CONSULTANTS ADVICE

Project:	Carlingford West Public School	**Ref No.:**	F201502_02
Address:	59-73 Felton Road and part of 183 Pennant Hills Road, Carlingford	**Date:**	26 May 2021
		Issue:	Final Issue

Attention: Gary Shaw, Taylor Construction Group

RE: Preliminary Fire Safety Strategy

1. INTRODUCTION

1.1 SCOPE

This Consultant Advice has been prepared to give guidance on the proposed Fire Safety Strategy for the redevelopment of Carlingford West Public School, specifically for Buildings X and Y.

1.2 BUILDING DESCRIPTION

The following upgrades are proposed to Carlingford West Public School:

- Proposed upgrades will cater for a capacity of 1,610 students
- Construction of 2 new buildings (refer to Figure 1):
  - Building X - A three storey building that contains 24 new homebases
  - Building Y - A 3 storey building containing 22 Homebases, 6 special program rooms and a single storey library, linking the 2 site entry points and includes a covered outdoor learning area below.
- Car par with 53 parking spaces for staff and visitors, and associated traffic strategy for the precinct
- Reconfiguration of the current kiss-and-drop zone at Felton Road East and West.
- Landscaping masterplan for the entire school
- Associated signage, civil works, utilities and services to support the proposed upgrades

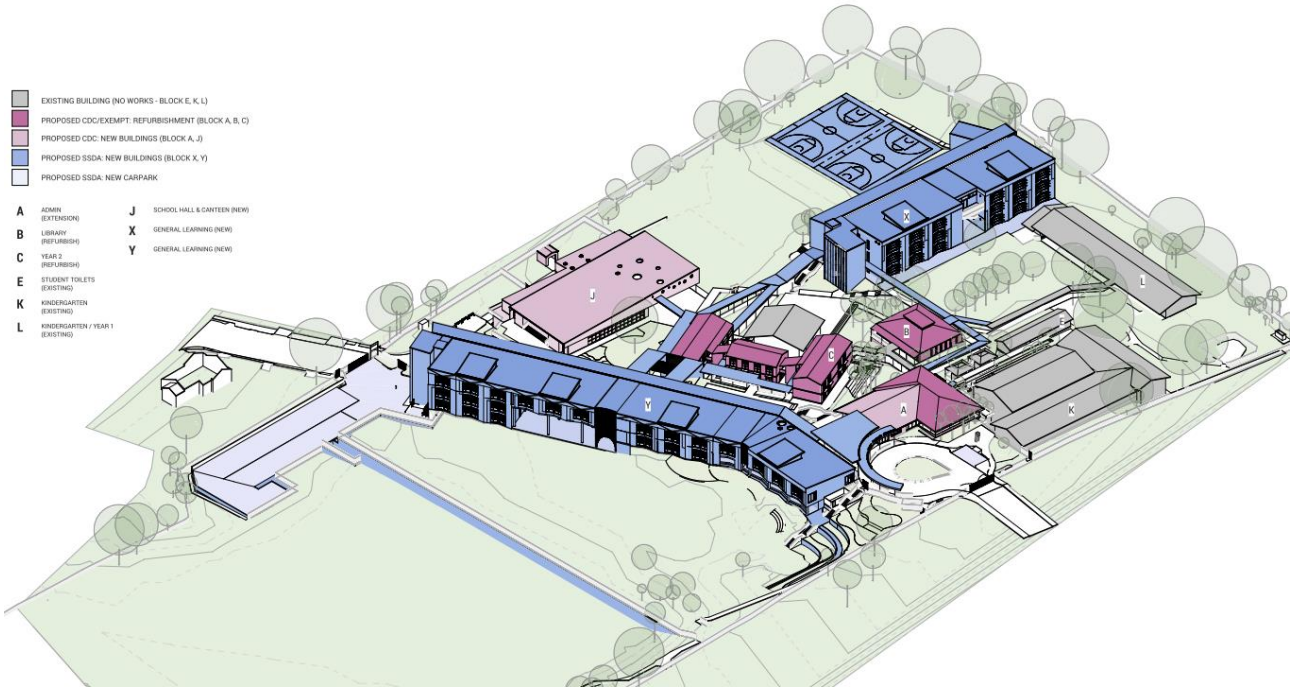

Figure 1: Proposed Buildings X and Y at Carlingford West Public School

1.3 SOURCES OF INFORMATION

- Architectural plans by NBRS Architecture dated 14 May 2021.
- BCA Report by Blackett Maguire + Goldsmith reference 210142 dated 18 May 2021 revision 1.

1.4 LIMITATIONS

- This CAN does not constitute a Performance Solution under Clause A2.2(2) of NCC 2019 Amendment 1 and cannot be relied upon as such.
- This CAN does not constitute evidence of suitability under Clause A2.3(2)(a) or Part A5 of NCC 2019 Amendment 1 and cannot be relied upon as such.
- This CAN does not constitute a compliance certificate or installation certificate under Clause A2.2 or A5.2 of NCC 2019 Amendment 1 and cannot be relied upon as such.
- The report is specifically limited to the scope defined in Section 1.1.
- The report is based on the information provided by the team as listed above in Section 1.3.
- 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.

2. FIRE SAFETY STRATEGY

2.1 PROPOSED PERFORMANCE SOLUTIONS

Based on review of the proposed construction being DfMA modules, in addition to the non-compliances identified in the BCA report, we believe there is opportunity to provide Performance Solutions for the following items summarised in Table 1.

It is important to note although not a legislative requirement for a Crown Works Certificate, the fire brigade are considered a key stakeholder. As such, a Fire Engineering Brief Questionnaire (FEBQ) will need to be submitted to FRNSW for the Carlingford West design to ensure a fire safety strategy is achieved which satisfies all stakeholders.

Table 1: Summary of Performance Solutions

ITEM	NON-COMPLIANCE	MEASURES RELIED UPON IN PERFORMANCE SOLUTION
1	**Spandrels** • The spandrels are proposed to achieve an FRL 60/60/60 from the outside only (with the exception of the portion below the RISF ceiling). • Although the total height of the vertical spandrel shall be 0.9 m, the part of vertical spandrel above the floor may reduce from 0.6 m to 0.1 m.	The assessment shall rely on: • A one-way spandrel (i.e. 60/60/60 FRL from outside to in only) in the zone between RISF ceiling and ~110 mm above the top of slab. • A spandrel fire rated from both directions 60/60/60 FRL for the portion that extends below the RISF ceiling. • Any design of the spandrels needs to be reviewed in conjunction with the fire-rating detail for the floor or ceiling (refer item 3 below).
2	**Reduction of FRLs** • To permit the reduction in general FRLs from the required FRL of 120 minutes down to 60 minutes.	The assessment shall use time equivalence (fire severity) calculations based on a number of assumed inputs and parameters. Feasibility will depend on detailed fire engineering analysis with verification of the input Given the reduced structural integrity and compartmentation provided from the DtS benchmark, a smoke detection and alarm system fully in accordance with AS1670.1 (i.e. max 10 m spacings and min. 1 per enclosure) will be relied on.
3	**RISF ceiling** • To permit the reduction of FRLs to the floors for buildings of Type A construction from 120/120/120 to a ceiling having a Resistance to Incipient Spread of Fire (RISF) of 60 minutes.	The assessment shall rely on the installation of 60 minute RISF ceiling as a tested system, including any penetrations such as lights, services and access panels. Additionally, the floor is to be of non-combustible materials (i.e. steel frame) with a layer of 24mm thick FC sheet on top. A consideration of this detail in conjunction with overall FRLs and spandrels is required.
4	**Egress under covered walkways** • Fire stairs discharge to areas which require occupants to egress along external walkways that are covered prior to reaching the road / open space.	The assessment shall rely on the degree of openness of these walkways, non-combustible construction and alternative egress paths to reach the road / open space.
5	**Fire Hydrant Booster Location** • To permit the location of the fire hydrant booster to not technically be within sight of each building entry on the site.	The hydrant booster is proposed at the bottom of the site, on Felton Road West (whereas the main entry is on Felton Rd East). Although this is not unreasonable, this will be subject to comment from FRNSW through the FEBQ process. It is noted that the main FDCIE shall be provided nearby at Building Y to improve communication between the FDCIE and the booster.

2.2 PROPOSED FIRE SAFETY MEASURES

2.2.1 Fire resistance

Building X and Building Y have a RIS of three (3) and therefore require Type A construction. The fire engineering analysis shall seek to reduce the FRLs to the following structural elements:

- Loadbearing columns and walls shall achieve an FRL of 60/60/60 in lieu of 120/120/120.
- The roof must have a non-combustible covering in accordance with Specification C1.1 Clause 3.5 such that the roof and internal columns supporting the roof do not require an FRL.
- Instead of the intermediate floors achieving an FRL of 120/120/120, they shall be protected by a 60-minute RISF ceiling. Penetrations in this ceiling shall be minimised, and if there are any penetrations that cannot be avoided, these shall be protected in accordance with a tested system.
- Spandrel panels will not prescriptively achieve 60/60/60 in accordance with C2.6 of the BCA. Instead, the spandrels shall achieve the FRL in one direction (from outside in) unless they extend below the RISF ceiling. Additionally, the spandrels might not extend above the floor for the requisite 600 mm. The proposed detail is shown in Figure 2-1. The elements above the spandrel must be fixed closed toughened glazing or FC sheet to a height no less than 1 m above the floor.

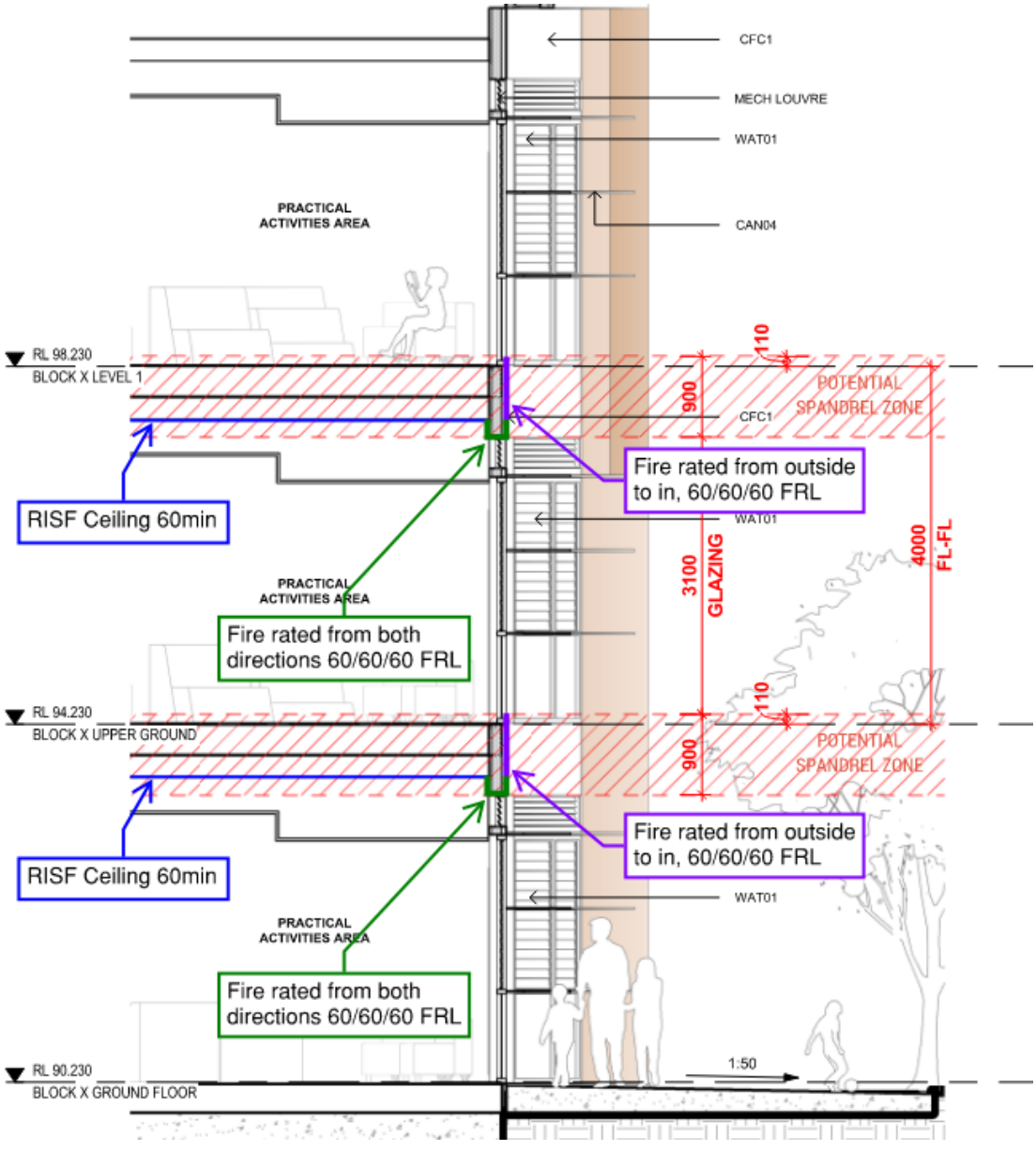

Figure 2-1: Proposed Spandrel Detail

2.2.2 Egress Provisions

- Travel distances to a point of choice, nearest exit and between alternative exits appear to be within the DtS limits of 20 m, 40 m and 60 m respectively.
- Where stairs serve or connect three levels, these stairs must be constructed as fire-isolated stairs, or external stairs in lieu of fire-isolated stairs. These stairs shall be either located no less than 6 m from the external wall of the building served, or protected by 60/60/60 wall construction.
- Discharge paths from exits require passing beneath covered walkways and other covered areas on the site before reaching open space (refer to Figure 2). This is permitted based on the walkways being constructed of non-combustible materials.

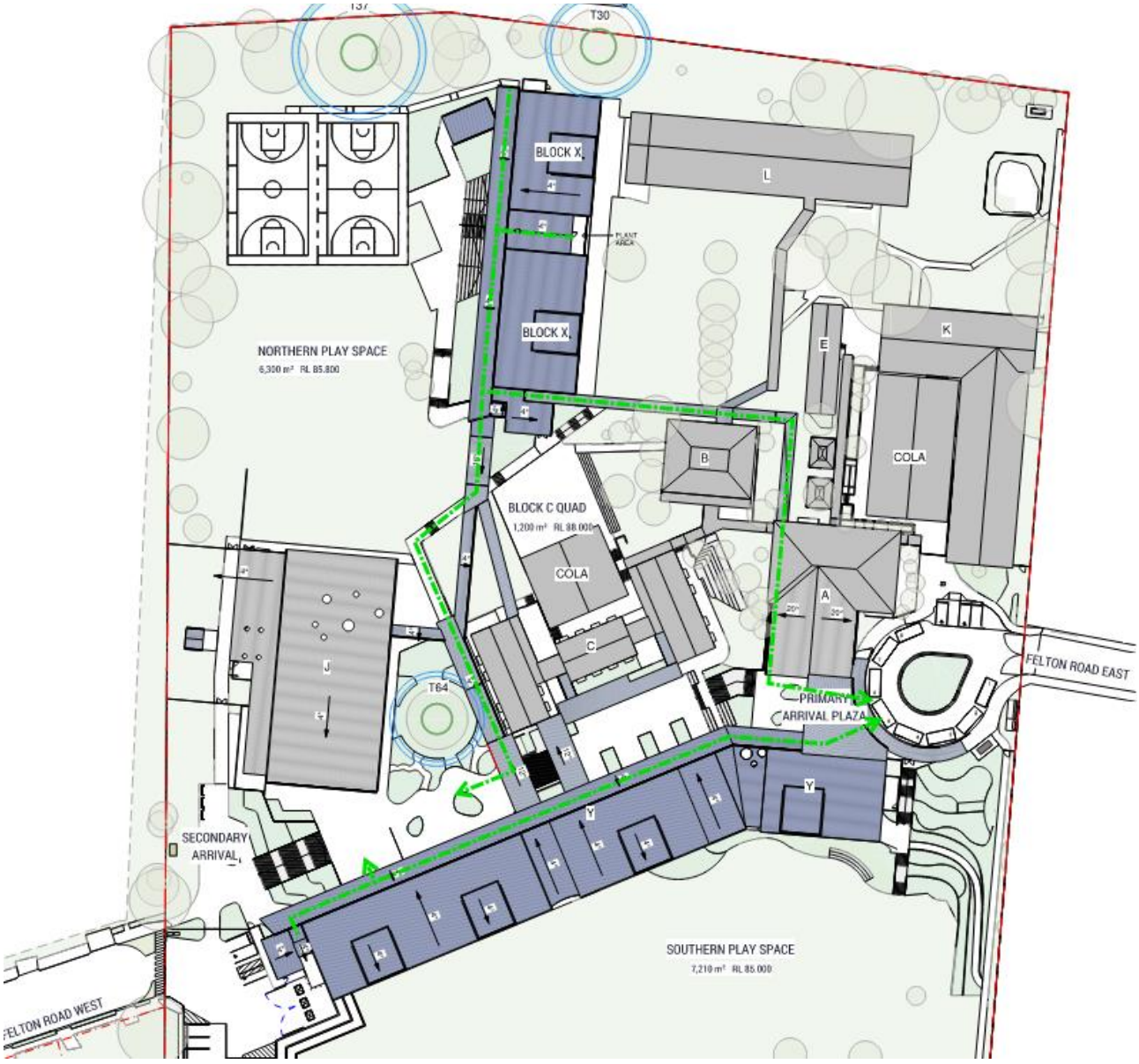

Figure 2: Egress paths under Class 10a structures

2.2.3 Fire Safety Systems

The following fire safety systems are expected within both Building X and Building Y:

- Fire hydrant system to AS2419.1:2005 (or AS2419.1:2017 if desired via Performance Solution). Fire hydrants are to be located externally as far as practical, with internal hydrants located within 4 m of an exit.

- Fire hose reels – as per E1.4 and AS2441 noting that these are required only to areas not considered ‘classrooms and associated corridors’.
- Portable fire extinguishers – located as per AS2444 as the primary means of suppression.
- Fire Detection Control and Indicating Equipment (FDCIE) – located at Building Y, with the strobe to be visible upon approach from Felton Road West. An additional sub FDCIE can be provided at Building X.
- Air handling shutdown (where the mechanical system could unduly contribute to the spread of smoke between fire compartments).
- Smoke detection and alarm system – to AS1670.1:2018 Section 1-6 (i.e. enhanced from that required solely for air handling shutdown).
- Building occupant warning system.

It is understood that the building has a rise in storeys of 3 at most, and therefore an Emergency Warning and Intercom System is not required. Should there be a part where a RIS of 4 is apparent, an EWIS would prescriptively be required.

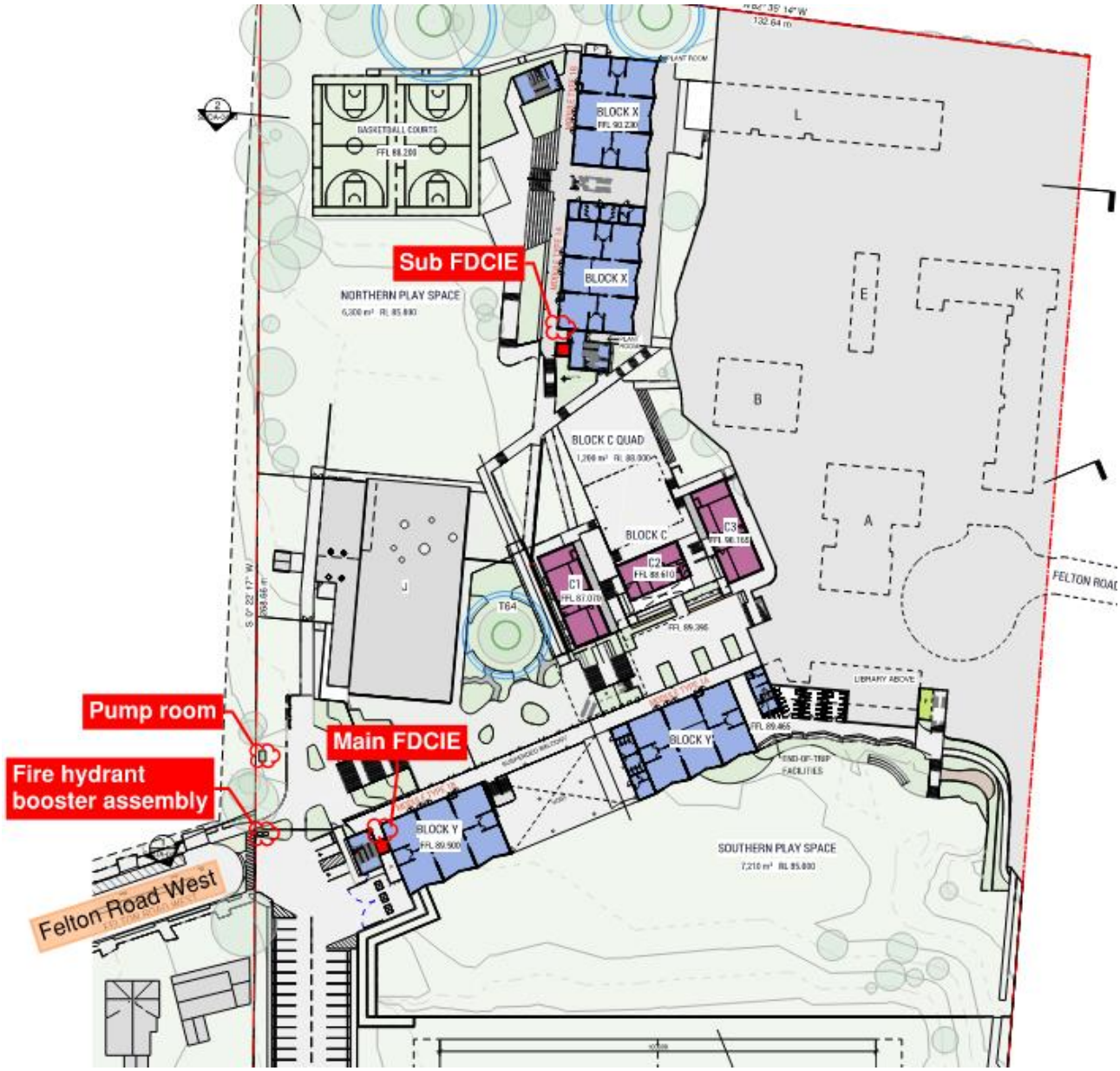

Figure 3: Proposed onsite fire services infrastructure

3. CONCLUSION

From initial review it appears the layout and design of the works are capable of complying with the Performance Requirements of the BCA. Further workshops with relevant consultants and stakeholders will be required in order to develop and finalise proposals for DfMA fire rating details, occupant egress provisions and fire services design requirements.

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