimise the risk of exposing fire fighters to hazardous or untenable conditions in an event of a fire.

- **Protection of adjoining buildings** - structures must not collapse onto adjacent property and fire spread by radiation should not occur. The objective of the Fire Engineering Assessment is to demonstrate that the proposed building design and fire safety systems would minimise the risk of fire spreading from one building to another.

1.2.2 Fire Brigade objectives

The overall philosophical Fire Brigade objective throughout Australia is to protect life, property and the environment from fire according to the Fire Brigade Intervention Model (FBIM) [3] as per the Fire Services State and Territory Acts and Regulations.

Over and above the requirements of the BCA, the Fire Brigade has functions with regard to property and environmental protection and considerations regarding occupational health and safety for its employees.

1.2.3 Non-prescribed objectives

Fire Engineering has an overarching benefit to many facets of the built environment where non-prescribed objectives can have an influence on the Fire Safety Strategy adopted. Although not assessed within, the following can be considered if requested.

- **Business continuity -** will the loss of a particular facility due to fire / smoke damage result in excessive financial impact on the client? For example, is the facility critical to business continuity?
- **Public perception -** should a fire occur within the facility is there likely to be questionable public perception about the safety and operation of the facility?
- **Environmental protection –** fires of excessive sizes can have significant effects on the environment which may require a detailed risk assessment to minimise such outcomes.
- **Heritage salvation –** buildings can have a heritage value for both cultural and educational purposes which can be destroyed by insufficient fire protection.
- **Risk mitigation / insurance limitations -** are there specific limitations on insurance with respect to risk mitigation and fire safety design? i.e. Does the relevant insurer have concerns with respect to open atriums through the building?
- **Future proofing (isolation of systems) -** what flexibility is required in the overall design to allow for future development or changes in building layout?
- **OHS requirements -** buildings may have specific fire safety requirements pertaining to OHS requirements.

1.3 REGULATORY FRAMEWORK OF THE FIRE ENGINEERING ASSESSMENT

1.3.1 Building Code of Australia

One of the goals of the BCA is the achievement and maintenance of acceptable standards of safety from fire for the benefit of the community. This goal extends no further than is necessary in the public interest and is considered to be cost effective and not needlessly onerous in its application.

Section A0.5 of the BCA [1] outlines how compliance with the Performance Requirements can be achieved. These are as follows:

(a) complying with the Deemed-to-Satisfy Provisions; or

(b) formulating an Alternative Solution which –

  (i) complies with the Performance Requirements; or

  (ii) is shown to be at least equivalent to the Deemed-to-Satisfy Provisions or

(c) a combination of (a) and (b).

Section A0.9 of the BCA provides several different methods for assessing that an Alternate Solution complies with the Performance Requirements. These methods are summarised as follows:

(a) Evidence to support that the use of a material, form of construction or design meets a Performance Requirement or a Deemed-to-Satisfy Provision.

(b) Verification Methods such as:

  (i) the Verifications Methods in the BCA; or

  (ii) such other Verification Methods as the appropriate authority accepts for determining compliance with the Performance Requirements.

(c) Comparison with the Deemed-to-Satisfy Provisions.

(d) Expert Judgment.

Section A0.10 of the BCA provides methods for complying with provisions A1.5 (to comply with Sections A to J of the BCA inclusive). The following method must be used to determine the Performance Requirements relevant to the Alternative Solution: These methods are summarised as follows:

(a) Identify the relevant Deemed-to-Satisfy Provision of each Section or Part that is to be the subject of the Alternative Solution.

(b) Identify the Performance Requirements from the same Section or Part that are relevant to the identified Deemed-to-Satisfy Provisions.

(c) Identify Performance Requirements from the other Sections and Parts that are relevant to any aspects of the Alternative Solution proposed or that are affected by the application of the Deemed-to-Satisfy Provisions that are the subject of the Alternative Solution.

1.3.2 International Fire Engineering Guidelines

The IFEG [2] document has been developed for use in fire safety design and assessment of buildings and reflects world's best practice. The document is intended to provide guidance for fire engineers as they work to develop and access strategies that provide acceptable levels of safety.

The document is particularly useful in providing guidance in the design and assessment of Alternative Solutions against the Performance Requirements of the BCA. The prescribed methodology set out in the IFEG has been generally adopted in the Fire Engineering Brief.

2 PROJECT SCOPE

2.1 PROJECT SCOPE

The Coca Cola Amatil (CCA) site at 9 Rousell Road, Eastern Creek, NSW currently houses an existing pick operation and future plans will add a cold store and a high bay storage area. The subject of the current scope of works is a pre-form Injection Moulding Plant in the South-East corner of the site to provide PET bottle blanks for transport to other CCA sites in Australia and Asia. As a warehouse/manufacturing facility the distance of travel to the nearest alternative exit must be no greater than 40m, which is not provided for in this case. The building will be classified as Large Isolated and therefore is required to have fire brigade perimeter access. The vehicle access arrangements are not fully compliant in this case

2.2 RELEVANT STAKEHOLDERS

This Fire Safety Strategy has been developed collaboratively with the relevant stakeholders as identified below:

Table 2-1: Relevant Stakeholders

ROLE	NAME	ORGANISATION
Project Manager	Stewart Johnson	Goodman
Principal Certifying Authority	Dean Goldsmith	Blackett, Maguire + Goldsmith
Fire Safety Consultant	Adrian de Booy	RAWFire Safety Engineering
Fire Safety Engineers	Sandro Razzi	RAWFire Safety Engineering

It should be noted that at times some parties may have a vested interest in the outcome of the Fire Engineering assessment. Such parties can include local fire brigades, insurers, EPA, project control groups, end users and community representatives. Although not always a legislative requirement, the design team should give due consideration to their inclusion in the Fire Engineering process. Where not required by legislation it is the client's decision to involve such parties, especially local fire brigade, to ensure a transparent and adequate fire safety solution for all. Where we are not notified of the inclusion of such parties it is assumed the client / representative has given due consideration to the above.

2.3 SOURCES OF INFORMATION

The following sources of information have been provided by the design team:

- BCA Assessment Report (revision 0, dated 16/08/2010) provided by Dean Goldsmith of Blackett Maguire + Goldsmith.
- Architectural Plans provided by Stewart Johnson of Goodman as indicated in Table 2-2 below.

Table 2-2: Drawings

DRAWING NO.	DESCRIPTION	ISSUE	DATE
HKCCA10	Option 6	E	24 June 2010
M7 CCA PT SK07	Site Setout	D	5 July 2010
M7 CCA PT SK08	Site Plan	C	2 June 2010
SK02	Master Site Plan	A	22 July 2010

DRAWING NO.	DESCRIPTION	ISSUE	DATE
SK03	Level 1 Floor Plan	C	15 July 2010
SK04	Sections	B	17 July 2010
SK05	Elevations	A	17 July 2010
SK06	Level 2 Floor Plan	B	26 July 2010
SK07	Roof Plan	A	23 July 2010
SK08	Office and Amenities Level 1 and 2 Plans	A	02 August 2010
-	Unnamed sketch – stage 1 and 2 areas	-	05 August 2010
SK07	Site Setout	E	08 September 2010
A18	12.5m Large Rigid Vehicle Swept Paths	-	23 July 2010
DA 01	Approved Site Plan With Proposed PET Facility	B	03 November 2010
DA 02	Modifications to Approved Site Plan	B	03 November 2010
DA 03	Proposed PET Facility Site Plan	C	03 November 2010
DA 04	Proposed PET Facility Level 1 Floor Plan	C	03 November 2010
DA 05	Proposed PET Facility Level 2 Floor Plan	C	03 November 2010
DA 06	Proposed PET Facility Roof Plan	B	03 November 2010
DA 07	Proposed PET Facility Stage 1 Elevations	C	03 November 2010
DA 08	Proposed PET Facility Stage 2 Elevations	C	03 November 2010
DA 09	Proposed PET Facility Sections	C	03 November 2010
DA 10	Proposed PET Office and Amenities Level 1 and 2 Plans	C	03 November 2010

2.4 LIMITATIONS AND ASSUMPTIONS

In this instance the Fire Engineering Strategy is developed based on applicable limitations and assumptions for the development which are listed as follows:

- The report is specifically limited to the project described in Section 2.1.
- The report is based on the information provided by the team as listed above in Section 2.3.
- Building and occupant characteristics are as per Section 3 and 4 respectively of this report. Variations to these assumptions may affect the Fire Engineering Strategy and therefore they should be reviewed by a suitably qualified Fire Engineer should they differ.
- The report does not provide guidance in respect of areas, which are used for bulk storage, processing of flammable liquids, explosive materials, multiple fire ignitions or sabotage of fire safety systems.
- The development complies with the DtS provisions of the BCA [1] with all aspects unless otherwise specifically stated in this report. Where not specifically mentioned, the design is expected to meet the BCA DtS requirements of all relevant codes and legislation at the time of construction and / or at the time of issue of this report.
- The assessment is limited to the objectives of the BCA and does not consider property damage such as building and contents damage caused by fire, potential increased insurance liability and loss of business continuity.
- Malicious acts or arson with respect to fire ignition and safety systems are limited in nature and are outside the objectives of the BCA. Such acts can potentially overwhelm fire safety systems and therefore further strategies such as security, housekeeping and management procedures may better mitigate such risks.
- This report is prepared in good faith and with due care for information purposes only, and should not be relied upon as providing any warranty or guarantee that ignition or a fire will not occur.
- The Fire Engineering Strategy is only applicable to the staged handover as defined herein as stages 1 and 2. This report is not suitable for any other staged handover unless approved.
- Where parties nominated in Section 2.2 have not been consulted or legislatively are not required to be, this report does not take into account, nor warrant, that fire safety requirements specific to their needs have been complied with.

3 PRINCIPAL BUILDING CHARACTERISTICS

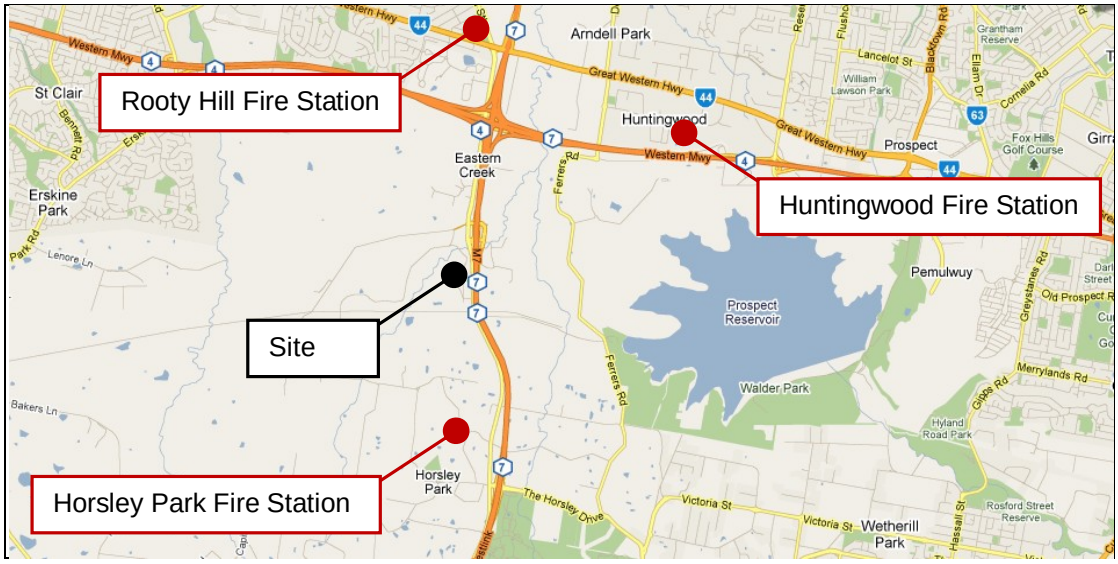
3.1 OVERVIEW

Principal Building Characteristics

Building characteristics are assessed as part of the Fire Engineering Review due the following:

1. The location can affect the time for fire brigade intervention and potential external fire exposure issues.
2. The structure will impact on the ability to resist a developing fire and support condition to allow occupants to escape the building and the fire brigade to undertake fire fighting to the degree necessary.
3. The floor area determines the potential fire size and area required to be evacuated in the event of a fire.
4. BCA details such as Type of Construction, Class and Height will dictate passive and active fire safety systems.

Figure 3-1: Site Location



The site is located at 9 Rousell Road, Eastern Creek, NSW, close to the M7 motorway. The area is a growing industrial hub with good access to freeways and only industrial traffic on the roads of the industrial estates. The travel route to the site for fire brigade appliances will be more constrained by the streets around the fire stations than the highway or industrial estate roads. The two nearest fire stations are within 5km at Rooty Hill and Horsley Park while a permanently staffed station is located approximately 7km away at Huntingwood.

The site currently has a pick operations building and plans for a future high bay storage building. The building that is the subject of this report is in the south-east corner and is used for the conversion of PET pellets to perform bottle blanks. Product is then stored for transport as small bottle blanks to other CCA sites where final formation occurs prior to bottling.

Figure 3-2: Site and subject building location indicating industrial surroundings.

Figure 3-3: Site Plan with PET pre-form facility in relation to other buildings.

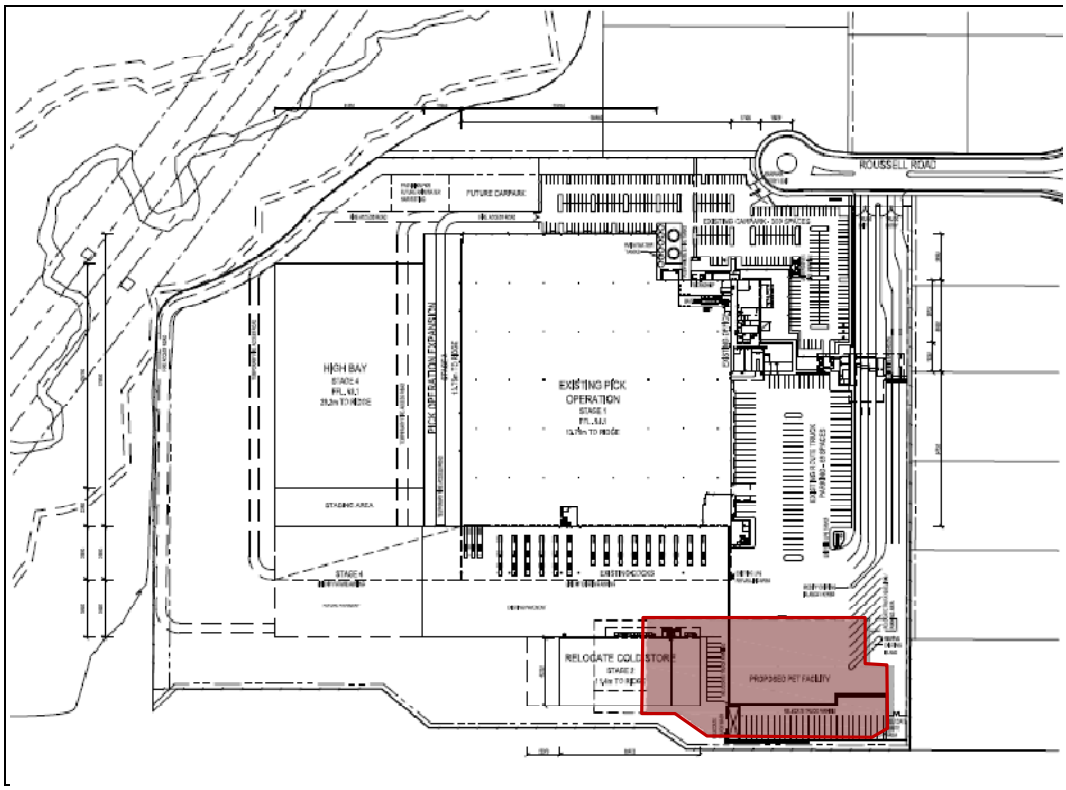


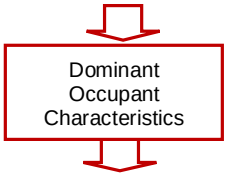
Table 3-1: Building Characteristics Assessment

CHARACTERISTIC	DESCRIPTION	RELEVANCE TO FIRE SAFETY STRATEGY
Location	Industrial Estate. 5km from two fire stations. >6m from property boundaries and >10m from other buildings on the same allotment.	The open space of the industrial site and ample trafficable areas for trucks will assist fire brigade operations. The arrival time of brigades will be short due to proximity to stations and the route via a major highway. The separation from other structures will inhibit fire spread between buildings.
Layout (Refer to APPENDIX A for floor plans)	Regular racking and plant layout simplifies egress paths.	While egress distances are extended, the long lines of sight in straight aisles will simplify way-finding, hazard identification and fire brigade searches.
Structure	Precast dado walls with cladding above. 5m to 9m ceilings to Production Hall and Storage Hall.	Inherent Fire resistance to concrete walls. High roof allows high degree of smoke accumulation before smoke concentrations become untenable.
Total Floor area	Stage 1 Approximately 9,200m^2 Stage 2 Approximately 1,800m^2. Total Approximately 11,000m^2	The floor area is used by the BCA to limit the fuel load and thereby limit the possible fire size. Large Isolated Building provisions adjust requirements to account for the greater fire size possible with greater area/volume.
Total Volume	Approximately 115,550m^3	As the volume exceeds 108,000m^3 and the roof height exceeds 12m, the large isolated building provisions and smoke hazard management provisions require sprinklers and a smoke exhaust system. Large isolated building provisions also require a perimeter vehicle access path. Variation to the smoke exhaust system will be rationalised by the provision of safe occupant evacuation conditions and the inclusion of the canopy in the volume despite the significant separation and ventilation of that part. A narrowed vehicle path of 4.5m will be rationalised by indicating adequate space for vehicle traffic and fire brigade operational requirements. Note that large isolated building requirements are triggered by the stage 2 extension.

CHARACTERISTIC	DESCRIPTION		RELEVANCE TO FIRE SAFETY STRATEGY
BCA Assessment	Classification	5/7b	The classification dictates fire resistance levels and occupant travel distances.
	Construction Type	C (large isolated building)	The fire resistance levels of Type C are low but complemented by the Large Isolated Building requirements.
	Rise in Storeys	1 (plus mezzanine and raised walkways)	Egress requires stairs. Structural support for the upper storey requires Fire Resistance Levels. Smoke hazard management must consider rising smoke to the upper levels.
	Effective Height	5m	No additional requirements are imposed by a 5m effective height. Aerial appliances can reach above the building height.

4 DOMINANT OCCUPANT CHARACTERISTICS

4.1 DOMINANT OCCUPANT CHARACTERISTIC ASSESSMENT



The occupant characteristics are assessed within the Fire Engineering Brief due to the following:

1. Population numbers can dictate the time required to evacuate the building and the required life safety systems to be provided due to evacuation times.
2. Physical and mental attributes affects the occupants capacity to respond to various fire cues and react accordingly.
3. Familiarity of occupants can affect the time taken to evacuate the building and subsequent active / passive requirements.

Table 4-1: Occupant Characteristics Assessment

CHARACTERISTIC	DESCRIPTION	RELEVANCE TO FIRE SAFETY STRATEGY
Population numbers	The plant operates 24 hours a day, 7 days a week, with a 4 shift rotation, each of 12 hours. The day shift will require 16 staff while the night shift will require only 4.	The low number of occupants will limit queuing and warden activity times.
Population location	Population will be distributed across the storage, manufacturing and administration parts of the building. Further detail will be required for final analysis.	Occupant distribution will likely place most occupants within the required distance of an exit. The opportunity for occupants to be more than 40m from an exit in some isolated areas must however be assessed.
Physical and mental attributes	Occupants are expected to be capable of identifying and responding to a fire alarm. Inhibitors to a rapid or effective response may be present due to mental or physical disability of varied degree, fatigue, medication, alcohol or other drugs. Occupants are expected to be capable of evacuation under their own power as the work performed on the ground floor and the access by stairs to the first floor indicates a level of mobility. The use of the building does not increase the likelihood or number of occupants with disabilities inhibiting efficient egress, as would a hospital, aged care facility or the like.	Occupant travel speeds will incorporate the slowest expected travel speed based on research data from studies into the movement of occupants both able bodied and with varied disabilities.

CHARACTERISTIC	DESCRIPTION	RELEVANCE TO FIRE SAFETY STRATEGY
Familiarity with the building	Occupants are expected to become familiar with their working environment through regular use and therefore knowledge of the egress paths and first aid fire fighting equipment is expected. Through regular planning of fire drills and testing of alarms, occupants will become familiar with the sound of the alarms used to indicate fire and the need for evacuation.	Evacuation analysis will consider familiarity in applying appropriate pre-movement times for occupants reacting to the alarm. Evacuation will consider occupants travelling direct to an exit as appropriate to their familiarity with the building.
Emergency training	Occupants will be inducted before working on the site and this induction is to include identification of fire exits and first aid fire fighting equipment available. Regular fire drills are to be conducted. Production staff are to be trained in the particular fire hazards and first aid fire fighting requirements for the particular product (PET/HDPE) and processes (pellet drying/melting) on site.	It is expected that implementing skills learnt from emergency training will reduce the likelihood of many fires becoming significant however assessment must consider the possibility of fires of a size beyond occupant control.
Pre-movement time	Where occupants are relying on the Building Occupant Warning System as the only cue to a fire event, pre-movement times can be expected to be 180 seconds in accordance with research by Proulx [4]. Where a secondary cue is present, such as widespread smoke or direct communication from other evacuating occupants, the pre-movement time may be reduced.	Pre-movement time can account for one third or more of the required egress time. Familiarity, occupant warning and communication keeps this time low.
Travel speed	An occupant travel speed of 0.8m/s will be applied to evacuation calculations and is drawn from the research of Proulx [4] which indicates this is the average horizontal travel speed for occupants with a locomotive disability.	Travel speed multiplied by travel distance (one of the issues under assessment) accounts for a large part of the total required egress time. The value applied is conservative to provide an assurance of the provision of adequate time for safe egress.

5 BCA NON-COMPLIANCE ASSESSMENT

5.1 OVERVIEW

In this instance the BCA non-compliances have been formulated based on the regulatory review as provided by the project building surveyor and / or design team. Where not listed herein the building is required to achieve compliance with relevant DtS provisions and / or Standards approved at the time of consideration.

The following table lists the departures from the DtS provisions of the BCA for the proposed building and the analysis methodology proposed for the Fire Engineering assessment, which is to be generally in accordance with the IFEG [2].

Table 5-1: Summary of Alternative Solutions

BCA DTS PROVISIONS AND RELEVANT PERFORMANCE CLAUSE	RELEVANT BCA PERFORMANCE REQUIREMENTS NON-COMPLIANCE WITH BCA DTS PROVISIONS, PROPOSED ALTERNATIVE SOLUTION AND ASESSMENT METHODOLOGY	NON-COMPLIANCE LOCATION
D1.4 – Exit travel distances D1.5 – Distance between alternative exits DP4 EP2.2	The BCA requires all parts on the floor to be within 40m travel distance of the nearest exit where alternatives are available. Distances of travel in the proposed building are up to 45m from the nearest exit in the warehouse area and 52m in the production area. The BCA limits the distance between alternative exits to 60m. In the production area the distance between exits is up to 85m while from the mezzanine plant room and warehouse it reaches 75m. Note that the distances are calculated from the current layout and any change may result in greater distances. The Alternative Solution will address the above non-compliances by determination of the required safe egress time with extended travel and comparison to the available safe egress time, determined through fire modeling. Acceptance criteria will be set for tenability levels of temperature, toxicity and visibility and a margin of safety in ASET/RSET analysis will be applied as well as redundancy and sensitivity studies. The assessment will be conducted against Performance Requirements DP4 and EP2.2.	Locations within the production hall and near the box erector within the storage hall are greater than 40m from the nearest exit.

BCA DTS PROVISIONS AND RELEVANT PERFORMANCE CLAUSE	RELEVANT BCA PERFORMANCE REQUIREMENTS NON-COMPLIANCE WITH BCA DTS PROVISIONS, PROPOSED ALTERNATIVE SOLUTION AND ASESSMENT METHODOLOGY	NON-COMPLIANCE LOCATION
C2.3 – Large isolated buildings Inter alia C2.4 – Requirements for open spaces and vehicular access CP9	As a Large Isolated Building the building is required to be provided with perimeter vehicular access permitting continuous forward travel of emergency vehicles around the entire building, with a minimum unobstructed width of 6m. The proposed building has a vehicular path around its perimeter however it is only 4.5m wide in part. During staged construction, the path may be more than 18m from the ridgeline of the storage hall which forms the temporary facade of Stage 1 and the construction of stage 2 may inhibit the path or delay completion of the path. The Alternative Solution will seek to permit the path with the dimensions as proposed and will rely on consultation with the NSWFB for expert judgement on the appropriateness of the path provided, specifically with regard to operational procedures and accessibility for vehicles as would be required in this particular case. The Alternative Solution will seek to permit a management plan for the path between completion of stage 1 and completion of stage 2.This may require the location of exits and hydrants in strategic positions in the stage 1 part of the storage hall so that fire brigade access routes to that part are appropriate at either stage 1 or stage 2 and access across stage 2 construction areas is not required. The assessment methodology will involve qualitative assessment of the path, its suitability for general appliances and the limitations of its use by aerial appliances and will be reliant on fire brigade consultation and approval. The turning arc at the south-east corner may contradict the NSWFB policy on vehicular access paths. The South-East corner of the building is bevelled to allow space for trucks to turn the corner around the building however the inner and outer radii of the path are currently indicated as being shorter than NSWFB Policy 4 requires. While not a BCA non-compliance, this is relevant to the vehicle access path issue and has been addressed by providing adequate space for the movement of fire vehicles, calculated by traffic software.	The part of the path concerned is on the South and East facades of the building.
E2.2 – General requirements EP2.2	As a Large Isolated Building the building is required to be provided with smoke hazard management systems complying with Clause E2.2. The selection of systems is controlled by the compartment volume. As the building exceeds 108,000m^3, it is required to have a smoke exhaust system in accordance with BCA Specification E2.2b. This would require an exhaust rate of 20m^3/s in ground floor only smoke zones and 35m^3/s or more in smoke zones with higher floor levels. An alternative solution is proposed to reduce the requirements for exhaust to allow a post incident smoke clearance system with a capacity of one air change per hour for the smoke zone it	Throughout the subject building

BCA DTS PROVISIONS AND RELEVANT PERFORMANCE CLAUSE	RELEVANT BCA PERFORMANCE REQUIREMENTS NON-COMPLIANCE WITH BCA DTS PROVISIONS, PROPOSED ALTERNATIVE SOLUTION AND ASESSMENT METHODOLOGY	NON-COMPLIANCE LOCATION
	serves. The assessment must consider the production and retention of smoke and through quantitative fire, evacuation and fire brigade intervention modelling, determine whether the solution provides adequate levels of safety for occupants and for the fire brigade activities.	
E1.3 – Fire Hydrants EP1.3	Fire hydrants located under an awning are deemed to be internal. Internal hydrants are required to provide coverage to the building with only one length of hose. External Hydrants are permitted two lengths of hose. The proposed hydrants under the northern awning will not be able to provide complete coverage with a single hose length but would be sufficient with two hose lengths. It is proposed to consider the canopy hydrants as external, providing all necessary protection and system requirements as applicable to external hydrants excepting that a narrow and high level awning exists above. Signage will indicate to fire fighters that two lengths of hose are required. The assessment will consider the equivalent provisions applied to these hydrants and the minor risk the awning poses beyond a compliant external hydrant. The assessment will be qualitative and indicate fire brigade operation requirements and safety are met in accordance with Performance Requirement EP1.3.	Hydrant locations along the northern facade under the awning. Affecting internal areas throughout.

6 PROPOSED FIRE SAFETY STRATEGY

6.1 OVERVIEW

The Fire Safety Strategy dictates the preliminary requirements to achieve the required BCA objectives.

6.2 FIRE SAFETY STRATEGY

As a result of the identified building and occupant characteristics, fire safety objectives, identified fire hazards, BCA non-compliances the Fire Safety Strategy (Trial Design) has been formulated.

In this instance the Fire Engineering requirements are put forward as the trial concept design. These preliminary requirements are put forward to achieve the following:

- Provide possible passive / active fire safety systems which are reviewed via the assessment methodology contained herein.
- Provide sufficient redundancies that are commensurate with expected risks.

Where these recommendations are insufficient further requirements may be put forward in the Fire Engineering Brief or final Fire Engineering Report.

6.3 EGRESS PROVISIONS

6.3.1 Evacuation Strategy

Activation of any single smoke detector or sprinkler head shall evacuate all areas of the building. This is required as the building is a single large fire compartment. Dedicated fire wardens shall ensure that all staff have evacuated. Wardens should be appointed for specific sections of the building appropriate to the population and the normal distribution of staff. It is suggested that the storage hall, production hall and first floor should all be represented by an area warden to reduce the time taken for wardens to inspect their area. A single warden would have too great an area to cover.

6.3.2 Exit Travel Distances

There are areas within the Production Hall which are greater than 40m from the nearest exit (up to 50m).The Storage Hall (except a minor part near the box erector / Production Hall) and the first floor are provided with compliant travel distances. Exit travel distances are expected to be rationalised up to 52m by the Fire Engineering process.

6.3.3 Distance between Alternative Exits

The distance between alternative exits exceeds 60m in the production area. Distances up to 85m between exits are expected to be rationalised through the Fire Engineering process.

6.3.4 Emergency Lighting

Emergency lighting is to be provided throughout in accordance with BCA DtS Provisions E4.2 and E4.4 and AS 2293.1.

6.3.5 Exit Signage

Exit signage is to be provided throughout in accordance with the BCA DtS Provisions E4.5, E4.6 and E4.8 and AS 2293.1.

6.4 FIRE RESISTANCE

6.4.1 Elements of Structure

All building elements, materials and assemblies must meet the requirements of Type C construction for a Class 8 building.

6.4.2 Fire Hazard Properties

Fire Hazard properties of all building materials must comply with Clause C1.10 of the BCA.

6.5 SUPPRESSION, DETECTION & WARNING

6.5.1 Smoke Detection

As the building is over 108,000m^3 an AS1670.1 smoke detection system will be required as a part of the Alternative Solution to rationalise reduced smoke hazard management provisions.

6.5.2 Sprinkler Protection

An automatic fire sprinkler system is required to be fitted throughout in accordance with BCA DtS Provisions E1.5 and C2.3 and AS 2118.1.

Sprinkler systems may require commodity based design, for higher hazard fuel loads, process areas or high bay storage.

The system will be served by existing site infrastructure.

Where ESFR sprinklers are to be installed, it is proposed to meet NFPA13-2007 to match the infrastructure and systems provided to the existing building.

Existing pumps meet AS2941-2002 and not AS2941-2008 hence the water supply is to be retained in accordance with the codes applicable when it was constructed.

6.5.3 Building Occupant Warning System (BOWS)

A Building Occupant Warning System is required to be installed throughout in accordance with Specification E1.5 and in the case of smoke hazard management detection, in accordance with Clause 6 of Specification E2.2a. The BOWS is to be interfaced with all sprinkler systems and smoke or heat detection systems such that the activation of any sprinkler head or detector will initiate the Building Occupant Warning System.

6.5.4 Fire Brigade Notification

An automatic link shall be provided directly to an approved monitoring centre on activation of the sprinkler system or smoke control system.

6.6 SMOKE HAZARD MANAGEMENT SYSTEM

6.6.1 Smoke Control System

As the building is greater than 108,000m^3, an alternative solution will rationalise a reduction to the exhaust requirements. A post incident smoke clearance system is proposed with the following attributes:

- Fire rated fans and cabling designed to operate at 200°C for 30 minutes
- System capacity of one air change per hour for the smoke compartment served
- Manual controls at the FIP for fire brigade personnel use only.
- Make up air at low level (partly provided by manual opening of roller doors).

6.7 FIRST AID FIRE FIGHTING

6.7.1 Fire Hose Reels

Fire Hose Reels are to be installed in accordance with the provisions within the BCA (2010) and AS 2441.

6.7.2 Portable Fire Fighting Equipment

Portable fire extinguishers are to be provided throughout in accordance with BCA Table E1.6 and selected, located and distributed in accordance with AS 2444.

6.8 FIRE BRIGADE INTERVENTION

6.8.1 Perimeter Vehicle Access

The vehicle path around the building may be permitted by negotiation with the NSWFB to have a section of reduced width at 4.5m in lieu of 6m. The provision of an adequate turning radius at the south-east corner will be determined by traffic software appropriate to the dimensions of vehicles and not to the requirements of NSWFB Policy. The path may also be permitted to be discontinuous or greater than 18m from the building where Stage 2 inhibits use of part of the path and locates the temporary facade too far from the designated path, again subject to negotiation with the NSWFB. The path must in all other aspects comply with Clause C2.4(b) of the BCA.

6.8.2 Fire Indicator Panel

A fire indicator panel is required at the building's main entrance. If any other arrangement is to be provided, fire brigade approval should be sought.

6.8.3 Tactical Fire Plans

Tactical fire plans are to be provided for use by the fire brigade. These shall be floor plans with the location of the following clearly identified:

- Fire hydrants
- Fire hose reels and fire extinguishers
- Fire indicator and any other repeater panels
- Egress paths
- Control equipment
- Any significant hazards on site
- Identification of rendezvous point
- Sprinkler valve and fire pump rooms
- Isolation valves
- Booster and suction pumps
- The year of original installation and the date of the latest revision to the block plan
- Notice advising "in the event of a fire, ring '000' to ensure fire service response"
- Any other relevant information pertaining to fire brigade intervention.

6.8.4 Fire Hydrants

A fire hydrant system is required in accordance with BCA DtS Provision E1.3 and AS2419.1-2005. The fire hydrants and booster assembly hose connections must be fitted with Storz couplings which comply with AS 2419.1 – 2005. Storz couplings must be fitted with blank caps and be manufactured in accordance with AS 2419.2 – 1994. The hydrant system design may need to account for a compliant system at Stage 1 as well as at completion of Stage 2. The northern facade hydrants will be under an awning however by a Fire Engineered Alternative Solution, they will be treated as external hydrants, with all protections and provisions as appropriate to external hydrants and additional signage will indicate to fire fighters that the hydrants require two hose lengths to provide full internal coverage.

6.9 BUILDING MANAGEMENT PROCEDURES

The ongoing management of the building is as important to maintaining a high level of life safety as the provisions recommended during the design phase of the building.

6.9.1 Fire Precautions During Construction

The requirements of DTS Provision E1.9 of the BCA must be complied with for fire precautions during construction. Scaffolding, wire fencing, barricades and the like must not prevent fire brigade access for

vehicles or personnel to essential fire safety components (hydrants, boosters, FIP, etc.) or prevent fire brigade personnel from intervening in the event of a fire.

6.9.2 Maintenance of Fire Safety Equipment

The fire alarm system, sprinkler system, fire hydrants, hose reels, portable fire extinguishers, emergency lighting and all other proposed essential services shall be tested and maintained in accordance with the latest Australian Standards.

6.9.3 No Smoking Policy

A no-smoking policy shall be implemented and enforced through all internal areas of the building.

6.9.4 Hot Works Policy

A hot works policy should be put in place and rigorously enforced to ensure that all hot works, including thermoplastic drying and melting operations as well as building and plant maintenance such as grinding and welding, are managed to avoid the accidental ignition of fires.

6.9.5 Housekeeping

A Fire Risk Assessment (FRA) or similar method should be adopted upon occupation to determine high risk areas and processes and instigate appropriate control measures. The FRA should be undertaken periodically or upon major alterations to the building layout or fuel load distribution or to the occupancy demographic or distribution.

6.9.6 Fire Drills and General Fire Safety Training

Periodic fire drills must be conducted and with 4 shifts of 12 hours, consideration must be made to plan fire drills for all staff. Staff induction must include identification of fire exits and first aid fire fighting equipment. Basic fire fighting and product/process specific fire safety training should be provided to staff in the Perform Injection Moulding Plant.

6.9.7 Personal Emergency Evacuation Plan (PEEP)

A personal emergency evacuation plan shall be developed for staff with disabilities. This is a specific evacuation plan developed for those individuals who may take longer or require additional levels of assistance during an evacuation.

6.9.8 Evacuation Plan

An evacuation plan shall be developed in accordance with AS 3745-2002.

6.9.9 Assembly Area

An assembly area is to be designated in a suitably safe and open location.

6.9.10 Fire Safety Manual

A fire safety manual shall be developed to provide an overview of all fire safety procedures and systems within the building. The manual will also record false alarms, outcomes from fire drills and provide details of the ongoing maintenance and inspection procedures. The manual should be reviewed annually and a lessons learned exercise undertaken. Any conclusions drawn from this exercise should be implemented into the fire safety procedures.

6.9.11 Premises Security

Arson is a major cause of fires and malicious arson attacks may be well planned to overcome specific fire safety systems. The provision of adequate levels of security is a key parameter in reducing the number of malicious arson attacks in any premises.

6.10 COMMISSIONING REQUIREMENTS

6.10.1 Equipment testing

Periodic inspection, testing, and maintenance of all fire safety systems shall be implemented in accordance with regulatory requirements and AS 1851.

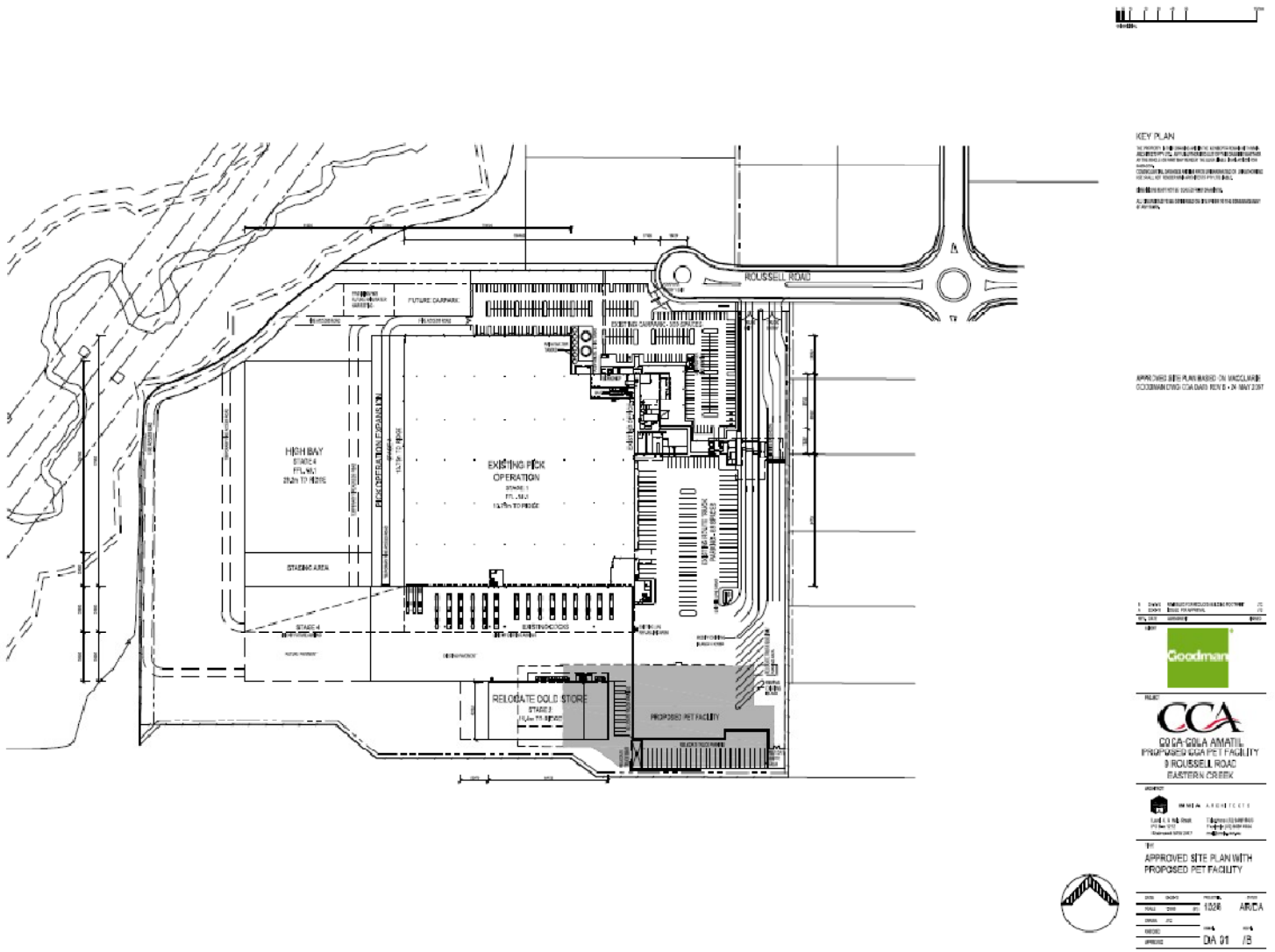
6.10.2 System maintenance

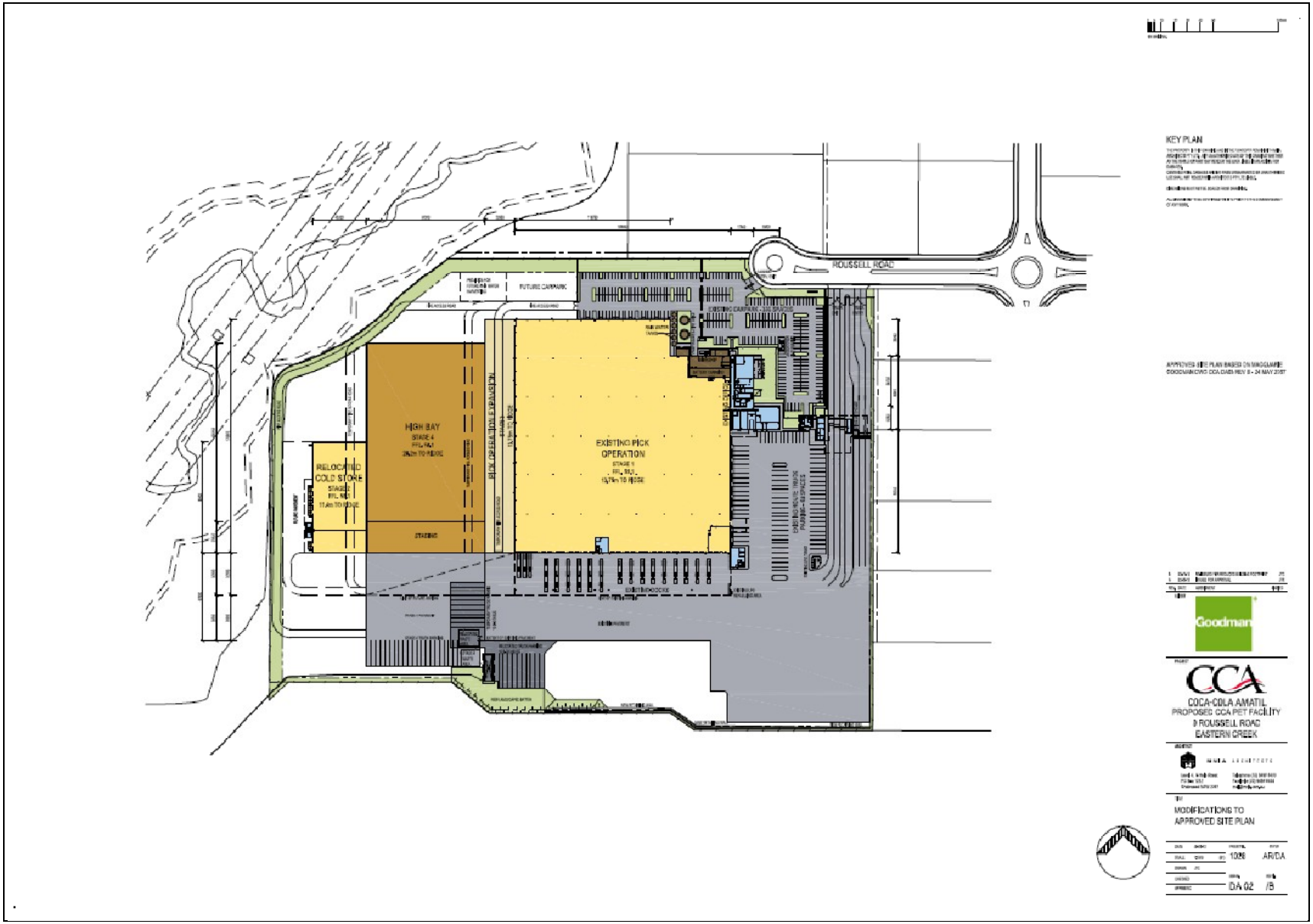
Under all circumstances, it is important to keep as much of the systems fully operational as is practical. Should any building works extend over a number of days, the system should be reinstated as far as practical at the end of each day.

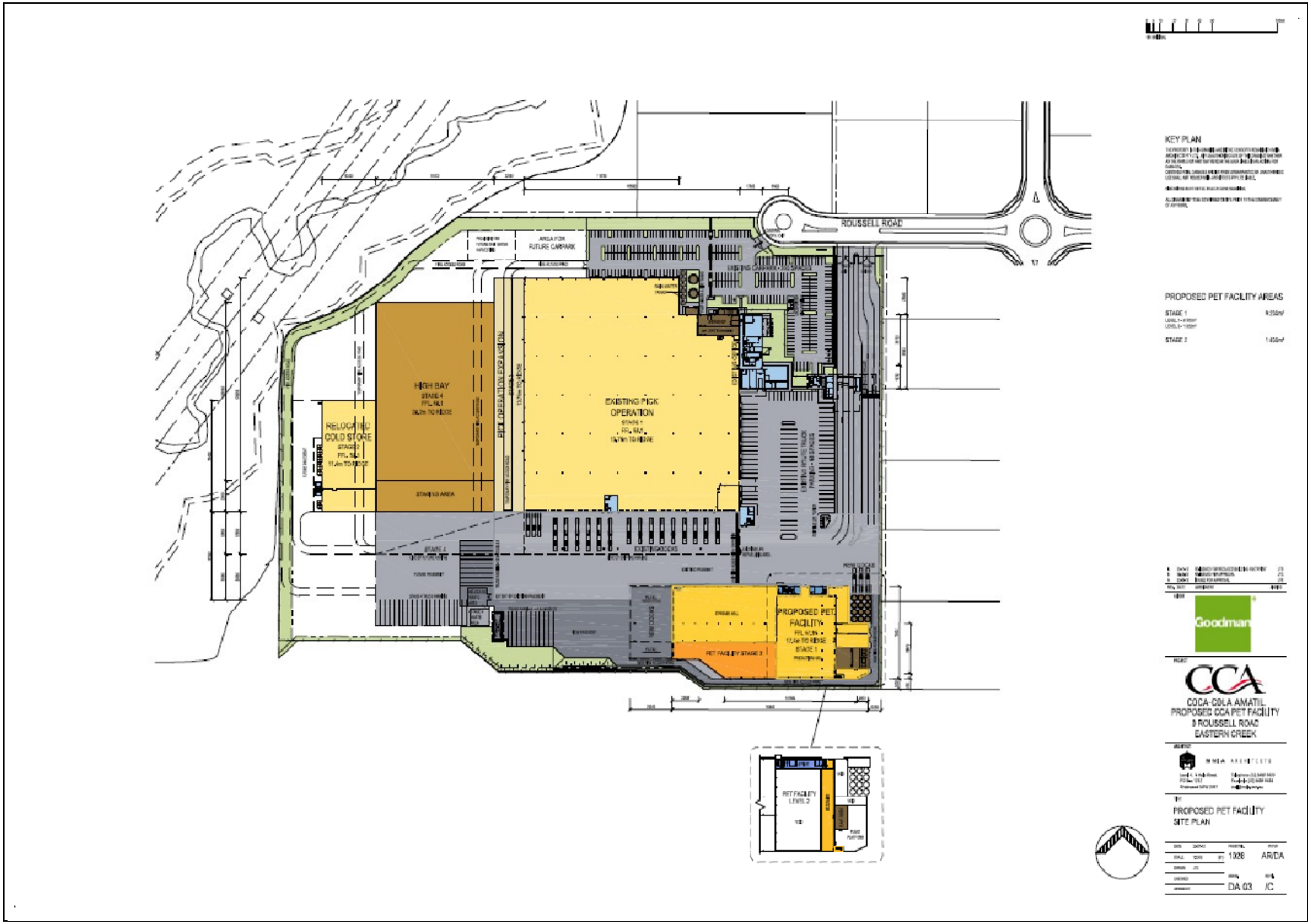
7 REFERENCES

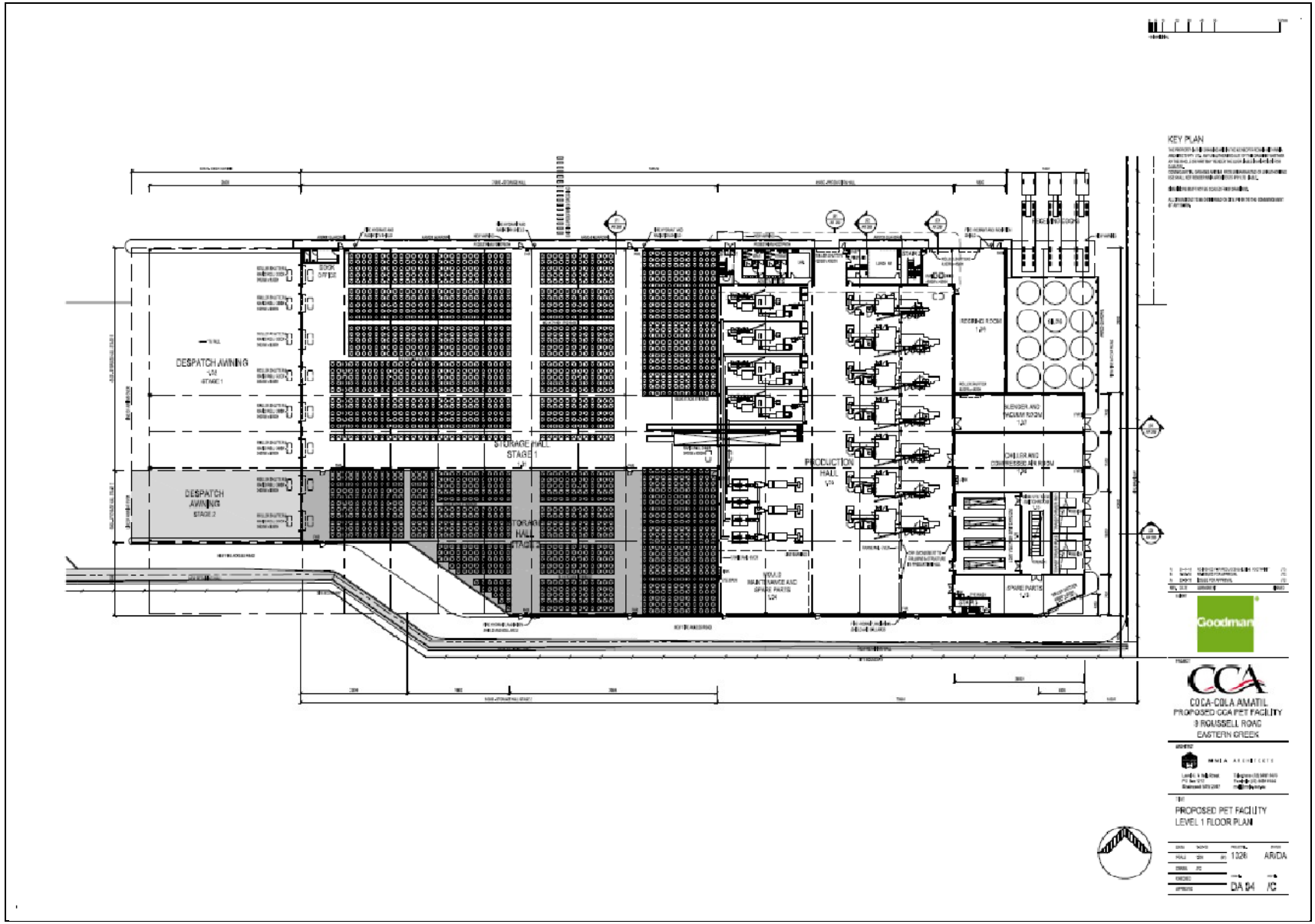
1. ABCB, “Building Code of Australia, Volume One”, CanPrint Communications, Canberra 2010.
2. ABCB, “International Fire Engineering Guidelines”, ABCB, Canberra, 2005.
3. Australasian Fire Authorities Council, ‘Fire Brigade Intervention Model V2.1’, November 1997.
4. Proulx, G. Movement of People: the evacuation timing. The SFPE Handbook of Fire Protection Engineering (3rd edition), DiNenno, P.J. (ed.) National Fire Protection Association, Quincy, MA 02269, 2002 pp. 3/342-366

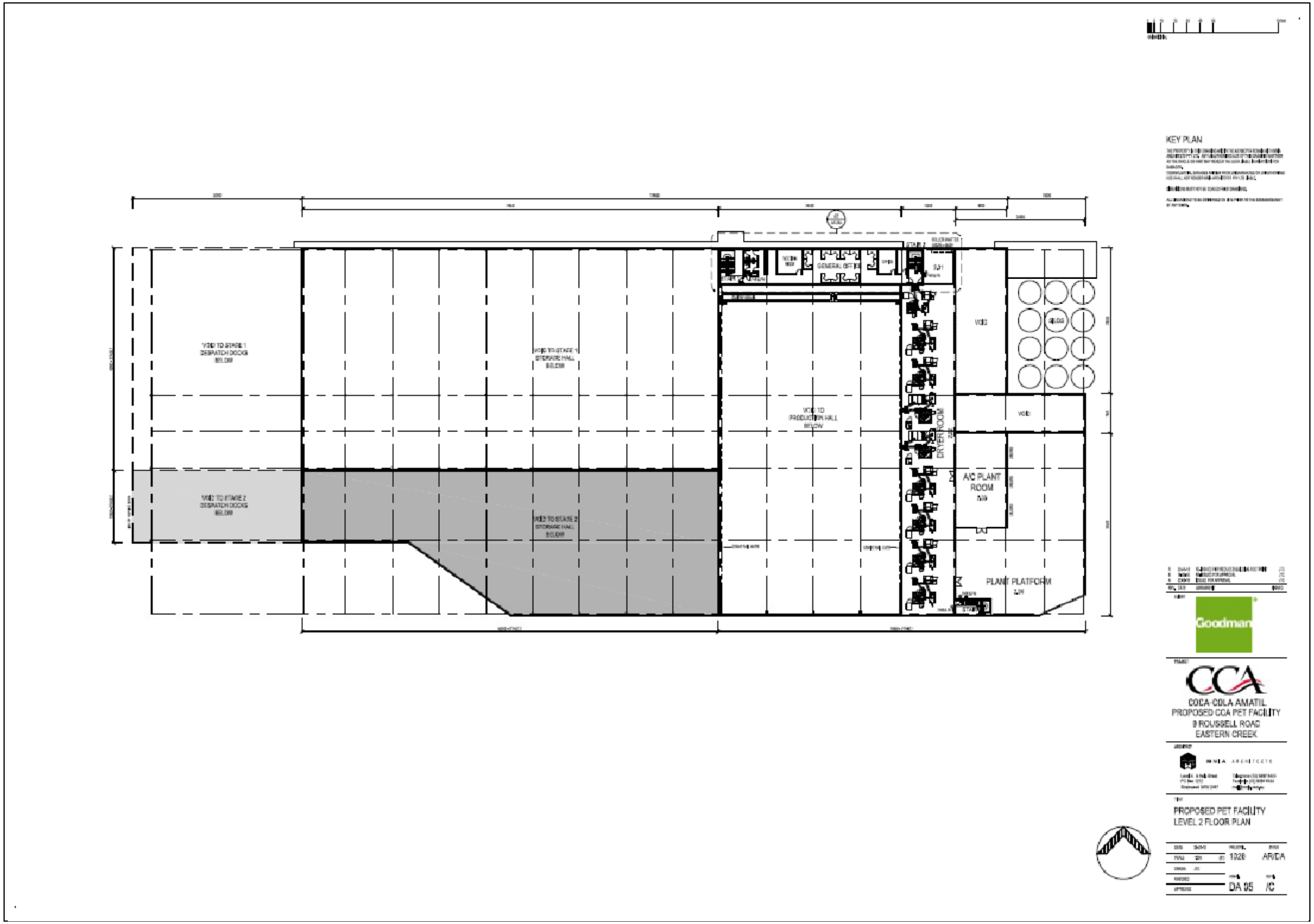
APPENDIX A BUILDING LAYOUT

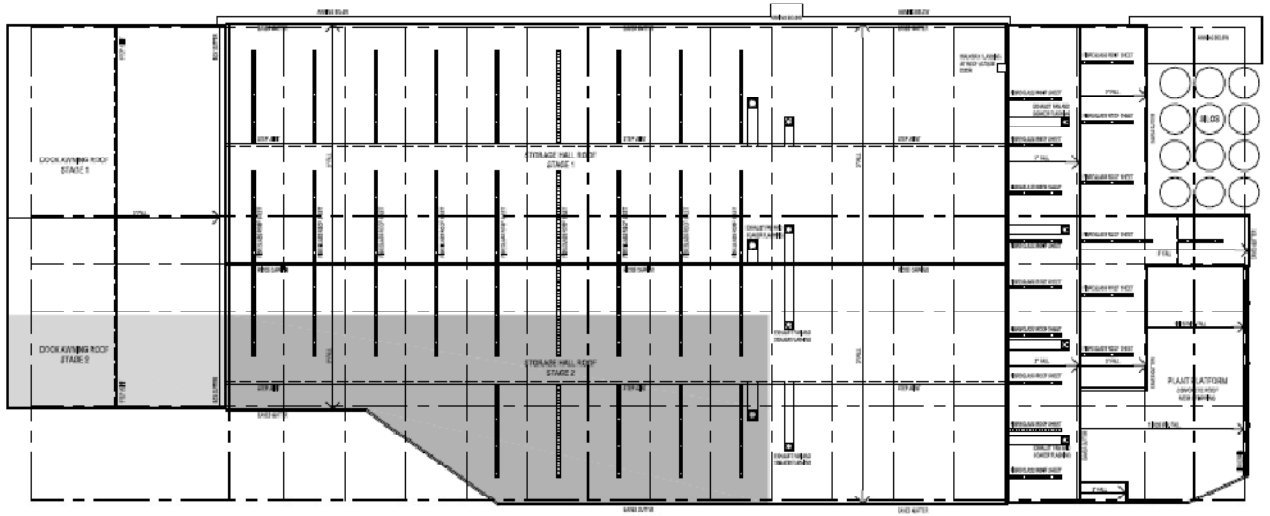



KEY PLAN
ROUSSELL ROAD
FUTURE CARPARK
HIGH BAY
STAGE 4
EXISTING PICK
OPERATION
RELOCATED
COLD STORE
Goodman
CCA
COCA-COLA AMATIL
PROPOSED CCA PET FACILITY
9 ROUSSELL ROAD
EASTERN CREEK
MODIFICATIONS TO
APPROVED SITE PLAN
1020
AR/DA
DA 02
/B


ROUSSELL ROAD
AREA FOR FUTURE CARPARK
EXISTING CARPARK - 150 SPACES
HIGH BAY
STAGE 4
RELOCATED COLD STORE
STAGE 3
EXISTING PET OPERATION
EXISTING PET FACILITY
EXISTING WAREHOUSE
PROPOSED PET FACILITY
PET FACILITY STAGE 2
PET FACILITY LEVEL 2
KEY PLAN
PROPOSED PET FACILITY AREAS
STAGE 1
STAGE 2
Goodman
CCA
COCA-COLA AMATIL
PROPOSED CCA PET FACILITY
9 ROUSSELL ROAD
EASTERN CREEK
PROPOSED PET FACILITY
SITE PLAN
1:500
AR/DA
DA.03
JC


KEY PLAN
DESPATCH AWNING
STAGE 1
DESPATCH AWNING
STAGE 2
STORAGE HALL
STAGE 1
PRODUCTION HALL
Goodman
CCA
COCA-COLA AMATIL
PROPOSED CCA PET FACILITY
9 ROUSSELL ROAD
EASTERN CREEK
PROPOSED PET FACILITY
LEVEL 1 FLOOR PLAN
1328
AR/DA
DA 04
/C


KEY PLAN
VOID TO STAGE 1 DESPATCH DOCKS BELOW
VOID TO STAGE 1 STORAGE HALL BELOW
VOID TO PRODUCTION HALL BELOW
VOID TO STAGE 2 DESPATCH DOCKS BELOW
VOID TO STAGE 2 STORAGE HALL BELOW
GENERAL OFFICE
DRYER ROOM
VOID
A/C PLANT ROOM
PLANT PLATFORM
Goodman
CCA
COCA-COLA AMATIL
PROPOSED CCA PET FACILITY
8 ROUSSELL ROAD
EASTERN CREEK
PROPOSED PET FACILITY
LEVEL 2 FLOOR PLAN
AR/DA
DA 05
/C



KEY PLAN

Goodman

CCA

COCA-COLA AMATIL
PROPOSED CCA PET FACILITY
9 ROUSSELL ROAD
EASTERN CREEK

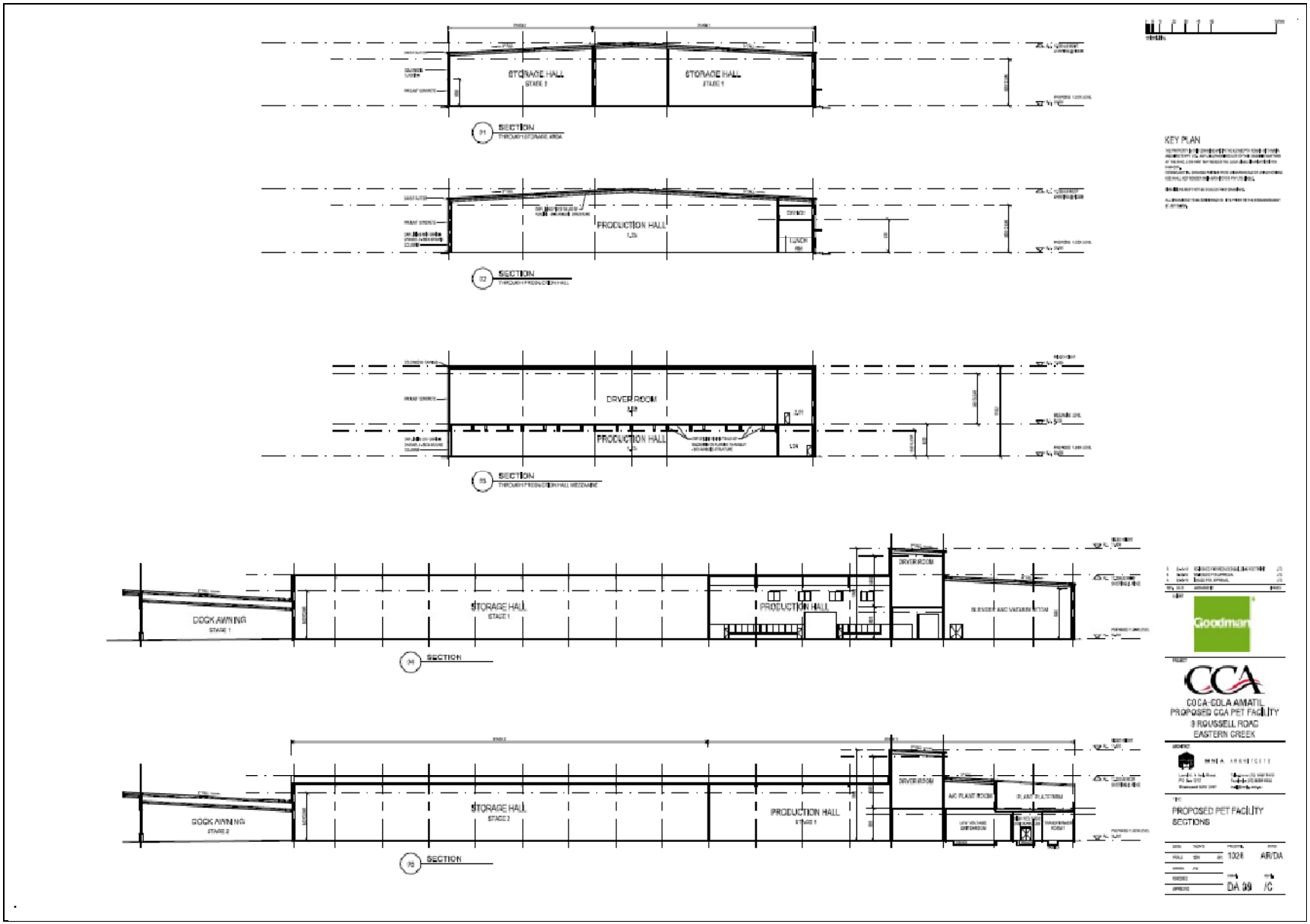
PROPOSED PET FACILITY
ROOF PLAN

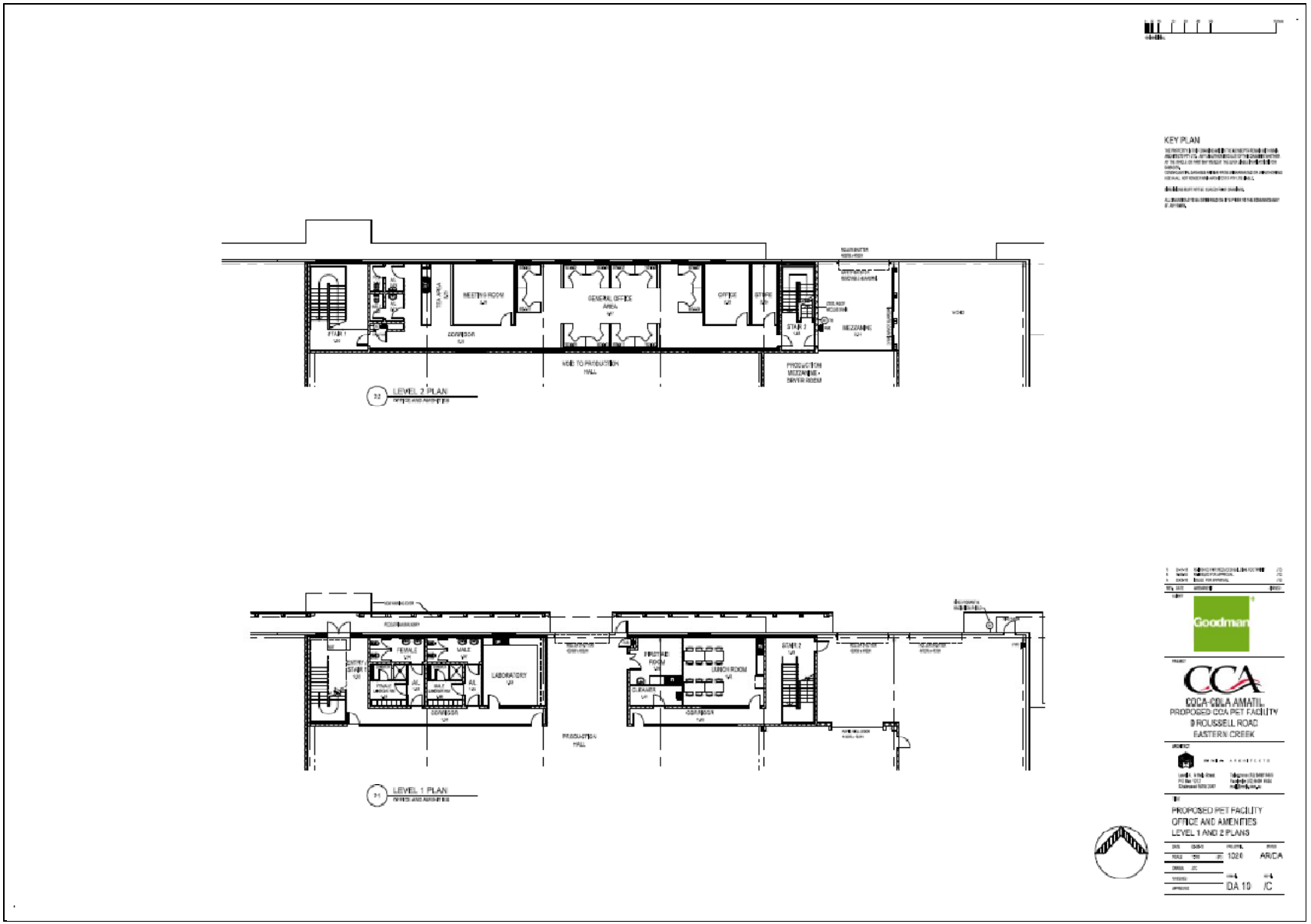
1028 A1/C1A

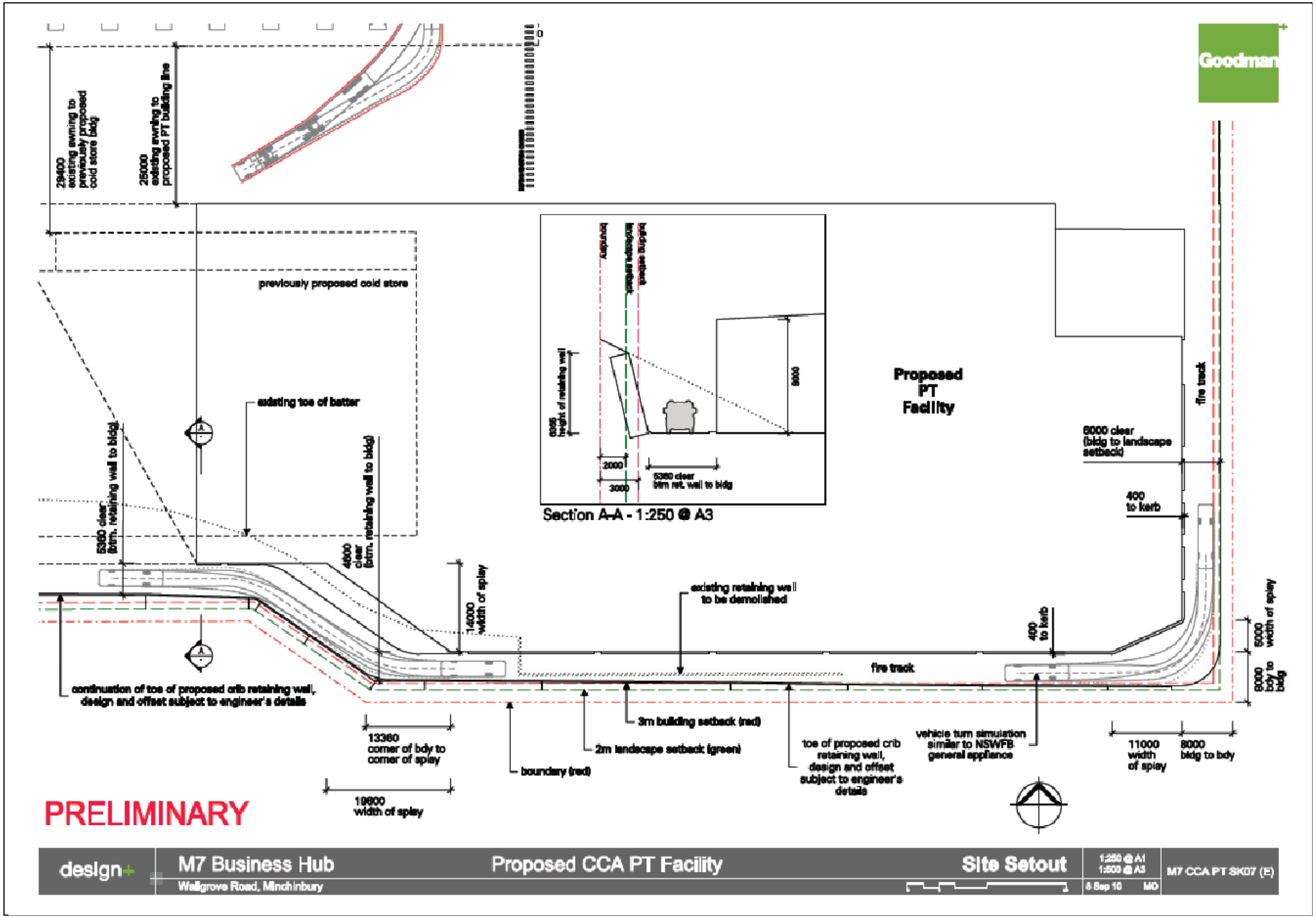
DA 05 /B

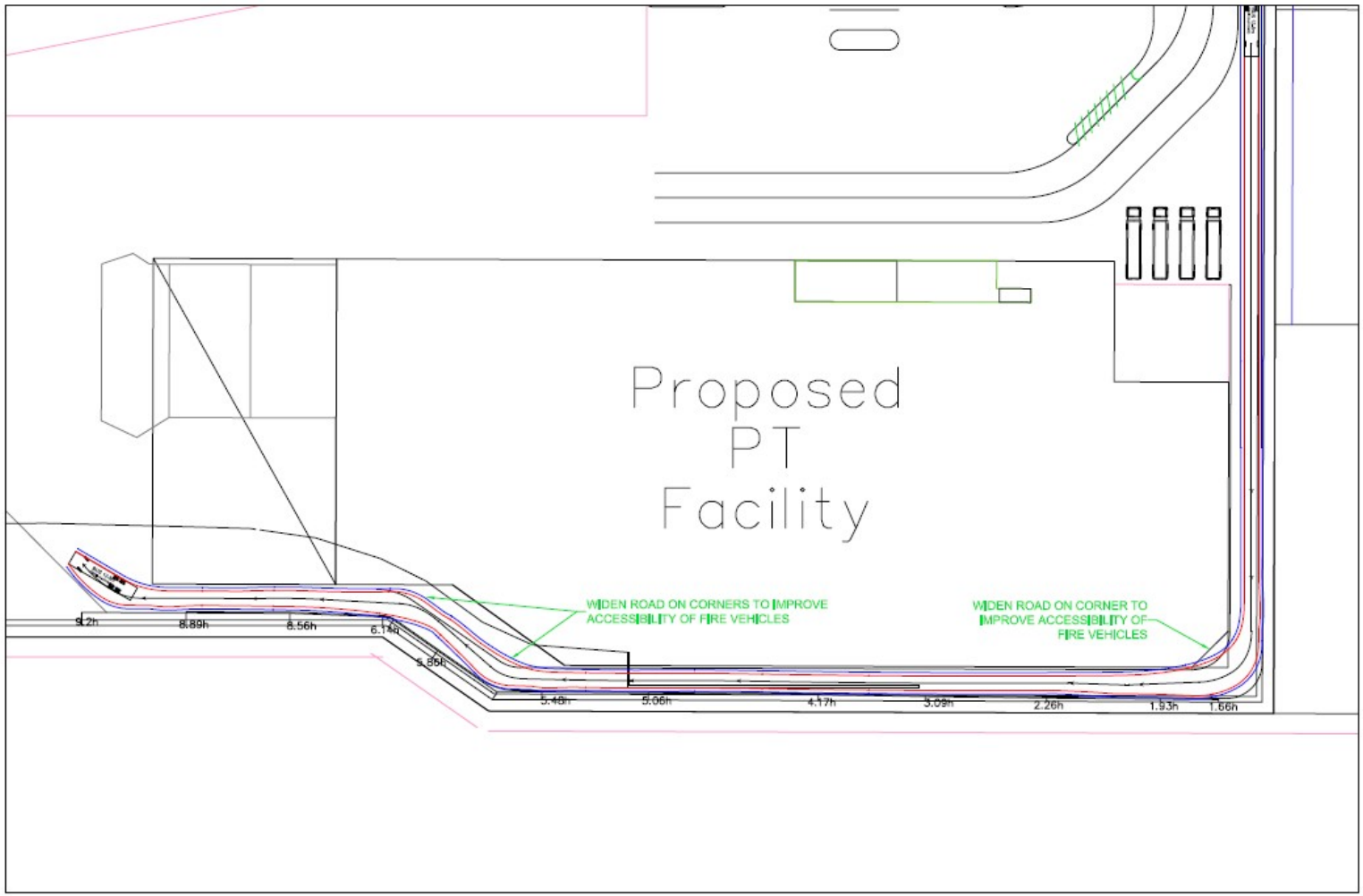

NORTH ELEVATION
EAST ELEVATION
SOUTH ELEVATION
WEST ELEVATION
KEY PLAN
Goodman
CCA
COCA-COLA AMATIL
PROPOSED CCA PET FACILITY
9 ROUSSELL ROAD
EASTERN CREEK
PROPOSED PET FACILITY
STAGE 1 ELEVATIONS
DA 07


NORTH ELEVATION
EAST ELEVATION
SOUTH ELEVATION
WEST ELEVATION
SOUTH ELEVATION
KEY PLAN
Goodman
CCA
COCA-COLA AMATIL
PROPOSED CCA PET FACILITY
9 ROUSSKELL ROAD
EASTERN CREEK
PROPOSED PET FACILITY
STAGE 2 ELEVATIONS
1026
DA 08


STORAGE HALL
STAGE 1
STORAGE HALL
STAGE 1
SECTION
PRODUCTION HALL
SECTION
DRIVER ROOM
UP
PRODUCTION HALL
SECTION
DOCK AWNING
STAGE 1
STORAGE HALL
STAGE 1
PRODUCTION HALL
DRIVER ROOM
SECTION
DOCK AWNING
STAGE 2
STORAGE HALL
STAGE 2
PRODUCTION HALL
STAGE 1
DRIVER ROOM
A/C PLANT ROOM
SECTION
KEY PLAN
Goodman
CCA
COCA-COLA AMATIL
PROPOSED CCA PET FACILITY
9 RUSSELL ROAD
EASTERN CREEK
PROPOSED PET FACILITY
SECTIONS
DA 09
/C


KEY PLAN
MEETING ROOM
GENERAL OFFICE AREA
OFFICE
STORE
STAIR 1
STAIR 2
MEZZANINE
CORRIDOR
WALK TO PRODUCTION HALL
PRODUCTION MEZZANINE - DRYER ROOM
LEVEL 2 PLAN
FEMALE
MALE
LABORATORY
LUNCH ROOM
CLEANER
PRODUCTION HALL
LEVEL 1 PLAN
Goodman
CCA
CCA-COLA AMATIL
PROPOSED CCA PET FACILITY
9 ROUSSELL ROAD
EASTERN CREEK
PROPOSED PET FACILITY
OFFICE AND AMENITIES
LEVEL 1 AND 2 PLANS
1:100
A1/DA
DA 10
/C


Goodman
29400 existing awning to previously proposed cold store bldg
25000 existing awning to proposed PT building line
previously proposed cold store
existing toe of batter
Section A-A - 1:250 @ A3
Proposed PT Facility
6000 clear (bldg to landscape setback)
400 to kerb
fire track
5360 clear (btm. retaining wall to bldg)
4600 clear (btm. retaining wall to bldg)
14000 width of splay
existing retaining wall to be demolished
continuation of toe of proposed crib retaining wall, design and offset subject to engineer's details
3m building setback (red)
2m landscape setback (green)
boundary (red)
toe of proposed crib retaining wall, design and offset subject to engineer's details
vehicle turn simulation similar to NSWFB general appliance
13360 corner of bdy to corner of splay
19600 width of splay
11000 width of splay
8000 bldg to bdy
5000 width of splay
PRELIMINARY
design+
M7 Business Hub
Wallgrove Road, Minchinbury
Proposed CCA PT Facility
Site Setout
1:250 @ A1
1:500 @ A3
M7 CCA PT SK07 (E)



NOTE:
SKETCH PLAN ONLY, PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN, TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

12.5m LARGE RIGID VEHICLE
SWEPT PATHS

A18