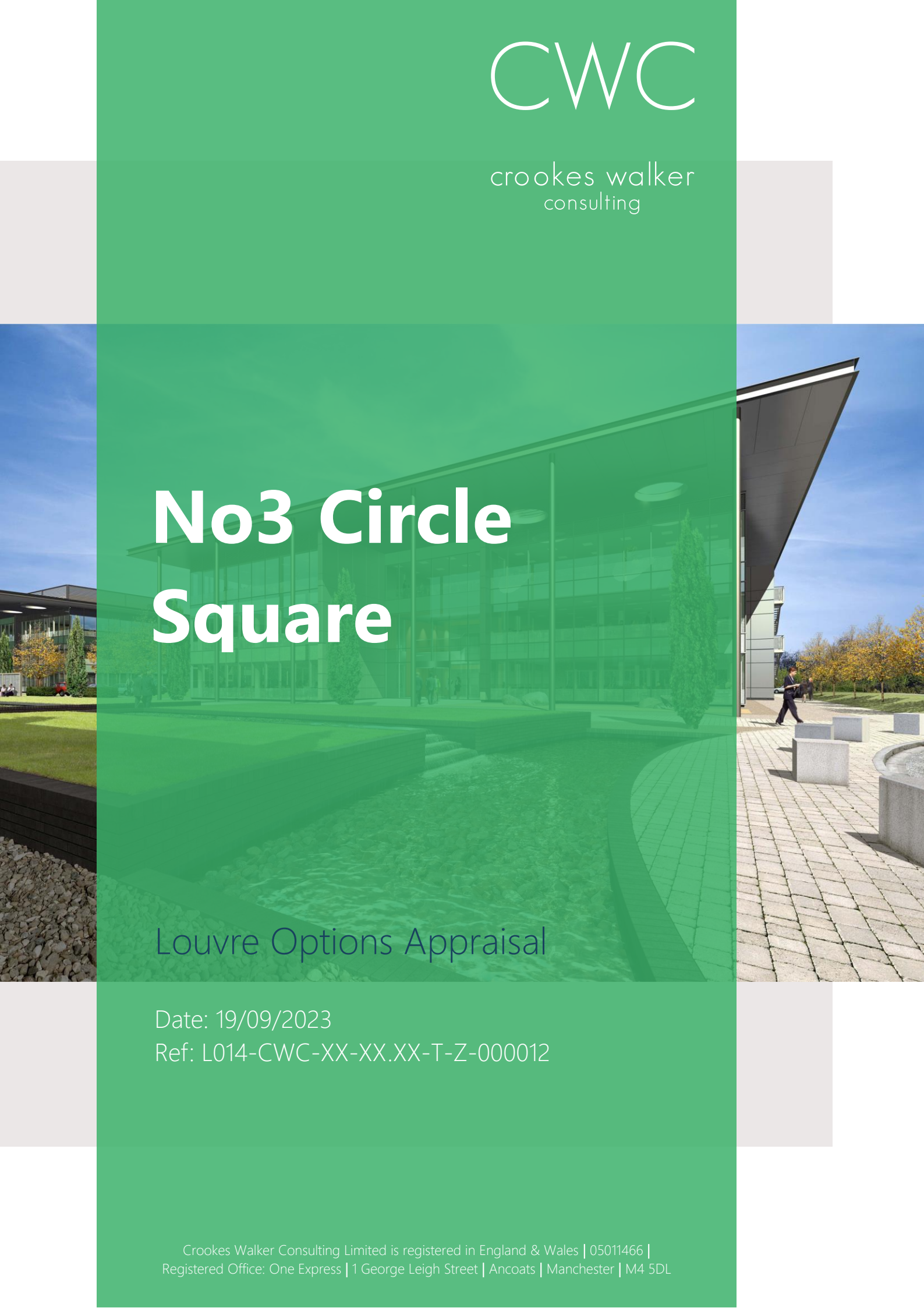




CWC

crookes walker
consulting

No3 Circle Square

Louvre Options Appraisal

Date: 19/09/2023

Ref: L014-CWC-XX-XX.XX-T-Z-000012

Revision Record

Date	Reference	Revision	Prepared By	Checked By	Authorised By
19/09/2023	L014-CWC-XX- XX.XX-T-Z- 000012	0	George Talbot	Saifullah	George Talbot
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1.0 Introduction

The purpose of this report is to provide a summary of the technical implications for each of the proposed louvre variations for the No3 Circle Square development. The conclusions of this report should be read in conjunction with the Architects louvre/vent panel options appraisal: 0256-CS3-BAR-03-XX-RP-A-0030.

There are currently 3 vent type options, vent types A, B and C with the design currently based upon "Vent type A". There has been extensive modelling and calculation undertaken to date to ensure confidence that the current design achieves the ambitious sustainability and technical requirements of the scheme, which are as follows:

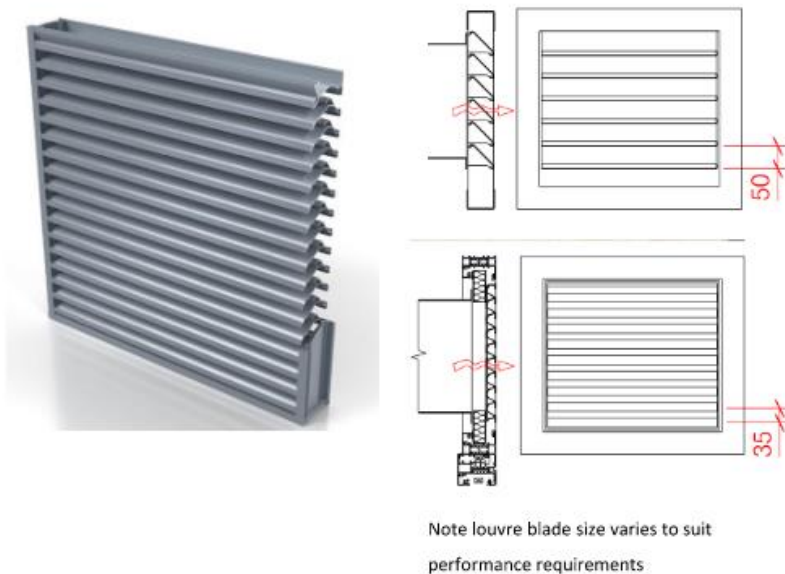
1. Nabers 5-star rating
2. BREEAM Excellent
3. EPC A
4. Part L2A compliance and MCC betterment
5. UKGBC NZC Interim Targets for operational energy

2.0 Vent Types

There are 3 variations of vents that have been proposed:

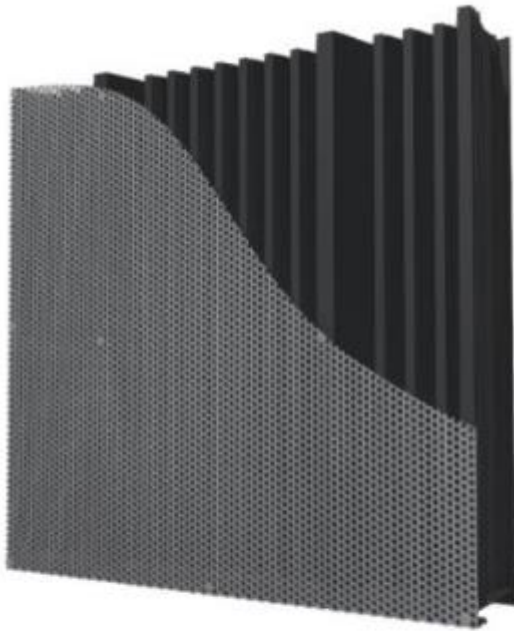
Vent Type A

Horizontal weather louvre with angled blades and internal insulated plenum for connection from ducted ventilation systems



Vent Type B

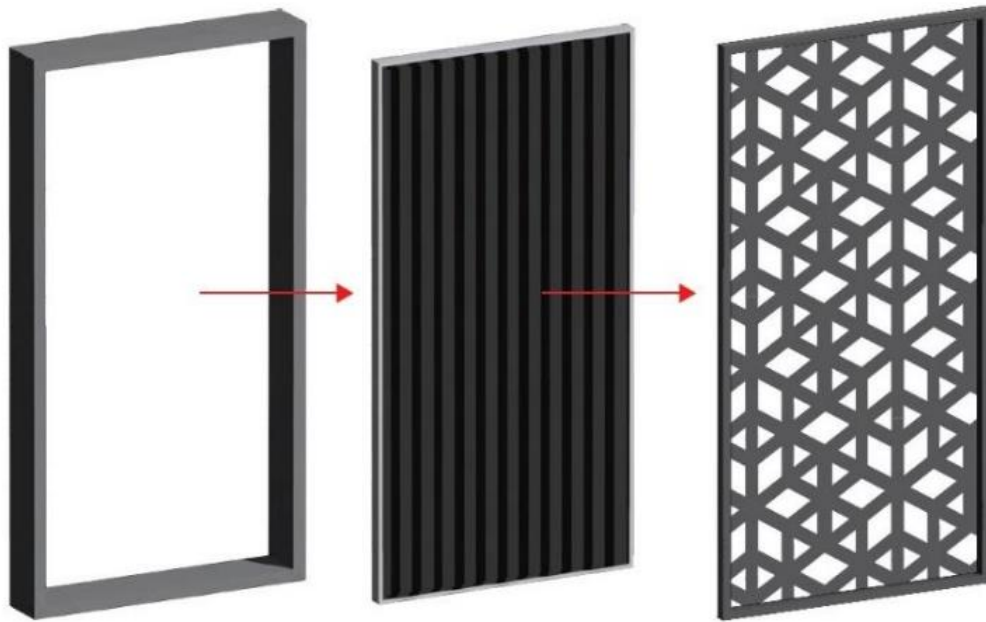
Combination of exterior mesh vent panel with internal louvre.



Typical proprietary louvre with perforated
mesh overlay system

Vent Type C

Bespoke perforated metal panels with internal louvre.



3.0 Vent Type A

Louvre Type A is a weather louvre with angled blades and insect mesh on the inside face. The blades are spaced closely which minimises ingress whilst maintaining enough free area to keep overall resistance low to ensure an energy efficient solution.

Performance Implications

- Lowest resistance yields good fan efficiency compared to other vent types.
- Enables compliance with key sustainability criteria such as NABERS and UKGBC interim targets.
- Works as a solution from a coordination perspective in the current structural and architectural limitations (now fixed due to site progress).

4.0 Vent Type B

Vent Type B is a mesh screen externally with an internal weather louvre and insect mesh and internal insulated plenum. This detail has a far higher resistance than the currently proposed Vent Type A due to the added external mesh screen. To accommodate this increase in resistance, the internal plenum could be made larger to increase the free area, however this is not possible with the known structural and architectural constraints on the Cloak Street elevation. If it were possible to increase plenum sizes to offset the reduction in free area, we would end up with poorer air quality on the office floors – larger discharge/intake areas will result in more clashes of airstreams and therefore increased likelihood of short-circuiting between fresh air and exhaust air. For an example, this will

have a significant impact in particular on office intakes on the upper floors if the mezzanine level exhausts below are made larger.

Performance Implications

- Increase in resistance due to reduced free area decreases fan efficiency which increases energy consumption – this puts compliance with scheme sustainability criteria at risk, particularly with the NABERS operational energy assessment.
- Larger vent sizes would be required to offset the decrease in free area – this would cause significant coordination issues which would likely be unsolvable at this stage.
- Reduction in insulation thickness would be likely in order to enable increased depth requirement of the construction would lead to increased thermal losses.

5.0 Vent Type C

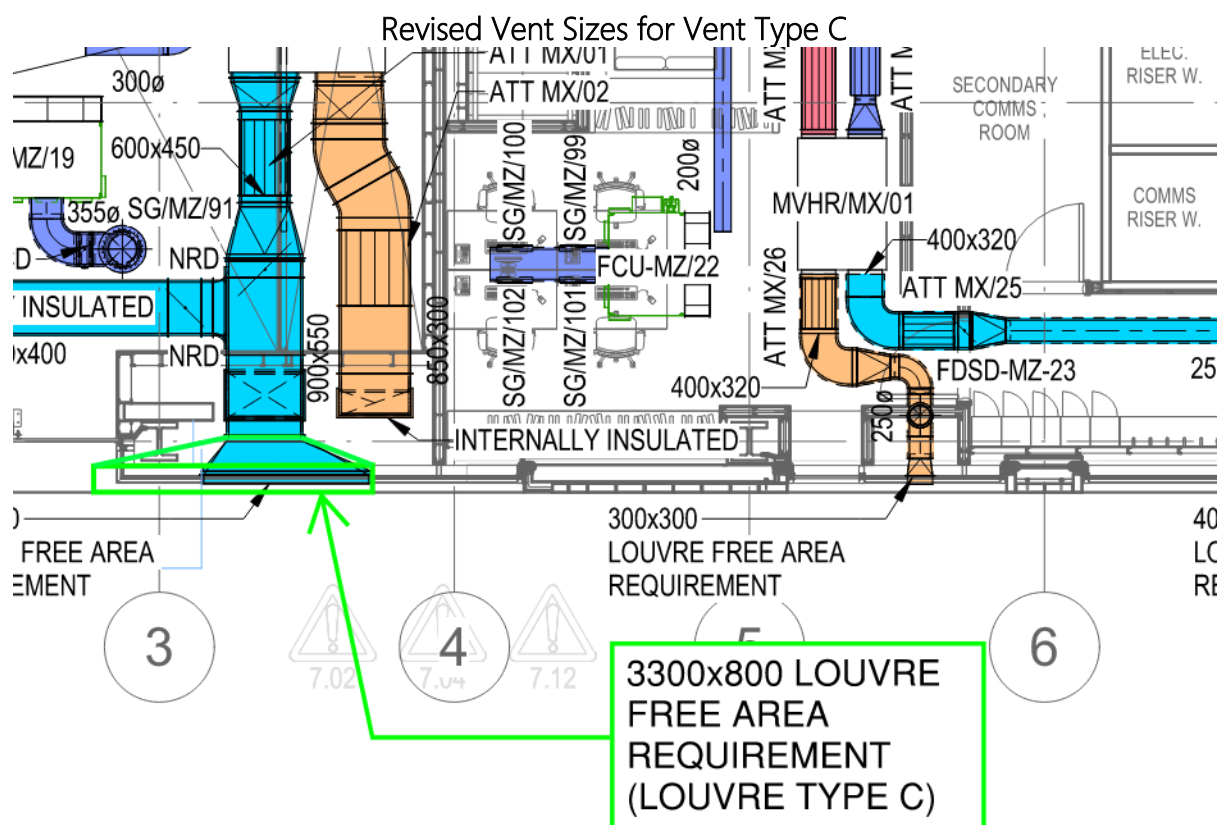
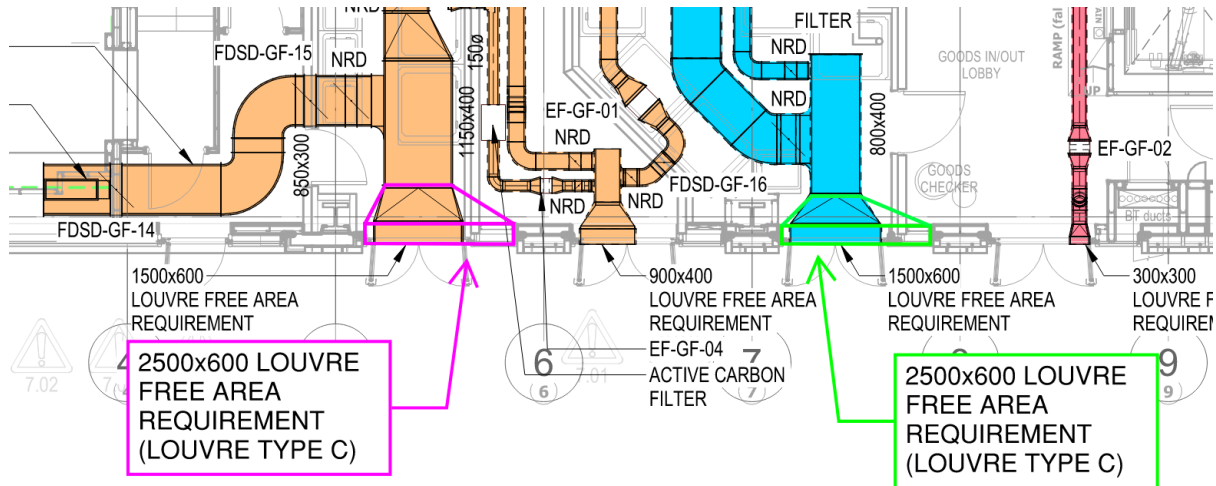
Vent Type C takes inspiration from the adjacent multi-storey car park which utilises bespoke perforated panels for the purpose of enabling natural ventilation into and out of the car park. This is not suitable for our intended purpose of intake and exhaust air louvring as there would be little or no protection from weather ingress, we would therefore need to add the internal weather louvre, as with Vent Type B, to avoid detrimental weather ingress. This would result in a large reduction of free area and therefore higher resistance compared to other vent types, thus reducing energy efficiency of the fans and therefore increasing energy usage – again proving detrimental to key project sustainability requirements. In addition, a lack of direction on the airflow would result in air quality issues similar to those described above with Vent Type B – if exhaust air cannot be thrown away from the building then there is a risk that the nearby intakes could draw the air back into the building.

Performance Implications

- Large increase in resistance due to reduced free area decreases fan efficiency which increases energy consumption – this puts compliance with scheme sustainability criteria at risk, particularly with the NABERS operational energy assessment.
- Following assessment, a number of ventilation units at ground and mezzanine level would need to be reselected as the current fans cannot handle the additional pressure requirement from the increased resistance.
- Larger vent sizes would be required to offset the decrease in free area – this would cause significant coordination issues on the south façade which would be unsolvable at this stage. In addition, one of the reselected ventilation units does

not fit within the current internal service space allocation within the F&B unit at mezzanine level.

- Reduction in insulation thickness would be likely in order to enable increased depth requirement of the construction would lead to increased thermal losses.



Revised Vent Sizes for Vent Type C

6.0 Conclusion

In conclusion, it is the recommendation of Crookes Walker Consulting that the currently utilised Vent Type A is retained in the design as it achieves the best efficiency out of the proposed options which minimises energy consumption and it is a coordinated solution that works within the current structural and architectural limitations.