

Attachment A15

**Sky View Factor Report – 2 Chifley Square,
Sydney**

Prepared for
Charter Hall

Date
29/06/2021

616

Submission for Planning Proposal

Sky View Factor Report

2 Chifley Square, Sydney

Document Information

| | |
|----------------------------|---|
| Job / Project title | 2 Chifley Square, Sydney |
| Document title | Submission for Planning Proposal Sky View Factor Report |
| Prepared by | Architectus |
| Author | Ignacio Alcalde |
| Reviewer | Steve Fox |
| Prepared for | Charter Hall |

Architectus Australia Pty Ltd
ABN 90 131 245 684

Adelaide
Lower Ground Floor
57 Wyatt Street
Adelaide SA 5000
T +61 8 8427 7300
adelaide@architectus.com.au

Brisbane
Level 2, 79 Adelaide Street
Brisbane QLD 4000
T +61 7 3221 6077

Melbourne
Level 25, 385 Bourke Street
Melbourne VIC 3000
T +61 3 9429 5733
F +61 3 9429 8480
melbourne@architectus.com.au

Perth
QV1, Upper Plaza West
250 St Georges Terrace
Perth WA 6000
T +61 8 9412 8355
perth@architectus.com.au

Sydney
Level 18, MLC Centre
25 Martin Place
Sydney NSW 2000
T +61 2 8252 8400
sydney@architectus.com.au

architectus.com.au

Architectus Disclaimer:

Architectus have used their best efforts in collecting the information published in this report. Architectus does not assume, and hereby disclaims any liability for any loss or damage caused by errors or omissions in this report, whether such errors or omissions result from negligence, accident or other causes.

Notice: No part of this publication may be produced or transmitted in any form or by any means, or electrical or mechanical, without the prior written permission of Architectus.

Contents

| | |
|-----------------------------|----|
| 1. Introduction | 4 |
| a. Purpose of assessment | 4 |
| 2. Planning context | 5 |
| 2.1 Planning context | 5 |
| 2.2 Building envelope | 6 |
| 3. Methodology | 8 |
| 3.1 Testing methodology | 8 |
| 4. Sky View Factor Analysis | 10 |
| 4.1 Results | 10 |
| 4.2 Conclusion | 11 |

List of figures

| | |
|--|----|
| Figure 1 Subject site, 2 Chifley Square. | 4 |
| Figure 2 Maximum permissible complying building envelope | 6 |
| Figure 3 Proposed building envelope | 7 |
| Figure 4 Parametric script | 8 |
| Figure 5 Test geometry 1 | 8 |
| Figure 6 Sydney LiDAR model | 9 |
| Figure 7 Analysis Surface with Proposed Envelope | 9 |
| Figure 8 Sky View Factor Average Complying Scheme | 10 |
| Figure 9 Sky View Factor Average Proposed Scheme | 10 |
| Figure 10 Sky View Factor Difference Complying Scheme vs Proposed Scheme | 11 |
| Figure 11 Analysis Points 1 to 14 | 11 |

List of tables

| | |
|--|---|
| Table 1 Procedures for demonstrating compliance with Sky View Factor | 5 |
|--|---|

Attachments

2 Chifley Square_SVF[v2.0].xlsx

1. Introduction

This Sky View Factor (SVF) Report has been prepared by Architectus on behalf of Charter Hall in relation to the site at 2 Chifley Square, Sydney. This report provides analysis of the extent of sky visible above various points in proximity to the site as a proportion of the total possible sky hemisphere above the point. SVF is calculated as the proportion of sky visible when viewed from the ground up. SVF is provided as value that ranges from 0 to 1, where SVF of 0 denotes no sky visible and SVF of 1 denotes that the sky is completely visible to the horizon in all directions.

A total of 20,792 test points were analysed. The analysis finds the proposed scheme would increase sky visibility compared to the complying scheme when averaged across all test points. A complying scheme provides a SVF value of 25.583949% and the proposed scheme provides a SVF value of 25.648188%, resulting in an overall increase in sky visibility of SVF value of 0.064239%.

a. Purpose of assessment

The purpose of the SVF analysis is to demonstrate compliance with *Central Sydney 2020 - Draft Sydney Development Control Plan 2012* regarding variation to side and rear setbacks, and to varying tapering provisions. This analysis has been prepared in accordance with the requirements of the *Attachment D6 - Draft Development Control Plan - Central Sydney* with specific reference to 'Procedure B' of Schedule 11 of the Draft DCP.

1.1.1 The site

This report relates to the site at 2 Chifley Square, Sydney. The site is located centrally within the Sydney CBD, and is identified in **Figure 1** below.



Figure 1 Subject site, 2 Chifley Square.

2. Planning context

This section outlines the planning context that has informed the methodology used to undertake this SVF analysis.

2.1 Planning context

This report has been prepared in accordance with the requirements of the *Central Sydney 2020 - Draft Sydney Development Control Plan 2012: Procedure B of Schedule 11 of the Attachment D6 - Draft Development Control Plan - Central Sydney*.

Table 1 Procedures for demonstrating compliance with Sky View Factor

| Schedule 11 – Procedures for demonstrating compliance with variation provisions for setbacks, separations and tapering in Central Sydney | |
|---|---|
| Procedure B: Equivalent or improved wind comfort and wind safety and daylight levels in adjacent Public Places | <p>In order to demonstrate compliance with Section 5.1.1.1(3)(b) and Section 5.1.1.3(5) in regards to varying Minimum Street Setbacks and Side and Rear Setbacks, Building Form Separations and Tapering provisions respectively, the following procedure must be followed:</p> <p>5) the average annual daylight level (which may be approximated by the average Sky View Factor)</p> <p><i>Note:</i> Sky View Factor (SVF) means the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the point. SVF is calculated as the proportion of sky visible when viewed from the ground (as an abstract horizontal surface) up. SVF is a dimensionless value that ranges from 0 to 1 (0% to 100%). A SVF of 1 denotes that the sky is completely visible to the horizon in all directions; for example, in a flat terrain. When a locations has topography or buildings blocking view to any part of the sky, it will cause the SVF to decrease proportionally.</p> <p>7) Daylight levels or SVF must be measured within the existing city form (including developments under construction as if they were completed) and should exclude any elements within a Public Place e.g. trees and awnings to a distance of at least 50m from site boundaries.</p> |



Figure 1.10: Sky View Factor means the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the point.

Source: Schedule 11 of Attachment D6 - Draft Development Control Plan - Central Sydney

2.2 Building envelope

The *Attachment D6 - Draft Development Control Plan - Central Sydney* provides built form controls relating to: Minimum Street Setbacks (5.1.1.1); Side and Rear Setbacks and Building Form Separations (5.1.1.3); and Built form massing, tapering and maximum dimensions (5.1.1.4);

Refer to the complying and proposed building envelopes at **Figure 2** and **Figure 3**.

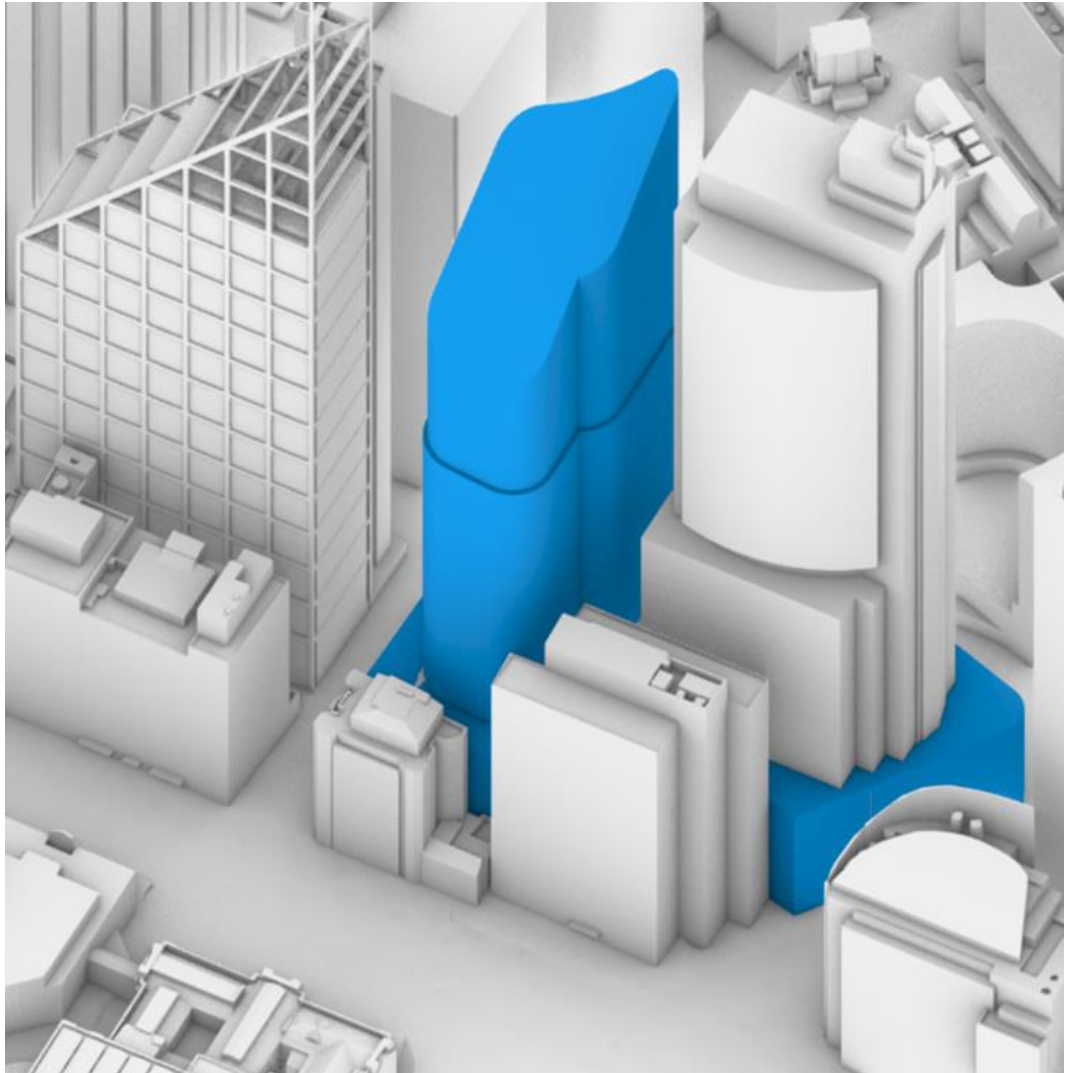


Figure 2 Maximum permissible complying building envelope

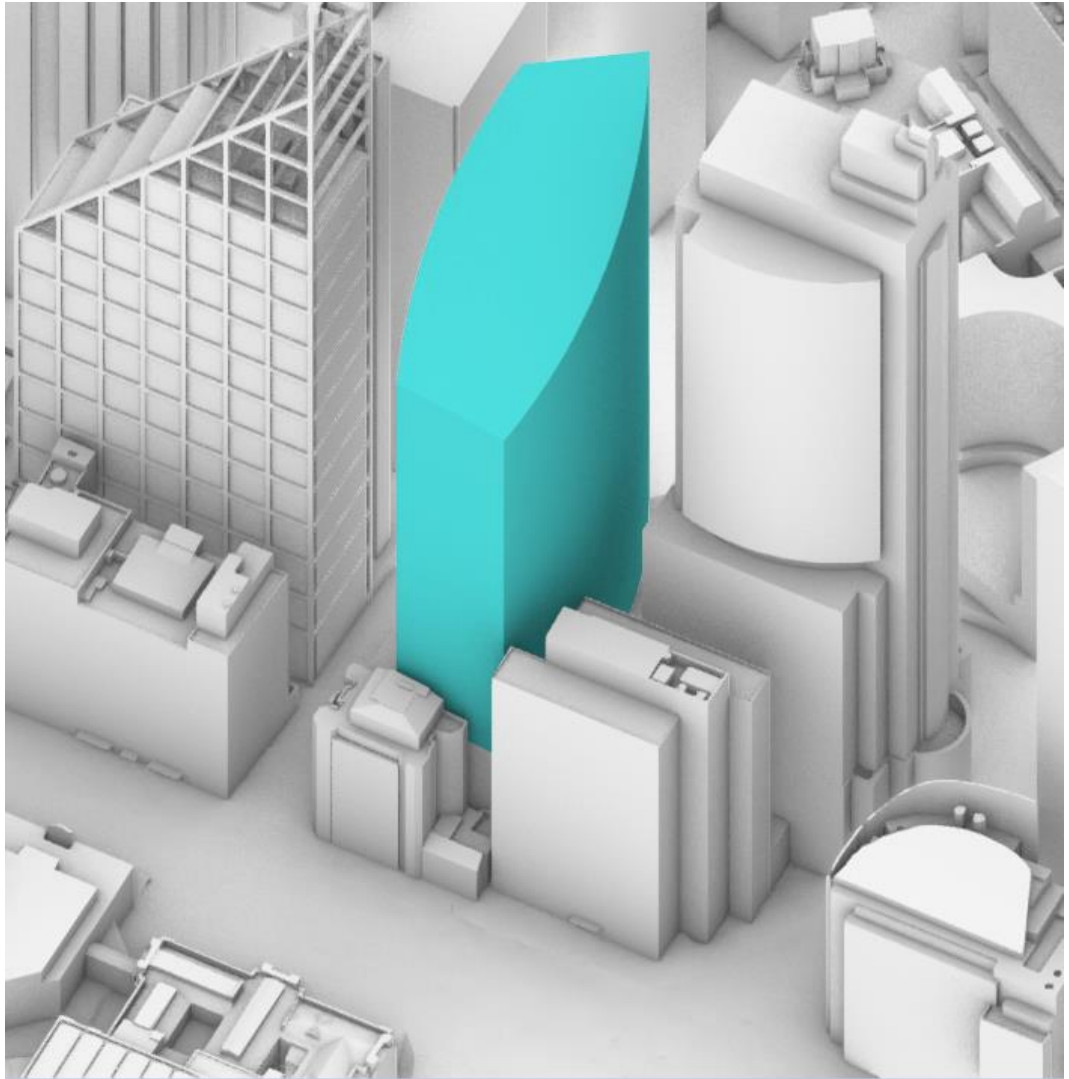


Figure 3 Proposed building envelope

3. Methodology

This section outlines the methodology applied to undertake this SVF analysis.

3.1 Testing methodology

SVF analysis was undertaken using the open source environmental plug-in 'Ladybug for Grasshopper' which adds-in to Rhinoceros 3D, available from Robert McNeel and Associates.

Figures 4 & 5 below indicate the methodology used to prepare this report.

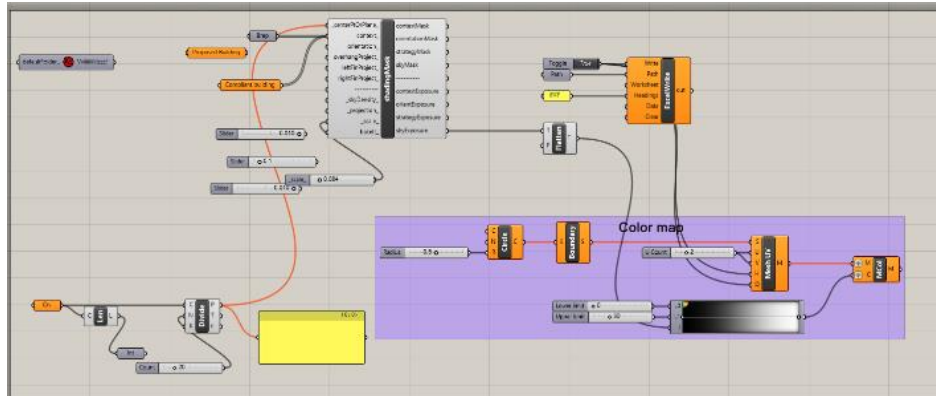


Figure 4 Parametric script

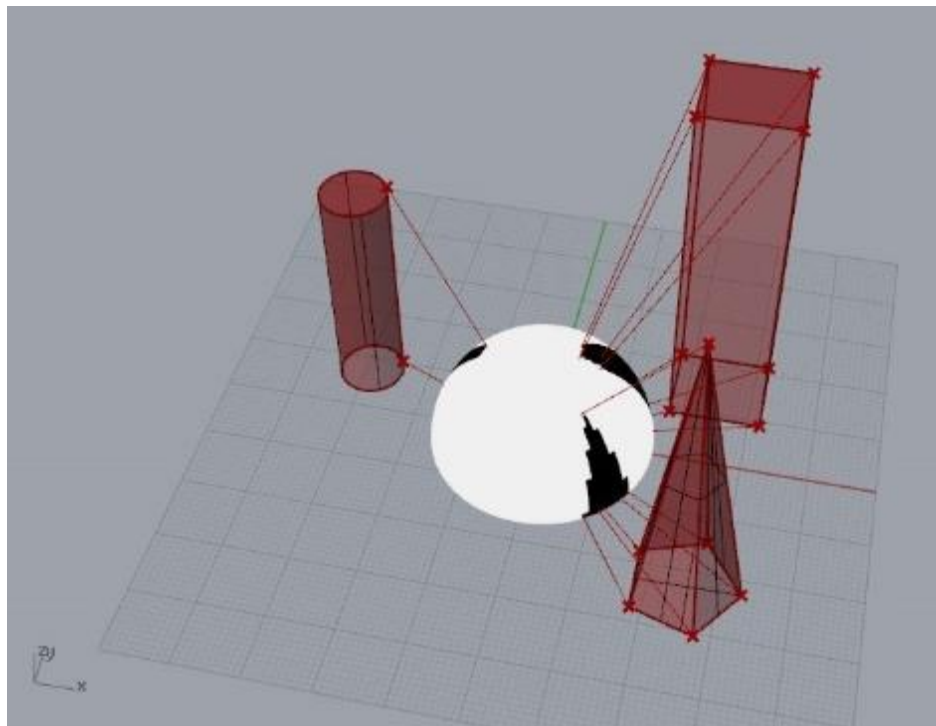


Figure 5 Test geometry 1

The proposed model envelope and compliant model envelope were created using Rhinoceros 3D. City of Sydney context models were brought into Rhinoceros 3D from a LiDAR scan. Refer to **Figure 6** below.

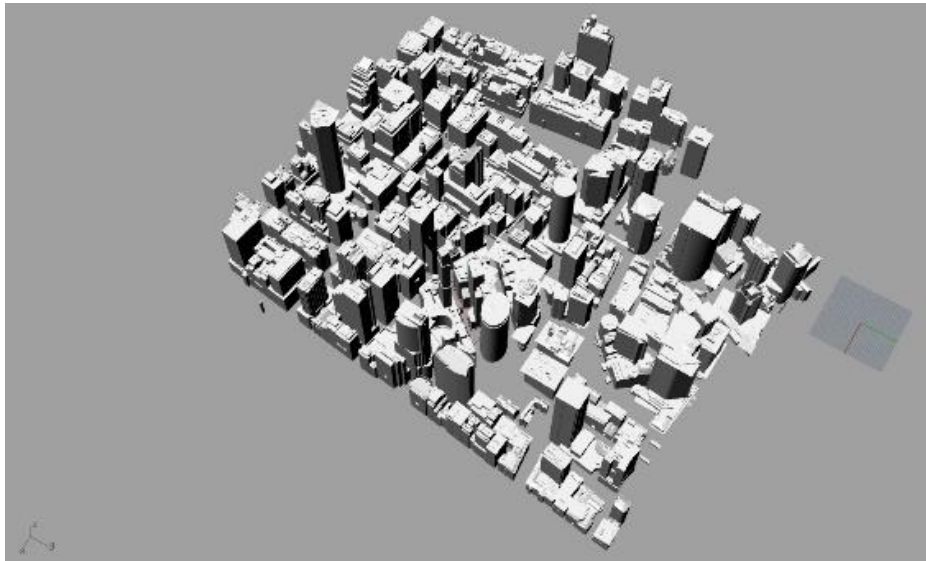


Figure 6 Sydney LiDAR model

A comparative analysis was run with test zone extending 50 meters from the site. A total **20,792 test points** were analysed. Grid spacing of the test zone, and sky density criteria are not specified in *Attachment D6 - Draft Development Control Plan - Central Sydney*.

Grid spacing of every test point was set to 1 meter. Computational time is greatly increased with smaller grid sizes with negligible improvement in the margin of error. Sky density (the resolution of the imagery generated by the analysis) was set to 2,305 patches (vectors) per test point. Our nominated grid spacing and sky density testing criteria ensures highly accurate results and is therefore considered adequate to satisfy requirements of the *D6 - Draft Development Control Plan - Central Sydney*.

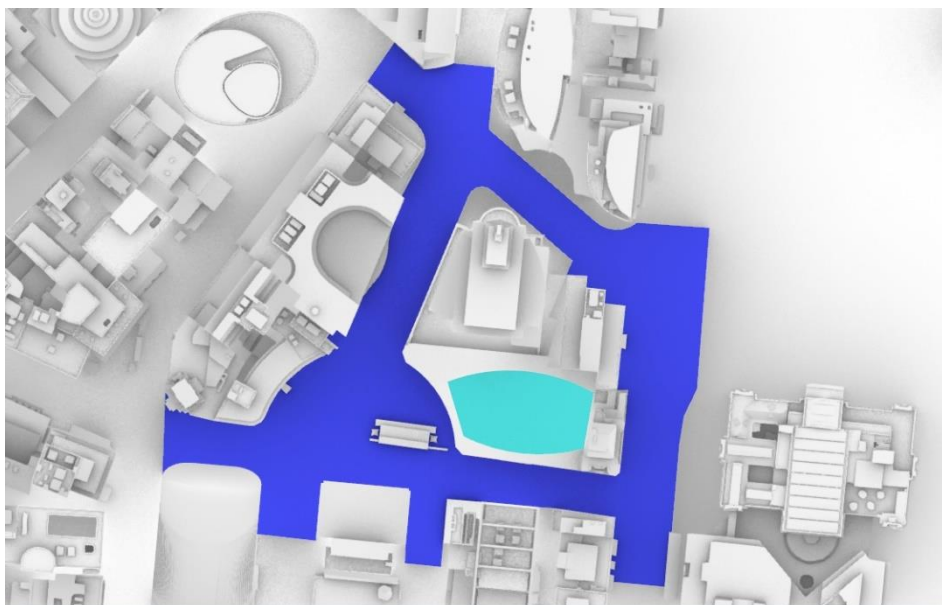


Figure 7 Analysis Surface with Proposed Envelope

4. Sky View Factor Analysis

This section provides a description of the results of this SVF analysis.

4.1 Results

A total of 20,792 test points were analysed. The analysis finds the proposed scheme would increase sky visibility compared to the complying scheme when averaged across all test points. A complying scheme provides a SVF value of 25.583949% and the proposed scheme provides a SVF value of 25.648188%, resulting in an overall increase in sky visibility of SVF value of 0.064239%. These results are graphically demonstrated in the images below.

Data has been compiled into Excel spreadsheets where totals and averages can be extracted. The SVF values and overall averages are submitted with this report in Excel format.

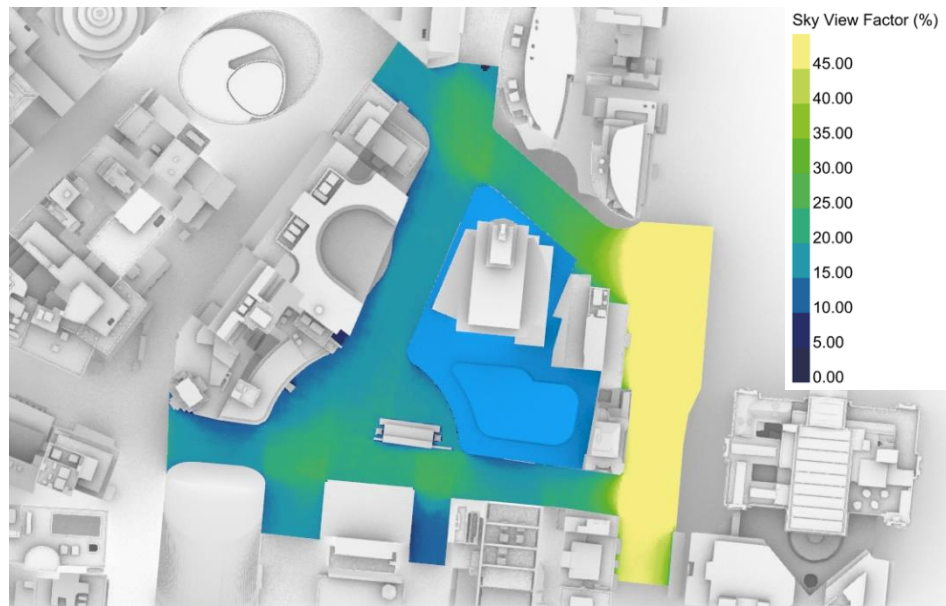


Figure 8 Sky View Factor Average Complying Scheme

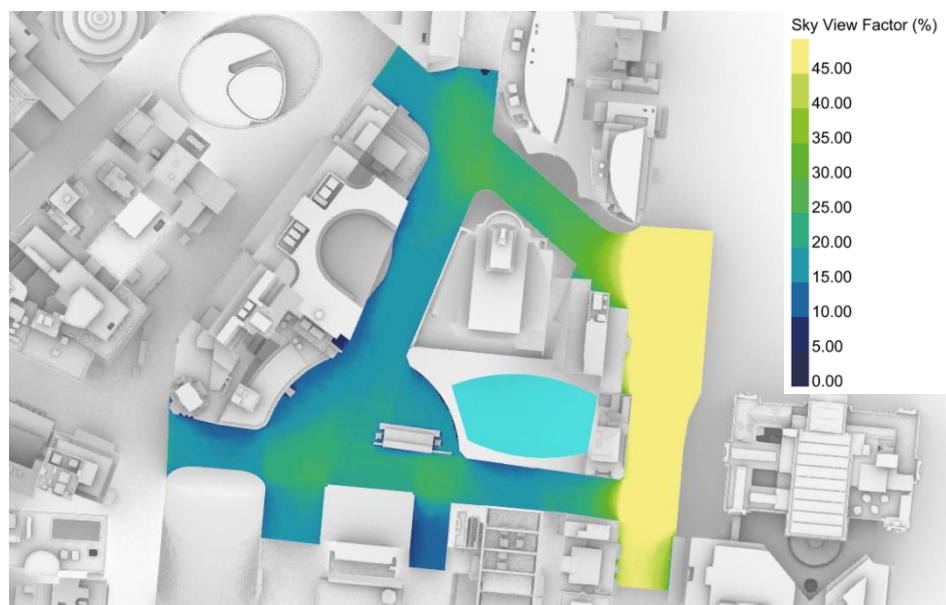


Figure 9 Sky View Factor Average Proposed Scheme

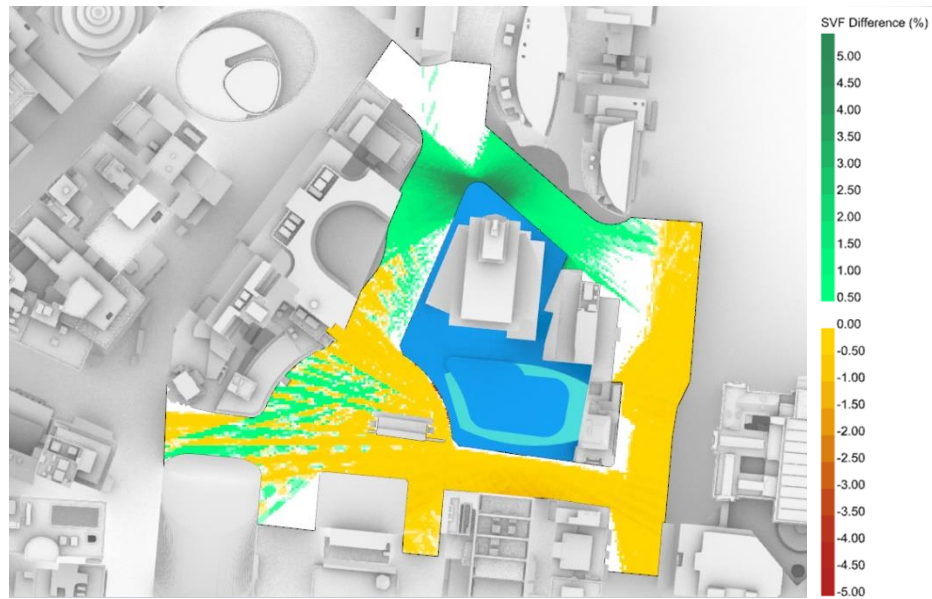


Figure 10 Sky View Factor Difference Complying Scheme vs Proposed Scheme

The image below represents the available sky view at specific points by generating 'dome view' visualisations. The 'dome views' or shading masks show the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the specific point of analysis. There are 14x points represented below out of a total of 20,792x points of analysis.



Figure 11 Sky View at different points

4.2 Conclusion

The SVF analysis demonstrates compliance of the proposed envelope based on testing criteria provided in *Attachment D6 - Draft Development Control Plan - Central Sydney*.