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Chris Michaels
City Plan Services
by email

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Dear Chris

UNSW Biological Science Building

Introduction

This letter considers the fire safety design of the new Biological Sciences Building at the University of NSW Kensington Campus, and specifically those aspects of the fire safety design that impact upon planning and the SSD Application for the building.

The proposed development will be split into 2 stages.

Stage 1 is for an nine storey building on the site of the existing Biomedical Theatres Building. Stage 1 also involves minor refurbishment of the lower ground floor of the existing D26 building and new pedestrian connections on the ground floor.

Stage 2 comprises refurbishment of the Ground Floor of Building D26 and the Ground Floor of the Biolink building. Stage 2 also involves the provision of a new facade to D26 and Biolink building.

The proposed new stage 1 building will be 9 storey mixed use including Class 8 laboratory, Class 9b education, Class 5 office and Class 7b storage as documented by Woods Bagot. It has an effective height more than 25m. The building features an atrium through all the levels.

Proposed Fire Safety Issues

The fire safety design of the building will generally satisfy the Performance Requirements of the Building Code of Australia (BCA) by complying with the Deemed-to-Satisfy (DtS) Provisions. However, there are some aspects of the design that are developed using performance based fire engineering to achieve compliance with the Performance Requirements of the BCA. The main aspects that affect the building layout are highlighted below.

The new building will abut the existing D26 development but is considered, for the purposes of the BCA, to be a separate building. The separation of buildings will need to be addressed through performance based fire engineering. There are a series of existing

operable windows within the façade of the existing D26 building that will now open into the new atrium space and these will need to be taken into account from a smoke and fire spread point of view between buildings. The building code would expect a full height vertical fire wall be provided between the buildings in accordance with the Deemed to Satisfy Provisions of the BCA. It is proposed instead to provide a level of fire separation to the degree necessary as required to meet the performance requirements of the BCA. At this time it is proposed to utilise the existing façade with side through sprinklers at Level 2 into atrium in order to reduce the risk of fire spread into the existing building. Smoke spread is addressed through a smoke exhaust system.

The interaction of this atrium is shown below;

Figure 1: Location of the atrium relative to the existing building line

The façade of the new building, where within 6m of the existing D26, will be glazed and will have internal and external wall wetting to limit fire spread between buildings. Areas will be addressed on a case by case base based on analysis of radiation between the two buildings.

The proposed atrium in stage 1 will run through the new building on the eastern side from Level 2 and is to be largely isolated from the floors i.e. will have bounding non fire rated glazed construction apart from an open stair and minimal circulation space. The design for fire safety, particularly with regard to the existing building, is anticipated to utilise either natural or mechanical smoke exhaust from the atrium, with supply or passive make up air through the ground floor. Sprinkler protection will be provided throughout to minimise potential fire sizes. Smoke temperatures will be minimised through the sprinklers and high dilution of the smoke, preventing fire spread to non-fire floors. Smoke ingress onto non-fire floors will be minimised through the large air flows and glass walls. The atrium will have a number of non compliances with regards to the DtS provision of the BCA and will be addressed on a performance based approach.

The building is expected to have an oversized fire compartment when compared to the DtS provisions of the BCA, This is to be addressed through performance based fire engineering

that will demonstrate adequate separation is provided around the atrium that would limit fire spread floor to floor.

The stairs will comply with the deemed to satisfy provisions.

By the nature of the contents within the the lab fume cupboards are not to be provided with fire dampers as the duct passes into the shafts, An alternative solution will need to be prepared to assess this non compliance.

Egress from the floors appears to comply with the deemed to satisfy provisions, however to provide future flexibility, extended travel distances will be allowed for in the design, through the use of AS1670 smoke detection and possible enhanced warning systems. Due to the level of separation from the atrium it may not be necessary to exit all levels of the existing D26 and the new biological sciences buildings simultaneously. This will be assessed in more detail as the design progresses however it will be likely that both buildings will be notified of a fire regardless of the location due to the close interaction of the two, but if possible the evacuation would be staged to minimise disruption from nuisance alarms.

At this stage of the design, other fire safety aspects of the building appear to be DtS compliant. It is anticipated that there will be other non-compliances with the DtS Provisions of the BCA as the design develops, however it is considered that there are no issues that would affect the building layout arising from fire safety.

Yours sincerely

Neil McPhail
Senior Engineer