

Skyview Factor Assessment

Sydney Metro Martin Place Integrated Station Development

Macquarie

Stage 2 South Site

Prepared for

Savills

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1. Executive Summary

This Sky View Factor (SVF) Report has been prepared by Surface Design on behalf of Macquarie for Metro Martin Place development South site, Sydney.

This report provides a study of the sky visible around the South site as a percentage of the sky's hemisphere. The SVF is the extent of sky at a given location or point, with an SVF of 0% representing a fully obstructed sky and 100% represent no obstruction (e.g. in a grass field).

This assessment analysed a total of seven (7) points at ground level located around the South Site to compare the impact of Sky View Factor for the following models:

- Model 1: Existing city (as of 2014)
- Model 2: Proposed Amending Stage 1 SSDA (PA)
- Model 3: Detailed South Site with Proposed Amending Stage 1 SSDA North Site

The detailed South Site, Model 3 was compared with the Proposal Amending Stage 1 SSDA Model 2.

The analysis found that the Architectural Detailed South Design Model 3 has negligible reduction of visible sky at the relevant test points in reference to the Existing City Model 1 and the Proposed Amending Stage 1 SSDA Model 2.

The seven (7) points experience Typical Sky View Factors which are similar to the current conditions experienced at these locations in the city Central Business District. This report demonstrates compliance with Schedule 11 of the City of Sydney Guidelines for SVF assessment as the views stay within the banding (Typical) with negligible sky view difference between models.

2. Stage 2 South Site SSDA

This section of this report has been provided by Savills.

2.1. Introduction

This report supports a State Significant Development (SSD) Development Application (DA) (SSD DA) submitted to the Minister for Planning (Minister) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on behalf of Macquarie Corporate Holdings Pty Limited (Macquarie), who is seeking to create a world class transport and employment precinct at Martin Place, Sydney.

The SSD DA seeks approval for the detailed design and construction of the **South Site** Over Station Development (OSD), located above and integrated with Metro Martin Place station (part of the NSW Government's approved Sydney Metro project). The southern entrance to Metro Martin Place station and the South Site OSD above are located at 39-49 Martin Place.

This application follows:

- Approval granted by the Minister for a Concept Proposal (otherwise known as a Stage 1 SSDA) for two OSD commercial towers above the northern (North Site) and southern (South Site) entrances of Metro Martin Place station (SSD 17_8351). The approved Concept Proposal establishes building envelopes, land uses, Gross Floor Areas (GFA) and Design Guidelines with which the detailed design (otherwise known as a Stage 2 SSDA) must be consistent.
- Gazettal of site specific amendments to the Sydney Local Environmental Plan (LEP) 2012 (Planning Proposal reference: PP_2017_SYDNE_007_00) permitting greater building height (over a portion of the South Site) and additional floor space (over both the North and South Sites).

Lodged concurrently with this SSD DA, is a Stage 1 Amending SSD DA to the Concept Proposal (Stage 1 Amending DA), which seeks approval for an amended concept for the Metro Martin Place Precinct (the Precinct), aligning the approved South Site building envelope with the new planning controls secured for the Precinct.

To ensure consistency, the Stage 1 Amending DA must be determined prior to the determination of the subject Stage 2 SSD DA for the South Site.

This application does not seek approval for elements of the Metro Martin Place Precinct which relate to the Sydney Metro City and Southwest project, which is subject to a separate Critical State Significant Infrastructure (CSSI) approval. These include:

- Demolition of buildings on the North Site and South Site;
- Construction of rail infrastructure, including station platforms and concourse areas;
- Ground level public domain works; and
- Station related elements in the podium of the South Tower.

However, this application does seek approval for OSD areas in the approved Metro Martin Place station structure, above and below ground level, which are classified as SSD as they relate principally to the OSD. These components are within the Sydney Metro CSSI approved station building that will contain some OSD elements not already approved by the CSSI Approval. Those elements include the end of trip facilities, office entries, office space and retail areas, along with other office/retail plant and back of house requirements that are associated with the proposed OSD and not the rail infrastructure.

The Sky View Factor (SVF) was assessed by Surface Design for various key locations of the Metro Martin Place development site to understand the levels of sky view achieved for the South site of the Macquarie Bank development proposal. The developments SVF has been assessed against the allowable City of Sydney DCP envelope limits.

2.2. Context

The New South Wales (NSW) Government is implementing Sydney's Rail Future (Transport for NSW, 2012), a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future.

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro Northwest (Stage 1) and Sydney Metro City and Southwest (Stage 2).

Stage 2 of Sydney Metro entails the construction and operation of a new metro rail line from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham and onto Bankstown through the conversion of the existing line to metro standards. The project also involves the delivery of seven (7) new metro stations, including Martin Place.

This step-change piece of public transport infrastructure once complete will have the capacity for 30 trains an hour (one every two minutes) through the CBD in each direction catering for an extra 100,000 customers per hour across the Sydney CBD rail lines.

On 9 January 2017 the Minister approved the Stage 2 (Chatswood to Sydenham) Sydney Metro application lodged by Transport for NSW (TfNSW) as a Critical State Significant Infrastructure (CSSI) project (reference SSI 15_7400). Work is well underway under this approval, including demolition of buildings at Martin Place.

The OSD development is subject to separate applications to be lodged under the relevant provisions of the EP&A Act. One approval is being sought for the South Site – this application – and one for the North Site via a separate application.

2.3. Site Description

The Metro Martin Place Precinct project relates to the following properties (refer to **Figure 1**):

- 50 Martin Place, 9 – 19 Elizabeth Street, 8 – 12 Castlereagh Street, 5 Elizabeth Street, 7 Elizabeth Street, and 55 Hunter Street (North Site);
- 39 – 49 Martin Place (South Site); and
- Martin Place (that part bound by Elizabeth Street and Castlereagh Street).

This application relates **only to the South Site**, being the land at 39-49 Martin Place (refer to **Figure 1**).

The North Site is the subject of a Stage 2 SSD DA.

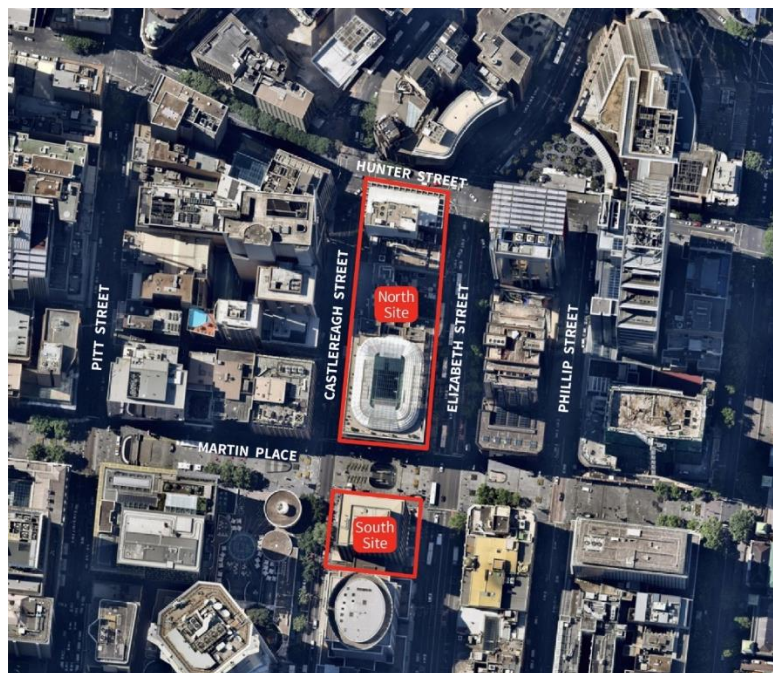


Figure 1 – Aerial Photo of the North and South Site of the Metro Martin Place Precinct

2.4. Background

Sydney Metro Stage 2 Approval (SSI 15 7400)

The Sydney Metro CSSI Approval approves the demolition of existing buildings at Martin Place, excavation and construction of the new station (above and below ground) along with construction of below and above ground structural and other components of the future OSD, although the fit-out and use of such areas are the subject of separate development approval processes.

On 22 March 2018, the Minister approved Modification 3 to the Sydney Metro CSSI Approval. This enabled the inclusion of Macquarie-owned land at 50 Martin Place and 9-19 Elizabeth Street within Metro Martin Place station, and other associated changes (including retention of the opening to the existing MLC pedestrian link).

Concept Proposal (SSD 17 8351)

On 22 March 2018, the Minister approved a Concept Proposal (SSD 17_8351) relating to Metro Martin Place Precinct. The Concept Proposal establishes the planning and development framework through which to assess the detailed Stage 2 SSD DAs.

Specifically, the Concept Proposal encompassed:

- Building envelopes for OSD towers on the North Site and South Site comprising:
 - 40+ storey building on the North Site
 - 28+ storey building on the South Site (see **Figure 2**)
 - Concept details to integrate the North Site with the existing and retained 50 Martin Place building (the former Government Savings Bank of NSW)
- Predominantly commercial land uses on both sites, comprising office, business and retail premises
- A maximum total GFA of 125,437m² across both sites
- Design Guidelines to guide the built form and design of the future development
- A framework for achieving design excellence
- Strategies for utilities and services provision, managing drainage and flooding, and achieving ecological sustainable development
- Conceptual OSD areas in the approved Metro Martin Place Metro station structure, above and below ground level¹

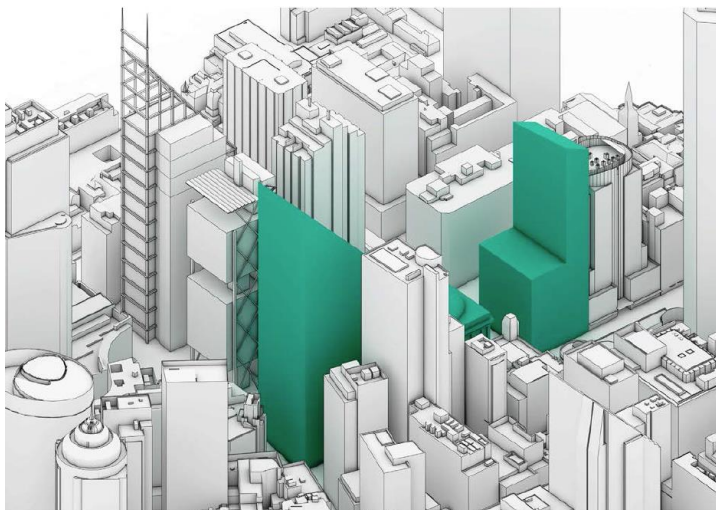
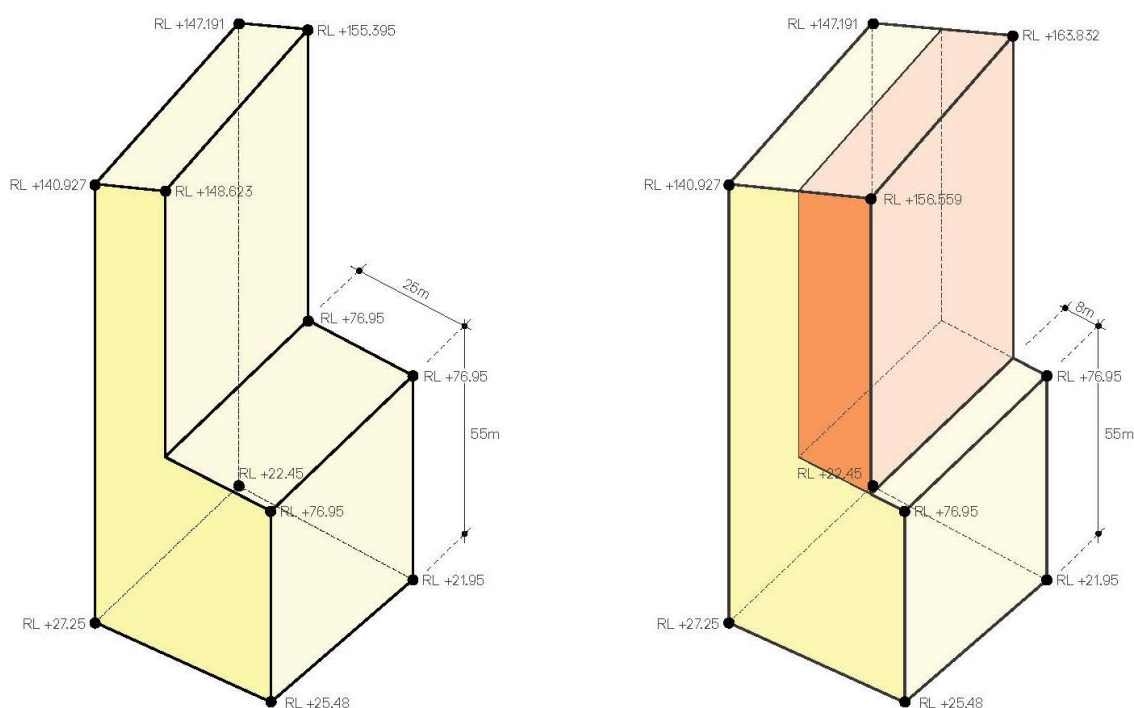


Figure 2 – North Site and South Site Approved OSD Building Envelopes

¹ Refers to those components within the Metro CSSI approved station envelope that will contain some OSD elements not approved in the CSSI consent. Those elements include the end of trip facilities, office entries, office space and retail areas, along with other office/retail plant and back of house requirements that are associated with the proposed OSD and not the rail infrastructure.

The Planning Proposal (PP_2017_SYDNE_007_00) sought to amend the development standards applying to the Metro Martin Place Precinct through the inclusion of a site-specific provision in the Sydney LEP 2012. This site-specific provision reduced the portion of the **South Site** that was subject to a 55 metre height limit from 25 metres from the boundary to Martin Place, to 8 metres, and applies the Hyde Park North Sun Access Plane to the remainder of the South Site, forming the height limit of the tower. It also permits a revised FSR of 22:1 on the South Site and 18.5:1 on the North Site. These amendments were gazetted within Sydney LEP 2012 (Amendment No. 46) on 8 June 2018 and reflect the new planning controls applying to the Precinct.

The Concept Proposal was prepared and determined prior to the site specific Sydney LEP 2012 amendment (PP_2017_SYDNE_007_00) being gazetted and was developed based on the height development standards that applied to the South Site at the time. As a result, the Concept Proposal allows for a tower on the South Site that is now inconsistent with the building envelope envisaged through the amendment to the Sydney LEP 2012. Accordingly, a Stage 1 Amending SSD DA to the Concept Proposal (Stage 1 Amending DA) has been lodged concurrently with this subject Stage 2 SSD DA, which seeks to align the approved Concept Proposal building envelope for the South Site with the revised site specific development standards applying under the Sydney LEP 2012, being increased FSR and building height. This Stage 1 Amending DA seeks to amend the planning and development framework established under the approved Concept Proposal that is used to assess this Stage 2 SSD DA. The Stage 1 Amending DA is to be assessed concurrently with, and determined prior to the subject Stage 2 SSD DA, with the amended South Site building envelope setting the broad development parameters for the South Site (see **Figure 3** below).



Approved South Site OSD Envelope

Proposed Amended South Site OSD Envelope
(aligning with site specific amendment to Sydney LEP 2012)

Figure 3 – Relationship between the approved and proposed amended South Site building envelope

2.5. Overview of the Proposed Development

The subject application seeks approval for the detailed design, construction and operation of the South Tower. The proposal has been designed as a fully integrated station and OSD project that intends to be built and delivered as one development, in-time for the opening of Sydney Metro City and Southwest in 2024. The application seeks consent for the following:

- The design, construction and operation of a new 28 storey commercial OSD tower (plus rooftop plant) within the approved building envelope for the South Site, including office space and retail tenancies.
- Vehicle loading within the basement levels.
- Extension and augmentation of physical infrastructure / utilities as required.
- Detailed design and delivery of 'interface areas' within both the approved station and Concept Proposal envelope that contain OSD-exclusive elements, such as office entries, office space and retail areas not associated with the rail infrastructure.

Planning Approvals Strategy

The *State Environmental Planning Policy (State and Regional Development) 2011* (SEPP SRD) identifies development which is declared to be State Significant. Under Schedule 1 and Clause 19(2) of SEPP SRD, development within a railway corridor or associated with railway infrastructure that has a capital investment value of more than \$30 million and involves commercial premises is declared to be State Significant Development (SSD) for the purposes of the EP&A Act.

The proposed development (involving commercial development that is both located within a rail corridor and associated with rail infrastructure) is therefore SSD.

Pursuant to Section 4.22 of the EP&A Act a Concept DA may be made setting out concept proposals for the development of a site (including setting out detailed proposals for the first stage of development), and for which detailed proposals for the site are to be the subject of subsequent DAs. This SSD DA represents a detailed proposal and follows the approval of a Concept Proposal on the site under Section 4.22 of the EP&A Act.

Figure 4 below is a diagrammatic representation of the suite of key planning applications undertaken or proposed by Macquarie and their relationship to the subject application (the subject of this report).

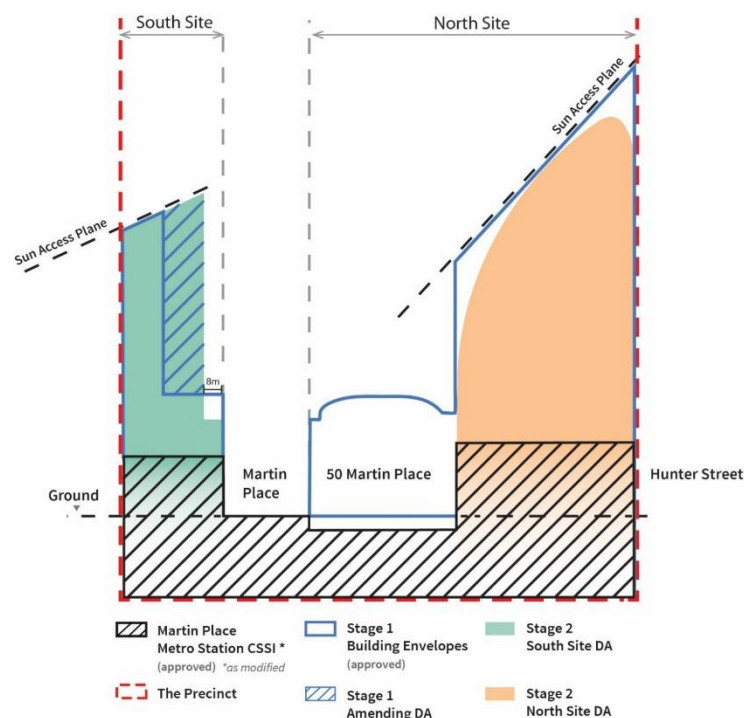


Figure 4 – Relationship of key planning applications to the Stage 2 South Site DA (this application)

The Department of Planning and Environment have provided Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared having regard to the SEARs as follows:

- Stage 2 DA: Assess and report on the sky view factor for the Proposed Building (South Tower). Provide 1 report; South Site DA report.

3. Sky View Factor Introduction

The City of Sydney has development conditions that define allowable building envelope limits. These limits have been set to enable appropriate levels of sky views to be provided to the public at the street level. Sky views throughout the City enables the public to experience the benefits of natural daylighting and environmental views. The Sydney Metro Martin Place project recognises the importance of providing appropriate levels of sky views to the public with the proposed development.

This study has assessed the Sky View Factor (SVF) achieved for various key locations of the Metro Martin Place development site to understand the levels of sky view achieved for the South site of the Macquarie Bank development proposal. The developments SVF has been assessed against the allowable City of Sydney DCP envelope limits.

This report summarises guiding principles in the Sky view factor assessment, the different models assessed, the points of interest, the method of assessment and a discussion on the results.

This report does not comment on planning decisions and overshadowing limits and is responding to limits set by the Authorities.

This report has been prepared on behalf of Savills for the Stage 2 Development Application submission.

3.1. Development Guidelines

There are two development guidelines that apply to this site, the City of Sydney Development Control Plan (DCP) and State Significant Planning (SSD) provisions 2017. Refer to Section 3.4.1 for further detail of the model descriptions.

3.2. Reference Documents

This report has been prepared in reference to the following documents:

Table 1: Reference documents

Description	Drawing Number/File Name	Issue	Reference
Existing Model	GAS_170721_Existing	October 2017	Grimshaw
Approved Stage 1 SSD 17_8351 Model Envelope	SSDA ENVELOPES_DXF	April 2018	
Amending DA envelope drawing	PP ENVELOPE_DXF	October 2017	
Detailed South Envelope	CSWSMP-MAC-SMS-AT-MOD-999915DA_dxf	23 rd July 2018	Tzanne
Existing Street Frontage Height and setback controls	Appendix D Street Frontage Height and Setback	2016	City of Sydney
Schedule 11	Guidelines for a Visual Impact Assessment Report	2012	
Skyview Factor Assessment	Stage 1 Amending DA	21 th June 2018	SFD

3.3. Terms of Reference

SVF – Sky View Factor, is the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the point.

CoS – City of Sydney.

Sydney LEP – Sydney Local Environmental Plan 2012.

SSD DA – Approved Stage 1 State Significant Development.

PA – Proposed Amending Stage 1 SSDA Model.

SS – Detailed Architectural Design of the South Site

3.4. Study Boundary and Models

The Sydney Metro Martin Place Precinct includes two towers, a North Site between 50 Martin Place and Hunter Street and a South site adjacent to Martin Place as shown in Figure 1. The Architectural South Site Detail design with the North site modelled with the Proposed Amending Stage 1 SSDA Sky View Factor was assessed.

It is understood that the development is to consider the building extent to local and state planning. The proposed Metro Martin Place Towers have been designed with consideration of the City of Sydney Development Control Plan (DCP) envelope limits and State Application. The models used in this assessment reflects these City of Sydney guidelines built by Grimshaw.

3.4.1. Model Description

The planning provisions that are to be considered for the development are summarised below:

Model 1: Existing buildings

The existing Sydney CBD as of 2014 was assessed to understand the current sky views around the proposed site. This assessment confirms the current conditions experienced and has been used as a validation of the Surface Design study by comparing these results to the Street Frontage Heights and Setback Study by the City of Sydney dated 2016.

Model 2: Proposed Amending Stage 1 SSDA (PA)

The PA model is a variation of SSD DA, with the design applying site-specific provisions based from Sydney LEP 2012. This site-specific provision reduced the setback limit from 25 metres from the boundary to Martin Place, to 8 metres, and applies the Hyde Park North Sun Access Plane to the remainder of the South Site, forming the height limit of the tower. These amendments were published within Sydney LEP 2012 and reflect the new planning controls applying to the precinct.

Model 3: Architectural South Site Detailed Design

This model has assessed the detailed design proposed for the development on the South Site and the Proposed Amending Stage 1 SSDA North Building in the Assessment.

3.4.2. Model Graphics

Model 1 Existing Building

Model 1 is shown in the figure below represents City Model as of 2014 with the inclusion of the 50 Martin Place. The buildings shown in Green represent the current Metro Martin Place site buildings. It is noted that the North building No1. Castlereagh Street has been demolished but has been included in this study.



Figure 5: Existing City of Sydney Model as at 2014 (courtesy of Grimshaw)

Model 2 Proposed Amending Stage 1 SSDA Envelope

The PA model represents the proposed Amending Stage 1 DA North Building and South Site as depicted in the figure below. The Planning Proposal envelope aims is to clarify development standards based of the design for the SSD with the inclusion of a site-specific provision in the Sydney LEP 2012. This includes a boundary setback reduction to 8m and the height limit is in accordance with the Hyde Park North Sun Access Plane.



Figure 7: Proposed Amending Stage 1 Envelope (courtesy of Grimshaw)

Model 3 Architectural South Site Detailed Design

The detailed design model represents the proposed Metro Martin Place South Building design as depicted in the figure below. The entire site has been assessed with the detailed proposed South Building and the Proposed Amending Stage 1 SSDA North Site.



Figure 9: Architectural Detailed South Site Envelope with PA North Site

3.5. Key Study Points for Comparative Assessment

This study is a comparative assessment that has considered points of interest around the South Site of the Metro Martin Place project as shown in Figure 10 below. These locations represent the areas where the extent of Sky Views may be influenced by the proposed South Site Metro Martin Place development as they have a clear line of sight to the South proposed building site. These points were agreed upon with Savills and are consistent with testing done to date. Each key location, excluding points 6 to 12, has been assessed for each of the different models outlined in Section 3.4. Points 6 to 12 Sky View Factor are not influenced by the South Site and are excluded from this comparative assessment.



Figure 10: Key location study points for the Proposed South Site in orange

The address of each locations chosen point and the building site assumed to influence the SVF is listed in Table 2 below. For the Stage 2 Architectural South Detailed Design Assessment the points

located around the North site will have limited to no Sky View Factor change from the architectural detailed design on the South Tower and has been removed from this assessment. These points are highlighted in grey in Table 2.

Table 2: Point Location

Point	Location	Site Sky View Factor Influence by Proposed development	Hemispherical Angle the Architectural South Detailed Design Model 3 influences	
1	36 Martin Place	South	90° - 180°	SE
2	Cnr of Martin Place and Castlereagh St	North & South	90° - 180°	SE
3	37 Martin Place	North & South	135° - 225°	SE - SW
4	Cnr of Martin Place and Elizabeth St	North & South	180° - 270°	SW
5	63 Martin Place	South	180° - 270°	SW
6	Richard Johnson Square	North	Points 6-12 are deemed to be influenced by the North Site and are excluded from this assessment	
7	Chifley Square	North		
8	20 Elizabeth St	North		
9	7 Elizabeth St	North		
10	55 Hunter St	North		
11	4 Castlereagh St	North		
12	9/17 Castlereagh St	North		
13	30 Castlereagh St	North & South	45° - 180°	NE - S
14	80-85 Elizabeth St	North & South	180° - 315°	S - NW

4. Sky View Assessment

4.1. Sky View Factor

Sky View measures the extent of hemispherical sky (or sky vault) with views to the sky viewed from a single point. It is the extent of sky (as a percentage) at a given location or point, where a SFV of 0% represents a fully obstructed sky, whereas 100% represent no obstruction (e.g. in a grass field).

This study has assessed the Sky View Factor taking into consideration all the surrounding buildings obstructing views of the sky, for buildings at a distance of at least 50m from any of the 7 points on the ground. No trees, traffic lights and permeable structures were included in the models as they were not considered to have a significant impact on the results and the effects of these elements would be the same in all models.

4.2. City of Sydney SVF

The City of Sydney (CoS) Street Frontage Height and Setback report allocate the Sky View Factor into bands with a Low SFV, Typical SVF, High SVF and Highest SFV as shown in the table below.

The CoS report dated 2016 notes the majority of street environments within the Centre Sydney are typical SVF (15-25%).

Table 3: Sky View Factor Key

SVF Colour Code			Category	Comments
0% - 5%	5% - 10%	10% - 15%	Low SVF	Small Streets or Laneways
15% - 20%	20% - 25%		Typical SVF	Has long and straight streets
25% - 30%	30% - 35%		High SVF	Short, wide streets with limited tall developments or at an intersection
35% - 40%	40%-45%	>45%	Highest SVF	Streets located at the edge of Sydney

4.3. Domestic and International Assessments

In Auckland specified public areas are required to have sunshine during times of the day when they are in high use, whereas in Melbourne the public space is required to offer sunlight at all times of the year when the intensity of pedestrian activity is highest. Sydney Hyde park has height regulations for new developments so that they do not shade the public park.

New York, Auckland and Melbourne employ similar methods of assessment. It has been shown that a setback from the street reduce developments impact on sky views into the street.

4.4. Comparative Analysis and Impact Assessment

To provide a comparative analysis of the impact of the different development models Stereographic SVF diagrams have been developed with the extent of SVF calculated as a percentage. The percentage represents the extent of Sky View provided to the viewer at that point, for example 0.1 is equivalent to 10% of the sky being visible.

The benchmark for this comparative study has been taken as the Development Control Plan model however the Existing Site conditions have also been assessed to establish what is considered an appropriate impact. Any change in SVF between the Existing City Model (Model 1) to the DCP Model (Model 2) is to be considered for this study as an acceptable level of SVF change.

The base case DCP Model 2 was compared with both the SSDA Model 3 and the PA Model 2 in Metro Martin Place Skyview Assessment Stage 1 to assess if the SVF meets the City of Sydney Council requirements of an SVF that is equivalent or improved.

The assessment compares the Architectural South Detailed Design site with the SSD and PA models to assess if the SVF reduces below the banding set by the City of Sydney. Refer to Appendix B for more details on the City of Sydney Banding.

4.5. Ecotect Analysis and Stereographic Diagrams

The software used to analyse the Sky View Factor was Autodesk Ecotect Analysis. Ecotect is an environmental analysis tool that allows designers to simulate building performance based off the geometry of the proposed development and the surrounding buildings. It provides a platform to assess the Sky View Factor at a given location.

The stereograph is a projection of the entire sky dome presented onto a flat image. The Sky View Factor assessment takes a stereograph of the sky with 200 points distributed pseudo randomly based on figure 7 number of points per 10° altitude angle. The randomise surface points leads to slightly different results between two calculations however is more accurate as it samples the surface and the surrounding geometry differently on each iteration, making it able to accommodate even highly detailed site geometry.

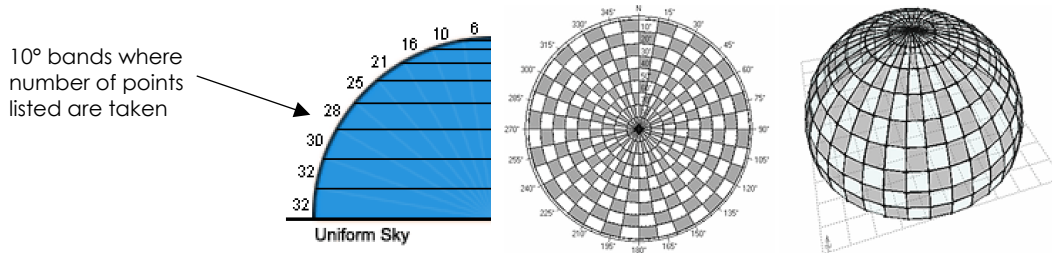


Figure 11: Points taken in Stereograph Study (From Ecotect)

Below are the Sky View Assessments results. The stereograph represents a viewer's potential view of the sky, 180 degrees from the horizon and a 360 view (North, East, South West). In this graph the buildings North of the SVF below blocks out sky views from North-West to North-East. The MLC building in the South blocks the sky view for a smaller proportion of the South sky.

The image below the stereograph shows the existing buildings used in the model, as well as potential for a sky view as limited by the camera lens.

In the stereograph, as shown by the blue circle, the building is shown as a small slit in the area between 75° to 80°. This is because the building is partially in this section so the software models the shading in the tested 5° band.

The green circle shows another case where the point measures no building or obstruction, however the point above it measures a building. This is due to the building residing partially in both sectors, with the lower point measuring the non-shaded section and the upper point measuring the shaded section.

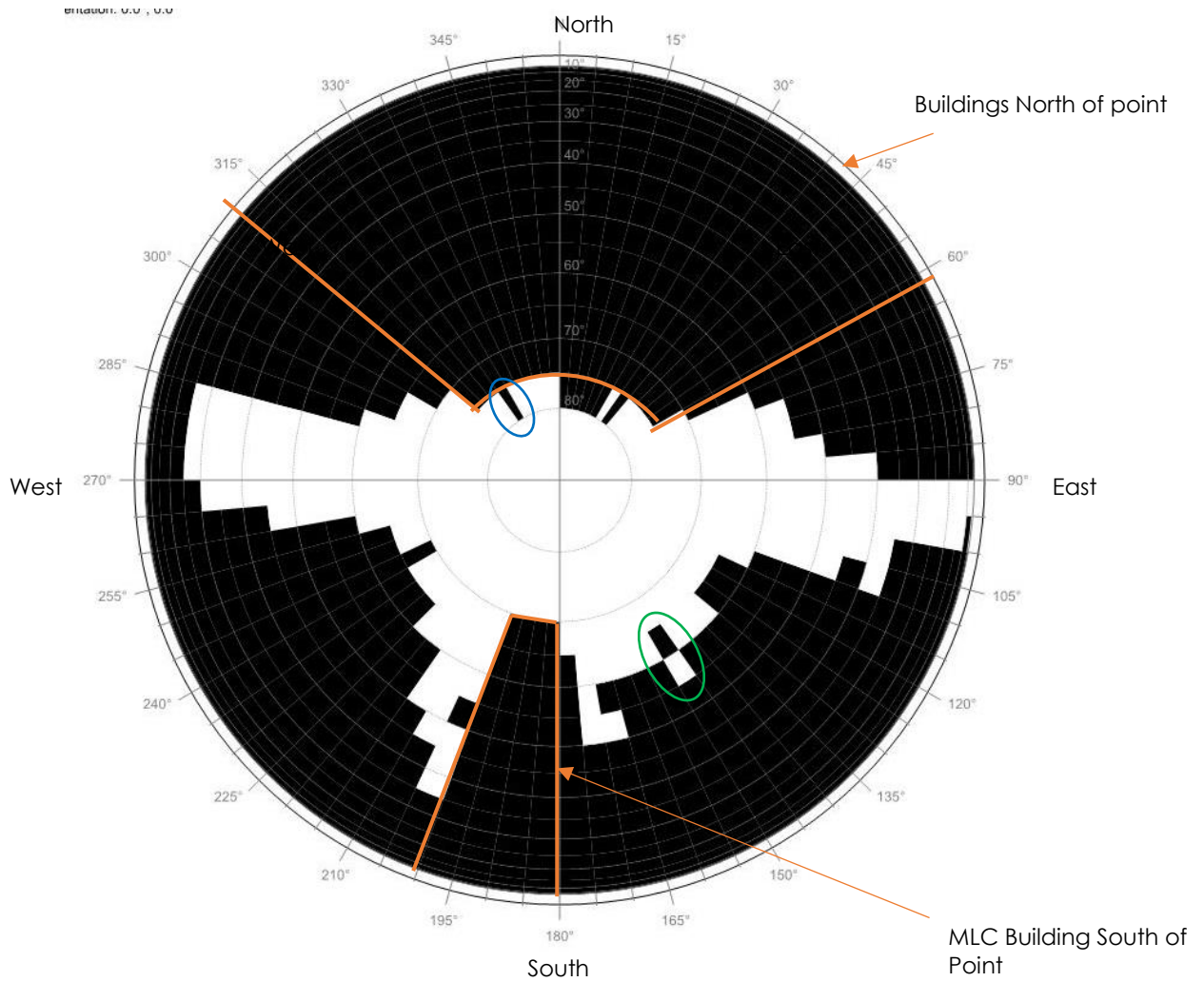


Figure 12: Stereographic Sky View

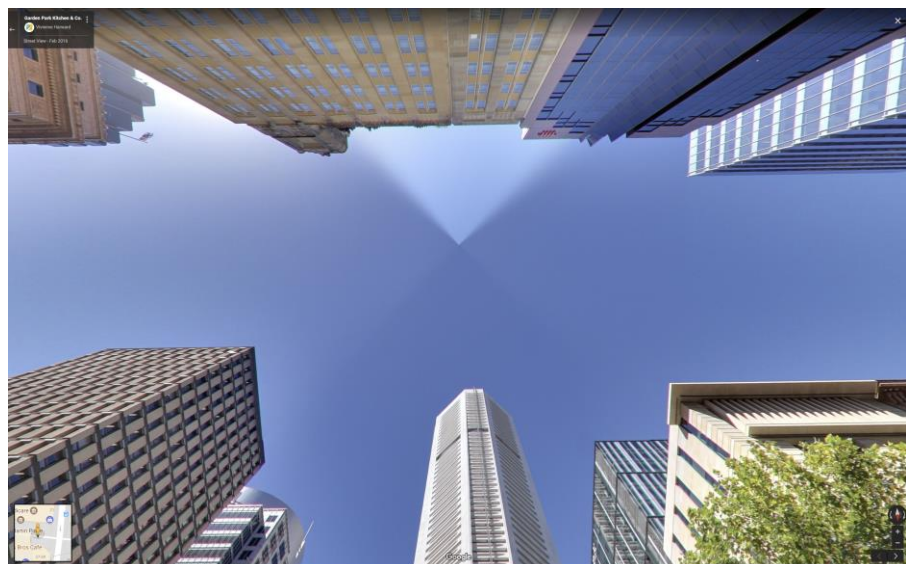


Figure 13: Site image at Martin Place (Google images)

4.6. Disclaimer

This Sky View Factor assessment provides an estimate of the views obstructed by the different buildings. This estimate is based on a necessarily simplified and idealised version of the surrounding buildings located in the Sydney Central Business District (CBD). The assessment is a simulation and cannot fully represent all of the intricacies of the Sydney Central District and the perspective of viewers.

As a result, simulation results only represent an interpretation of the potential Sky View Factor effected by the building.

4.7. Model Geometry

The building models for this study have been provided by Grimshaw Architects and Tzanee, as such any planning assessments on allowable building setbacks has been completed by Grimshaw Architects or Tzanee. Three (3) models have been provided that include:

- Model 1: Existing City of Sydney building model as at December 2014
- Model 2: Proposed Amending Stage 1 SSDA Envelope
- Model 3: Architectural Detailed Design South Building Envelope

The city model was imported into Autodesk Ecotect Analysis and used to assess the Sky View Factor (SVF) at 7 points, as shown in Section 3.5. key study points for comparison assessment. The points were chosen by Savills and Ethos Urban to assess the SVF at ground level and in the centre of the street.

4.8. Assessed Points

All points were taken from the centre of the street to provide a holistic view. Along Martin Place, at points 1 – 5, taking the point from the centre of the street provide a view where pedestrians walk as well as the average SVF.

The figure below shows the potential sky view factor at three points along a road. The three coloured stars represent different points that could be taken across a street. The blue star shows that is a point if taken next to a smaller building then a SFV is reduced compared with the yellow or green points SVF. The Yellow star shows that is the point is taken next to a large building then the SFV is increased. The middle point is used as this is the average view of the three points.

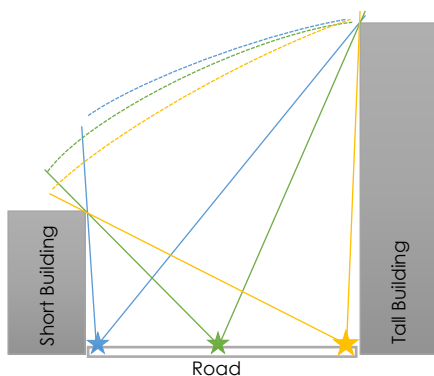


Figure 14: Section View of Assessment Point across a road for SVF

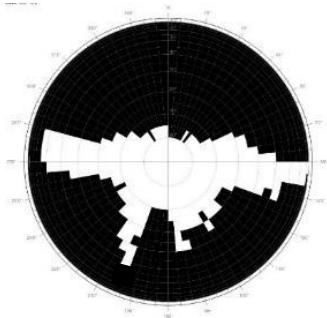
4.9. Existing Sky Views

The images below show actual image and stereograph for the various levels described in City of Sydney Street Frontage Height and Setbacks document. The extent of existing sky views for the viewer is a typical SVF.

The Corner of Martin Place and Elizabeth Street has a SVF of 23.5% as it is at a intersections, which have an increase in sky views as less buildings shadow the space.



36 Martin Place (Google Images)

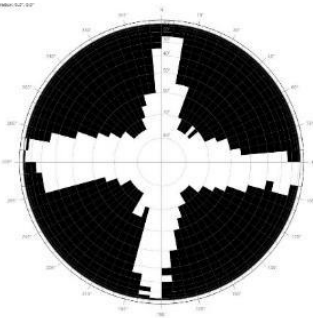


Point 1

Lower limits of a Typical Sky View Factor



Corner Martin Place and Elizabeth Street (Google Images)

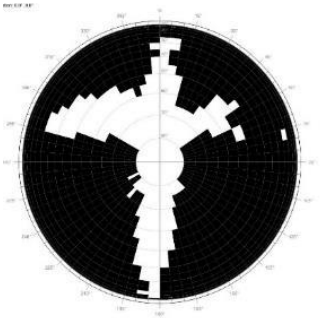


Point 4

Upper limits of a Typical Sky View Factor



80-85 Elizabeth Street (Google Images)



Point 14

Typical Sky View Factor

The above existing typical sky view factors are deemed to be acceptable levels of Sky Views within the City Central Business District and have been referred to in the discussion of the results of this study.

5. Sky View Factor Results

The following section details the Sky View Factor results for only four (4) of the seven (7) points listed below as they are considered to have the most notable change in Sky View Factor from the Architectural South Detail Design. The remaining three (3) points have been included in a summary table in Section 6.2 and Appendix A.

The four points include:

- Point 3: 37 Martin Place
- Point 4: Corner of Martin place and Elizabeth Street
- Point 13: 30 Castlereagh Street
- Point 14: 80-85 Elizabeth Street

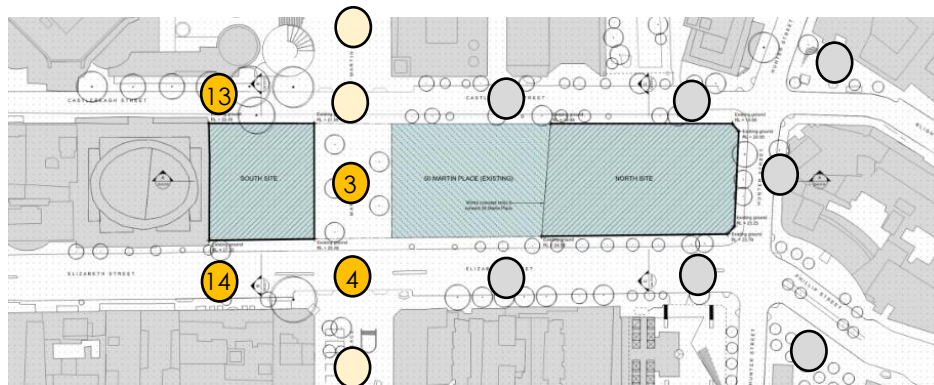
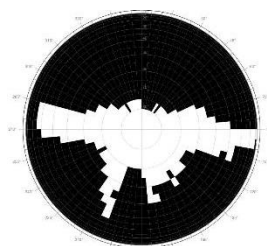


Figure 15: Key locations

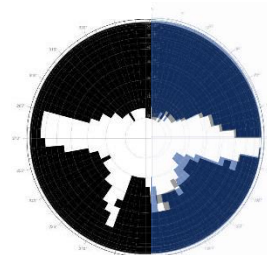
The results for all seven (7) points of this study are included in Section 6.1 and Appendix A.

5.1. Discussion of Results

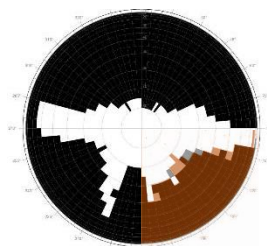
To illustrate the change in Sky View Factor at each key location overlays of the SVF model results have been provided. The first stereograph, as shown in the example below, is the sky view experienced by the viewers on the points around the existing buildings at the proposed site. The second stereograph shows the Sky View Factor of the existing model 1 (in black/grey), along with an overlay of the PA Model 2 coloured in blue. The third diagram shows the existing model 1 (in black/grey) with the Architectural Detailed South Site Design Model 3 overlayed in orange. Only the side of the graph the proposed site is located on is shown.



Existing: Model 1



Proposed Amending Stage 1 SSDA: Model 2



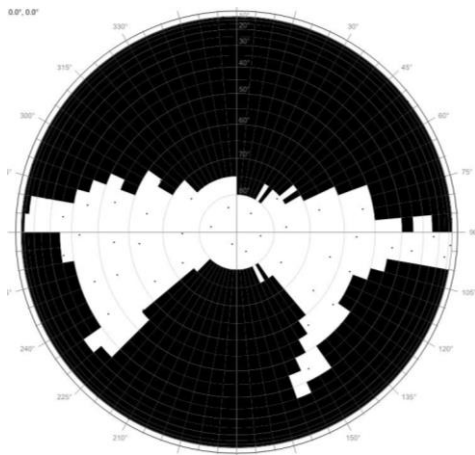
Detailed South Site Design: Model 3

5.2. Stereograph Results

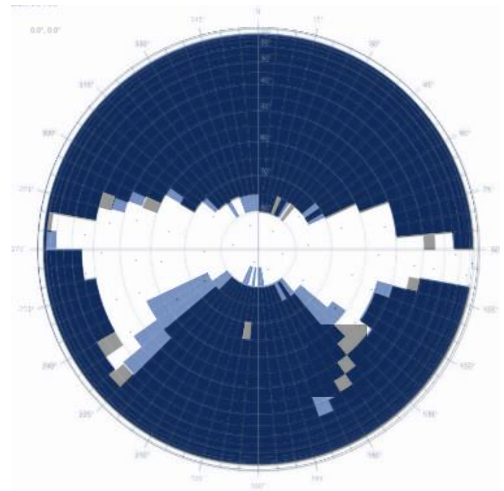
5.2.1. 37 Martin Place

When assessing point three (3), 37 Martin Place Model 3 experiences a decrease sky view factor on the Southern quadrant of the stereograph when compared with the Existing City, Model 1.

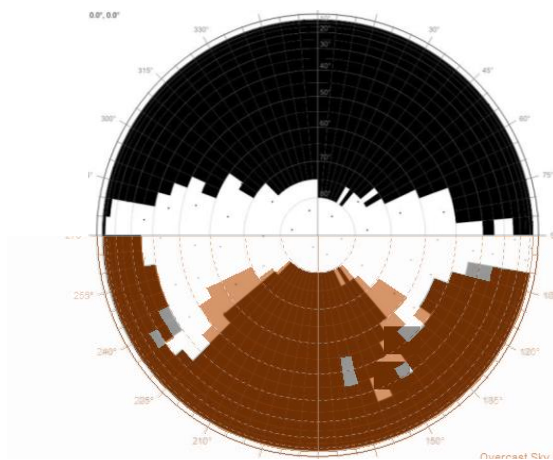
For reference, Model 2 (PA) have been compared to the DCP envelope, Model 2 and do not have a notable change in sky views.



Model 1: Existing Model Sky View Factor: 20%



Model 2: PA Sky View Factor 17.5% (Blue) above Model 1: Existing Model (Black/Grey)

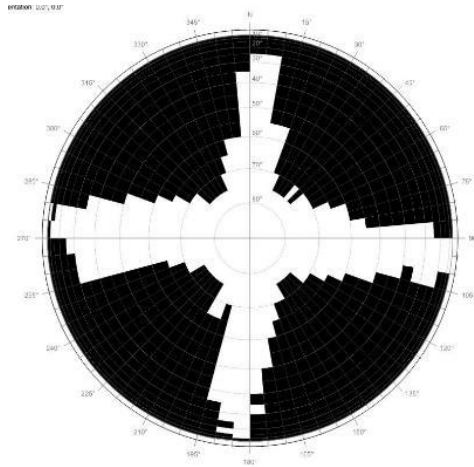


Model 3: Architectural Detailed Design South site with PA North Site: 18% (Orange) above Model 1: Existing Model (Black/Grey)

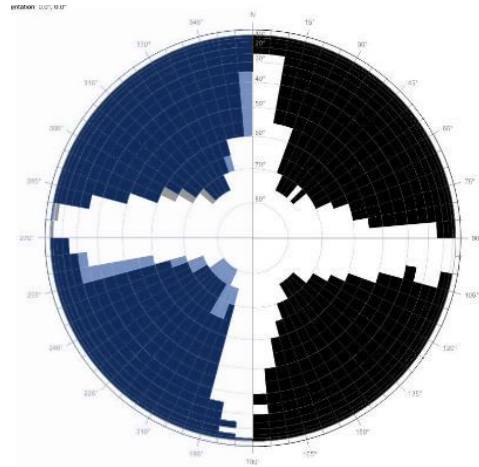
5.2.2. Corner of Martin Place and Elizabeth Street

When assessing point four (4), Corner of Martin place and Elizabeth Street Model 3 experiences a decrease sky view factor on the South-Western quadrant of the stereograph when compared with the Existing City Model 1..

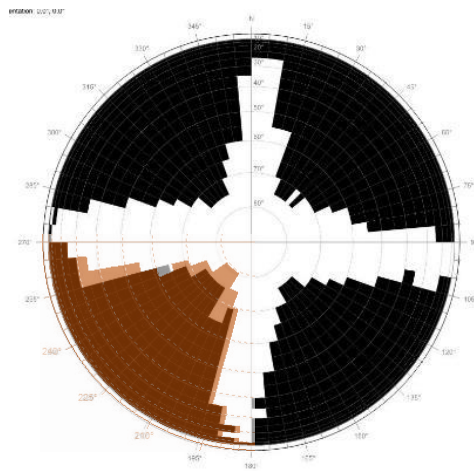
For reference, Model 2 (PA) have been compared to the Existing Envelope, Model 1 and do not have a notable change in sky views.



Model 1: Existing Model Sky View Factor: 24.5%



**Model 2: PA Sky View Factor 22.5% (Blue)
above Model 1: Existing Model
(Black/Grey)**

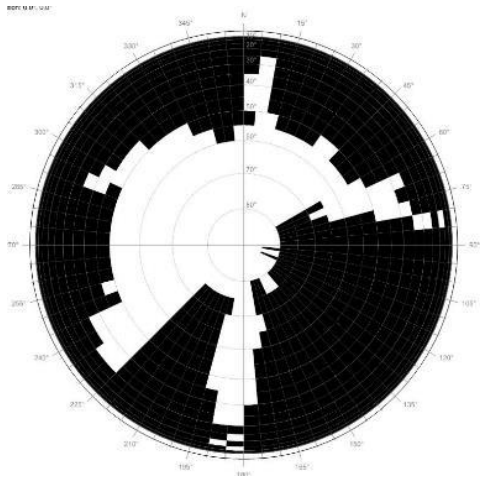


**Model 3: Architectural Detailed Design South site
with PA North Site: 22.5% (Orange) above Model 1:
Existing Model (Black/Grey)**

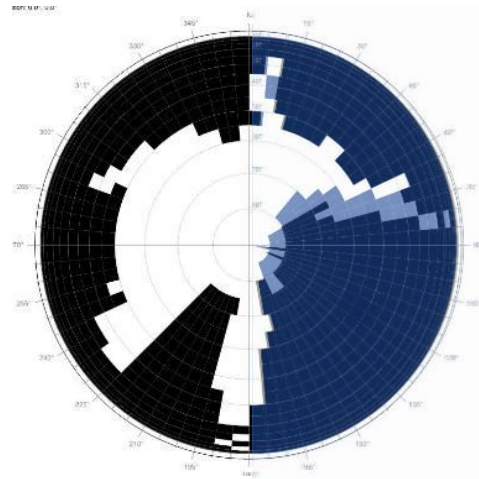
5.2.3. 30 Castlereagh Street

When assessing point thirteen (13), 30 Castlereagh Street Model 3 experiences a decrease sky view factor to the North-Eastern to Southern quadrant when compared with the Existing City Model 1.

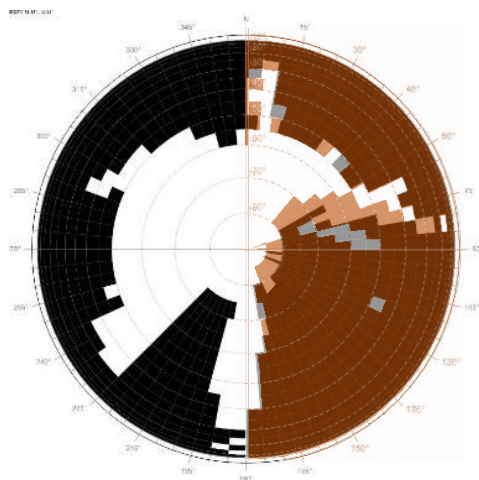
For reference, Model 2 (PA) have been compared to the Existing Model 1 and do not have a notable change in sky views.



Model 1: Existing Model Sky View Factor: 19.5%



**Model 2: PA Sky View Factor: 19.0% (Blue)
above Model 1: Existing Model (Black/Grey)**

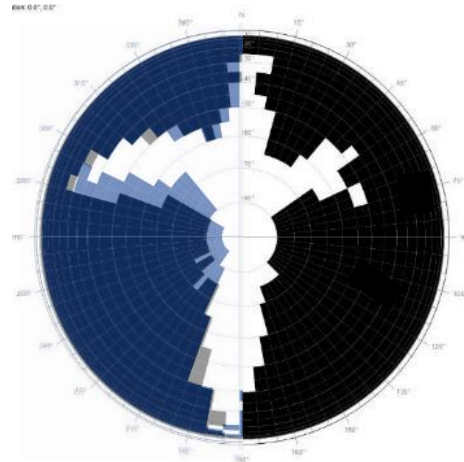
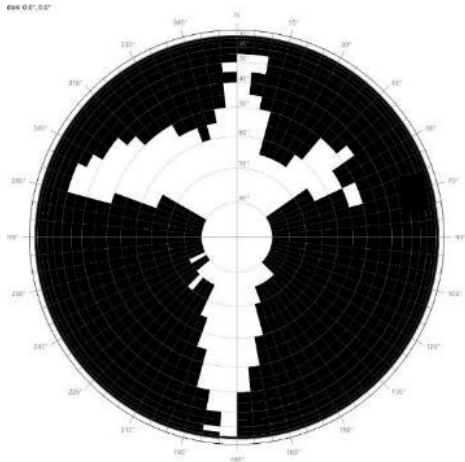


**Model 3: Architectural Detailed Design South
site with PA North Site: 18.5% (Orange)
above Model 1: Existing Model (Black/Grey)**

5.2.4. 80-85 Elizabeth Street

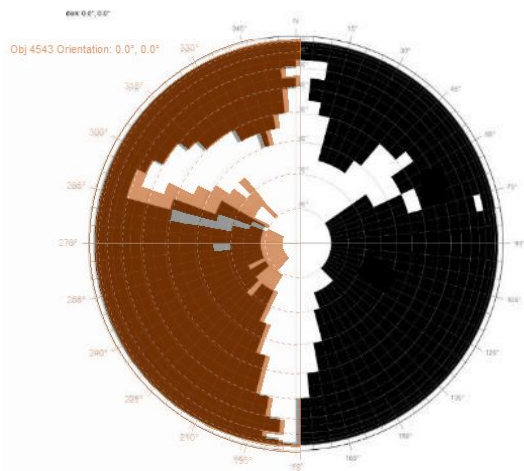
When assessing point fourteen (14) 80-85 Elizabeth Street Model 3 experiences a decrease sky view factor to the South to North-Western quadrant when compared with the Existing City Model 1.

For reference, Model 2 (PA) have been compared to the Existing City, Model 1 and do not have a notable change in sky views.



Model 1: Existing Model Sky View Factor: 18.5%

**Model 2: PA Sky View Factor: 17.0% (Blue)
above Model 1: Existing Model (Black/Grey)**



**Model 3: Architectural Detailed Design South
site with PA North Site: 16.5% (Orange) above
Model 1: Existing Model (Black/Grey)**

6. Results and Discussion

6.1. Sky View Factor Model 1, Model 2 and Model 3

The Sky View Factor was assessed for three models, Existing City, Proposed Amending Stage 1 SSDA (PA) and Architectural Detailed Design South Site Stage 2, at 7 points surrounding the proposed South site. Points 6 to 12 were excluded due to the influence the North site have to these points.

Model 1, the Existing City Model achieves Typical Sky View Factors (SVF) at all seven (7) points around the South site.

Model 3 SVF remains with the Typical SVF, refer to Section 4.2 for the SVF colour code. Seven points, 6 to 12, were not assessed as they were deemed to not be affected by the South Sites development.

Table 5 lists the sky view factor at each point for each model.

Table 5: Summary Sky View Factor Results

Location		SVF Banding	Model 1: Existing	Model 2: PA Envelope	Model 3: Detailed Design, South Site*
1	36 Martin Place	Typical SVF	19.50%	18.50%	19.00%
2	Cnr of Martin Place and Castlereagh St	Typical SVF	21.50%	20.00%	20.00%
3	37 Martin Place	Typical SVF	20.00%	17.50%	18.00%
4	Cnr of Martin Place and Elizabeth St	Typical SVF	24.50%	22.50%	22.50%
5	63 Martin Place	Typical SVF	18.50%	18.00%	17.50%
6 - 12	Points 6-12 are deemed to be influenced by the North Site and are excluded from this assessment				
13	30 Castlereagh St	Typical SVF	19.50%	19.00%	18.50%
14	80-85 Elizabeth St	Typical SVF	18.50%	17.00%	16.50%

*Model 3 includes the Proposed Architectural Detail Design South Site and the Proposed Amending Stage 1 SSDA North Site

All 7 points stay within the Sky View Factor band used by the City of Sydney.

Three (3) points, 37 Martin Place, corner of Martin Place and Elizabeth Street and 80-85 Elizabeth Street, experience a decrease in sky view factor by 2.0% when compared with the Existing Model.

Four (4) points experience a decrease sky view factor between 0.5% to 1.5% compared with the DCP Model 2.

This report demonstrates compliance with Schedule 11 of the City of Sydney Council Guidelines for Sky View Factor Assessment because the sky view for the Architectural South Detailed Design with the Proposed Amending Stage 1 North Site does not result in a change in the banding category of the Sky View Factor.

6.2. Sky Views reduction between Model 1 and Model 3

The Sky View Factor (SVF) reduction in Section 6.1 consider the level of influence over the entire view/hemisphere, as shown in Section 4.5.

The sky view reduction considers the difference in sky views to the available sky views only. When assessing the difference in available sky views between Model 1 and Model 3 the reduction increases up to 10.8%.

Table 6: Summary Sky View Factor Results

Location		SVF Category	Model 1: Existing	Model 3: Detailed Design, South Site	Sky View Reduction
1	36 Martin Place	Typical	39/200	38/200	2.6%
2	Cnr of Martin Place and Castlereagh St	Typical	43/200	40/200	7.0%
3	37 Martin Place	Typical	40/200	36/200	10.0%
4	Cnr of Martin Place and Elizabeth St	Typical	49/200	45/200	8.2%
5	63 Martin Place	Typical	37/200	35/200	5.4%
6 - 12	Points 6-12 are deemed to be influenced by the North Site and are excluded from this assessment				
13	30 Castlereagh St	Typical	39/200	37/200	5.1%
14	80-85 Elizabeth St	Typical	37/200	33/200	10.8%

4. Conclusion

By adopting the Development Control Plan (DCP), a 3% reduction in Sky View Factor (SVF) is deemed as permitted.

The comparative assessment indicated the following:

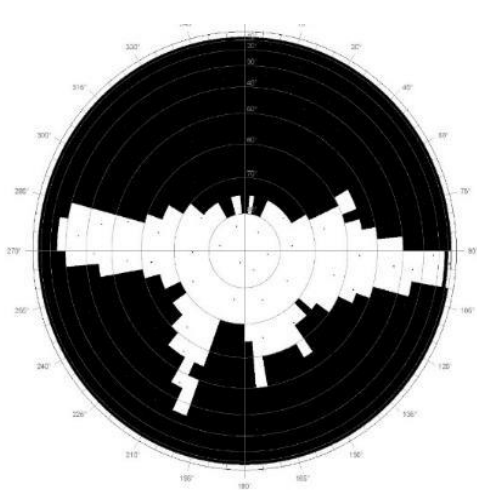
- All 7 viewpoints for the South Site maintained the sky view classification of Typical Sky View Factor
- Four (4) points experience a decreased SVF up to 1.5%. These points are located at 36 Martin Place, corner of Martin Place and Castlereagh Street, 63 Martin place and 30 Castlereagh street
- Three (3) points experience a decreased SVF up to 2.0%. This point is located at 37 Martin place, corner of Martin Place and Elizabeth Street and 80-85 Elizabeth Street

These results demonstrate the Architectural Detailed Design Model 3 have a negligible reduction of the Sky View Factor in reference to the Existing City Model 1 and the Proposed Amending Stage 1 SSDA Model 2.

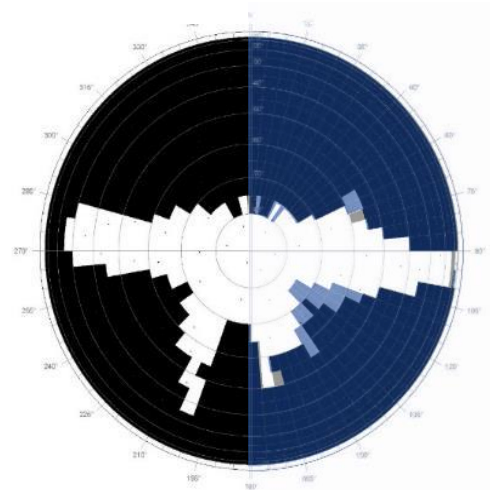
Appendix A

Stereographs

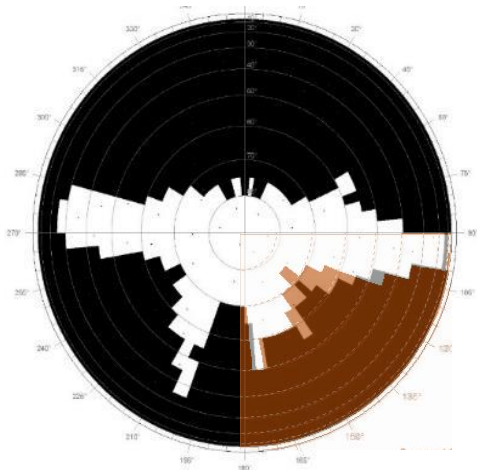
36 Martin Place



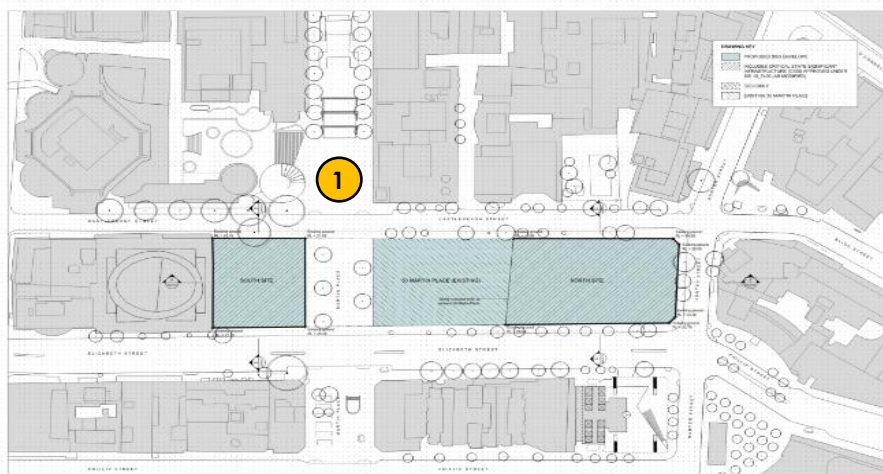
Model 1: Existing Model Sky View Factor: 19.5%



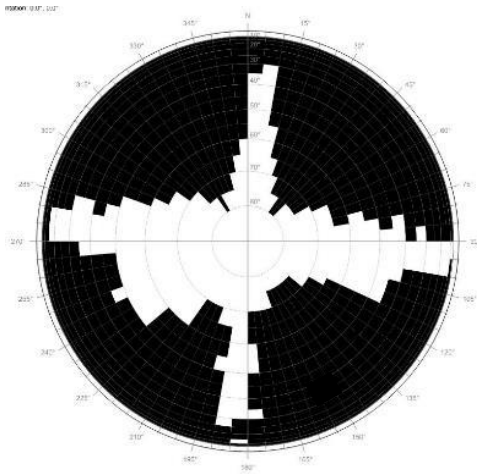
Model 2: PA Sky View Factor 18.5% (Blue) above Model 1: Existing Model (Black/Grey)



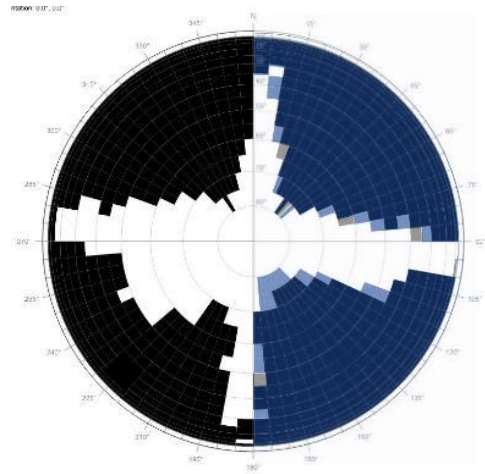
Model 3: Architectural Detailed Design South site with PA North Site: 19.0% (Orange) above Model 1: Existing Model (Black/Grey)



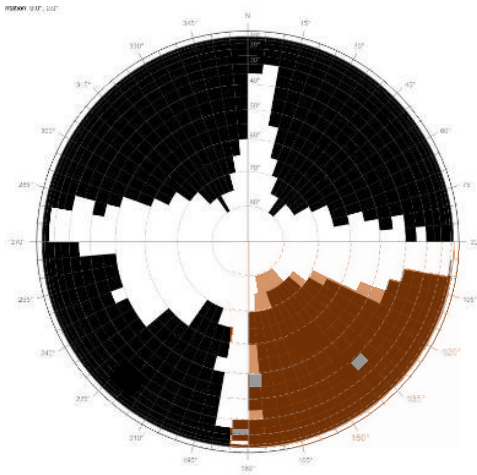
Corner of Martin Place and Castlereagh Street



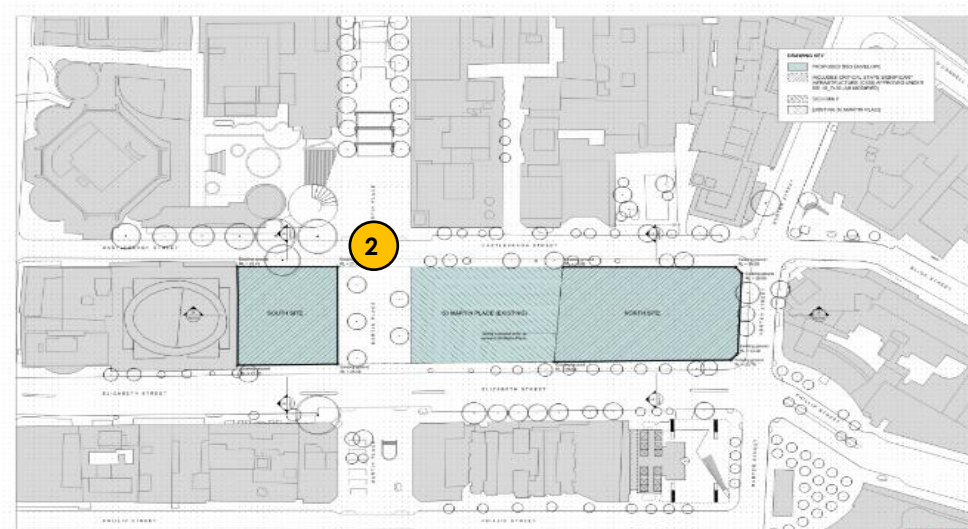
Model 1: Existing Model Sky View Factor: 21.5%



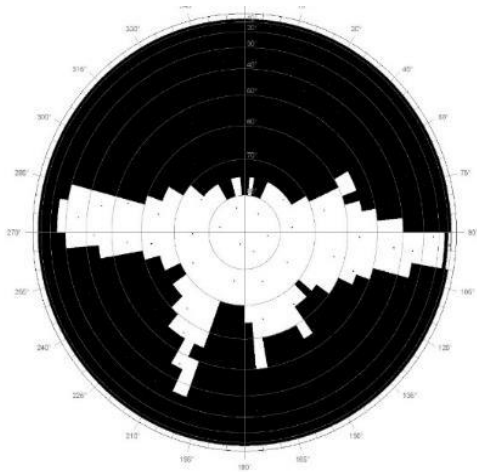
**Model 2: PA Sky View Factor 20.5% (Blue) above
Model 1: Existing Model (Black/Grey)**



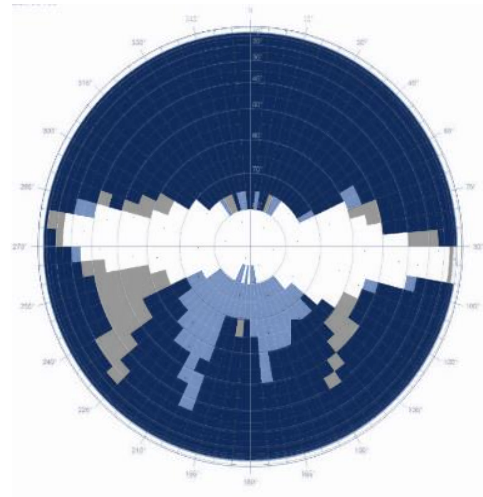
Model 3: Architectural Detailed Design South site with PA North Site: 20.0% (Orange) above Model 1: Existing Model (Black/Grey)



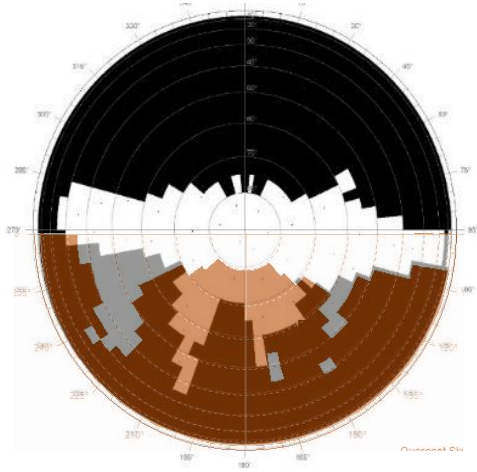
37 Martin Place



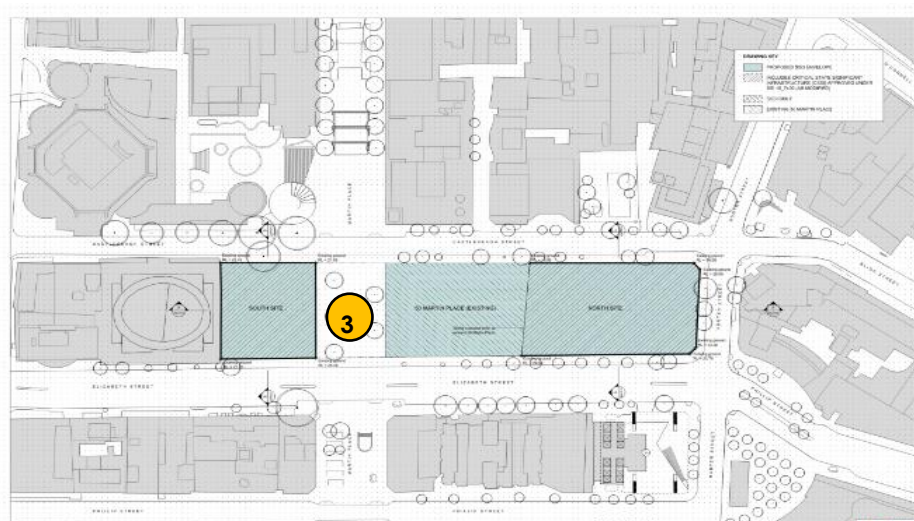
Model 1: Existing Model Sky View Factor: 20.0%



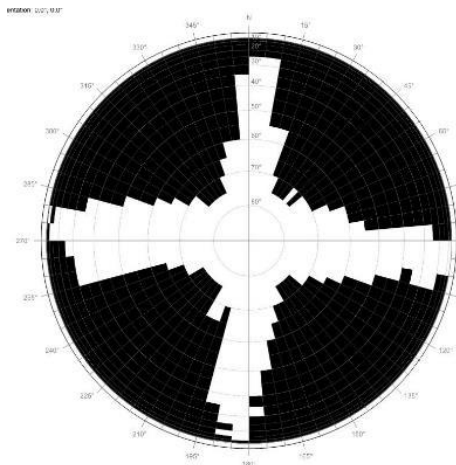
Model 2: PA Sky View Factor 17.5% (Blue) above Model 1: Existing Model (Black/Grey)



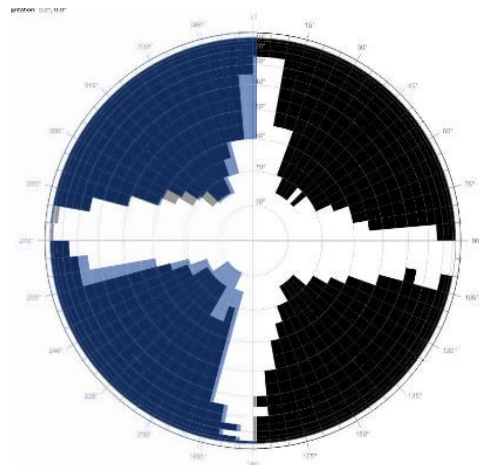
Model 3: Architectural Detailed Design South site with PA North Site: 18.0% (Orange) above Model 1: Existing Model (Black/Grey)



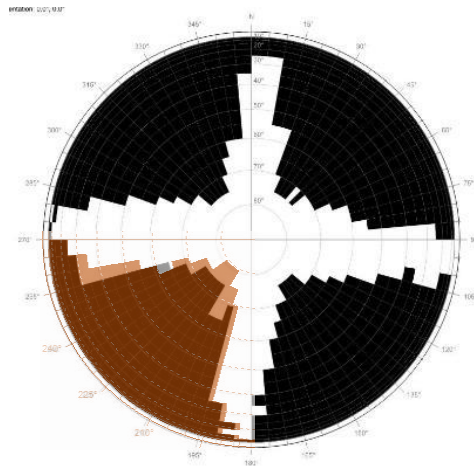
Corner of Martin Place and Elizabeth Street



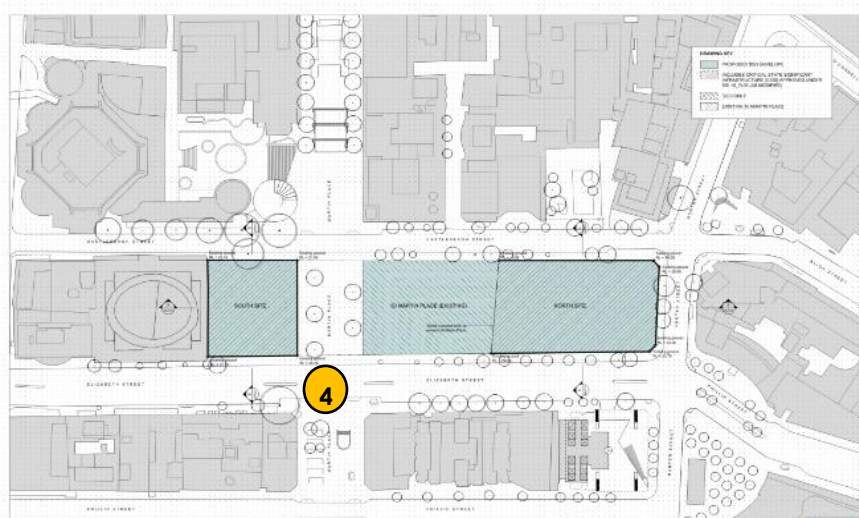
Model 1: Existing Model Sky View Factor: 24.5%



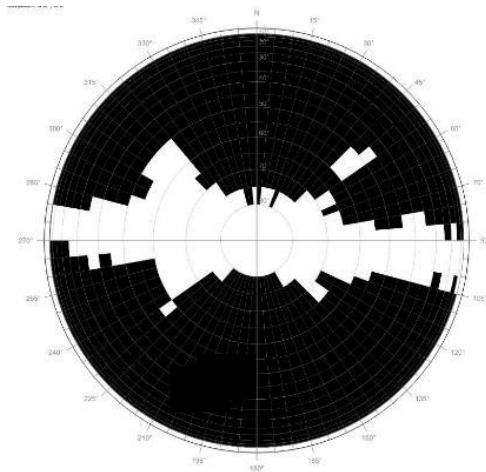
**Model 2: PA Sky View Factor 22.5% (Blue)
above Model 1: Existing Model
(Black/Grey)**



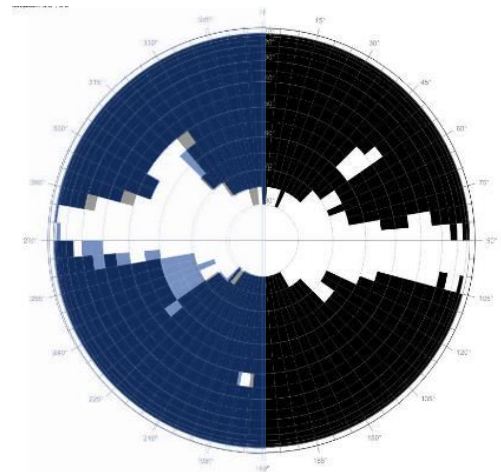
**Model 3: Architectural Detailed Design South site
with PA North Site: 22.5% (Orange)
above Model 1:
Existing Model (Black/Grey)**



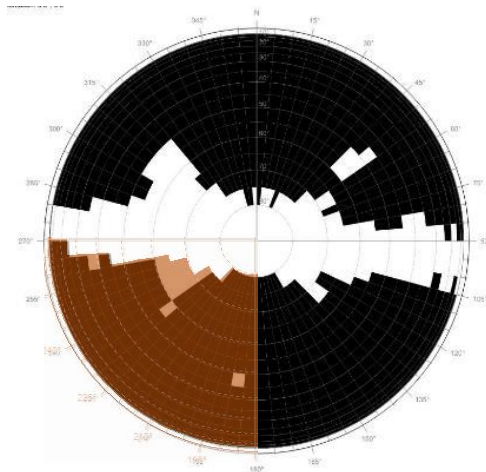
63 Martin Place



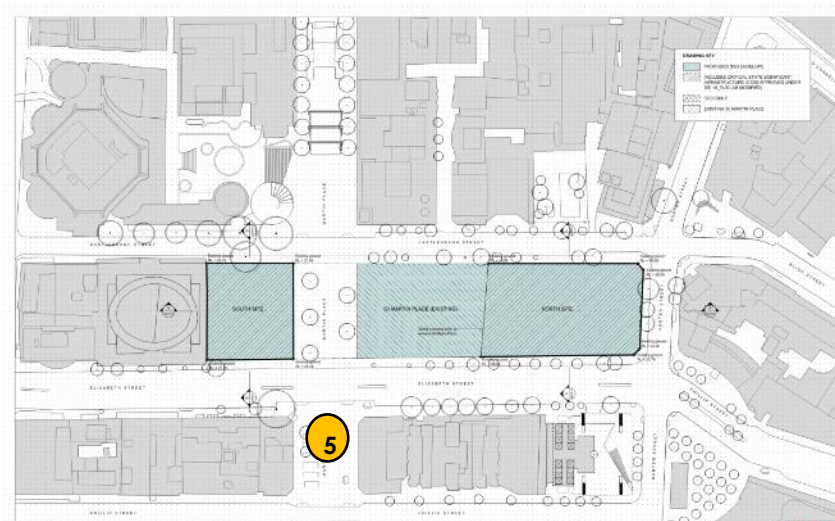
Model 1: Existing Model Sky View Factor: 18.5%



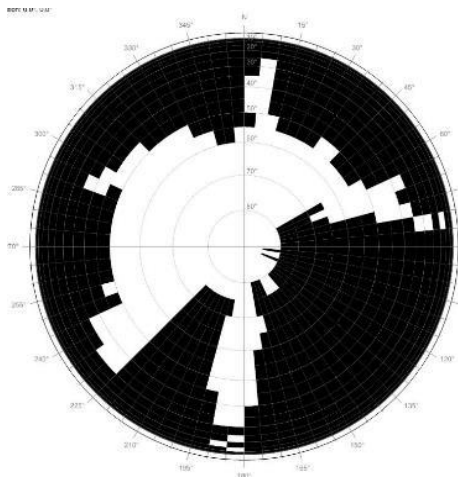
**Model 2: PA Sky View Factor: 18.0% (Blue)
above Model 1: Existing Model (Black/Grey)**



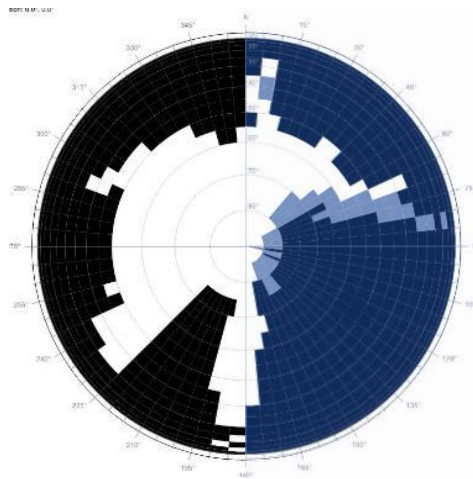
**Model 3: Architectural Detailed Design South site
with PA North Site: 17.5% (Orange) above Model 1:
Existing Model (Black/Grey)**



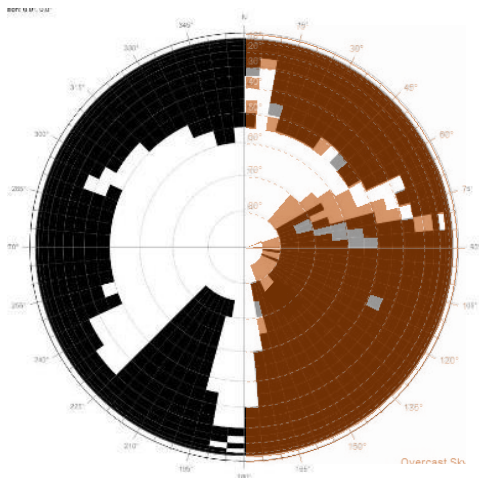
30 Castlereagh Street



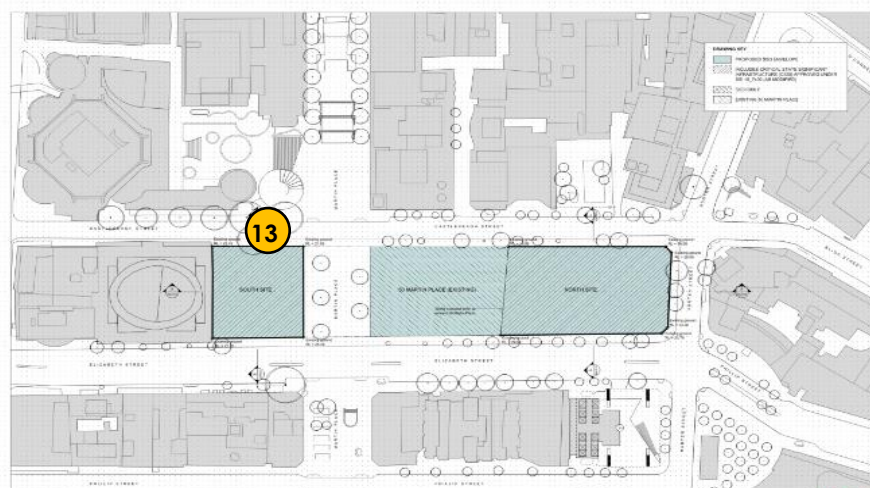
Model 1: Existing Model Sky View Factor: 19.5%



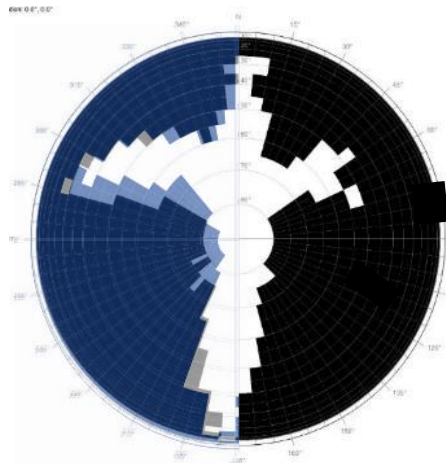
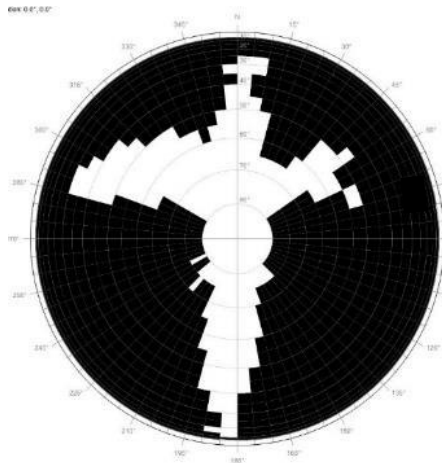
**Model 2: PA Sky View Factor: 19.0% (Blue)
above Model 1: Existing Model (Black/Grey)**



**Model 3: Architectural Detailed Design South
site with PA North Site: 18.5% (Orange) above
Model 1: Existing Model (Black/Grey)**

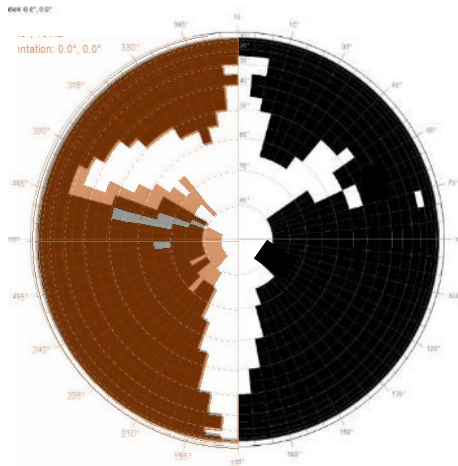


80-85 Elizabeth Street

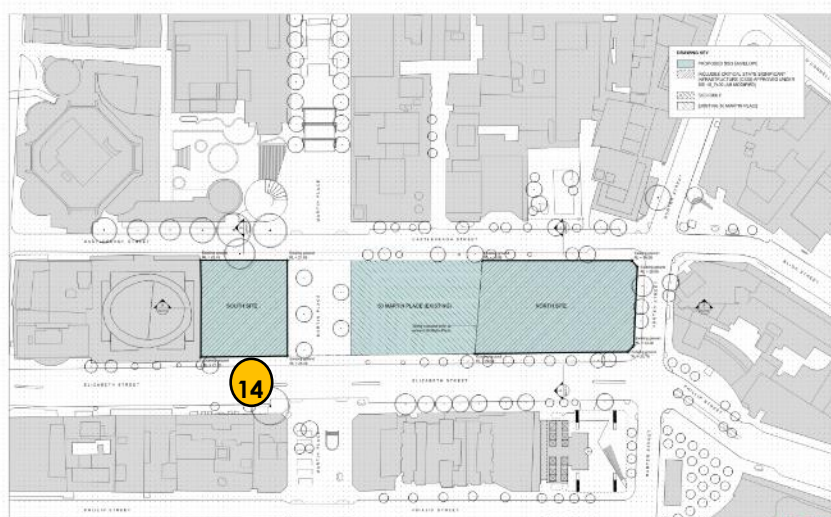


Model 1: Existing Model Sky View Factor: 18.5%

**Model 2: PA Sky View Factor: 17.0% (Blue)
above Model 1: Existing Model (Black/Grey)**



**Model 3: Architectural Detailed Design South
site with PA North Site: 16.5% (Orange)
above Model 1: Existing Model (Black/Grey)**



Appendix B

City of Sydney Report

Extracts from the City of Sydney and Discussion

The City of Sydney Street Frontage Height and Setback Study investigates the existing street frontage height and setback controls applying to the city for both the existing condition of the city and the likely development outcomes. They used a 3D digital city model in GIS software to assess the Sky View Factor. They confirm that the sky view is affected by the proximity of built element to the location where the measurement is calculated and the overall composition of built elements.

This assessment has compared the Sky View Factors from the City of Sydney Street Frontage Height and Setback Study Sky View Factor, where they grouped the existing Sky View Factors in 5% ranges, as shown below.



Figure 1: City of Sydney Frontage Height and Setback Study Sky View Factor Results

The Skyview factor in this study was classified into the same ranges described in the City of Sydney Street Frontage Height and Setback Study page 24 to 31:

- <15% low Sky View Factor
- 15-25% typical Sky View Factor
- 25-35% higher Sky View Factor
- 35-45% highest Sky View Factor

The table below shows the SVF range the City of Sydney found in their assessment, compared with the SVF that was studied in this report for the existing model. The SVF ranges within a street approximately match the results of the existing 2014 city model. However, at 20 Elizabeth Street the SVF was assessed to notably reduced when compared to the CoS study. This may be due to the fact the existing model used in this report was a city modelled based on the 2014 city, whereas the Cos

Assessment model may have taken into account the deconstruction of the buildings where the new North site is proposed to be built.

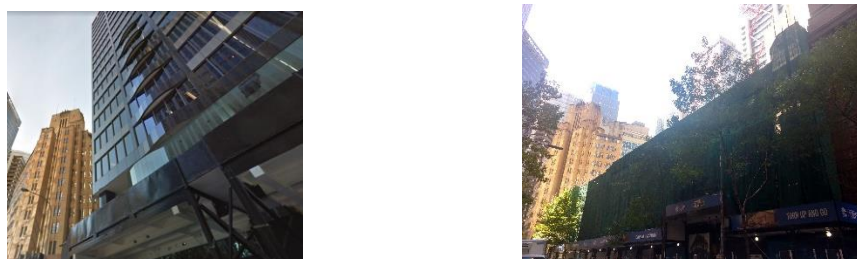




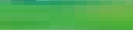

























Figure 12: Image taken by Google on July 2017 vs image taken on May 2018

Location		City of Sydney SVF	Surface Design SVF	Within COS Calculated Range
1	36 Martin Place	 15-25%		Y
2	Cnr of Martin Place and Castlereagh St	 20-30%		Y
3	37 Martin Place	 20-30%		Y
4	Cnr of Martin Place and Elizabeth St	 20-30%		Y
5	63 Martin Place	 15-25%		Y
6	Richard Johnson Square	 10-20%		Y
7	Chifley Square	 15-25%		Y
8	20 Elizabeth St	 10-20%		Y
9	7 Elizabeth St	 10-20%		Y
10	9/17 Castlereagh St	 10-20%		Y
11	4 Castlereagh St	 5-10%		Y
12	55 Hunter St	 5-15%		Y
13	30 Castlereagh St	 15-25%		Y
14	80-85 Elizabeth St	 15-20%		Y