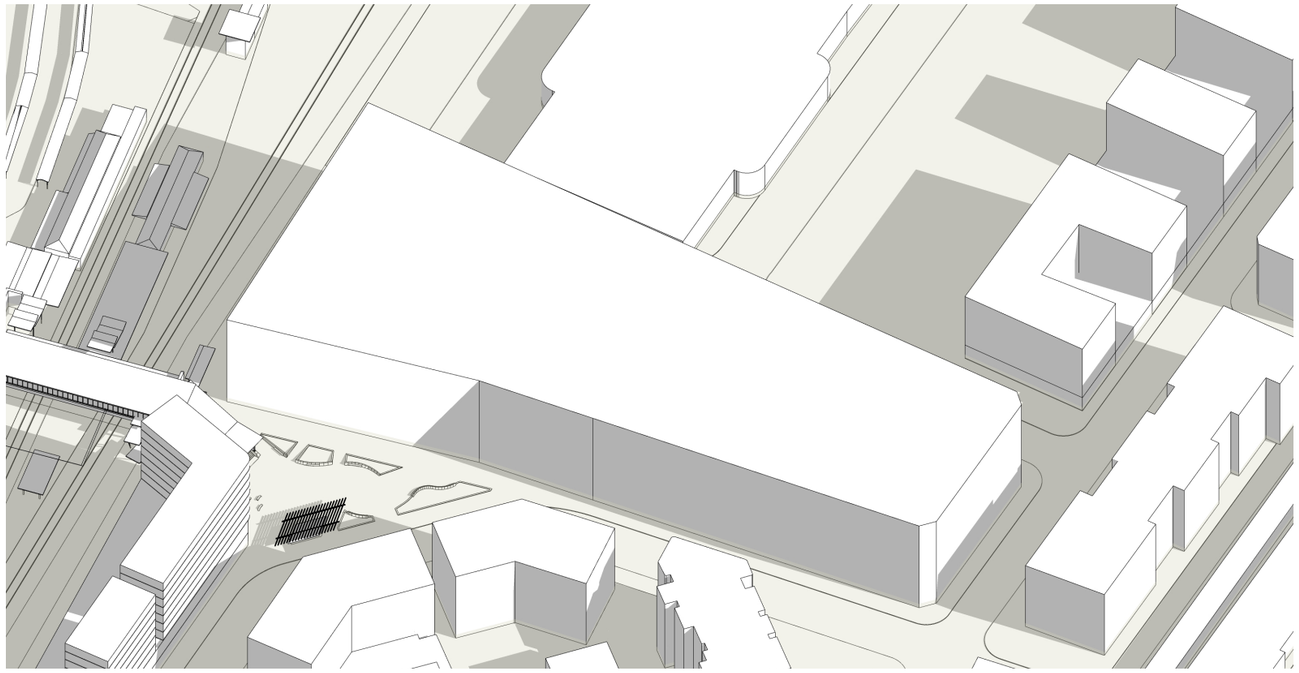
Thornton, Lots 3003,3004, 3005,
Penrith, NSW 2750

Public Square Solar Studies

20.12.23

Client: St Hilliers and First Point Projects

Base Case Model



DA Proposal Model

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Thornton, Penrith NSW 2750
Location & Context

The proposed DA site is located within the heart of Penrith, adjacent to the train station and across from Penrith Town Centre.

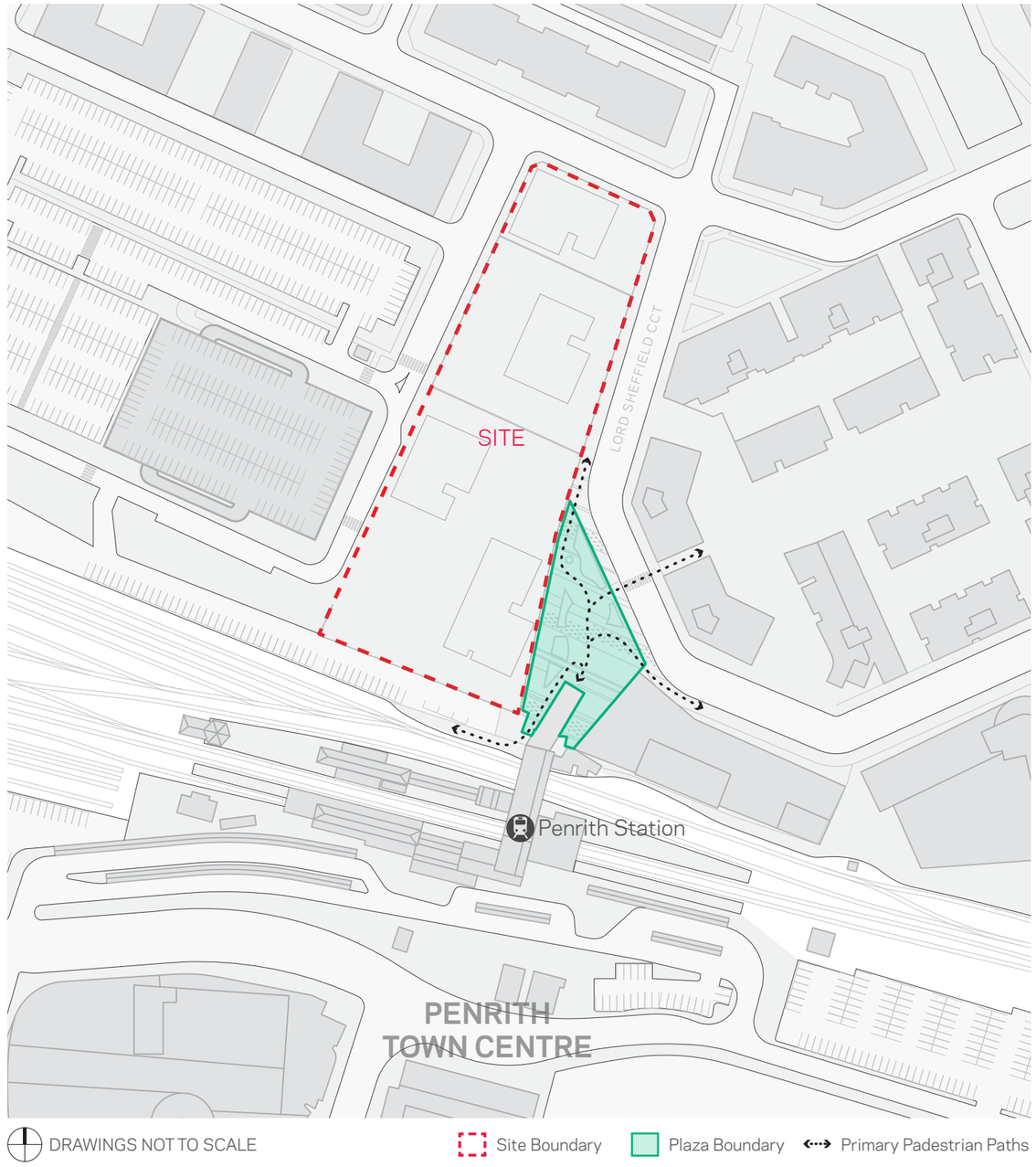
The neighbouring buildings around the site are multi-residential buildings, and a large public commuter carpark located to the west of the site. The site enjoys 180° views to the Blue Mountains to the west, while to the east, it looks over the district with distant views to the Sydney CBD.

Thornton is rapidly developing with several nearby developments completed or under construction.

The Public Plaza

The Public Plaza is located to the east of the subject DA site. Penrith Station is positioned south of the plaza and is subject to high commuter activity during the week. It can be assumed that the plaza is primarily occupied during these peak commuter times, serving as a thoroughfare to and from the station.

Existing infrastructure of the plaza is set around its perimeter, offering public seating as well as a commuter bus stop to the site's north east. Vegetation has been planted across these garden beds, offering a green canopy and shading.



Thornton, Penrith NSW 2750
Methodology

3D Model and Shadow Analysis

The diagrams and data in this report have been developed by using Sketch Up as a primary tool to extract shadow captures across the public plaza adjacent to the Thornton project site. The following points explain the methodology of attaining the diagrams and data to display the impacts of the DA proposal in comparison with the complaint Base Case.

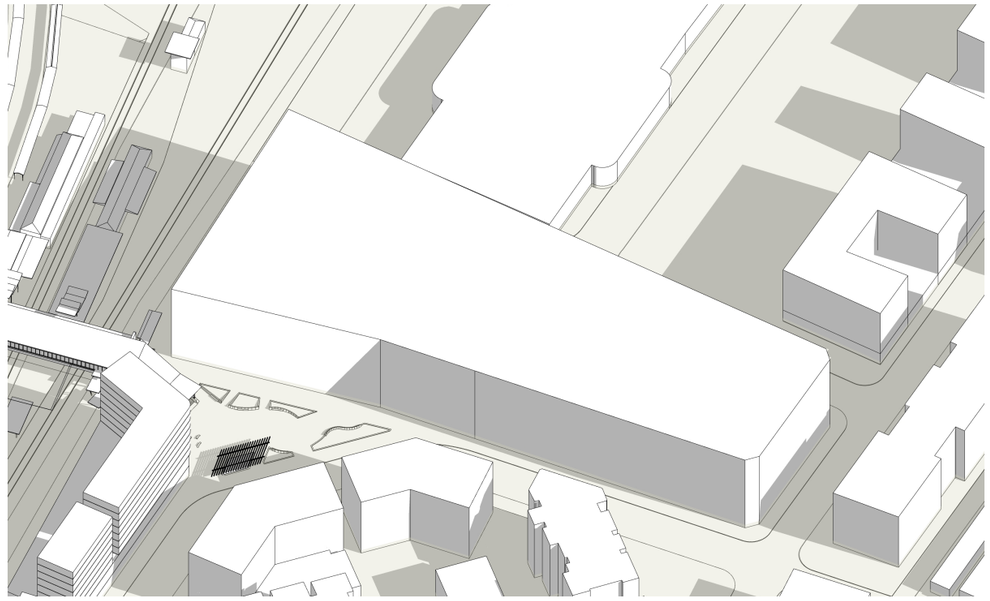
Modeling the Environment
The surrounding context, Base Case and DA Proposal have been 3D modeled and imported into sketch up, with detailed plaza infrastructure also included for analysis.

Setting the Location, Date and Time
The geographic location of the model is established to ensure accurate sun positioning. Dates and times are configured and saved to capture the following dates at an hourly basis from 9am to 3pm:

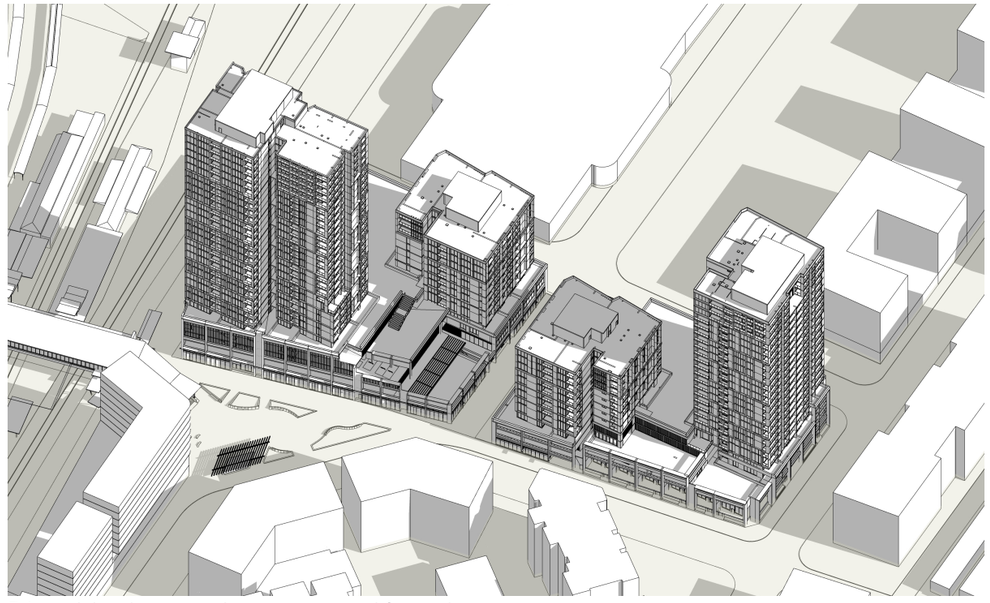
- Winter Solstice (June 21)
- Spring Equinox (September 23)
- Summer Solstice (December 22 AEDT)
- Autumn Equinox (March 21)

Capturing Shadow Information
Using the saved dates and times, individual shadow diagrams are captured for both the Base Case and DA proposal, including captures where only DA1 (southern development) is exclusively built on the site.

Analysing Results and Generating Diagrams
Each option is then analyses across all dates and times, capturing the data for shadows cast and sun access provided (in sqm and %) across the public plaza. The numerical area data is entered into Excel, incorporating formulas to specify the percentage of the total plaza area in shade or sunlight. Diagrams illustratively display this data across the site.



Base Case model with surrounding context used for analysis



DA model with surrounding context used for analysis

Existing Context

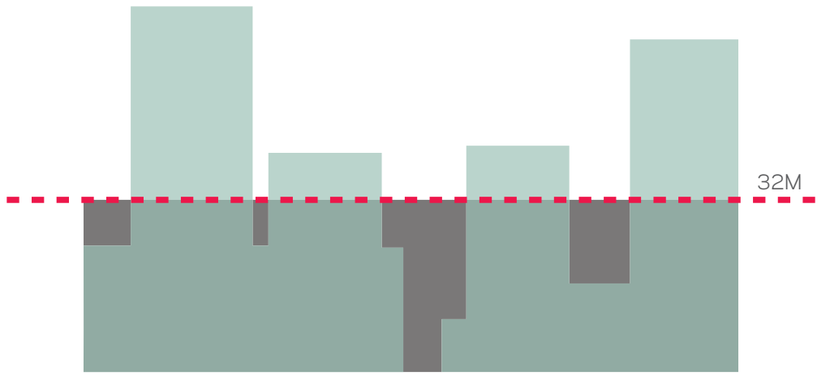
The analysis also considers all the detailed built infrastructure that encompasses the public plaza area. The train station shelter, bus stop shelter, garden beds, and public bench seating have been modeled to provide accurate shadow readings of the plaza once the Base Case and DA Proposal is turned on for testing. Images below display the exiting condition of the site as of 20 November 2023.

32m Delineation

The shadow analysis takes into consideration the stipulated **32m height limit from the Penrith Local Environmental Plan (LEP) 2010**. This has informed the Base Case height. The analysis aims to comply with the following extract from the Penrith LEP found in Section 8.2 Sun Access.

(3) Despite clauses 4.3, 5.6 and 8.4, development consent may not be granted to development on land to which this Part applies if the development would result in overshadowing of public open space to a greater degree than would result from adherence to the controls indicated for the land on the Height of Buildings Map

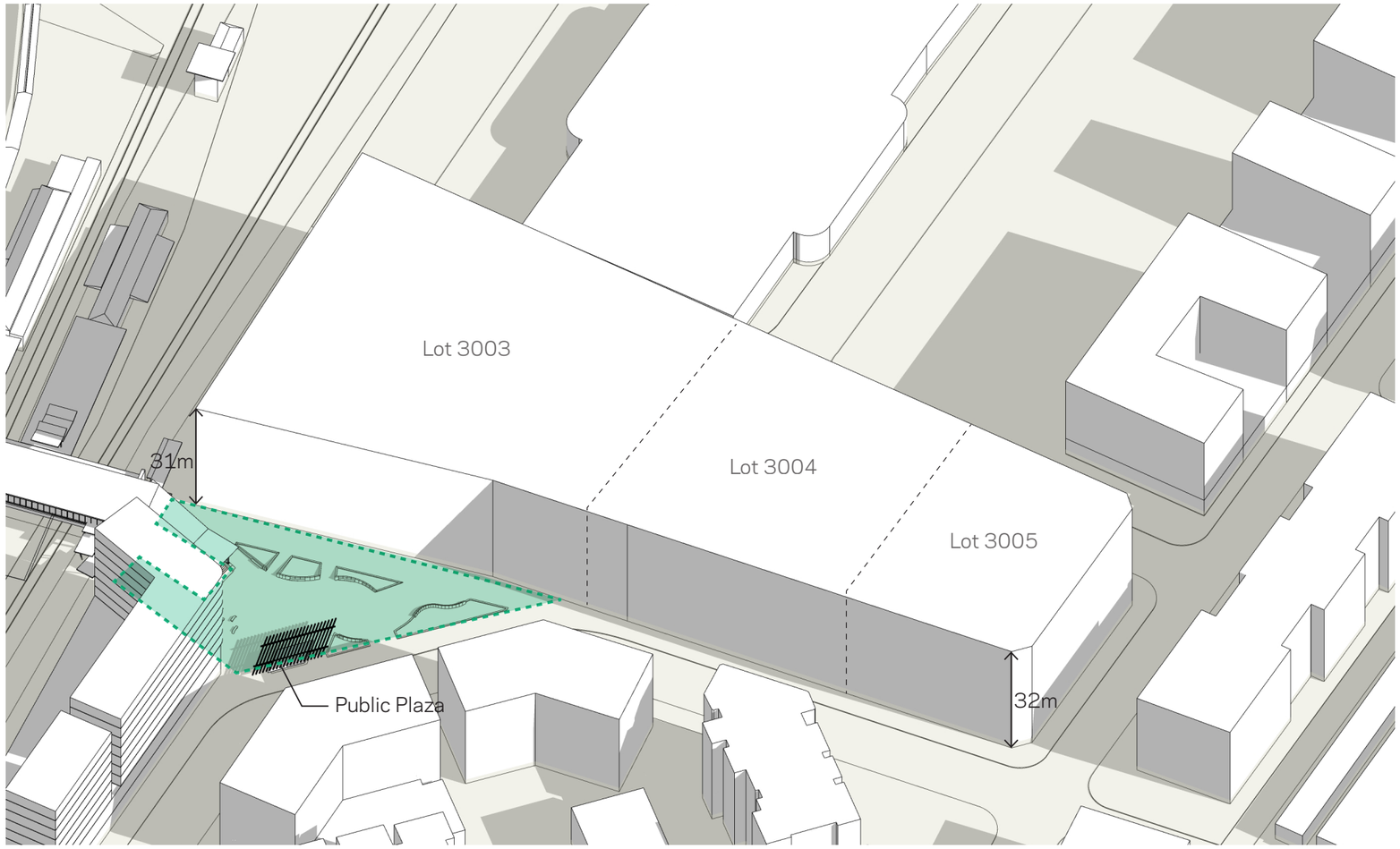
This document's analysis identifies the segments of the DA shadow that are cast both above and below the 32m height plane. It also highlights areas where additional shadow, beyond the base case, is present and where additional sunlight access is provided.



Indicative Base Case and DA proposal overlay. Not to scale.

Thornton, Penrith NSW 2750
Base Case

The base case has been modeled according to the Penrith LEP controls which provides a height limit of 32m across the site. The Base Case is modelled at 32m across both the DA 01 and DA 02 sites, at the maximum development allowance.



Thornton, Penrith NSW 2750
DA Proposal

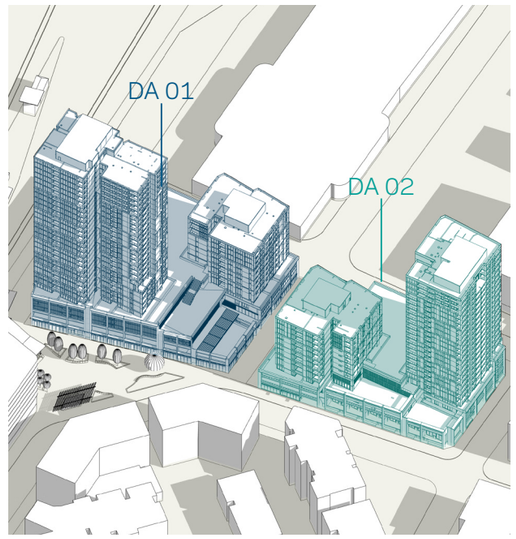
The Proposal is for a mixed use building at Thornton over Lots 3003, 3004 and 3005. Two (2) Development Applications for a single development , constructed in stages according to the DA 01 and DA 02.

The Development includes:

- A single basement with its sole entry within DA 01 being the first stage.
- DA 01 includes a podium up 5 storeys and Towers A (32 storeys) and Tower B (13 storeys) with 316 dwellings,
- DA 02 includes a podium up 5 storeys and Towers A (26 storeys) and Tower B (13 storeys) with 237 dwellings,
- Retail uses and activation of the Ground Floor Public square and street frontages,
- Commercial and Community Infrastructure to podium frontages sleeving carparking.

The development allows for high density accommodation adjacent to the Thornton station as a major transport node for the City of Penrith The proposal activates Railway Square with retail and amenity, with a through site link connected to commuter parking stations west of the site.

This solar study provides aggregate values for the first stage (DA 01) and completed stage (DA 01 + DA 02) of the development.



1

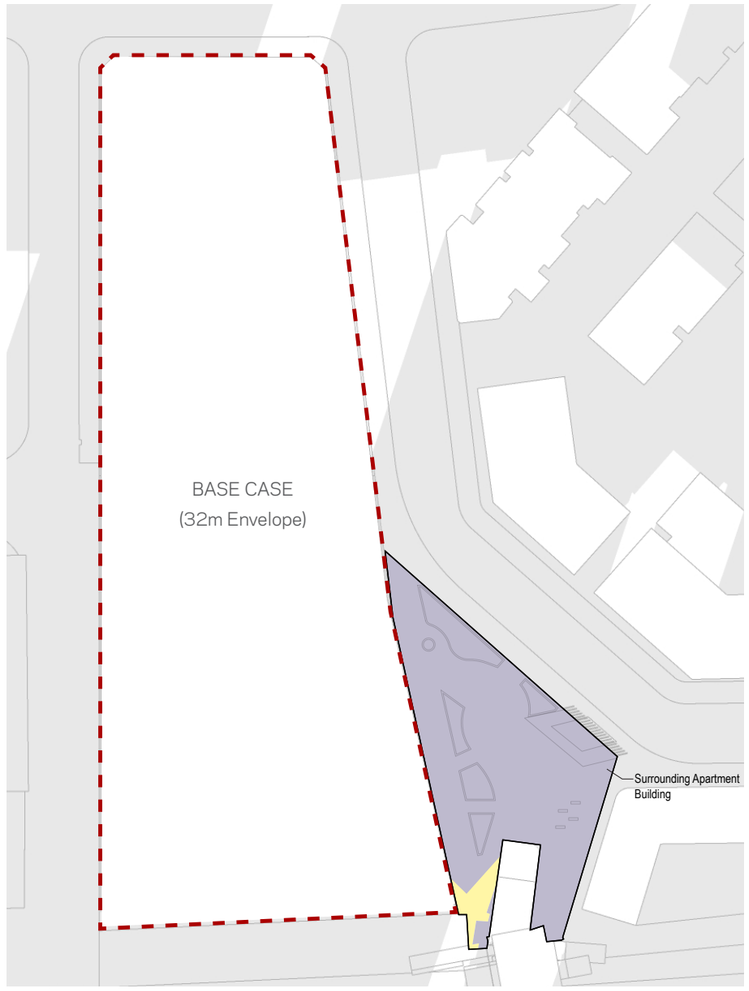
Solar Analysis

Winter Solstice (June 21)

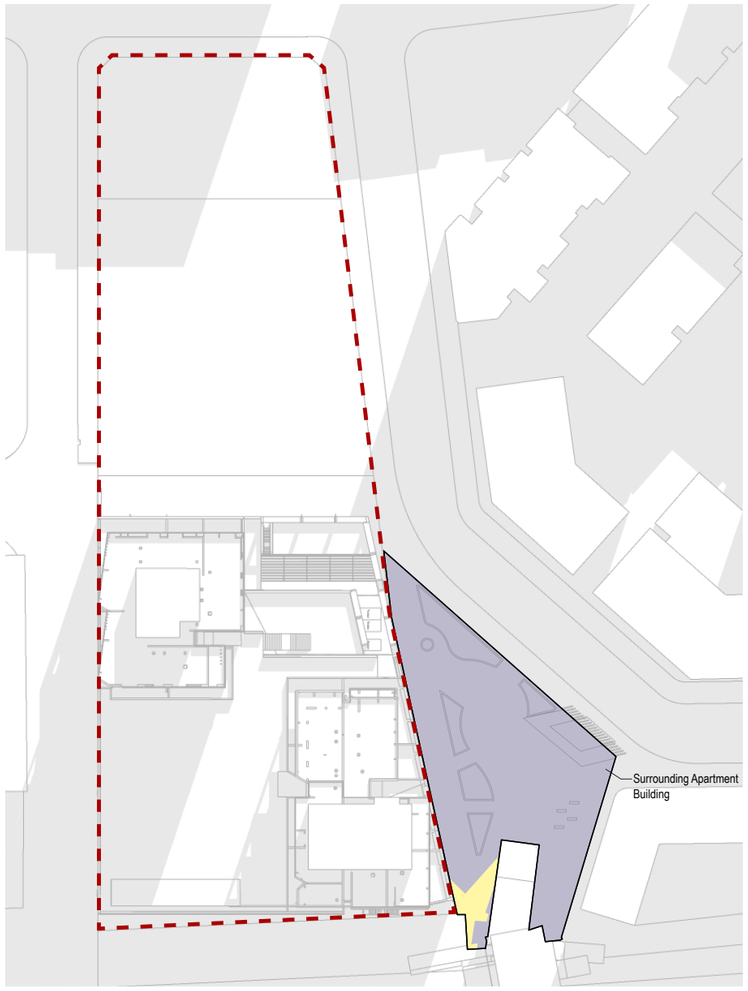
Thornton, Penrith NSW 2750

9AM Shadow Comparison: Winter Solstice (Jun. 21)

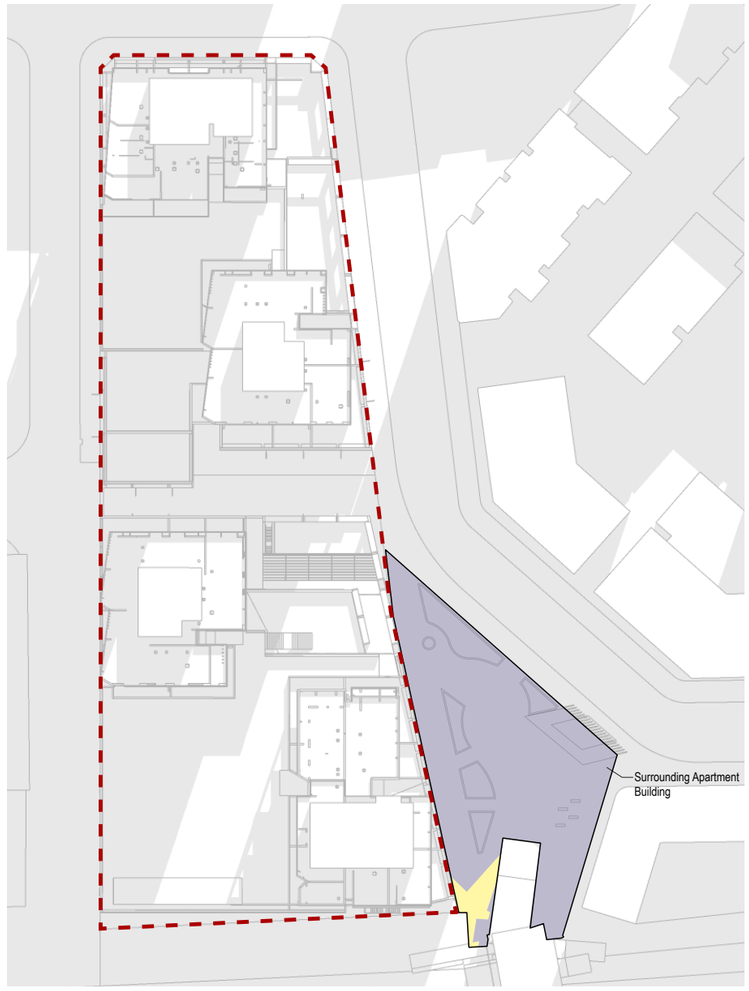
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 3.91% of sun on the area of public square

DA PROPOSAL — 3.91% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	1870	0	0	0	0	0	0	0
Shadow (%)	96.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		76	76		76			
Sun (%)		3.91%	3.91%		3.91%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 9am in Winter.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 3.91% as a result.

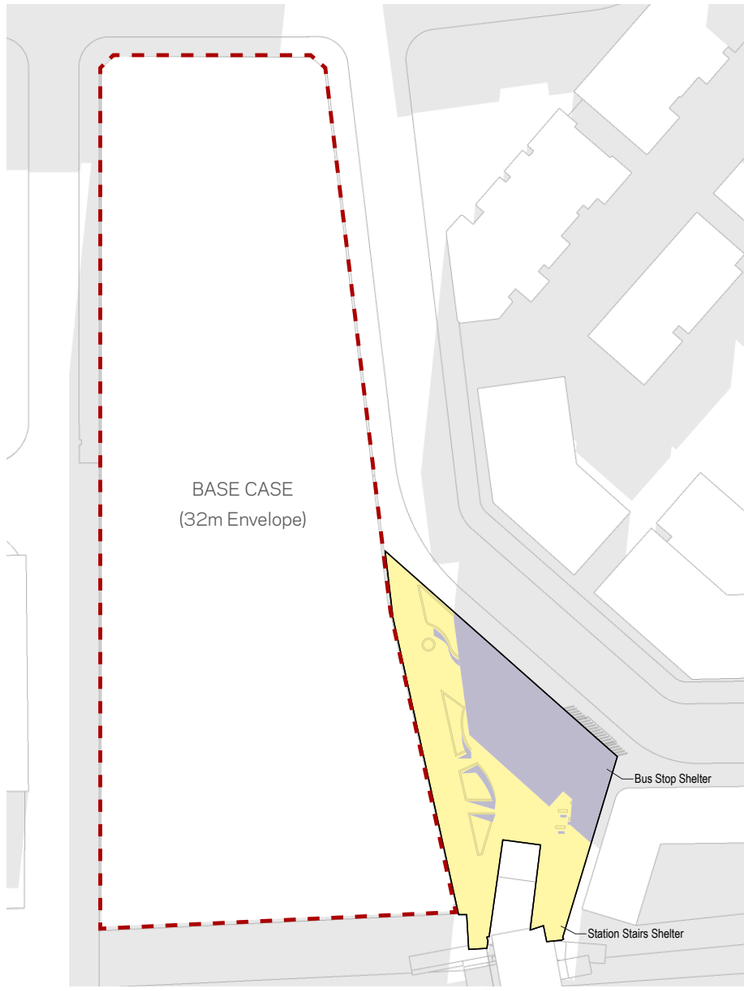
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

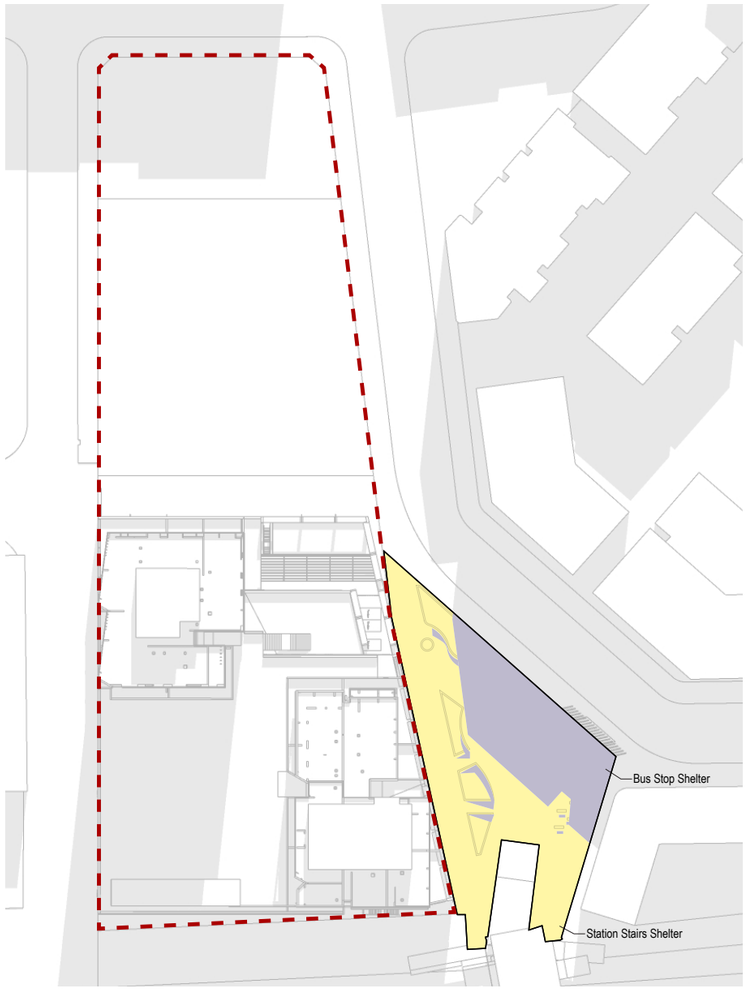
Thornton, Penrith NSW 2750

10AM Shadow Comparison: Winter Solstice (Jun. 21)

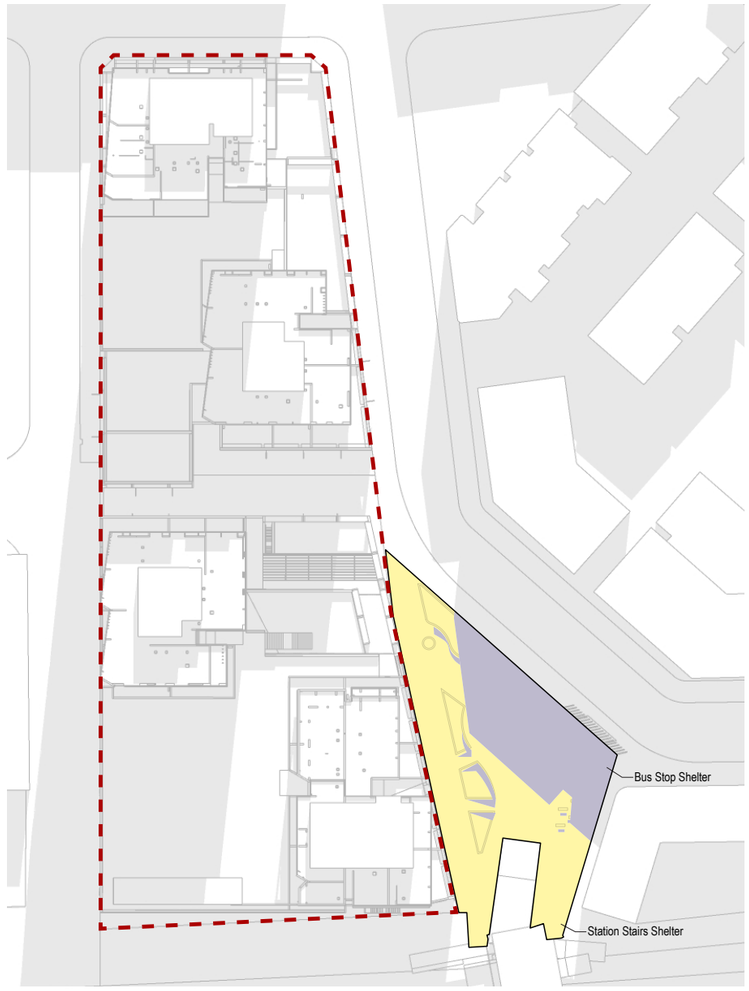
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 62.74% of sun on the area of public square

DA PROPOSAL — 62.74% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	726	0	0	0	0	0	0	0
Shadow (%)	37.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1221	1221		1221			
Sun (%)		62.74%	62.74%		62.74%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 10am in Winter.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 62.74% as a result.

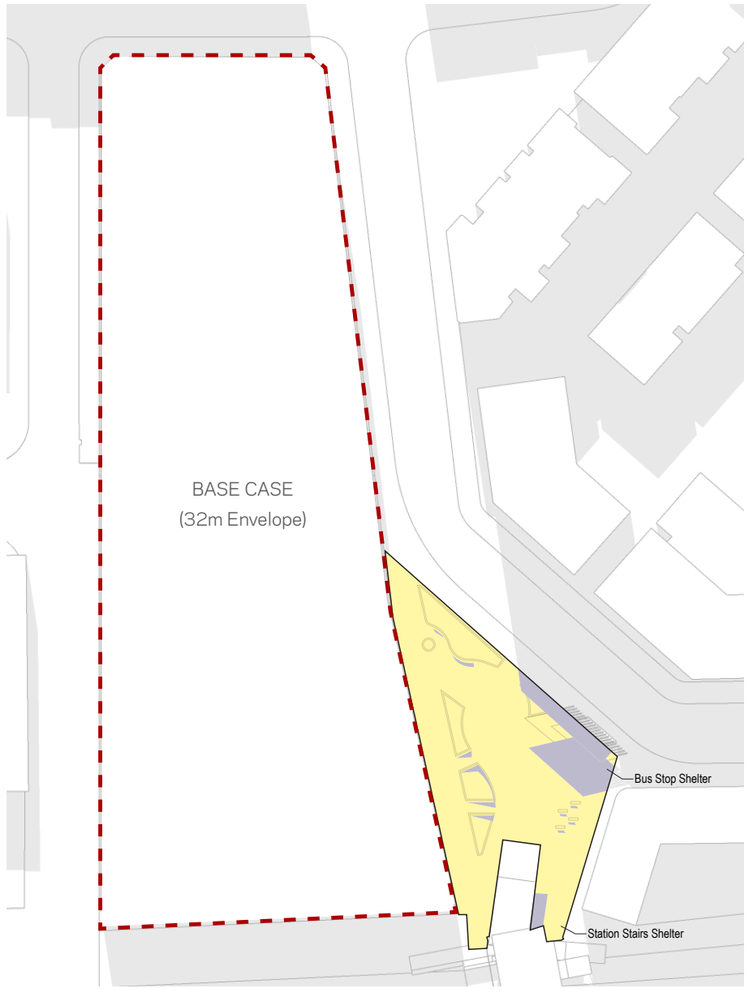
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

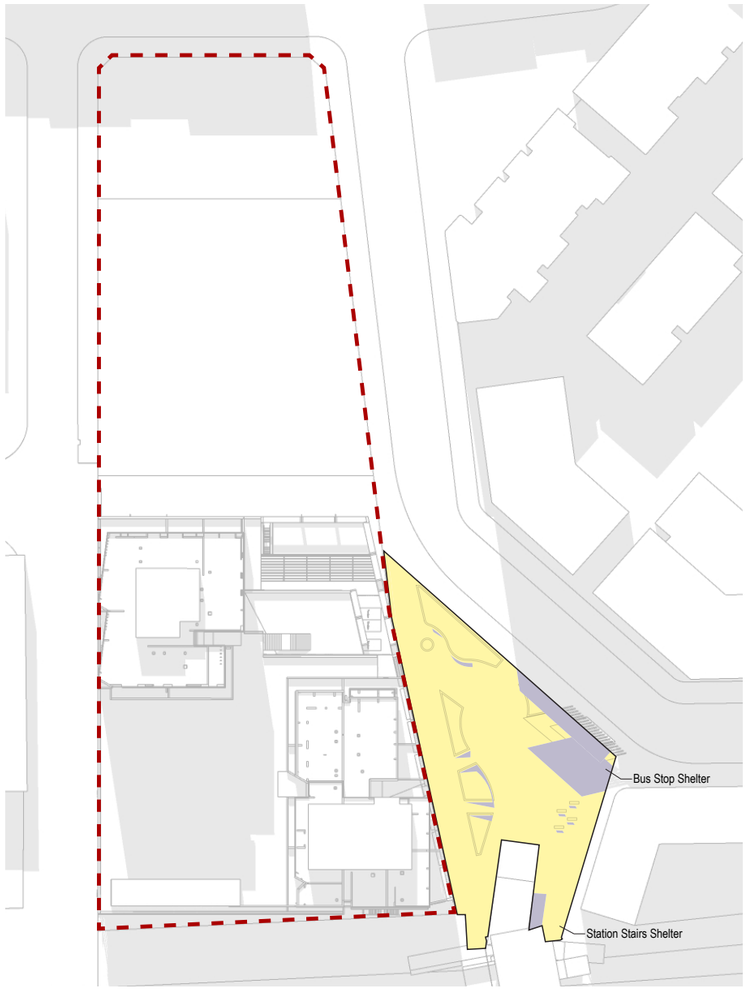
Thornton, Penrith NSW 2750

11AM Shadow Comparison: Winter Solstice (Jun. 21)

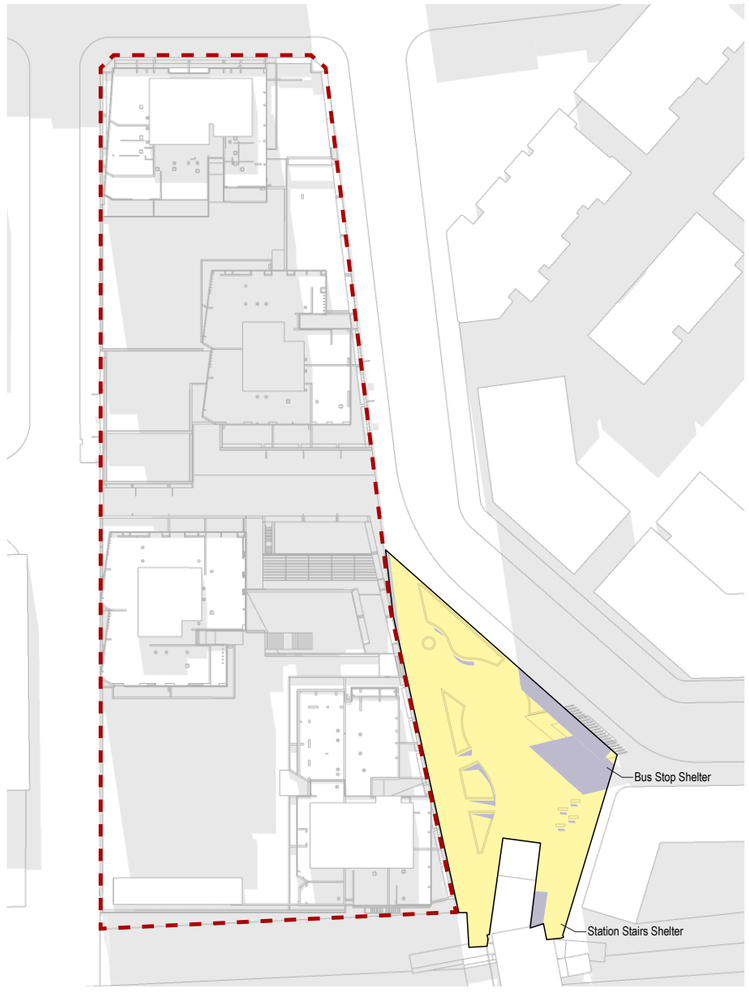
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 86.95% of sun on the area of public square

DA PROPOSAL — 87.62% of sun on the area of public square

- Only the **Base Case** overshadows the plaza at 11am during Winter.
- **DA1 + DA2** offer 0.67% more solar access than the Base Case.

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	238	16	0	0	0	0	0	0
Shadow (%)	12.23%	0.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1692	1705		1705			
Sun (%)		86.95%	87.62%		87.62%			

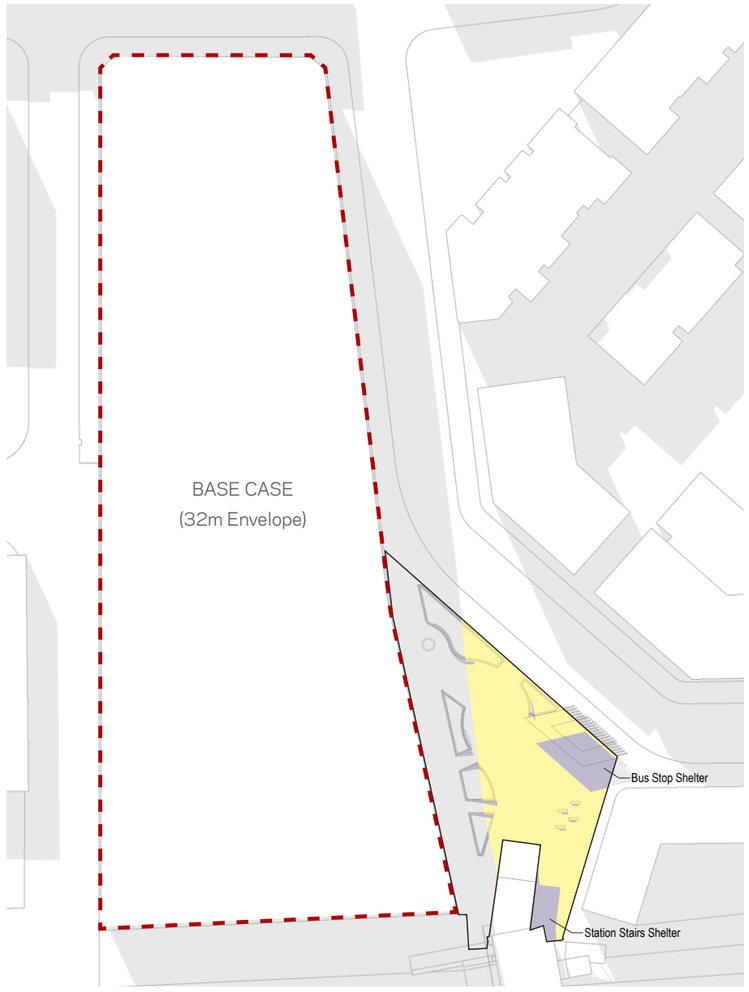
KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

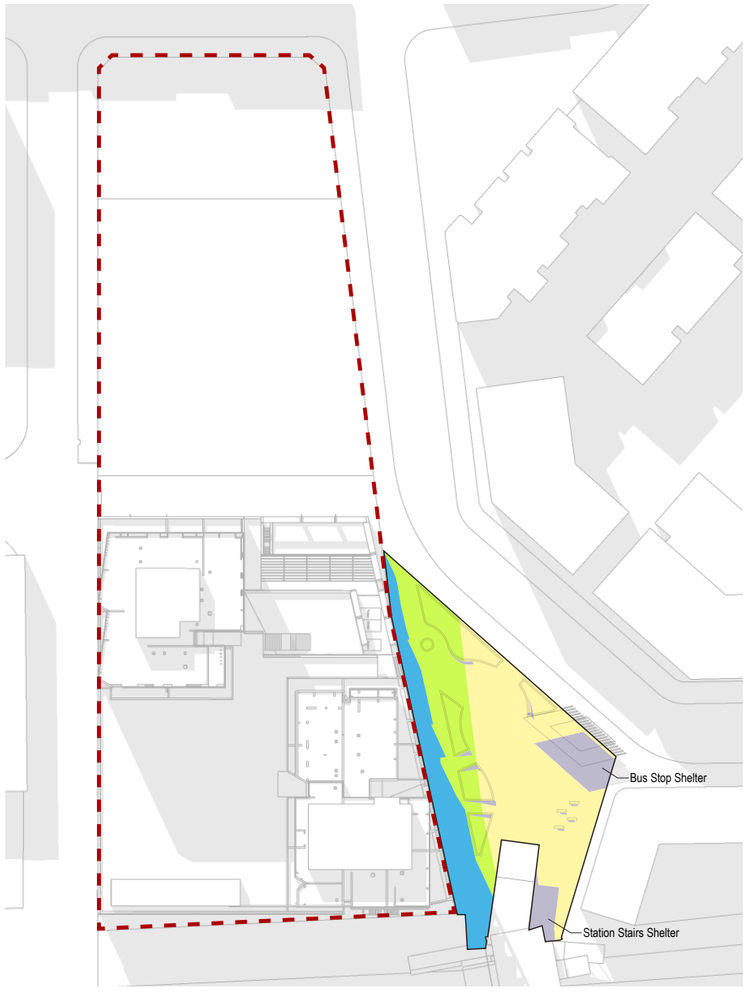
Thornton, Penrith NSW 2750

12PM Shadow Comparison: Winter Solstice (Jun. 21)

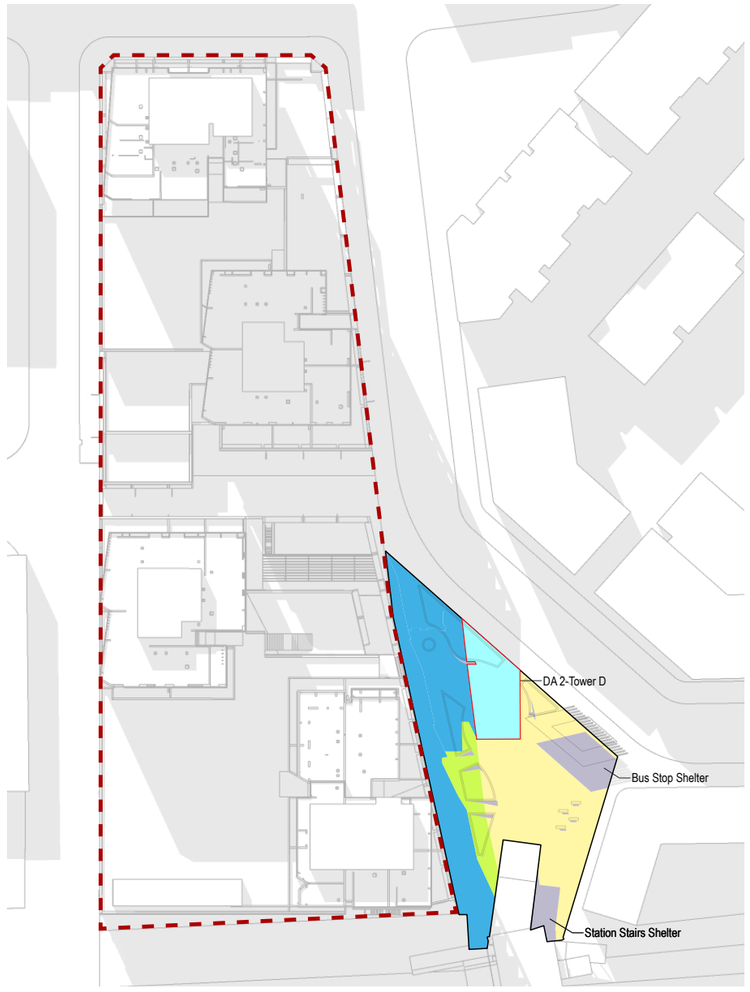
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 46.66% of sun on the area of public square

DA PROPOSAL — 43.37% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	186	852	374	0	374	0	91	451
Shadow (%)	9.56%	43.78%	19.22%	0.00%	19.22%	0.00%	4.68%	23.18%
Sun (sqm)		908	1386		844			
Sun (%)		46.66%	71.22%		43.37%			

- DA1 as a standalone development offers 24.56% more solar access than the Base Case.
- DA1 + DA2 provides 3.29% less solar access than the Base Case.
- Additional overshadowing is caused by DA2 at this time.

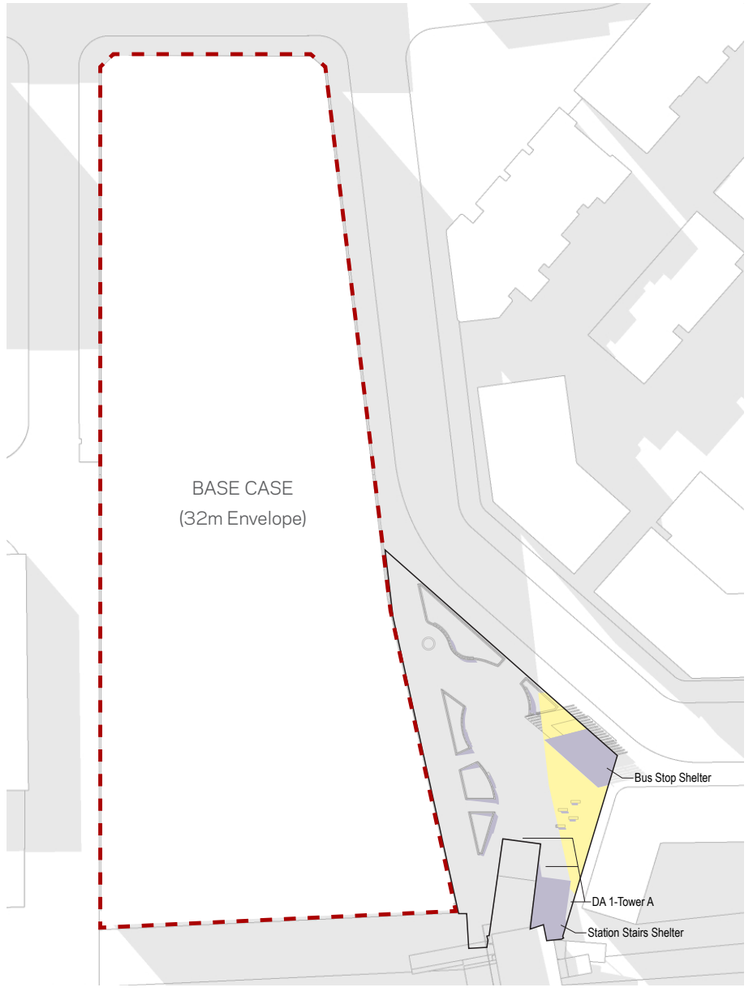
KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

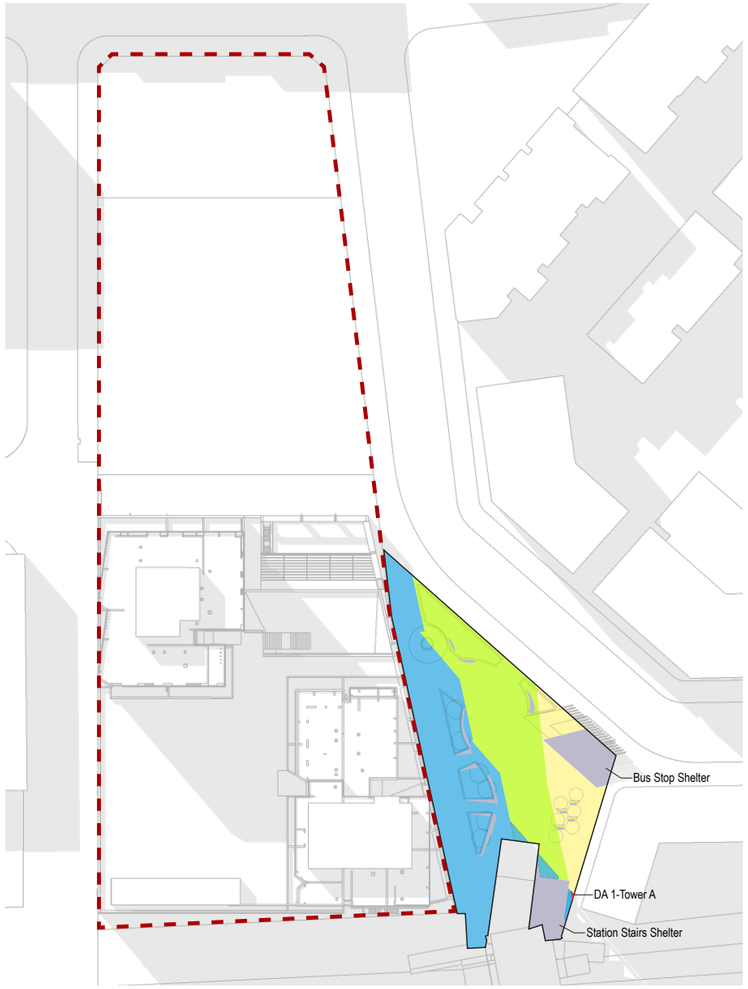
Thornton, Penrith NSW 2750

1PM Shadow Comparison: Winter Solstice (Jun. 21)

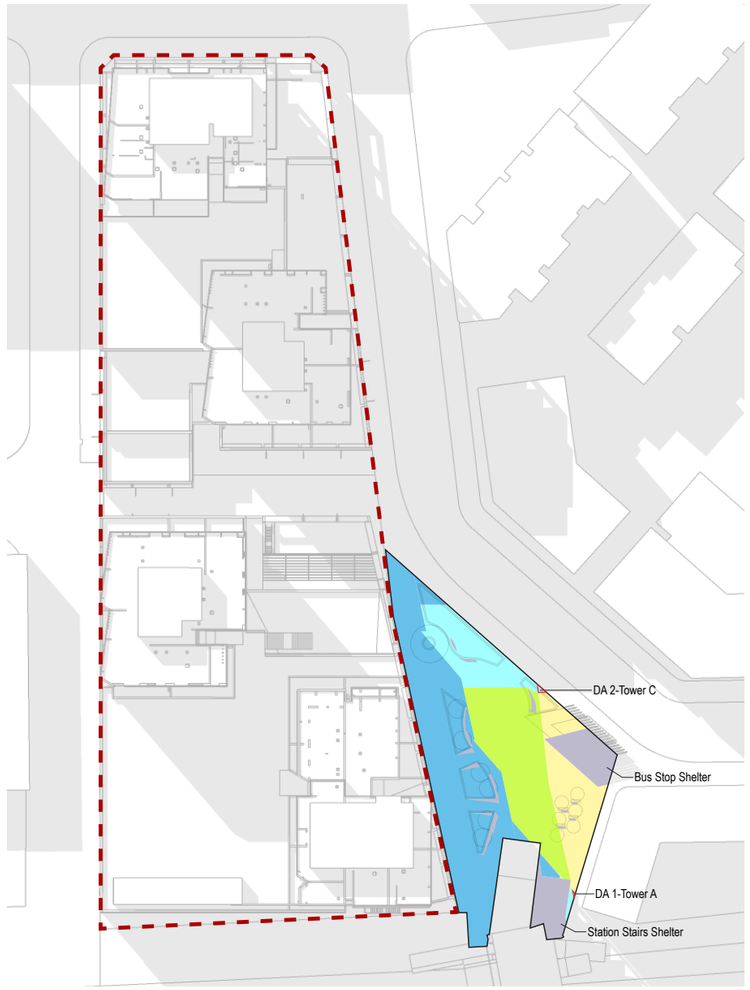
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 12.90% of sun on the area of public square

DA PROPOSAL — 37.05% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	221	1474	766	6	766	6	18	215
Shadow (%)	11.36%	75.75%	39.36%	0.31%	39.36%	0.31%	0.92%	11.05%
Sun (sqm)		251	953		721			
Sun (%)		12.90%	48.97%		37.05%			

- DA1 as a standalone development offers 24.15% more solar access than the Base Case.
- The development of DA 1 primarily affects the garden beds but enhances solar access to the open plaza.
- DA1 + DA2 offer 21.33% more solar access than the Base Case.
- DA1 + DA2 causes additional shadow only on the plaza's perimeter, where public activity is infrequent.

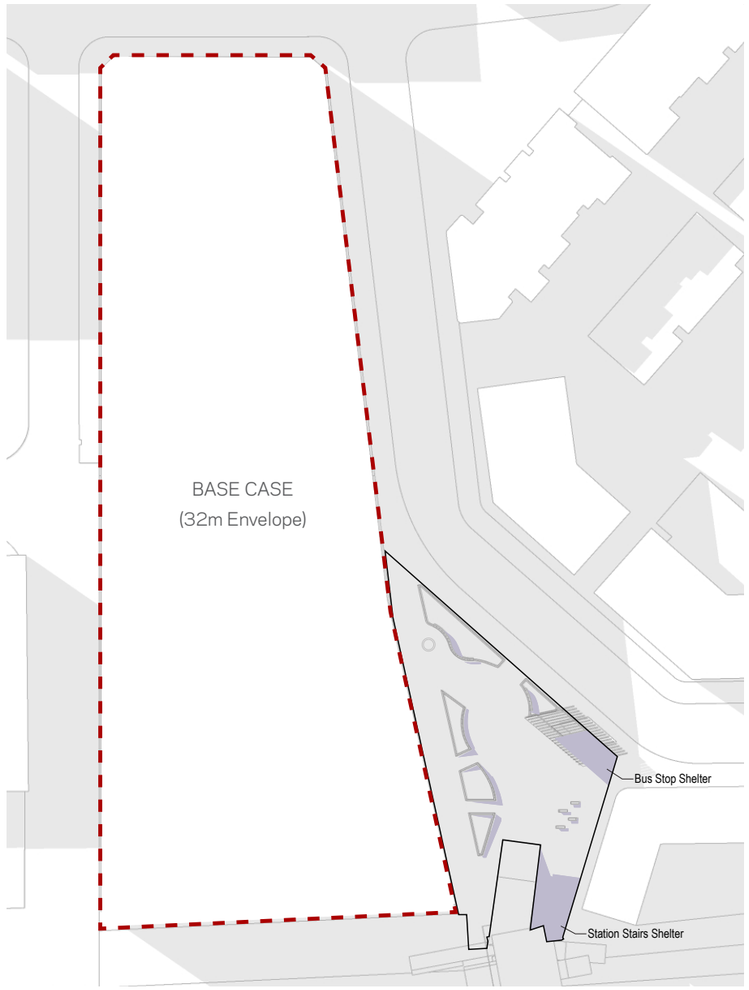
KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

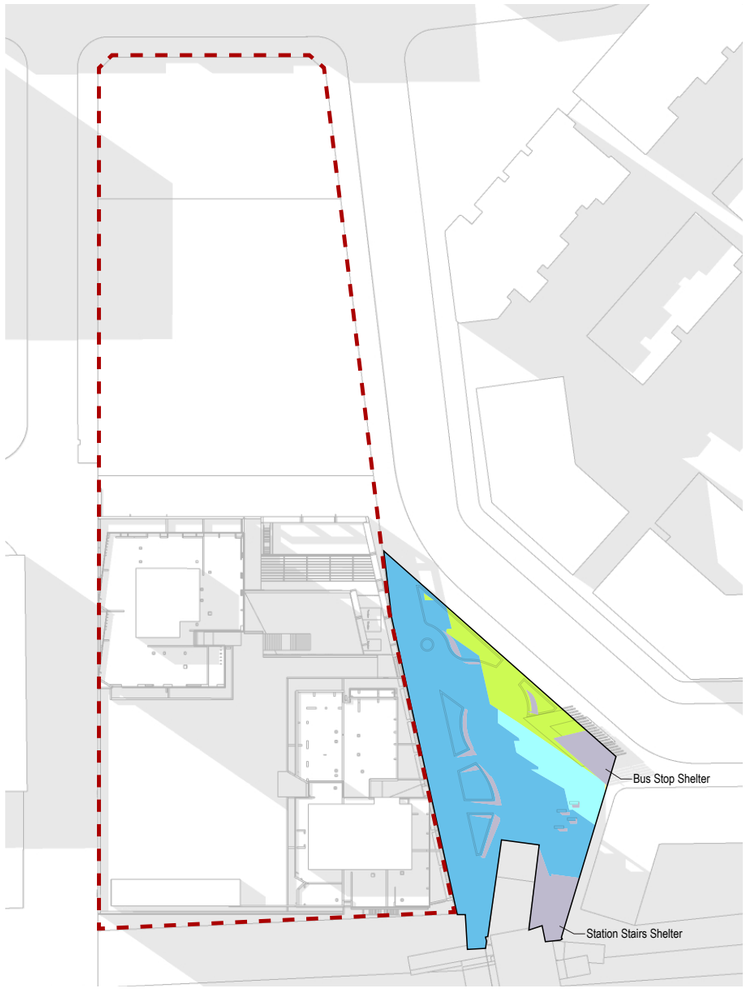
Thornton, Penrith NSW 2750

2PM Shadow Comparison: Winter Solstice (Jun. 21)

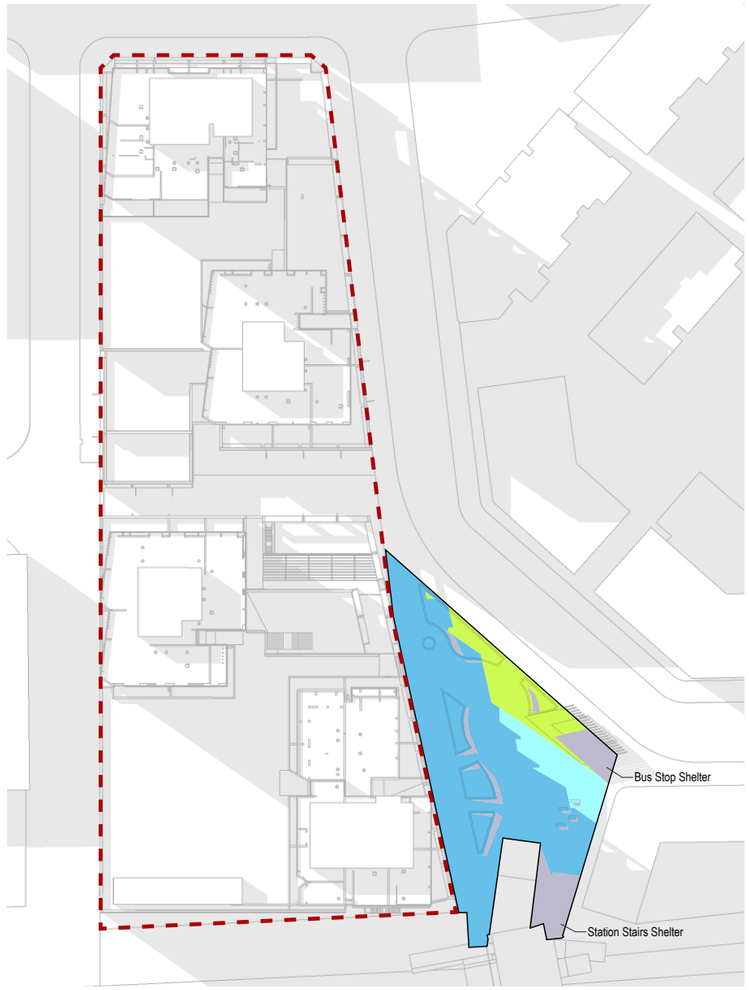
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 0.00% of sun on the area of public square

DA PROPOSAL — 12.08% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	228	1718	1318	165	1318	165	0	0
Shadow (%)	11.72%	88.28%	67.73%	8.48%	67.73%	8.48%	0.00%	0.00%
Sun (sqm)		0	235		235			
Sun (%)		0.00%	12.08%		12.08%			

- The **Base Case** provides no sun access at this time.
- **DA1** as a standalone development offers 12.08% more solar access than the Base Case.
- **DA 2** does not cast shadows onto the public square at this time.
- Greater solar access is provided at the north-eastern boundary of the site where residents often enter the plaza from.

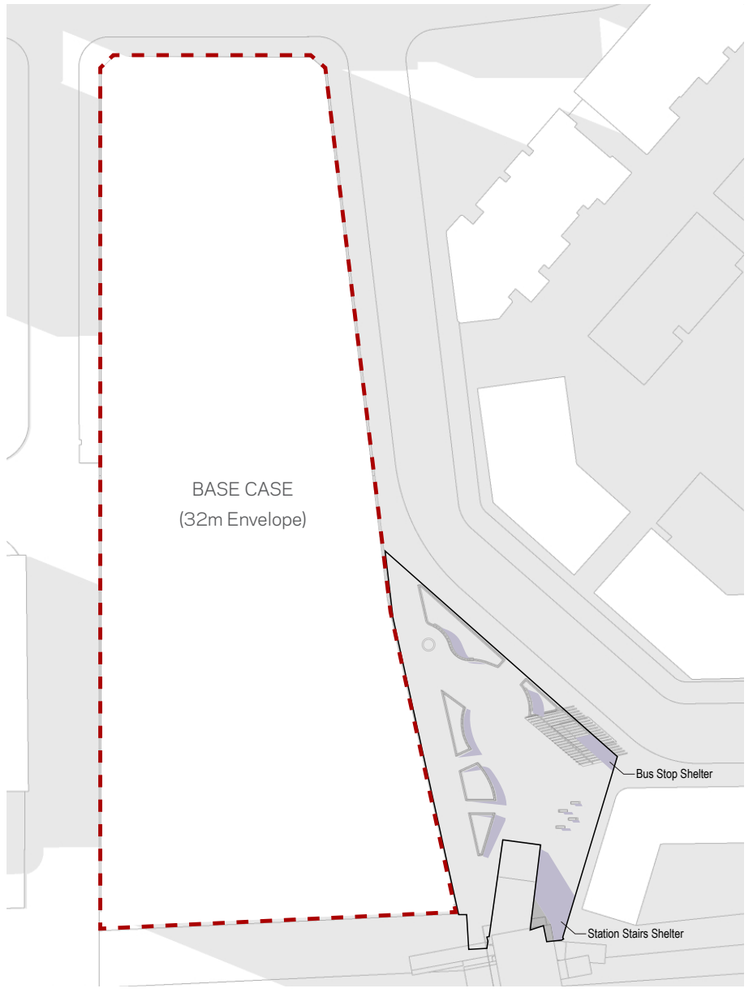
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

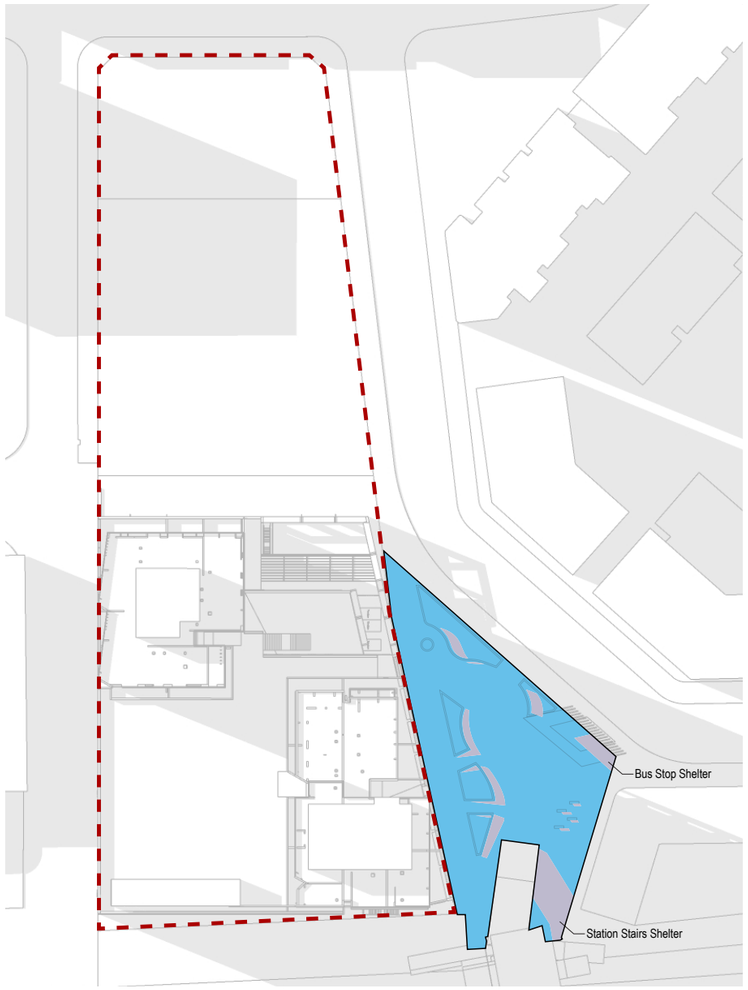
Thornton, Penrith NSW 2750

3PM Shadow Comparison: Winter Solstice (Jun. 21)

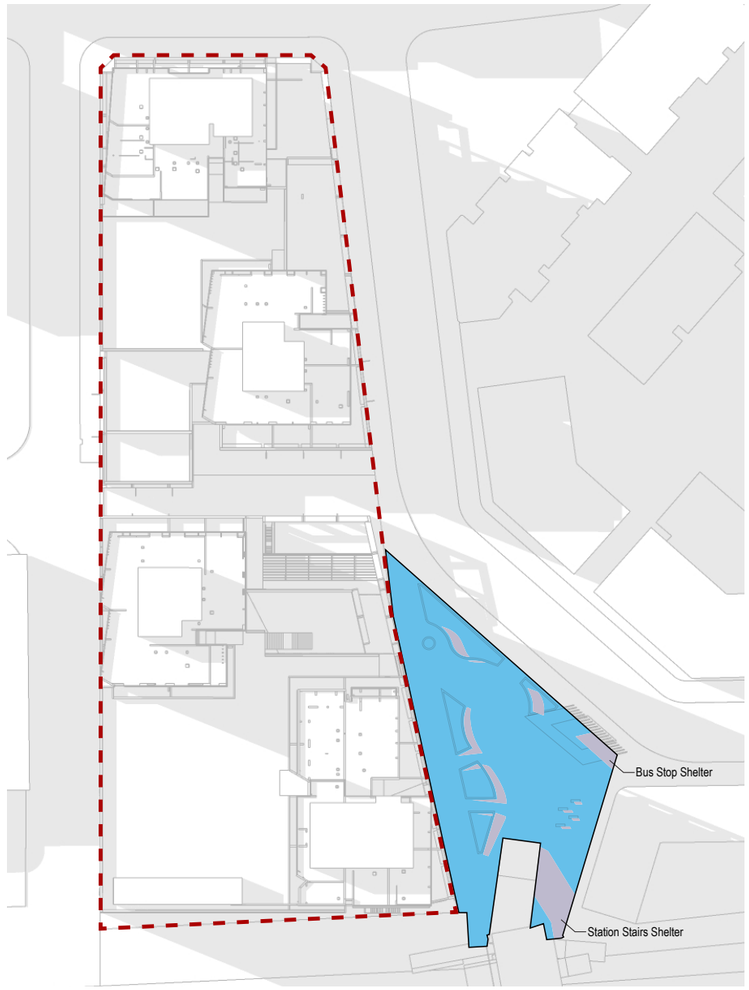
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 0.00% of sun on the area of public square

DA PROPOSAL — 0.00% of sun on the area of public square

- Both the **DA Proposal** and **Base Case** overshadow the plaza area at 3pm during Winter.

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	196	1750	1750	0	1750	0	0	0
Shadow (%)	10.07%	89.93%	89.93%	0.00%	89.93%	0.00%	0.00%	0.00%
Sun (sqm)		0	0		0			
Sun (%)		0.00%	0.00%		0.00%			

KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

2

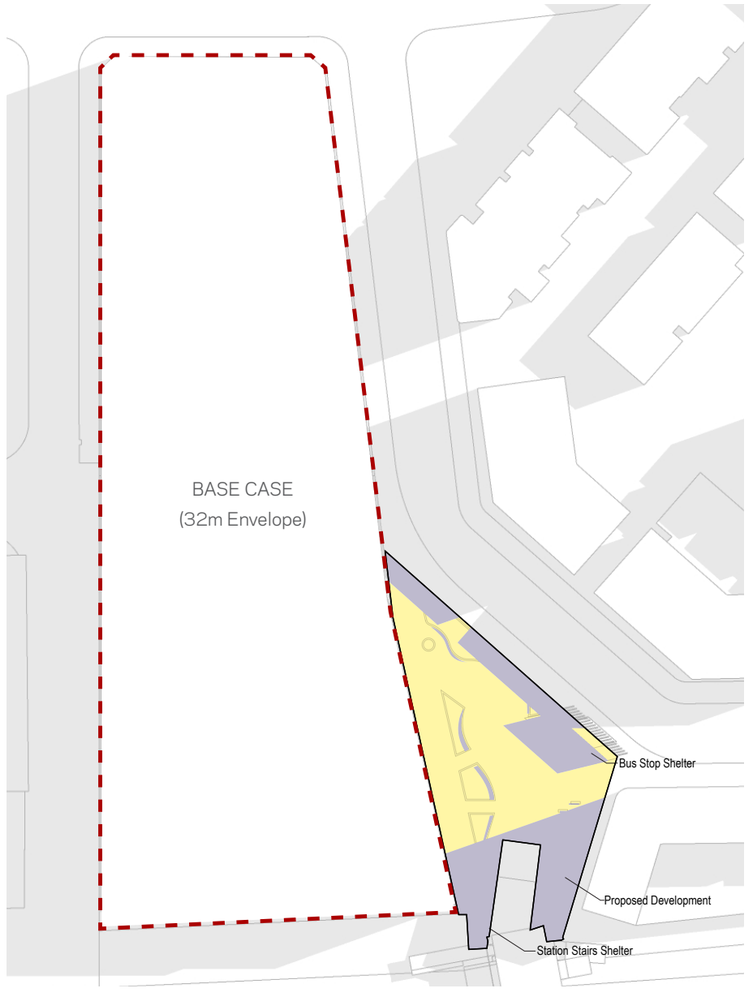
Solar Analysis

Summer Solstice (December 22 AEDT)

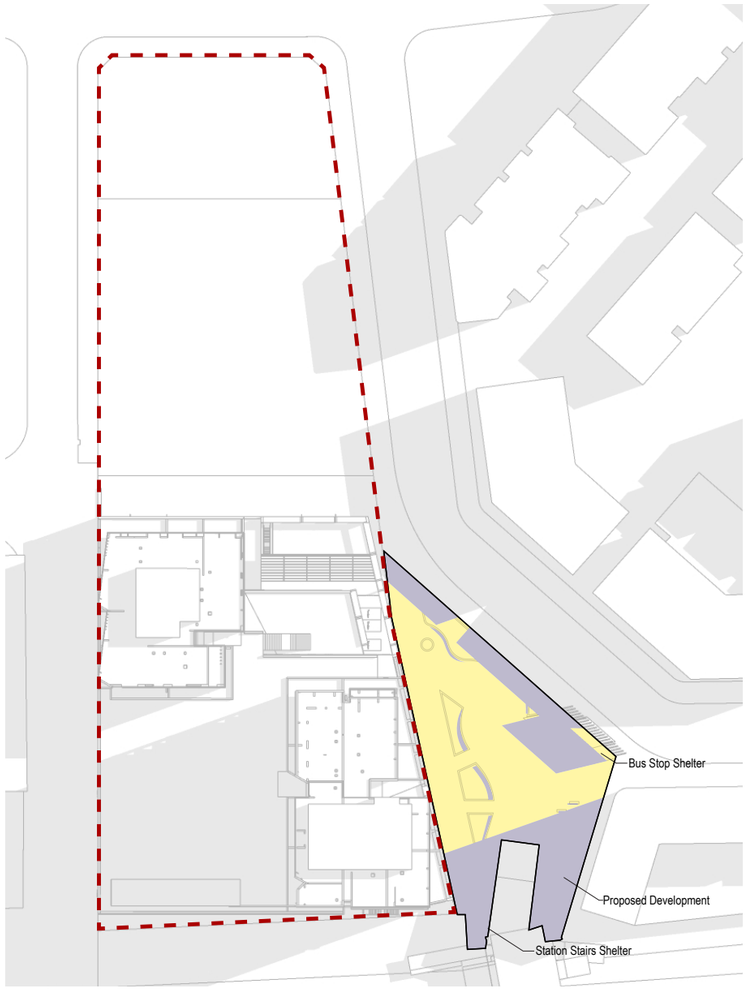
Thornton, Penrith NSW 2750

9AM Shadow Comparison: Summer Solstice (Dec. 22 AEDT)

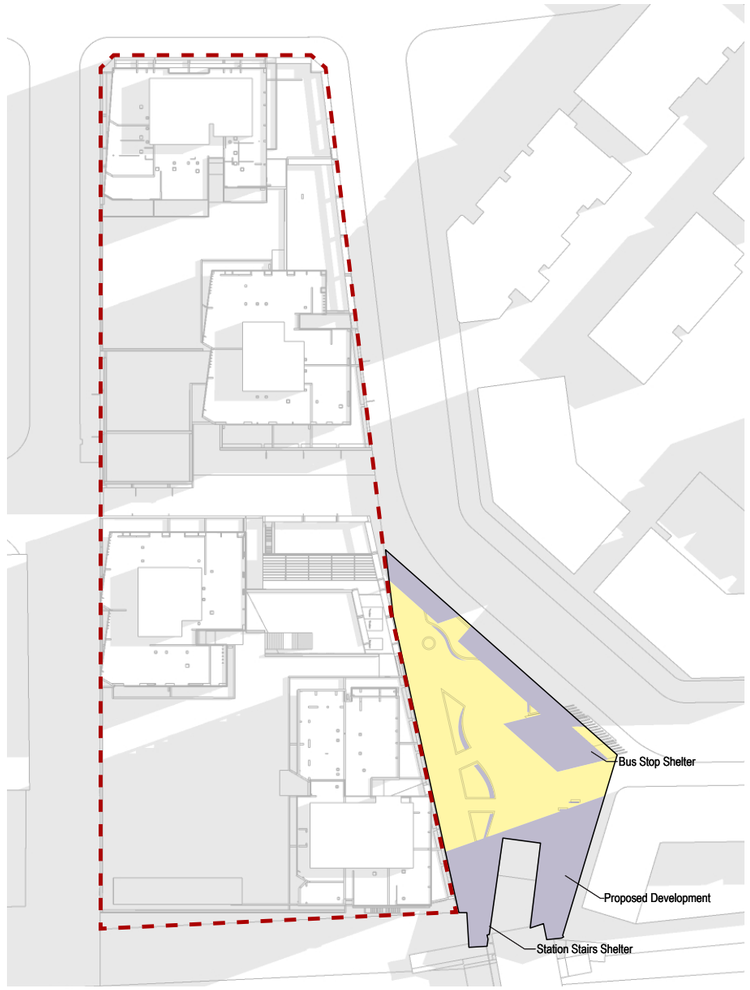
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 57.40% of sun on the area of public square

DA PROPOSAL — 57.40% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	829	0	0	0	0	0	0	0
Shadow (%)	42.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1117	1117		1117			
Sun (%)		57.40%	57.40%		57.40%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 9am in Summer.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 57.40% as a result.

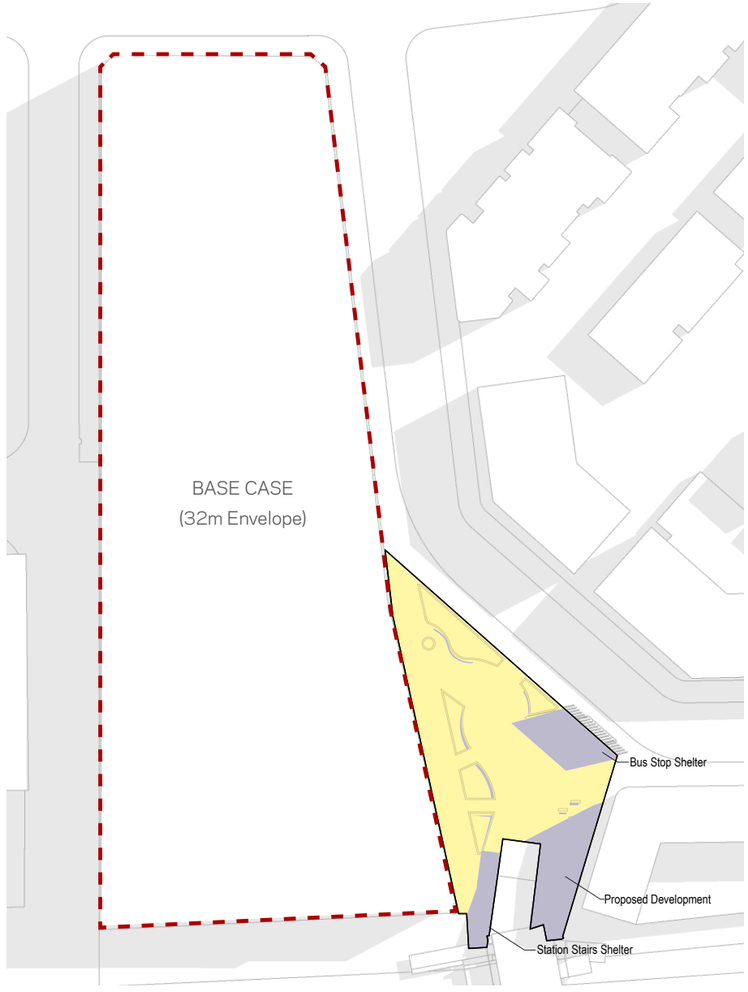
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

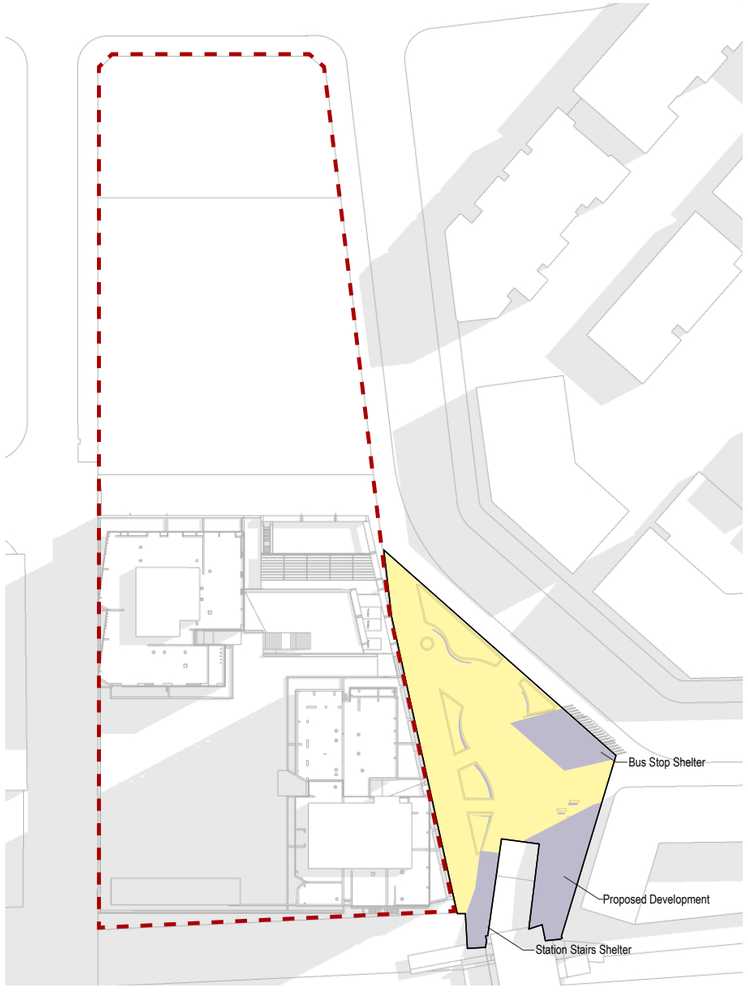
Thornton, Penrith NSW 2750

10AM Shadow Comparison: Summer Solstice (Dec. 22 AEDT)

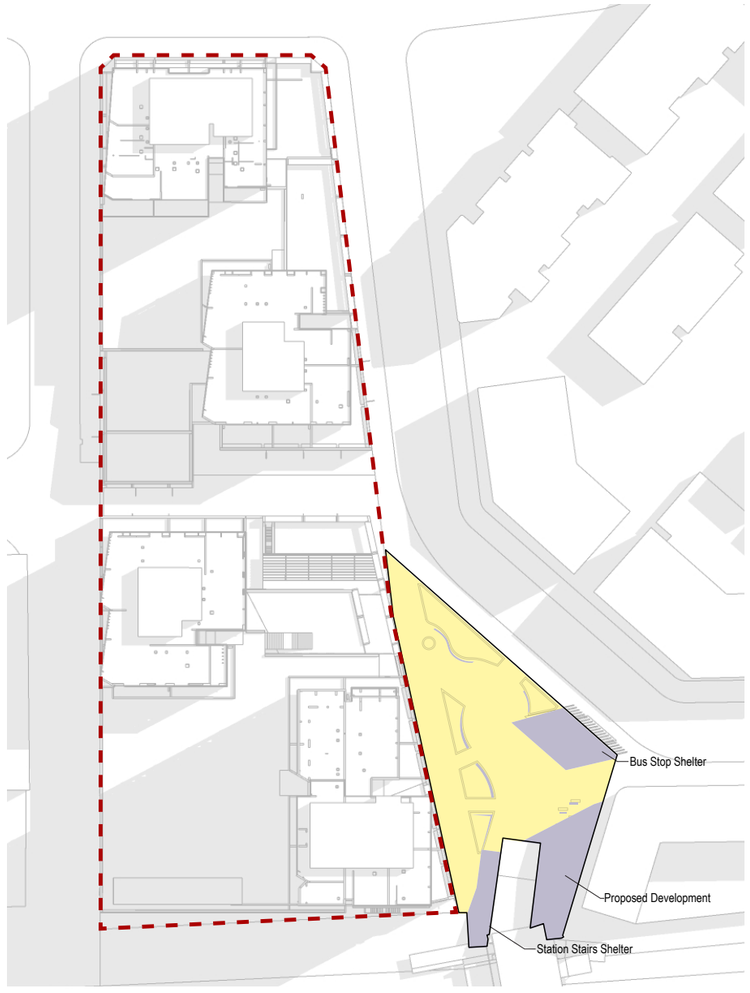
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 74.25% of sun on the area of public square

DA PROPOSAL — 74.25% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	501	0	0	0	0	0	0	0
Shadow (%)	25.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1445	1445		1445			
Sun (%)		74.25%	74.25%		74.25%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 10am in Summer.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 74.25% as a result.

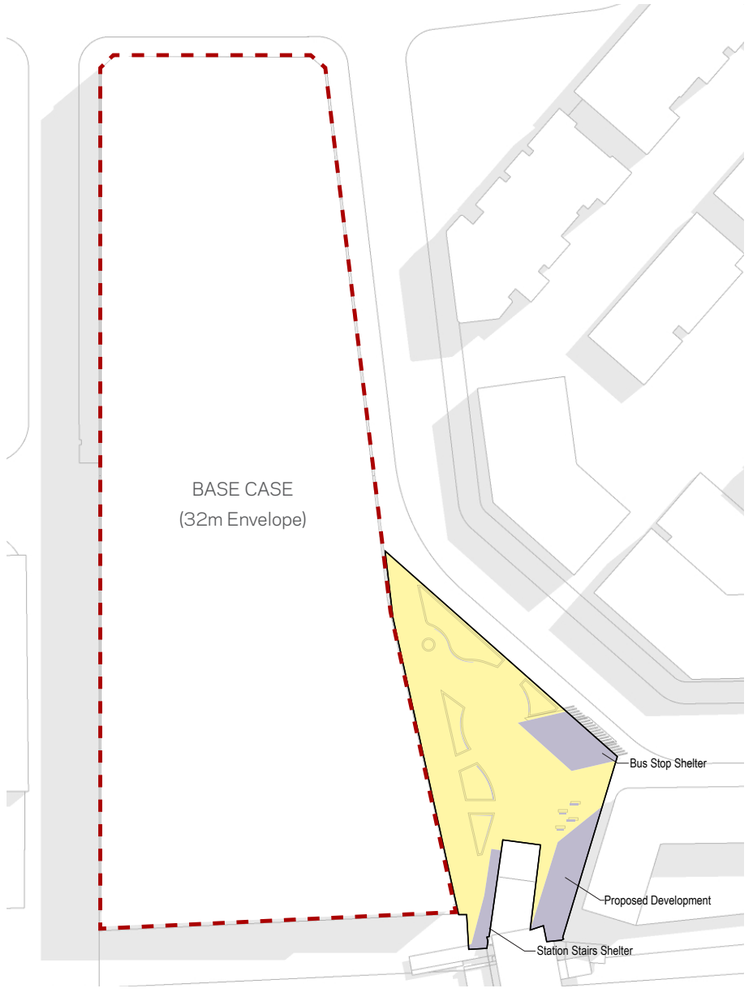
KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

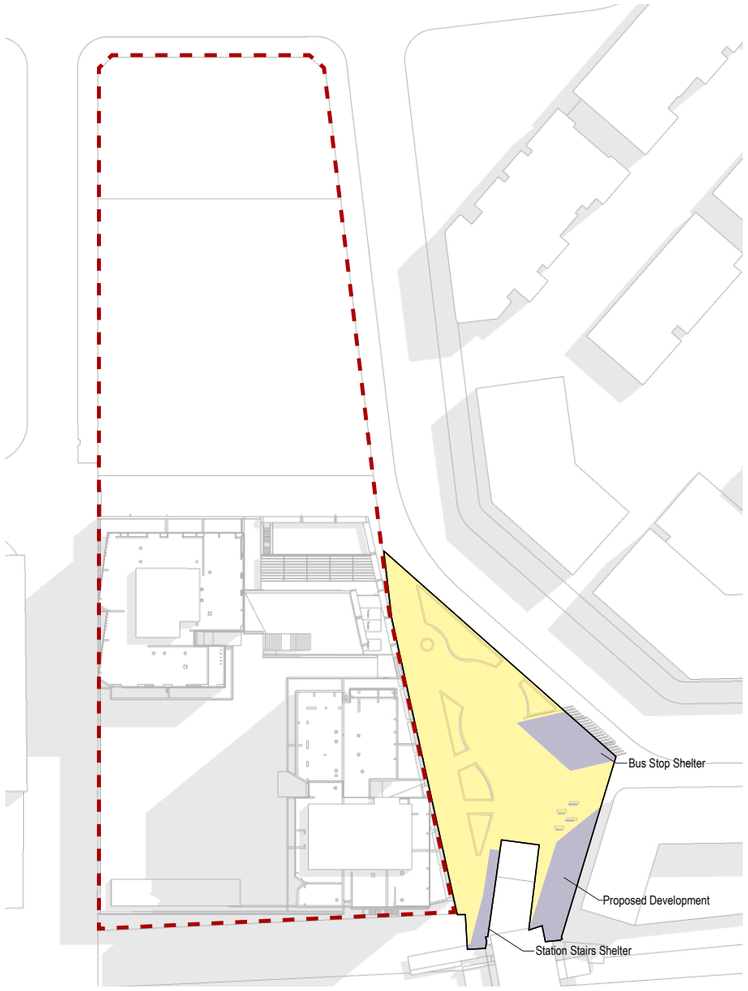
Thornton, Penrith NSW 2750

11AM Shadow Comparison: Summer Solstice (Dec. 22)

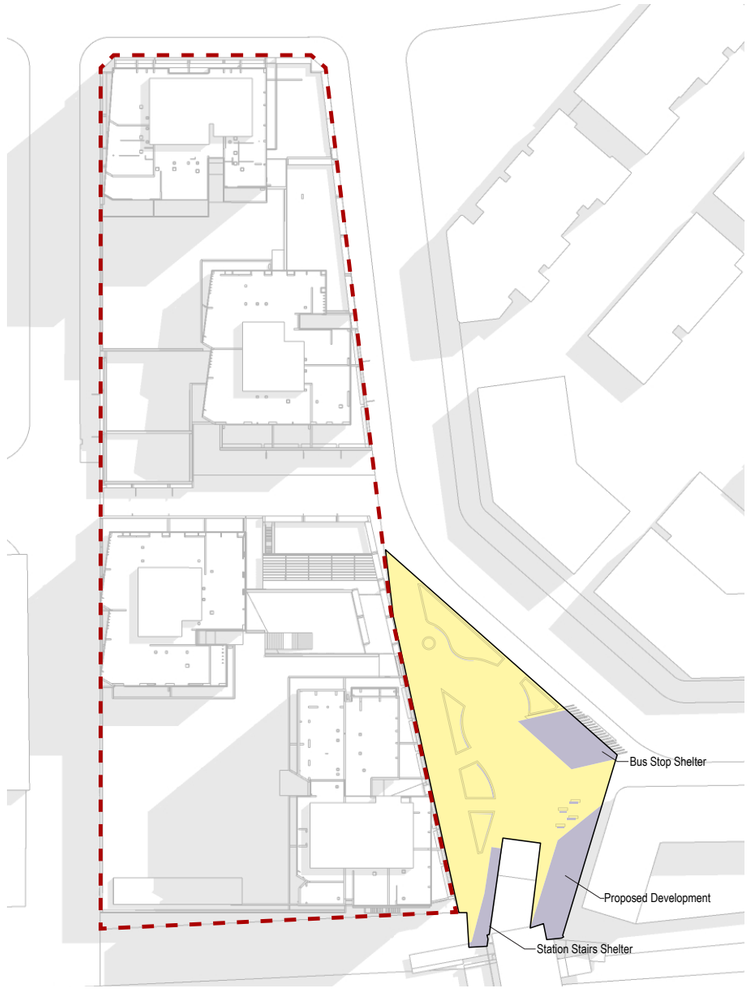
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 81.19% of sun on the area of public square

DA PROPOSAL — 81.19% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	366	0	0	0	0	0	0	0
Shadow (%)	18.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1580	1580		1580			
Sun (%)		81.19%	81.19%		81.19%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 11am in Summer.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 81.19% as a result.

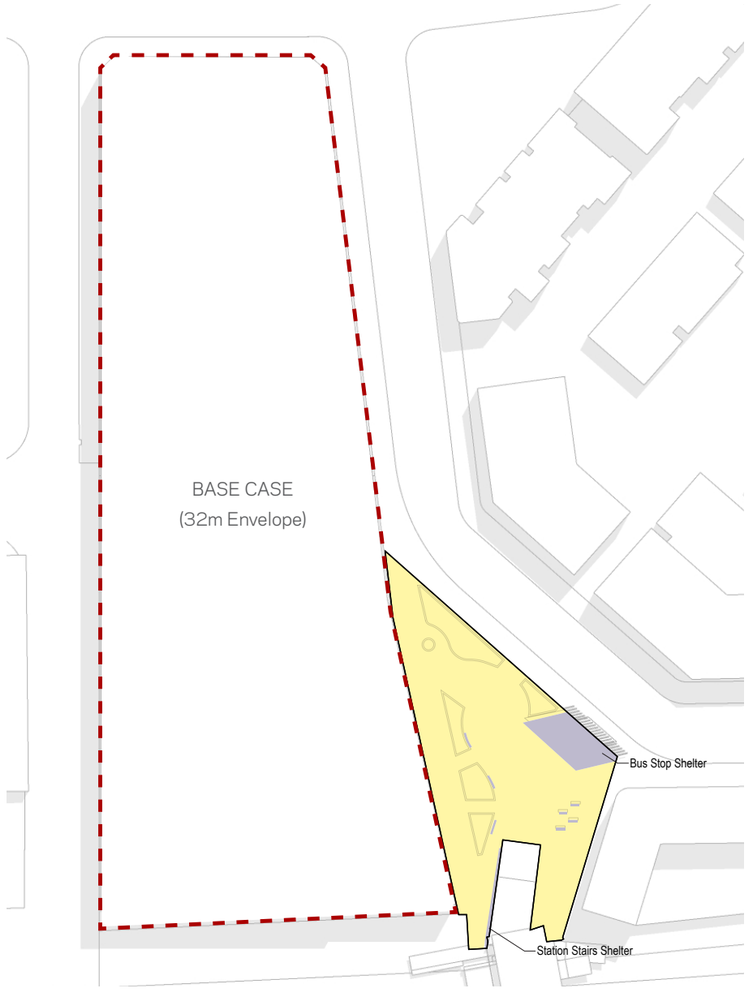
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

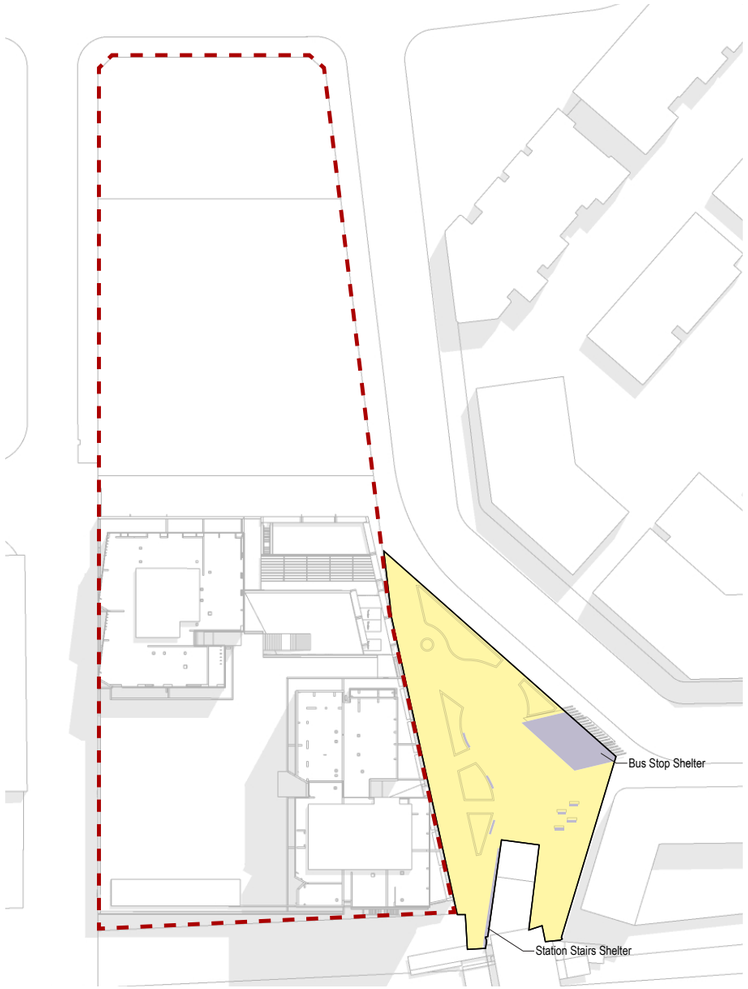
Thornton, Penrith NSW 2750

12PM Shadow Comparison: Summer Solstice (Dec. 22)

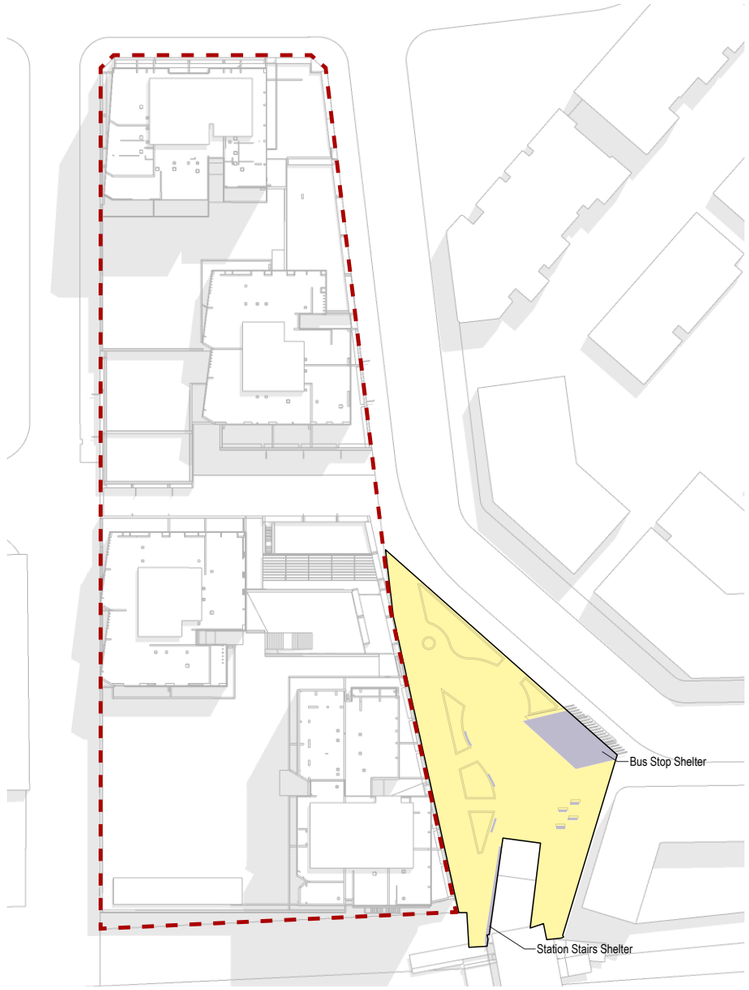
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 92.70% of sun on the area of public square

DA PROPOSAL — 92.70% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	142	0	0	0	0	0	0	0
Shadow (%)	7.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1804	1804		1804			
Sun (%)		92.70%	92.70%		92.70%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 12pm in Summer.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 92.70% as a result.

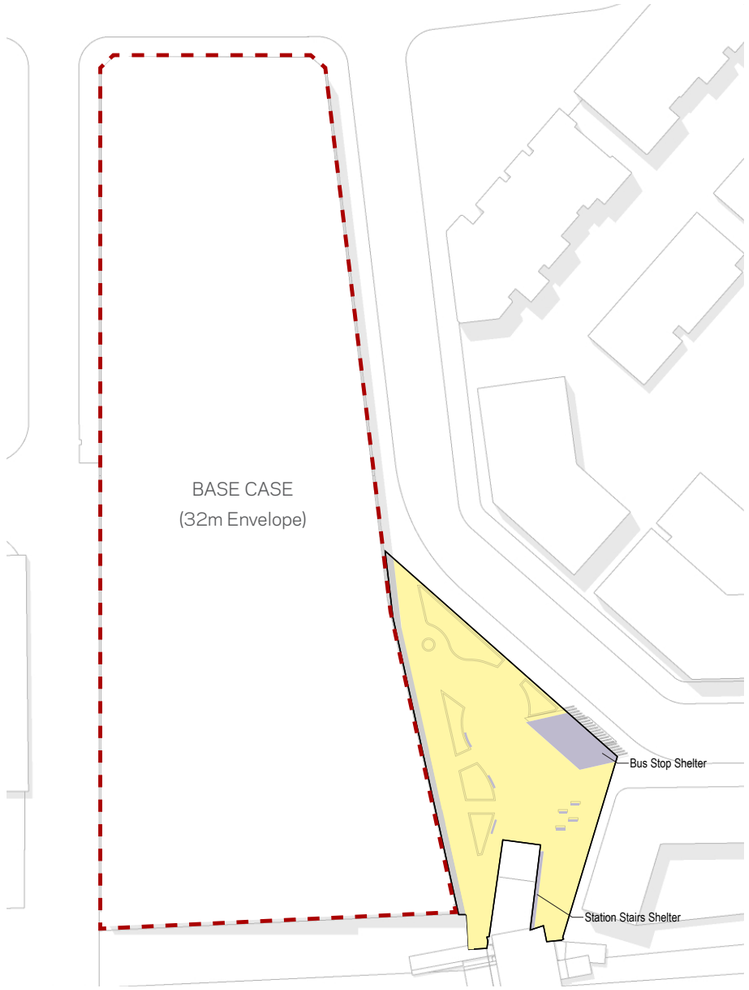
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

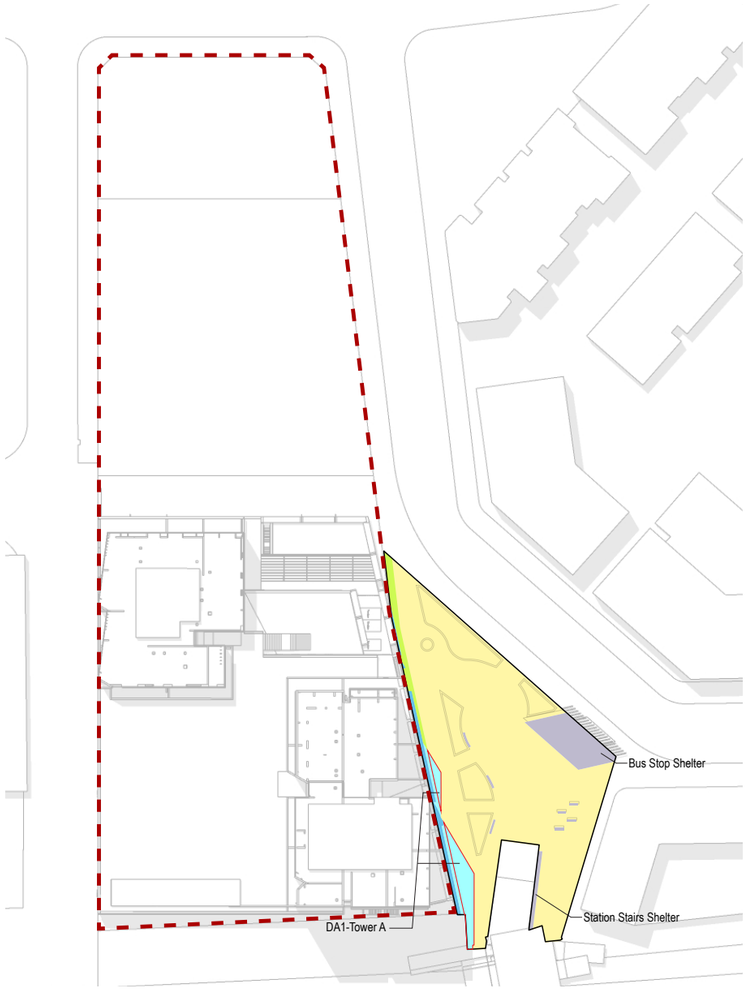
Thornton, Penrith NSW 2750

1PM Shadow Comparison: Summer Solstice (Dec. 22)

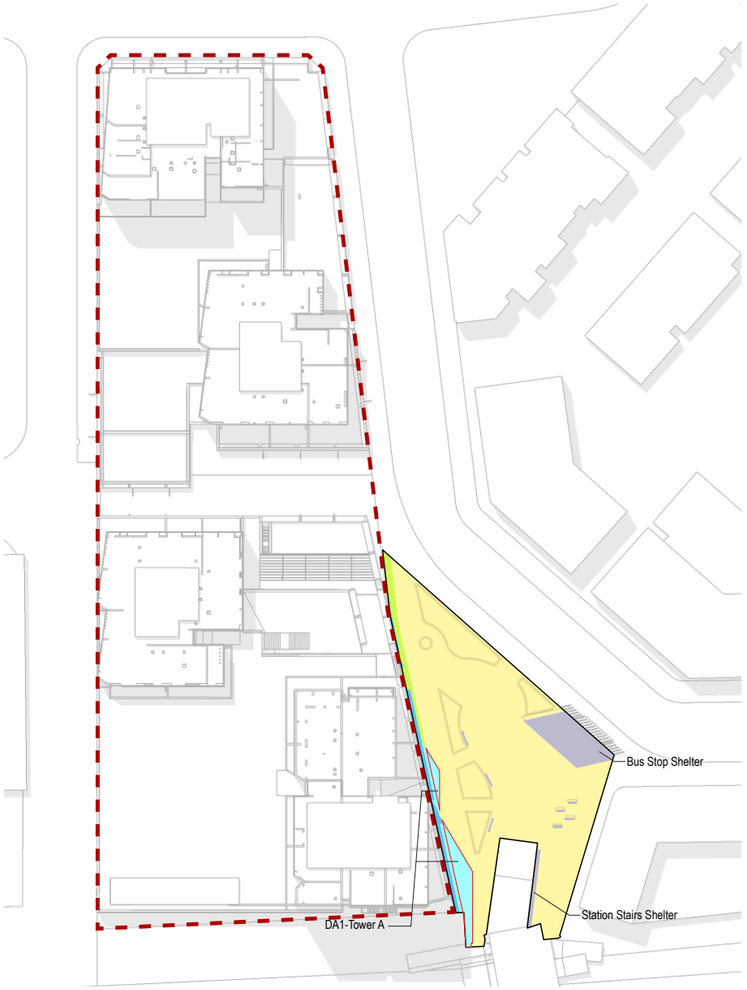
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 87.77% of sun on the area of public square

DA PROPOSAL — 86.02% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	132	110	46	94	46	94	0	0
Shadow (%)	6.78%	5.65%	2.36%	4.83%	2.36%	4.83%	0.00%	0.00%
Sun (sqm)		1704	1674		1674			
Sun (%)		87.56%	86.02%		86.02%			

- DA1 as a standalone development provides 1.54% less solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow only on the plaza's south-eastern perimeter, where vegetation is presumed to be planted as part of the development.

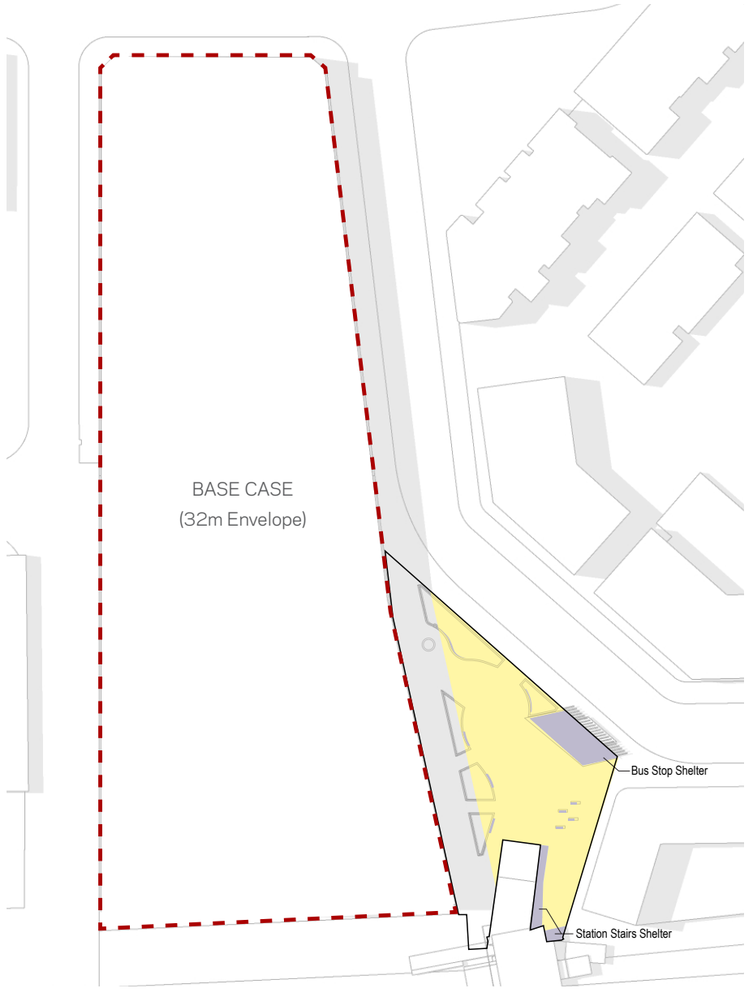
KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

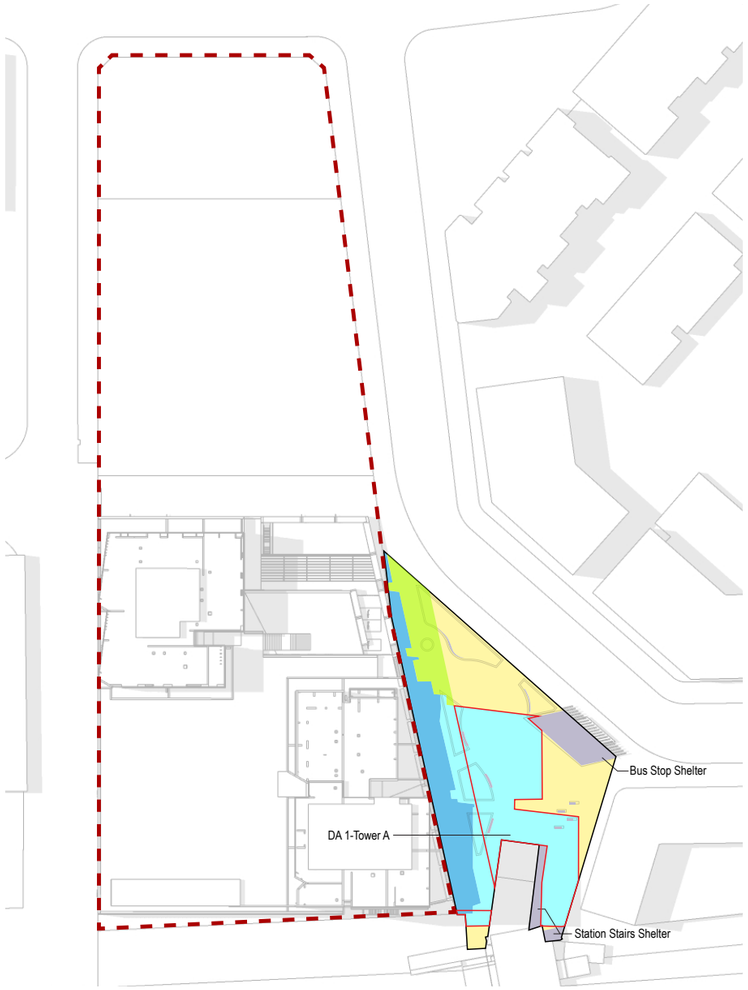
Thornton, Penrith NSW 2750

2PM Shadow Comparison: Summer Solstice (Dec. 22)

DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1

Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 58.89% of sun on the area of public square

DA PROPOSAL — 36.49% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	147	653	344	745	344	745	0	0
Shadow (%)	7.55%	33.56%	17.68%	38.28%	17.68%	38.28%	0.00%	0.00%
Sun (sqm)		1146	710		710			
Sun (%)		58.89%	36.49%		36.49%			

- DA1 as a standalone development provides 22.4% less solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow predominantly over the centre of the plaza as well as the existing garden beds which would also cause tree shadows at this time.
- DA1 also provides additional sun access to the northern peremeter of the plaza.

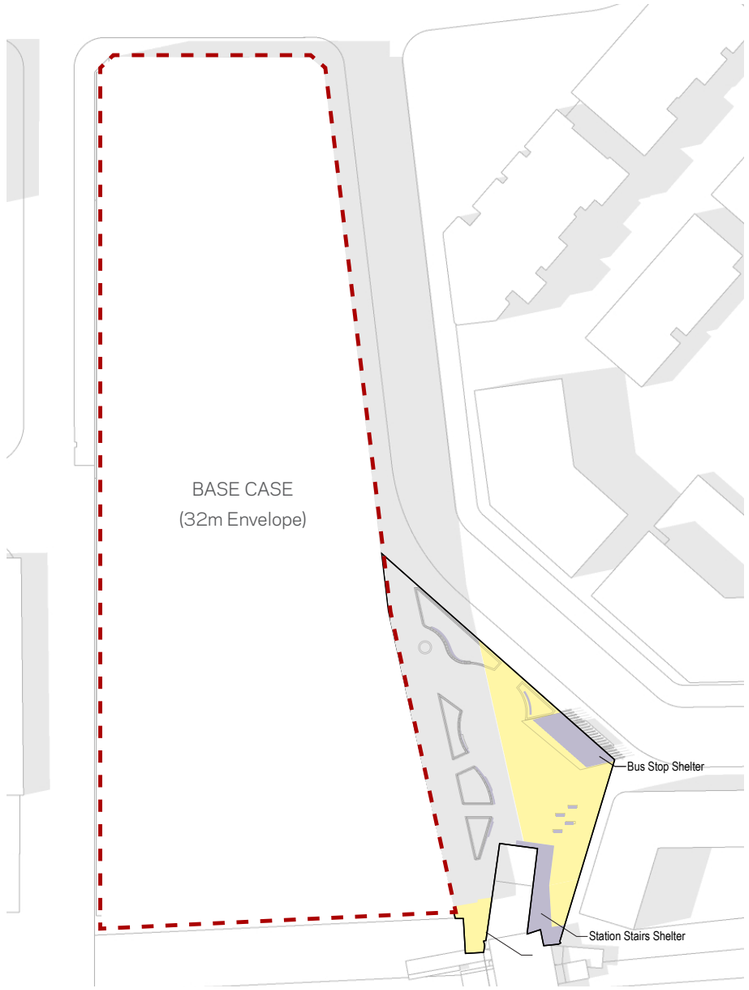
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

Thornton, Penrith NSW 2750

3PM Shadow Comparison: Summer Solstice (Dec. 22)

DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case

Solar Access Diagram
Base Case + DA 1

Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 35.41% of sun on the area of public square

DA PROPOSAL — 12.02% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	186	1071	769	757	769	757	0	0
Shadow (%)	9.56%	55.04%	39.52%	38.90%	39.52%	38.90%	0.00%	0.00%
Sun (sqm)		689	234		234			
Sun (%)		35.41%	12.02%		12.02%			

- DA1 as a standalone development provides 23.39% less solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow predominantly across the eastern sector of the plaza.
- DA1 also provides additional sun access to the northern peremeter of the plaza.

KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

3

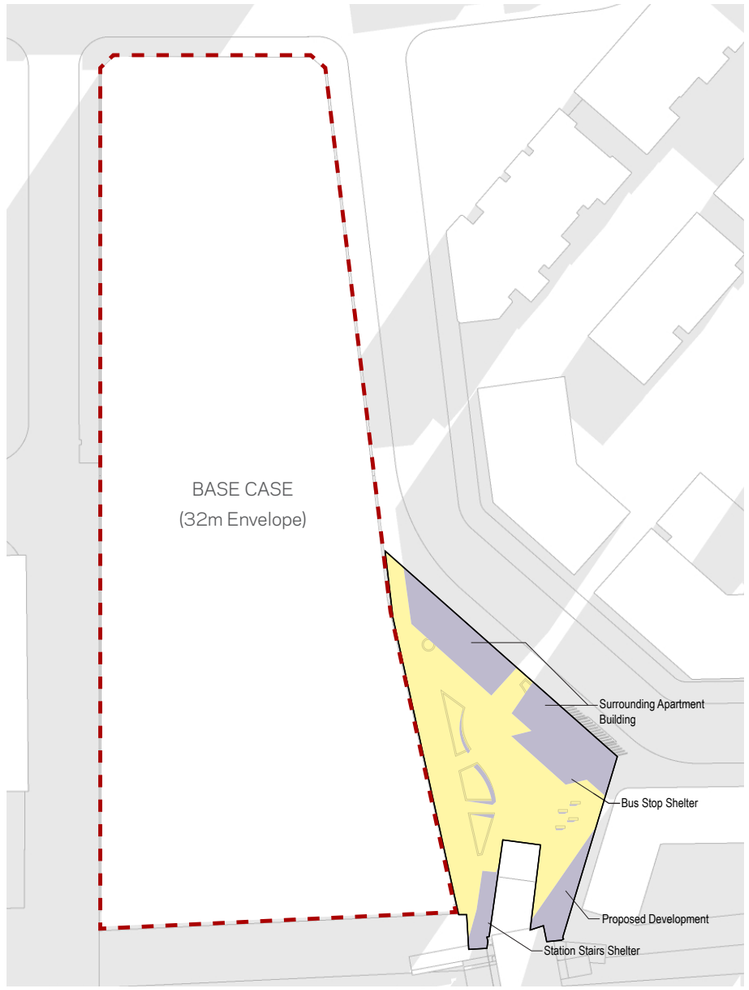
Solar Analysis

Spring Equinox (September 23)

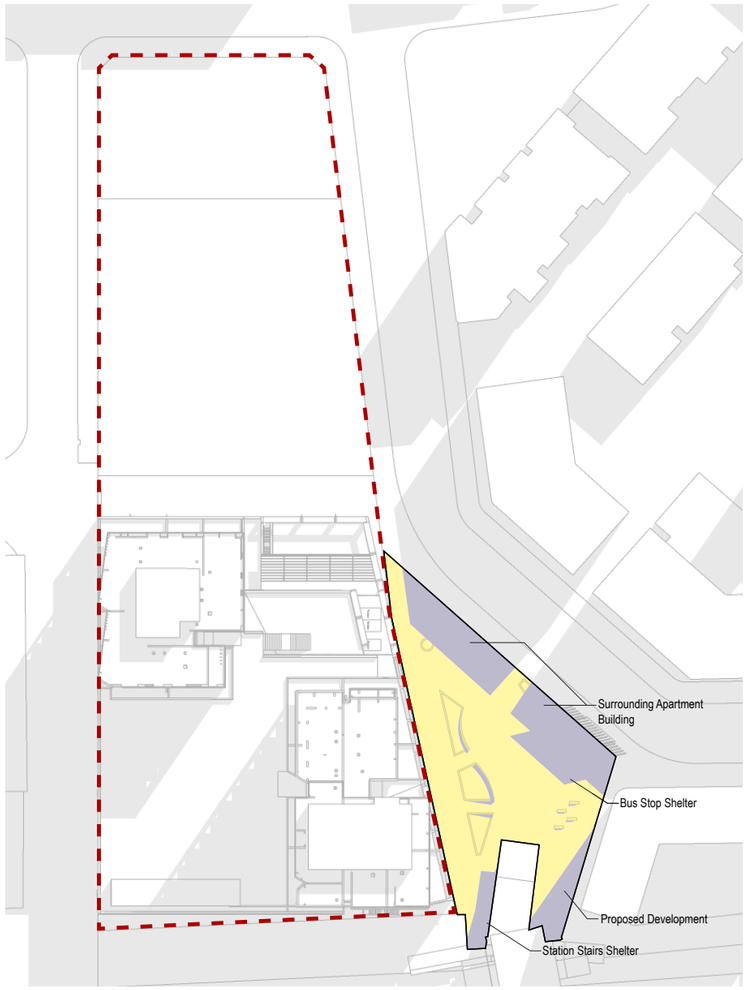
Thornton, Penrith NSW 2750

9AM Shadow Comparison: Spring Equinox (Sep. 23)

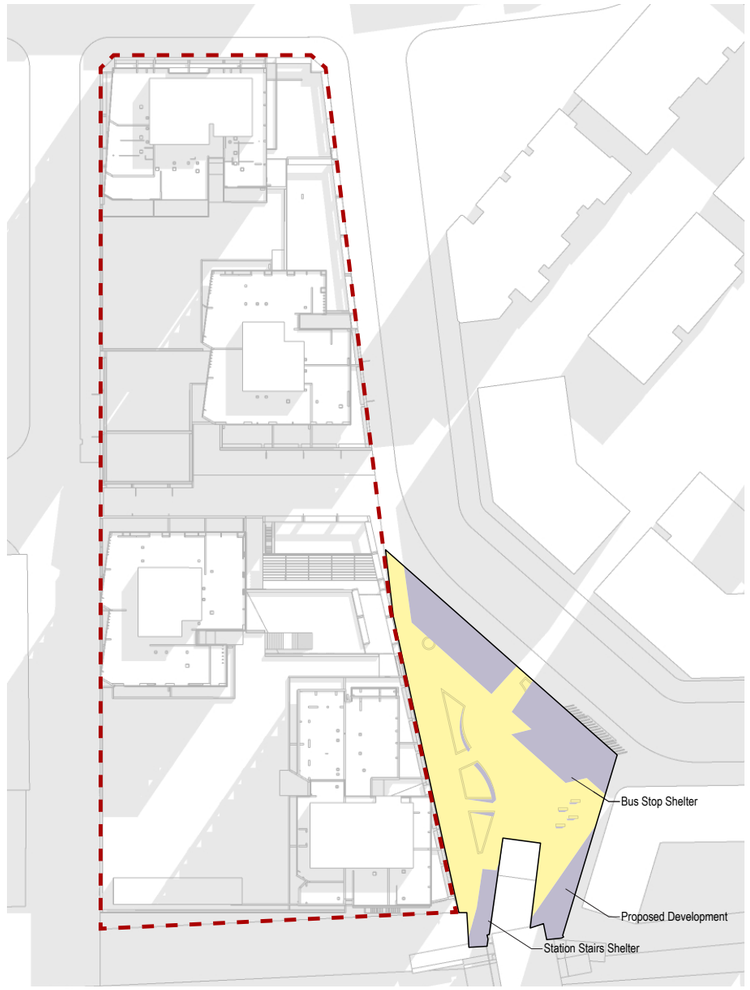
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 66.19% of sun on the area of public square

DA PROPOSAL — 66.19% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	658	0	0	0	0	0	0	0
Shadow (%)	33.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1288	1288		1288			
Sun (%)		66.19%	66.19%		66.19%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 9am in Spring.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 66.19% as a result.

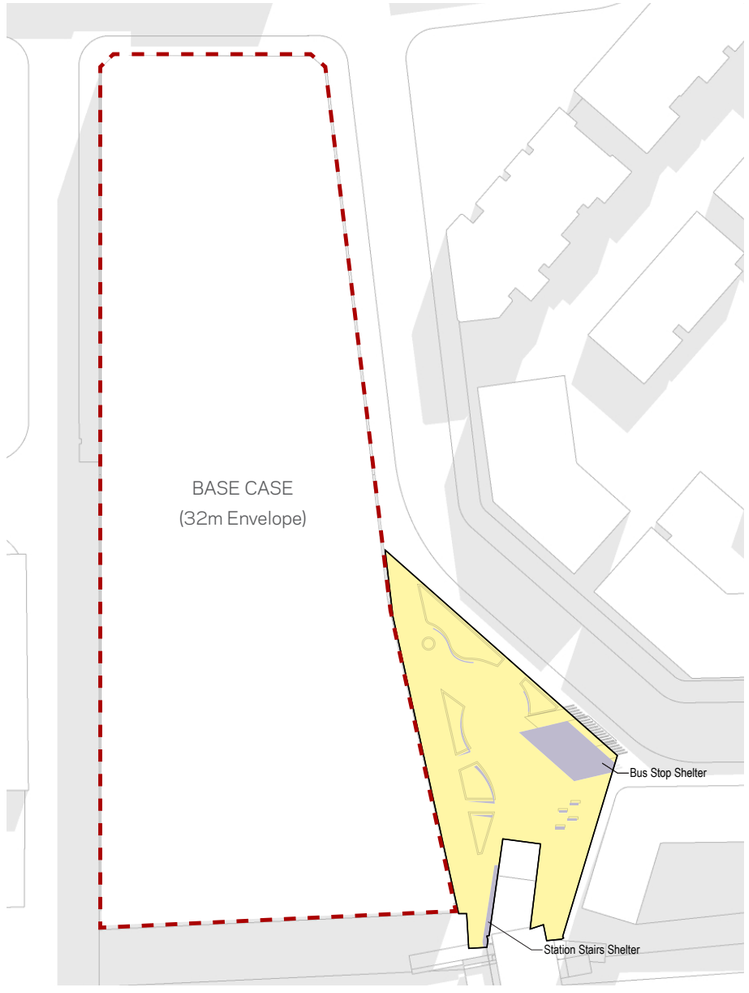
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

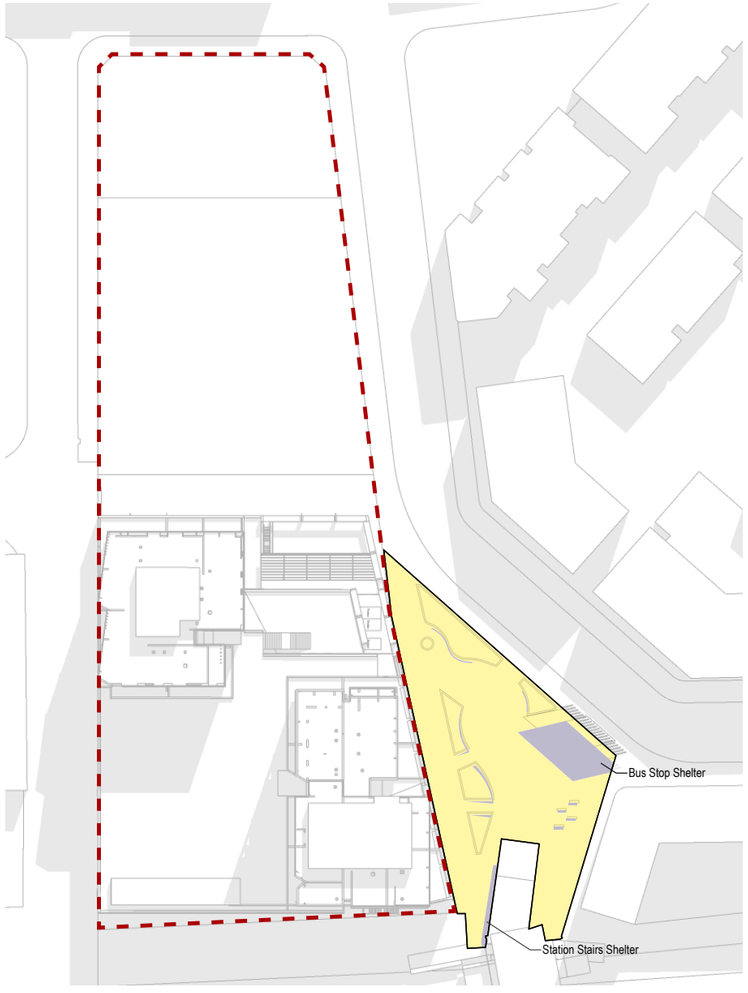
Thornton, Penrith NSW 2750

10AM Shadow Comparison: Spring Equinox (Sep. 23)

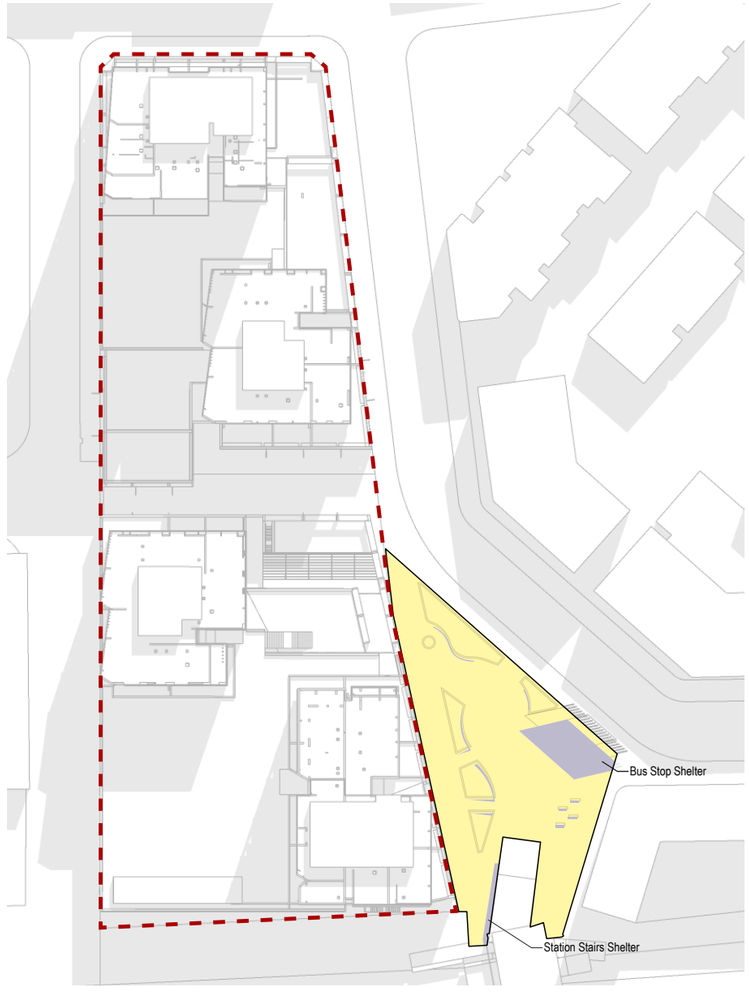
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 91.37% of sun on the area of public square

DA PROPOSAL — 91.37% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	168	0	0	0	0	0	0	0
Shadow (%)	8.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1778	1778		1778			
Sun (%)		91.37%	91.37%		91.37%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 10am in Spring.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 91.37% as a result.

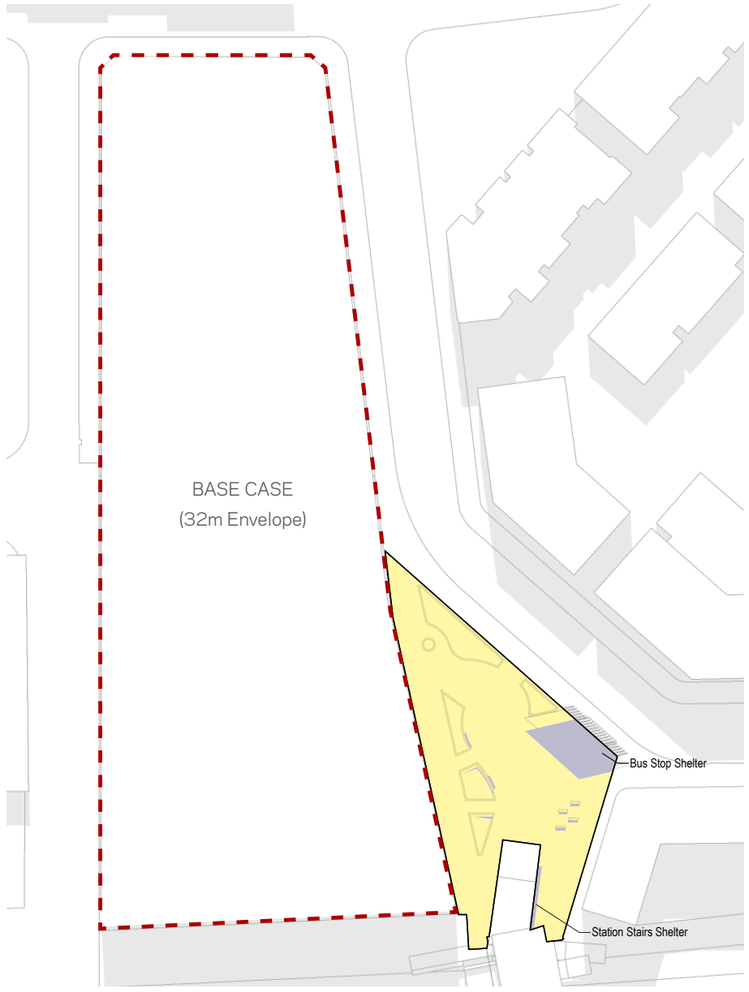
KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

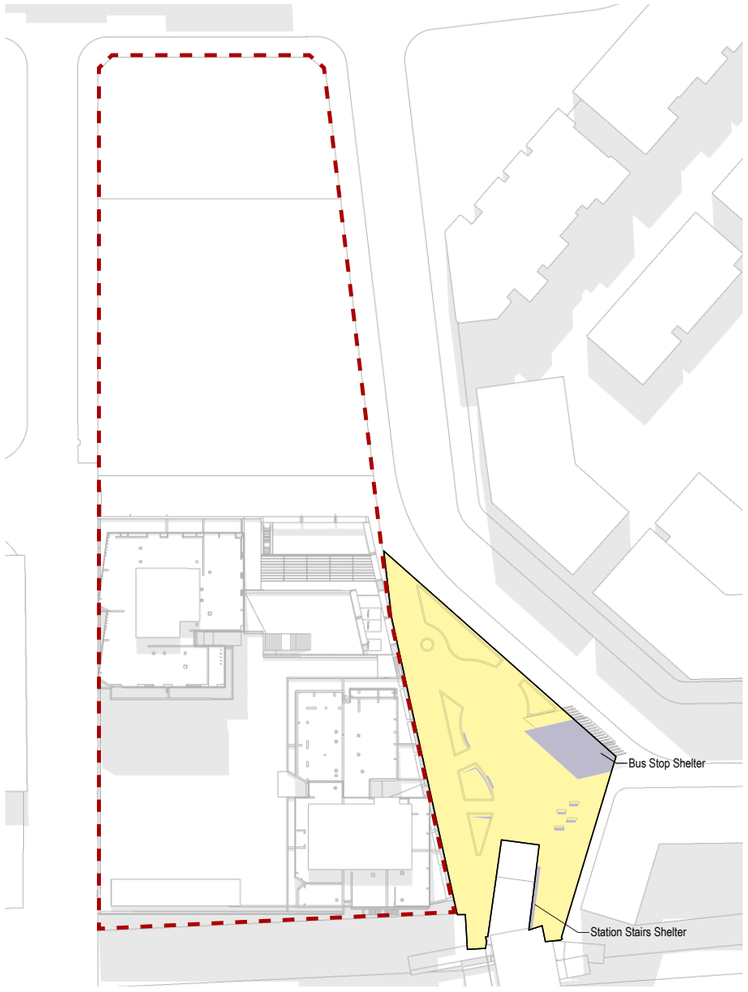
Thornton, Penrith NSW 2750

11AM Shadow Comparison: Spring Equinox (Sep. 23)

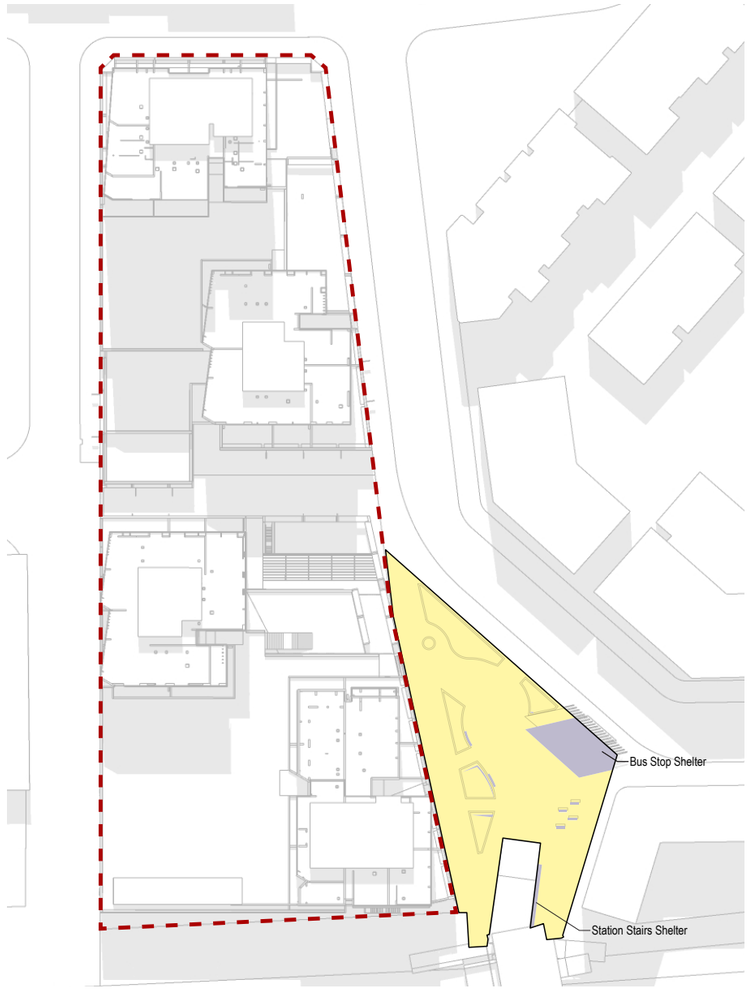
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 92.09% of sun on the area of public square

DA PROPOSAL — 92.09% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	154	0	0	0	0	0	0	0
Shadow (%)	7.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1792	1792		1792			
Sun (%)		92.09%	92.09%		92.09%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 11am in Spring.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 92.09% as a result.

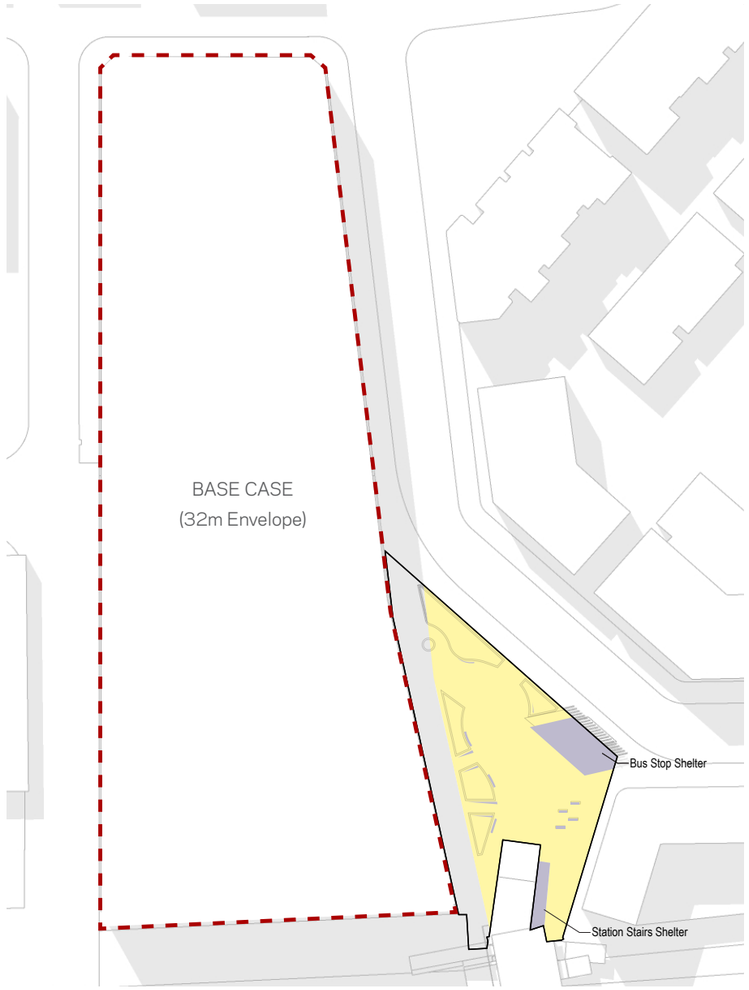
KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

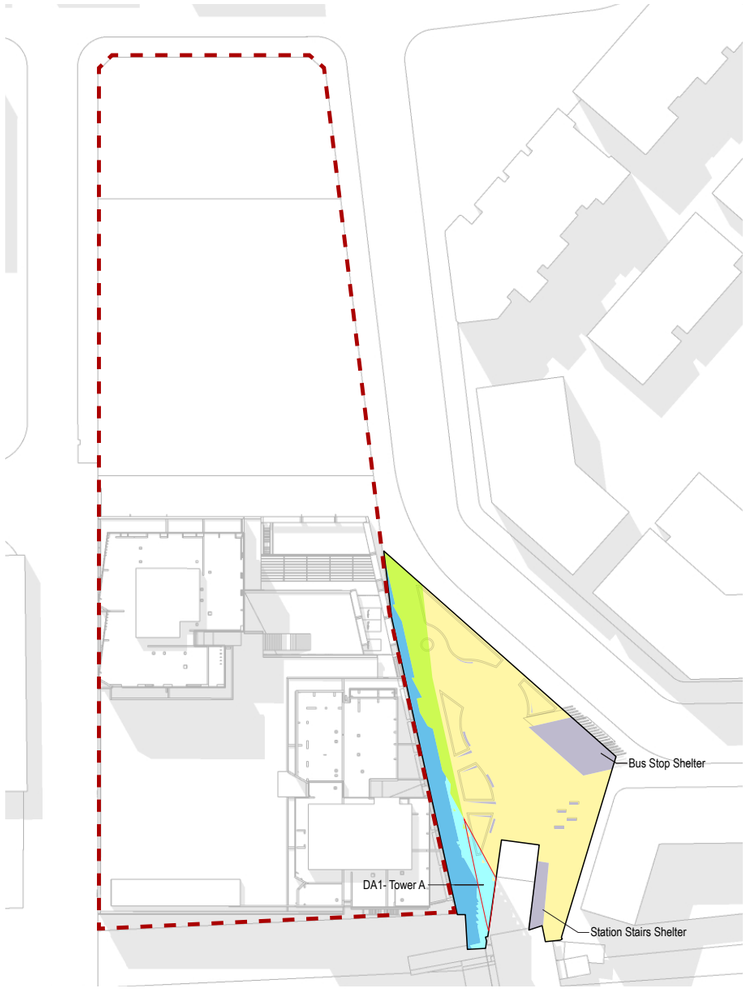
Thornton, Penrith NSW 2750

12PM Shadow Comparison: Spring Equinox (Sep. 23)

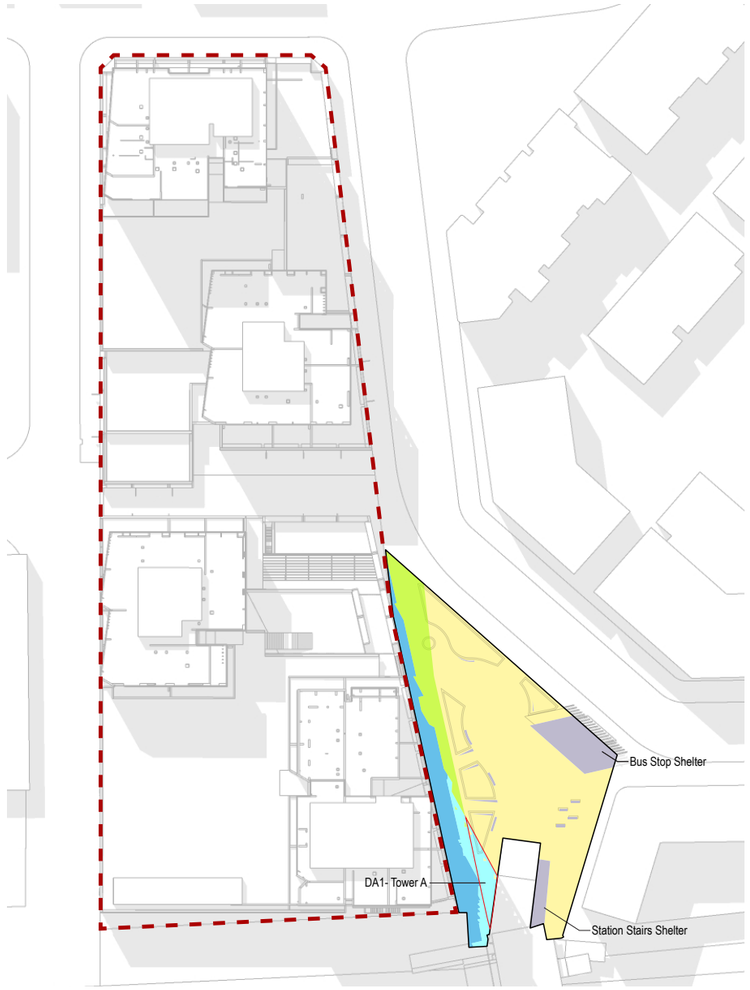
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 66.29% of sun on the area of public square

DA PROPOSAL — 74.36% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	168	488	233	99	233	99	0	0
Shadow (%)	8.63%	25.08%	11.97%	5.09%	11.97%	5.09%	0.00%	0.00%
Sun (sqm)		1290	1447		1447			
Sun (%)		66.29%	74.36%		74.36%			

- DA1 as a standalone development offers 8.07% more solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow only on the plaza's south-west perimeter, adjacent to the station stairs.
- DA1 provides additional sun access to the north-western boundary.

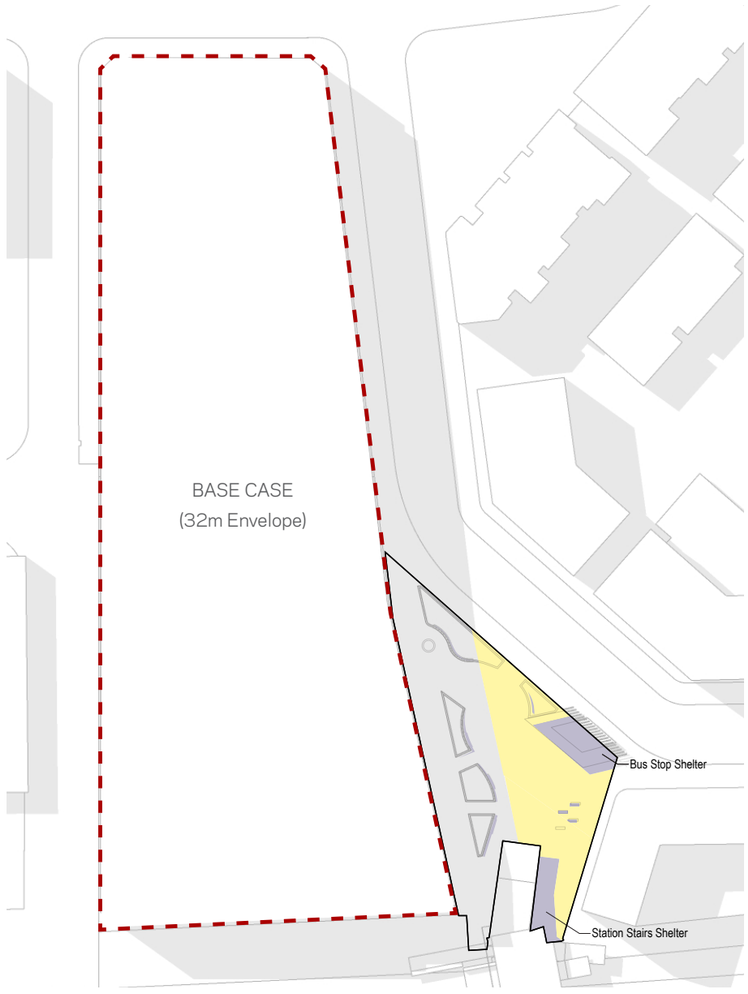
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

Thornton, Penrith NSW 2750

1PM Shadow Comparison: Spring Equinox (Sep. 23)

DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case

Solar Access Diagram
Base Case + DA 1

Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 35.97% of sun on the area of public square

DA PROPOSAL — 40.65% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	198	1049	668	289	668	289	0	0
Shadow (%)	10.17%	53.91%	34.33%	14.85%	34.33%	14.85%	0.00%	0.00%
Sun (sqm)		700	791		791			
Sun (%)		35.97%	40.65%		40.65%			

- DA1 as a standalone development offers 4.69% more solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow only on the plaza's south-eastern perimeter.
- DA1 provides additional sun access to the northern section of the plaza.

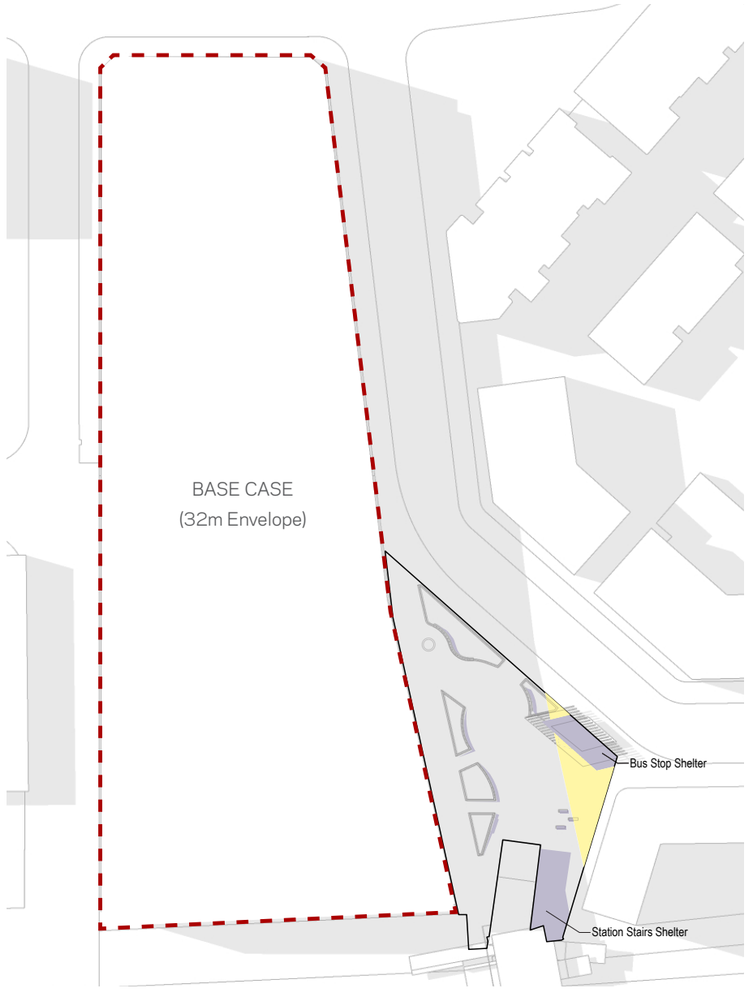
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

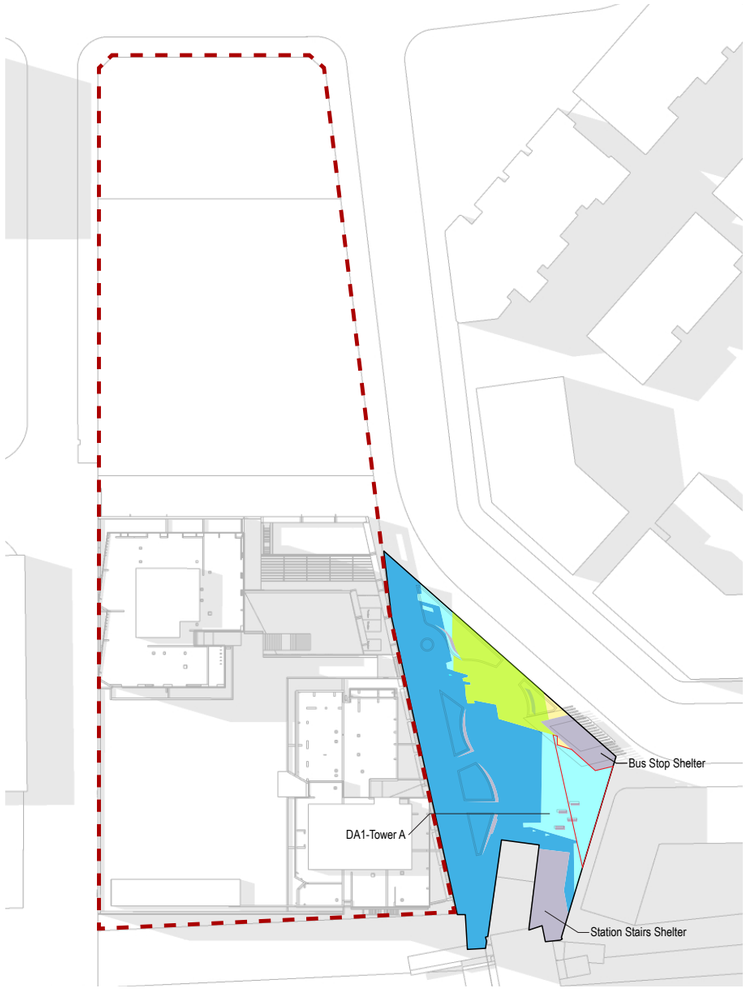
Thornton, Penrith NSW 2750

2PM Shadow Comparison: Spring Equinox (Sep. 23)

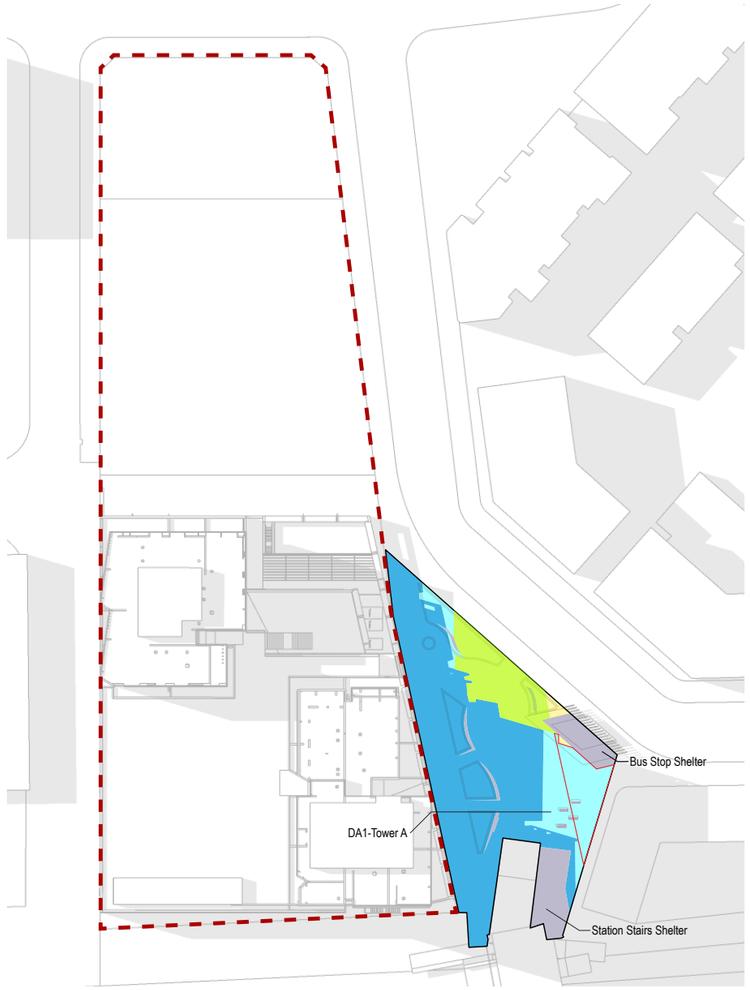
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 8.07% of sun on the area of public square

DA PROPOSAL — 12.90% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	228	1561	1177	289	1177	289	0	0
Shadow (%)	11.72%	80.22%	60.48%	14.85%	60.48%	14.85%	0.00%	0.00%
Sun (sqm)		157	251		251			
Sun (%)		8.07%	12.90%		12.90%			

- DA1 as a standalone development offers 4.83% more solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow only at the plaza's eastern sector.
- DA1 provides additional sun access to the north-eastern section of the plaza.

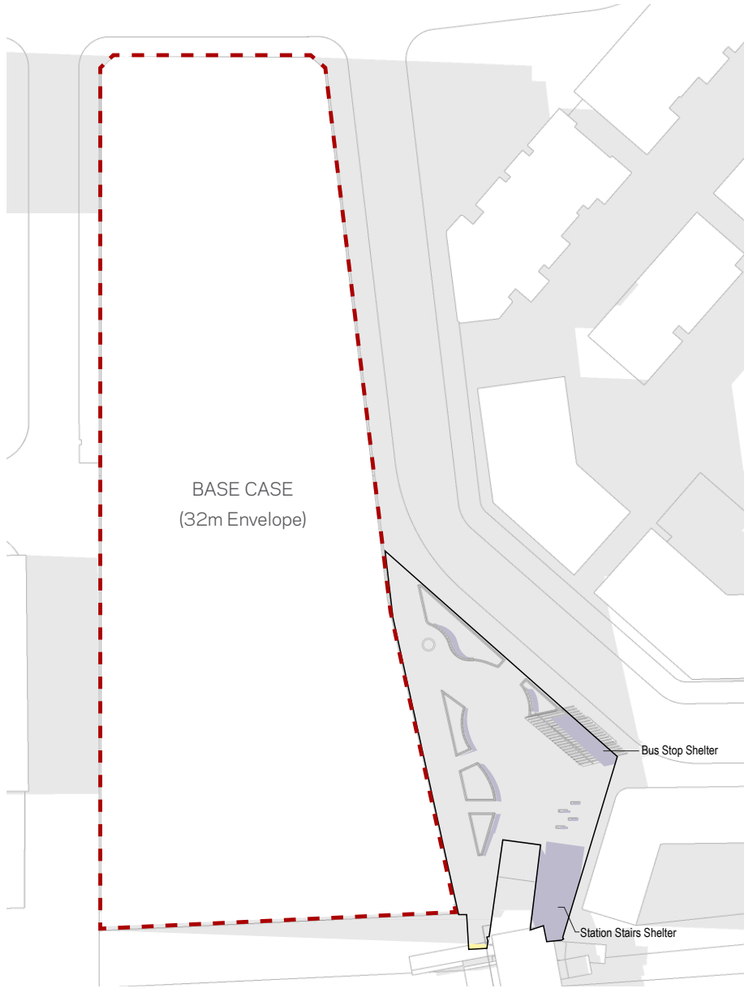
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

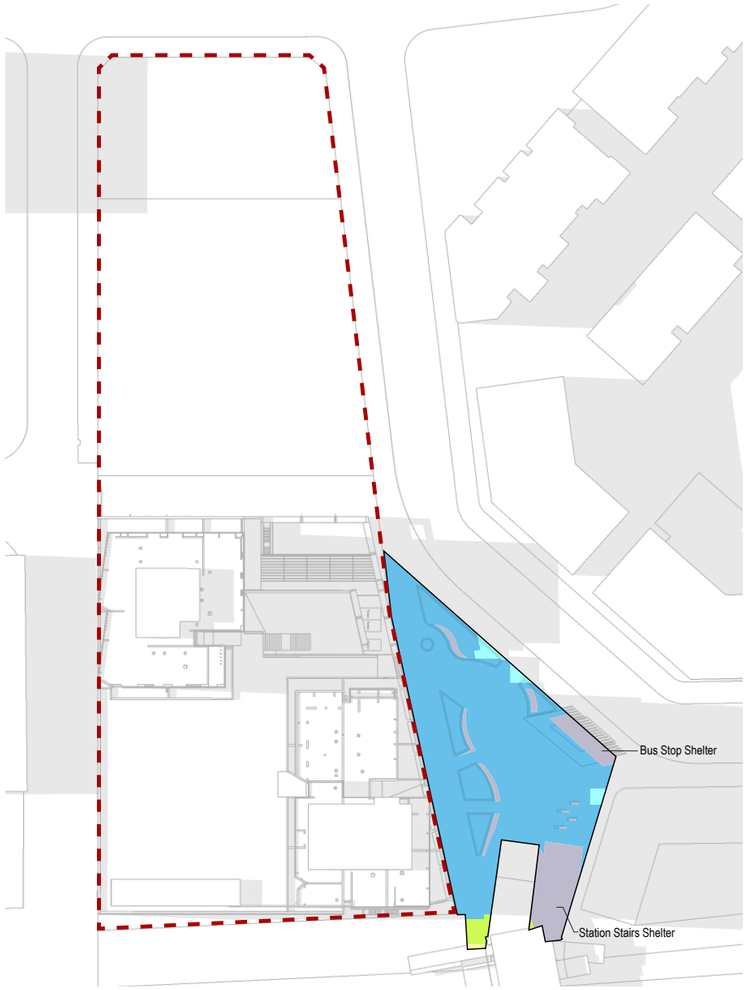
Thornton, Penrith NSW 2750

3PM Shadow Comparison: Spring Equinox (Sep. 23)

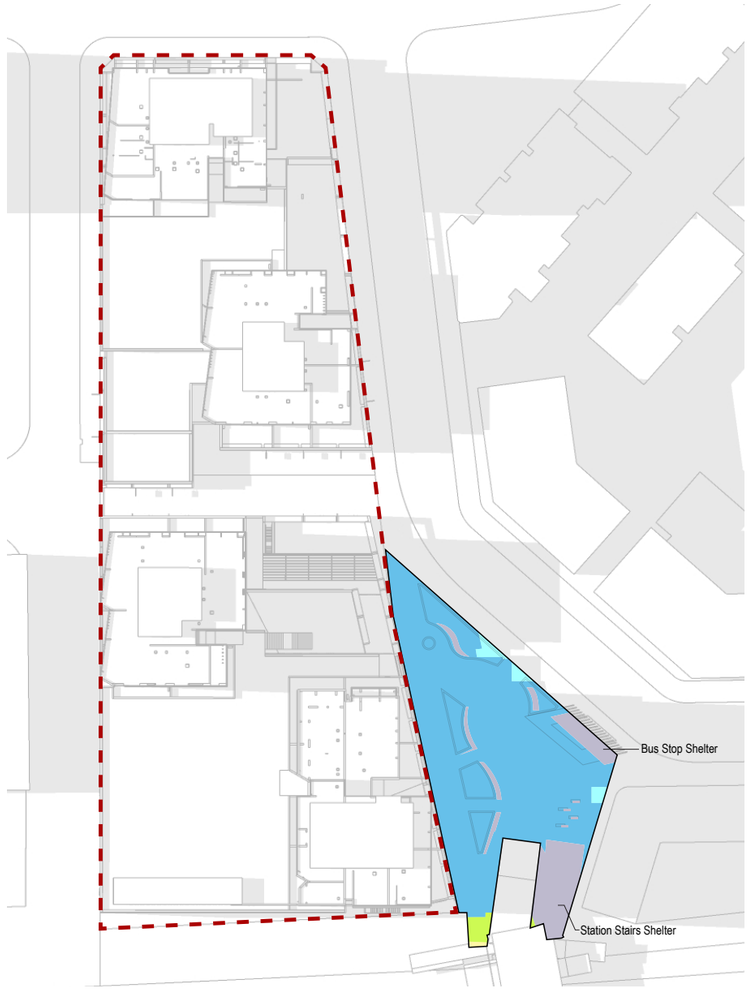
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 0.16% of sun on the area of public square

DA PROPOSAL — 1.59% of sun on the area of public square

- DA1 as a standalone development offers 1.43% more solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	246	1689	1625	36	1625	36	0	0
Shadow (%)	12.64%	86.79%	83.50%	1.85%	83.50%	1.85%	0.00%	0.00%
Sun (sqm)		3.1	31		31			
Sun (%)		0.16%	1.59%		1.59%			

KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

4

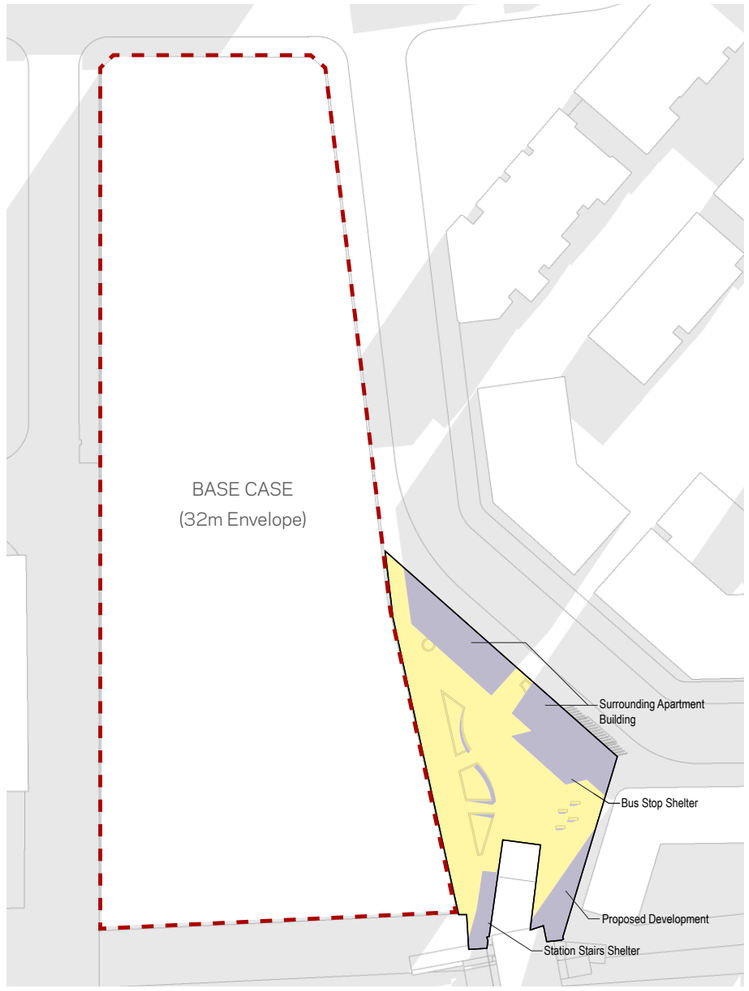
Solar Analysis

Autumn Equinox (March 21)

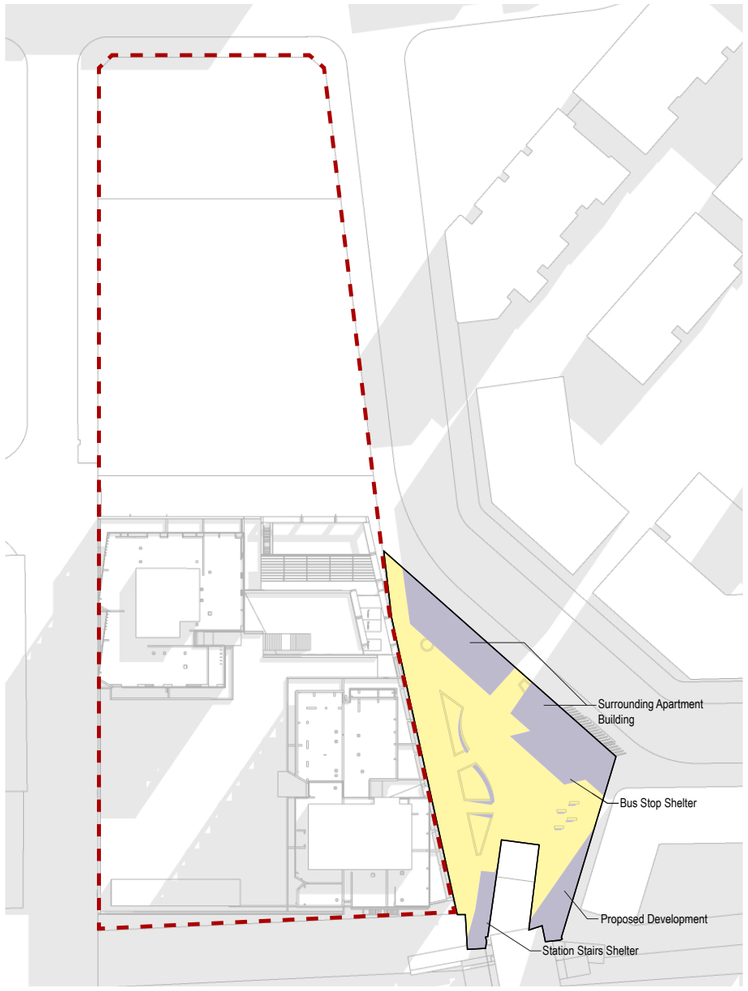
Thornton, Penrith NSW 2750

9AM Shadow Comparison: Autumn Equinox (Mar. 21)

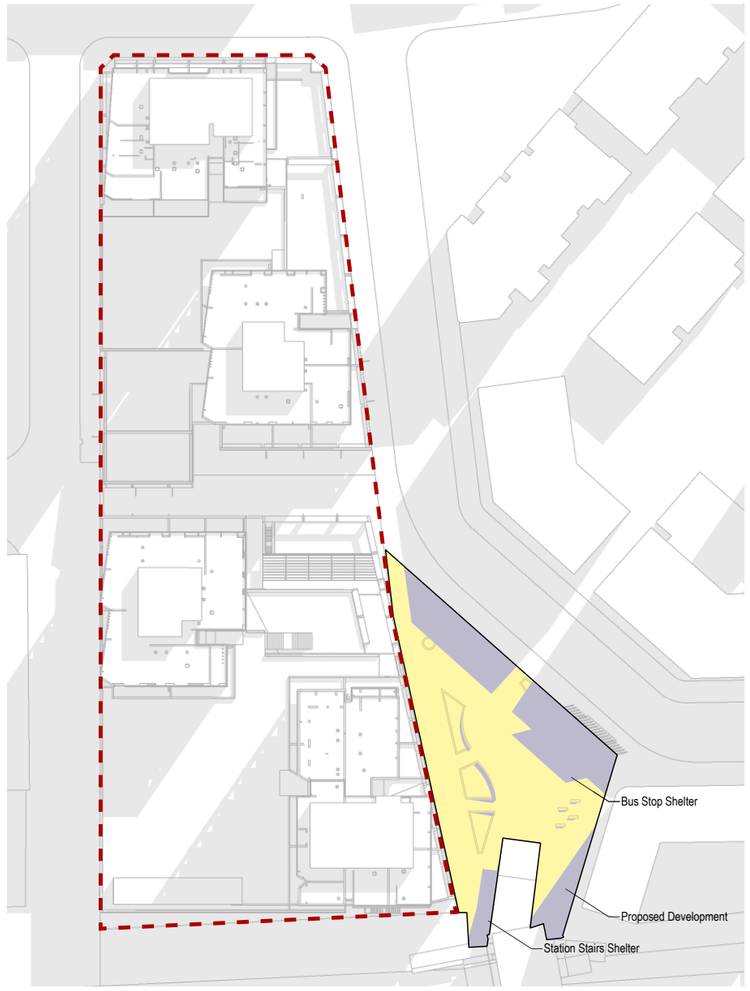
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 66.19% of sun on the area of public square

DA PROPOSAL — 66.19% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	658	0	0	0	0	0	0	0
Shadow (%)	33.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1288	1288		1288			
Sun (%)		66.19%	66.19%		66.19%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 9am in Spring.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 66.19% as a result.

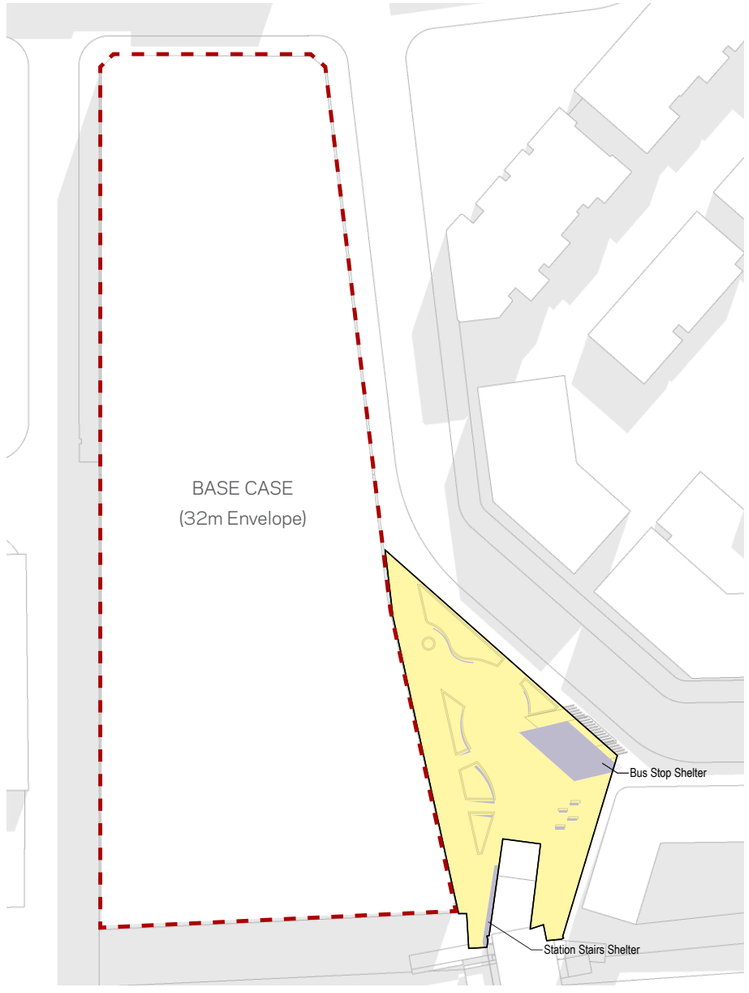
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

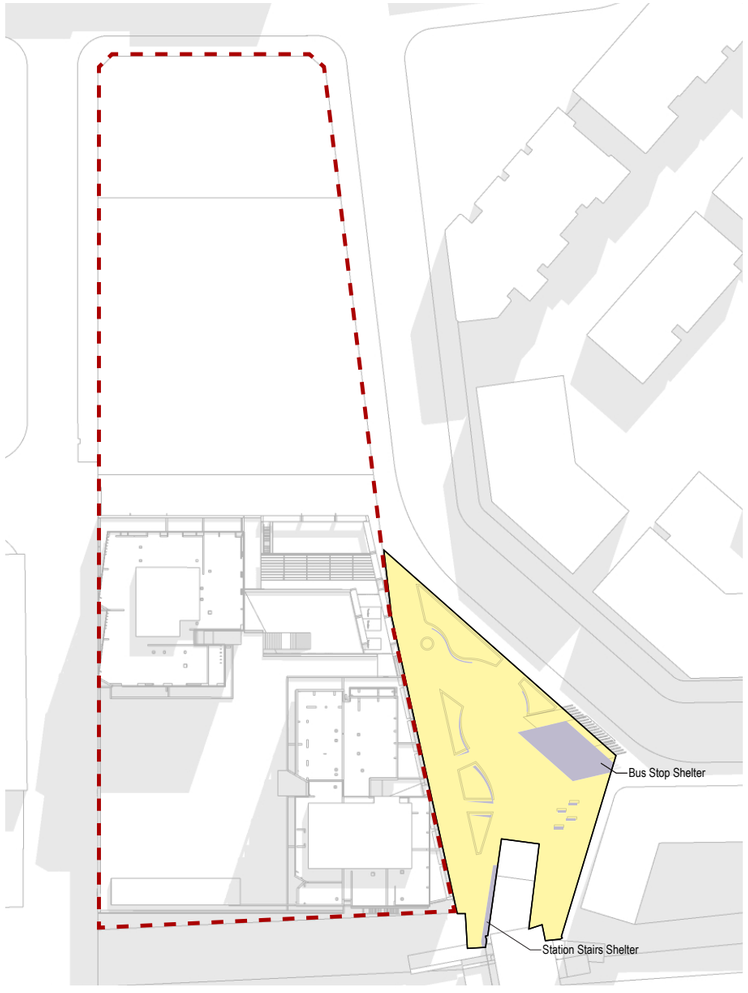
Thornton, Penrith NSW 2750

10AM Shadow Comparison: Autumn Equinox (Mar. 21)

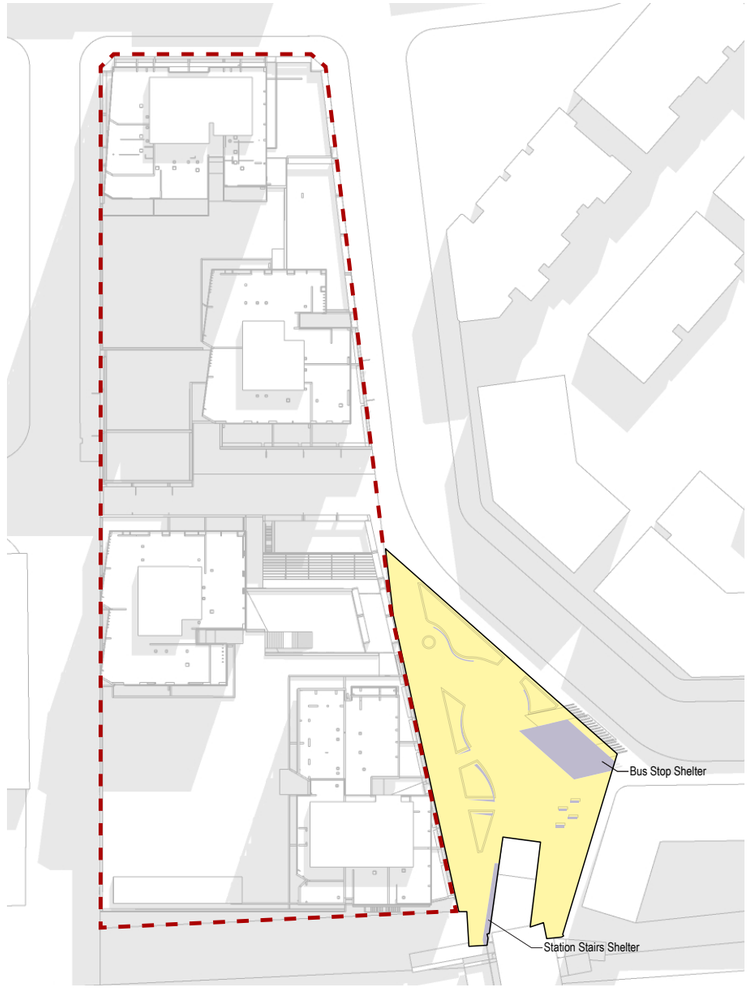
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 91.37% of sun on the area of public square

DA PROPOSAL — 91.37% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	168	0	0	0	0	0	0	0
Shadow (%)	8.63%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1778	1778		1778			
Sun (%)		91.37%	91.37%		91.37%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 10am in Spring.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 91.37% as a result.

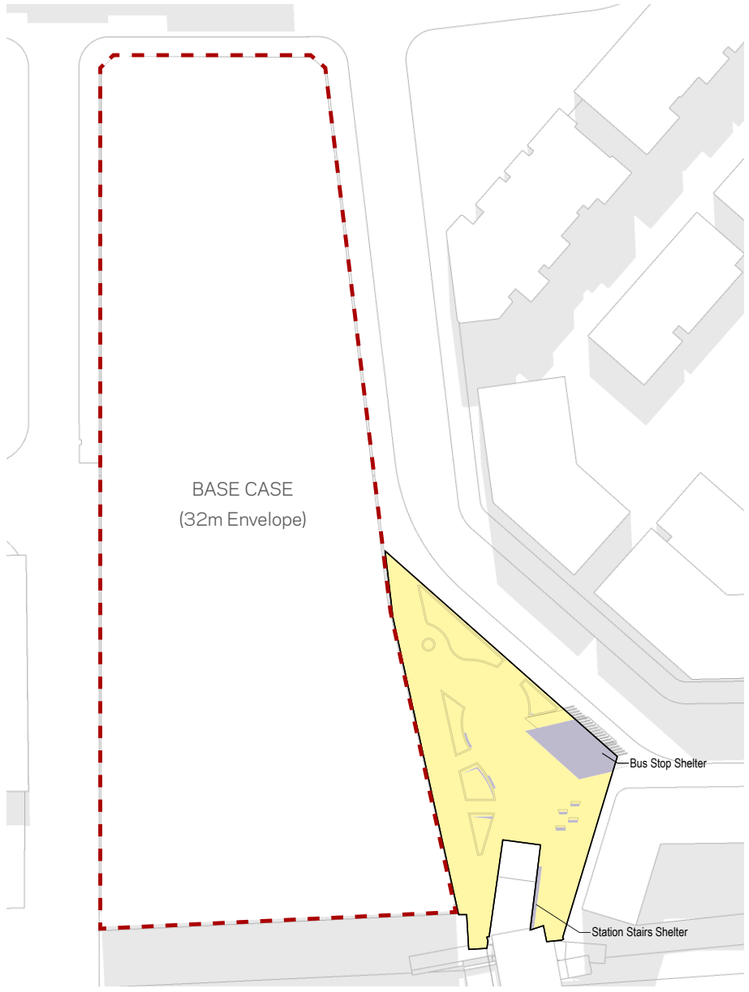
KEY

Site Boundary
Base Case Shadow
Existing Shadow
Base Case Sun Access
DA Shadow under 32m
DA Shadow above 32m
DA Additional Sun Access
Additional DA Shadow

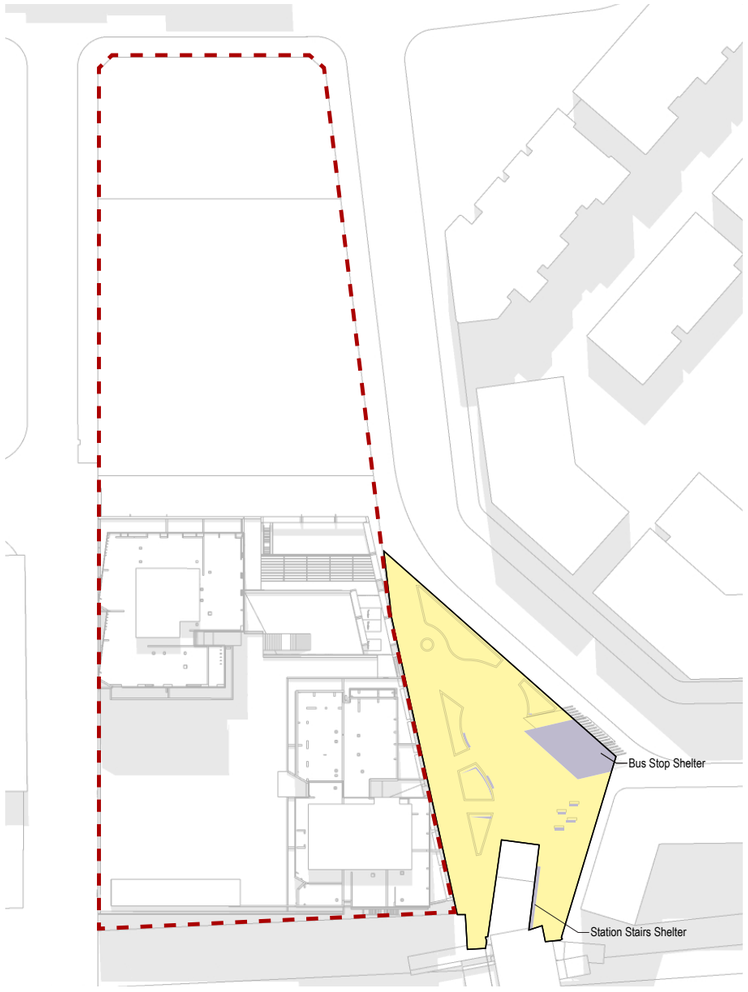
Thornton, Penrith NSW 2750

11AM Shadow Comparison: Autumn Equinox (Mar. 21)

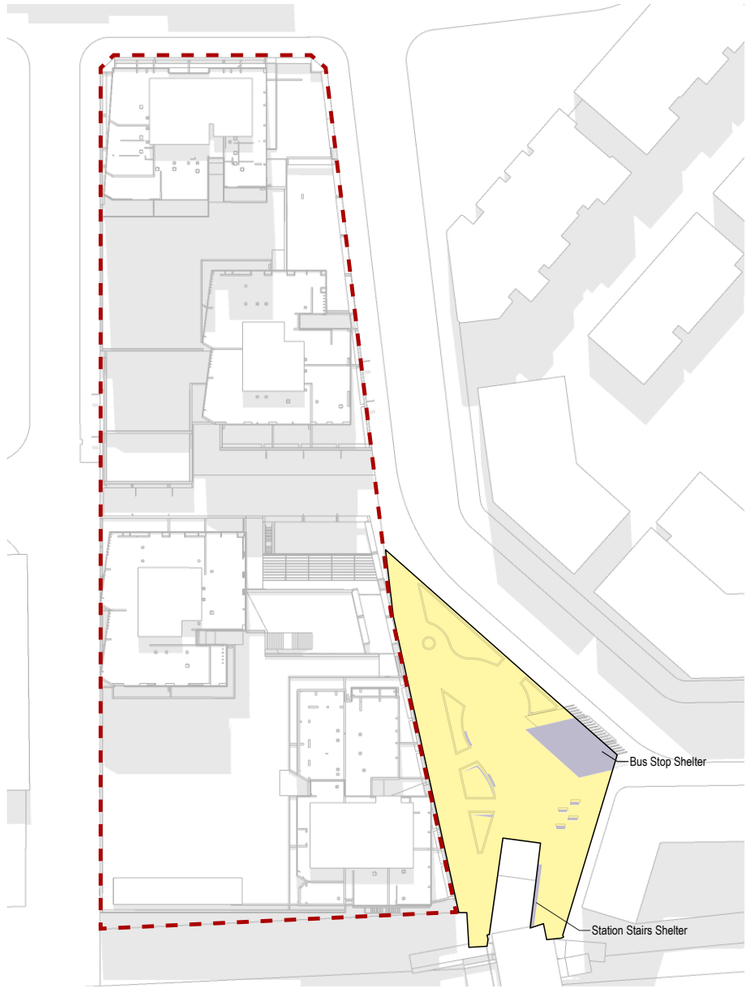
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 92.09% of sun on the area of public square

DA PROPOSAL — 92.09% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	154	0	0	0	0	0	0	0
Shadow (%)	7.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sun (sqm)		1792	1792		1792			
Sun (%)		92.09%	92.09%		92.09%			

- The plaza is **only overshadowed by existing infrastructure and surrounding buildings** at 11am in Spring.
- **DA1 + DA2** and the **Base Case** offer the same sun access value of 92.09% as a result.

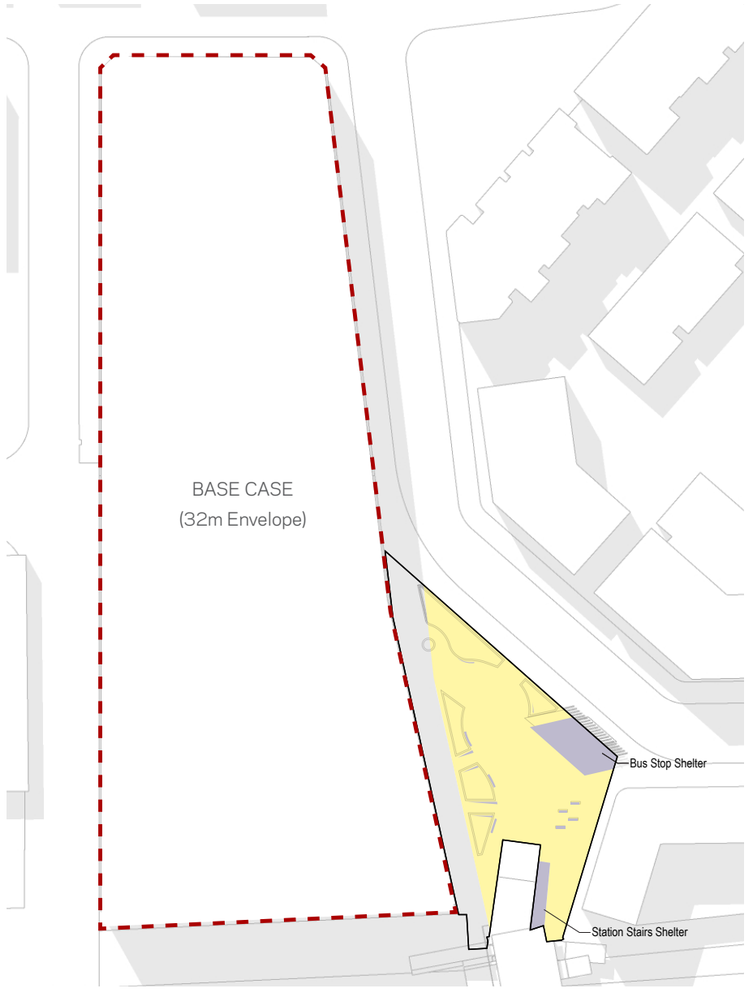
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

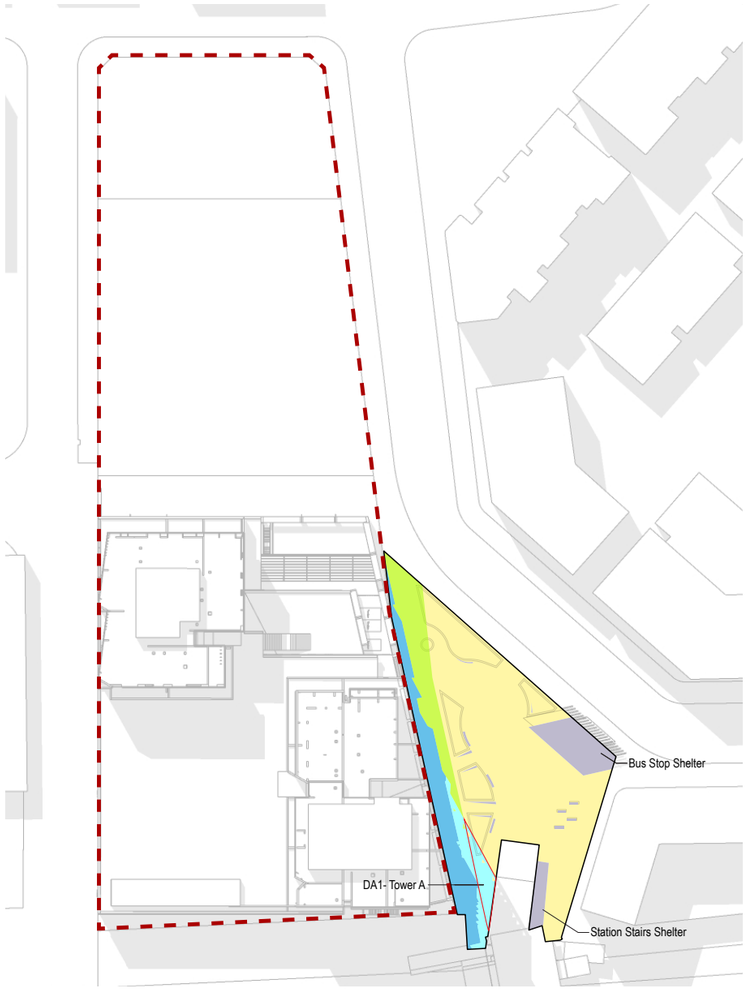
Thornton, Penrith NSW 2750

12PM Shadow Comparison: Autumn Equinox (Mar. 21)

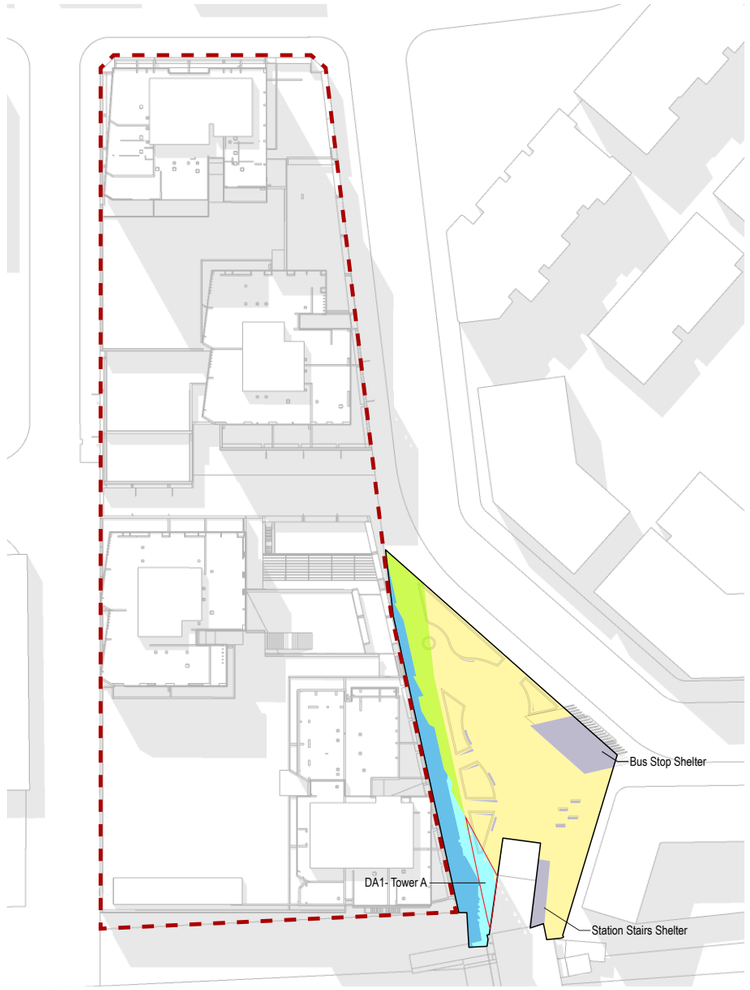
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 66.29% of sun on the area of public square

DA PROPOSAL — 74.36% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	168	488	233	99	233	99	0	0
Shadow (%)	8.63%	25.08%	11.97%	5.09%	11.97%	5.09%	0.00%	0.00%
Sun (sqm)		1290	1447		1447			
Sun (%)		66.29%	74.36%		74.36%			

- DA1 as a standalone development offers 8.07% more solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow only on the plaza's south-west perimeter, adjacent to the station stairs.
- DA1 provides additional sun access to the north-western boundary.

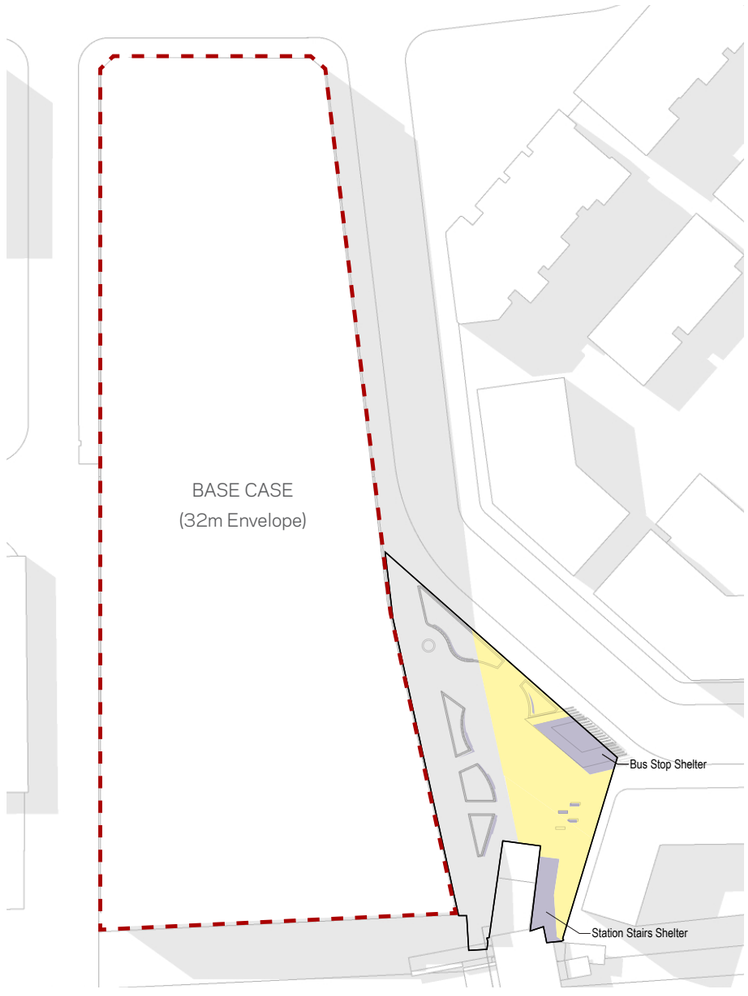
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

Thornton, Penrith NSW 2750

1PM Shadow Comparison: Autumn Equinox (Mar. 21)

DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case

Solar Access Diagram
Base Case + DA 1

Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 35.97% of sun on the area of public square

DA PROPOSAL — 40.65% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	198	1049	668	289	668	289	0	0
Shadow (%)	10.17%	53.91%	34.33%	14.85%	34.33%	14.85%	0.00%	0.00%
Sun (sqm)		700	791		791			
Sun (%)		35.97%	40.65%		40.65%			

- DA1 as a standalone development offers 4.69% more solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow only on the plaza's south-eastern perimeter.
- DA1 provides additional sun access to the northern section of the plaza.

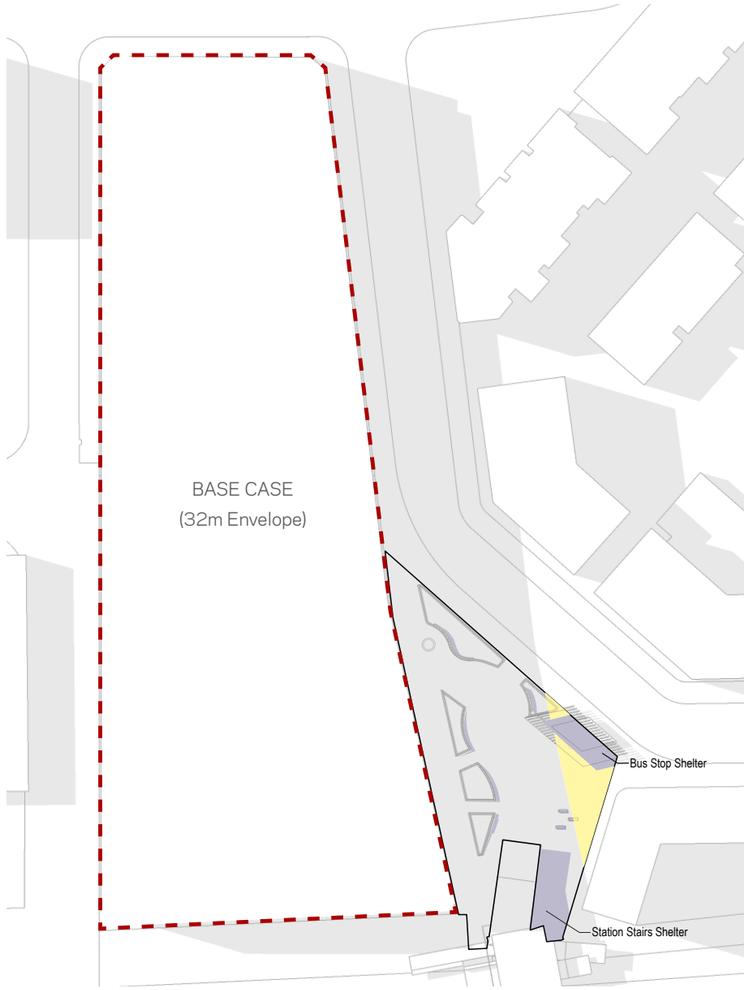
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

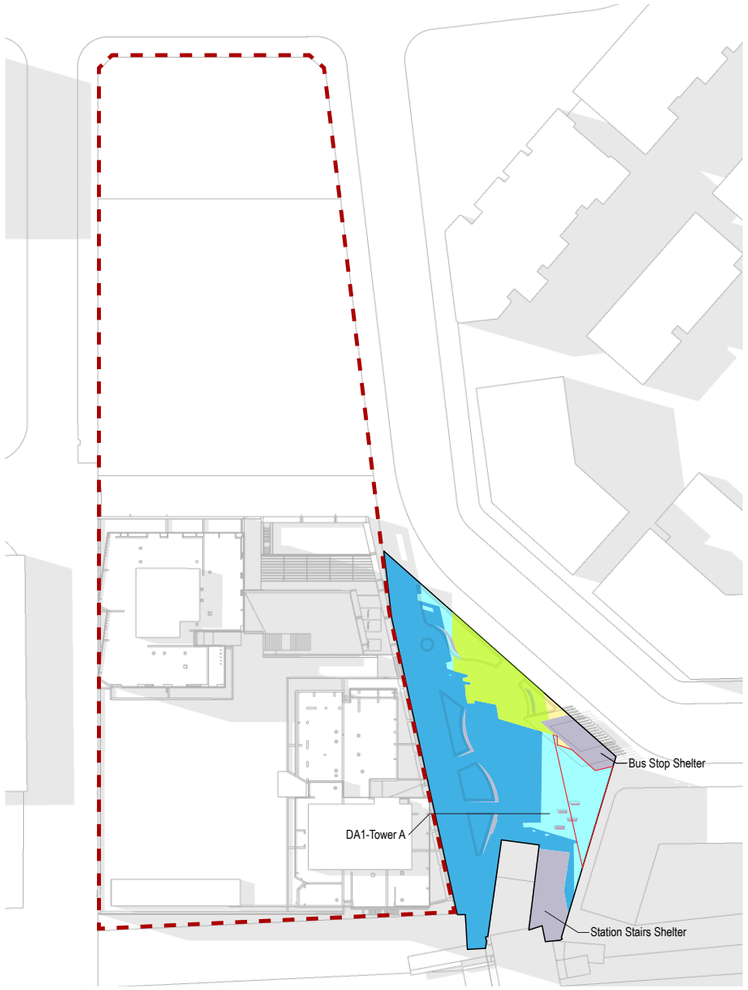
Thornton, Penrith NSW 2750

2PM Shadow Comparison: Autumn Equinox (Mar. 21)

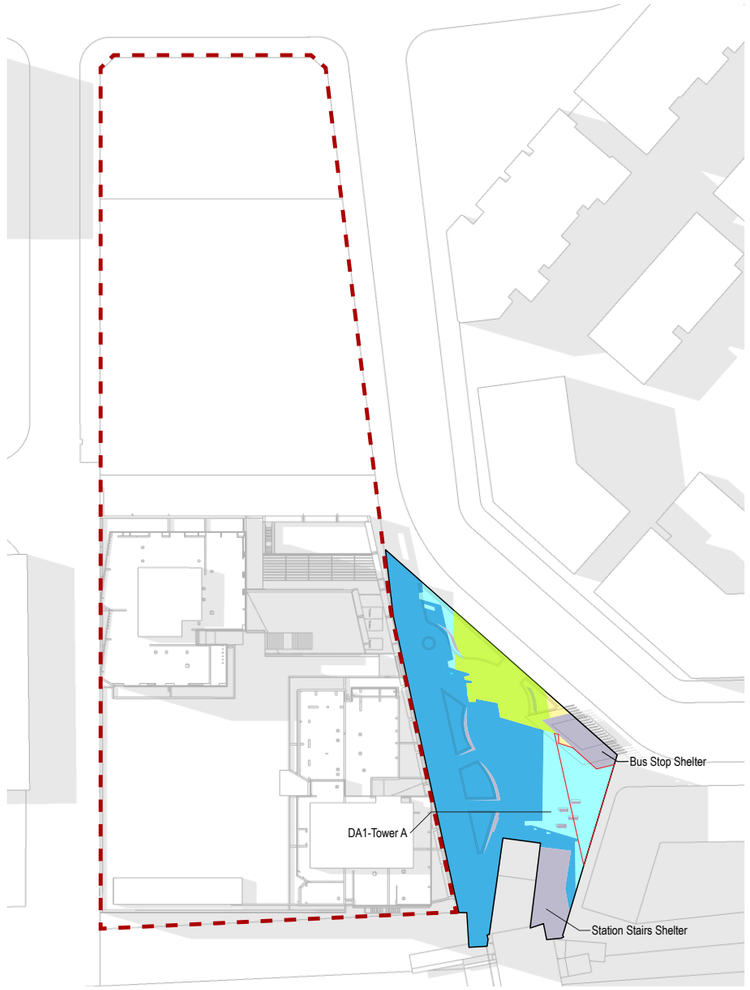
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 8.07% of sun on the area of public square

DA PROPOSAL — 12.90% of sun on the area of public square

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	228	1561	1177	289	1177	289	0	0
Shadow (%)	11.72%	80.22%	60.48%	14.85%	60.48%	14.85%	0.00%	0.00%
Sun (sqm)		157	251		251			
Sun (%)		8.07%	12.90%		12.90%			

- DA1 as a standalone development offers 4.83% more solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.
- DA1 causes additional shadow only at the plaza's eastern sector.
- DA1 provides additional sun access to the north-eastern section of the plaza.

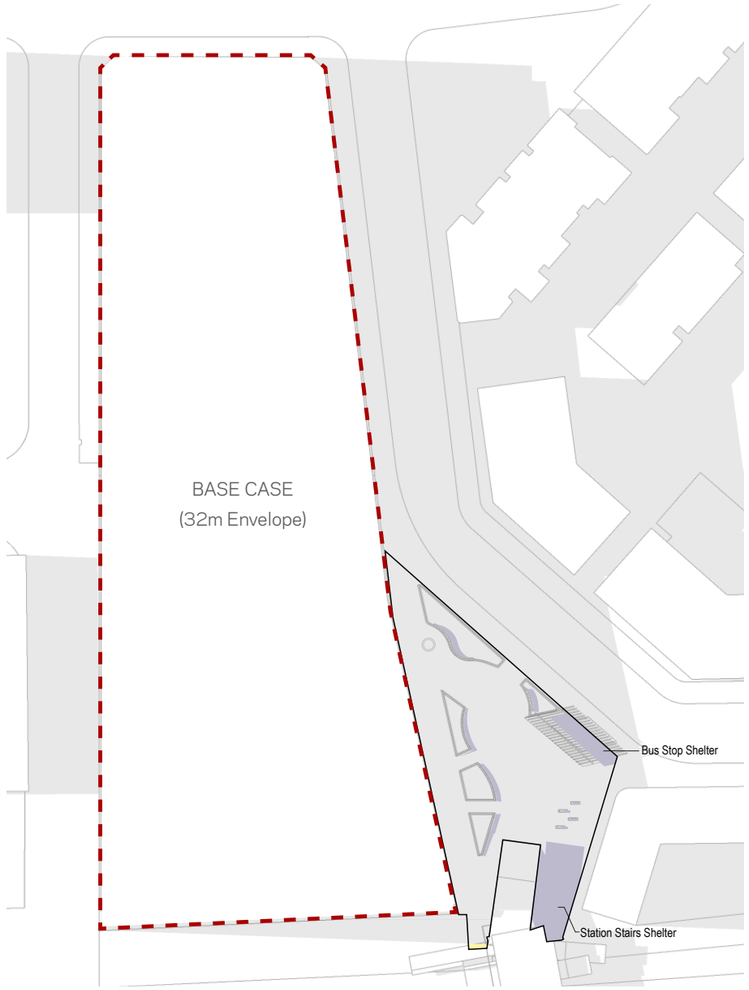
KEY

- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

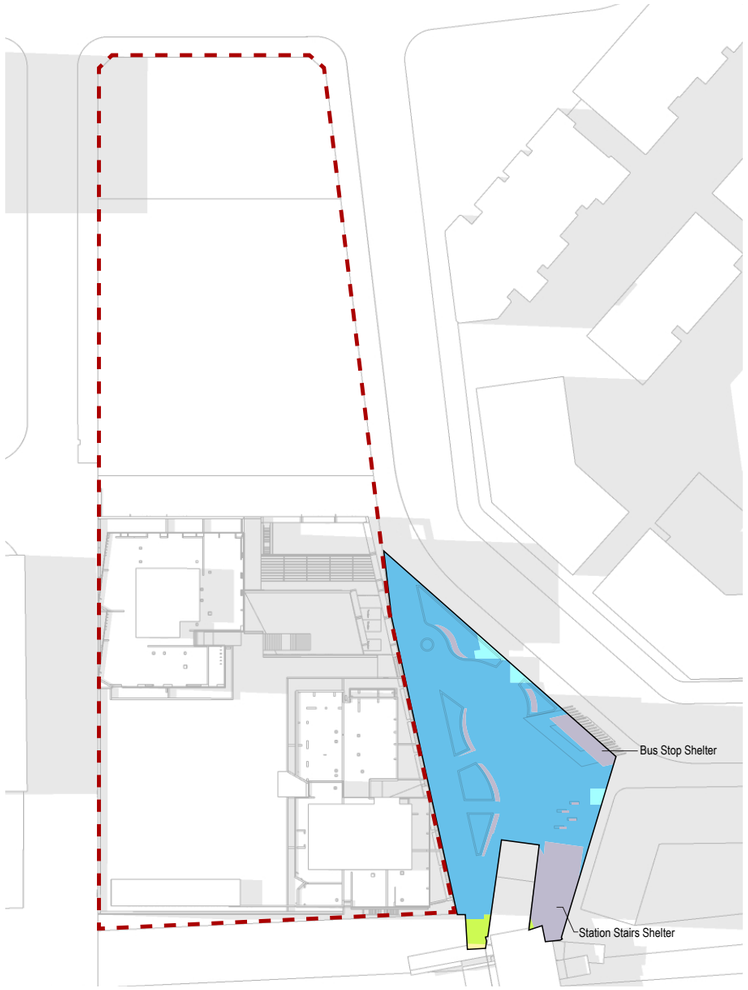
Thornton, Penrith NSW 2750

3PM Shadow Comparison: Autumn Equinox (Mar. 21)

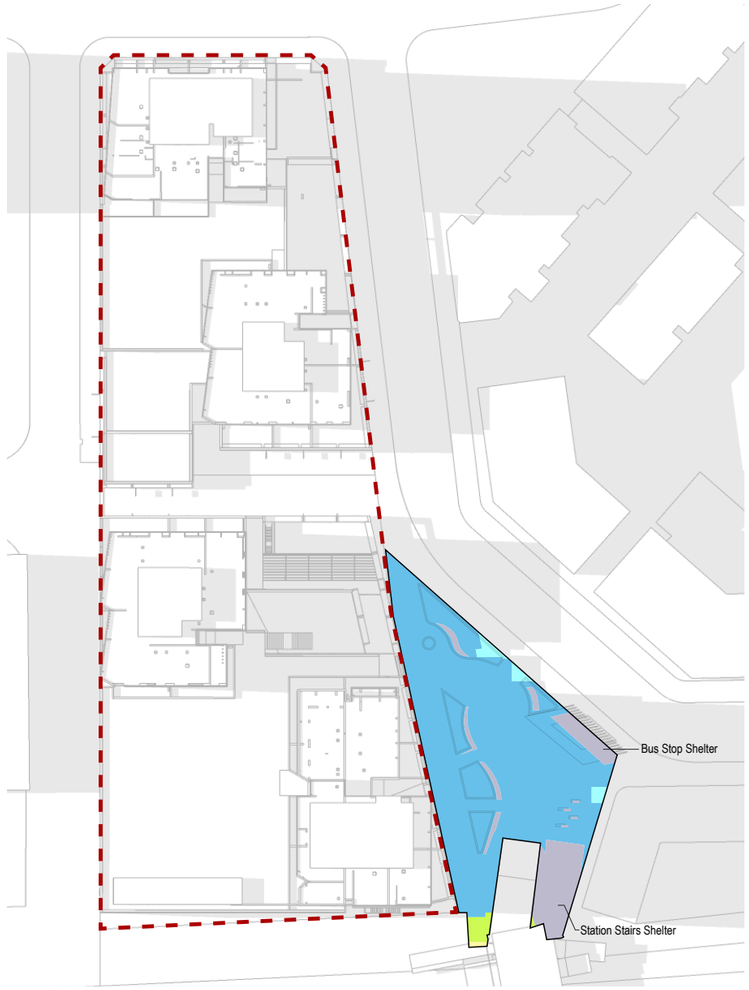
DRAWINGS NOT TO SCALE



Solar Access Diagram
Base Case



Solar Access Diagram
Base Case + DA 1



Solar Access Diagram
Base Case + DA 1 + DA 2

SUMMARY

BASE CASE — 0.16% of sun on the area of public square

DA PROPOSAL — 1.59% of sun on the area of public square

- DA1 as a standalone development offers 1.43% more solar access than the Base Case.
- DA2 does not cast shadows onto the public square at this time.

Plaza Area 1,946 sqm	Existing Infrastructure	Base Case	DA 1		DA 1		DA 2	
		32m	-32m	+32m	-32m	+32m	-32m	+32m
Shadow (sqm)	246	1689	1625	36	1625	36	0	0
Shadow (%)	12.64%	86.79%	83.50%	1.85%	83.50%	1.85%	0.00%	0.00%
Sun (sqm)		3.1	31		31			
Sun (%)		0.16%	1.59%		1.59%			

KEY

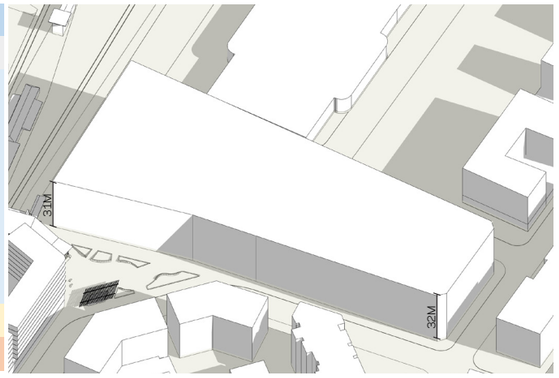
- Site Boundary
- Base Case Shadow
- Existing Shadow
- Base Case Sun Access
- DA Shadow under 32m
- DA Shadow above 32m
- DA Additional Sun Access
- Additional DA Shadow

Thornton, Penrith

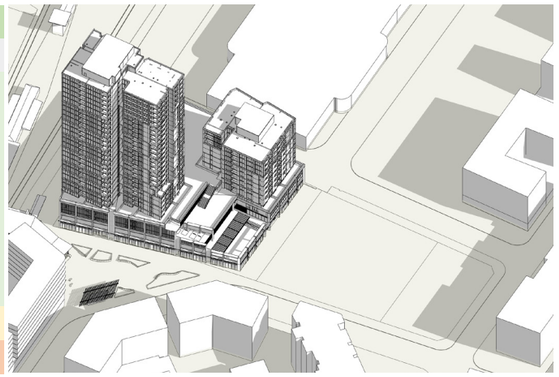
Solar Calculations for the Year

CRONE ARCHITECTS

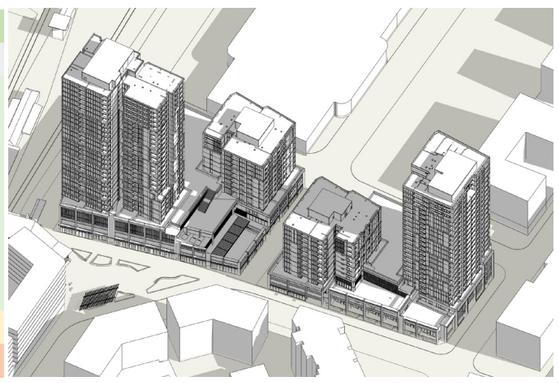
	BASE CASE (32M)			
	Winter Solstice (JUN 21)	Summer Solstice (DEC 21)	Spring Equinox (SEP 23)	Autumn Equinox (MAR 20)
9:00 AM	3.9%	57.4%	66.2%	66.2%
10:00 AM	62.7%	74.3%	91.4%	91.4%
11:00 AM	87.0%	81.2%	92.1%	92.1%
12:00 PM	46.7%	92.7%	66.3%	66.3%
1:00 PM	12.9%	87.6%	36.0%	36.0%
2:00 PM	0.0%	58.9%	8.1%	8.1%
3:00 PM	0.0%	35.4%	0.2%	0.2%
	35.5%	81.3%	60.1%	60.1%
AGGREGATE	59.2%			



	DA PROPOSAL (DA01)			
	Winter Solstice (JUN 21)	Summer Solstice (DEC 21)	Spring Equinox (SEP 23)	Autumn Equinox (MAR 20)
9:00 AM	3.9%	57.4%	66.2%	66.2%
10:00 AM	62.7%	74.3%	91.4%	91.4%
11:00 AM	87.6%	81.2%	92.1%	92.1%
12:00 PM	71.2%	92.7%	74.4%	74.4%
1:00 PM	49.0%	86.0%	40.7%	40.7%
2:00 PM	12.1%	36.5%	12.9%	12.9%
3:00 PM	0.0%	12.0%	1.6%	1.6%
	47.8%	73.4%	63.2%	63.2%
AGGREGATE	61.9%			



	DA PROPOSAL (DA01 + DA02)			
	Winter Solstice (JUN 21)	Summer Solstice (DEC 21)	Spring Equinox (SEP 23)	Autumn Equinox (MAR 20)
9:00 AM	3.9%	57.4%	66.2%	66.2%
10:00 AM	62.7%	74.3%	91.4%	91.4%
11:00 AM	87.6%	81.2%	92.1%	92.1%
12:00 PM	43.4%	92.7%	74.4%	74.4%
1:00 PM	37.1%	86.0%	40.7%	40.7%
2:00 PM	12.1%	36.5%	12.9%	12.9%
3:00 PM	0.0%	12.0%	1.6%	1.6%
	41.1%	73.4%	63.2%	63.2%
AGGREGATE	60.2%			



Note: Calculations include shadow caused by existing plaza infrastructure and surrounding buildings.

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