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1 August 2019

Sam McLean
Executive Director
Leader Independent Planning Commission
Level 3, 201 Elizabeth Street
Sydney, NSW 2000

Dear Ms McLean

11 Gibbons Street, Redfern (SSD 7449)
Additional information to respond to Peer reviews - proposed trickle ventilation system and fire mitigation measures

This submission has been prepared on behalf of St George Community Housing (SGCH) (Applicant) to provide additional information to respond to the Independent Planning Commission's (IPC) independent peer reviews of the proposed ventilation system, acoustic and fire mitigation measures for the above project (SSD 7449) at 11 Gibbons Street, Redfern.

We have carefully considered the peer reviews in consultation with the Applicant and our expert consultant team including Lendlease Building - who have partnered with SGCH for the design and construction of the project. We have attached detailed expert advice to specifically address the findings of the peer reviews (**Attachments 1- 6**). This submission should be reviewed in conjunction with these reports.

We welcome the opportunity for our consultants to meet with the independent peer review consultants and/or the IPC to clarify any further matters prior to determination.

The structure of this submission is outlined below:

1. Executive Summary
2. Background
3. Documentation Status
4. The proposed Ventilation System
5. Response to Peer Reviews
6. Conclusion

On 26 July 2019, the City of Sydney Council (Council) provided further comments to the IPC on the proposed ventilation system and setbacks. This submission addresses issues relating to ventilation. Our position on the setbacks remains unchanged as all services will be undergrounded with no large poles obstructing pedestrians along Marian Street.

This proposal will provide much needed new social and affordable housing to the City of Sydney LGA within very close proximity to transport nodes and within walking distances to services and employment. The affordable housing will be retained on site in perpetuity – well exceeding the provisions of the *State Environmental Planning Policy (Affordable Rental Housing) 2009* to retain units for a period of 10 years.

The timely determination of this project is now critical to ensure its delivery.

1. Executive Summary

We are advised that the IPC commissioned independent peer reviews to confirm whether:

- the proposed noise mitigation measures will be effective i.e. would the proposed acoustic baffles on the door and window vents provide effective noise attenuation;
- the proposed fire mitigation measure (i.e. fire dampers) will effectively mitigate any potential fire risk associated with the ventilation system; and
- the system would have the ability to provide future tenants with a comfortable and viable system of ventilation i.e. will the system be able to support the likely loads required particularly during extreme weather events.

The ventilation system documentation considered in the peer reviews was prepared as part of the SSD level of design (15%-20%) in late 2018. We note that the peer reviews raise a number of questions on the level of design detail in the SSD application that is not normally provided at this stage of the development assessment process.

Since the lodgement of the SSD, our consultant team in conjunction with Lendlease has developed more detailed documentation in readiness for an imminent start of work on site for the project, should Development Consent be granted. The design is now developed to a 70% level of detailed resolution across the major disciplines.

The updated details and documents (Attachment 1-6) provide further clarity on the proposal and directly address issues raised by the independent peer reviews.

Critically, the expert consultants confirm that the ventilation system and its associated fire mitigation measures will comply with the relevant codes and standards and be fit for purpose.

Our evidence based approach confirms that the proposal will provide future tenants with a comfortable and viable system of ventilation with effective noise mitigation and fire management mitigation measures. The proposal provides affordable housing in perpetuity with SGCH taking a lifecycle approach to the design and maintenance of the development.

Further detailed design is required as part of the Construction Certificate process as part of the construction and delivery phase. The Department of Planning, Infrastructure and Environment (DPIE) has recommended draft conditions to ensure the applicant documents how the system will comply with relevant standards prior to construction and occupation.

SGCH generally accept these conditions and have proposed minor modifications or additional conditions to provide the IPC with further confidence the system will be fit for purpose and the amenity of our residents will be maintained into the future.

2. Background

The application was lodged on 28 September 2018 and was subject to a five month design excellence review process as part of the NSW State Design Review Panel (SDRP) pilot program. The design of the building and its systems have undergone significant review and redesign over more than 15 months to accommodate requests from the NSW Government Architect, DPIE and City of Sydney Council (Council).

We understand that Council raised concern in part because they maintain the proposed mechanical ventilation system does not comply with the Apartment Design Guide (ADG) and alternative passive ventilation options should be explored, namely the incorporation of plenums and or chimneys.

Impacts from road noise are unavoidable given the site's location between Gibbons Street and Regent Street and its proximity to Redfern train station. Consequently there is a conflict between natural ventilation and acoustic privacy. This issue is acknowledged in previous IPC SSD approvals in the locality as well as the ADG. The ADG states it may not be possible to achieve natural ventilation and acoustic privacy in noisy environments and allows for flexibility in the application of design guidelines.

The proposal provides a ventilation solution that ensures sufficient volumes of fresh air are able to move through an apartment to maintain a healthy indoor environment to comply with National Construction Code (NCC) requirements.

We maintain that this system specifically meets the objectives of the ADG taking into consideration its context and location. We note that this position was fully supported in the DPIE's assessment and recommendations. This system is not intended to deal with extreme weather events which is consistent with any passive ventilation system. However, based on the findings of our analysis, this system will ensure a level of thermal comfort for tenants consistent with Government policy and relevant Australian Standards (Attachment 3).

The mechanical ventilation system provides fresh air from the roof to apartments without the need to open windows. The system is powered by solar PV panels located on the roof, addressing Council's concerns around reliance on systems consuming energy. Importantly, residents may still open windows to enable flexibility to manage their amenity levels to achieve both acoustic privacy and/or natural ventilation.

SGCH's vision is "*Great places for everyone*". SGCH will own the building, maintain and manage it for social and affordable housing in perpetuity and have a vested interest in building quality developments for their residents.

SGCH set design standards to meet and exceed this vision, with an 8 star NatHERs requirement to reduce energy consumption and keep running costs low and electricity bills for tenants low and economical. SGCH's policy is not to install air conditioning for this reason.

Relevantly, it is also noted that air conditioning is not required by the ADG.

3. Documentation Status

Since the lodgement of the SSD, SGCH propose to appoint Lendlease Building to deliver this project on a design and construction contract basis. Lendlease have engaged a full consultant team of expert designers for the project (including some existing and new consultants) who have developed detailed documentation in readiness for an imminent start of work on site for the project should approval be granted. The design is now developed to a 70% level of detailed resolution across the major disciplines.

Northrop have been engaged to complete the ventilation design for the project and Acoustic Logic as the acoustician. Core Engineering has also been engaged to provide advice on the fire engineering solutions.

All consultants have been involved in the preparation of this submission. The updated details and documents (Attachments 1-6) are part of the developed design to clarify how issues/questions raised by the peer reviews have been resolved during the detailed design phase of the project.

The ventilation system documentation considered in the peer reviewers submitted up to the 22nd February 2019 was at a SSD design level (15%-20%), which is an accepted practice for this stage of the development assessment process. Further refined design details are typically provided at the Construction Certificate stage.

Notwithstanding, as the design has advanced, the responses provided by our consultant team in this submission are based on updated design documents that have been developed over the last five months of design development to inform future construction certificates.

As the design and construction contractor for the project, Lendlease will be responsible for ensuring the project works (including the mechanical and ventilation systems) are designed and built so that they are fit for the purposes specified by SGCH, and are in accordance with the approved development consent documents and relevant codes and standards. Lendlease are also required to procure and provide to SGCH subcontractor and supplier warranties in relation to the project works.

4. The proposed ventilation system

An outline of the purpose and detailed description of the proposed ventilation system is detailed below to clarify questions in the reviews and assist the IPC in its assessment of the application.

The base system for achieving compliant ventilation in accordance with BCA 2019 for residential apartments typically comprises a trickle vent system and the use of operable doors and windows to each habitable room. The proposed design meets the building code requirements for ventilation and is commonly implemented in residential apartment developments. The system also provides additional air flow to the apartments to ensure mould prevention.

The ventilation system within this development has been designed as an alternative means of providing fresh air to habitable rooms to comply with the BCA 2019. This is to address acoustic concerns relating to the site's noisy location where a windows closed option should be available to tenants.

The system is not an air-conditioned system but rather a viable alternative to opening the windows in apartments in potentially noisy environments. The mechanical ventilation system comprises:

- a central supply outside air (COAS) system fan on roof with full redundancy
- gas fired heating hot water generator located at roof level to provide air tempering to the COAS
- at each level there are duct branches to each apartment, via fire dampers, terminating in each apartment above the wardrobe
- supply ducts to each bedroom via side blown grille
- trickle vents on windows designed to act as make-up and relief air path depending on each apartments current mechanical ventilation activations
- local (each apartment) exhaust systems for bathroom and laundry to façade
- local exhaust system for kitchen rangehood to façade
- ceiling fans to all bedrooms and living areas to assist with air movement and comfort

Importantly, the mechanical ventilation system has been designed in accordance with the following documents:

- NCC 2019 Section F, Clauses F4.5 and F4.6 Mechanical and Natural Ventilation of Rooms
- AS 1668.2:2012 The use of ventilation and air conditioning in buildings – Mechanical ventilation in buildings
- AS/NZS 1668.1:2015 The use of ventilation and air conditioning in buildings – Fire and smoke control in buildings.

The ventilation system utilises a hybrid system. Air is initially supplied to the bedrooms and also ventilates the adjoining living area via relief to outside or to provide make up to the exhaust system, which includes a Central Outside Air System (COAS) located at roof level to supply to all bedrooms. This includes ducting through the building from roof level and branching into every apartment and two fans for redundancy in design.

During winter months air from the COAS is tempered (when required) using a cascading condensing heating hot water generator. The COAS will be controlled via a timer with initial setup to have the fan shut down during periods when ambient air conditions may negatively impact occupant amenity.

The proposed ventilation system includes trickle vents that serve all apartment living spaces. These vents are designed to draw outside air from the façade utilising the kitchen and/or laundry fan depending on operation. This system also provides relief air for the COAS if all mechanical exhaust systems in the apartments are inactive.

The proposed mechanical *outside air* system will provide fresh air in accordance with the NCC 2019 to all apartments in addition to the deemed to satisfy natural ventilation openings.

5. Response to Peer Reviews

5.1. Mechanical Ventilation System

Team Catalyst were engaged to provide a specific response to the IPC's query as follows:

> *Advise whether the system would have the ability to provide future tenants with a comfortable and viable system of ventilation i.e. will the system be able to support the likely loads required particularly during extreme weather events.*

We have carefully considered the Team Catalyst advice and provide the advice from our expert consultant (Northrop) that directly addresses the findings of the Advice (Attachments 2 and 3).

Northrop have further developed the conceptual mechanical system design by Arrow submitted as part of the DA documentation. The design is fully compliant with the NCC 2019 (formerly BCA) and all relevant Australian Standards, as confirmed in Attachment 2.

A number of comments raised by the peer reviewing engineer around compliance have been addressed as part of the design development process. Further information is provided in Attachment 3 to demonstrate compliance with all relevant guidelines and standards and Draft Conditions B34, B35 and E29 issued by DPIE.

Following adaptive thermal comfort modelling undertaken by Northrop, a control strategy has been designed to centrally regulate the COAS during unfavourable ambient conditions to manage comfort levels. A gas fired heating hot water generator has also been included to temper the air during winter months.

During summer, ceiling fans are provided for cooling via convection mixed. The thermal performance of the building envelope (8 Star NatHERS) is predicted to provide adequate comfort in the dwellings.

5.2. Suggested Response

If approved, the consultant team will continue to develop the detailed design of the ventilation system to comply with relevant codes and standards and satisfy these conditions of consent.

DPIE has recommended the following conditions to ensure the ventilation system will be designed to meet relevant codes and standards prior to construction, and appropriately installed and maintained. These Draft Conditions provide the IPC with certainty that the system will be designed appropriately as an Occupation Certificate cannot be issued unless final testing demonstrates the system's performance complies.

> *B34. All mechanical ventilation systems shall be installed in accordance with the BCA and shall comply with Australian Standards AS1668.2 and AS3666 - Microbial Control of Air Handling and Water Systems of Building, to ensure adequate levels of health and amenity to the occupants of the building and to ensure environment protection. Details shall be submitted to the Certifying Authority prior to the issue of the relevant Construction Certificate.*

B35. The mechanical exhaust system for the ground floor retail/commercial tenancy is to be designed to be capable of accommodating exhaust requirements in accordance with relevant Australia Standards, in order to allow for the event that the tenancy is approved for future use as a food premises or other use which requires mechanical exhaust.

E29. Following completion, installation and testing of all the mechanical ventilation systems, the Applicant shall provide evidence to the satisfaction of the PCA, prior to the issue of any Occupation Certificate, that the installation and performance of the mechanical systems complies with:

(a) the BCA;
(b) Australian Standard AS1668 and other relevant codes;
(c) the development consent and any relevant modifications; and,
(d) any dispensation granted by the New South Wales Fire Brigade.

In our previous response to the IPC, SGCH also proposed Draft Condition F18:

F18. Each year, the Applicant must provide the Department of Planning and Environment with documentary evidence that the Applicant's annual inspection of the mechanical ventilation system has been undertaken.

SGCH also support the potential re-drafting of draft Condition B34 to ensure the provision of user controls and air tempering in the proposed system.

5.3. Acoustic Review

WSP were engaged to provide a specific response to IPC's query as follows:

Advise whether the proposed noise mitigation measures will be effective i.e. would the proposed acoustic baffles on the door and window vents provide effective noise attenuation

We have carefully considered the WSP Peer Review and provide this advice from our expert consultants (Acoustic Logic and Northrop) that directly address the findings of the Peer Review (Attachments 4 and 5).

Both reports provide additional information that supports the proposed trickle ventilation system for the project as it:

- is consistent with the criteria specified in Development Near Rail Corridors and Busy Roads – Interim Guidelines (Department of Planning 2008)
- satisfies the Draft Condition B12 issued by the Department of Planning and Environment
- provides effective noise mitigation measures and adequate internal residential amenity

5.4. Trickle ventilation system

The Northrop Report specifies the performance requirements for the proposed trickle ventilation system concluding that it meets the relevant standards and requirements nominated under the NCC.

The proposed trickle vents are a proprietary product that include baffles to diffuse sound while maintaining the required airflow to internal areas in the apartments. This proposed system is commonly used in noisy locations such as the site. It provides compliant outside air to the living areas, which is transferred through each apartment.

The final size of each trickle vent will differ depending on the number of bedrooms and toilets. This level of detail is typically provided during the Construction Certificate stage as it is part of the detailed ventilation design for each apartment and the overall building.

Further, as the trickle ventilation is part of an integrated window system, the window manufacturer will also provide input which can also be confirmed at the Construction Certificate stage.

5.5. Assessment of Acoustic impacts and noise mitigation measures

Acoustic Logic have undertaken an analysis of the proposed trickle ventilation system with respect to Interim Guidelines consistent with Draft Condition B12 as recommended by DPIE.

The analysis undertaken has been prepared based upon the trickle vents being open and closed. The analysis incorporates traffic noise levels and the predicted resultant internal noise levels of the apartments.

Acoustic Logic's analysis concludes that:

- the proposed vent system (even in its open state) will meet the noise criteria
- the proposed trickle vent system will satisfy the requirements of draft Condition B12

5.6. Suggested Response

We note that Draft Condition B12 requires details demonstrating compliance with the DPIE's Interim Guideline be submitted to the certifying authority prior to the issue of any Construction Certificate.

As detailed in our previous correspondence on 9 May 2019, (in response to the Draft conditions of consent) we support this condition subject to an amendment to ensure the findings of the Renzo Tonin and Associates Report are referenced to ensure compliance with draft Condition B10.

Notwithstanding the findings of this submission, we advise that the Applicant will accept a further amended Condition B12 requiring that the detailed noise modelling of the Gibbons Street façade be conducted by a qualified acoustic engineer and issued to the Secretary for approval prior to the issue of a Construction Certificate as provided below:

> *B12 The building must be designed and constructed to incorporate the recommendations within the Acoustic Assessment Report prepared by Renzo Tonin and Associates dated 14 February 2019. Detailed noise modelling of the Gibbons Street façade assembly must be undertaken by a qualified acoustic engineer and* ***submitted to the Secretary for approval prior to the issuing of the relevant Construction Certificate****.*

5.7. Fire & Smoke Control in Buildings

Two MS were engaged to provide a specific response to the IPC's query as follows:

> *Advise whether the proposed fire mitigation measure (i.e. fire dampers) will effectively mitigate any potential fire risk associated with the ventilation system.*

We have carefully considered the Two MS Advice and provide this advice by our expert consultants (Northrop and Core Engineering) that directly address the findings of this Peer Review (Attachments 3 and 6).

As mentioned in Section 4, further design development to inform the Construction Certificate process has resolved a number of concerns raised in the independent peer reviews, as detailed in Attachment 3.

Final design documentation will demonstrate compliance with relevant codes and standards to ensure potential fire risks associated with the ventilation system are effectively mitigated.

5.8. Suggested Response

DPIE have recommended Draft Conditions B6, E29, E33 and F2 requiring details demonstrating compliance be submitted to the certifying authority prior to the issue of any Construction Certificate.

This provides the IPC with certainty that the system will be designed appropriately as an Occupation Certificate cannot be issued unless final testing demonstrates the system's performance complies.

We also note that SGCH are required by draft Condition F2 to certify annually that the building's essential services has been inspected and operate to the required standards.

> *B6. The proposed works must comply with the applicable performance requirements of the BCA to achieve and maintain acceptable standards of structural sufficiency, safety (including fire safety), health and amenity for the ongoing benefit of the community. Compliance with the performance requirements can only be achieved by:*
> *(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 provision; or*
> *iii) a combination of (a) and (b).*
>
> *E29. Following completion, installation and testing of all the mechanical ventilation systems, the Applicant shall provide evidence to the satisfaction of the PCA, prior to the issue of any Occupation Certificate, that the installation and performance of the mechanical systems complies with:*
> *(a) the BCA;*
> *(b) Australian Standard AS1668 and other relevant codes;*
> *(c) the development consent and any relevant modifications; and,*
> *(d) any dispensation granted by the New South Wales Fire Brigade.*
>
> *E33. Prior to the occupation or commencement of use of the development, a Fire Safety Certificate shall be obtained for all the Essential Fire or Other Safety Measures forming part of this consent. A copy of the Fire Safety Certificate must be submitted to the relevant authority and be prominently displayed in the building.*
>
> *F2. The owner of the building shall certify to Council or the relevant authority every year that the essential services installed in the building for the purposes of fire safety have been inspected and at the time of inspection are capable of operating to the required minimum standard. This purpose of this condition is to ensure that there is adequate safety of persons in the building in the event of fire and for the prevention of fire, the suppression of fire and the prevention of spread of fire.*

6. Conclusion

This submission provides updated detail and documentation that responds to the multiple peer reviews to assist the IPC its assessment of the application. This submission clearly demonstrates that the key issues raised in peer reviews have been resolved to enable the IPC to finalise its assessment of the project.

The expert consultants confirm that the ventilation system and its associated acoustic and fire mitigation measures will comply with the relevant codes and standards and be fit for its purpose. The proposal will provide future tenants with a comfortable and viable system of ventilation supported by effective acoustic and fire risk mitigation measures .

Further detailed design is required as part of the Construction Certificate process and DPIE has recommended draft conditions to ensure the applicant documents how the system will comply with relevant standards, both prior to construction and occupation.

SGCH accept these conditions and have proposed minor modifications or additional conditions to provide the IPC with further confidence the system will be fit for purpose, and the amenity of our residents will be maintained.

We trust this additional information fully addresses the findings of the peer reviews and combined with the suggested amendments to Conditions will allow the IPC to determine this project.

If you have any further enquiries, please do not hesitate to contact Michael Woodland on 02 8459 7506 email michael@keylan.com.au in the first instance if you wish to discuss any aspect of this response.

Yours sincerely

Michael Woodland BTP
Director

Attachments

Attachment 1 – Lendlease response
Attachment 2 – Northrop response relating to the mechanical ventilation system and plans
Attachment 3 – Consultants response matrix
Attachment 4 – Northrop letter relating to the trickle vent system
Attachment 5 – Acoustic Logic's response
Attachment 6 – Core Engineering's response