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# Redfern North Eveleigh Skyview Report - Inne 2022

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# 1. Technical Study Preamble

#### 1.1 Introduction

The NSW Government is investing in the renewal of the Redfern North Eveleigh Precinct to create a unique mixeduse development, located within the important heritage fabric of North Eveleigh. The strategic underpinning of this proposal arises from the Greater Sydney Region Plan and District Plan. These Plans focus on the integration of transport and land use planning, supporting the creation of jobs, housing and services to grow a strong and competitive Sydney.

The Redfern North Eveleigh Precinct is one of the most connected areas in Sydney, and will be a key location for Tech Central, planned to be Australia's biggest technology and innovation hub. Following the upgrading of Redfern station currently underway, the Precinct's renewal is aimed at creating a connected destination for living and working, and an inclusive, active and sustainable place around the clock.

The Redfern North Eveleigh Precinct comprises three Sub-Precincts, each with its own distinct character:

- The Paint Shop Sub-Precinct which is the subject of this rezoning proposal;
- The Carriageworks Sub-Precinct, reflecting the cultural heart of the Precinct where current uses will be retained; and
- The Clothing Store Sub-Precinct which is not subject to this rezoning proposal.

This State Significant Precinct (SSP) Study proposes amendments to the planning controls applicable to the Paint Shop Sub-Precinct to reflect changes in the strategic direction for the Sub-Precinct. The amendment is being undertaken as a State-led rezoning process, reflecting its status as part of a State Significant Precinct located within the State Environmental Planning Policy (Precincts - Eastern Harbour City) 2021.

The amended development controls will be located within the City of Sydney Local Environmental Plan. Study Requirements were issued by NSW Department of Planning and Environment (DPE) in December 2020 to guide the investigations to support the proposed new planning controls.

#### 1.2 Purpose of this Report

A Sky View Factor (SVF) Report has been produced by Power and Digital Instruments Pty Ltd. (PDI) on behalf of AECOM to support this State Significant Precinct Skyview Study.

The purpose of this Report is to provide a detailed Skyview Assessment of the proposed changes, and consider any potential impacts that may result within and surrounding the Paint Shop Sub-Precinct. This report addresses Study Requirement 3.5 - Amenity. The relevant study requirements, considerations and consultation requirements, and location of where these have been responded to is outlined in **Table1** below.

Table1:	Study Requirements
Ref.	Study Requiremen
Ame	nitv

Prepare a daylight, skyview and Solar Access Analysis for areas within the Precinct and in affected adjacent areas. The analysis should examine daylight, skyview and solar access using the City of Sydney Council's preferred methodology or an alternate approach from an accepted and agreed national or international standard. The analysis must demonstrate that redevelopment of the Precinct is able to be undertaken in a manner that ensures existing and new open/public space and residential uses achieve appropriate solar access standards.

Following the release of the study requirements Transport for NSW has coordinated with DPE to refine the intent of the skyview analysis specifically. In their email from 20th of October 2021 the Department of Planning and Environment have provided the following clarification "The intent of the sky view analysis in the context of RNE is to get a sense of the quality of the public spaces and streets in consideration of the density and scale being proposed - in particular the kind of light/daylight and sky visible from the public domain and in key places for example between existing and proposed buildings.". This report has been developed to address this intent.

The Paintshop proposal will be adopting the City of Sydney's solar access development standards to minimise overshadowing, including relevant provisions of the Sydney Development Control Plan.

#### **Report Reference**

Section 3, page 11. To be read in conjunction with the Sun Access Analysis in Section 9.6.5 of the Urban Design Report prepared by BatesSmart April 2022

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#### 1.3 Redfern North Eveleigh Precinct

The Redfern North Eveleigh Precinct is located approximately 3km south-west of the Sydney CBD in the suburb of Eveleigh (refer to **Figure 1**). It is located entirely within the City of Sydney local government area (LGA) on government-owned land. The Precinct has an approximate gross site area of 10.95 hectares and comprises land bounded by Wilson Street and residential uses to the north, an active railway corridor to the south, residential uses and Macdonaldtown station to the west, and Redfern station located immediately to the east of the Precinct. The Precinct is also centrally located close to well-known destinations including Sydney University, Victoria Park, Royal Prince Alfred Hospital, the University of Technology Sydney, and South Eveleigh, forming part of the broader Tech Central District. The Precinct is located within the State Heritage-listed curtilage of Eveleigh Railway Workshops and currently comprises the Platform Apartments with 88 private dwellings, Sydney Trains infrastructure and key state heritage buildings including the Paint Shop, Chief Mechanical Engineer's Building, and the Carriageworks and Blacksmith Shop which provide shared community spaces for events including the Carriageworks Farmers Markets.

A map of the precinct and relevant boundaries is illustrated in **Figure 2**.



Figure 1: Location plan of Redfern North Eveleigh Precinct (Source: Ethos Urban)



Figure 2: Redfern North Eveleigh and sub-precincts (Source: Ethos Urban)

#### 1.4 Redfern North Eveleigh Paint Shop Sub-Precinct

The Redfern North Eveleigh Paint Shop Sub-Precinct is approximately 5.15 hectares and is bounded by Wilson Street to the north, residential terraces and Redfern station to the east, the Western Line rail corridor to the south and the Carriageworks Sub-Precinct to the west. The Sub-Precinct has a significant level change from a Reduced Level (RL) height of RL25 metres to RL29 metres on Wilson Street.

The Paint Shop Sub-Precinct currently hosts a number of items of heritage significance, including the Paint Shop Building, Fan of Tracks, Science Lab Building, Telecommunications Building, and Chief Mechanical Engineer's Building. The Sub-Precinct has a number of disused spaces adjacent to the rail corridor as well as functioning Sydney Trains' infrastructure, offices and operational space. Vehicle and pedestrian access to this area is used by Sydney Trains. The site has a clear visual relationship to South Eveleigh and the Eveleigh Locomotive Workshops across the active rail corridor.

A map of the Paint Shop Sub-Precinct and relevant boundaries is illustrated in **Figure 2**.

#### 1.5 Renewal Vision

The Redfern North Eveleigh Paint Shop Sub-Precinct will be a connected centre for living, creativity and employment opportunities that support the jobs of the future, as well as providing an inclusive, active and sustainable place for everyone, where communities gather.

Next to one of the busiest train stations in NSW, the Sub-Precinct will comprise a dynamic mix of uses including housing, creative and office spaces, retail, local business, social enterprise and open space. Renewal will draw on the past, adaptively re-using heritage buildings in the Sub-Precinct and will acknowledge Redfern's existing character and particular significance to Aboriginal peoples, culture and communities across Australia. The Sub-Precinct will evolve as a local place contributing to a global context.

#### 1.6 Project description

An Urban Design and Public Domain Study has been prepared to establish the urban design framework for the Redfern North Eveleigh Paint Shop Sub-Precinct. The Urban Design and Public Domain Study provides a comprehensive urban design vision and strategy to guide future development of the Sub-Precinct and has informed the proposed planning framework of the SSP Study.

The Urban Design Framework for the Paint Shop Sub-Precinct comprises:

- Approximately 1.4 hectares of publicly accessible open space, comprising:
  - A Public Square a 7,900 square metre public square fronting Wilson Street;
  - An eastern park a 3,871 square metre park located adjacent to the Chief Mechanical Engineer's Building and the new eastern entry from Platform 1 of the Redfern station; and
  - Traverser No1 a 2,525 square metre public square edged by Carriageworks and the Paint Shop.
- Retention of over 90% of existing high value trees.
- An overall greening coverage of 40% of the sub-precinct.
- A maximum of 142,650 square metre gross floor area (GFA), comprising:
  - Between 103,700 109,550 square metres of gross floor area (GFA) for employment and community facility floor space (minimum 2,500 square metres). This will support approximately 6,200 direct jobs on the site across numerous industries including the innovation, commercial and creative sectors.
  - Between 33,100 38,950 square metres of GFA for residential accommodation, providing for between 381 and 449 new homes (including 15% for the purposes of affordable housing).
- New active transport infrastructure and routes to better connect the Paint Shop Sub-Precinct with other parts of Tech Central and the surrounding localities.
- Direct pedestrian connections to the new Southern Concourse at Redfern station.
- Residential parking rates, comprising:
  - Studio at 0.1 per dwelling
  - 1 Bed at 0.3 per dwelling
  - 2 Bed at 0.7 per dwelling
  - 3 Bed at 1.0 per dwelling
- Non-residential car parking spaces (including disabled and car share) are to be provided at a rate of 1 space per 700 square metres of GFA.
- 66 car spaces are designated for Sydney Trains maintenance and operational use.

The key features of the Urban Design Framework, include:

- The creation of a new public square with direct pedestrian access from Wilson Street to provide a new social and urban hub to promote outdoor gatherings that will accommodate break out spaces and a pavilion structure.
- An eastern park with direct access from Redfern station and Little Eveleigh Street, which will provide a high amenity public space with good sunlight access, comfortable wind conditions and community character.
- Upgraded spatial quality of the Traverser No1 yard, retaining the heritage setting, and incorporating complementary uses and good access along Wilson Street to serve as a cultural linkage between Carriageworks and the Paint Shop Building.
- The establishment of an east-west pedestrian thoroughfare with new public domain and pedestrian links.
- A range of Water Sensitive Urban Design (WSUD) features.
- Activated ground level frontages with commercial, retail, food and beverage and community and cultural uses.
- Adaptive reuse of heritage buildings for employment, cultural and community uses.
- New buildings for the sub-precinct, including:
  - Commercial buildings along the rail corridor that range between 3 and 26 occupied storeys;
  - Mixed use buildings along the rail corridor, comprising a three-storey non-residential podium with residential towers ranging between 18 to 28 occupied storeys;
  - Mixed use buildings (commercial and residential uses) along Wilson Street with a four-storey street wall fronting Wilson Street and upper levels at a maximum of 9 occupied storeys that are set back from the street wall alignment;
  - A commercial building on the corner of Wilson Street and Traverser No.1 with a four-storey street wall fronting Wilson Street and upper levels at a maximum of 8 occupied storeys that are set back from the street wall alignment. There is flexibility to allow this building to transition to a mixeduse building with active uses at ground level and residential uses above; and
  - Potential options for an addition to the Paint Shop Building comprising of commercial uses. These options (all providing for the same GFA) include:
    - A 5-storey commercial addition to the Paint Shop Building with a 3m vertical clearance, with the adjacent development site to the east comprising a standalone 3-storey commercial building (represented in **Figure 3**);

- A 3-storey commercial addition to the Paint Shop Building with a 3m vertical clearance which extends and connects to the commercial building on the adjacent development site to the east; and
- No addition to the Paint Shop Building, with the adjacent development site to the east comprising a standalone 12-storey commercial building.
- Commitment to a 5 Star Green Star Communities rating, with minimum 5 Star Green Star Buildings rating.
- All proposed buildings are below the Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) to ensure Sydney Airport operations remain unaffected.

The proposed land allocation for the Paint Shop Sub-Precinct is described in **Table2** below.

**Table2:** Breakdown of allocation of land within the Paint Shop sub-precinct

Land allocation	Existing	Proposed
Developed area	15,723 sqm / 30% of total site area	20,824 sqm / 40% of total site area
Public open space	Area not publicly accessible	14,306 sqm / 28% of total site area
Other public domain areas		15,149 sqm / 29% of total site area
(Including streets, shared zones, pedestrian paths and vehicular zones)	Area not publicly accessible	links and private spaces ~ 3% of total site area)

## The Indicative Concept Proposal for the Paint Shop Sub-Precinct is illustrated in **Figure 3** below.



Figure 3: Indicative Concept Proposal (Source: Bates Smart and Turf)

# 2. Methodology

To generate the skyview diagrams prepared for the Paint Shop Sub-Precinct Bates Smart have provided PDI with Dome Plots of the 6 internal and 4 external view locations (further described in Section 2.1) in the postdevelopment scenario. In generating their DomePlots Bates Smart have used the open source environmental plug-in 'Ladybug for Grasshopper' which adds-in to Rhinoceros 3D, available from Robert McNeel and Associates. These points create shading domes based off the surrounding context. This method is a known and accepted methodology for generating SkyView Dome Plots by City of Sydney. Subsequently PDI have generated skyview plots for the following scenarios:

- Summer solstice day time sky views;
- Winter solstice day time sky view; and
- Typical night time sky view.

PDI have also evaluated the percentages of SkyView that are clear and obstructed to generate a SkyView Factor (SVF). SVF is the level of sky visible over the hemisferical sky from a designated location. SVF can range from 0%, where there is a complete obstruction of the hemisferical sky, to 100% where there is no obstruction at all.The SVF Report produced by PDI identifies ten viewpoints and takes in account obstructions generated by both buildings proposed in the Redfern North Eveleigh SSP as well as the surrounding existing ones. City of Sydney distributes SVF into ranges representing Low SVF, Typical SVF, High SVF and Highest SVF (as shown in **Table3**) and notes that the majority of streets within the City Centre of Sydney are featuring Typical SVF (15-25%).All viewpoints assessed within the SVF Report by PDI are featuring Highest SVF – consistent with streets at the edge of the Sydney CBD.

Finally – AECOM has consolidated the SVF produced in PDIs Report and have benchmarked the identified viewpoint locations against Google Streetview images across City of Sydney featuring similar levels of SVF (as defined by Figure 4 in the Draft Central City Planning Strategy 2016 - Appendix D Street Frontage Height and Setbacks). This approach was agreed with the Department of Planning through consultation sessions in March 2022. This strategy does not distinguish SVF levels beyond 45%, therefore AECOM has used a place-based approach referring to specific conditions of the built environment such as street width, height of buildings, setbacks, etc.. In providing these images we aim to provide an impression of the future light quality proposed in the precinct and demonstrate potential alignment with similar areas with the scope of the Draft Central City Planning Strategy (noting the Paintshop sub-precinct falls outside the area of this strategy).

SVF Colour Code				Category	Comments
0% - 5%	5%	% - 10% 10% - 15%		Low SVF	Small Streets or Laneways
15% - 20%	15% - 20% 20% -		% - 25%	Typical SVF	Has long and straight streets
25% - 30%		309	% - 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		

 Table3:
 Sky View Factor Key (Source: Surface Design)



Figure 4: Existing Sky view Factor % (Source: City of Sydney)

#### 2.1 Summary of Viewpoints

Ten specified viewpoints have been assessed within and adjacent to the proposed Redfern North Eveleigh SSP. Their location is shown in **Figure 5**.

The total percentage of sky view obstructed by surrounding buildings and the percentage of sky view clearance per each location have been calculated and reported in **Table4**.

All the viewpoints have been grouped based on their percentage level of clear sky view and the overall outcomes from this grouping are:

- **GROUP 1 (MINOR 45% Clear Sky)** Location #02 and #03 are the viewpoints featuring the smaller percentage of clear sky view, with clearance levels ranging between 40.8 and 42.2%.
- **GROUP 2 (45 to 55% Clear Sky)** Location #05 and #06 are characterised by similar levels of clearance and obstruction, featuring levels of clear sky ranging between 53.3 and 53.8%. These are the two viewpoints closer to a 50-50 balance between obstruction and clearance.
- GROUP 3 (55 to 65% Clear Sky) Location #01 and #10 have slightly higher level of clearance than obstruction, featuring levels of clear sky view ranging between 55.7 and 57.4%. Location #04 has clearance level at 62.6%
- GROUP 4 (65 to 75% Clear Sky) Location #07 and #09 feature high levels of clearance ranging between 65.1 and 66.1%
- GROUP 5 (MAJOR 75% Clear Sky) Location #08 is the viewpoint featuring the highest level of clear sky view at 75.4%



Figure 5: Site layout showing on-site and off-site viewpoint locations

 Table4:
 Percentage of sky view obstructed and clear at each selected location

Location	<b>Obstruction %</b>	Clearance %	Benchmarking Group	
Location #01	42.6 %	57.4%	Group 3 - 55 to 65%	
Location #02	59.2%	40.8%	Croup 1 Mipor 45%	
Location #03	57.8%	42.2%	Group I - Minor 45%	
Location #04	37.4%	62.6%	Group 3 - 55 to 65%	
Location #05	46.7%	53.3%	Group 2 45 to 55%	
Location #06	46.2%	53.8%		
Location #07	34.9%	65.1%	Group 4 - 65 to 75%	
Location #08	24.6%	75.4%	Group 5 - Major 75%	
Location #09	33.9%	66.1%	Group 4 - 65 to 75%	
Location #10	44.3%	55.7%	Group 3 - 55 to 65%	

# 3. Benchmarking

### 3.1 Group 1 (MINOR 45% Clear Sky) - Location #02 and Location #03



- Both these two viewpoints are located in proximity of the tallest buildings within the proposed development.
- Even if these viewpoints are characterised by the lowest level of SVF recorded across all the assessed locations (SVF between 40.8 and 42.2%) they still sit within the Highest SVF category according to City of Sydney.



#### Location #02

Obstruction	59.2 %
Clearance	40.8%
Street Width	~22m
НОВ	9 - 90m





Location #03				
Obstruction	57.8 %			
Clearance	42.2 %			
Street Width	~17m			
НОВ	5 - 96m			





- Selected streets across City of Sydney are featuring similar level of SVF ranging between 40 to 45%
- Location 1A Harris Street, Ultimo
- Location 1B Quay Street, Haymarket
- Location 1C Lee Street, Sydney
- Location 1D Regent Street, Sydney



Figure 6: Harris Street, Ultimo



Figure 8: Lee Street, Sydney



Figure 7: Quay Street, Haymarket



Figure 9: Regent Street, Sydney

### 3.2 Group 2 (45 to 55% Clear Sky) - Location #05 and Location #06



- Both these two viewpoints are located in proximity of the south edge of the proposed development.
- Both locations feature almost 50-50 balance between clearance and obstruction. Location #05 has wide street and low buildings all around it, while Location #06 has high buildings on one edge and almost full clearance on the other.



#### Location #05

Obstruction	46.7 %
Clearance	53.3 %
Street Width	~30m
НОВ	10-15m





## Location #06

Obstruction	46.2 %
Clearance	53.8 %
Street Width	~18m
НОВ	0-96m







- Selected streets across City of Sydney are featuring similar level of SVF ranging between 45 and 55%
- Location 2A Lee Street, Ultimo
- Location 2B George Street, Sydney
- Location 2C Hay Street, Haymarket
- Location 2D Elizabeth Street, Sydney



Figure 10: Lee Street, Ultimo



Figure 12: Hay Street, Haymarket



Figure 11:George Street, Sydney



Figure 13: Elizabeth Street, Sydney

## 3.3 Group 3 (55 to 65% Clear Sky) - Location #01, #04 and Location #10



- Both these three viewpoints are located in public spaces without buildings in the immediate surroundings.
- Obstruction levels are provided by tall buildings at approximately 50m distance.



#### Location #01

Obstruction	42.6 %
Clearance	57.4 %
Street Width	~40 m
НОВ	~90m





## Location #04

Obstruction	37.4 %
Clearance	62.6 %
Street Width	~50m
НОВ	~96m





Location	#10	

Obstruction	44.3 %
Clearance	55.7 %
Street Width	~45m
НОВ	~96m





- Selected locations across City of Sydney are featuring similar built environment characteristics and SVF above 45%
- Location 3A Belmore Park, Sydney
- Location 3B One Central, Chippendale



Figure 14:Belmore Park, Sydney



Figure 15: One Central, Chippendale

#### 3.4 Group 4 (65 to 75% Clear Sky) - Location #07 and Location #09



- Both these two viewpoints are located outside of the proposed development.
- Location #07 is surrounded by 2 storey buildings.
   Medium tall buildings are at approximately 50m and higher buildings are at approximately 200m distance.
- Location #09 is on the railway. Medium tall buildings are at approximately 50m distance and higher buildings are at approximately 170m distance.



#### Location #07

Obstruction	34.9 %
Clearance	65.1 %
Street Width	~20m
НОВ	~6m





#### Location #09

Obstruction	33.9 %
Clearance	66.1 %
Street Width	n.a.
НОВ	n.a.







- Selected locations across City of Sydney are featuring similar built environment characteristics and SVF above 45%
- Location 4A Eddy Avenue, Sydney
- Location 4B Park Street, Sydney
- Location 4C Goods Line, Haymarket



Figure 16: Eddy Avenue, Sydney



Figure 18: Goods Line, Haymarket



Figure 17: Park Street, Sydney

#### 3.5 Group 5 (MAJOR 75% Clear Sky) - Location #08



- This viewpoint is located outside of the proposed development. It is surrounded by 2 -3 storey buildings and a neighbourhood pocket park. Higher buildings are at approximately 300m distance.



#### Location #08

Obstruction	24.6%
Clearance	75.4%
Street Width	~28m
НОВ	~6-9m





- Selected locations across City of Sydney are featuring similar built environment characteristics and SVF above 45%
- Location 5A Mary Ann Street Park, Ultimo
- Location 5B Harmony Park, Surry Hills



Figure 19: Mary Ann Street Park, Ultimo



Figure 20: Harmony Park, Surry Hills



# 4. Conclusions

In preparing this report AECOM has provided an indication of the Sky View Factors for the proposed Paint Shop sub-precinct as well as the precedents within the City of Sydney CBD (where the Draft Central City Planning strategy applies). In presenting these precedents it is demonstrated that the Sky View Factors for the proposed development are all but one in the highest range of visible sky experienced in the CBD. All assessed Sky View Factors are higher than the 15-20% factors in many parts of the central CBD (as shown in **Figure 4**).



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