ATLASSIAN

+

YHA AUSTRALIA

WESTERN GATEWAY
SUB-PRECINCT BLOCK A

RAILWAY SQUARE
8-10 LEE STREET

APPENDIX C
SOLAR ANALYSIS OF ENVELOPE

PREPARED FOR
ATLASSIAN, YHA & AVENOR

OCTOBER 2019

CONTENTS

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ARCHITECTURE	EC3 with Terroir Previous phase undertaken by Bates Smart
LANDSCAPE ARCHITECTURE	Aspect Studios

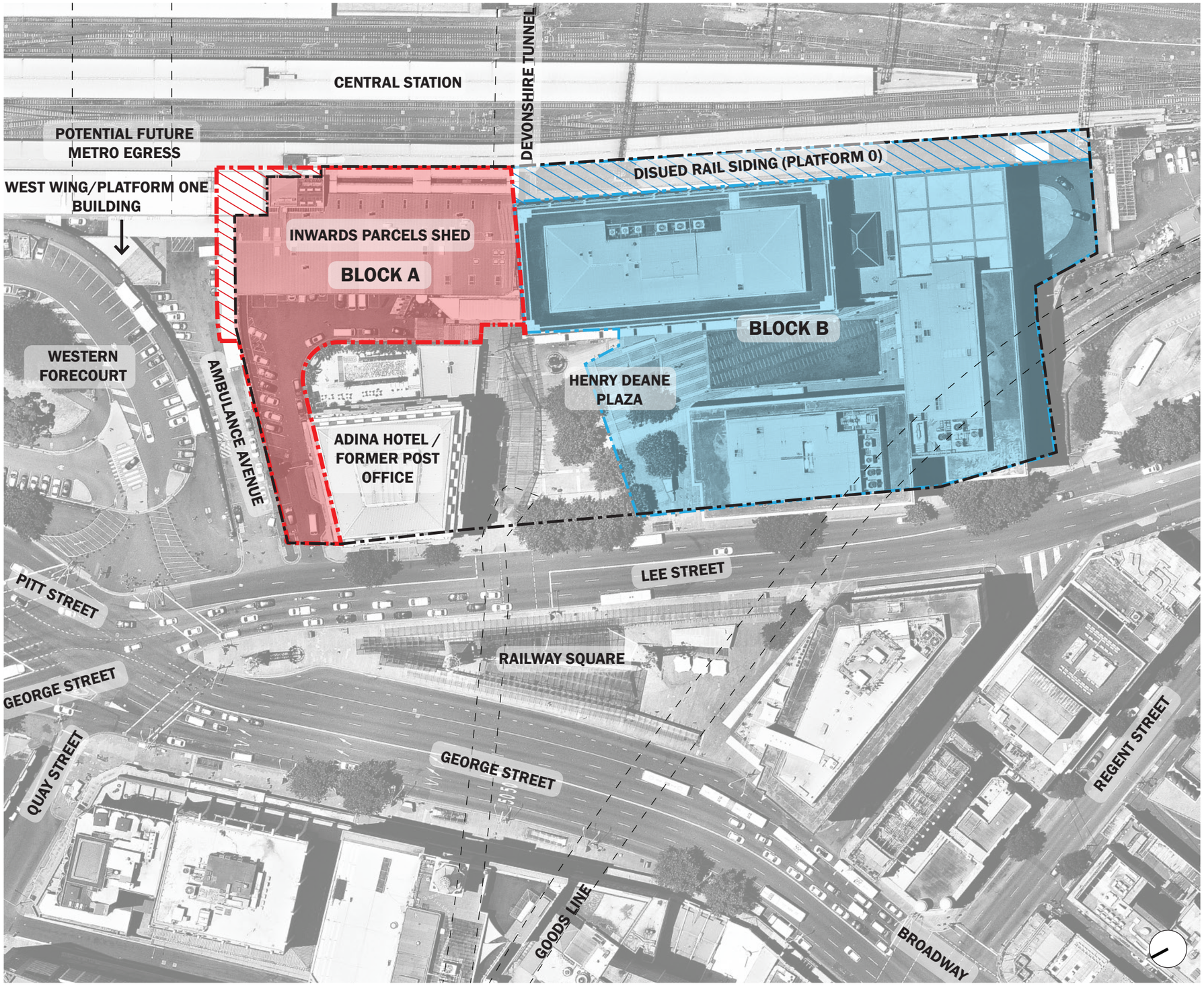
INTRODUCTION

Solar Analysis of the proposed envelopes of the Western Gateway sub-precinct proposals is included in this document. The analysis includes plan views in 15min increments of the overshadowing produced on both the Winter Solstice and Spring/Autumn Equinox from 10am - 2pm.

Initial analysis has been undertaken for the Western Gateway sub-precinct Block A development in isolation.

Further analysis has also been provided of the cumulative impact with the inclusion of the other Western Gateway sub-precinct development. Analysis has been provided which indicate the Block A built form with the addition of Block B.

There are also more detailed overshadowing and sky view exposure assessment provided on the Block A envelope and reference scheme relative to the potential impacts on the proposed public domain zones within the Western Gateway sub-precinct.



High resolution photograph from January 2016 clearly shows disused rail siding (not in shadow). Image capture is prior to construction of Sydney Yards Access Bridge.

LEGEND

- Sub Precinct Block A Site Boundary
- Sub Precinct Block A Air Rights
- Sub Precinct Block B Site Boundary
- Sub Precinct Block B Platform 0
- Western Gateway Sub Precinct Boundary

SOLAR ANALYSIS OF ENVELOPE: EXISTING AND PROPOSED PROTECTIONS

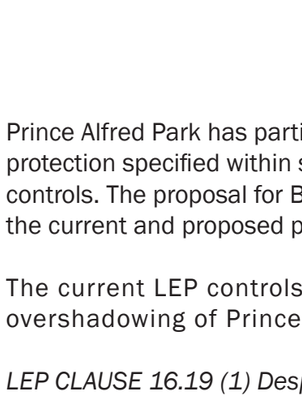
Prince Alfred Park has particular solar access protection specified within statutory planning controls. The proposal for Block A has reviewed both the current and proposed protections.

The current LEP controls relative to overshadowing of Prince Alfred Park state:

LEP CLAUSE 16.19 (1) Despite clause 4.3, development consent must not be granted to development that results in any part of a building causing additional overshadowing, at any time between 14 April and 31 August in any year, of any of the following locations (as shown with blue hatching on the Sun Access Protection Map) during the times specified in relation to those locations—

(h) Prince Alfred Park (beyond the shadow that would be cast by a wall with a 20 metre frontage height on the boundary between the park and the railway land)—between 12.00–14.00

The City of Sydney's Draft Central Sydney Planning Strategy provides greater protection for solar access to Prince Alfred Park. The document includes the addition of a Sun Access Plane to this key open space area and expanding the period of protection to 10am - 2pm.



Draft Central Sydney Planning Strategy Document

The City of Sydney's Draft Central Sydney Planning Strategy Solar Access Contour Map allows for low-scale buildings to be located along the disused rail-siding fronting Prince Alfred Park. The coordinates provided for the Sun Access Plane are equivalent to with a 20m high frontage which aligns to the current LEP controls.

The City of Sydney's Draft Central Sydney Planning Strategy Sun Access Plane plan is shown adjacent and the coordinates for these points have been referenced from Appendix M of this document. The coordinates provided for the Sun Access Plane have been used to establish the maximum permitted envelope for Block A of the Western Gateway sub-precinct.

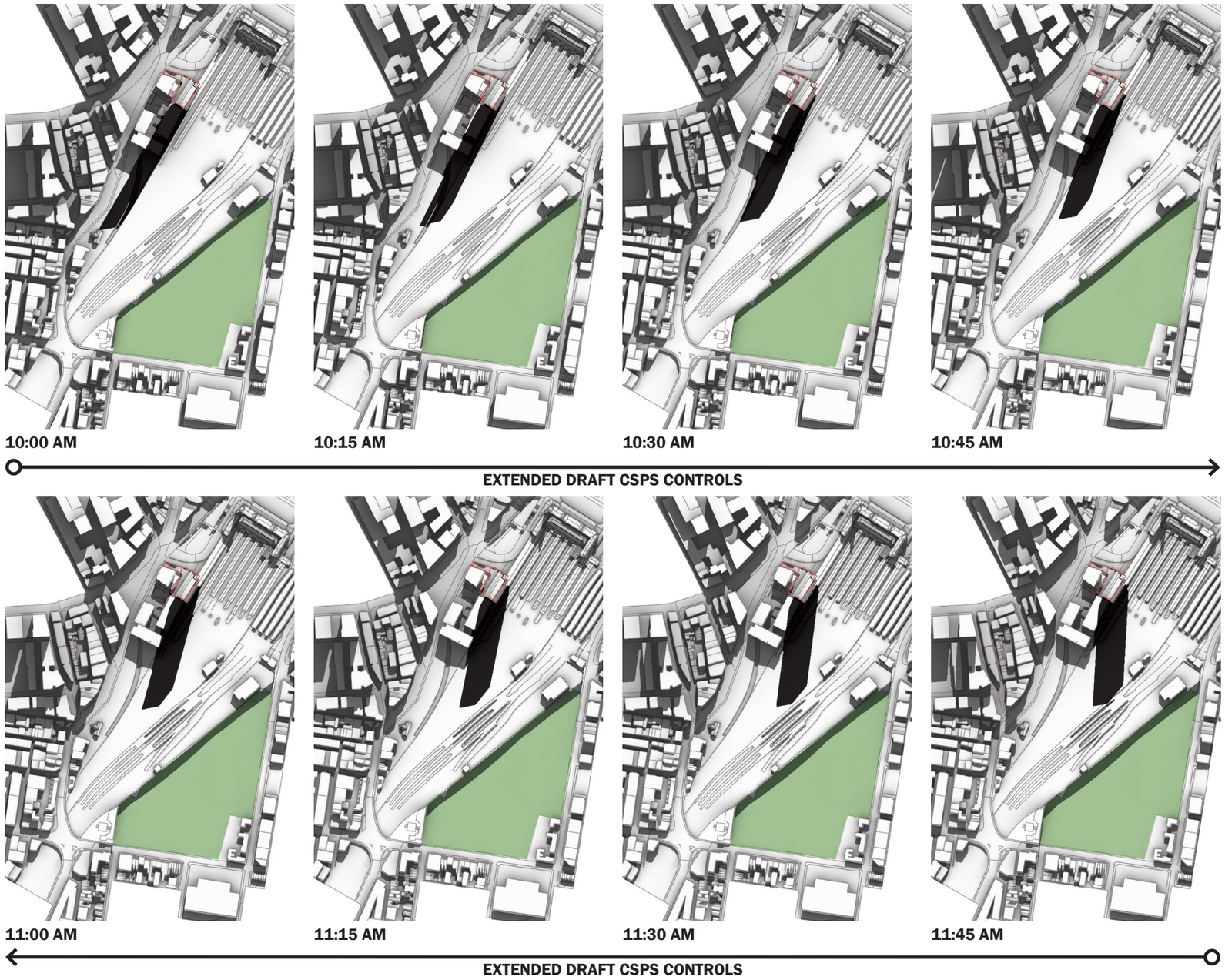
Solar analysis has been undertaken utilising the Sun Access Plan coordinates to create the height of the wall along the boundary of Prince Alfred park, rather than a 20m extrusion above the 3D model levels of the park to assess the overshadowing relative to the more accurate control.

SOLAR ANALYSIS OF ENVELOPE: WINTER
WESTERN GATEWAY SUB-PRECINCT BLOCK A ENVELOPE

JUNE 21ST WINTER SOLSTICE
The proposed envelope complies with the sun access plane of the City of Sydney's Draft Central Sydney Planning Strategy. This allows for low-rise built form along the rail siding adjacent to Prince Alfred Park and the potential shading that this creates has been included in the analysis to demonstrate the compliance of the Block A envelope with these controls. These low-rise buildings would have high amenity and provide passive night-time surveillance onto Prince Alfred Park.

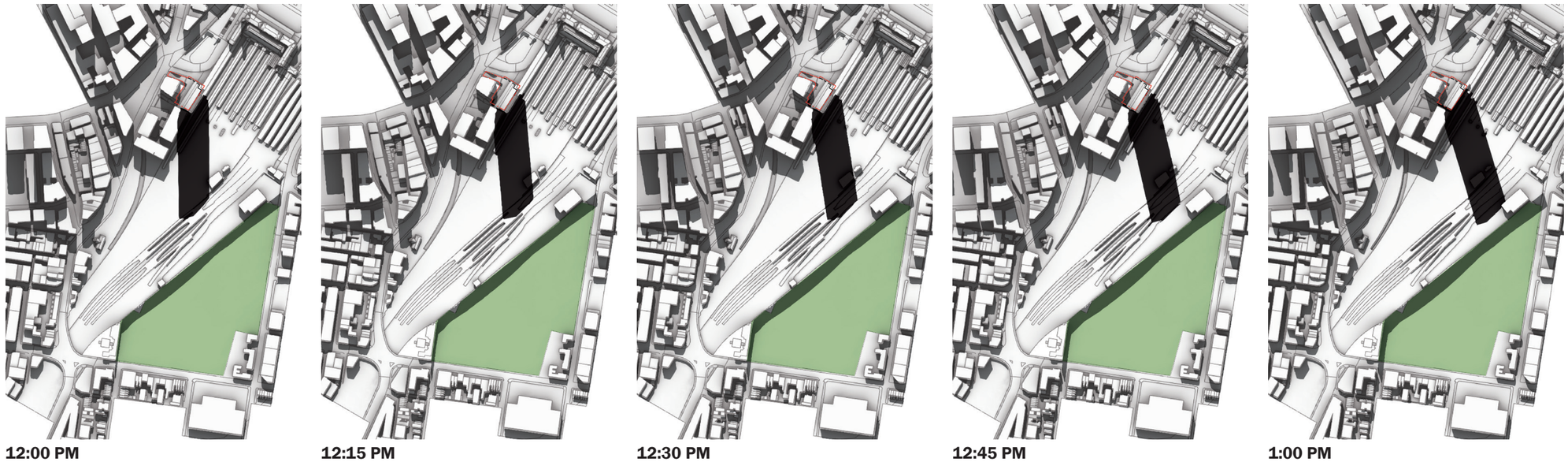
The image below show the existing tree cover to the North Eastern corner of Prince Alfred Park, which is not shown in the solar analysis diagrams.

The Block A envelope solar analysis also indicates that it does not over shadow the existing Henry Deane Plaza area and new proposed public domain zone between Block A and Block C of the Western Gateway sub-precinct during the 10am - 2pm period on Winter Solstice.



APPENDIX C - SOLAR ANALYSIS OF ENVELOPE

Block A Site Boundary
Existing shadow extent with assumed 20m high park frontage
Block A Building Envelope shadow extent



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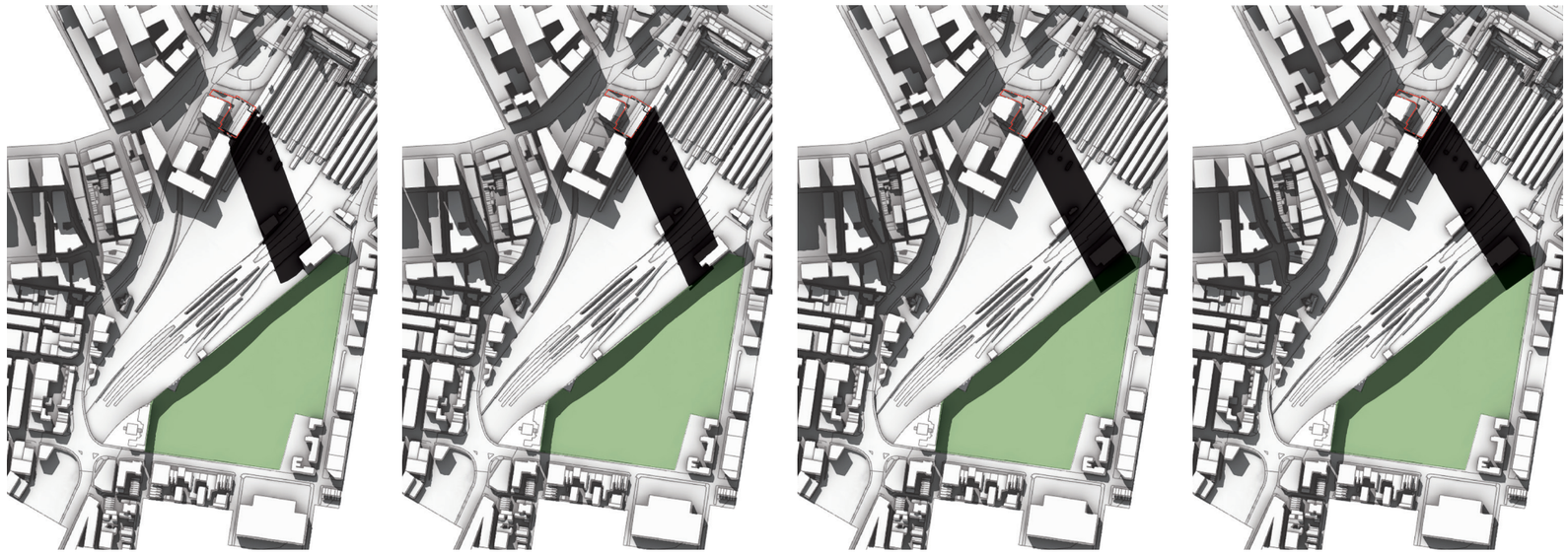
EXISTING LEP CONTROLS



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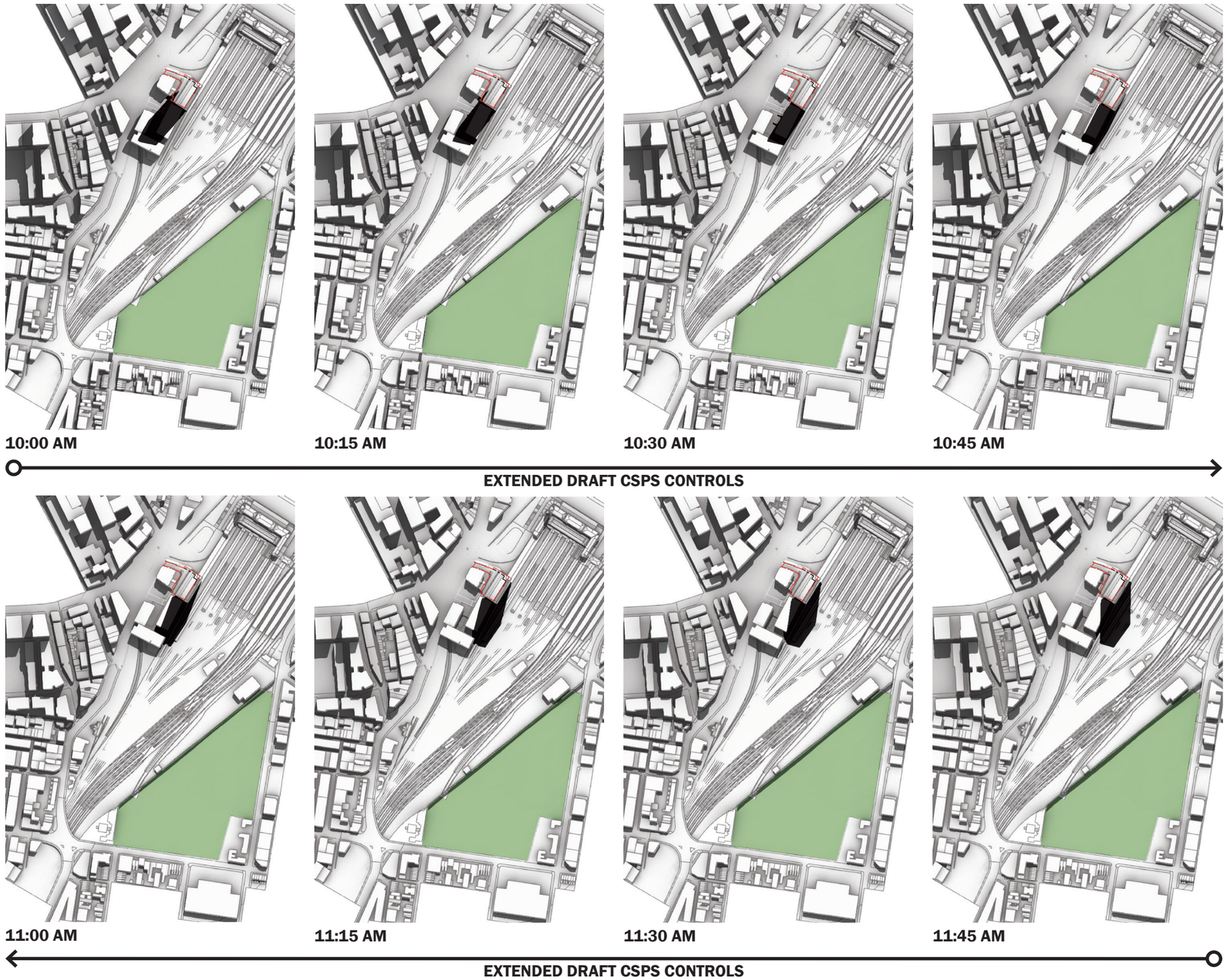
EXISTING LEP CONTROLS

SOLAR ANALYSIS OF ENVELOPE: SPRING/AUTUMN
WESTERN GATEWAY SUB-PRECINCT BLOCK A ENVELOPE

SEPTEMBER 23RD SPRING EQUINOX
For the majority of the year the tower's shadow is significantly distant from Prince Alfred Park, and does not overshadow the park at any hour given the envelope has been set to comply with the winter solstice protections.

The existing Henry Deane Plaza area and new proposed public domain zone between Block A and Block C of the Western Gateway sub-precinct do receive a very small portion of overshadowing as a result of the Block A envelope. This is during the early morning period and at the spring equinox these areas are not impacted beyond 10.30am.

The image below show the existing tree cover to the North Eastern corner of Prince Alfred Park, which is not shown in the solar analysis diagrams.



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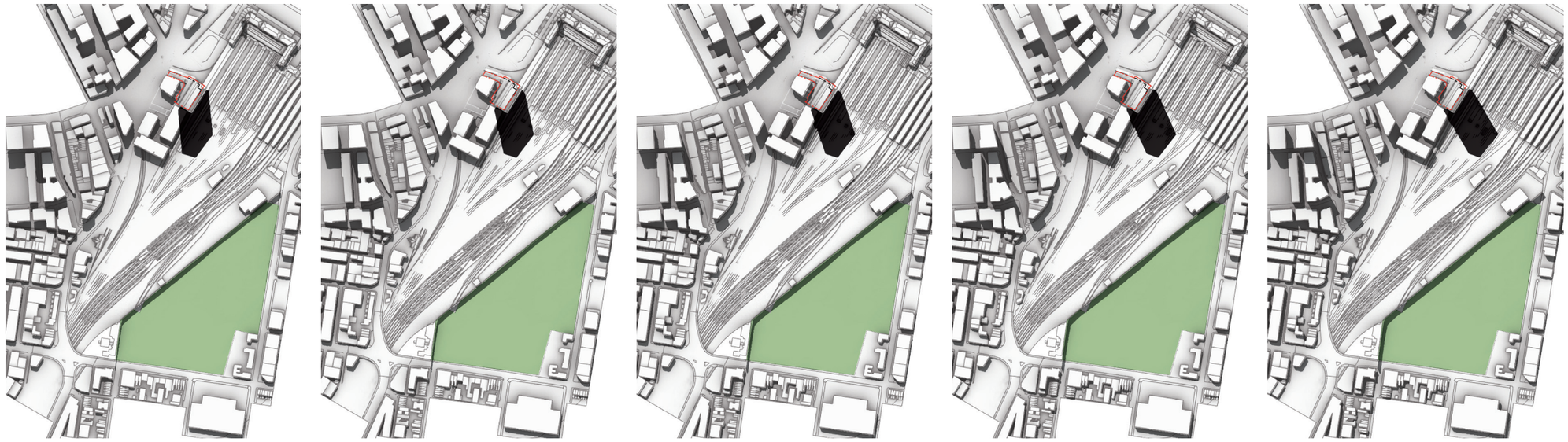
Block A Site Boundary
Existing shadow extent with assumed 20m high park frontage
Block A Building Envelope shadow extent



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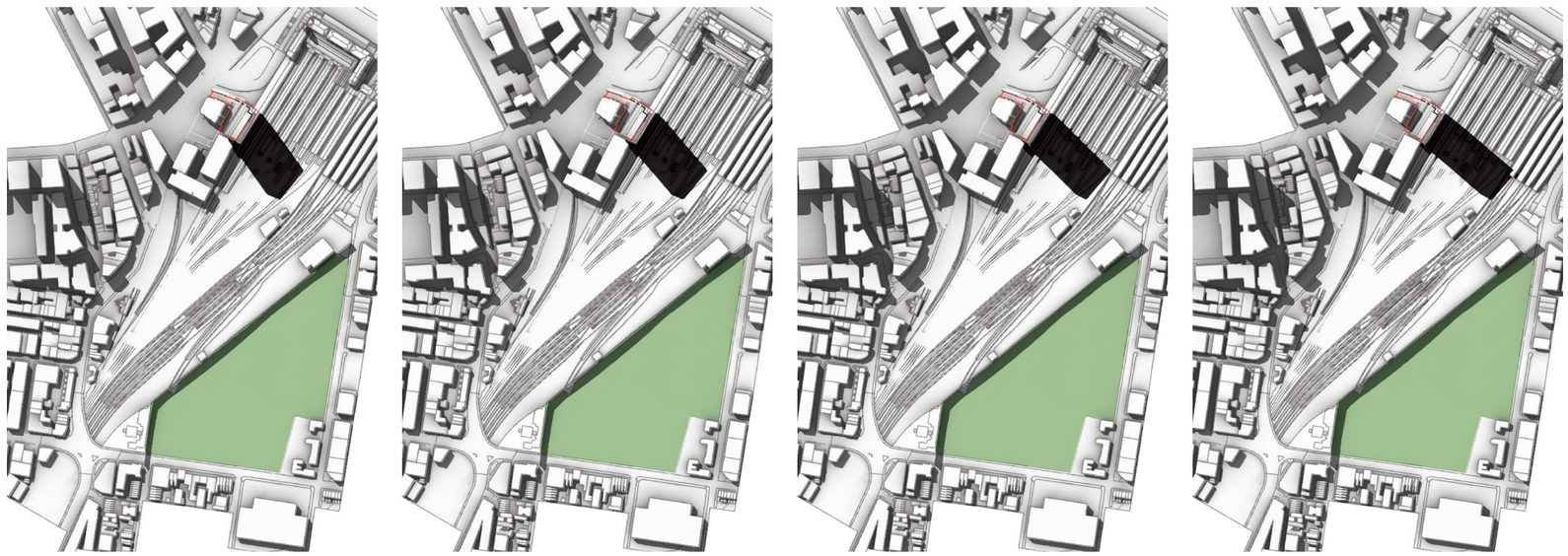
EXISTING LEP CONTROLS



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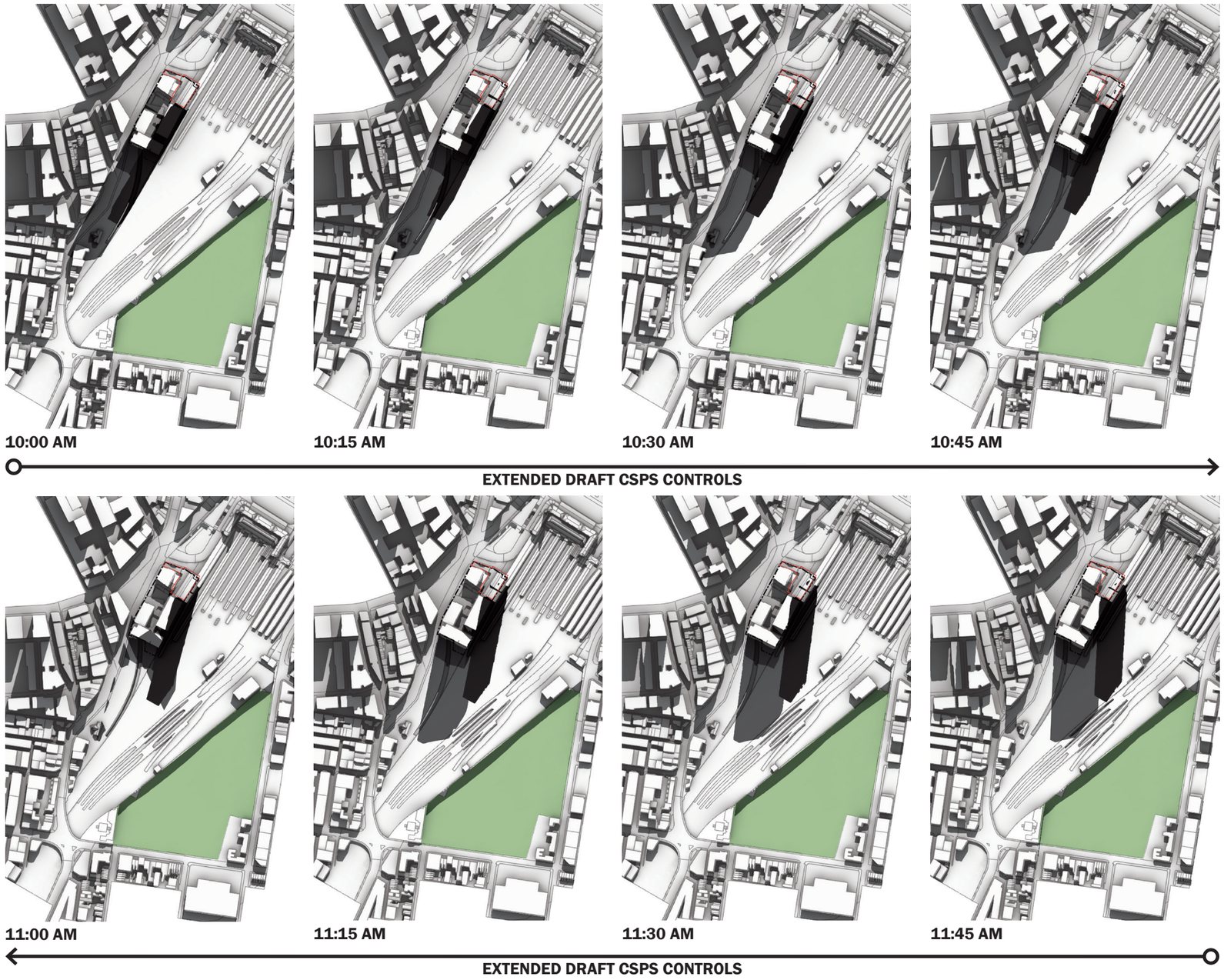
EXISTING LEP CONTROLS

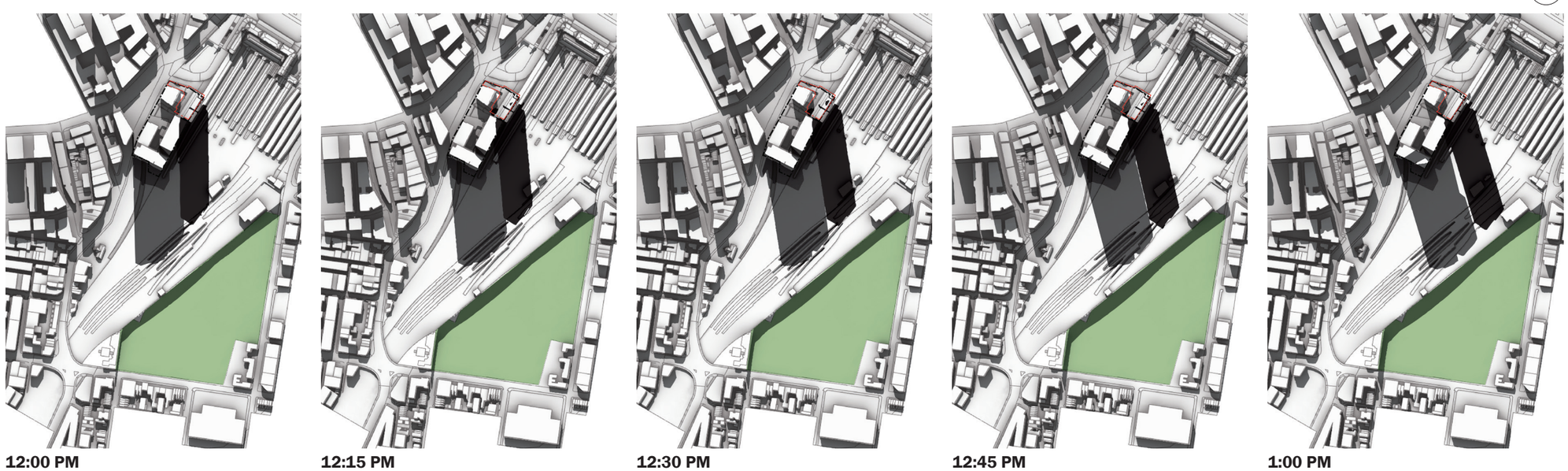
SOLAR ANALYSIS OF ENVELOPE: WINTER
WESTERN GATEWAY SUB-PRECINCT BLOCK A & B ENVELOPES

JUNE 21ST WINTER SOLSTICE
Additional analysis indicting Block A Reference Scheme massing with Block B Reference Scheme massing to indicate potential cumulative impacts.



APPENDIX C - SOLAR ANALYSIS OF ENVELOPE

- Block A Site Boundary
- Western Gateway Precinct Boundary
- Existing shadow extent with assumed 20m high park frontage
- Block A Building Envelope shadow extent
- Block B Building Envelope shadow extent



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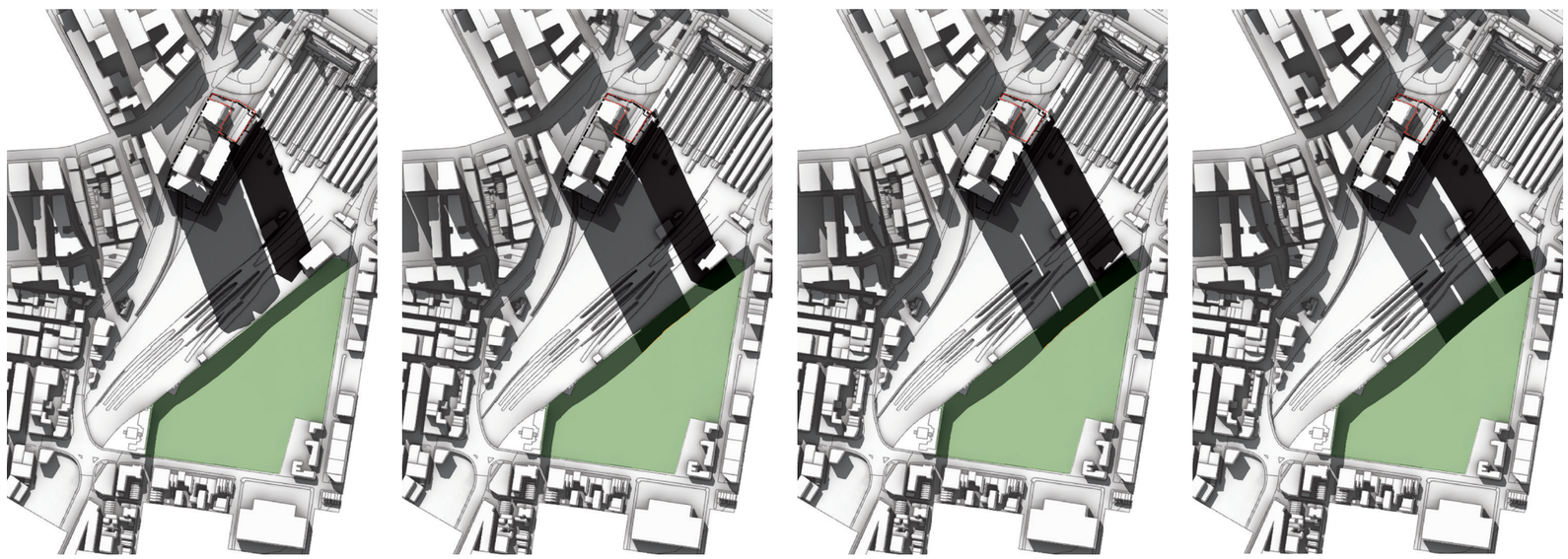
EXISTING LEP CONTROLS



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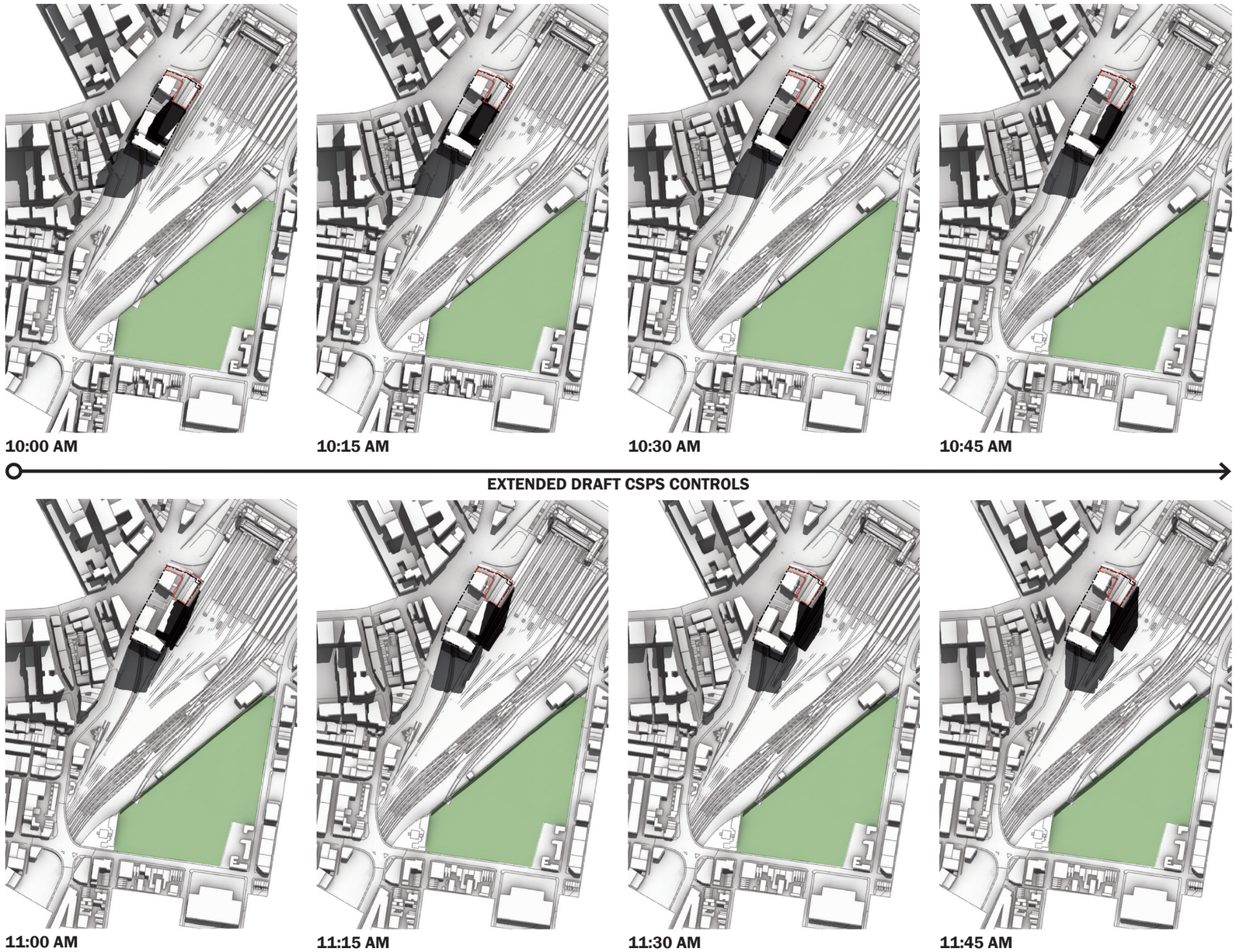
EXISTING LEP CONTROLS

SOLAR ANALYSIS OF ENVELOPE: SPRING/AUTUMN
WESTERN GATEWAY SUB-PRECINCT BLOCK A & B ENVELOPES

SEPTEMBER 23RD SPRING EQUINOX
Additional analysis indicting Block A Reference Scheme massing with Block B Reference Scheme massing to indicate potential cumulative impacts.



APPENDIX C - SOLAR ANALYSIS OF ENVELOPE

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- Block A Building Envelope shadow extent
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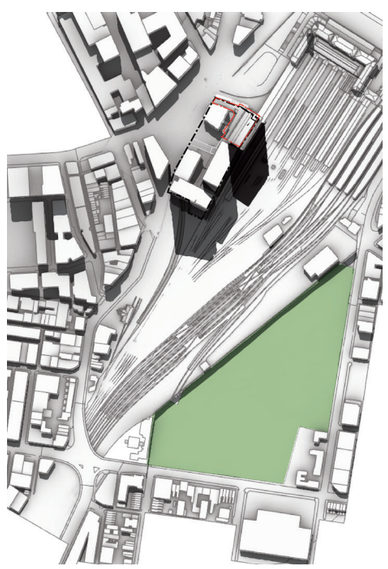

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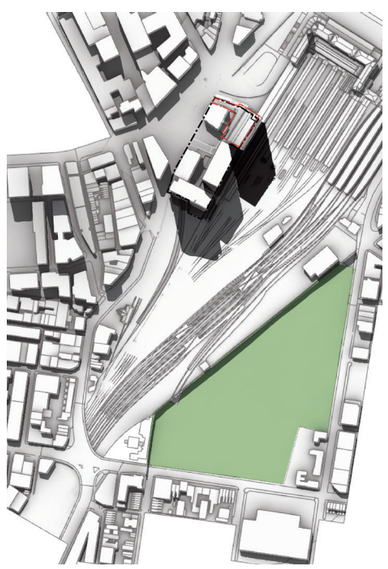

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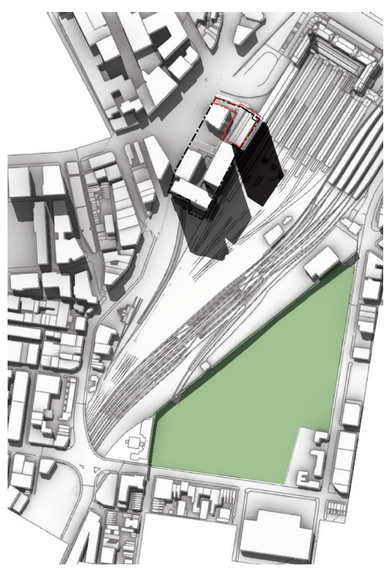

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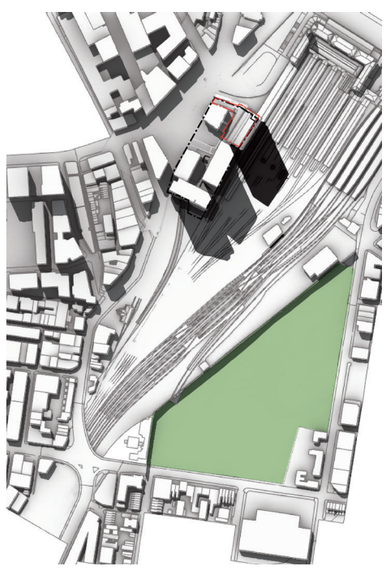

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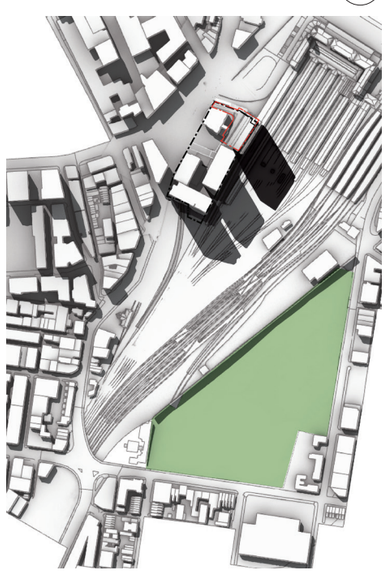

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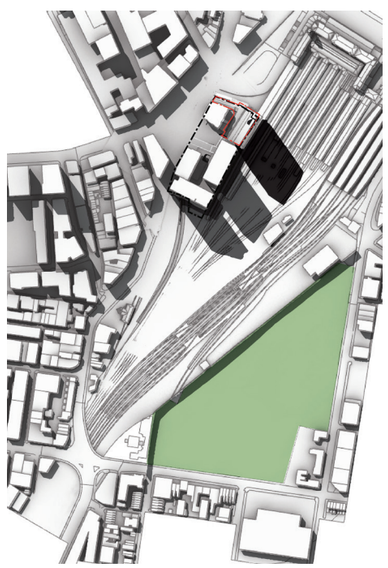
EXISTING LEP CONTROLS



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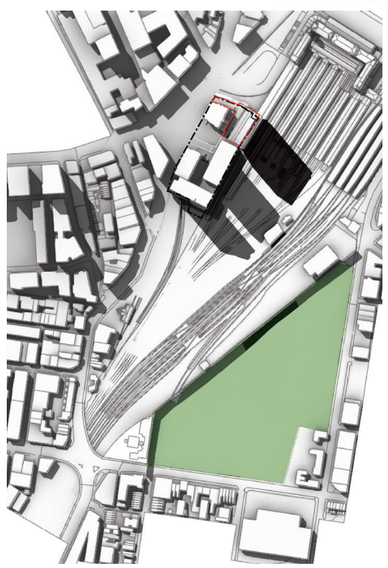

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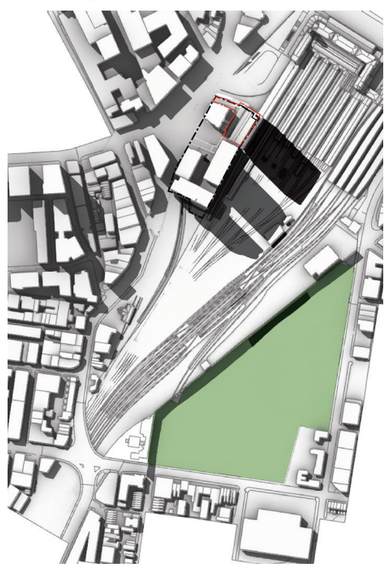

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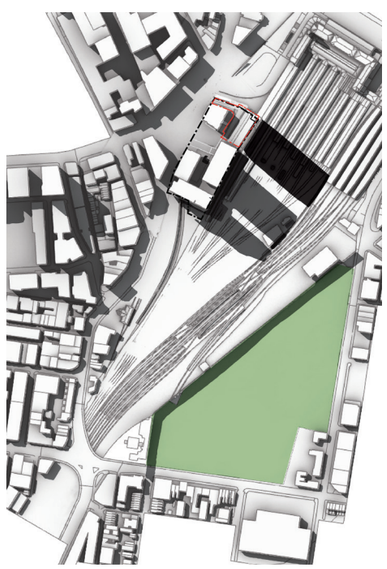

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EXISTING LEP CONTROLS

SOLAR ANALYSIS OF ENVELOPE: WINTER
WESTERN GATEWAY SUB-PRECINCT BLOCK A ENVELOPES
DETAILED ANALYSIS ON IMPACT ON WESTERN GATEWAY PUBLIC DOMAIN

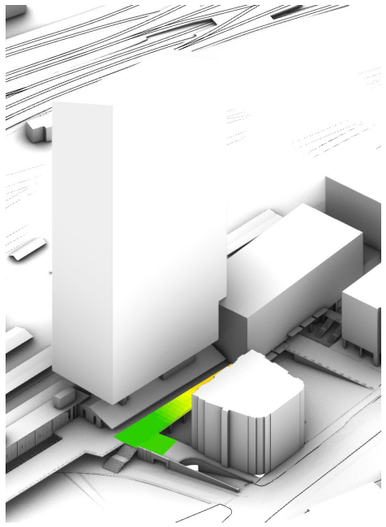
Detailed analysis of the impacts of the Atlassian envelope on the proposed public domain zones within the Western Gateway sub-precinct has been undertaken. The below table indicates the % proportion of the public domain zone impacted by the Block A envelope zones with and without the cantilever and the Block A Reference Scheme.

CUMULATIVE DIAGRAMS OF FULL DAY RESULTS: JUNE 21ST WINTER SOLSTICE

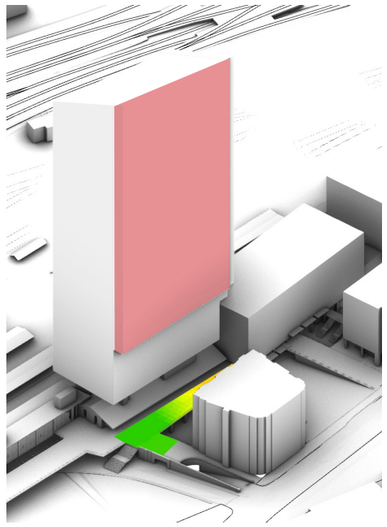
Building Mass
Cantilever Mass
Overshadowing %
100%
0%

TIME	LINK ZONE BETWEEN BLOCK A & C				HENRY DEANE PLAZA			
	Existing % Shaded	Additional % Shaded by Main Envelope	Additional % Shaded by Cantilever to Main Envelope	Additional % Shaded by Reference Scheme (to existing)	Existing % Shaded	Additional % Shaded by Main Envelope	Additional % Shaded by Cantilever to Main Envelope	Additional % Shaded by Reference Scheme (to existing)
10:00	17.02	-7.98	0	-4.89	68.57	0	0	0
10:15	17.35	0	0	0	70.4	0	0	0
10:30	17.51	0	0	0	71.51	0	0	0
10:45	17.51	0	0	0	72.54	0	0	0
11:00	17.51	0	0	0	73.61	0	0	0
11:15	17.51	0	0	0	72.16	0	0	0
11:30	17.51	0	0	0	67.7	0	0	0
11:45	20.28	0	0	0	62.81	0	0	0
12:00	25.33	0	0	0	57.93	0	0	0
12:15	31.43	0	0	0	53.05	0	0	0
12:30	38.6	0	0	0	47.67	0	0	0
12:45	42.1	0	0	0	42.14	0	0	0
13:00	44.87	0	0	0	36.96	0	0	0
13:15	47.23	0	0	0	32.3	0	0	0
13:30	49.27	0	0	0	27.15	0	0	0
13:45	51.14	0	0	0	22.58	0	0	0
14:00	52.93	0	0	0	18.76	0	0	0
14:15	54.48	0	0	0	16.7	0	0	0
14:30	54.64	0	0	0	24.52	0	0	0
14:45	54.89	0	0	0	41.91	0	0	0
15:00	54.97	0	0	0	64.99	0	0	0

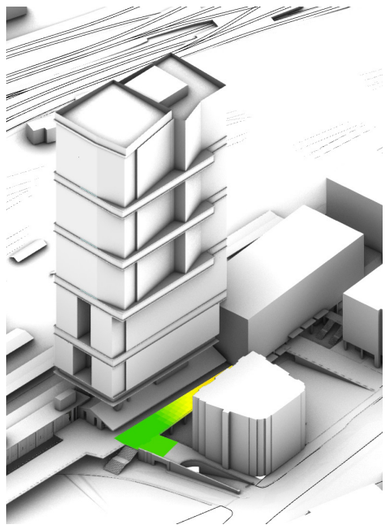
LINK ZONE



BLOCK A MAIN BUILDING ENVELOPE

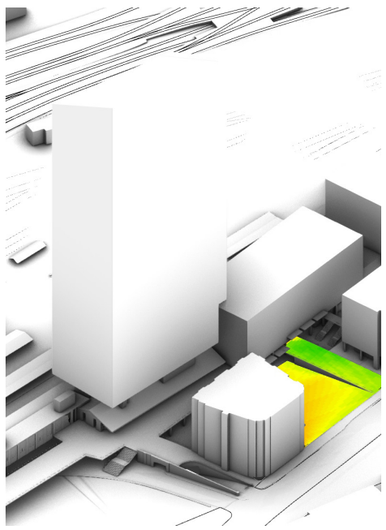


BLOCK A MAIN BUILDING ENVELOPE & CANTILEVER
(100% UTILISATION ASSESS)



BLOCK A REFERENCE SCHEME
(LOWEST IMPACT)

HENRY DEANE PLAZA



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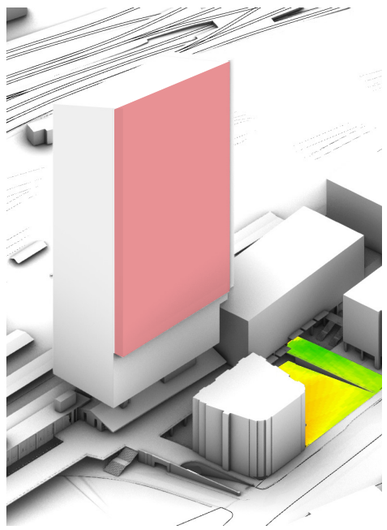

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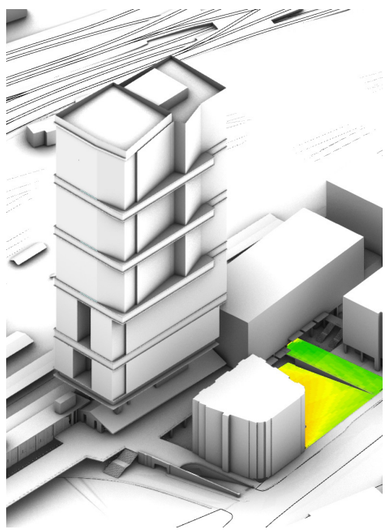


BLOCK A REFERENCE SCHEME
(LOWEST IMPACT)

SKY EXPOSURE
WESTERN GATEWAY SUB-PRECINCT BLOCK A ENVELOPES
DETAILED ANALYSIS ON IMPACT ON WESTERN GATEWAY PUBLIC DOMAIN

Solar exposure is not the only quality consideration for the quality of public domain areas and consideration is needed of other factors. Another consideration which comes with large scale built form is the amount of sky exposure impact.

Sky Exposure is the percentage of the sky that is visible from the points of the input _geometry (as opposed to Sky View, which is the amount of sky seen by a surface). This is equivalent to a solid angle or even-spaced ray-tracing calculation from the point. It is useful for evaluating one's general visual connection to the sky at a given set of points.

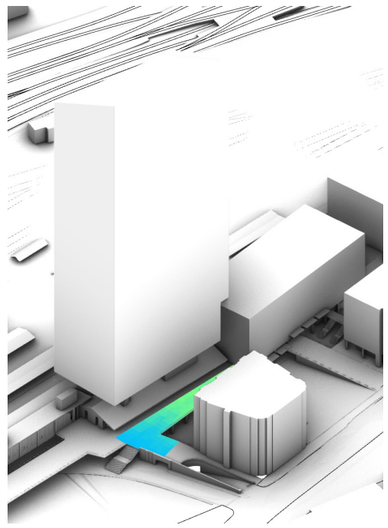
Any built form has a material impact on the sky exposure and the analysis indicates the difference that the Block A envelope zones with and without the cantilever and the Block A Reference Scheme result in as % change.

YEAR ROUND CUMULATIVE SKY EXPOSURE DIAGRAMS

Building Mass
Cantilever Mass
Sky Exposure %
100%
0%

ZONE	Existing % Sky Exposure	% Reduction by Main Envelope	Additional % Reduction by Cantilever to Main Envelope	Additional % Reduction by Reference Scheme to Main Envelope
LINK ZONE	57.8%	-18.5%	-0.71%	+ 0.97%
HENRY DEANE PLAZA	45.06%	-7.07%	-0.33%	+ 0.13%

LINK ZONE



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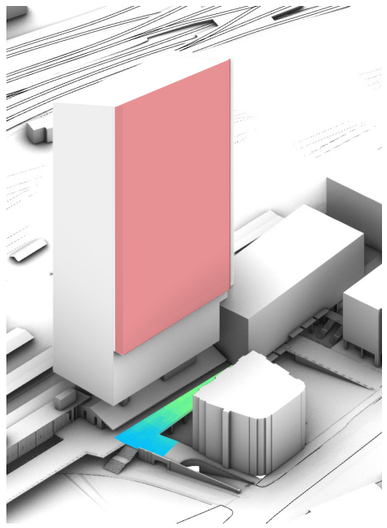
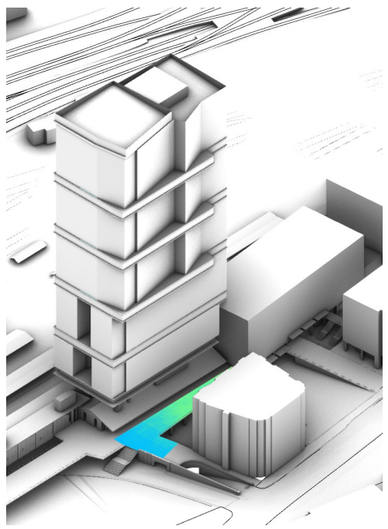
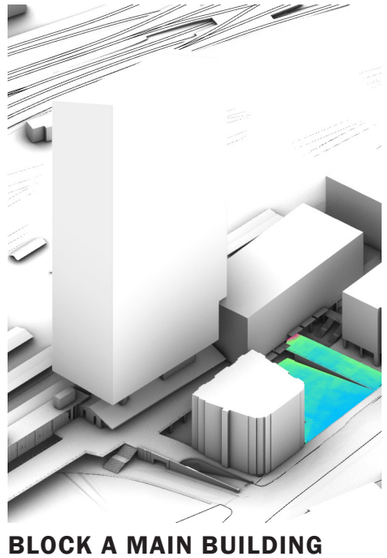


BLOCK A MAIN BUILDING ENVELOPE & CANTILEVER
(100% UTILISATION ASSESS)



BLOCK A REFERENCE SCHEME
(LOWEST IMPACT)

HENRY DEANE PLAZA



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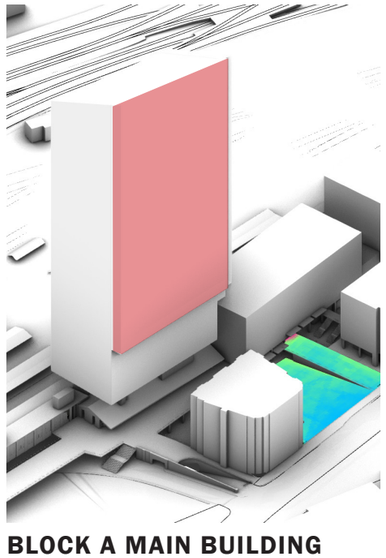
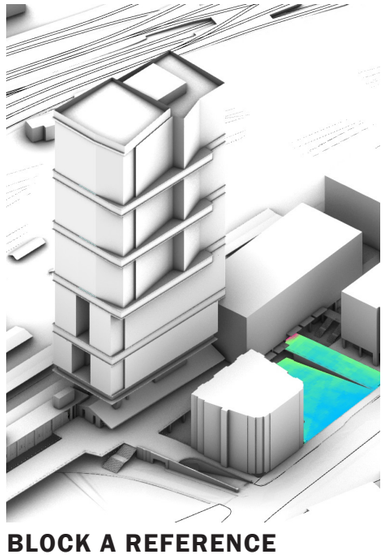


BLOCK A MAIN BUILDING ENVELOPE & CANTILEVER
(100% UTILISATION ASSESS)



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