The Timberyards
SSDA Façade Report

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Inhabit

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Revision History

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02	16/12/2024	Updates from team review in blue	MCr	DW	DW

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Development Summary

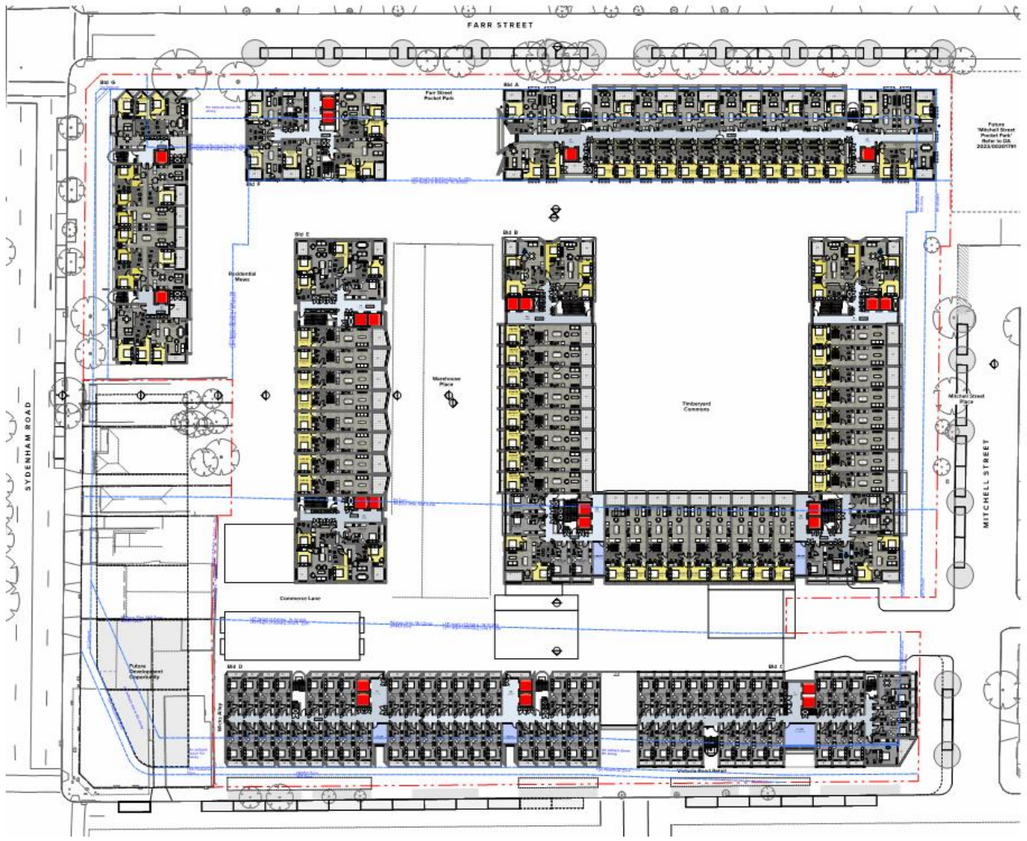
This *Façade SSDA Report* has been prepared on behalf of Varsity Assets Management Pty Ltd (Developer) on behalf of RTL Investments 2 Pty Ltd as trustee for RTL Marrickville Property Trust ('RTL Co.') (**the Applicant**) to support a State Significant Development Application (SSDA) for the proposed *Timberyards* development. The SSDA (SSD-76927247) seeks consent for a diverse rental housing precinct comprising build-to-rent (BTR), co-living and affordable housing. The precinct development comprises seven buildings ranging from eight to thirteen storeys, with open space that includes a pocket park, through site links and communal open spaces. Specifically, consent is sought for the following:

- Site preparation (including remediation), demolition and bulk excavation for basement parking;
- Residential accommodation (shop top housing, residential flat buildings and mixed use buildings) that includes BTR, co-living and affordable housing;
- Retail premises on the ground floor within the MU1 zoned land and extending up to 25m into the R4 zoned land;
- Publicly accessible recreation area (pocket park) and through site links;
- Neighbourhood shop (within the R4 zoned land);
- Associated landscaping and public domain works; and
- Augmentation of, and connection to, existing utilities as required.

A detailed description of the proposal is provided in the Environmental Impact assessment (EIS) by Ethos Urban. The development is declared State Significant by virtue of being a BTR development on land in Greater Sydney with an Estimated Development Cost (EDC) of greater than $50 million, with the tenanted component representing greater than 60% of the EDC (Schedule 1, *State Environmental Planning Policy (Planning Systems) 2021*).

1.0 Introduction

This report discusses the key design considerations and requirements for the façades to the new Mixed Use Rental Housing Precinct development at the multiple lots bound by Victoria Road, Sydenham Road, Farr Street and Mitchell Street and summarises the façade design work conducted during the State Significant Development Application (SSDA) phase. The project will comprise 7 low to medium rise towers (A-G) ranging from 8 to 13 storeys offering various residential platforms including Co-Living, Build To Rent and Affordable Housing with low level communal and retail spaces.



Level 3 Sitewide General Arrangement

2.0 Façade Types / Descriptions

The main facades to the development are understood to comprise the following:

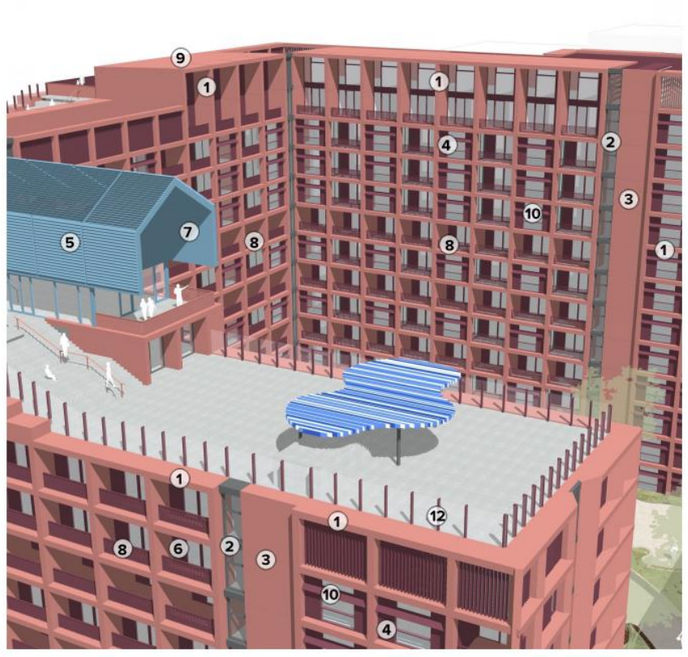
- Aluminium framed double glazed window wall with operable awning & casement style windows and sliding doors to balconies
- Brick veneer cladding
- Lightweight metal cladding (eg. profiled colourbond, powdercoated aluminium)
- Compressed Fibre Cement (CFC) cladding
- Off-Form Concrete
- Aluminium Mechanical louvres
- Metal roof plant screens
- Metal & glass balustrades

Some examples of the application of these materials across the development are shown below.

Building B

1. **Cladding.** Prefinished aluminium cassette system, express jointed. Colour and finish to match PCF5 (Interpon Headland Matt matt or similar).
2. **Cladding.** Prefinished aluminium cassette system, express jointed. Colour and finish to match PCF2 (Dulux Monument matt or similar)
3. **Off form concrete**, natural finish to blades and wall on ground level UNO. Clear penetrating sealer. Red pigmented stain finish to match PCF5.
4. **Residential Facade System**: Aluminium glazed fixed and operable windows/slidding doors and matching cover plats to fixed side panels and slab edges where applicable. Colour to match PCF6. Glass clear top, tanslucent bottom, integral to facade system. Max. 20% reflectivity.
5. **Mechanical Louvres.** Fixed horizontal mechanical louvre system, aluminium. Powder coat finish, colour and finish to match PCF7 (Outremer Pale blue matt). Where integral to a cladding or façade system the colour and finish to match the overall system.
6. **Compressed fibre cement cladding**, express jointed system. Colour and finish to match PCF6 (Interpon Claret matt or similar)
7. **Cladding.** Prefinished aluminium cassette system, express jointed. Colour and finish to match PCF7
8. **Metal balustrade**. Vertical 75 x 10mm metal baluster, angled at 45° for increased privacy and matching top rail. Where fixed to face of facade, metal fascia to back of balustrade to conceal face of slab. Powder coat finish varies, colours to match PCF6 (TYP.), PCF2 (Terrace Houses) and PCF9 (Mitchel St. Entry).
9. **Off form concrete** roof + waterproofing membrane. Paint finish to match PCF5.
10. **Screen.** Decorative privacy / sunshade sunhood system. Fixed horizontal louvre system, aluminium and required sub framing. Powder coat finish, refer to colour code for paint finish.
11. **Mechanical Louvres.** Fixed vertical mechanical louvre system, aluminium. Powder coat finish, colour and finish to match PCF2. Where integral to a cladding or façade system the colour and finish to match the overall system.
12. **Rooftop wind screen.** Fixed vertical steel posts to eng. requirements with clear glass panels. 1800 AFFL. Powder coat finish structure to match PCF6.

- All material and finishes to have a reflectivity of 15% or less.
- All PCF and PF to be matt finish. PF matches in number and colour with PCF



Façade Materials – Building B

Building F

Material

1. **Custom orb cladding.** Decorative profile metal cladding system. Profile equal to Custom orb (Zincalume).
2. **Residential Window System**: Aluminium glazed fixed and operable windows/slidding doors and matching cover plates to fixed side panels and slab edges where applicable. Colour to match PCF10 (Interpon Silver Pearl matt). Glass clear integral to facade system. Max. 20% reflectivity.
3. **Metal staircase.** Aluminium balustrade system to open stairs. Colour to match PCF4 (Colorbond Tamar Green matt).
4. **Face brick base.** Pink / brown colour range, equal to Nubrik 290 Murray Sunset. Mortar colour to match brickwork. Soldier stack bond.
5. **Ground level Window System:** Street level glazing system: Aluminium framed with Renlita glazing system in retail areas. Framing colour to match PCF11 (Duralloy Lama matt). Glass Clear min. 75% visual light transmission. Max. 20% reflectivity.
6. **Off form concrete balcony soffits.** Off form pigmented stain concrete, equal to Ecotone B10047 Peach Whisper.

- All material and finishes to have a reflectivity of 15% or less.
- All PCF and PF to be matt finish. PF matches in number and colour with PCF

Façade Materials – Building F

Building C

Material

1. **Off form concrete**, natural colour and finish. Clear penetrating sealer.
2. **Cladding system.** Decorative profile perforated metal cladding system. Profile equal to 'Super 8'. Colour and finish to match PCF1 (Dulux Appliance White matt)
3. **Cladding system.** Decorative profile metal cladding system. Profile equal to 'Super 8'. Colour and finish to match PCF4 (Colorbond Tamar Green).
4. **Compressed fibre cement cladding**, express jointed system. Colour and finish to match PCF4
5. **Residential Facade System**: Aluminium glazed fixed and operable windows/slidding doors and matching cover plates to fixed side panels and slab edges where applicable. Colour to match PCF4 (5a) or PCF1 (5b). Glass clear integral to facade system. Max. 20% reflectivity.
6. **Metal balustrade**. Vertical 75 x 10mm metal baluster, angled at 90° and matching top rail. Where fixed to face of facade, metal fascia to back of balustrade to conceal face of slab. Powder coat finish, colour to match PCF4 (6a) or PCF1 (6b).

- All material and finishes to have a reflectivity of 15% or less.
- All PCF and PF to be matt finish. PF matches in number and colour with PCF

Façade Materials – Building C

3.0 Design Criteria

3.1 General

The design of the façades will be required to meet a number of design parameters and project specific requirements. The following table is a general summary of the expected & recommended requirements:

General Project Façade Design Requirement

Structural Design Life	50 Years
Building Code	NCC 2022
Building Class	TBC with Relevant Building Surveyor
Loading	Wind, dead loads, live loads, access and maintenance loads in accordance with AS/NZS 1170
Weatherproofing & Building Sealing	Façade systems weather and airtightness performance will be validated off-site via prototype testing at a NATA accredited laboratory in accordance with AS2047 or AS/NZS4284 depending on the part of the building. Quality of site assembled facades will be validated via AAMA501.2 site hose testing. As-built construction will be subject to blower door air tightness testing.
Façade and finishes warranties	Trade warranty from date of practical completion - 10 Years Glazing -10 years Sealants and gaskets - 10 years Aluminium finishes – 25 years film, 15 years colour Steel finishes – 15 years Brick & Precast -10 years
ESD	4 Star Greenstar and Minimum 5.5 Star individual and 7 Star weighted average NaTHERS
Quality Requirements	The performance and quality requirements of the façade will be in accordance with the requirements outlined the Façade Performance Technical Specification and Facade Performance Schedules (to be submitted for Facade tender at a later date). This document has been prepared to capture requirements in accordance with Australian Standards, best practice recommendations and relevant international standards.

3.2 Superstructure Movement

The façade systems will need to be designed to accommodate relative floor-to-floor movements and deflections at the horizontal control joints located in the cladding. Movement and deflection that will be accommodated includes that originating from dead loads, live loads, long term creep, concrete shrinkage and column shortening. These are in addition to the effects of fabrication tolerance and thermal expansion. Definition of these movements will be developed further through subsequent project design phases.

3.3 Building Envelope Energy

AtelierTen have undertaken a variety of Environmental Sustainable Design (ESD) analysis via their Multi-Parameter assessment to provide guidance on the likely performance requirements for the building facades and to inform the architectural intent. Inhabit have provided guidance on anticipated thermal performance of the various window, door and wall types given their likely detailing and project specific geometry for inputs into the detailed NatHERS modelling that has been conducted. The following building envelope performance requirements for the building envelope that result in successful NatHERS star ratings are:

Façade Component	U-Value (W/m2K)	Low Solar Gain SHGC	High Solar Gain SHGC	Wall with added Bulk Insulation with R-value of (m2K/W)
Sliding Doors	< 3.12	0.35	0.44	-
Fixed Windows	< 3.20	0.35	0.43	-
Awning Windows	< 3.35	0.35	0.43	-
Casement Windows/Doors	< 3.10	0.35	0.43	-
External Walls	-	-	-	>2.5*

*Assumed Average total system R > 1.4 m^2K/W with thermal break tape added to studs where appropriate Glazing with a minimum VLT of 50% is to be provided for daylight amenity.

3.4 Condensation

Per the NCC Part F8 requirements, the risk associated with water vapour and condensation must be managed to minimise impact on the health of occupants in Sole-occupancy building class areas. Key design aspects to be implemented to assist in the resolution of this as the design progresses include:

- Internal space relative humidity levels are to be controlled and managed via provision of mechanical heat recovery ventilation units (TBC by RTLCo & Mechanical Engineer)
- Lightweight clad walls and brick veneer walls will incorporate Class 4 vapour permeable weather/air barriers enabling vapour migration through the wall system
- Locations of use and detailing of precast and in-situ concrete facades are to be reviewed carefully

3.5 Embodied Carbon

Construction material supply, fabrication and installation require energy which with current technology involves the use of fossil fuels resulting in carbon emissions. Life cycle assessment of materials and processes will become more common in the coming years with industry intent to reduce embodied carbon. Inhabit understand the Green Star Buildings target for this project must comply with the Climate Positive Pathway which includes Upfront Carbon Emissions to be reduced by 20%. The majority of embodied carbon within base build construction is within concrete and steel structural framing however aluminium and glass production (key components of the façade) are energy intensive and their use in facade systems involves carbon emissions that should be considered for reduction where possible. Preliminary input from façade perspective has been provided into AtelierTEN's upfront carbon pathway.

3.6 Safety Glass and Human Impact

The selection and sizing of glazing for the project will be in accordance with AS1288. All glass for balustrades, low lying glazing, doors and side lites shall be designed to resist human impact loads.

3.6.1 Toughened Glass

AS1288 allows the use of toughened glass (as a Grade A safety glass) in locations where there is risk of accidental human impact. Toughened glass when broken will fracture into small dice sized pieces and is therefore considered to be a safety glass. However, the process of toughening can also lead to an increased risk of spontaneous glass fracture (associated with nickel sulphide inclusions).

AS1288 includes provision for Heat Soak Testing toughened glass to minimize the risk of spontaneous breakage, however it must be noted that Heat soaking will significantly reduce but not totally eliminate the risk of fracture due to nickel sulphide inclusions.

Inhabit recommend the following employed for the project to reduce risK

- No monolithic toughened glass is permitted for use in any lite where in the event of glass breakage the fall to finished floor level below is over 3000mm.
- Any toughened glass proposed shall be 100% heat soak tested in accordance with EN 14179 Part 1.
- The use of toughened glass is limited in any scenario where a low residual risk is required by the Building Owner.

The alternative to toughened glass is heat strengthened laminated glass which meets AS1288 human impact requirements but adds cost to glazing systems and can cause functionality issues such as to sliding door operation due to increased weight.

3.6.2 Doors

AS1288 requires doors and glass adjacent to doors to be Grade A safety glass.

3.6.3 Terrace

Locations where façade separates internal to external, for example terrace, balcony or Ground Level spaces, and glazing that can be mistaken for an opening through the façade with vertical drop of 1m or less, must be Grade A safety glass.

3.6.4 Balustrade

Any glazed balustrades are to comprise heat treated laminated glass. Monolithic toughened glass is not to be used.

3.6.5 Residential Low Level Glazing

Low level glazing, within 500mm from finished floor level, is required to be Grade A safety glass.

3.7 Acoustics

The acoustic requirements for the façade to mitigate noise ingress from environmental factors have been a key focus area. Through work with the acoustic engineer (Acoustic Logic), minimum glass thicknesses & wall compositions have been advised. Refer to Appendix A for a summary of provided system data that has been used to inform this process.

Building	External Noise Level dB(A)Lmax	Space	Internal Noise Criteria dB(A)Lmax	Façade Glazing Area	Recommended Single Glazing System	Recommended DGU System	Light Weight Façade Structure
C & D	84-85	Studio /CoLiv/ Bedroom	50	Glazing applies to **2/3 of façade**, remaining façade is by Rw 50 wall structure	12.5mm Hush	8/12mm air gap/13.52	2 layers 9mm FC sheet/92mm stud with 75mm thick 11Kg/m^3 Glasswool/ 1 layer 13mm plasterboard
		Living Room	55	All façade is glazing	12.38mm Lam	6/12mm air gap/13.52	
	83 or less	Studio /CoLiv/ Bedroom	50	Glazing applies to **2/3 of façade**, remaining façade is by Rw 50 wall structure	12.38mm Lam	6/12mm air gap/13.52	
		Living Room	55	All façade is glazing	10.38mm Lam	6/12/10.38	
Remaining Buildings	84-86	Studio /CoLiv/ Bedroom	50	Glazing applies to **1/3 of façade**, remaining façade is by Rw 50 wall structure	12.38mm Lam	6/12mm air gap/13.52	
		Living Room	55	All façade is glazing	12.38mm Lam	6/12mm air gap/13.52	2 layers 9mm FC sheet/92mm gap with 75mm thick 11Kg/m^3 Glasswool/ 1 layer 13mm plasterboard
	83 or less	Studio /CoLiv/ Bedroom	50	Glazing applies to **1/3 of façade**, remaining façade is by Rw 50 wall structure	10.38mm Lam	6/12/10.38	
		Living Room	55	All façade is glazing	10.38mm Lam	6/12/10.38	

Generally, this approach will require the following 3 glass types:

1. 8mm/12mm air gap/ 13.52mm lam (6 + 1.52interlayer + 6)
2. 6mm/12mm air gap/ 13.52mm lam (6 + 1.52interlayer + 6)
3. 6mm/12mm air gap/ 11.52mm lam (5 + 1.52interlayer + 5)*

Some notes on these glass types:

- A 0.38mm interlayer is typically only able to be used with annealed glass due to it's flatness compared to heat-treated glass. Due to strength & thermal stress resistance factors, only heat-treated glass would be recommended by Inhabit for the project. This necessitates a 0.76 or 1.52mm laminated interlayer. Hence the minor increase on what is shown in the acoustic summary.
- Additionally a minimum glass thickness of 5-6mm is usually required for procurement/handling purposes to heat treat glass thus these thicknesses represent almost the minimum we could procure anyway.

- Laminated glass will serve a dual purpose as grade A safety glass (Refer above) meaning the need for monolithic toughened glass in large parts of the façade can be reduced thus improving the risk mitigation of spontaneous nickel sulphide fracture. The balcony facades are an exception to this where grade A safety glass would also be required to the outer face too.
- There will be minimal visible difference between these glass types, meaning an apartment could use the minimum glass required in each room without needing to up spec an entire apartment for aesthetic consistency. This aligns with one of the carbon strategies suggested.
- The glazing thicknesses here vary from 29.52mm to 33.52mm total thickness. This can be accommodated by most commercial framing suites albeit wider pocket versions. Off the shelf sliding door suites that can accommodate this are more limited however this is a relative standard glass thickness on the commercial residential scale and many specialist façade sub-contractors have their own suites capable of accommodating this with a wider glazing pocket.
- Keeping operable awnings & sliding doors to manageable sizes is important in ensuring compliant initiating and operating forces can be achieved

3.8 Glazing Selection

To address the previously established energy, safety and acoustic requirements the facades will generally require double glazing with a low-Emissivity coating.

A selection process to determine benchmark glass products, which satisfy both aesthetic and performance requirements, will be undertaken with the project team through the proceeding project phases. The design intent for the vision glazing is understood to be a clear neutral "colourless" appearance. The spandrel glazing will utilise the same vision glazing in a shadowbox style orientation with a powdercoated aluminium backpan set back from the glass to provide a uniform appearance. Any benchmark products selected will be visual benchmarks only and are not intended as prescriptive design. The eventual Contractor may put forth alternative glass products subject to approval.

3.9 Access and Maintenance

Access to the façade systems is an essential to allow for periodic cleaning and maintenance, including glazing replacement, activities during the life of the project. The design of the façade and surrounding building elements and zones (i.e. hardscaping) will need to consider potential access needs, and imposed loads that will occur during these activities.

Inhabit expect the façades will typically be accessible for maintenance via a combination of Elevated Work Platform (EWP), industrial rope access and cleaning pole depending on the area of the project given the low mid- and low-rise lying nature of the buildings. Access to the variety of roofs will require various walkways along with static and fall restraint lines where parapets do not form compliant barrier heights.

The facades of the project are generally proposed of low relative maintenance materials being shear face glass, metal cladding, CFC cladding, brick & concrete surfaces. Elements which form shelves in the façade should include reasonable falls & drip grooves to promote drainage and discourage streaking and accelerated soiling of the façade.

It is expected the façade will be required to be cleaned approximately bi-annually. Annually is typically the longest interval that is recommended as this frequency is required to prolong the life of materials for performance (eg. Weatherproofing) and maintain compliance with supplier warranty requirements.

3.10 Façade Construction Methodology

Various façade materials are proposed to be used on the project, this will offer opportunities for some pre-fabricated facades for systems such as glazing and site assembled works such as traditional brick veneer. For the glazed façade systems, the specification of unitised systems has the added benefit of quality control within a factory environment as this is more readily controlled and monitored, ensuring the façade systems arrive on site with the expected level of quality and finish.

The design life of the primary structural façade members shall not be less than 50 years, from Date of Practical Completion. As defined by AS1170.0, this is the duration of the period during which a structure or structural element, when designed, is assumed to perform for its intended purpose with expected maintenance but without major structural repair being necessary. The finish of materials must be take into account their location within the external walls and thus the ease of accessibility and the minimum Service Life to be achieved.

3.11 Fire

As per the fire performance requirements of the NCC the façade will need to be comprised of non-combustible elements either via demonstrated performance via AS1530.1 testing or via inclusion in NCC permitted materials lists C2D10. The current external facade system design is composed of typically non-combustible materials such as precast concrete, brick, glass, compressed fibre cement, rockwool insulation, aluminium and steel.

Additional fire performance aspect affecting the façade such as exposure of external walls between buildings/fire compartments which may require performance solution treatment will require ongoing coordination of the façade design with requirements from the Fire PBDB in the subsequent design phases.

3.12 Accessibility

Fair and equitable accessibility within publicly accessible buildings is vital. With regards to the façade these requirements will be integrated into the design at spaces such as ground level entries via the adoption of DDA access principles into the design of doors in the building envelope throughout the project.

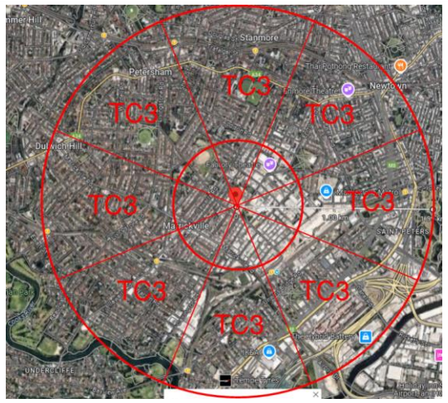
These hinge and sliding doors to the ground level located within the façade will include automated operation opening & closing devices as well as flush thresholds combined with the use of strip drains for water ingress control. It is acknowledged that DDA door thresholds generally require modifications to door suites which may adversely affect the weatherproofing performance. Door suites are expected to be provided with demonstrated successful testing when standard sill thresholds are utilised, these may be subsequently modified for DDA flush thresholds.

Provision of decals for visibility shall be in accordance with AS1288 to the architect's design.

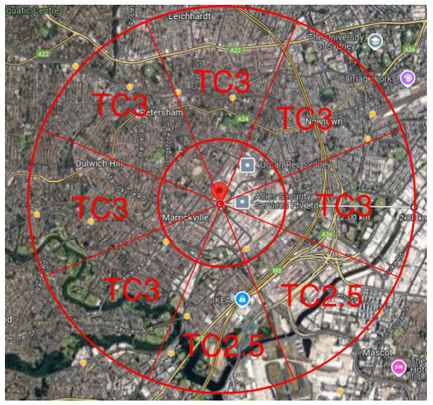
4.0 Façade Wind Analysis

As part of the preliminary façade works Inhabit have conducted an AS/NZS 1170.2 wind pressure analysis. Due to the large number of buildings on the site, buildings of similar height have been grouped together for the purposes of wind analysis. The results are summarised below.

4.1 Surrounding Terrain Category Assessment



Terrain Category Map – Buildings A,C,D,F,G



Terrain Category Map – Buildings B,E

4.2 Wind Load Summary

Refer Appendix B for Detailed Wind Calculation Summaries.

Building	Type of Pressure	Equally Permeable		Vented Façade Condition	
		Ultimate Pressure	Serviceability Pressure	Ultimate Pressure	Serviceability Pressure
A,C,D,F,G	Largest Positive	**+1.76 kPa**	**+1.14 kPa**	**+3.88 kPa**	**+1.14 kPa**
	Largest Negative	**-2.54 kPa**	**-1.65 kPa**	**-3.81 kPa**	**-1.65 kPa**
B, E	Largest Positive	**+1.95 kPa**	**+1.27 kPa**	**+4.32 kPa**	**+1.27 kPa**
	Largest Negative	**-2.82 kPa**	**-1.83 kPa**	**-4.24 kPa**	**-1.83 kPa**

4.3 Dominant Openings in Facade

Per AS/NZS1170.2, potential openings in a building envelope (such as operable windows and doors) can significantly impact on the wind pressure behaviour of a building during high wind events if left open. A project specific wind mitigation strategy focussed on helping ensure windows and doors are closed during such events is recommended to be developed in the subseqeunt project design phases. Strategies such as administrative controls, owner operator agreements, self-shutting and latching window hardware are some low-cost effective measures to achieve this.

4.4 Vertical Termination Height

AS4654.2 requires a vertical height from membrane at external surface to internal surface, related to project Ultimate Limit State site design wind speeds. The following approximate wind speed and associated vertical termination height has been calculated using the previous wind analysis results.

- Buildings A, C, D, F, G – 46.55 m/s
- Buildings B, E – 49.12 m/s

APPENDIX A

VERTICAL UPWARD TERMINATION HEIGHTS

(Informative)

This Appendix applies to the determination of vertical upward termination of height as given in Table A1.

The vertical heights may be determined by either of the following methods:

(a) Vertical upward termination to be at a height above finished level not less than specified in Table A1.

(b) Where stormwater retention is designed into the waterproofed area, the height of the upturn to be above the overflow level.

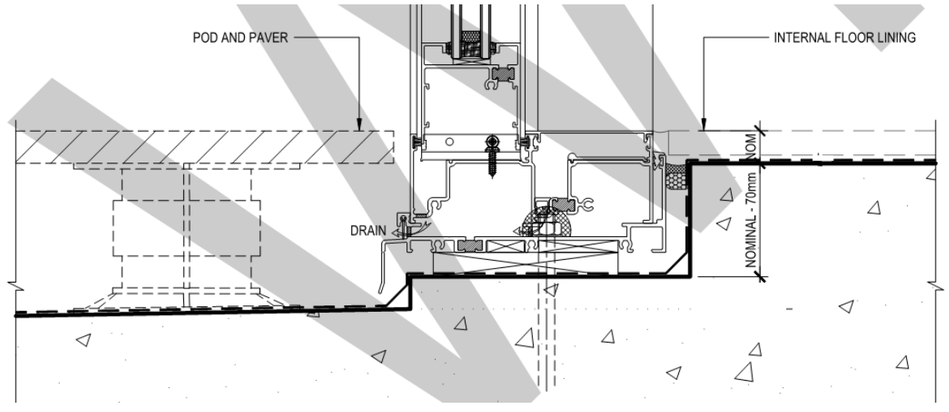
TABLE A1

VERTICAL UPWARD TERMINATION HEIGHTS

Wind class Regions A and B (non-cyclonic) AS 4055	Wind class Regions C and D (cyclonic) AS 4055	Ultimate limit state wind speed ($V_{h,u}$) AS/NZS 1170.2	Termination height mm
N1	—	34	40
N2	—	40	50
N3	C1	50	70
N4	C2	61	100
N5	C3	74	150
N6	C4	86	180

AS4654.2 Extract

As such, the window and door thresholds are recommended to incorporate a min 70mm setdown + allowances for tolerance and falls to drainage outlets.



5.0 Façade Design Sketches

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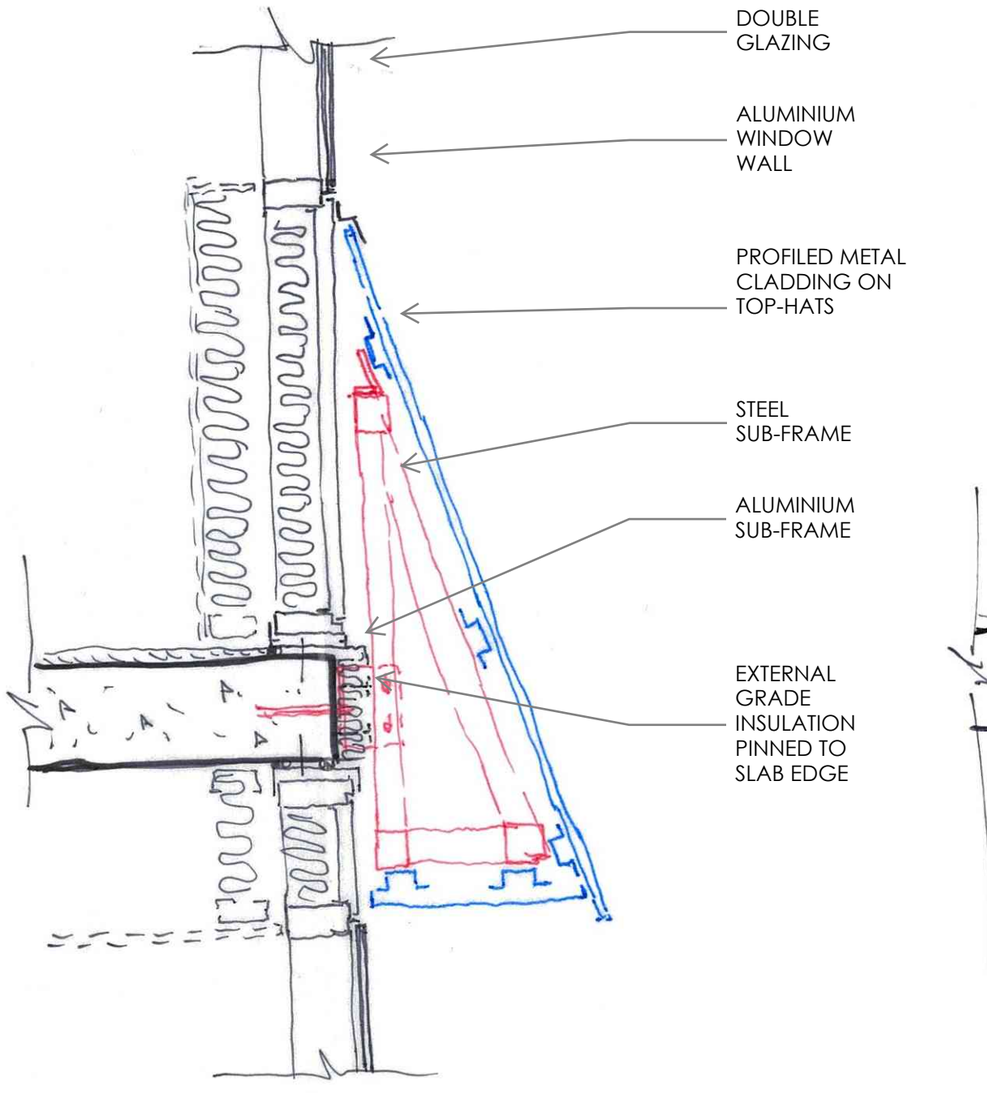
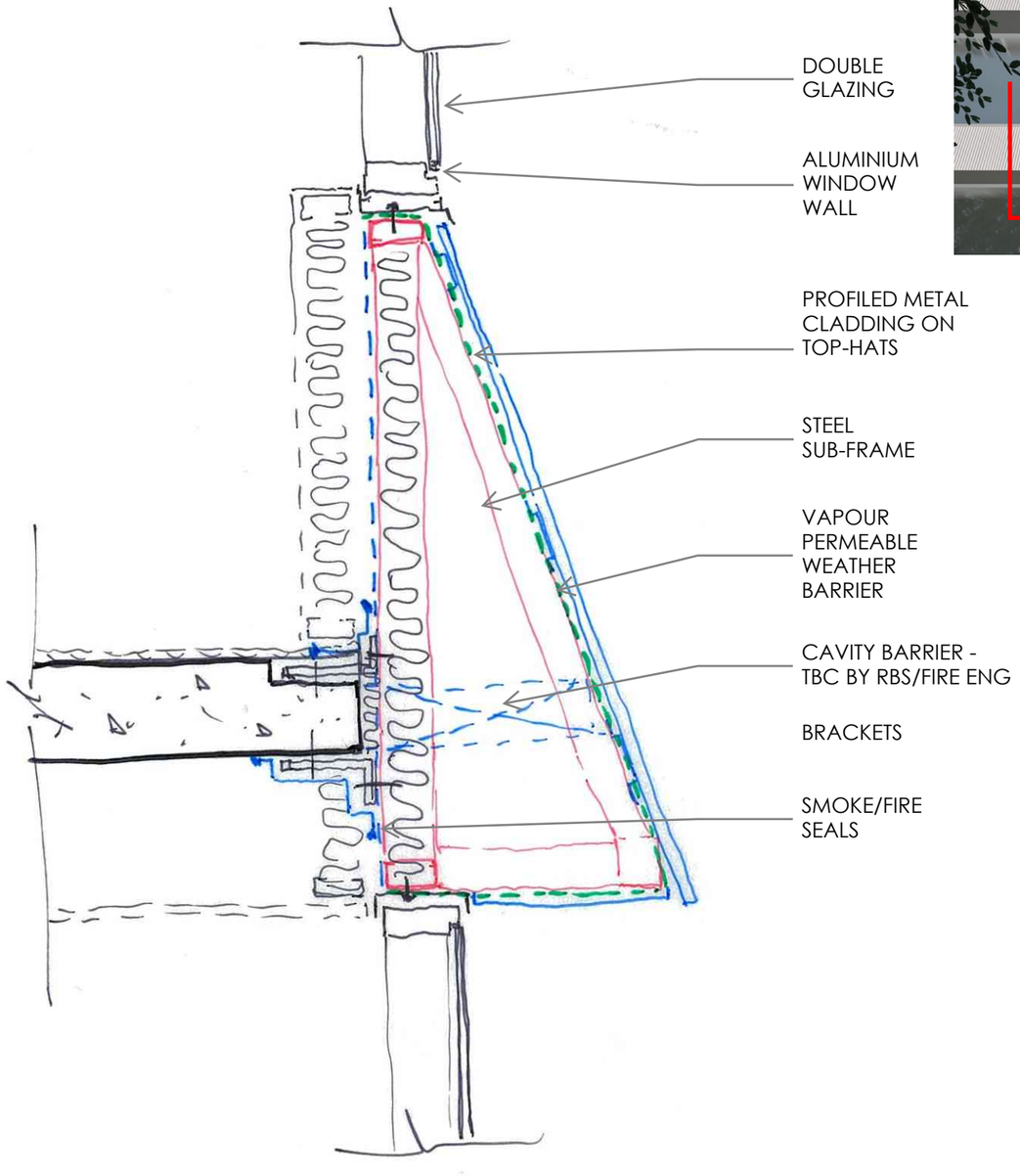


OPTION 1 - FULL HEIGHT WINDOW WALL + SEPARATE EYEBROW



OPTION 2 - CLAD FRAME SPANDREL WITH INBETWEEN WINDOW WALL

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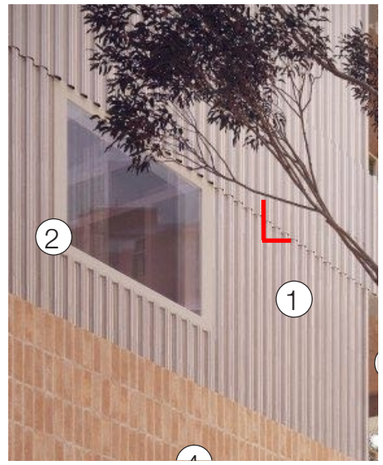

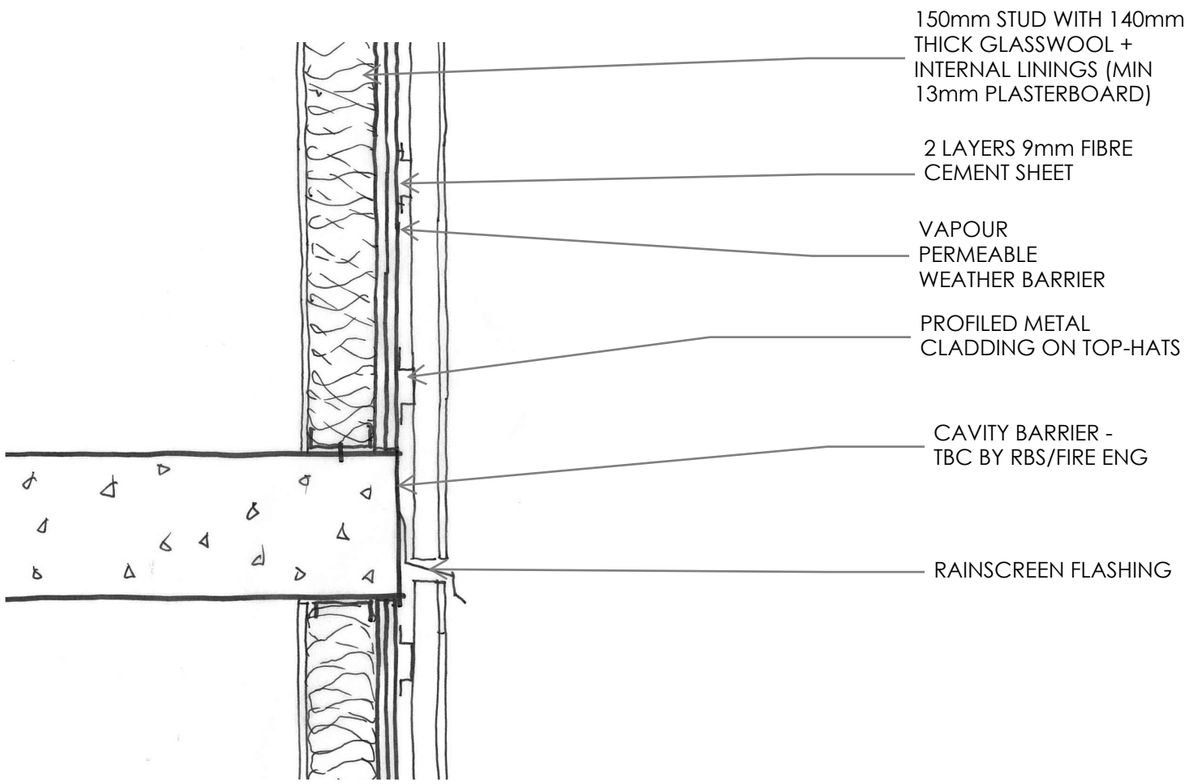

RAINSCREEN CLADDING
CUSTOM ORB FINISH

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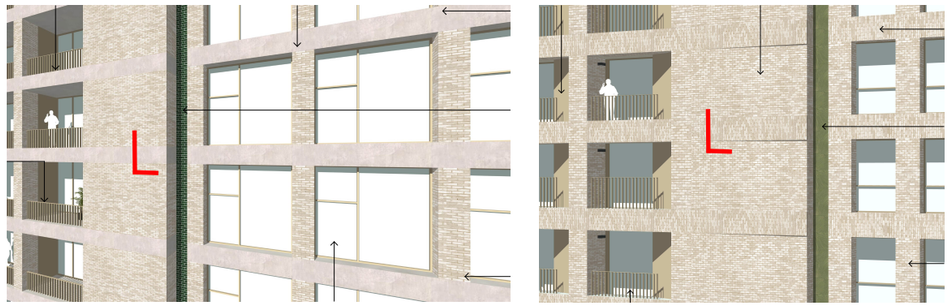
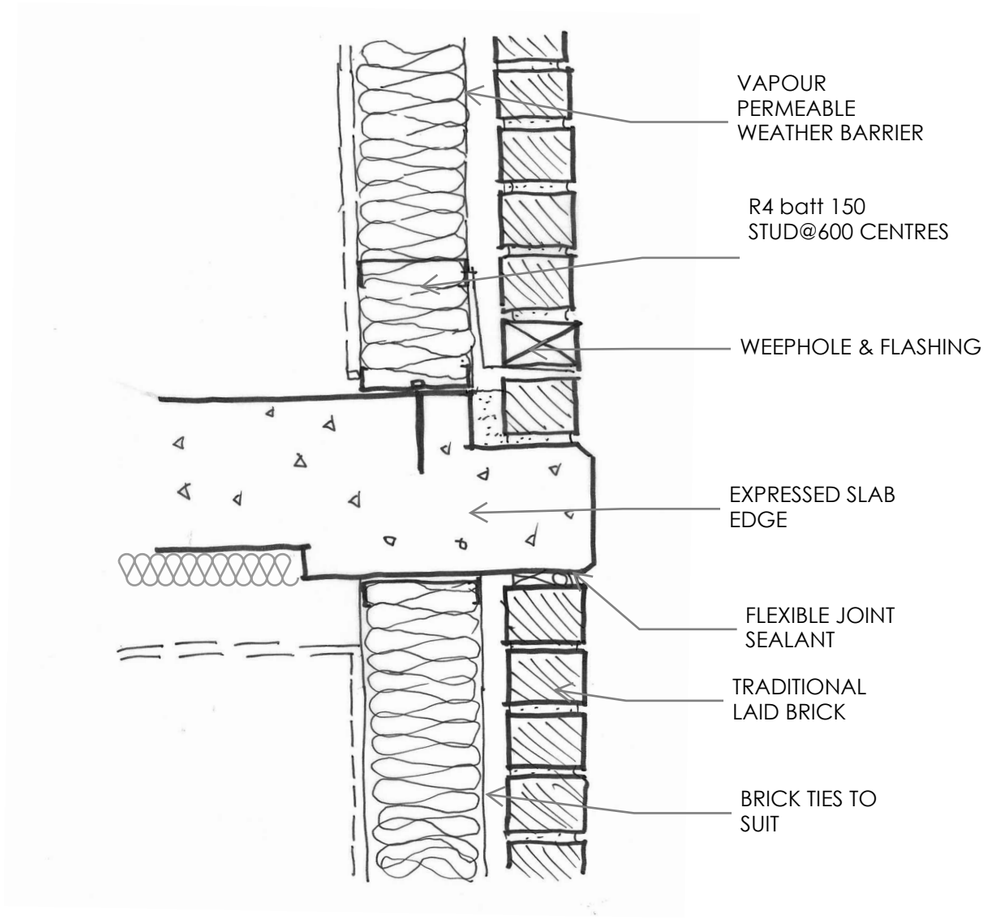
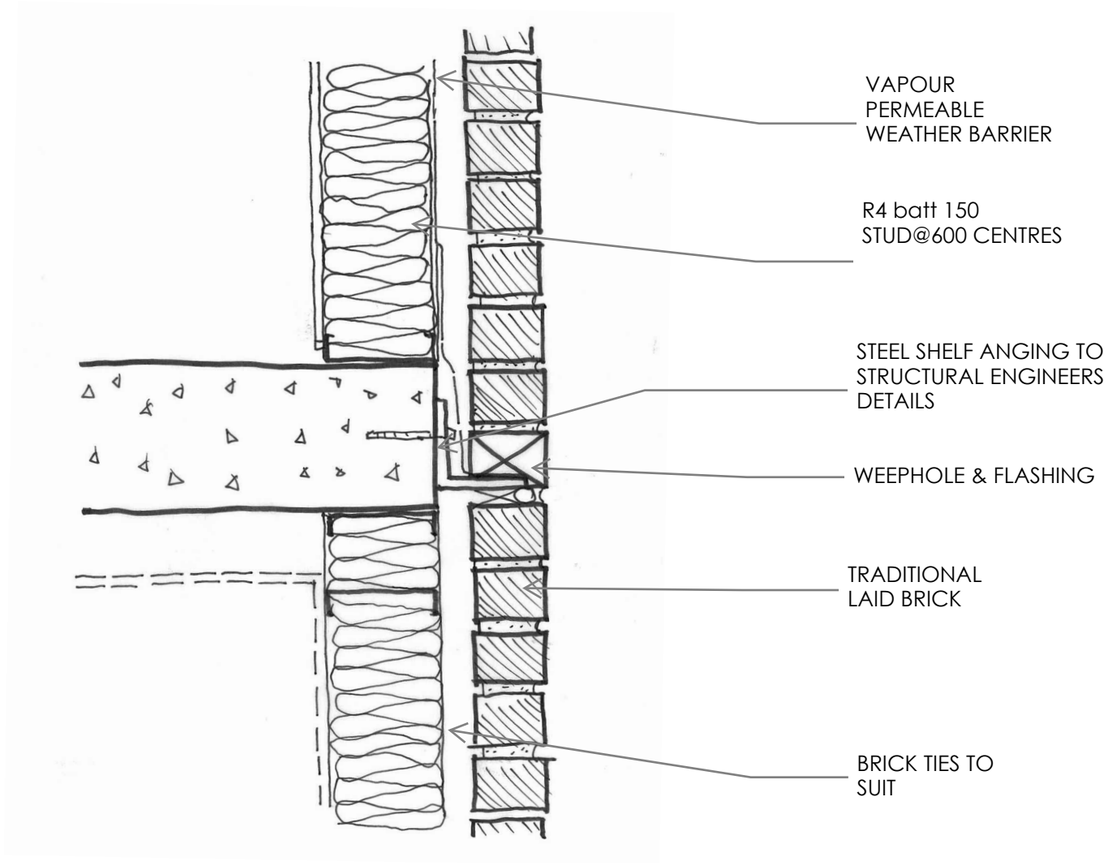




OPTION 1 - BRICK VENEER
EXPRESSED SLAB



OPTION 2 - BRICK VENEER
BRICK OVER SLAB

A Appendix A – Glazing System Acoustic Data

System Description	Supplier	System Name	Glass tested	Test Report Ref	Rw (C;Ctr) dB	Notes
Fixed 150 front glazed window wall	Capral	419 Flushline 150 Fixed	6/12/10.38	4870-30	37 (-1;-4)	
			6/12/10.5 VLAM Hush	4870-29	40 (-2;-6)	
	Capral	419 Futureline thermally broken 150 Fixed	6/12/10.38	TL613-03-1	39 (-2;-4)	
			6/16/10.5 VLAM Hush	TL613-04-1	41 (-2;-5)	
	AWS	FrontGLAZED double glazed framing	6/12/6	Pending	32 (-2;-5)	
			12.5 vlam hush	Pending	39 (-1;-3)	
Top Hung Awning sash	Capral	Futureline Awning	6/12/10.38	TL599-03-1	36 (0;-2)	Cam handles on either jamb
			6/12/10.5 VLam Hush	TL599-04-1	38 (-1;-3)	Cam handles on either jamb
	Capral	50 Series Awning	10.38/12/6.38	ATF1787	40 (-1;-4)	Central cam Handle
	AWS	466 Commercial Awning	6/12/6.5 Vlam Hush	4867-11	40 (-1;-5)	
			6.5 vlam hus/10/8.5 vlam hush	4867-10	41 (-1;-5)	
		726 thermalheart awning	6/12/6.5 Vlam Hush	4867-13	40 (-1;-5)	
			6.5 Vlam hush/10/8.5 Vlam hush	4867-12	41 (-1;-5)	
XO Manual Sliding Door	Capral	994TB Thermally Broken Sliding Door	6.5 Vlam Hush/12/6	TL762-35-2	37 (-1;-3)	
			6 /10/10.38	TL762-32-2	36 (-2;-3)	
			6 /10/10.5 vlam Hush	TL762-31-2	35 (-1;-2)	
	AWS	731 thermally broken Sliding Door	6.5 vlam hus/10/8.5 vlam hush	4867-14	37 (-1;-3)	
			6/12/6.5 vlam Hush	4867-15	37 (-1;-4)	
		704 series sliding door	6/8/10.38	ALA 14-087-2	35 (0;-2)	
	Reynaers	Slimpatio 68 XQ Door	8/16/6	AC7735	35 (-4;-4)	
			8.5 lam /16/6	AC7736	39 (-2;-5)	
			8.5 lam /16/8	AC7737	40 (-2;-4)	
		MasterPatio xx Lift & Slide	12.76/16/16.76	22-002767-PR01	41 (-12,-2)	Lift & slide hardware
Outwards Opening Hinge Door	Capral	225 Series hine door in 400 narrowline frame	6/12/10.5 Vlam Hush	TL620-26-1	36 (-1;-2)	Triple point lock hardware
			6/12/10.5 Vlam Hush	TL620-27-1	31 (-1;-1)	Single point lock
	Reynaers	Masterline 8 hinge door	6/16/6 6/20/4 6/20/8 6/20/8.76 8/16/12.76 Lam 8.76/20/12.76 Lam 16.76/16/12.76 Lam	Q2394.01-113-11-R0	Various	

B Appendix B – AS/NZS 1170.2 Wind Calculations

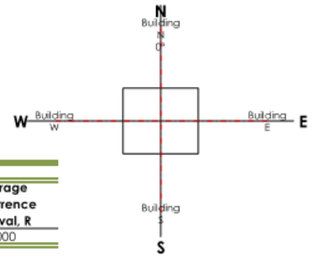
Buildings B & E: Equally Permeable Façade Condition

Wind Assessment to AS/NZS1170.2-2021

Project:	Marrickville TimberYards	**No:**	SY-22441	**Date:**	2024.10.21
Subject:	Building B & E	**By:**	JJ	**Rev:**	00

BUILDING INFORMATION

Element Design	Building Orientation -45°<θ<45°	Height h m	Depth d m	Width b m	Selected Height z m	a m
Cladding	0	48	19	73.6	48	3.8



WIND CLASSIFICATION

Terrain Category	Region	Building Importance Level	Design Working Life	Limit State	Average Recurrence Interval, R
3	A2	3	50 Years	Ultimate	1000

SITE WIND SPEED

Wind Direction	Terrain Category	V_R m/s	M_c	M_d	M_s	M_t	$M_{h,cat}$	$M_{z,cat}$	$V_{site,\beta,h}$ m/s	$V_{site,\beta,z}$ m/s
North	3	46.0	1.00	0.85	1.00	1.00	1.06	1.06	41.60	41.60
North East	3	46.0	1.00	0.75	1.00	1.00	1.06	1.06	36.71	36.71
East	3	46.0	1.00	0.85	1.00	1.00	1.06	1.06	41.60	41.60
South East	2.5	46.0	1.00	0.95	1.00	1.00	1.12	1.12	49.12	49.12
South	2.5	46.0	1.00	0.95	1.00	1.00	1.12	1.12	49.12	49.12
South West	3	46.0	1.00	0.95	1.00	1.00	1.06	1.06	46.50	46.50
West	3	46.0	1.00	1.00	1.00	1.00	1.06	1.06	48.94	48.94
North West	3	46.0	1.00	0.95	1.00	1.00	1.06	1.06	46.50	46.50

POSITIVE PRESSURES

Building Elevation	$V_{des,\theta,h}$ m/s	$V_{des,\theta,z}$ m/s	$q_{h(u)}$ kPa	$q_{z(u)}$ kPa	Area (A) m^2	K_l	K_c	$C_{p,e}$	$C_{p,i}$	$P_{h(u)}$ kPa	$P_{z(u)}$ kPa
North	46.50	46.50	1.30	1.30	3.61	1.5	0.9	0.80	-0.30	1.75	1.75
East	49.12	49.12	1.45	1.45	3.61	1.5	0.9	0.80	-0.30	1.95	1.95
South	49.12	49.12	1.45	1.45	3.61	1.5	0.9	0.80	-0.30	1.95	1.95
West	48.94	48.94	1.44	1.44	3.61	1.5	0.9	0.80	-0.30	1.94	1.94

NEGATIVE PRESSURES

Building Elevation	Zones	Aspect Ratio r	Pressure Zones		Area (A) m^2	K_l	K_c	$q_{h(u)}$ kPa	$C_{p,e}$	$C_{p,i}$	$P_{h(u)}$ kPa
East	NE Corner North Wind	2.5	SA5	0 - 1.9m	3.61	3.0	1.0	1.30	-0.65	0.00	-2.53
			SA4	1.9m - 3.8m	14.44	2.0	1.0	1.30	-0.65	0.00	-1.69
			SA3	> 3.8m	3.61	1.5	1.0	1.30	-0.65	0.00	-1.26
	SE Corner South Wind	2.5	SA5	0 - 1.9m	3.61	3.0	1.0	1.45	-0.65	0.00	-2.82
			SA4	1.9m - 3.8m	14.44	2.0	1.0	1.45	-0.65	0.00	-1.88
			SA3	> 3.8m	3.61	1.5	1.0	1.45	-0.65	0.00	-1.41
North	NE Corner East Wind	2.5	SA5	0 - 1.9m	3.61	3.0	1.0	1.45	-0.65	0.00	-2.82
			SA4	1.9m - 3.8m	14.44	2.0	1.0	1.45	-0.65	0.00	-1.88
			SA3	> 3.8m	3.61	1.5	1.0	1.45	-0.65	0.00	-1.41
	NW Corner West Wind	2.5	SA5	0 - 1.9m	3.61	3.0	1.0	1.44	-0.65	0.00	-2.80
			SA4	1.9m - 3.8m	14.44	2.0	1.0	1.44	-0.65	0.00	-1.87
			SA3	> 3.8m	3.61	1.5	1.0	1.44	-0.65	0.00	-1.40
West	NW Corner North Wind	2.5	SA5	0 - 1.9m	3.61	3.0	1.0	1.30	-0.65	0.00	-2.53
			SA4	1.9m - 3.8m	14.44	2.0	1.0	1.30	-0.65	0.00	-1.69
			SA3	> 3.8m	3.61	1.5	1.0	1.30	-0.65	0.00	-1.26
	SW Corner South Wind	2.5	SA5	0 - 1.9m	3.61	3.0	1.0	1.45	-0.65	0.00	-2.82
			SA4	1.9m - 3.8m	14.44	2.0	1.0	1.45	-0.65	0.00	-1.88
			SA3	> 3.8m	3.61	1.5	1.0	1.45	-0.65	0.00	-1.41
South	SE Corner East Wind	2.5	SA5	0 - 1.9m	3.61	3.0	1.0	1.45	-0.65	0.00	-2.82
			SA4	1.9m - 3.8m	14.44	2.0	1.0	1.45	-0.65	0.00	-1.88
			SA3	> 3.8m	3.61	1.5	1.0	1.45	-0.65	0.00	-1.41
	SW Corner West Wind	2.5	SA5	0 - 1.9m	3.61	3.0	1.0	1.44	-0.65	0.00	-2.80
			SA4	1.9m - 3.8m	14.44	2.0	1.0	1.44	-0.65	0.00	-1.87
			SA3	> 3.8m	3.61	1.5	1.0	1.44	-0.65	0.00	-1.40

Buildings B & E Dominant Opening Façade Condition

DESIGN POSITIVE WIND PRESSURES

Dominant Opening - Side Wall

Opening Width (m)	Opening Height (m)	Internal Volume V (m^3)	Opening Area A (m^2)	$100A^{1.6}/V$	Factor K_a
1.5	2.8	150	4.2	5.74	1.085

Aerodynamic shape factor - INTERNAL

K_a	$K_{c,i}$	K_l	$C_{p,e}$	$C_{p,i}$	$C_{net,i}$
1.085	0.9	3.0	-0.65	-1.95	-1.90

Aerodynamic shape factor - EXTERNAL

K_a	$K_{c,e}$	K_l	$C_{p,e}$	$C_{net,e}$
1.00	0.90	1.50	0.80	1.08

Design Postive Wind Pressures

Building Elevation	$q_{h(u)}$ kPa	$q_{z(u)}$ kPa	Area (A) m^2	C_{net}	$P_{h(u)}$ kPa	$P_{z(u)}$ kPa
North	1.30	1.30	3.61	2.98	3.87	3.87
East	1.45	1.45	3.61	2.98	4.32	4.32
South	1.45	1.45	3.61	2.98	4.32	4.32
West	1.44	1.44	3.61	2.98	4.29	4.29

Table 5.1(B) — Internal pressure coefficients ($C_{p,i}$) for buildings with openings greater than 0.5 % of the area of the corresponding wall or roof

Ratio of area of openings on one surface to the sum of the total open area (including permeability) of other wall and roof surfaces	Largest opening on windward wall	Largest opening on leeward wall	Largest opening on side wall	Largest opening on roof
0.5 or less	−0.3, 0.0	−0.3, 0.0	−0.3, 0.0	−0.3, 0.0
1	−0.3, 0.2	−0.3, 0.0	−0.3, 0.0	−0.3, 0.0
2	0.7 $K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$
3	0.85 $K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$
6 or more	$K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$	$K_a K_l C_{p,e}$
	(1-1/3n) 1	(1-1/3n) 1	(1-1/3n) 1	(1-1/3n) 1

NOTE 1 $C_{p,e}$ is the relevant external pressure coefficient at the location of the largest opening. For example, in Column 2, $C_{p,e}$ means the windward wall pressure coefficient obtained from Table 5.2(A) in Column 3, $C_{p,e}$ means the leeward wall pressure coefficient obtained from Table 5.2(B), in Column 5, $C_{p,e}$ means the side wall pressure coefficient for that part of the roof containing the opening.

NOTE 2 K_a is the area reduction factor related to the total area of the opening(s), A_o on the surface under consideration treating the "tributary area" as the area of the opening. See Clause 5.4.2.

NOTE 3 K_l is the local pressure factor, based on the area and location of the opening on the surface under consideration, treating the "Area, A" as the area of the opening. See Clause 5.4.3.

NOTE 4 Surfaces with openings have a ratio of total open area, A_o to the total area of that surface related to the internal volume (V_o) under consideration, greater than 0.5 %.

DESIGN NEGATIVE WIND PRESSURES

Dominant Opening - Windward Wall

Opening Width (m)	Opening Height (m)	Internal Volume V (m^3)	Opening Area A (m^2)	$100A^{1.6}/V$	Factor K_a	a (m)
1.5	2.8	150	4.2	5.74	1.085	3.8

Aerodynamic shape factor - INTERNAL

K_a	$K_{c,i}$	K_a	K_l	$C_{p,e}$	$C_{p,i}$	$C_{net,i}$
1.085	0.9	1.0	1.5	0.8	1.20	1.17

Design Postive Wind Pressures

Building Elevation	Zones	Aspect Ratio r	Pressure Zones		Area (A) m^2	K_l	$K_{c,e}$	$C_{net,e}$	$C_{net,i}$	C_{net}	$q_{h(u)}$ kPa	$P_{h(u)}$ kPa
East	NE Corner North Wind	2.5	SA5	0 - 1.9m	3.61	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.30	-3.80
			SA4	1.9m - 3.8m	14.44	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.30	-3.04
			SA3	> 3.8m	3.61	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.30	-2.66
	SE Corner South Wind	2.5	SA5	0 - 1.9m	3.61	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.45	-4.24
			SA4	1.9m - 3.8m	14.44	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.45	-3.39
			SA3	> 3.8m	3.61	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.45	-2.97
North	NE Corner East Wind	2.5	SA5	0 - 1.9m	3.61	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.45	-4.24
			SA4	1.9m - 3.8m	14.44	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.45	-3.39
			SA3	> 3.8m	3.61	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.45	-2.97
	NW Corner West Wind	2.5	SA5	0 - 1.9m	3.61	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.44	-4.21
			SA4	1.9m - 3.8m	14.44	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.44	-3.37
			SA3	> 3.8m	3.61	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.44	-2.95
West	NW Corner North Wind	2.5	SA5	0 - 1.9m	3.61	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.30	-3.80
			SA4	1.9m - 3.8m	14.44	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.30	-3.04
			SA3	> 3.8m	3.61	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.30	-2.66
	SW Corner South Wind	2.5	SA5	0 - 1.9m	3.61	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.45	-4.24
			SA4	1.9m - 3.8m	14.44	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.45	-3.39
			SA3	> 3.8m	3.61	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.45	-2.97
South	SE Corner East Wind	2.5	SA5	0 - 1.9m	3.61	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.45	-4.24
			SA4	1.9m - 3.8m	14.44	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.45	-3.39
			SA3	> 3.8m	3.61	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.45	-2.97
	SW Corner West Wind	2.5	SA5	0 - 1.9m	3.61	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.44	-4.21
			SA4	1.9m - 3.8m	14.44	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.44	-3.37
			SA3	> 3.8m	3.61	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.44	-2.95

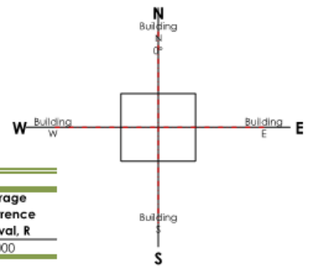
Buildings A, C, D, F, G Equally Permeable Façade Condition

Wind Assessment to AS/NZS1170.2-2021

Project:	Marrickville TimberYards	**No:**	SY-22441	**Date:**	2024.10.17
Subject:	Building A, C, D, F, G, H	**By:**	JJ	**Rev:**	00

BUILDING INFORMATION

Element Design	Building Orientation -45°<θ<45°	Height h m	Depth d m	Width b m	Selected Height z m	a m
Cladding	0	33	19.1	90.5	33	3.82



WIND CLASSIFICATION

Terrain Category	Region	Building Importance Level	Design Working Life	Limit State	Average Recurrence Interval, R
3	A2	3	50 Years	Ultimate	1000

SITE WIND SPEED

Wind Direction	Terrain Category	V_R m/s	M_c	M_d	M_s	M_l	$M_{h,cat}$	$M_{z,cat}$	$V_{site,\beta,h}$ m/s	$V_{site,\beta,z}$ m/s
North	3	46.0	1.00	0.85	1.00	1.00	1.01	1.01	39.57	39.57
North East	3	46.0	1.00	0.75	1.00	1.00	1.01	1.01	34.91	34.91
East	3	46.0	1.00	0.85	1.00	1.00	1.01	1.01	39.57	39.57
South East	3	46.0	1.00	0.95	1.00	1.00	1.01	1.01	44.22	44.22
South	3	46.0	1.00	0.95	1.00	1.00	1.01	1.01	44.22	44.22
South West	3	46.0	1.00	0.95	1.00	1.00	1.01	1.01	44.22	44.22
West	3	46.0	1.00	1.00	1.00	1.00	1.01	1.01	46.55	46.55
North West	3	46.0	1.00	0.95	1.00	1.00	1.01	1.01	44.22	44.22

POSITIVE PRESSURES

Building Elevation	$V_{des,\theta,h}$ m/s	$V_{des,\theta,z}$ m/s	$q_{h(u)}$ kPa	$q_{z(u)}$ kPa	Area (A) m^2	K_l	K_c	$C_{p,e}$	$C_{p,i}$	$P_{h(u)}$ kPa	$P_{z(u)}$ kPa
North	44.22	44.22	1.17	1.17	3.65	1.5	0.9	0.80	-0.30	1.58	1.58
East	44.22	44.22	1.17	1.17	3.65	1.5	0.9	0.80	-0.30	1.58	1.58
South	44.22	44.22	1.17	1.17	3.65	1.5	0.9	0.80	-0.30	1.58	1.58
West	46.55	46.55	1.30	1.30	3.65	1.5	0.9	0.80	-0.30	1.76	1.76

NEGATIVE PRESSURES

Building Elevation	Zones	Aspect Ratio r	Pressure Zones		Area (A) m^2	K_l	K_c	$q_{h(u)}$ kPa	$C_{p,e}$	$C_{p,i}$	$P_{h(u)}$ kPa
East	NE Corner North Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	1.0	1.17	-0.65	0.00	-2.29
			5A4	1.95m - 3.9m	14.5924	2.0	1.0	1.17	-0.65	0.00	-1.53
			5A3	> 3.9m	3.6481	1.5	1.0	1.17	-0.65	0.00	-1.14
	SE Corner South Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	1.0	1.17	-0.65	0.00	-2.29
			5A4	1.95m - 3.9m	14.5924	2.0	1.0	1.17	-0.65	0.00	-1.53
			5A3	> 3.9m	3.6481	1.5	1.0	1.17	-0.65	0.00	-1.14
North	NE Corner East Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	1.0	1.17	-0.65	0.00	-2.29
			5A4	1.95m - 3.9m	14.5924	2.0	1.0	1.17	-0.65	0.00	-1.53
			5A3	> 3.9m	3.6481	1.5	1.0	1.17	-0.65	0.00	-1.14
	NW Corner West Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	1.0	1.30	-0.65	0.00	-2.54
			5A4	1.95m - 3.9m	14.5924	2.0	1.0	1.30	-0.65	0.00	-1.69
			5A3	> 3.9m	3.6481	1.5	1.0	1.30	-0.65	0.00	-1.27
West	NW Corner North Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	1.0	1.17	-0.65	0.00	-2.29
			5A4	1.95m - 3.9m	14.5924	2.0	1.0	1.17	-0.65	0.00	-1.53
			5A3	> 3.9m	3.6481	1.5	1.0	1.17	-0.65	0.00	-1.14
	SW Corner South Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	1.0	1.17	-0.65	0.00	-2.29
			5A4	1.95m - 3.9m	14.5924	2.0	1.0	1.17	-0.65	0.00	-1.53
			5A3	> 3.9m	3.6481	1.5	1.0	1.17	-0.65	0.00	-1.14
South	SE Corner East Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	1.0	1.17	-0.65	0.00	-2.29
			5A4	1.95m - 3.9m	14.5924	2.0	1.0	1.17	-0.65	0.00	-1.53
			5A3	> 3.9m	3.6481	1.5	1.0	1.17	-0.65	0.00	-1.14
	SW Corner West Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	1.0	1.30	-0.65	0.00	-2.54
			5A4	1.95m - 3.9m	14.5924	2.0	1.0	1.30	-0.65	0.00	-1.69
			5A3	> 3.9m	3.6481	1.5	1.0	1.30	-0.65	0.00	-1.27

Buildings A, C, D, F, G Dominant Opening Façade Condition

DESIGN POSITIVE WIND PRESSURES

Dominant Opening - Side Wall

Opening Width (m)	Opening Height (m)	Internal Volume V (m^3)	Opening Area A (m^2)	$100A^{1.5}/V$	Factor K_c
1.5	2.8	150	4.2	5.74	1.085

Aerodynamic shape factor - INTERNAL

K_c	$K_{c,l}$	K_l	$C_{p,e}$	$C_{p,i}$	$C_{dyn,i}$
1.085	0.9	3.0	-0.65	-1.95	-1.90

Aerodynamic shape factor - EXTERNAL

K_p	$K_{c,e}$	K_l	$C_{p,e}$	$C_{dyn,e}$
1.00	0.90	1.50	0.80	1.08

Design Postive Wind Pressures

Building Elevation	$q_{h,i}$ kPa	$q_{h(u)}$ kPa	Area (A) m^2	C_{pe}	$P_{h,i}$ kPa	$P_{z(u)}$ kPa
North	1.17	1.17	3.65	2.98	3.50	3.50
East	1.17	1.17	3.65	2.98	3.50	3.50
South	1.17	1.17	3.65	2.98	3.50	3.50
West	1.30	1.30	3.65	2.98	3.88	3.88

Table 5.1(B) — Internal pressure coefficients ($C_{p,i}$) for buildings with openings greater than 0.5 % of the area of the corresponding wall or roof

Ratio of area of openings on one surface to the sum of the total open area (including permeability) of other wall and roof surfaces	Largest opening on windward wall	Largest opening on leeward wall	Largest opening on side wall	Largest opening on roof
0.5 or less	−0.3, 0.0	−0.3, 0.0	−0.3, 0.0	−0.3, 0.0
1	−0.1, 0.2	−0.3, 0.0	−0.3, 0.0	−0.3, 0.0
2	$0.7\,K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$
3	$0.85\,K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$
6 or more	$K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$	$K_l\,K_c\,C_{p,e}$
	(5.1(3)-1			

NOTE 1 $C_{p,e}$ is the relevant external pressure coefficient at the location of the largest opening. For example, in Column 2, $C_{p,e}$ means the windward wall pressure coefficient obtained from Table 5.2(A) in Column 3, $C_{p,e}$ means the leeward wall pressure coefficient obtained from Table 5.2(B), in Column 5, $C_{p,e}$ means the roof pressure coefficient for that part of the roof containing the opening.

NOTE 2 K_l is the area reduction factor related to the total area of the opening(s), A_o on the surface under consideration treating the "tributary area" as the area of the opening. See Clause 5.4.2.

NOTE 3 K_l is the local pressure factor, based on the area and location of the opening on the surface under consideration, treating the "Area, A" as the area of the opening. See Clause 5.4.4.

NOTE 4 Surfaces with openings have a ratio of total open area, A_o to the total area of that surface related to the

DESIGN NEGATIVE WIND PRESSURES

Dominant Opening - Windward Wall

Opening Width (m)	Opening Height (m)	Internal Volume V (m^3)	Opening Area A (m^2)	$100A^{1.5}/V$	Factor K_c	a (m)
1.5	2.8	150	4.2	5.74	1.085	3.82

Aerodynamic shape factor - INTERNAL

K_c	$K_{c,l}$	K_a	K_l	$C_{p,e}$	$C_{p,i}$	$C_{dyn,i}$
1.085	0.9	1.0	1.5	0.8	1.20	1.17

Design Positive Wind Pressures

Building Elevation	Zones	Aspect Ratio r	Pressure Zones		Area (A) m^2	K_l	$K_{c,e}$	$C_{p,e}$	$C_{dyn,e}$	$C_{dyn,i}$	C_{dyn}	$q_{h(u)}$ kPa	$P_{h(u)}$ kPa
East	NE Corner North Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.17	-3.43
			5A4	1.95m - 3.9m	14.5924	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.17	-2.75
			5A3	> 3.9m	3.6481	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.17	-2.40
	SE Corner South Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.17	-3.43
			5A4	1.95m - 3.9m	14.5924	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.17	-2.75
			5A3	> 3.9m	3.6481	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.17	-2.40
North	NE Corner East Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.17	-3.43
			5A4	1.95m - 3.9m	14.5924	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.17	-2.75
			5A3	> 3.9m	3.6481	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.17	-2.40
	NW Corner West Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.30	-3.81
			5A4	1.95m - 3.9m	14.5924	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.30	-3.04
			5A3	> 3.9m	3.6481	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.30	-2.66
West	NW Corner North Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.17	-3.43
			5A4	1.95m - 3.9m	14.5924	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.17	-2.75
			5A3	> 3.9m	3.6481	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.17	-2.40
	SW Corner South Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.17	-3.43
			5A4	1.95m - 3.9m	14.5924	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.17	-2.75
			5A3	> 3.9m	3.6481	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.17	-2.40
South	SE Corner East Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.17	-3.43
			5A4	1.95m - 3.9m	14.5924	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.17	-2.75
			5A3	> 3.9m	3.6481	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.17	-2.40
	SW Corner West Wind	1.7	5A5	0 - 1.95m	3.6481	3.0	0.9	-0.65	-1.76	1.17	-2.93	1.30	-3.81
			5A4	1.95m - 3.9m	14.5924	2.0	0.9	-0.65	-1.17	1.17	-2.34	1.30	-3.04
			5A3	> 3.9m	3.6481	1.5	0.9	-0.65	-0.88	1.17	-2.05	1.30	-2.66