# Sustainability Report

## The Mercantile Hotel

**25 George Street, The Rocks**

ESD REPORT


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# SUSTAINABILITY REPORT

## Activity Schedule

| Date | Revision | Issue | Prepared By | Approved By |
|---|---|---|---|---|
| 10.11.17 | 1 | Preliminary Issue | IVE | NVNV |
| 19.12.17 | 2 | SSDA Issue | IVE | NV |
| 18.12.18 | 3 | Updated SSDA Issue | IVE | NV |
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# TABLE OF CONTENTS


1. EXECUTIVE SUMMARY ..... 3
2. INTRODUCTION ..... 4
   2.1 GENERAL ..... 4
   2.2 PROJECT DESCRIPTION ..... 4
   2.3 SUSTAINABILITY OBJECTIVES ..... 5
   2.4 Response to Secretaries Environmental Assessment Requirements (SEARs) ..... 5
   2.5 LIMITATIONS ..... 5
3. Sustainability Initiatives ..... 6
   3.1 Energy Efficiency: ..... 6
   3.2 Indoor Environment Quality ..... 7
   3.3 Water Efficiency ..... 9
   3.4 Improved Ecology ..... 9
   3.5 Sustainable Transport ..... 9
   3.6 Waste Management ..... 11
4. National Construction Code (NCC) 2016 SECTION J ..... 12
5. Appendix 1 NCC 2016 Glazing Calculator outputs ..... 14
6. Appendix 2 Marked Up Thermal Envelope ..... 15

# 1. EXECUTIVE SUMMARY

This Sustainability Report outlines how the proposed refurbishment and expansion of The Mercantile Hotel meets the Secretary's Environmental Assessment Requirements (SEARs) as a state significant development.

The project is targeting the following sustainability objectives:

- Building Code of Australia – compliance with the requirements of Section J Energy Efficiency (mandatory);
- Address the Secretaries Environmental Assessment Requirements (SEARs); and
- Sustainability initiatives to improve the environmental and operational performance of the building.

Specific sustainability initiatives proposed for the building include, but are not limited to:

- Space efficient building layout;
- Energy efficient heating, ventilation and air conditioning including natural ventilation to open spaces;
- Water efficient building services;
- Reuse of the existing building with minimal demolition works;
- Responsible selection of materials;
- Waste minimisation strategies;
- Upgrade of existing aging and inefficient services; and
- Integration of a range of transport options.

# 2. INTRODUCTION

## 2.1 GENERAL

HBMS Pty Ltd are preparing a State Significant Development Application (SSD 17_8665) for the refurbishment and expansion of the Mercantile Hotel located at 25 George St, The Rocks.

The project is looking to create new roof top hospitality space and provide refurbishment to the hotel floors, expanding access to amenities and updating the decor.

Specifically, this proposal addresses the sustainability and ESD related elements for the development consent for the following works at the site:

- Internal reconfiguration and refurbishment of the existing heritage listed building to create:
    - Improved floor layouts;
    - Additional amenities; and
    - Better optimised kitchen and back of house areas.
- Construction of a new roof level hospitality space containing:
    - Roof terrace bar and restaurant;
    - Associated amenities;
    - Servery space;
    - Addition of a lift; and
    - Outdoor areas for food and beverage.
- Associated site landscaping and public domain improvements.

## 2.2 PROJECT DESCRIPTION

The Mercantile Hotel project incorporates the refurbishment and renewal of the hotel to accommodate a new rooftop bar & restaurant facilities and improve the amenity provided to hotel guests through the addition of ensuites alongside cosmetic refurbishments to the building interior. The project will provide high quality accommodation, dining and retail space, activating the surrounding area of the Rocks.

*Figure 1: Image of the current exterior of the building*

## 2.3 SUSTAINABILITY OBJECTIVES

The Mercantile Hotel project will be targeting the following sustainability objectives:

- Building Code of Australia – compliance with the requirements of Section J Energy Efficiency (mandatory);
- Address the Secretaries Environmental Assessment Requirements (SEARs); and
- Sustainability initiatives to improve the environmental performance of the buildings.

## 2.4 Response to Secretaries Environmental Assessment Requirements (SEARs)

This report addresses how the proposed project addresses Item 7 of the SEARs. These requirements are outlined below alongside where the response to each can be found within this report;

| Item | Action to Address The Requirement | Report Location |
|---|---|---|
| Detail how ESD principals (as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000) will be incorporated in the design and ongoing operation phases of the project. | This ESD report details how the project aims to address the ESD Principles and their incorporation into the design and ongoing operation of the project. | Section 3 |

## 2.5 LIMITATIONS

Due care and skill has been exercised in the preparation of this report.

No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Northrop for detailed advice, which will take into account that party's particular requirements.

# 3. SUSTAINABILITY INITIATIVES

The following section describes how ESD principals (as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000) are being incorporated in the design and ongoing operation phases of the project. These initiatives illustrate how the project addresses the following;

- The precautionary principle – through the implementation of environmental management and building maintainability, the project attempts to incorporate adaptability and resilience into the project design. The concepts behind the precautionary principle is to create spaces that can both; accommodate for changes, which may eventuate in the future, and avoid the risk of serious or irreversible damage to the environment.
- Inter-generational equity to ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations – through the inclusion of zero ozone depleting refrigerants, best practice PVC and low impact paints, sealants and adhesives, alongside a focus on providing greater vegetation and support for the buildings connection with nature, the project demonstrates a strong commitment to the preservation of environmental health, diversity and productivity of the local area.
- Conservation of biological diversity and ecological integrity – through the planting of native vegetation, improvement of stormwater runoff from the site and use of integrated landscaping, the project will act to improve, conserve and support the local biological diversity and integrity.
- Improved valuation, pricing and incentive mechanisms - the project has involved significant input from the Quantity Surveyor who will be involved throughout the entire design process to ensuring that the project both remains on budget and effectively considers environmental factors in the valuation of assets and services. Furthermore the project will look at maintainability and the operational costs associated with individual design initiatives and the overall design.

Through the inclusion of the above and the sustainability initiative outlined within this report the project clearly addresses the ESD Principles as defined in clause 7(4) of schedule 2 of the Environmental Planning and Assessment Regulation 2000. Further detail of the general sustainability initiatives are outlined below.

## 3.1 Energy Efficiency:

Energy efficiency will be considered throughout the design development process with the following improvements already considered as part of the design process;

### 3.1.1 Natural Ventilation of Circulation Spaces

The project incorporates new rooftop spaces. These areas will be able to operate as naturally ventilated spaces exploiting their elevated location. Central circulation spaces such as bathrooms and stairs will also look to incorporate natural ventilation.

### 3.1.2 Improved building fabric and glazing performance

The building envelope comprises a number of different façade types, with the proposed scheme using a combination of existing and new building fabrics and glazing to lower heat gains throughout summer while maintaining good views and daylighting throughout of the building.

The use of well-designed glazing and building materials will also assist the projects targets for energy efficiency, acoustic separation and thermal comfort.

### 3.1.3 HVAC System Control

The proposed HVAC system incorporates individual room control for thermal comfort conditions allowing building occupants and hotel guests to maintain comfort conditions suitable to the use and occupancy of spaces. This

system assists in optimising the sites energy efficiency while maintaining comfortable conditions within the conditioned areas and ensures that vacant rooms or spaces are not conditioned.

### 3.1.4 Energy Metering and Monitoring

An energy metering and monitoring strategy is to be considered to effectively monitor the main energy uses within the building, alongside the lighting and small power use. This aims to provide fault detection and monitoring of the different areas of the building.

### 3.1.5 Improved outdoor air provision

The project will aim to improve the outdoor air provided to regularly occupied spaces. This will minimise CO2 build up and improve comfort for the building occupants.

In order to address energy use concerns the design will also look to incorporate on an outdoor air economy cycle which will allow the building to exploit periods where the buildings external conditions can effectively provide thermal comfort in the space reducing the run times of the air-conditioning system.

### 3.1.6 Highly efficient lighting system

The installation of LED lighting in new areas and upgrading of existing lighting will assist in the minimisation of lighting energy use. Improved lighting energy also reduces the heat loads within the spaces and therefore lowers the energy used to condition the building.

### 3.1.7 Energy efficient domestic hot water

The use of gas boost (or heat pump) hot water systems will be explored throughout the detailed design process with an efficient solution incorporated into the final design.

### 3.1.8 Passive Design Measures

A focus has been placed on good passive design within the glazing and shading systems for the project. Examples of this includes the following;

- Northern eave overhangs on the rooftop glazing to prevent summer heat gain into the building while allowing winter warming;
- Deep eaves on the easterly facing doors to prevent glare and morning heat gains throughout summer;
- Use of well-designed western glazed areas to exploit overshadowing of adjacent buildings for peak occupancy periods; and
- Use of high performance thermal and acoustic insulation for the project extensions.

These measures can be seen on the shadow drawing provide as part of the SSDA submission (Drawings 405, 406 and 407).

## 3.2 Indoor Environment Quality

Indoor environment quality is always an important consideration in hospitality and retail projects. The following considerations have been considered as part of the building design:

### 3.2.1 Daylight Access

The design of the building addition aims to allow good daylight penetration into both internal and external spaces. This access to daylight throughout the building will both minimise energy used for lighting and will improve occupant connection to their external environment.

High level rooftop glaring has been provided to promote daylight access to the roof bar and restaurant areas with the addition of northern eave overhang to protect from excess heat loads.

### 3.2.2 Interior noise level control

Internal noise levels will be actively considered with the building layout and systems design considering how noise will reverberate through the building. The use of acoustic insulation and sound isolation will ensure that interior noise levels to be maintained below acceptable limits.

### 3.2.3 Material selection

Materials selection for the project aims to improve the internal environment of the site with materials with low volatile organic compound and formaldehyde content preferred to help minimise respiratory issues for building occupants.

Maximum TVOC limits for paints, adhesives and sealants are detailed in the table below:

*Table 1 Maximum TVOC Limits for Paints, Adhesives and Sealants*

| **Product Category** | **Max TVOC content in grams per litre (g/L) of ready to use product** |
|---|---|
| General purpose adhesives and sealants | 50 |
| Interior wall and ceiling paint, all sheen levels | 16 |
| Trim, varnishes and wood stains | 75 |
| Primers, sealers and prep coats | 65 |
| One and two pack performance coatings for floors | 140 |
| Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives | 250 |
| Structural glazing adhesive, wood flooring and laminate adhesives and sealants | 100 |

All engineered wood products used in the building will meet the relevant limits specified in the table below as per the specified test protocol, or have product specific evidence that it contains no formaldehyde.

*Table 2 Formaldehyde Emission Limit Values for Engineered Wood Products*

| **Test Protocol** | **Emission Limit/Unit of Measurement** |
|---|---|
| AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood | ≤1mg/ L |
| AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16 | ≤1.5 mg/L |
| AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16 | ≤1mg/ L |
| AS/NZS 4357.4 - Laminated Veneer Lumber (LVL) | ≤1mg/ L |
| Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL | ≤1mg/ L |
| JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460 | ≤1mg/ L |
| JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460 | ≤1mg/ L |
| JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates) | ≤0.1 mg/m²hr |

| | |
|---|---|
| ASTM D5116 (applicable to high pressure laminates and compact laminates) | ≤0.1 mg/m²hr |
| ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates | ≤0.1 mg/m²hr (at 3 days) |
| ASTM D6007 | ≤0.12mg/m³ |
| ASTM E1333 | ≤0.12mg/m³ |
| EN 717-1 (also known as DIN EN 717-1) | ≤0.12mg/m³ |
| EN 717-2 (also known as DIN EN 717-2) | ≤3.5mg/m²hr |

## 3.3 Water Efficiency

A strong focus has been put on the effective management of water within the building with the following initiatives being included in the design in all areas throughout the project:

### 3.3.1 Water efficient fixtures and fittings

Water Efficient fixtures and fitting will reduce the water consumption of the site. As an indication, the following should be targeted:

- Wash hand basin taps 6 star WELS
- General taps 6 star WELS
- Toilets dual flush 4 star WELS
- Urinals 0.8 L per flush 6 star WELS
- Shower heads 7-9 L per minutes 3WELS

### 3.3.2 Use of low maintenance landscaping

The sites landscaping will endeavour to incorporate native and low maintenance vegetation where possible which will significantly reduce the potable water consumption of the site.

### 3.3.3 Water Sensitive Urban Design

In line with the aim of the SEARs, the project in incorporating a strong focus on water sensitive urban design with the external landscape design assisting to minimise water use for irrigation. The inclusion within the design of a small “green roof” area will also assist in the reduction of site stormwater discharge and assist in the management of the projects broader impact on urban stormwater flows.

## 3.4 Improved Ecology

Through planting native vegetation and promoting improved interaction with the natural environment, the project will look to improve the site’s ecology and minimise the ongoing environmental impact of the project. The project is currently implementing the following:

- Incorporation of a green roof area;
- Minimisation of light spill from the facility which impacts on migratory animals and insects;
- Reduced dissolved pollutants in stormwater discharged from the site; and
- Adaption and reuse of a previously developed site.

## 3.5 Sustainable Transport

The project design is currently well located to support the use of active and sustainable transport. The site is highly walkable, in close proximity to Circular Quay for ferries, trains and busses, and is not providing additional parking as part of the proposed development in order to promote the use of public transport.

### 3.5.1 Walkability

Walk Score is a number between 0 and 100 that measures the walkability of any address. It is indicative of the number and type of existing amenities located nearby to the Mercantile Hotel. The project achieves a walk score of 98, a 'Walker's Paradise', in accordance with the website www.walkscore.com using their street smart method of calculation. For the purposes of this calculation at this stage, the address of the site has been taken as 25 George Street, The Rocks. Additionally with ongoing development of the area, further amenities will be provided within close proximity of the development into the future.

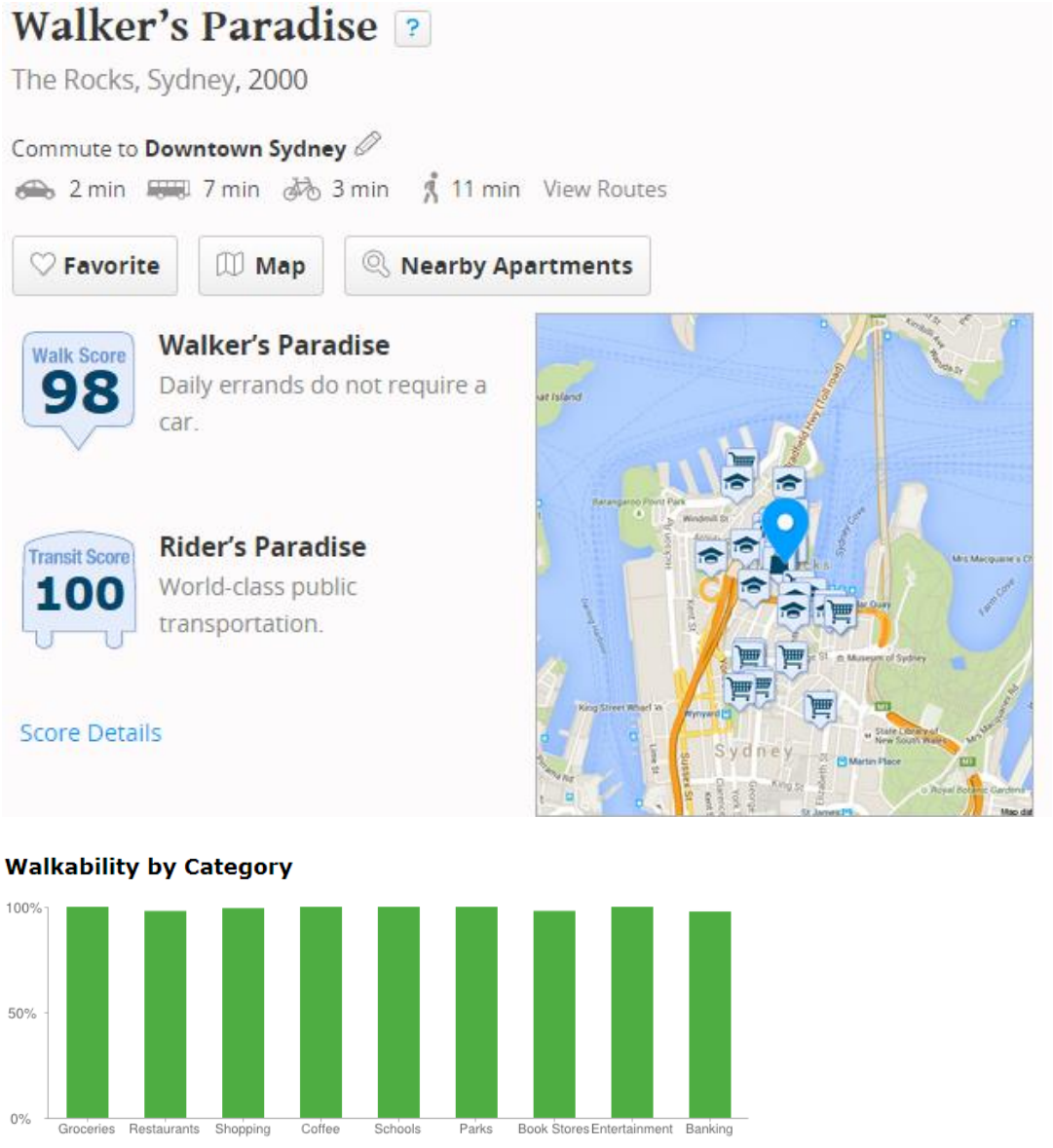


***Figure 1. Street Smart Walk Score Results***

## 3.6 Waste Management

Effective waste management throughout demolition, construction and operation of the site will help to promote resource efficiency and minimise the adverse environmental impacts of the project. The following are being considered as part of the design process;

### 3.6.1 Separated Waste and Recycling Streams

The provision of separated waste and recycling streams allows for more effective recycling of the projects operation waste. Providing separate bins for cardboard/paper waste, glass, food wastes, comingled recycling and general waste will improve the buildings operational efficiency and result in significant environmental benefits. Some additional waste management measures are detailed below;

### 3.6.2 Glass disposal

Restaurant facilities traditionally produce a large amount of glass waste which often results in significant waste storage requirements, noise issues at collection times, safety issues and a requirement for more regular truck movements for waste collection.

The installation of a bottle crusher to the project will improve waste efficiency, by reducing the space required for storage and minimise the number of truck movements in the local area for waste collection. Also by securing the crushed waste in a secured bin this process will reduce staff exposure to broken glass and improve site safety.

There is also potential for a recycling partnership where glass can be repurposed or recycled through partnerships with cultural or civic bodies such as the MCA.

### 3.6.3 Construction and Demolition Waste Minimisation

Through the retention of the existing building structure, façade and fabrics the project is looking to minimise the demolition and construction waste. This strong focus on maintaining existing materials will significantly reduce the embodied energy associated with the project and drastically reduce the project waste compared to the construction of a new hotel.

# 4. NATIONAL CONSTRUCTION CODE (NCC) 2016 SECTION J

### 4.1.1 Overview

The Mercantile Hotel Project is a mix of BCA Class 6a Restaurants and Class 3 Hotel facilities and is in Climate Zone 5.

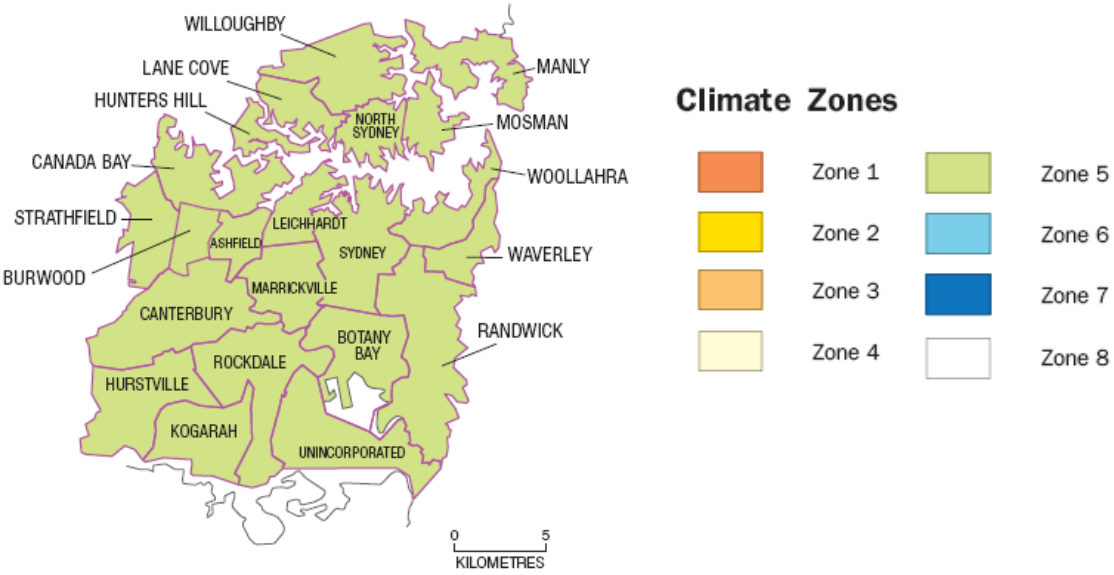


*Figure 2: Map of the BCA Climate Zones for Sydney Urban*

There are two methods of achieving NCC 2016 section J compliance. The building can be assessed against the Deemed-to-Satisfy (DTS) provisions; or JV3 performance based solution.

As the project is an existing building it is anticipated that only the areas that are undergoing major alteration or change of use are likely to need to demonstrate compliance with Section J. The detailed compliance pathway for this will be determined throughout the detailed design process and will need to conform to the heritage protection requirements for the site and account for varying levels of glazing on some facades.

This report highlights the building fabric requirements required to achieve compliance with Section J of the NCC DTS methodology, however this should be continually assessed as changes are made throughout the detailed design process.

The table below outlines the DTS compliance pathway requirements for parts J1 and J2 of the NCC 2016

Appendix A also provides the Glazing Calculator completed for the new glazing for the rooftop bar area;

**Table 1: Insulation requirements for the main building elements**

| Building Fabrics | Required total R-value | Equivalent insulation / glazing example |
|---|---|---|
| Roof and Ceiling (Solar absorptance value of more than 0.4 and not more than 0.6) | R3.7 | 100mm R2.3 Fletcher Permastop Building Blanket Insulation |

| | | |
|---|---|---|
| External Walls | R2.8 | 90mm R2.5HD Fletcher Pink Batts Insulation |
| Insulated Partition Walls | R1.8 | 65mm R1.5 Fletcher Pink Batts Insulation |
| Suspended Floors | R2.0 | 65mm R1.5 Fletcher Pink Batts Insulation |
| Floors and Ceilings to non-conditioned space e.g. Plantrooms | R2.0 | 65mm R1.5 Fletcher Pink Batts Insulation |
| Roof lights* | Stairwell | U-Value: < 3.4 & SHGC: < 0.34 |
| Glazing** | N/A | U-Value: 4.2 & SHGC: 0.25 |

* the roof lights over the lift, lift lobby and amenities areas exceed the maximum area allowed under the DTS assessment and will need to either be reduced or have their performance assessed through JV3 modelling.

** This represents a uniform glazing solution for the new glazed areas (rooftop restaurant and bar areas) and is being driven by the North East orientations high glazing levels

Should the requirements listed above be deemed infeasible, it is recommend that the project team should proceed with a JV3 performance based solution. This approach is more flexible as it offers a holistic assessment of the building performance, rather than individual components.

# 5. APPENDIX 1 NCC 2016 GLAZING CALCULATOR OUTPUTS

## NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014)

HELP

Building name/description: The Mercantile Hotel Roof Bar

Application: other

Climate zone: 5

Storey: Roof

Facade areas

| | N | NE | E | SE | S | SW | W | NW | internal |
|---|---|---|---|---|---|---|---|---|---|
| Option A | | 70m² | | 11m² | | 83m² | | 75.4m² | |
| Option B | | | | | | | | | n/a |
| *Glazing area (A)* | | 39.4m² | | 0.38m² | | 27.8m² | | 25.8m² | |

Number of rows preferred in table below: 21 *(as currently displayed)*

**GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS** | **SHADING** | **CALCULATED OUTCOMES OK (if inputs are valid)**

| Glazing element | | Facing sector | | Size | | | Performance | | P&H or device | | Shading | Multipliers | | | Size | Outcomes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ID | Description (optional) | Option A facades | Option B facades | Height (m) | Width (m) | Area (m²) | Total System U-Value (AFRC) | Total System SHGC (AFRC) | P (m) | H (m) | P/H | G (m) | Heating ($S_H$) | Cooling ($S_C$) | Area used (m²) | Element share of % of allowance used |
| 1 | | SW | | 0.48 | | 0.33 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 0.33 | 1% of 52% |
| 2 | | SW | | 3.40 | | 4.65 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 4.65 | 17% of 52% |
| 3 | | SW | | 3.40 | | 4.65 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 4.65 | 17% of 52% |
| 4 | | SW | | 3.40 | | 4.65 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 4.65 | 17% of 52% |
| 5 | | SW | | 3.40 | | 4.65 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 4.65 | 17% of 52% |
| 6 | | SW | | 2.00 | | 1.50 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 1.50 | 5% of 52% |
| 7 | | SW | | 2.70 | 1.25 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 3.38 | 12% of 52% |
| 8 | | SW | | 1.00 | | 1.65 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 1.65 | 6% of 52% |
| 9 | | SW | | 1.30 | | 2.30 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 2.30 | 8% of 52% |
| 10 | | NW | | 0.65 | 5.20 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 3.38 | 13% of 52% |
| 11 | | NW | | 1.96 | | 2.71 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 2.71 | 11% of 52% |
| 12 | | NW | | 0.47 | | 0.60 | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 0.60 | 2% of 52% |
| 13 | | NW | | 2.72 | 1.26 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 3.43 | 13% of 52% |
| 14 | | NW | | 2.72 | 1.88 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 5.11 | 20% of 52% |
| 15 | | NE | | 3.50 | | 34.75 | 4.2 | 0.25 | 0.100 | 3.500 | 0.03 | 0.00 | 0.99 | 0.98 | 34.75 | 88% of 100% |
| 16 | | NE | | 0.64 | 5.50 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 3.52 | 9% of 100% |
| 17 | | NE | | 1.36 | 0.86 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 1.17 | 3% of 100% |
| 18 | | NW | | 0.64 | 5.50 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 3.52 | 14% of 52% |
| 19 | | NW | | 0.64 | 5.50 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 3.52 | 14% of 52% |
| ## | | NW | | 0.64 | 5.50 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 3.52 | 14% of 52% |
| 21 | | SE | | 0.25 | 1.50 | | 4.2 | 0.25 | | | | 0.00 | 1.00 | 1.00 | 0.38 | 100% of 6% |

**IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR**

*if inputs are valid*

The Glazing Calculator has been developed by the ABCB to assist in developing a better understanding of glazing energy efficiency parameters. While the ABCB believes that the Glazing Calculator, if used correctly, will produce accurate results, it is provided "as is" and without any representation or warranty of any kind, including that it is fit for any purpose or of merchantable quality, or functions as intended or at all. Your use of the Glazing Calculator is entirely at your own risk and the ABCB accepts no liability of any kind.

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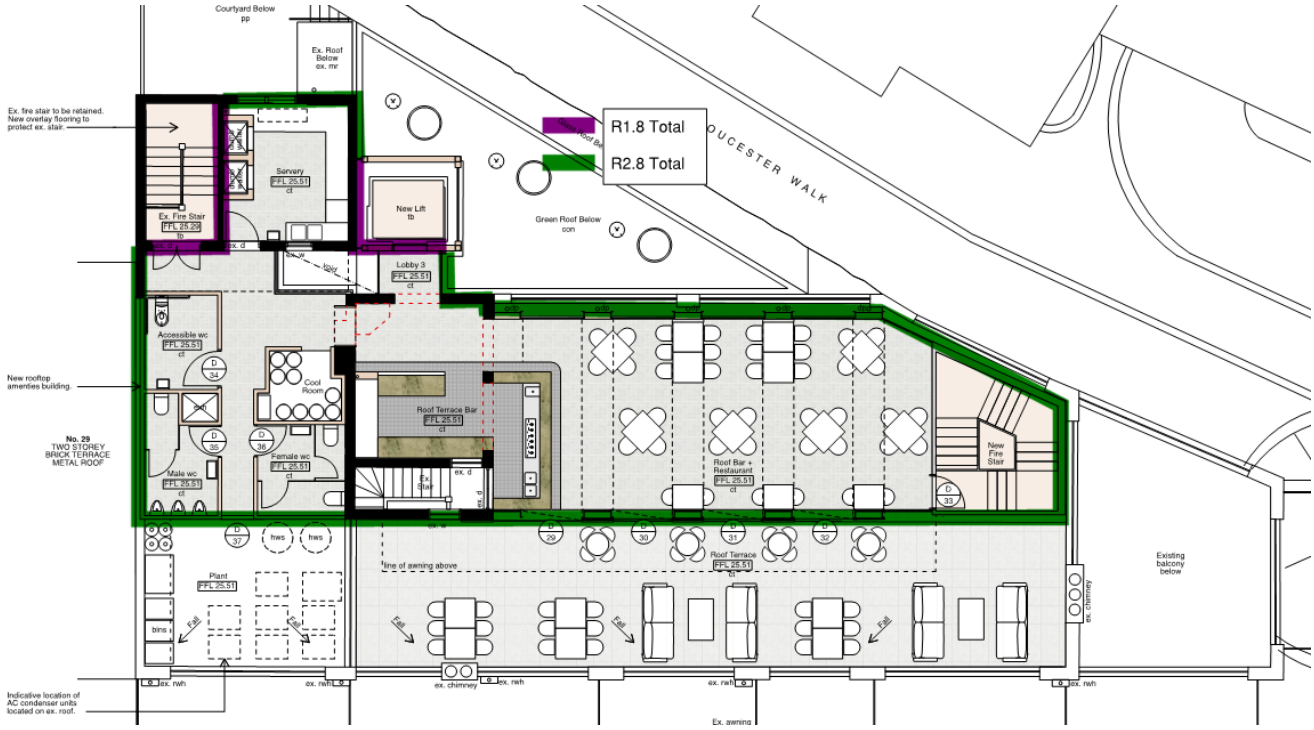
# 6. APPENDIX 2 MARKED UP THERMAL ENVELOPE

Roof top Bar Area




Roof Insulation