

**Engineering Design &
Assurance Technical Partner**



Associated Development
Appendix G
Shadow Impact Analysis

Sydney
Metro
West

Sydney Olympic Park

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Executive Summary

This Shadow Impact Analysis supports a Concept State Significant Development Application (Concept SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Concept SSDA is made under section 4.22 of the EP&A Act.

Sydney Metro is seeking to secure concept approval for an over station development (OSD) and adjacent station development (ASD) on an area defined as Site 47 within the Central Precinct of Sydney Olympic Park (referred collectively as the 'proposed development'). The proposed development will comprise of one new commercial and retail building (Building 1) above the Sydney Olympic Park metro station and two residential accommodation buildings (Buildings 2 and 3) with retail and commercial space, adjacent to the Sydney Olympic Park metro station.

The Concept SSDA seeks consent for a building envelope and mixed-use purposes, maximum building height, a maximum gross floor area (GFA), pedestrian and vehicular access, circulation arrangements and associated car parking and the strategies and design parameters for the future detailed design of development.

The Shadow Impact Analysis undertakes an analysis of the overshadowing impacts of the proposed OSD and ASD envelopes on existing surrounding properties and public spaces (during summer and winter solstice and spring and autumn equinox) at hourly intervals between 9am and 3pm. The analysis also assesses the overshadowing impacts on proposed future surrounding built form shown in the approved Sydney Olympic Park Master Plan 2030 (Interim Metro Review). The proposed OSD and ASD envelopes of 21, 27 and 45 storeys are within the maximum 45 storey height controls.

In light of submissions made by adjoining owners, an additional assessment has been carried out of the overshadowing impact of the proposed OSD and ASD envelopes on potential indicative building envelopes at sites 50 and 51 that are consistent with the height controls in the SEPP (Precincts - Central River City) 2021 and Sydney Olympic Park Master Plan 2030 (Interim Metro Review).

The results focus on the impacts from the proposed envelopes at Site 47 on sites 50 and 51 (rather than offer a proof of concept of the statutory and Master Plan building envelope controls) across the precinct). The results demonstrate impacts of the OSD and ASD envelopes are compliant with solar access guidelines for both existing properties and the potential future envelopes for the precinct shown in the Master Plan. The results also show that potential indicative compliant building envelopes on sites 50 and 51 could achieve ADG Objective 4A-1 solar access objectives.

Introduction

1.1 Sydney Metro West

Sydney Metro West will double rail capacity between Greater Parramatta and the Sydney Central Business District (CBD), transforming Sydney for generations to come. The once in a century infrastructure investment will provide fast, reliable turn-up-and-go metro services with fully accessible stations, link new communities to rail services and support employment growth and housing supply.

Sydney Metro West station locations are shown in Figure 1.1.



Figure 1.1 Sydney Metro West

1.2 Background and planning context

Sydney Metro is seeking to deliver Sydney Olympic Park metro station under a two part planning approval process. The station fit-out infrastructure is to be delivered under a Critical State Significant Infrastructure (CSSI) application subject to provisions under division 5.2 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), while the over and adjacent station developments are to be delivered under a State Significant Development (SSD) subject to the provisions of part 4 of the EP&A Act.

1.2.1 Critical State Significant Infrastructure

The State Significant Infrastructure (SSI) planning approval process for the Sydney Metro West metro line, including delivery of station infrastructure, has been broken down into a number of planning application stages, comprising the following:

- Concept and Stage 1 CSSI Approval (SSI-10038) – All major civil construction works between Westmead and The Bays including station excavation, tunnelling and demolition of existing buildings (approved 11 March 2021)
- Stage 2 CSSI Application (SSI- 19238057) – All major civil construction works between The Bays and Hunter Street Station (Approved 24 August 2022)
- Stage 3 CSSI Application (SSI- 22765520) – Tunnel fit-out, construction of stations, ancillary facilities and station precincts between Westmead and Hunter Street Station, and operation and maintenance of the Sydney Metro West line (Approved 26 January 2023).

1.2.2 State Significant Development Application

The SSDA will be undertaken as a staged development with the subject Concept State Significant Development Application (Concept SSDA) being consistent with the meaning under section 4.22 of the EP&A Act and seeking conceptual approval for a building envelope, land uses, maximum building heights, a maximum gross floor area, pedestrian and vehicle access, vertical circulation arrangements and associated car parking. A subsequent Detailed SSD/s is to be prepared by a future development partner which will seek consent for detailed design and construction of the development.

1.3 Purpose of the report

This Shadow Impact Analysis supports a Concept SSDA submitted to the Department of Planning and Environment (DPE) pursuant to part 4 of the EP&A Act. The Concept SSDA is made under section 4.22 of the EP&A Act.

This report has been prepared to specifically respond to the Secretary's Environmental Assessment Requirements (SEARs) issued for the concept SSDA on 18 February 2022 which states that the environmental impact statement (EIS) is to address the following requirements:

ITEM	SEARs requirement	Where addressed in report
4. Environmental Amenity	Assess amenity impacts on the surrounding locality, including lighting impacts, reflectivity, solar access, visual privacy, visual amenity, view loss and view sharing, overshadowing and wind impacts. A high level of environmental amenity for any surrounding residential or other sensitive land uses must be demonstrated.	This report
	Provide a solar access analysis of the overshadowing impacts of the development within the site, on surrounding properties and public spaces (during summer and winter solstice and spring and autumn equinox) at hourly intervals between 9am and 3pm, when compared to the existing situation and a compliant development (if relevant).	This report

The site and proposal

2.1 Site location and description

The site is located within Sydney Olympic Park and is situated within the City of Parramatta Local Government Area. The site is in the Central Precinct of Sydney Olympic Park and defined as Site 47 in the SOP Master Plan 2030(Interim Metro Review). The broader metro site is bound by Herb Elliot Avenue to the north, Olympic Boulevard to the west and Figtree Drive to the south as shown in Figure 1.2.

As described in Table 11, the site comprises part of Lot 59 in DP 786296 and Lot 58 in DP 786296, and comprises approximately 11,407m² of land.

Table 11 Site legal description

Street Address	Legal Description
5 Figtree Drive, Sydney Olympic Park	Lot 58 in DP 786296
7 Figtree Drive, Sydney Olympic Park	Lot 59 in DP 786296

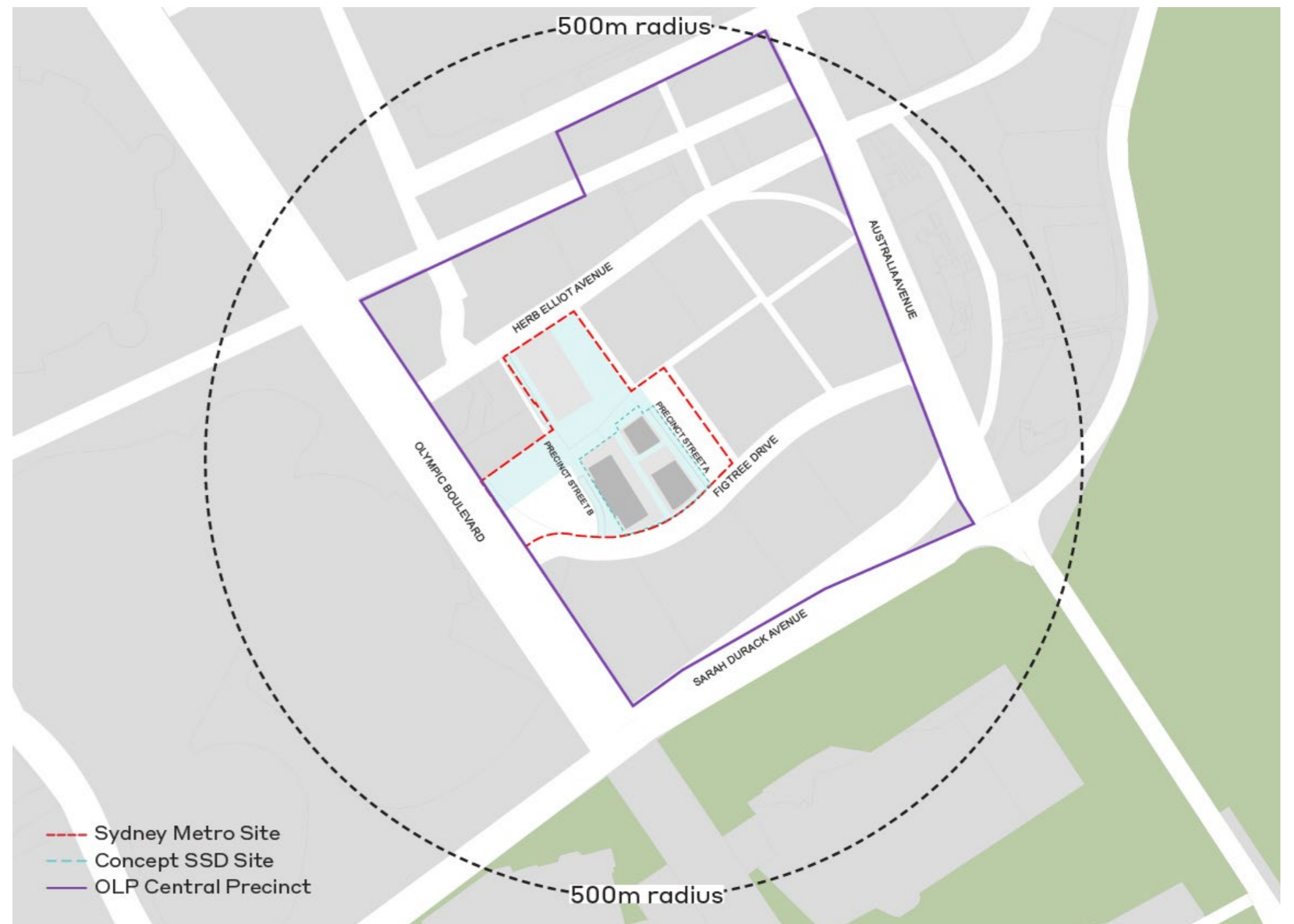


Figure 2.1 Sydney Olympic Park metro station location precinct

2.2 Overview of this proposal

The Concept SSDA will seek consent for three building envelopes and the delivery of Precinct Street A as detailed in Table 1-2 and Figure 2.2

Table 1-2 Sydney Olympic Park proposed development overview

Item	Description
Land use	Building 1: Commercial and retail Building 2: Commercial, retail and residential Building 3: Commercial, retail and residential
Building Height (RL) / Number of storeys	Building 1: 122.00 / 21 storeys Building 2: 118.00 / 27 storeys Building 3: 171.00 / 45 storeys
Gross Floor Area (m ²)	Building 1: 29,280 Building 2: 12,266 Building 3: 27,414 TOTAL: 68,960
Car parking spaces	358 (Maximum)

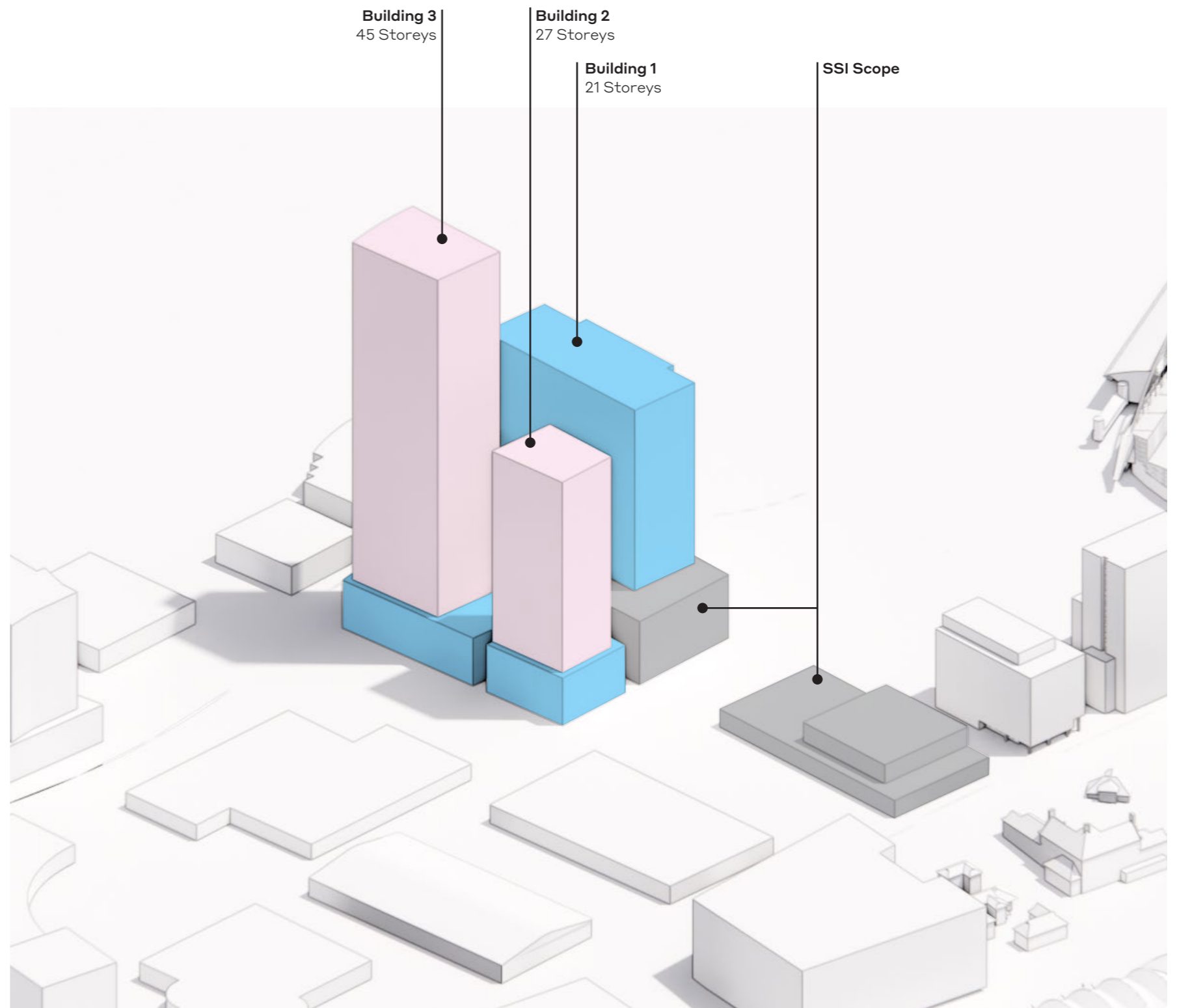
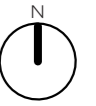


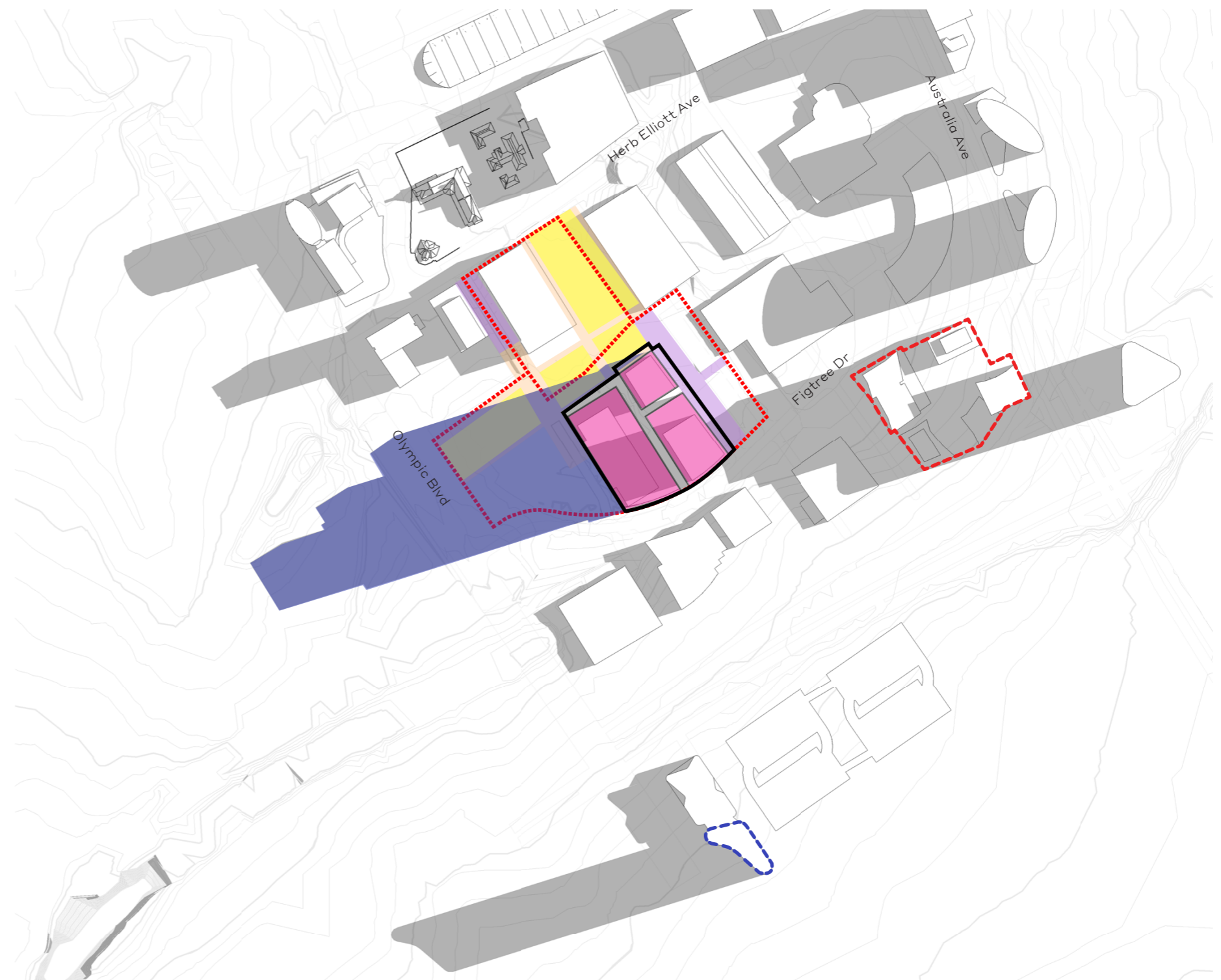
Figure 2.2- Proposed Concept SSDA development and CSSI scope

Overshadowing Impact on Existing Context

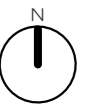


3.1 Autumn Equinox

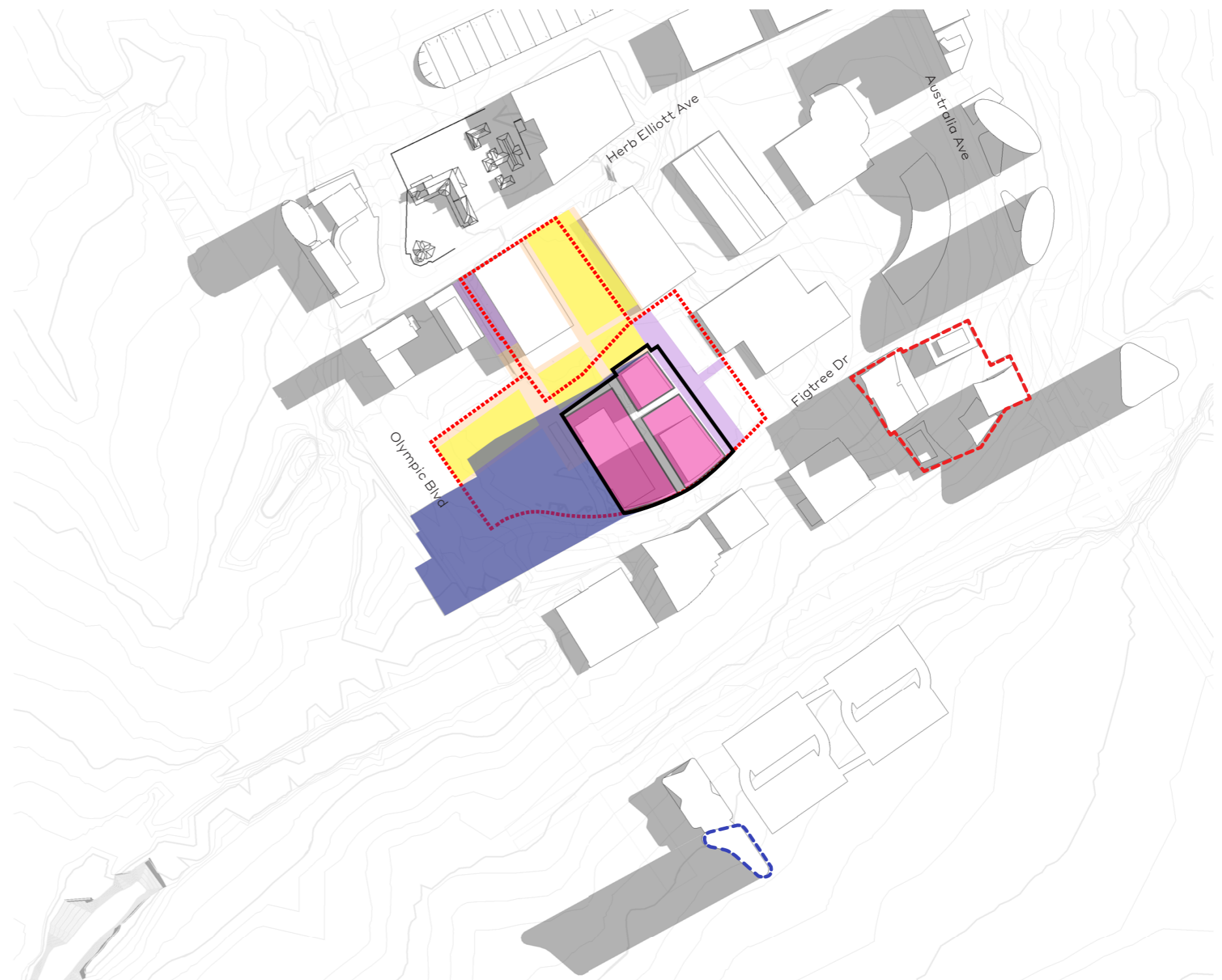
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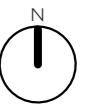
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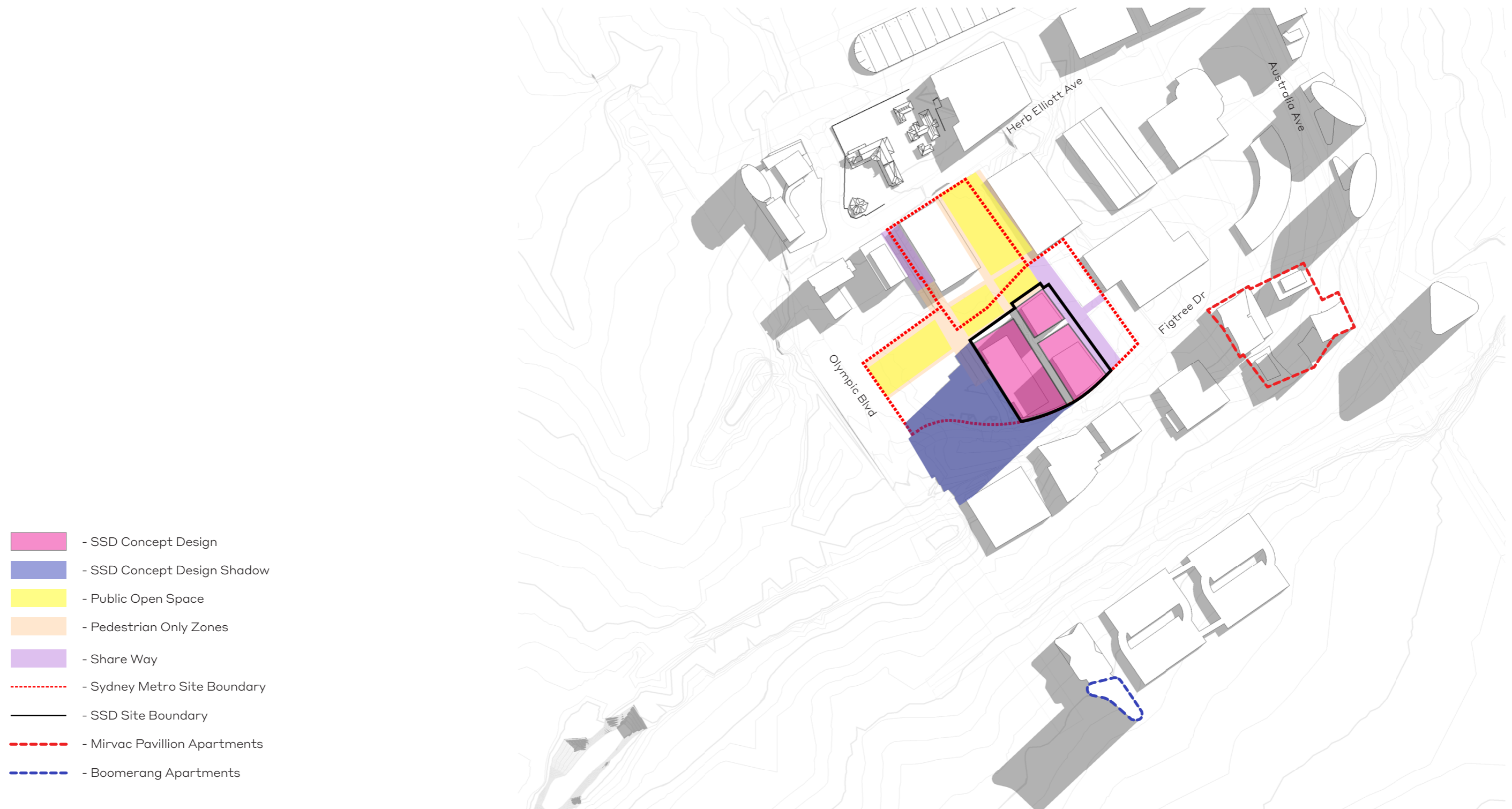
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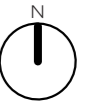
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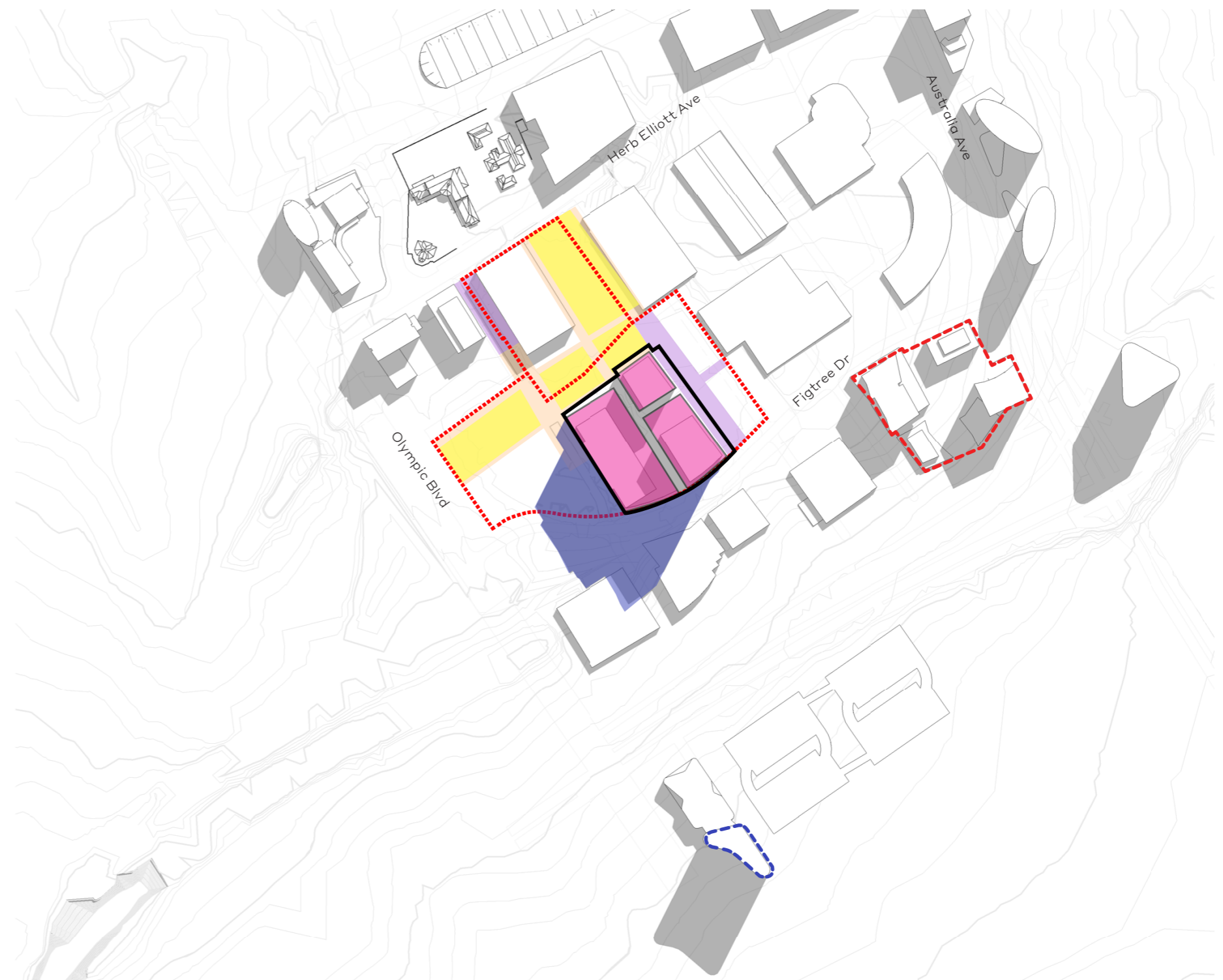
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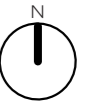
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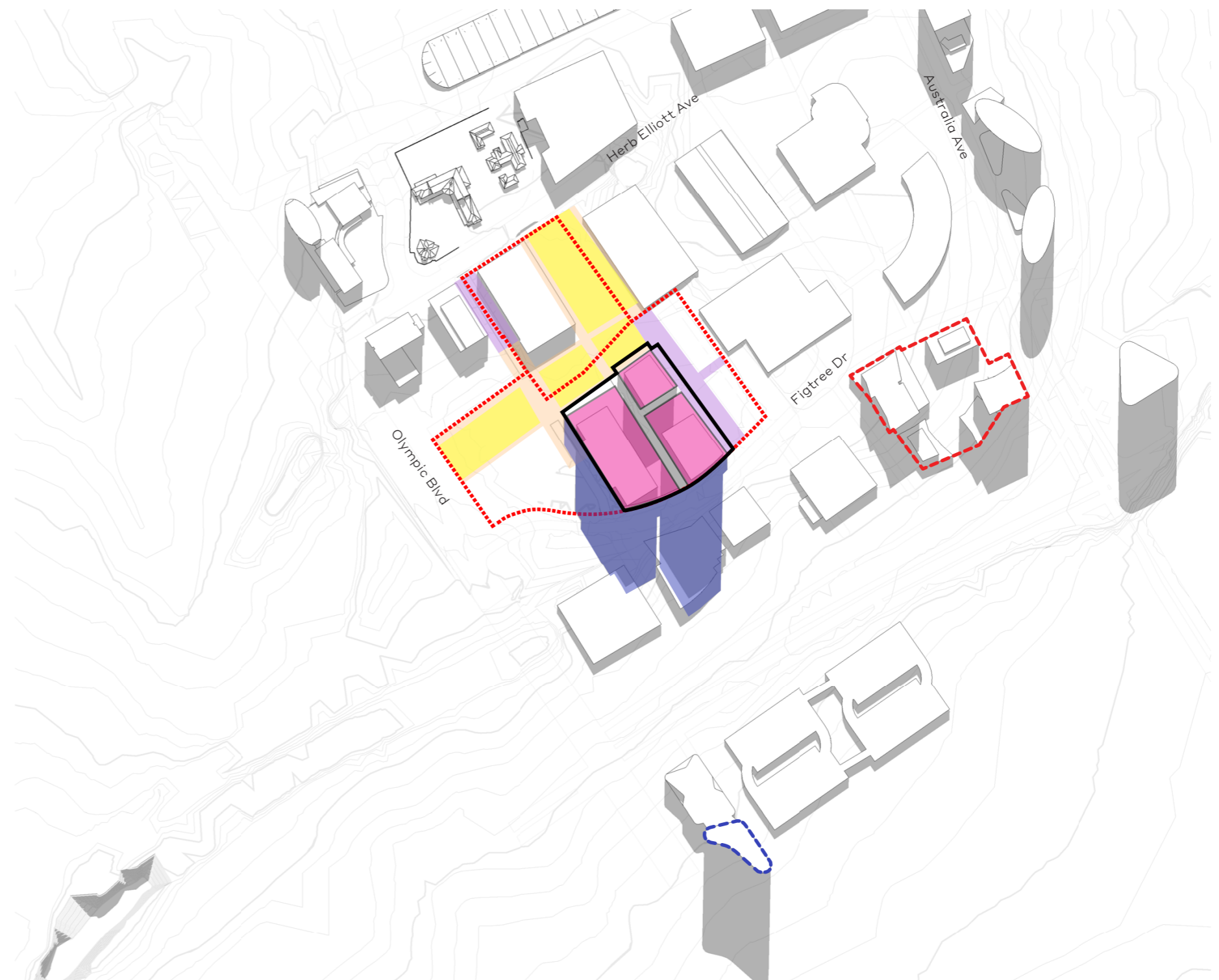
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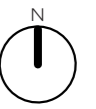
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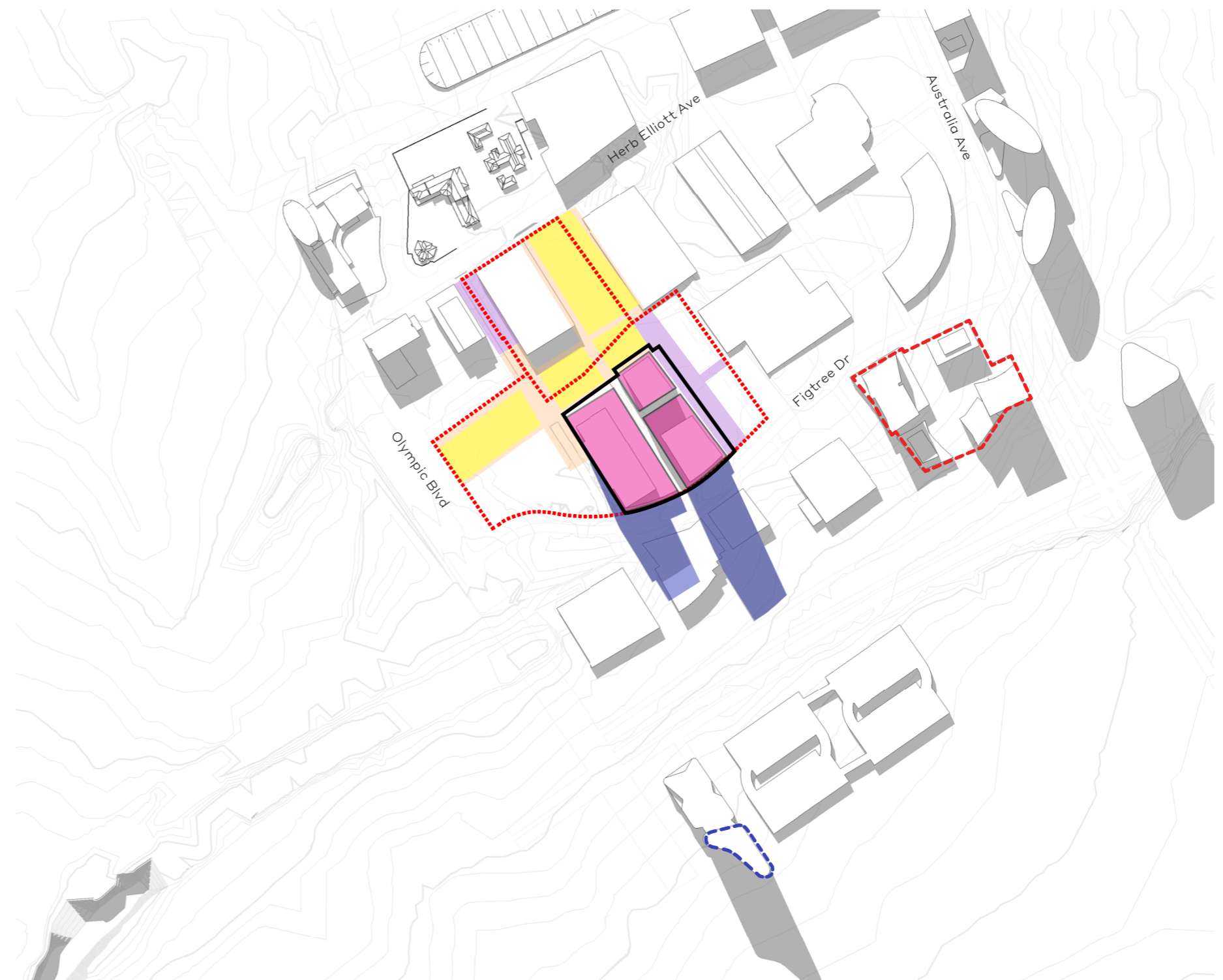
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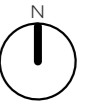
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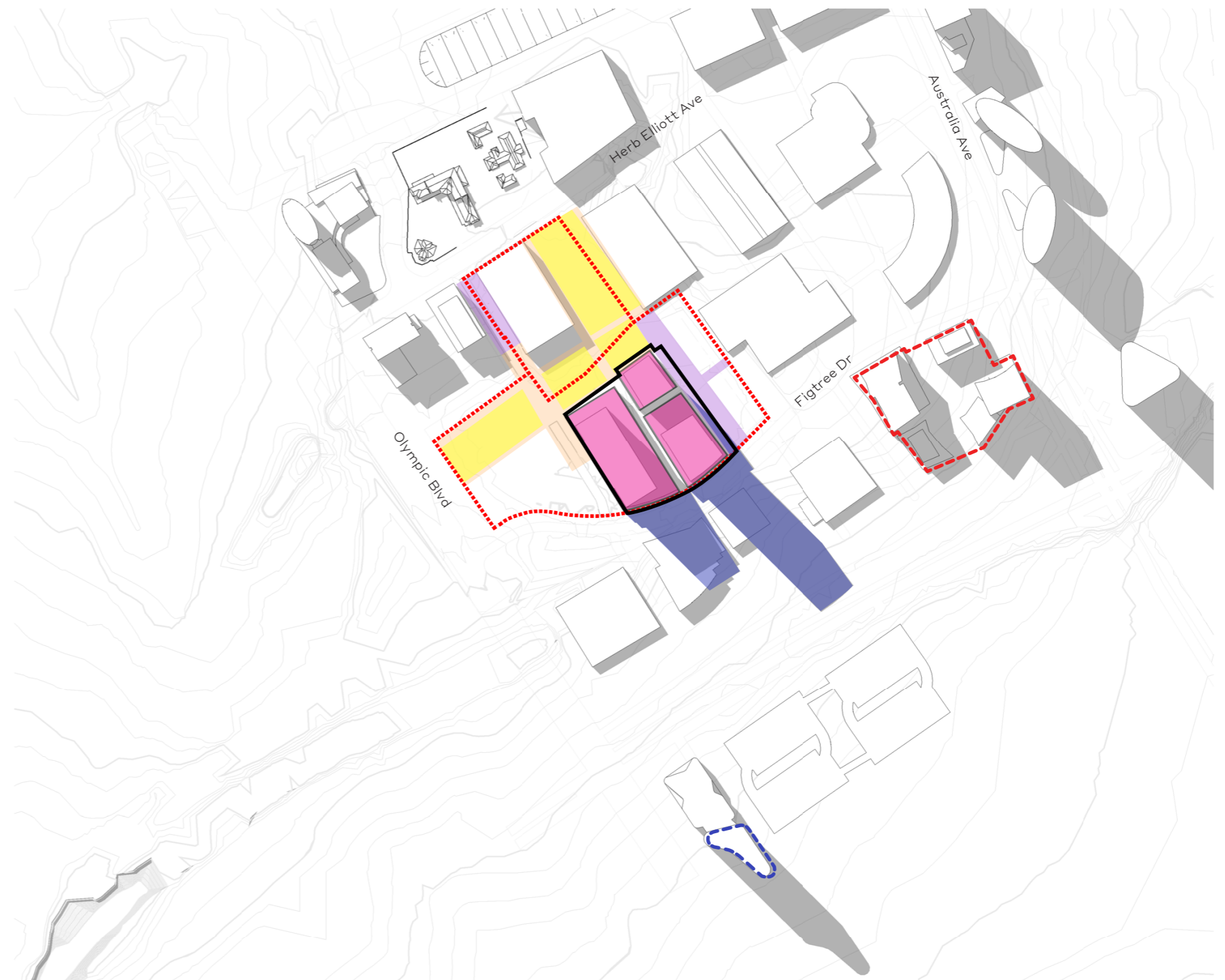
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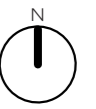
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3.1.7 21 March - 3:00pm

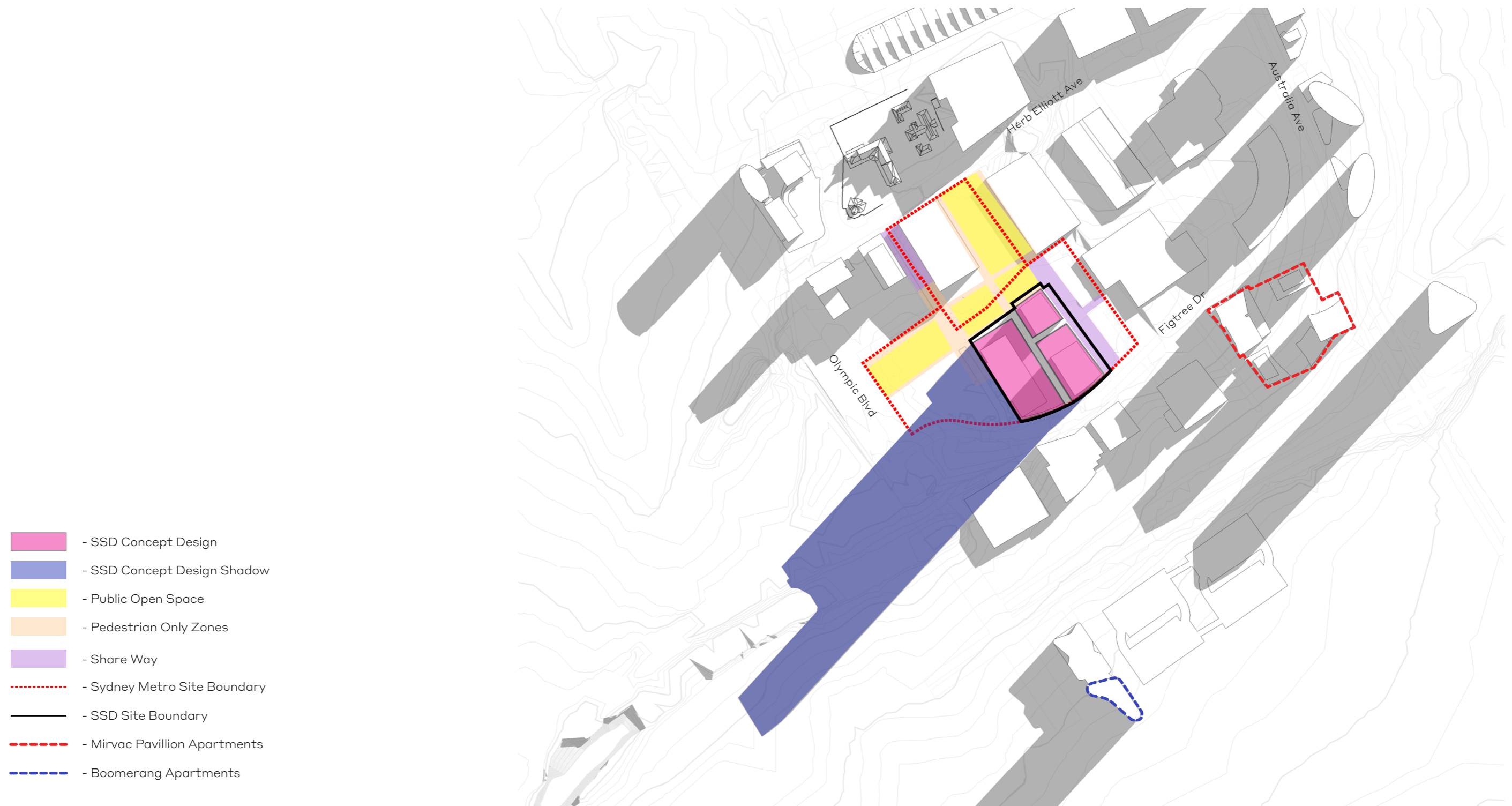











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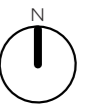


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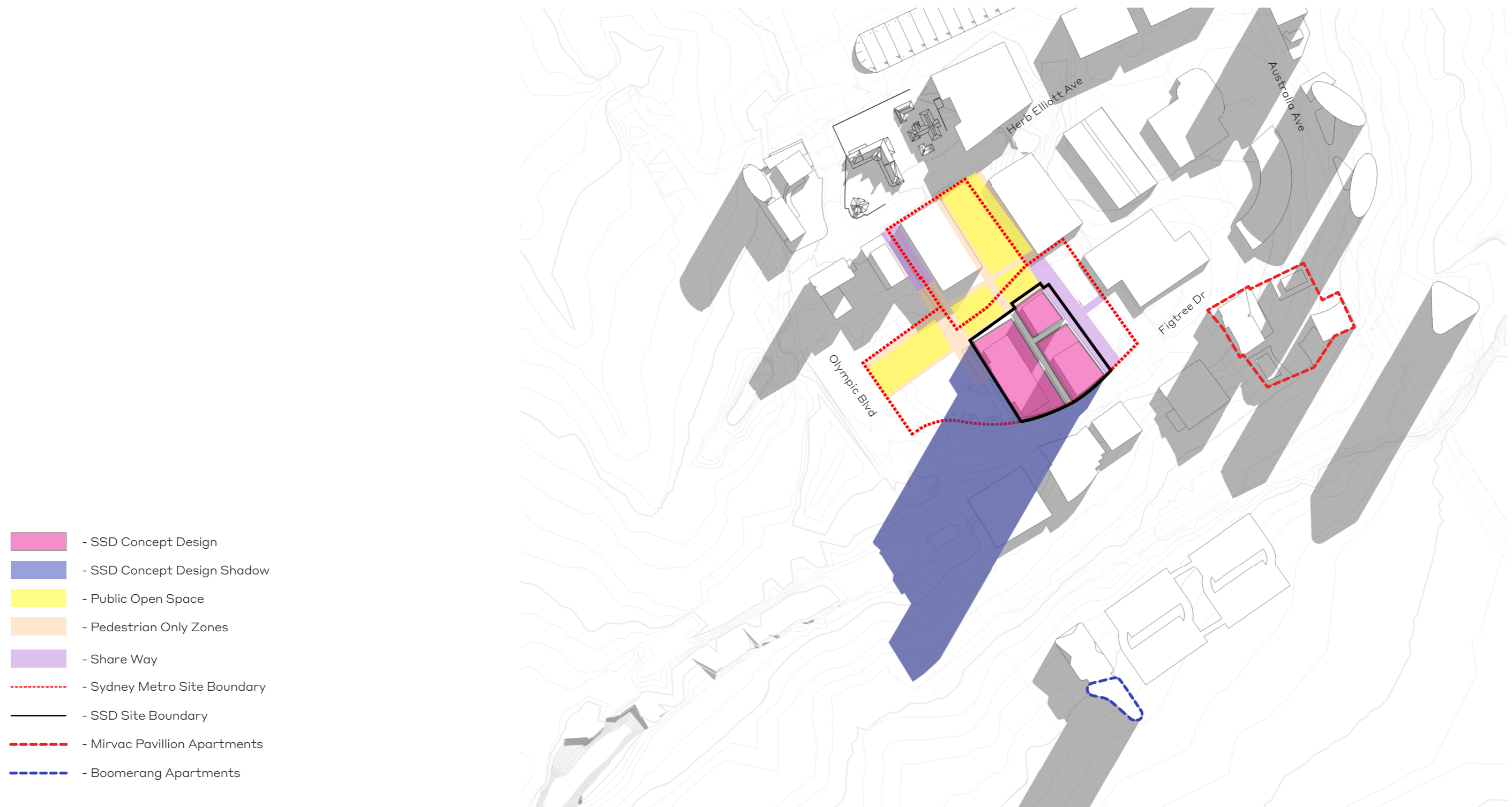
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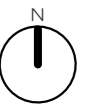
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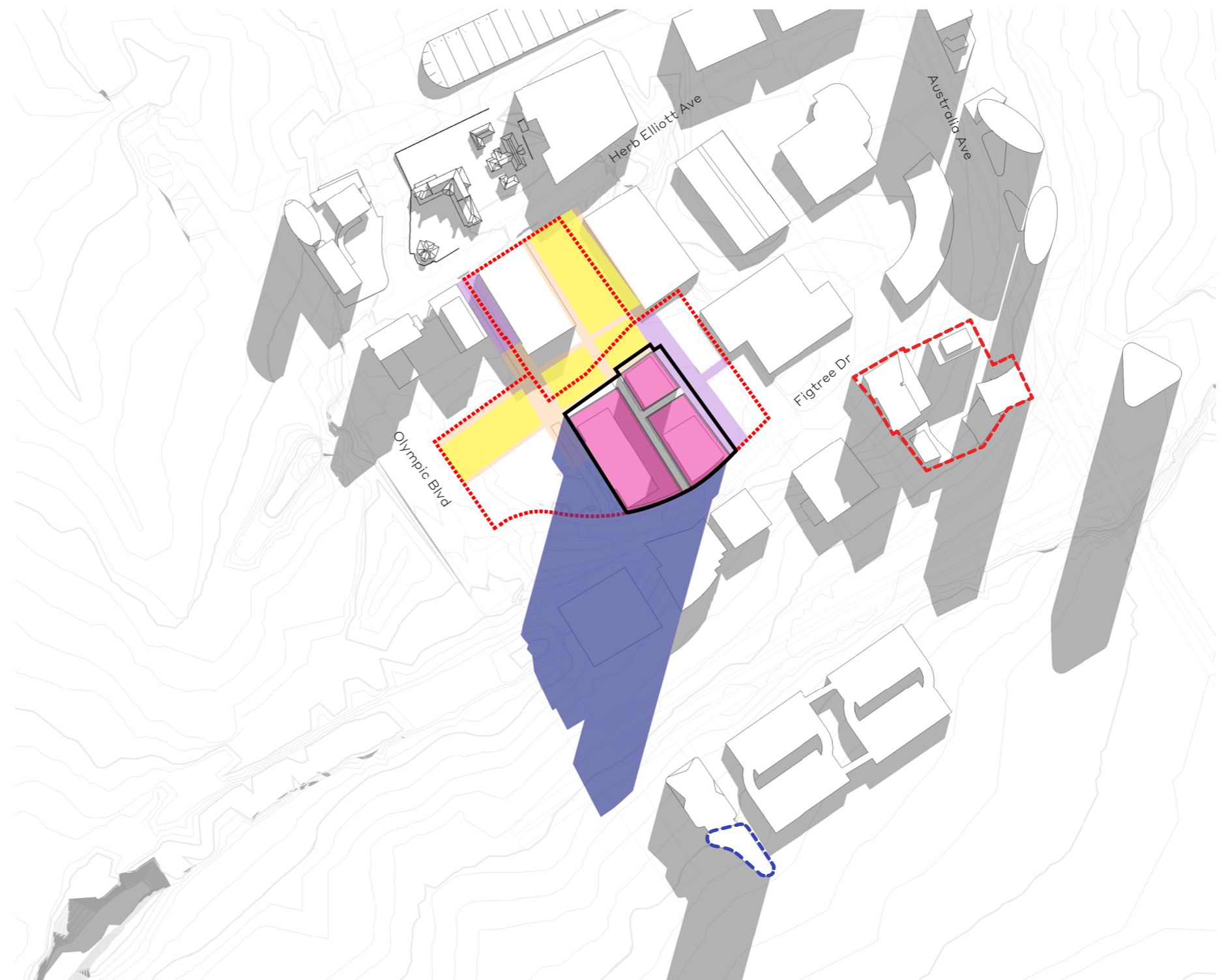
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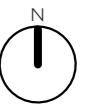
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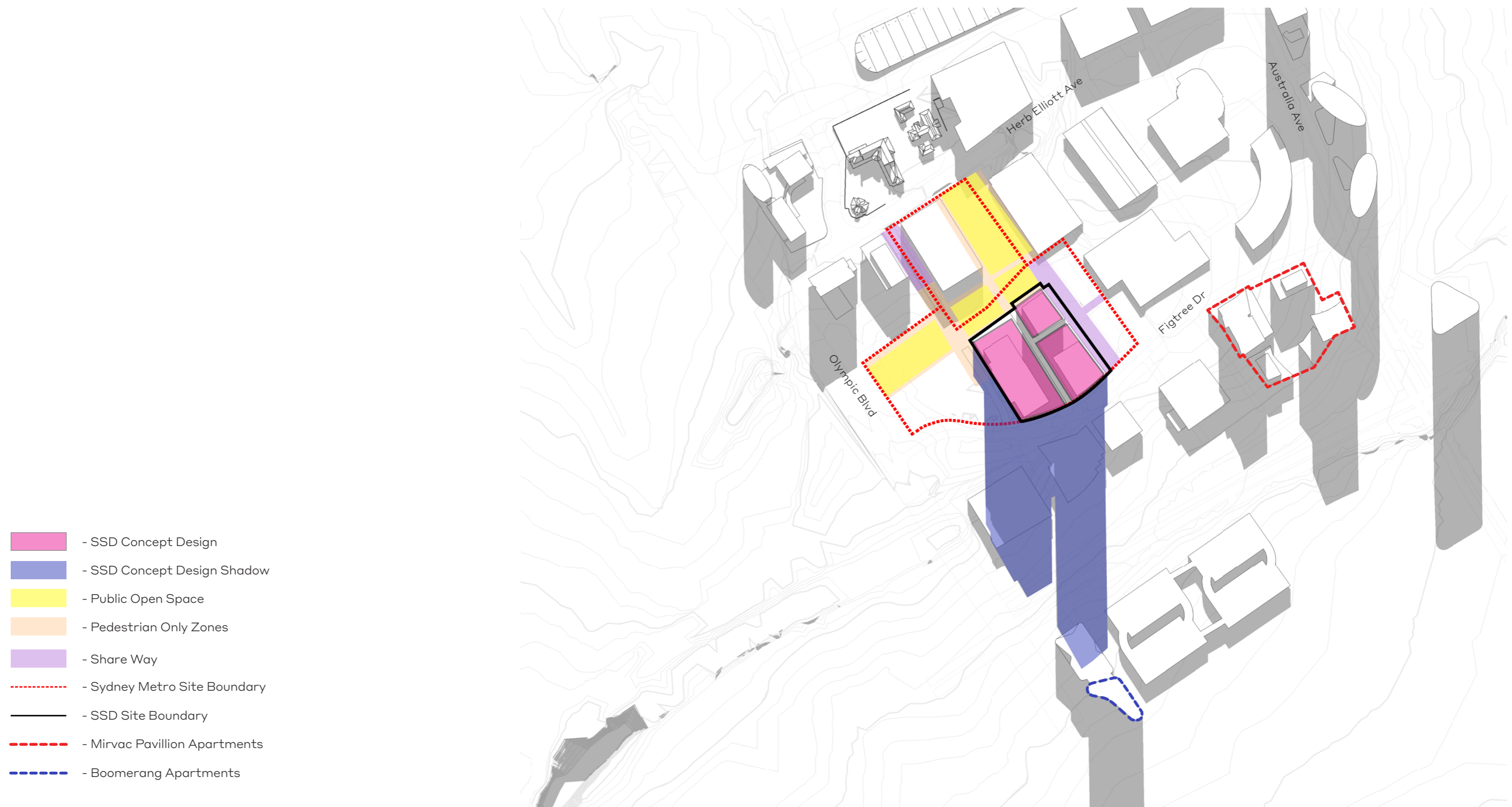
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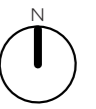
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3.2.4 21 June - 12:00pm












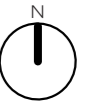
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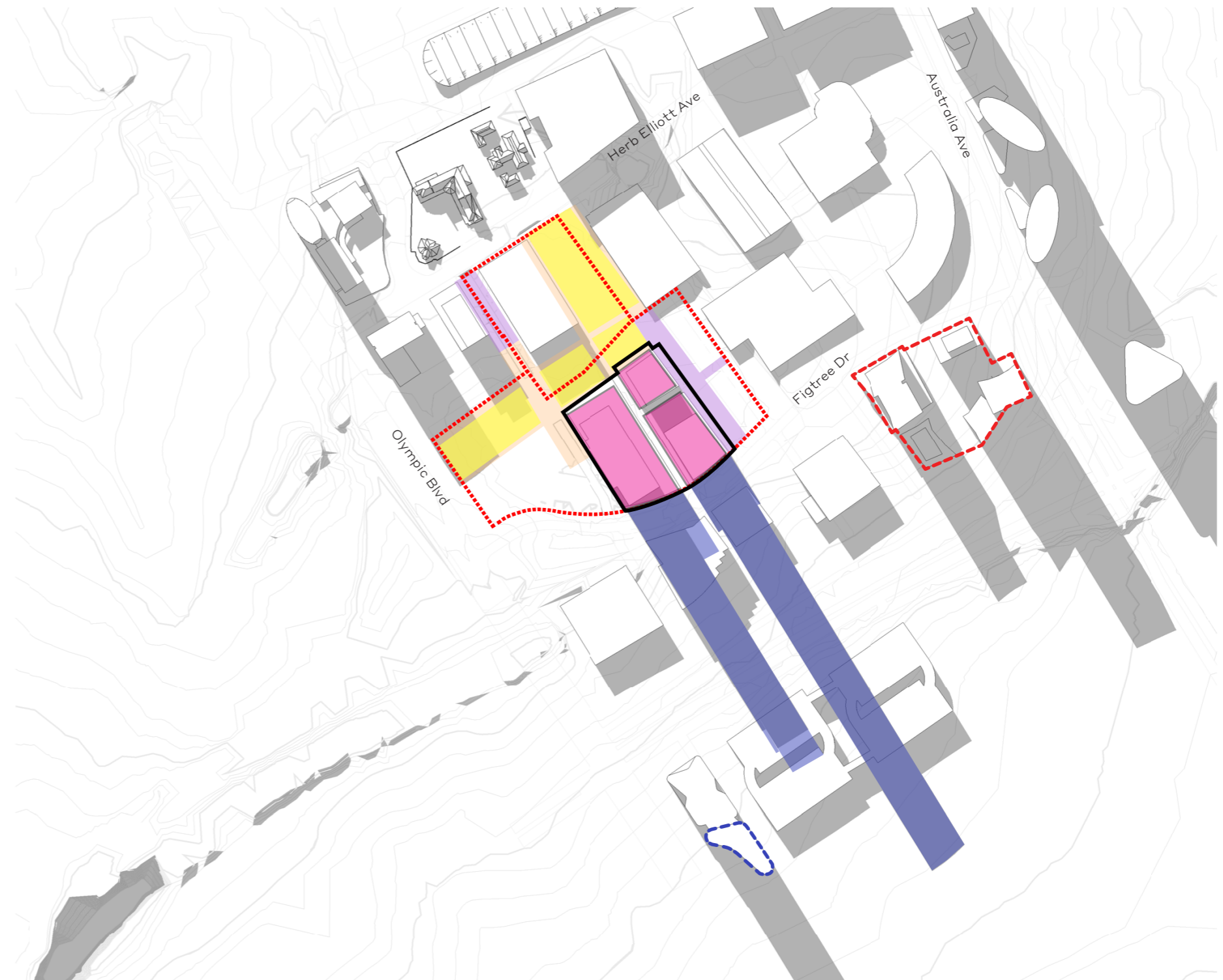
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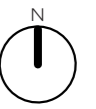
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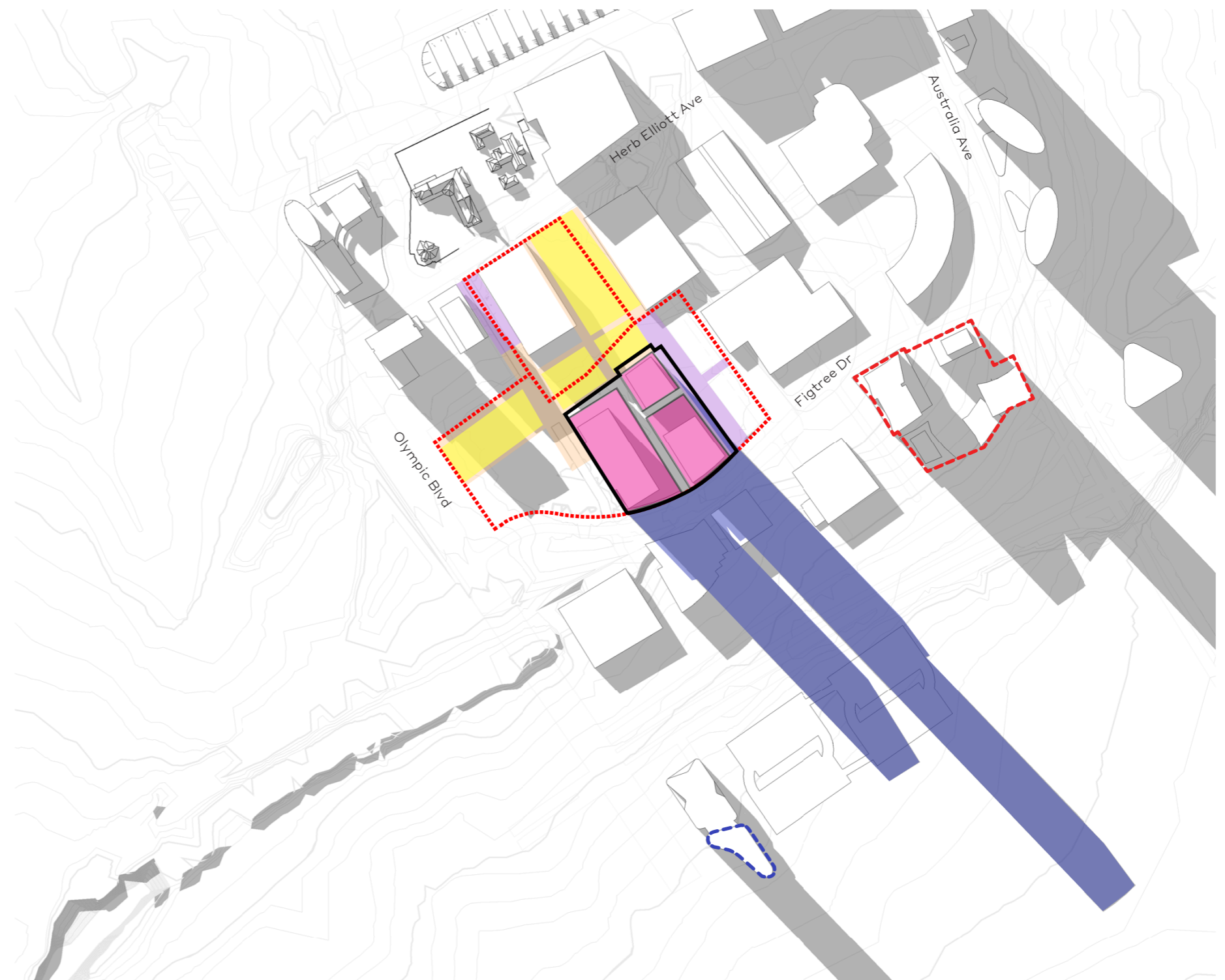
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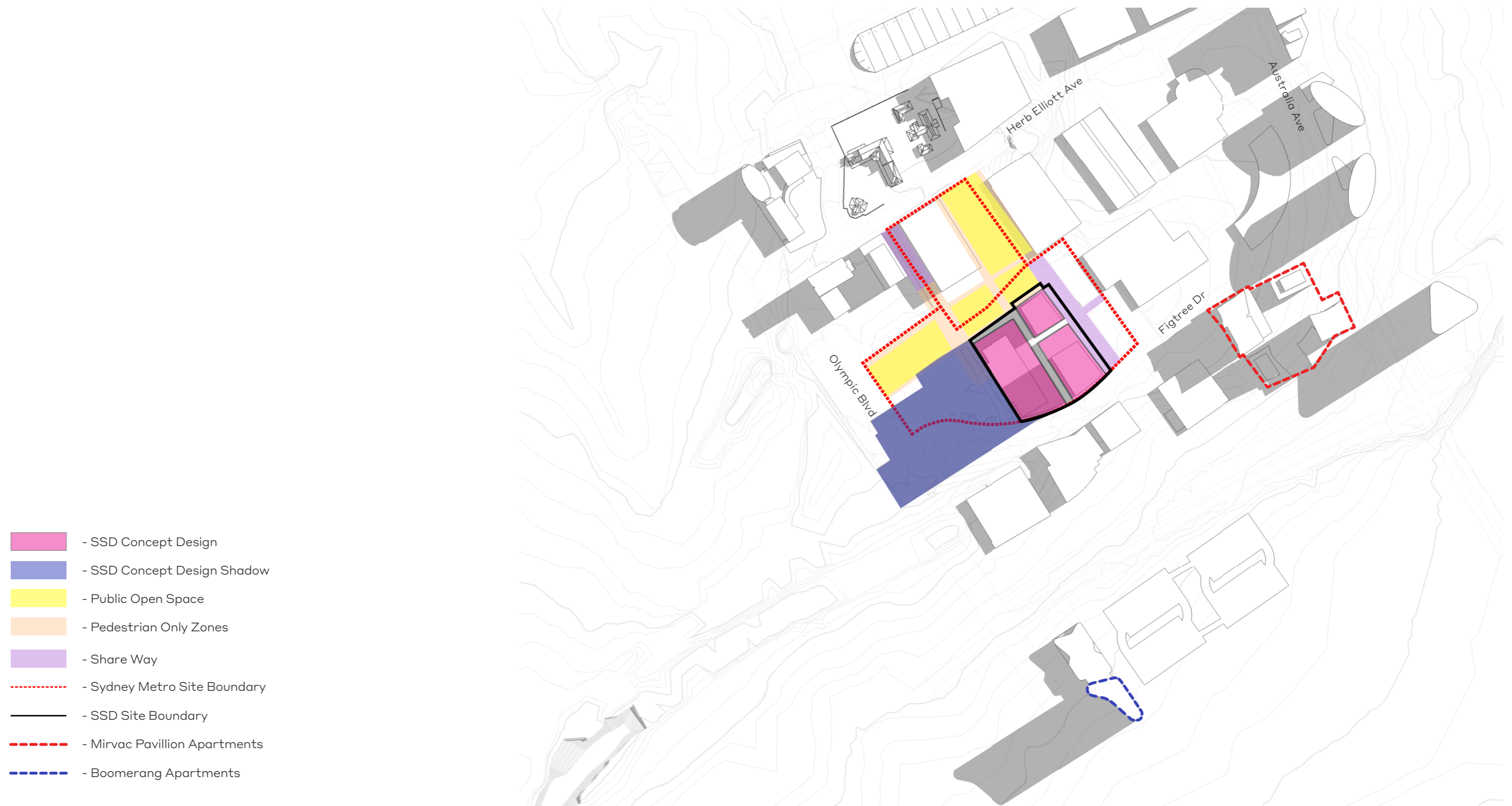
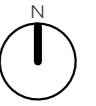
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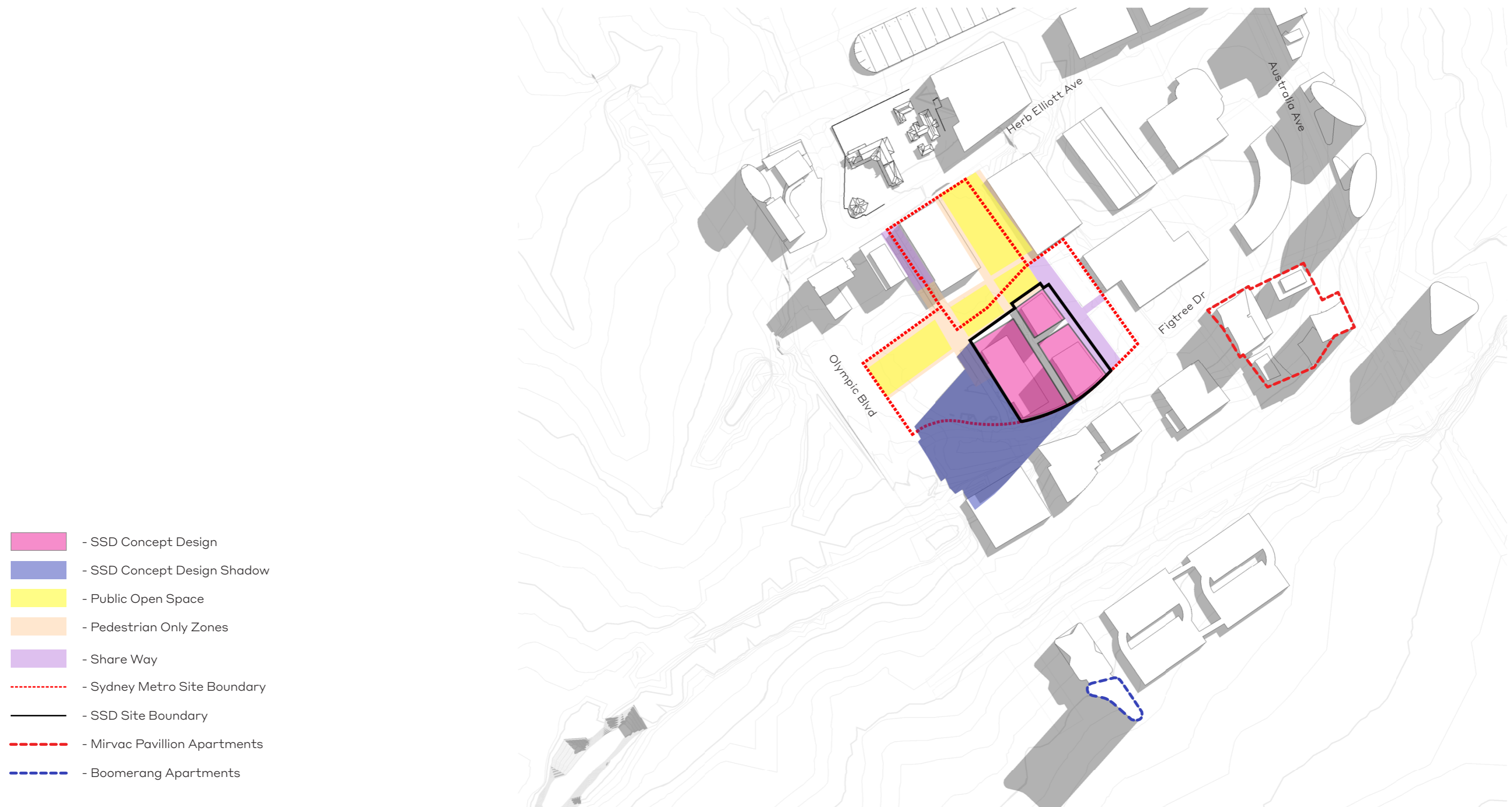
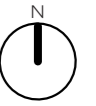
3.3 Spring Equinox










3.3.1 23 September - 9:00am



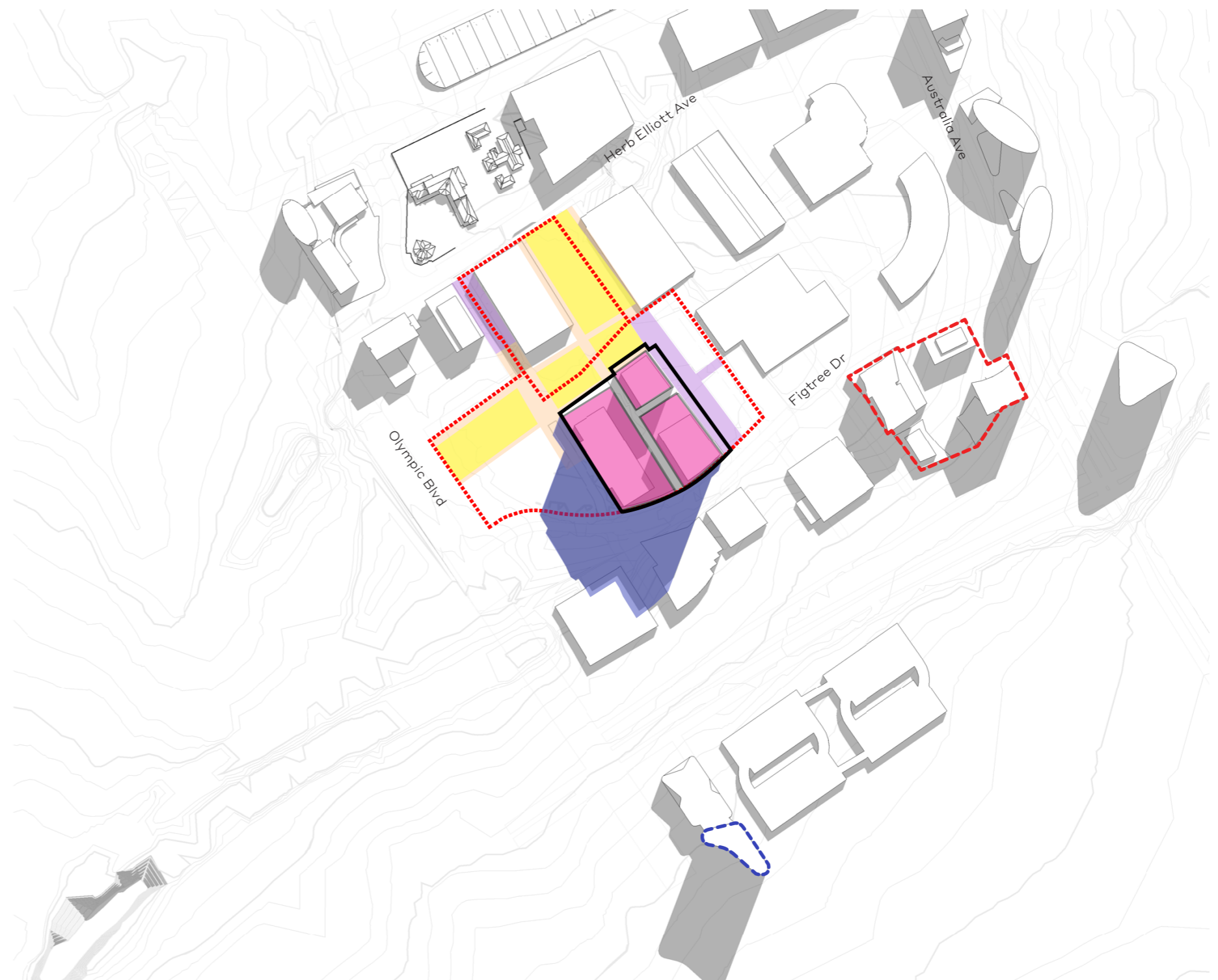
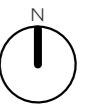
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3.3.2 23 September - 10:00am



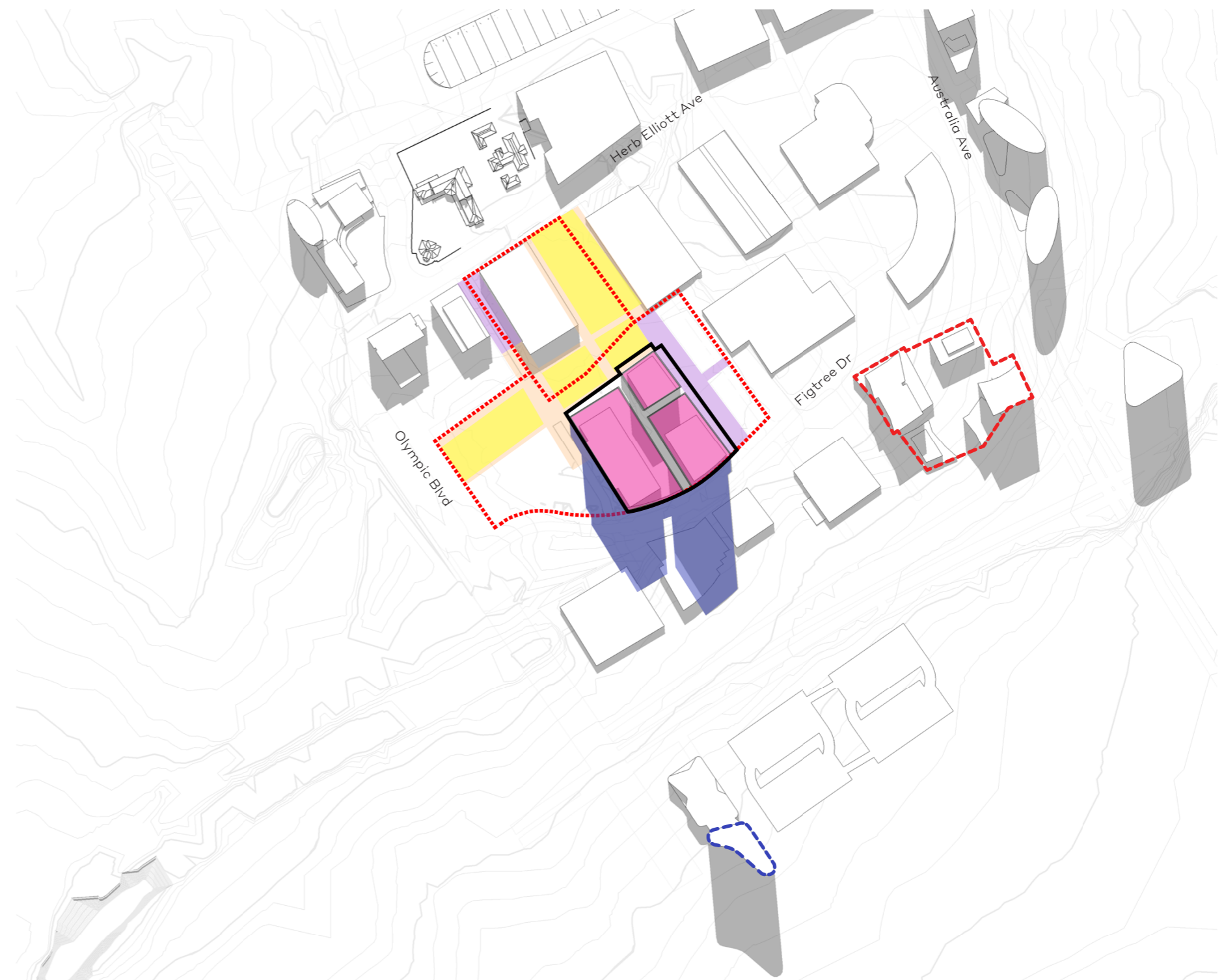
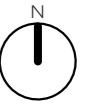
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3.3.3 23 September - 11:00am



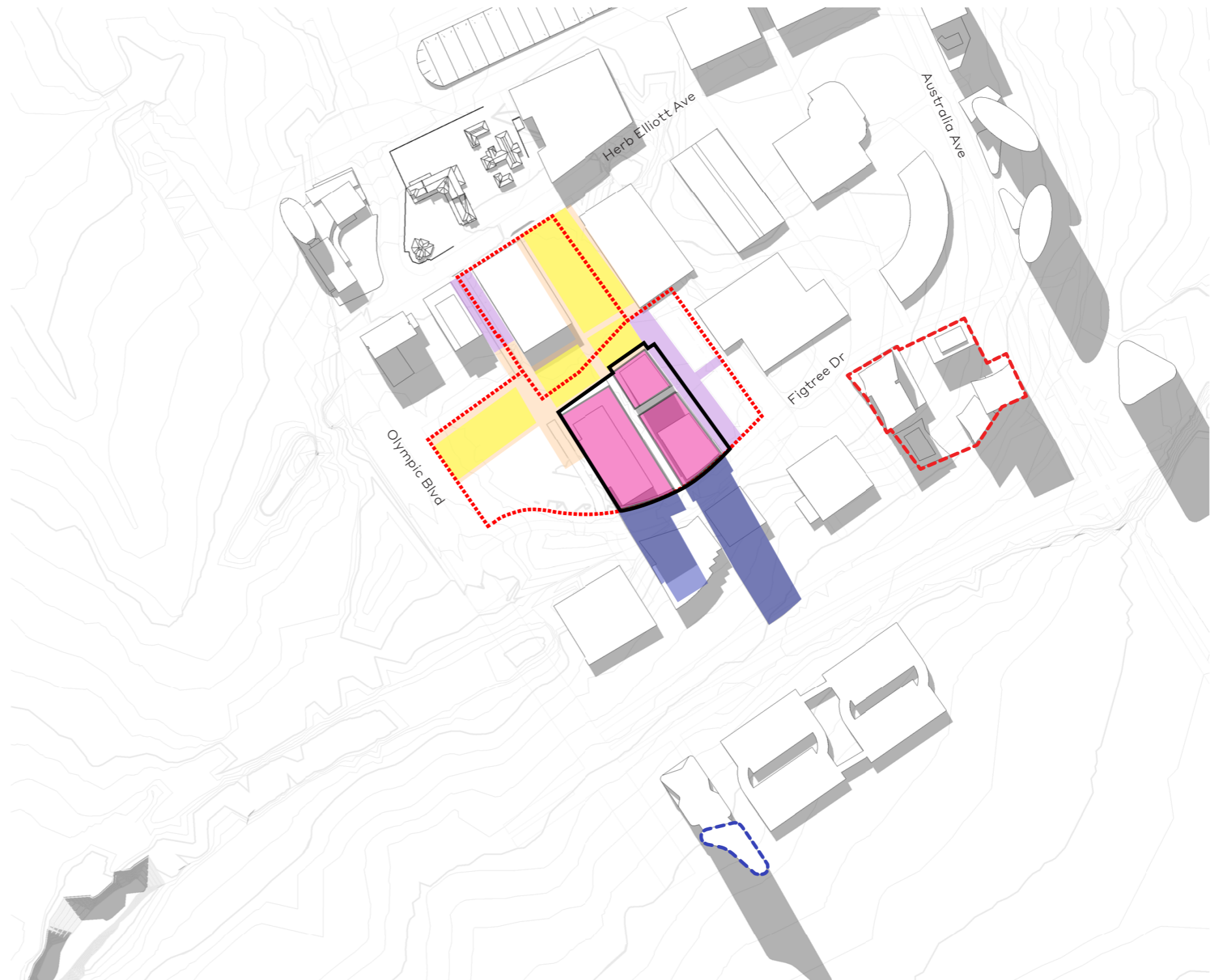
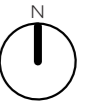
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3.3.4 23 September - 12:00pm



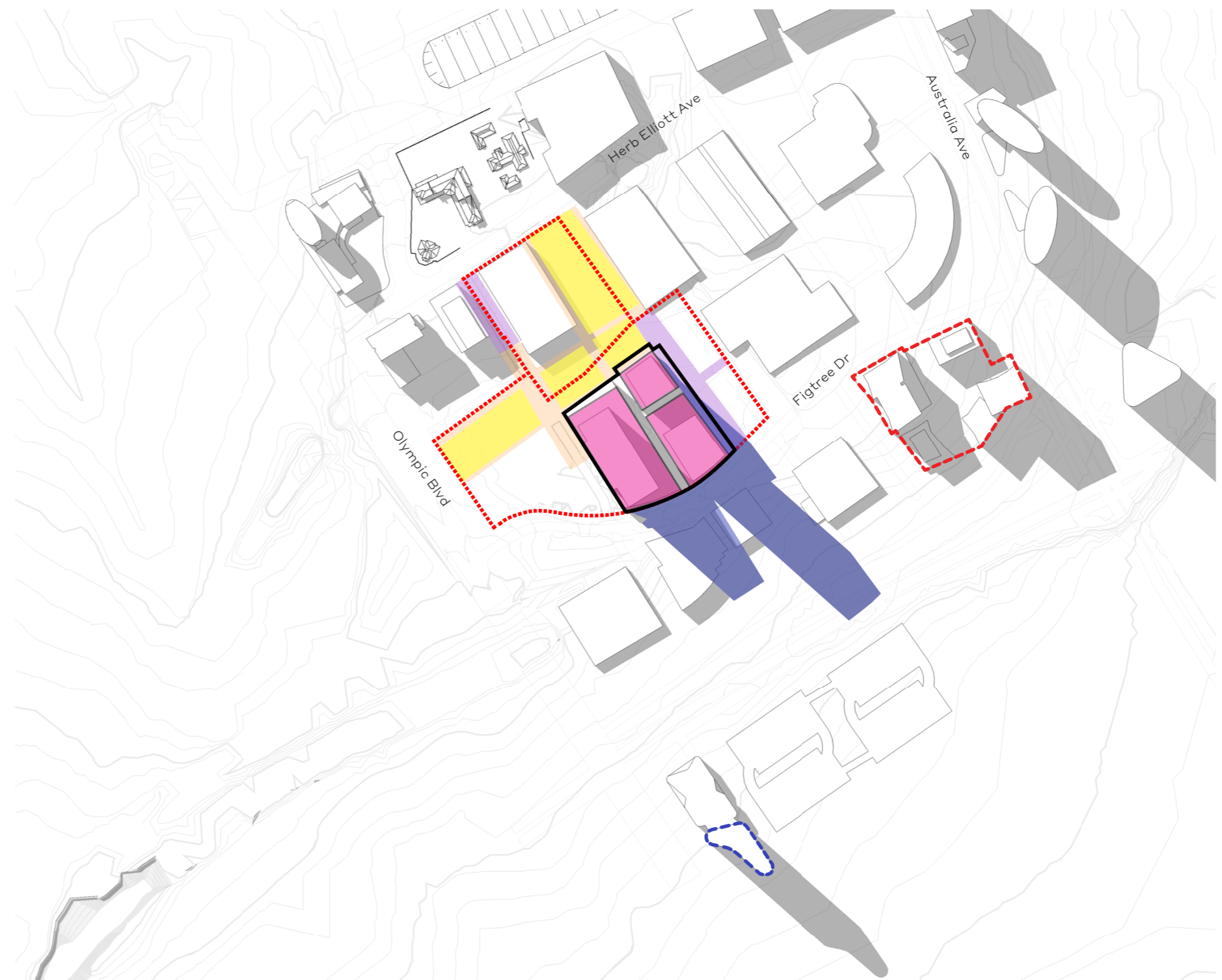
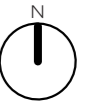
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3.3.5 23 September - 1:00pm



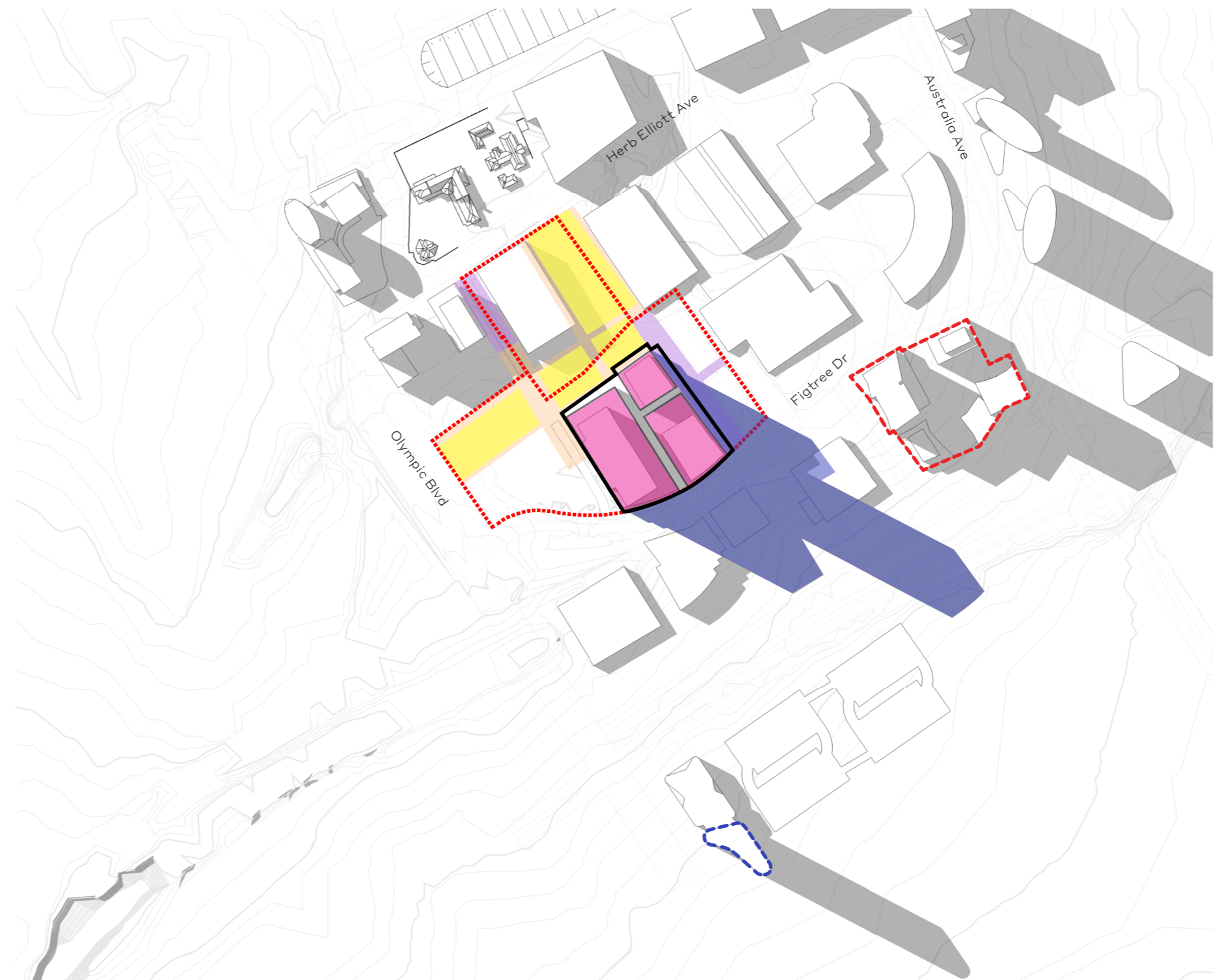
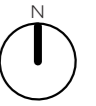
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3.3.6 23 September - 2:00pm



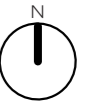
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Overshadowing Impact on 2030 SOPA Masterplan Context

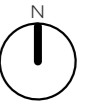


4.1 Autumn Equinox

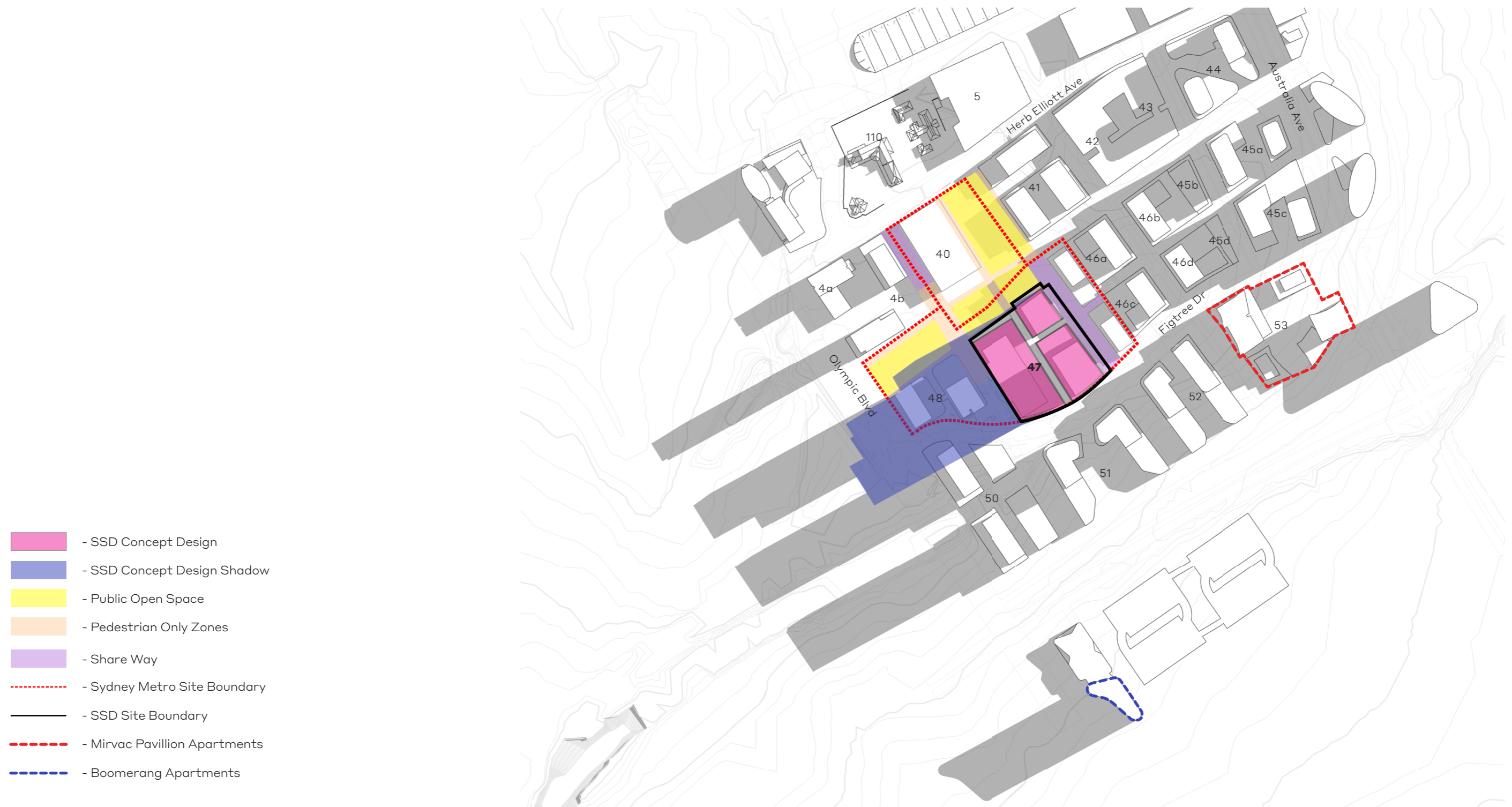
4.1.1 21 March - 9:00am












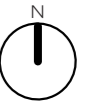
- SSD Concept Design
- SSD Concept Design Shadow
- Public Open Space
- Pedestrian Only Zones
- Share Way
- Sydney Metro Site Boundary
- SSD Site Boundary
- Mirvac Pavillion Apartments
- Boomerang Apartments



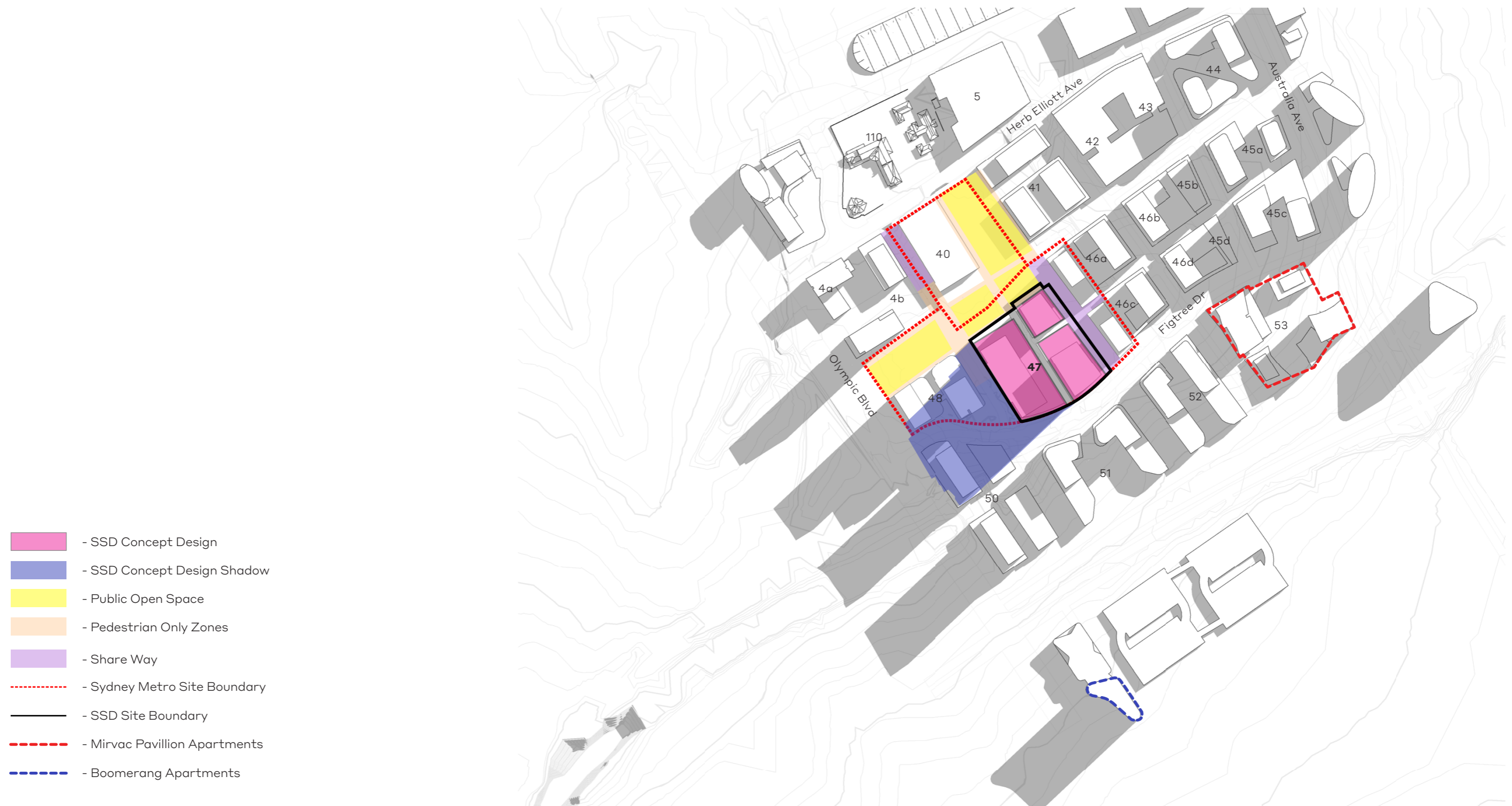
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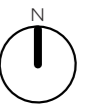
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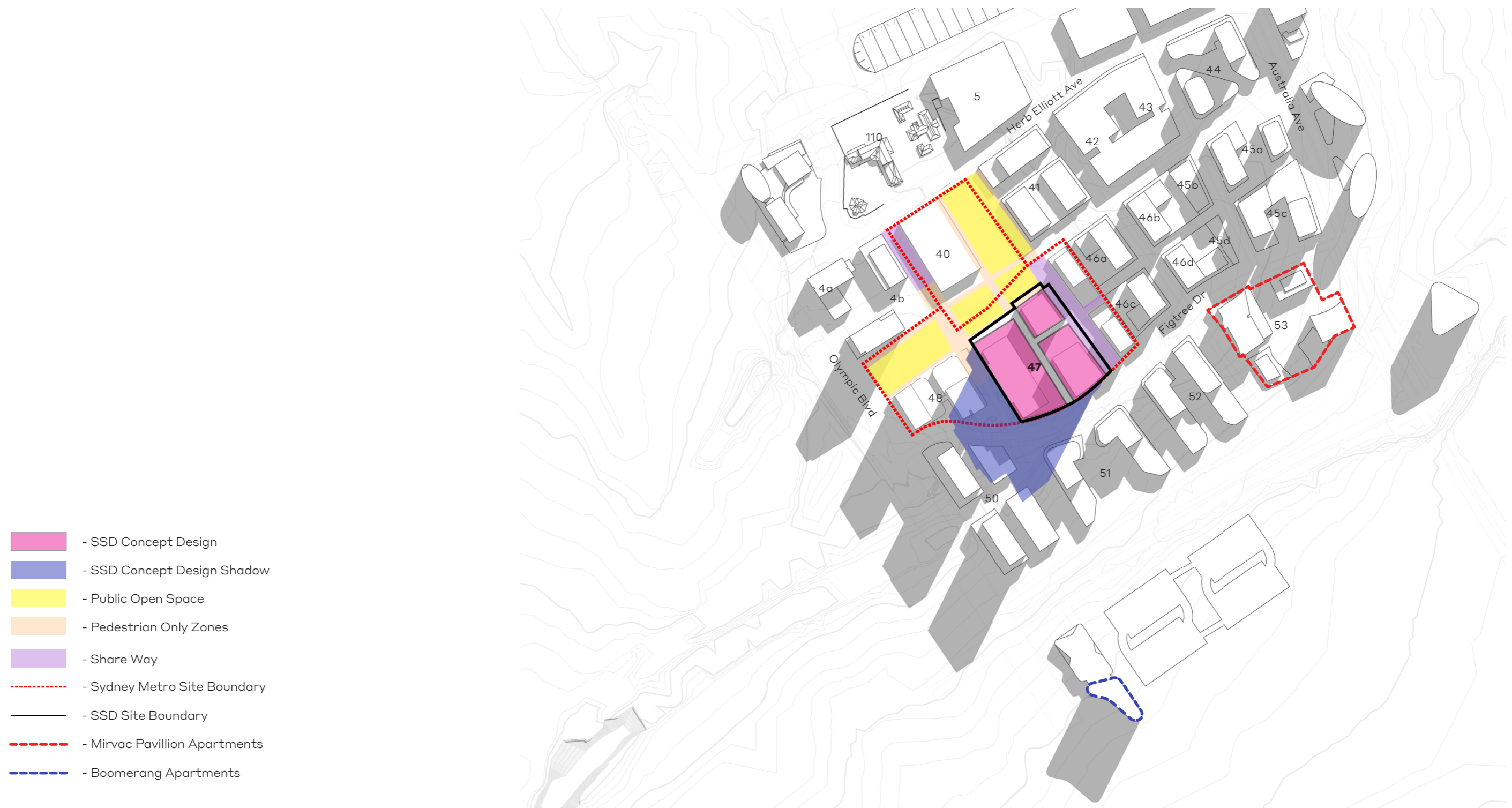
4.1.3 21 March - 11:00am



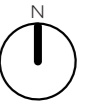
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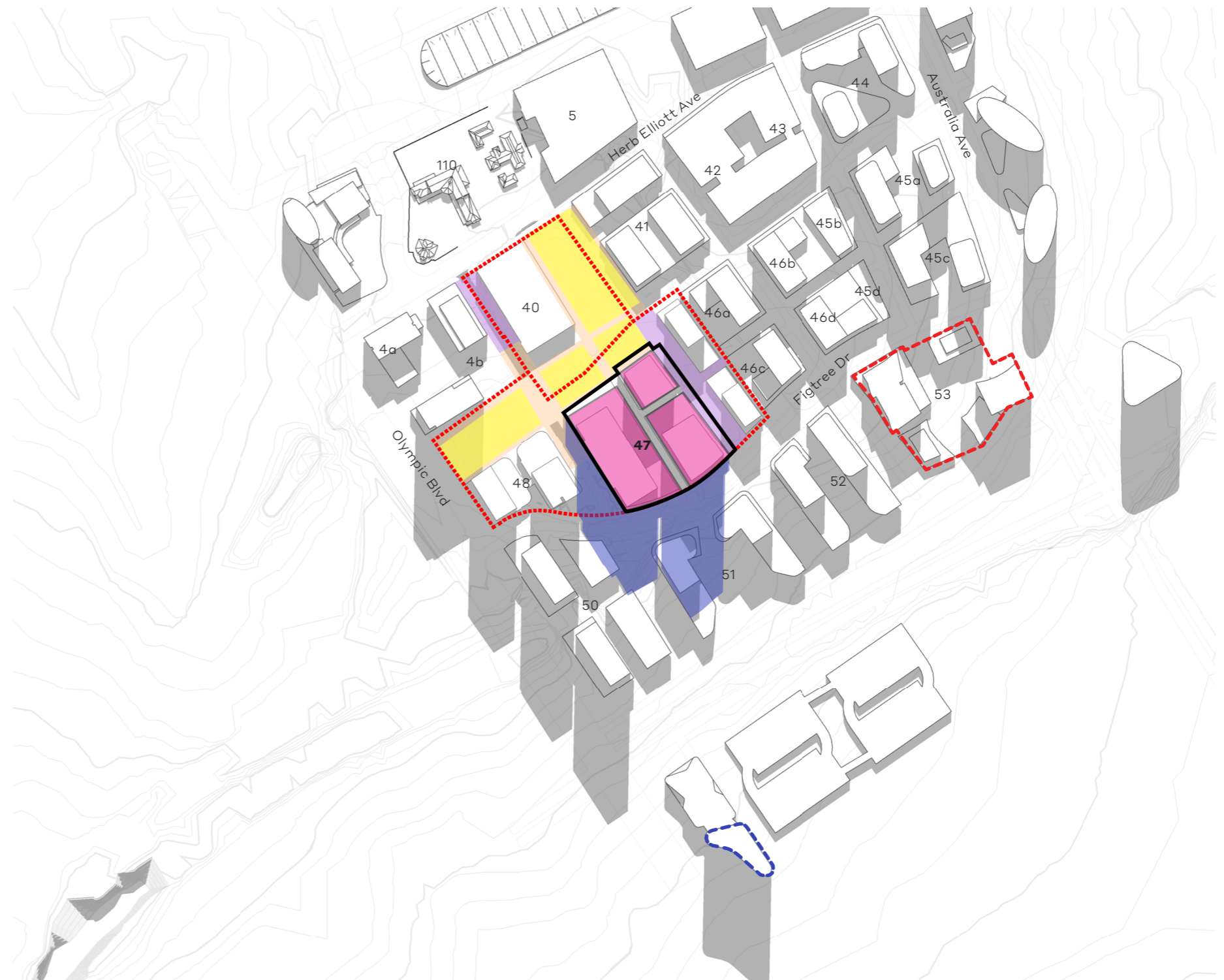
4.1.4 21 March - 12:00pm



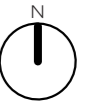
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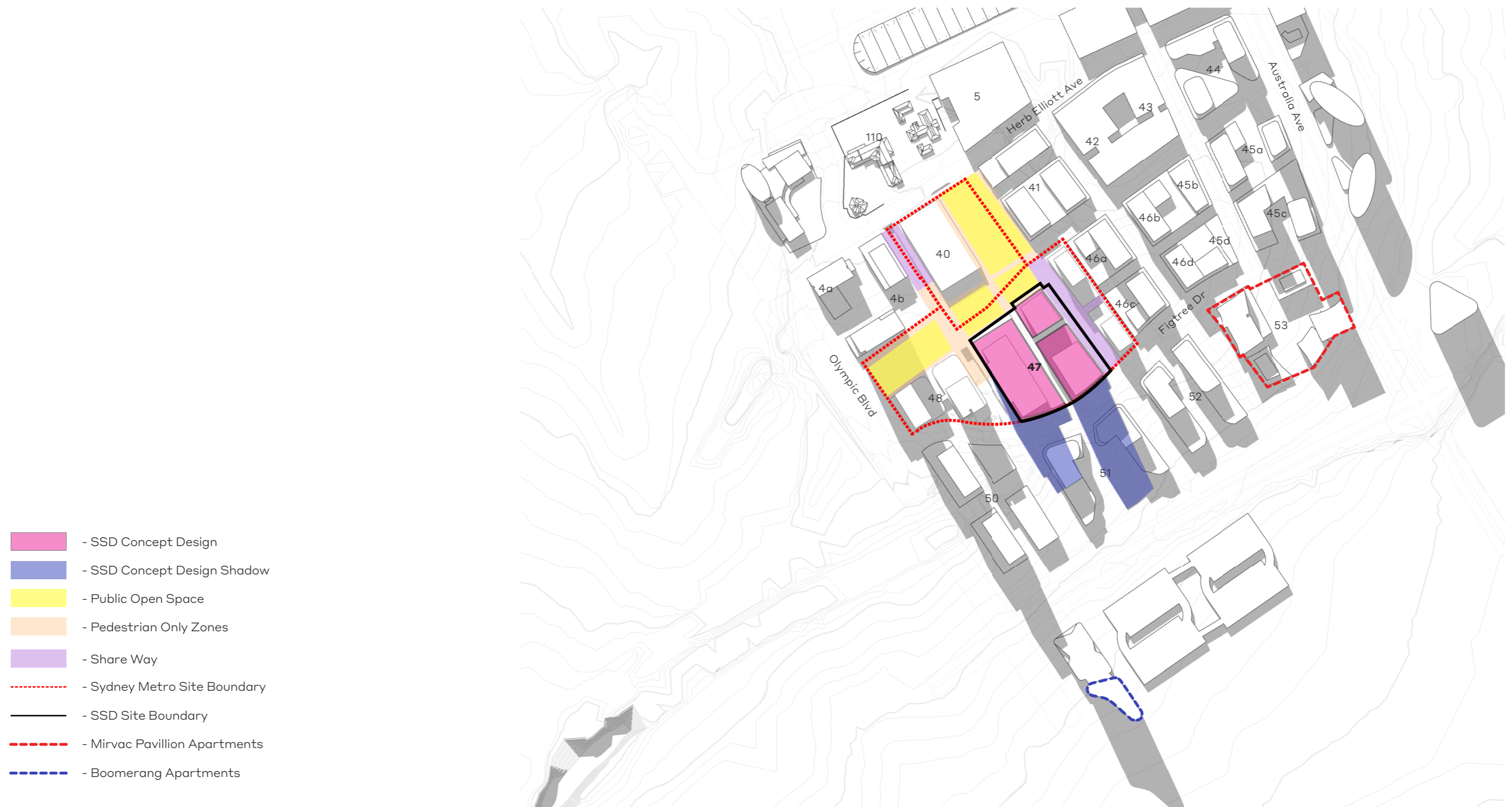
4.1.5 21 March - 1:00pm



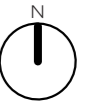
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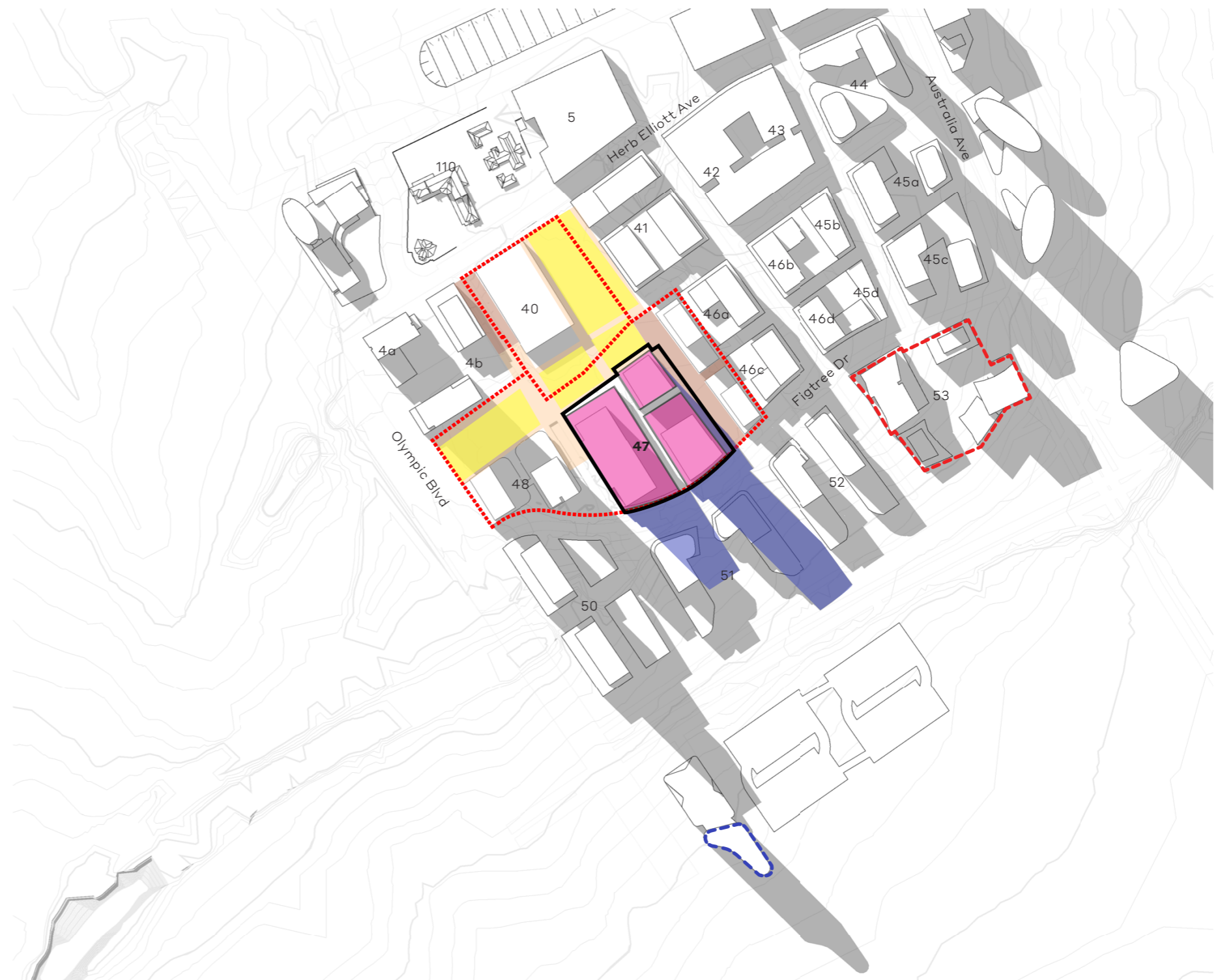
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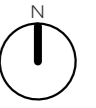
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- Boomerang Apartments



4.1.7 21 March - 3:00pm

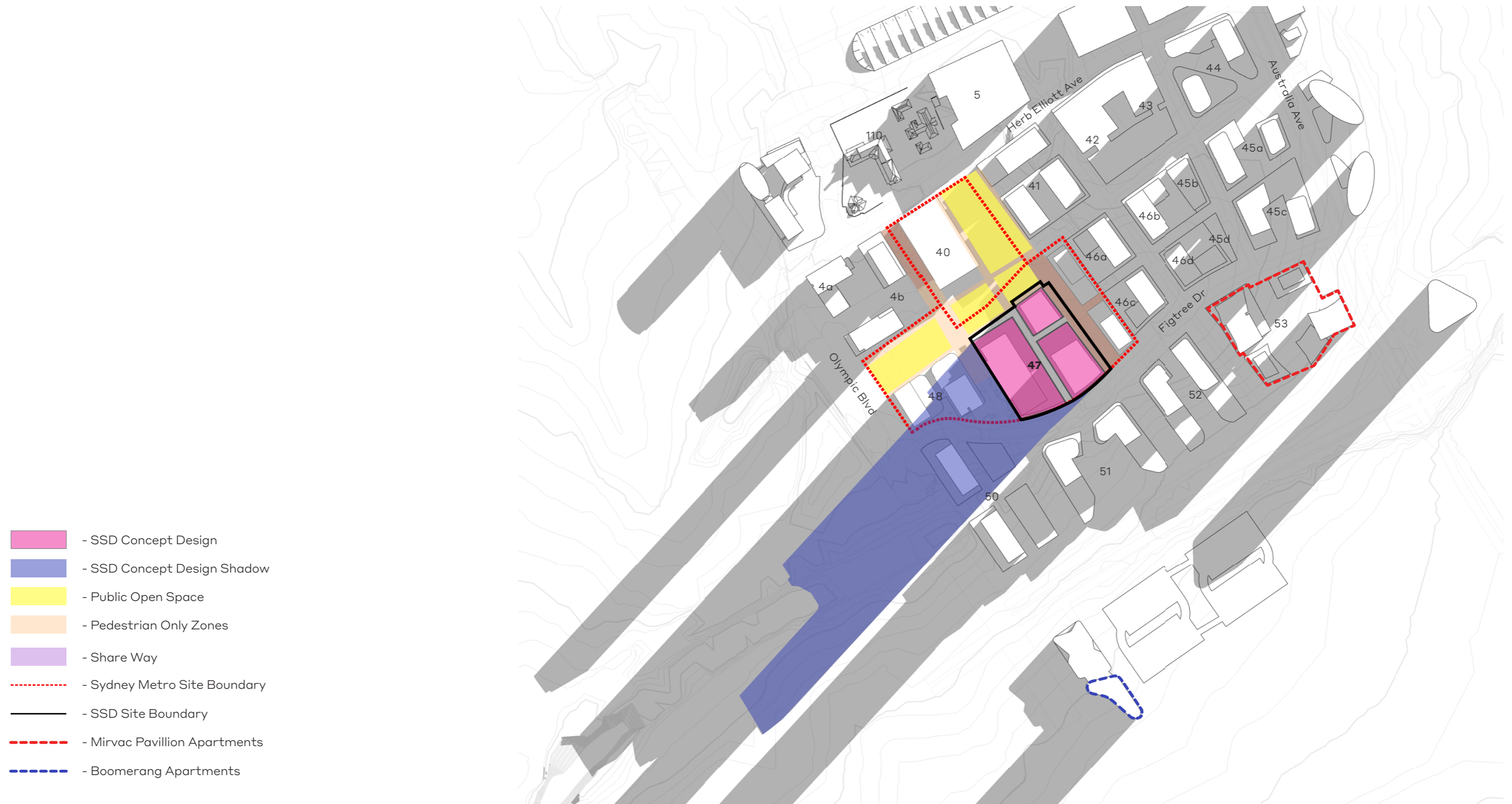











- SSD Concept Design
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- Public Open Space
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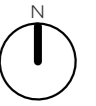


4.2 Winter Solstice

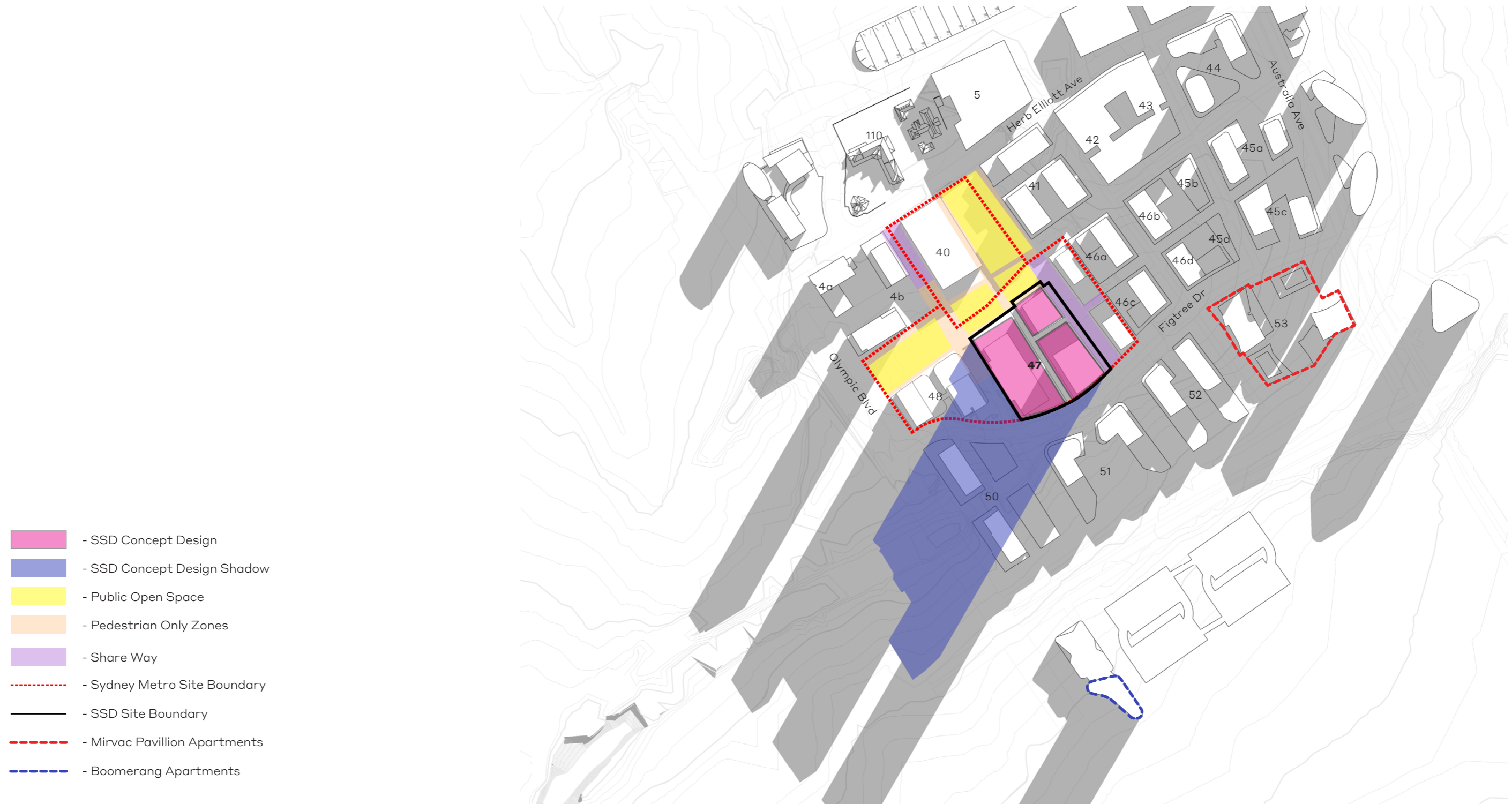
4.2.1 21 June - 9:00am



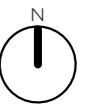
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-  - Boomerang Apartments



4.2.2 21 June - 10:00am












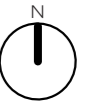
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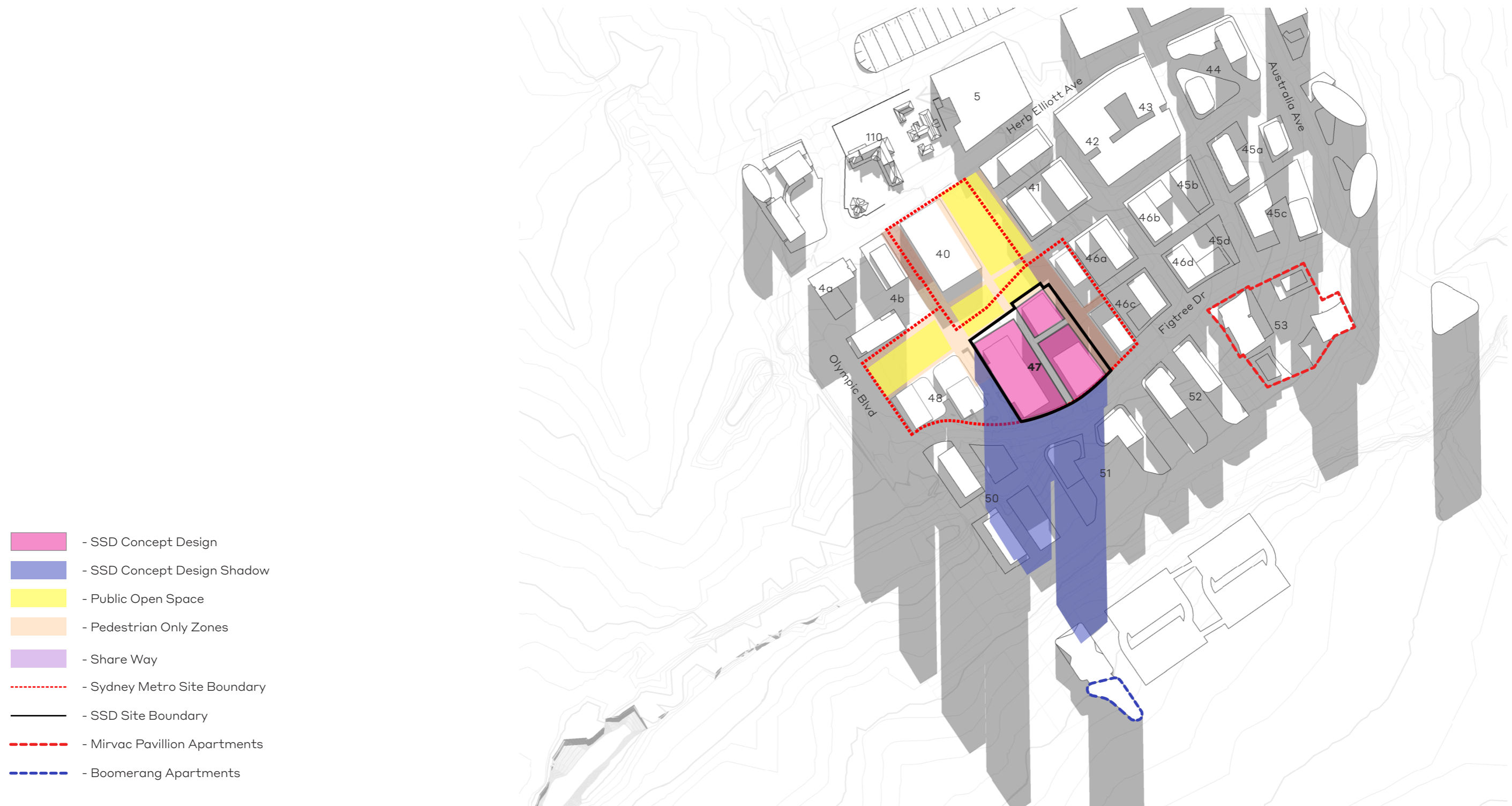
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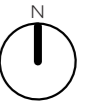
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4.2.4 21 June - 12:00pm











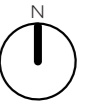
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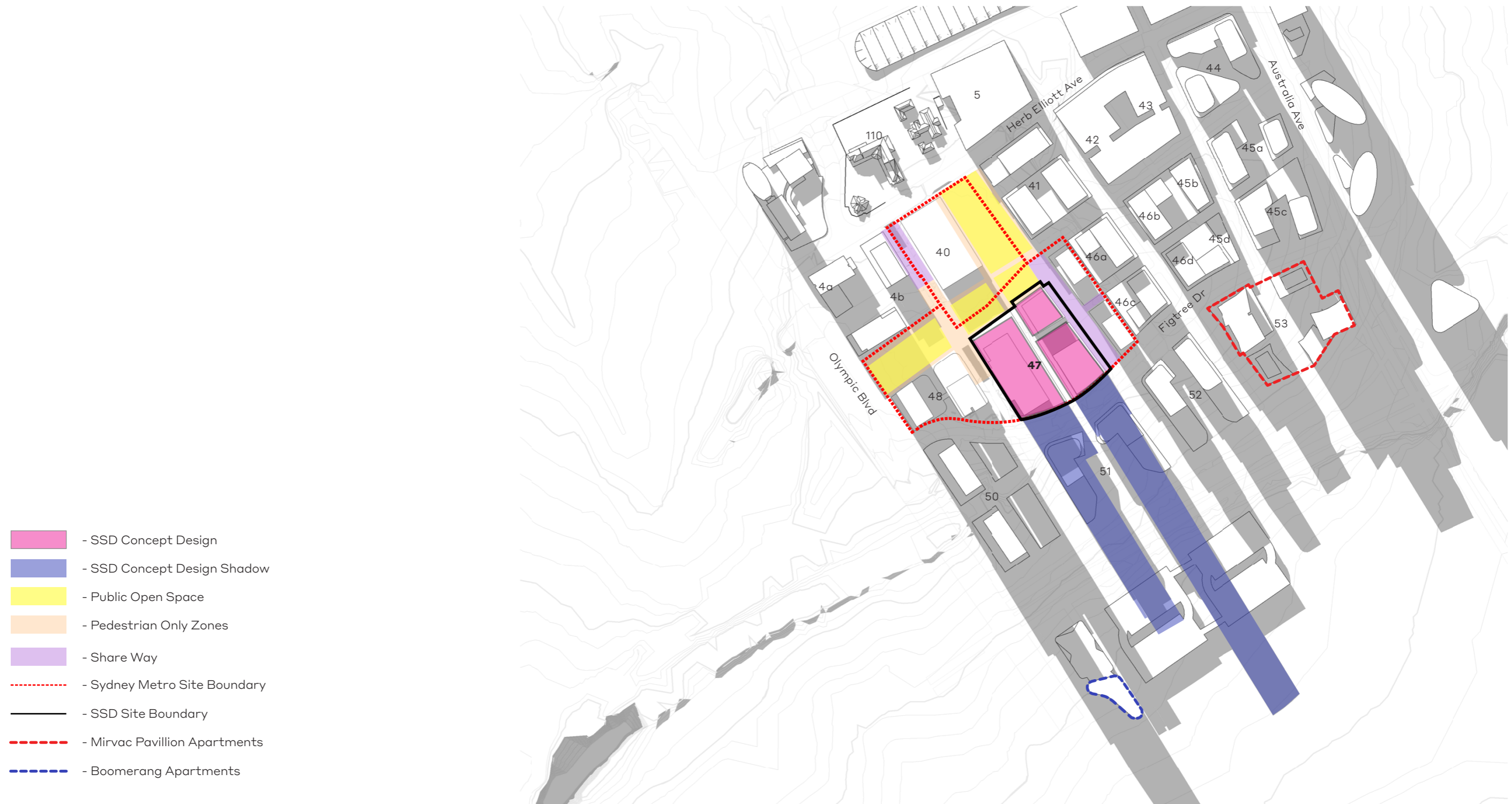
4.2.5 21 June - 1:00pm



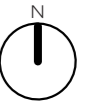
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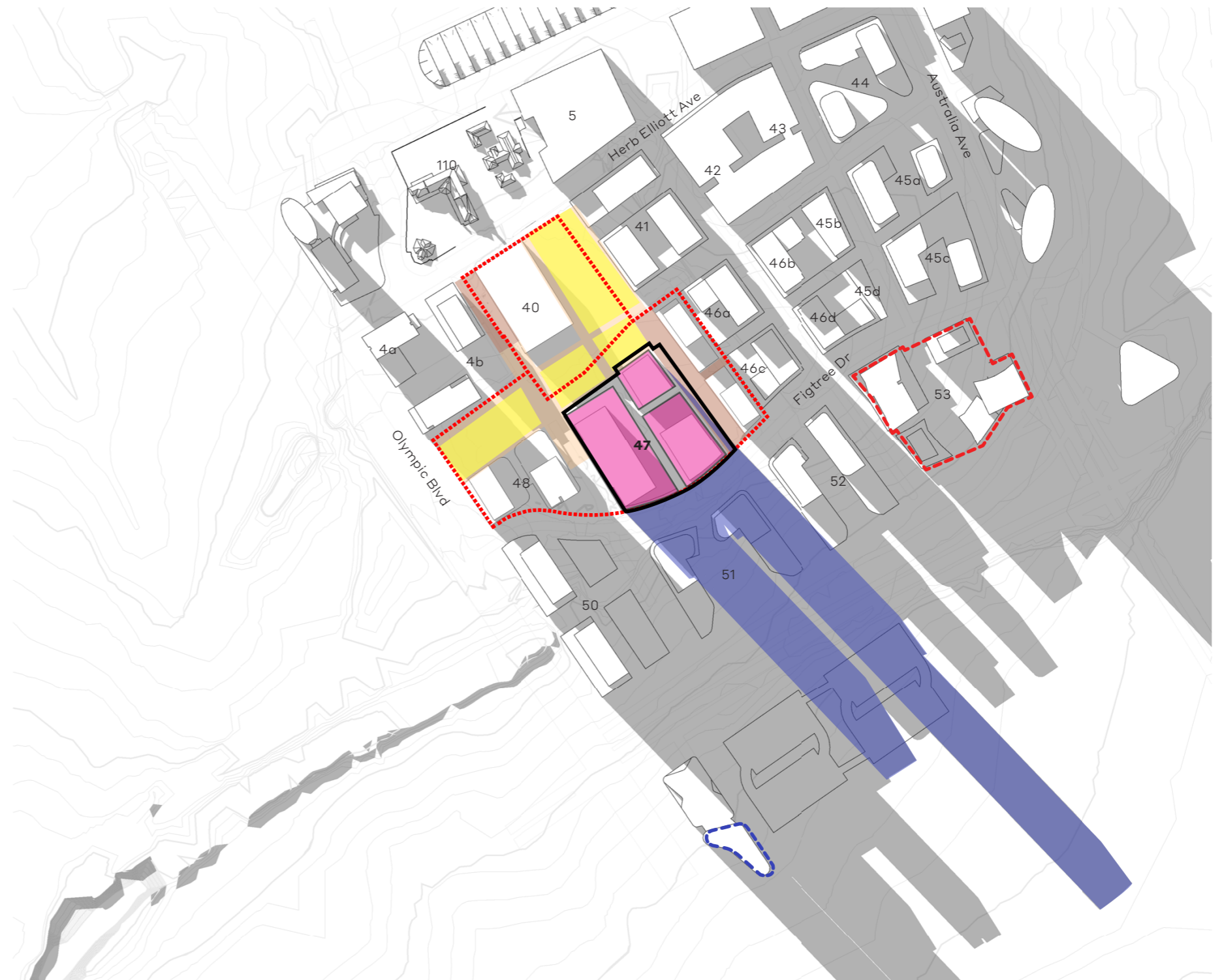
4.2.6 21 June - 2:00pm



- SSD Concept Design
- SSD Concept Design Shadow
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- Share Way
- Sydney Metro Site Boundary
- SSD Site Boundary
- Mirvac Pavillion Apartments
- Boomerang Apartments



4.2.7 21 June - 3:00pm

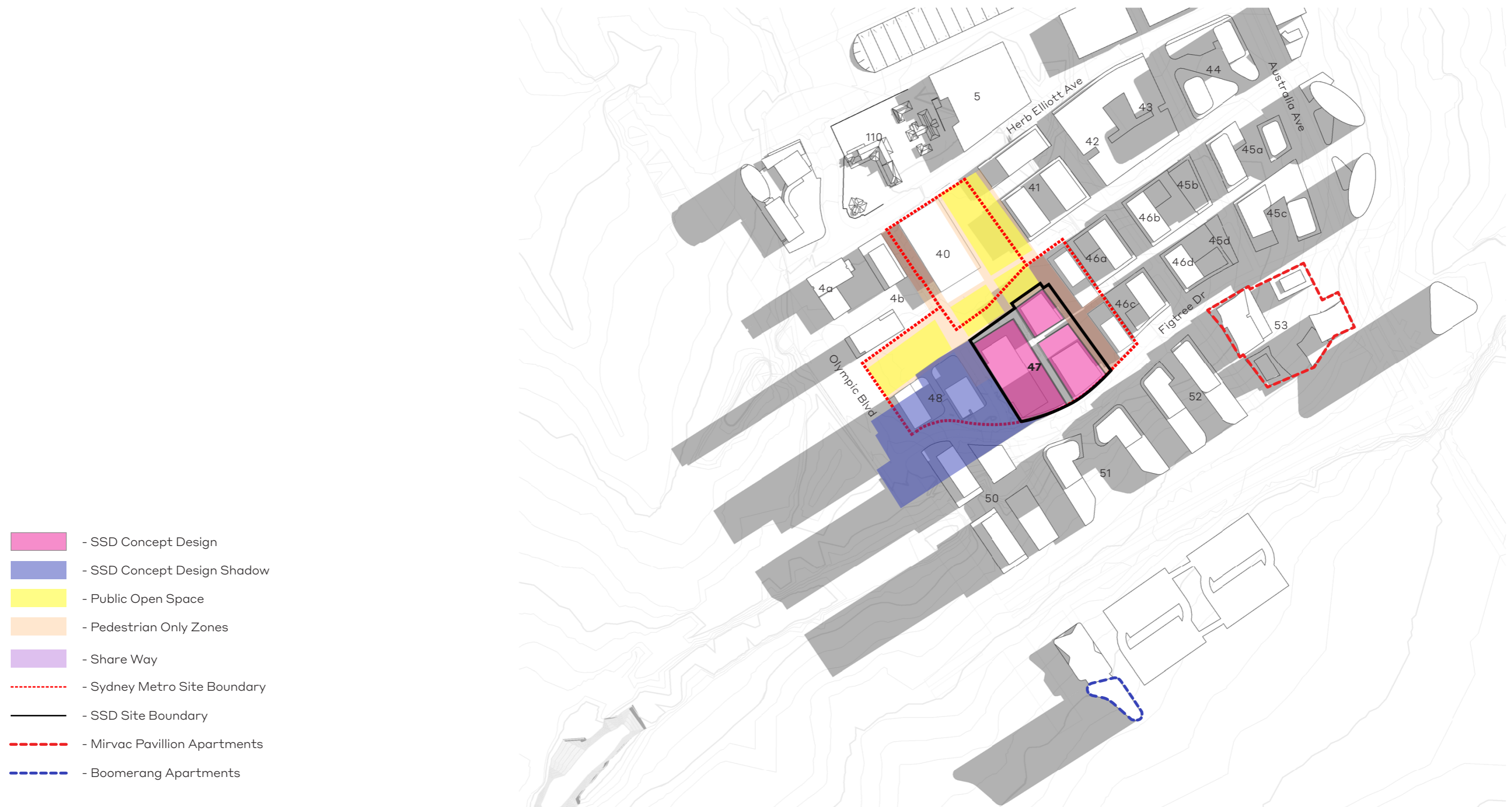











- SSD Concept Design
- SSD Concept Design Shadow
- Public Open Space
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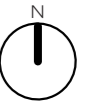


4.3 Spring Equinox

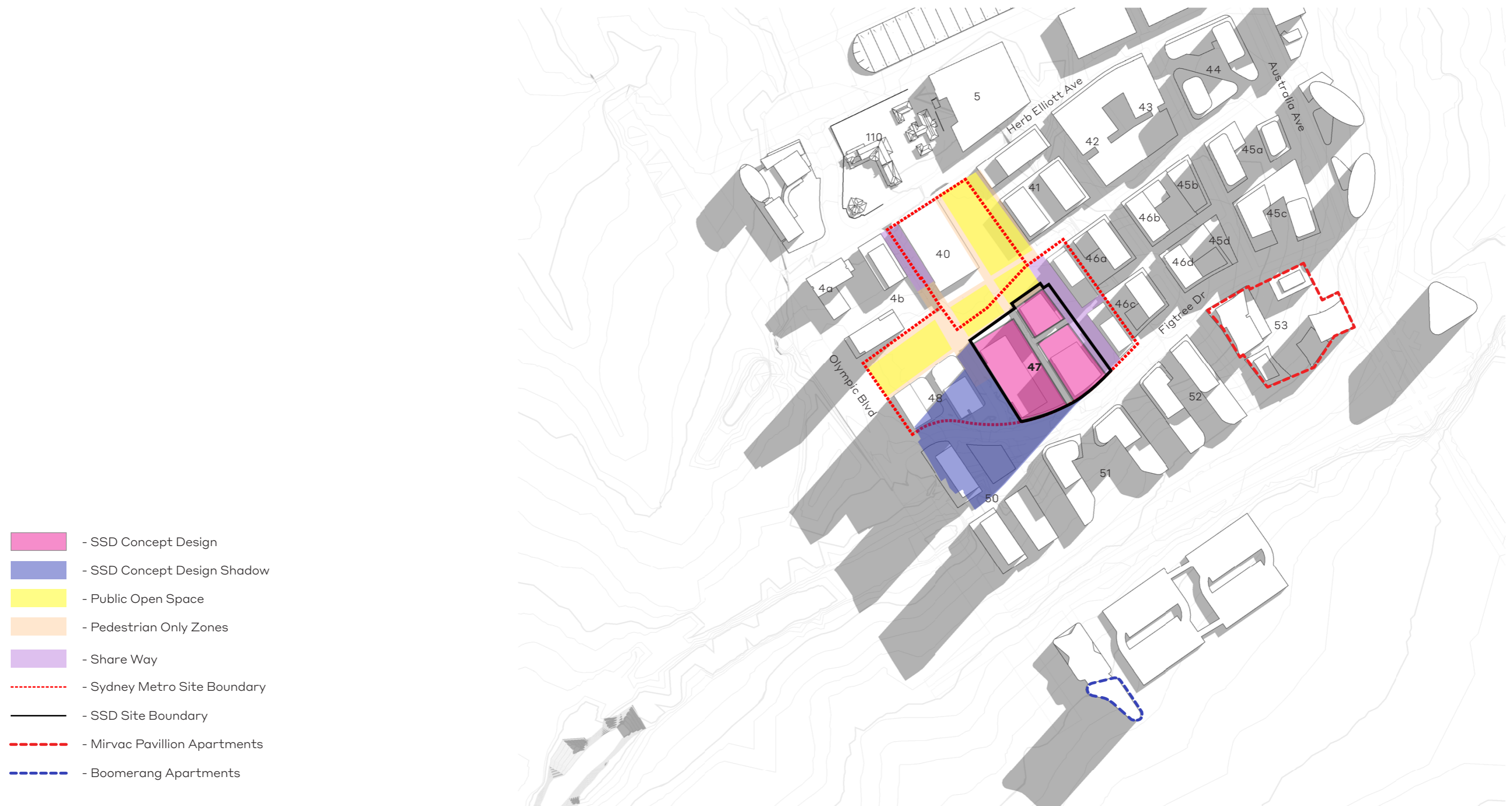
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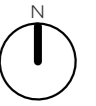
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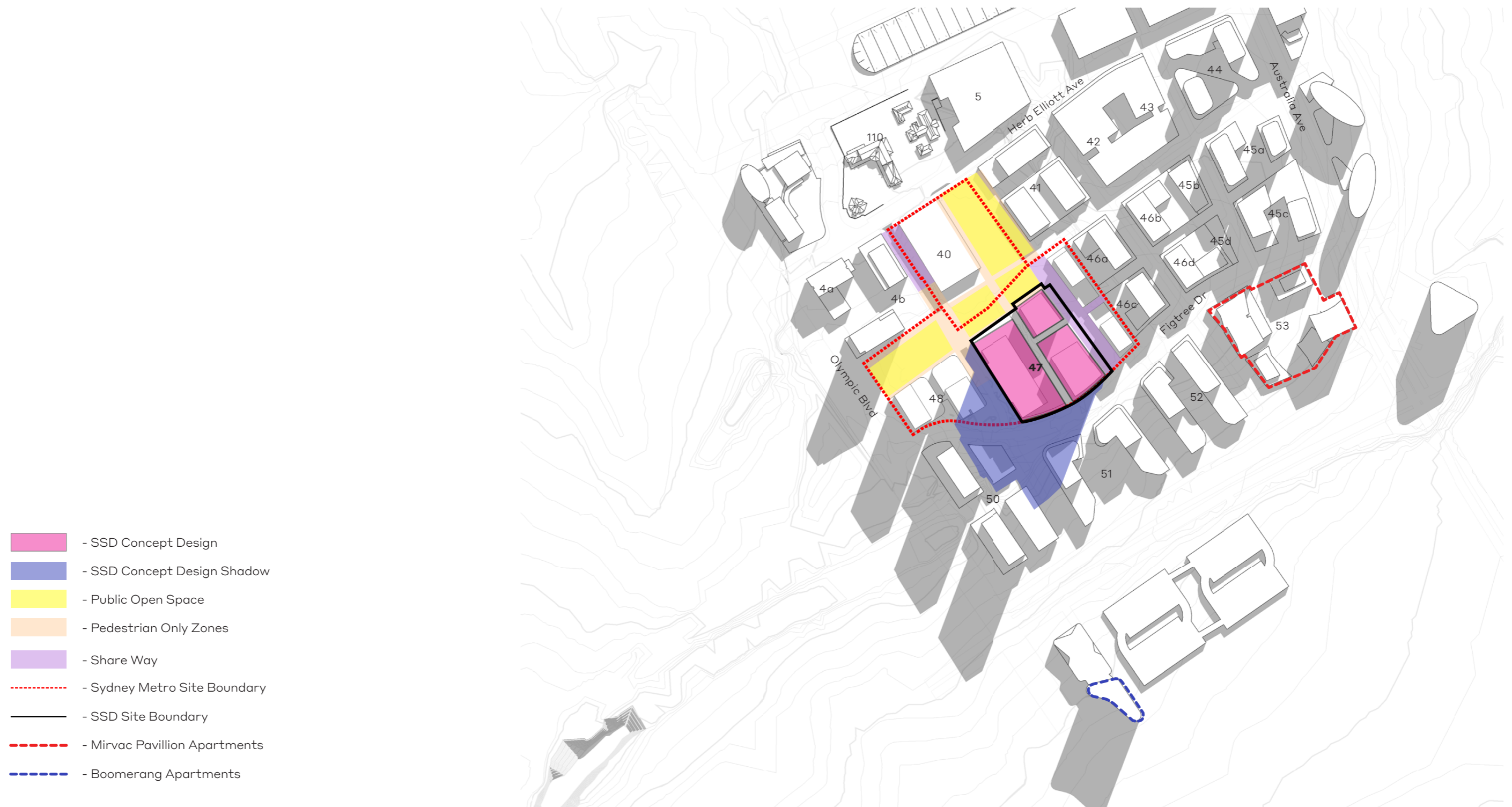
4.3.2 23 September - 10:00am



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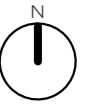


4.3.3 23 September - 11:00am



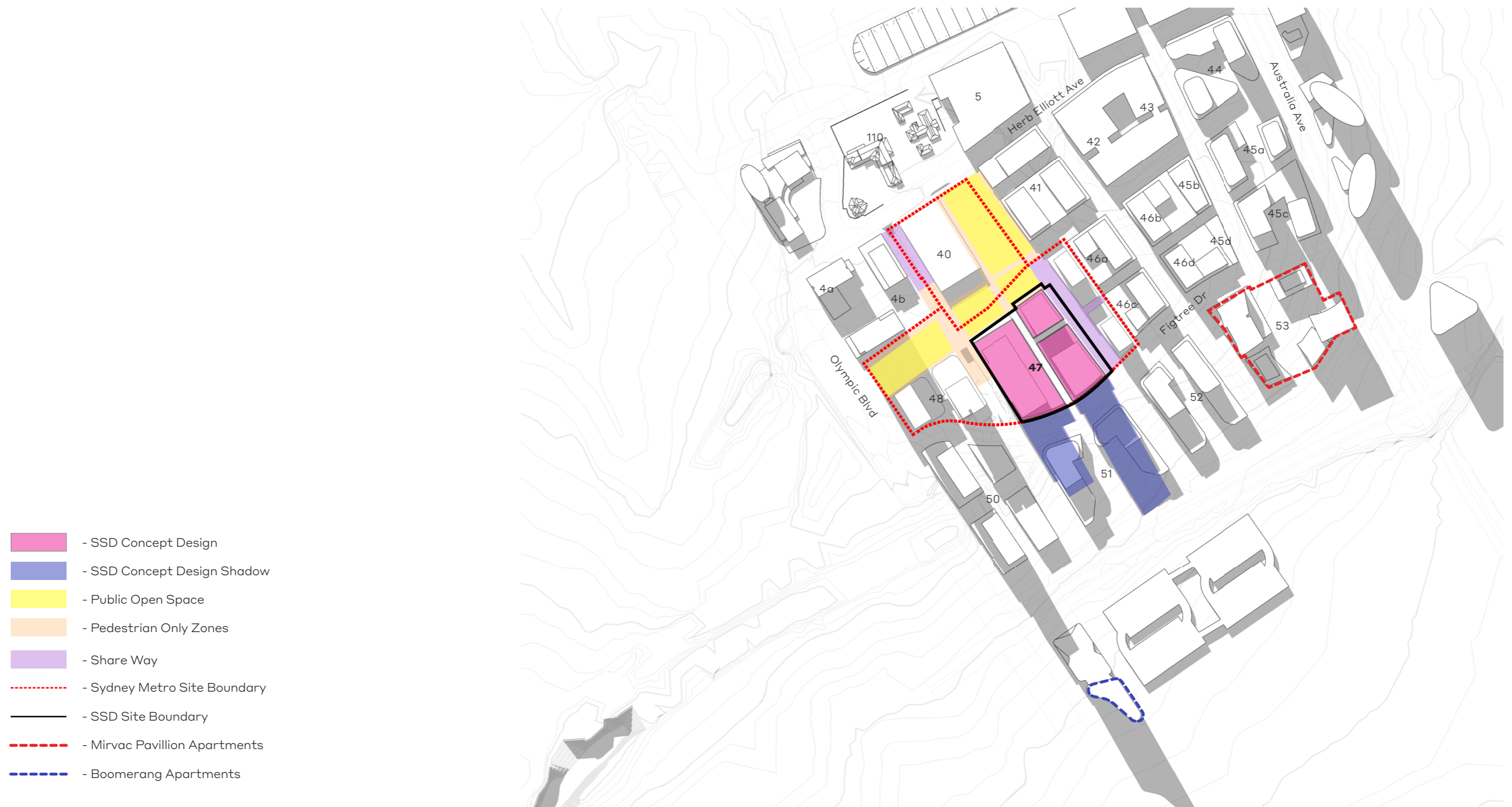
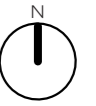
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4.3.4 23 September - 12:00pm



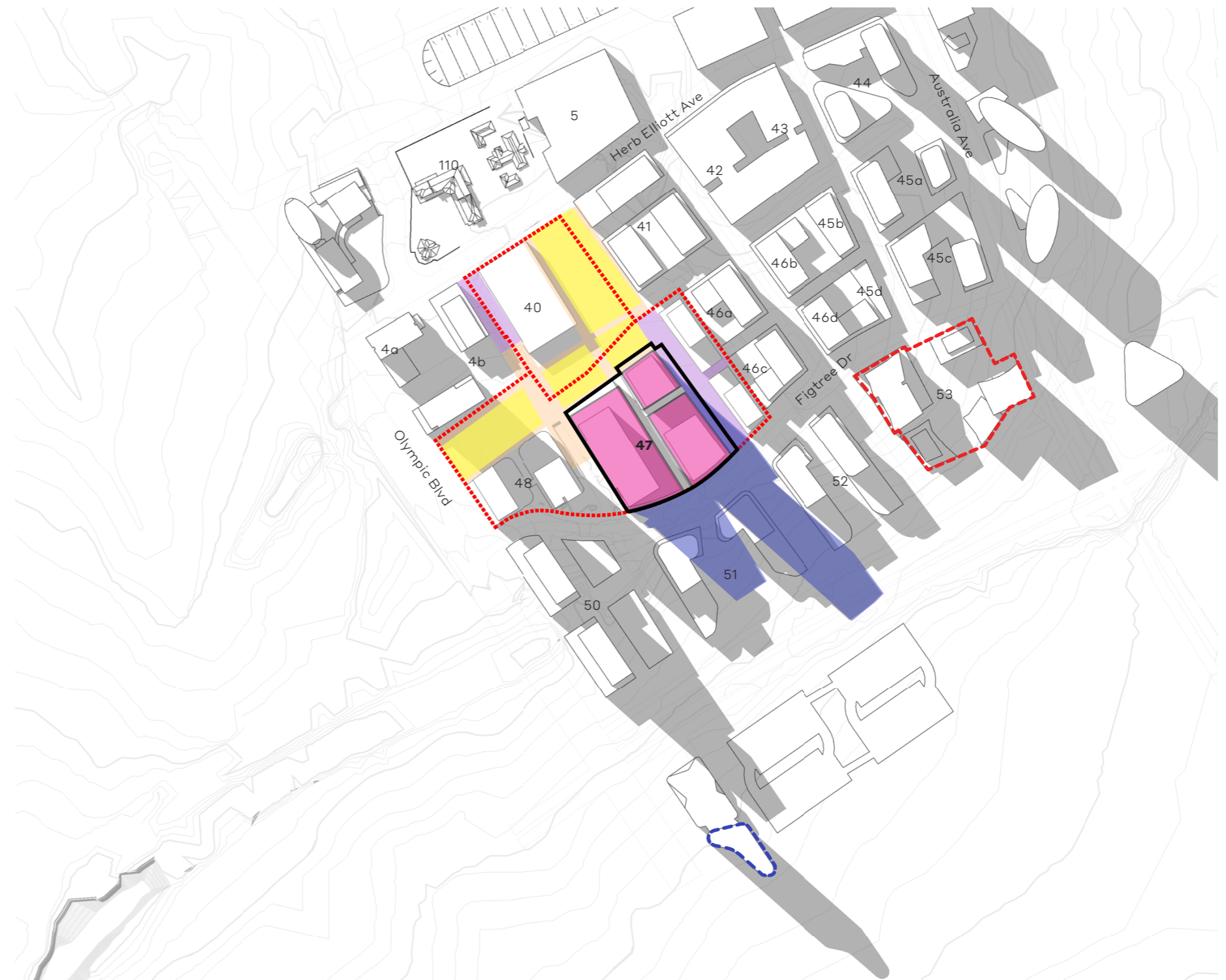
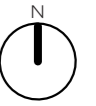
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4.3.5 23 September - 1:00pm



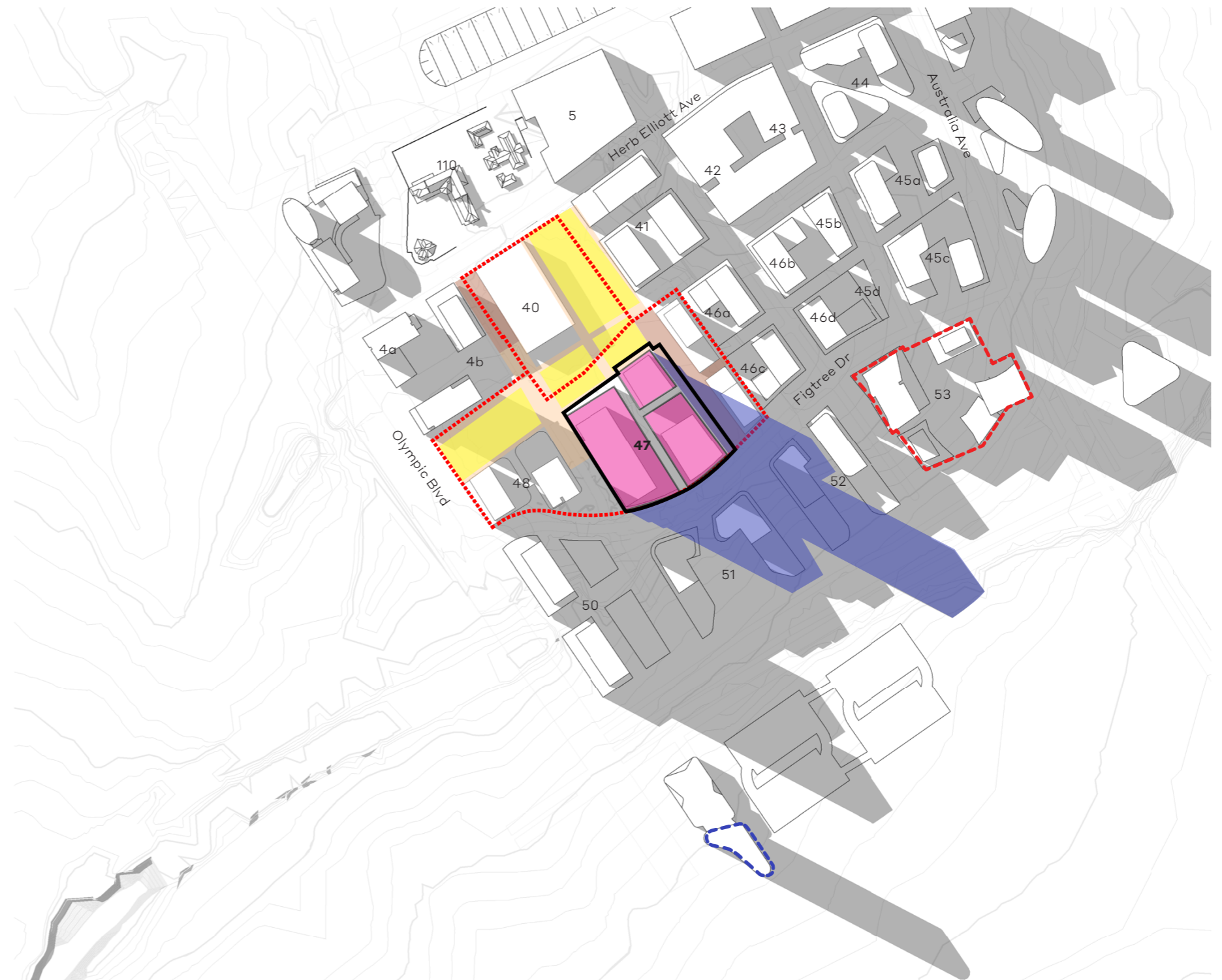
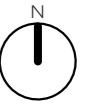
-  - SSD Concept Design
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4.3.6 23 September - 2:00pm



-  - SSD Concept Design
-  - SSD Concept Design Shadow
-  - Public Open Space
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-  - Sydney Metro Site Boundary
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-  - Mirvac Pavillion Apartments
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4.3.7 23 September - 3:00pm



-  - SSD Concept Design
-  - SSD Concept Design Shadow
-  - Public Open Space
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Overshadowing Impact on Surrounding Sites

5.1 Site 50

Methodology & Assumptions:

- This study represents one of many possible building forms compliant with controls under the SEPP (Precincts - Central River City) 2021 and under the SOP Master Plan 2030 (Interim Metro Review) setback and height controls on site 50
- A proof of concept typical floor plan is applied to all levels of the towers on site 50
- All solar analysis shown has been assessed on the 21st June, from 9am - 3pm as per ADG Objective 4A-1 relating to solar access
- The study focus is on the overshadowing impact of the proposed Concept SSD envelopes at Site 47 and does not account for impact from future development on other surrounding sites.

Observation:

- The proposed building envelopes on Site 47 (Figure 5.2) have minimal overshadowing impact on potential development at Site 50, as demonstrated in the analysis and view from sun diagrams (Figure 5.3) on the following page.
- This study is limited to one possible indicative design outcome on Site 50. Figure 5.2 shows that overall, living rooms and private open spaces of approximately 87.5% of units could receive a minimum of 2 hours direct sunlight between 9am and 3pm at 21 June.
- Through design consideration of alternative building form, layout and mix of units, further improvement can be made to meet and exceed ADG solar access objectives.
- Additionally, other surrounding sites are subject to future design excellence and DA assessment, where they would need to demonstrate their response to the precinct context.

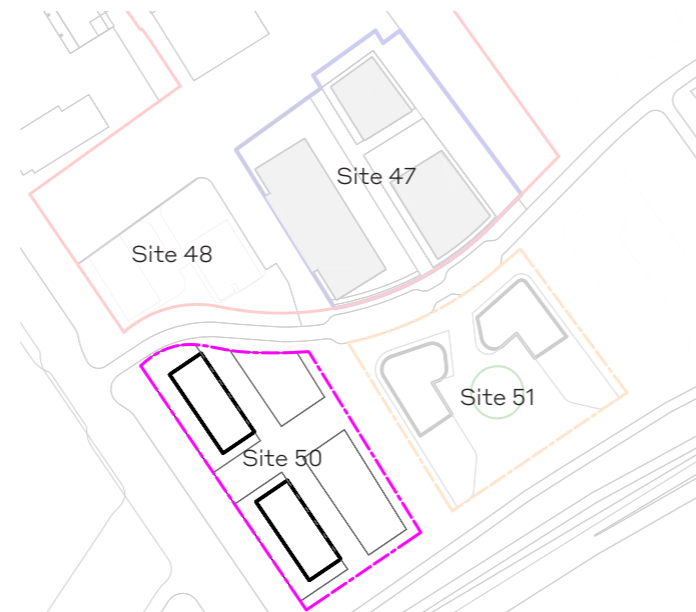
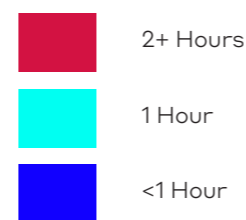


Figure 5.1 - Site 50 Site Plan (Indicative site boundary shown)



Note:

The proof of concept layout adopted for this analysis is limited to solar analysis and is not intended as a full feasibility study that complies with all other ADG requirements.

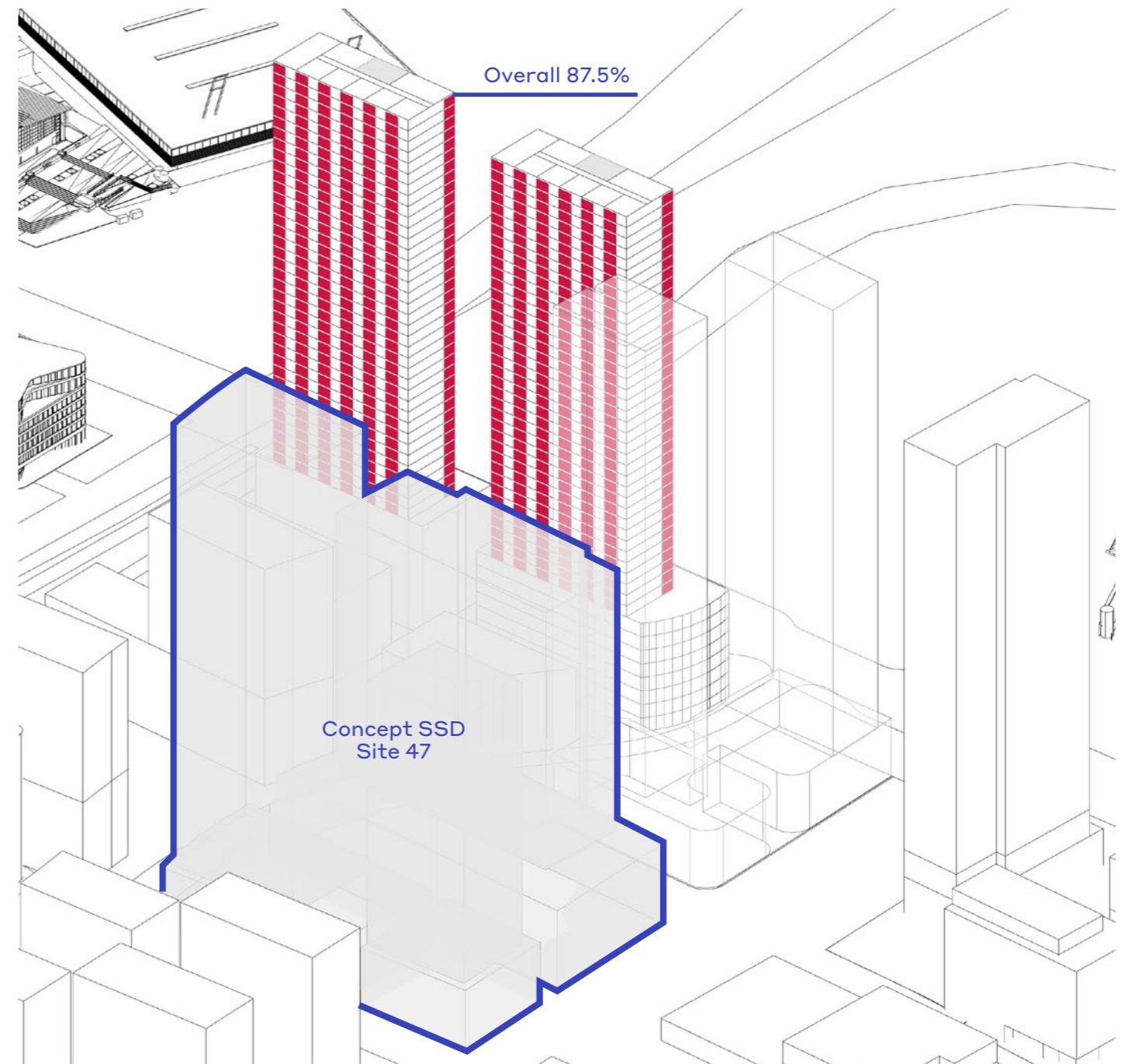


Figure 5.2 - Proposed Site 47 Envelope

5.1.1 Site 50 - View from sun diagram on 21 June, 9am - 3pm (Winter Equinox)

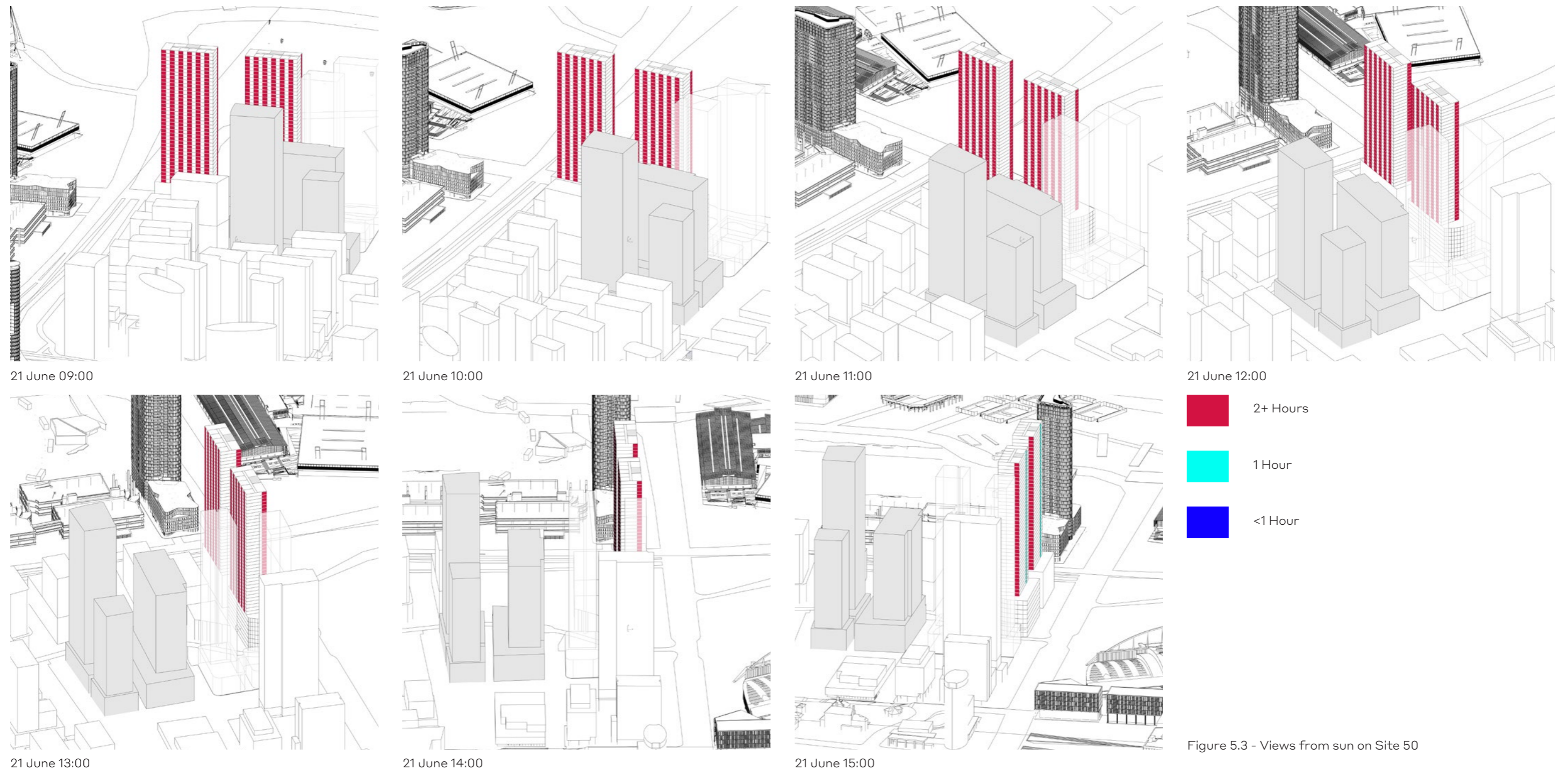


Figure 5.3 - Views from sun on Site 50

5.2 Site 51

Methodology & Assumptions:

- An alternative (non L-shaped) compliant form has been explored on Site 51 for this study. It represents one of many possible building forms compliant with controls under the SEPP (Precincts - Central River City) 2021 and under the SOP Master Plan 2030 (Interim Metro Review) setback and height controls for the site
- The original masterplan intent is maintained with the building form generally following the same orientation and the significant tree in the center retained
- A proof of concept typical floor plan is applied to all levels of the towers on site 51
- All solar analysis shown has been assessed on the 21st June, from 9am - 3pm as per ADG Objective 4A-1 relating to solar access
- The study focus is on the overshadowing impact of the proposed Concept SSD envelopes at Site 47 and does not account for impact from future development on other surrounding sites.

Observation:

- The proposed building envelopes on Site 47 (Figure 5.2) have some overshadowing impact on potential development at Site 51, as demonstrated in the analysis and view from sun diagrams (Figure 5.6) on the following page.
- This study is limited to one possible indicative design outcome on Site 51. Figure 5.5 shows that overall, living rooms and private open spaces of more than 70% of units could receive a minimum of 2 hours direct sunlight between 9am and 3pm at 21 June.
- Through design consideration of alternative building form, layout and mix of units, further improvement can be made to meet and exceed ADG solar access objectives.
- Additionally, other surrounding sites are subject to future design excellence process and DA assessment, where they would need to demonstrate their response to the precinct context.

Note:

The proof of concept layout adopted for this analysis is limited to solar analysis and is not intended as a full feasibility study that complies with all other ADG requirements.



Figure 5.4 - Site Plan (Indicative site boundary shown)

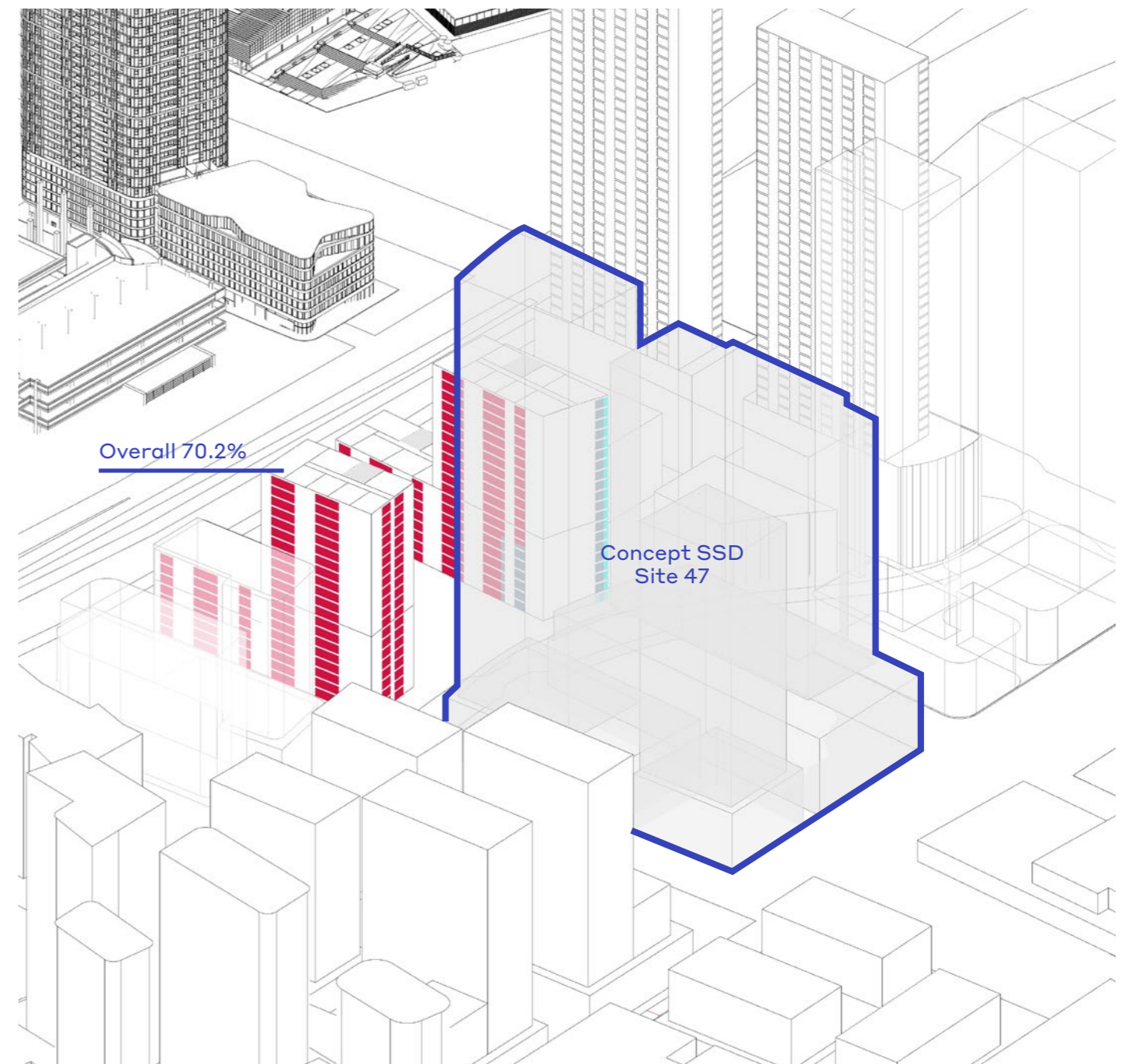


Figure 5.5 - Proposed Site 47 Envelope

5.2.1 Site 51 - View from sun diagram on 21 June, 9am - 3pm (Winter Equinox)

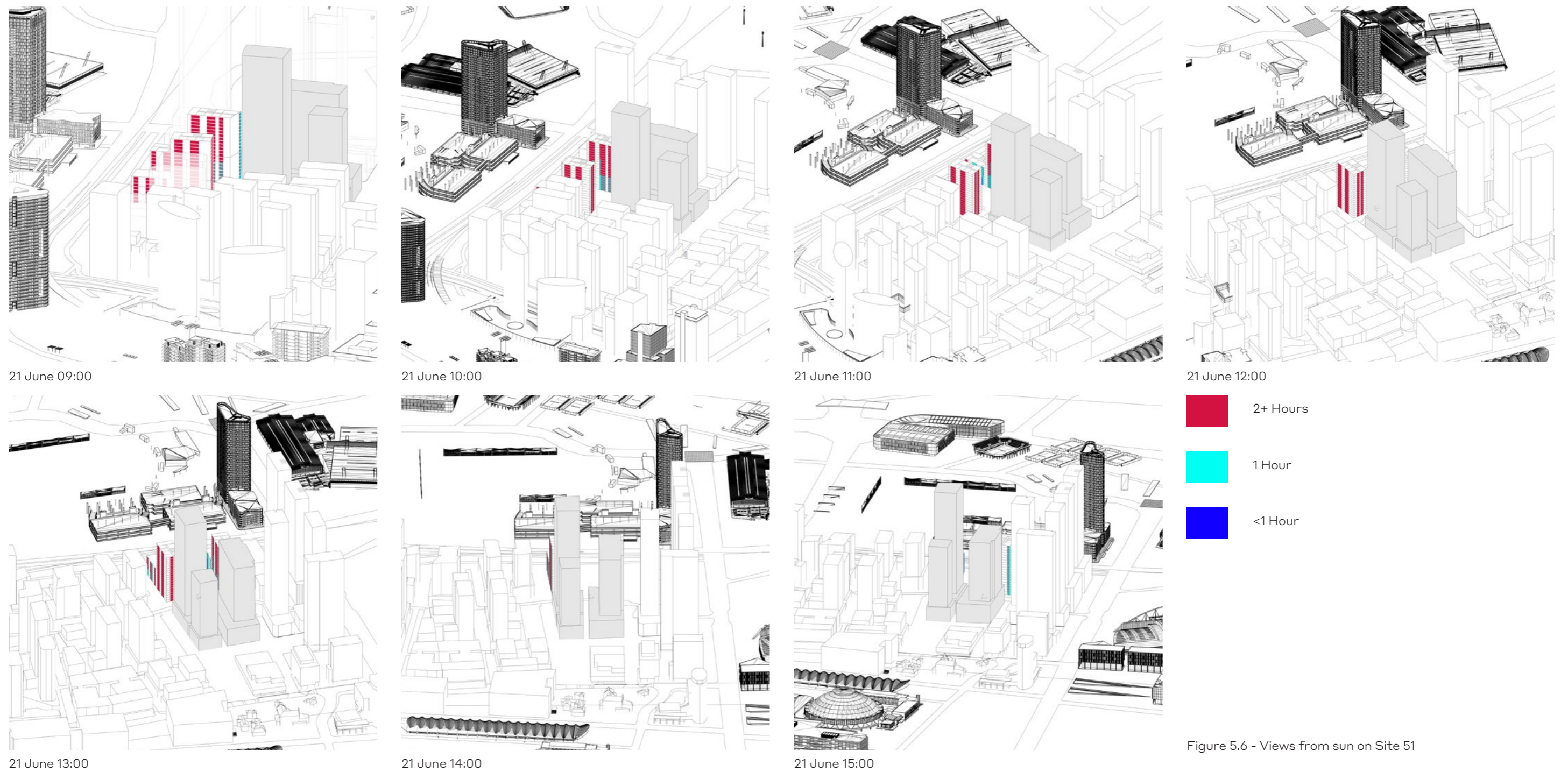


Figure 5.6 - Views from sun on Site 51

Conclusion

This Shadow Impact Analysis undertakes an analysis of the overshadowing impacts of the proposed Concept SSD over-station and adjacent-station envelopes at Site 47 on existing surrounding properties. The analysis also assesses the overshadowing impacts on proposed future surrounding built form shown in the approved Sydney Olympic Park Master Plan 2030 (Interim Metro Review). The proposed OSD and ASD envelopes of 21, 27 and 45 storeys are within the maximum 45 storey height controls.

An additional assessment has been carried out of the overshadowing impact of the proposed OSD and ASD envelopes on potential indicative building envelopes at sites 50 and 51 that are consistent with the height controls in the SEPP (Precincts - Central River City) 2021 and Sydney Olympic Park Master Plan 2030 (Interim Metro Review).

The results focus on the impacts from the proposed envelopes at Site 47 that are the subject of the Concept SSD. The results demonstrate impacts of the OSD and ASD envelopes are compliant with solar access guidelines for both existing properties and the potential future envelopes for the precinct shown in the Master Plan. The results also show that potential indicative compliant building envelopes on sites 50 and 51 could achieve ADG Objective 4A-1 solar access objectives.