

**Hunter Street Station**  
Over Station Development  
Draft Design Guidelines  
September 2022

## Introduction

This document is intended to guide the design of the Sydney Metro West Hunter Street Station Over Station Development (OSD) and provides a resource to assist the evaluation of design quality and excellence.

The Hunter Street Over Station Design Guideline (Guideline) outlines the desired design and place outcomes for the Hunter Street Station towers development and includes objectives and design guidance for built form, publicly accessible spaces, amenity, movement, connectivity and interfaces between the station and OSD. It will help to achieve the design quality outcomes for the Hunter Street Station Over Station Development (over station development).

## Relationship to other documents (and instruments)

This Design Guideline is to be read in conjunction with the provisions and requirements:

- the *Sydney Local Environmental Plan 2012* (Sydney LEP 2012)
- other relevant Environmental Planning Instruments

The Guideline sets out specific guidance to inform future integrated over station development related to the Sydney Metro West Hunter Street Station.

Separate approval pathways for the station and over station development have required the preparation of separate design guidelines for each component.

While this Guideline is not a relevant matter for consideration for the Sydney Metro Hunter Street Station Infrastructure application, it addresses how over station development should be integrated with the station design. The over station development is to be designed to integrate with the Hunter Street Sydney Metro Station so as not to compromise the operation or functionality of the Metro. Where this guideline provides guidance on the Infrastructure application, it is intended to reflect a relevant best practice approach.

This Guideline should be read in conjunction with the Sydney Metro West Station and Precinct Design Guidelines.

In the case of any inconsistency between the Sydney Metro West Station and Precinct Design Guidelines (line-wide) and the specific Guideline that relates to the over station development subject of this report, this Guideline prevails.

## Purpose

The purpose of this Guideline is to provide detailed provisions for the integrated over station development related to the Sydney Metro West Hunter Street station. The Guideline supplements the provisions of the Sydney LEP 2012 by providing detailed provisions to guide development on the site.

## How to use this Design Guideline

This Guideline provides a hierarchy of objectives and design guidance (guidance) to guide the future over station development linked to the Sydney Metro West Hunter Street station, as follows:

**Objectives:** describe the outcome sought for the key matter

**Guidance:** provides guidance on how objectives on key matters can be achieved through appropriate design responses.

Development must meet the objectives. The guidance provides clear measurable benchmarks for how the objectives can be practically achieved. If it is not possible to satisfy the guidance, applications must demonstrate what other design responses are used to achieve the objectives i.e. the guidance does not represent the only way the objectives can be achieved. Where alternate solutions to the guidance is proposed it must be demonstrated how the alternative solution achieves the objectives.

The figures and diagrams included in this Guideline that describe the building envelope are indicative, intended to detail a particular design outcome that this Guideline is attempting to achieve. Appendix C – Proposed Planning Envelope Drawings are accurate scale drawings that describe the maximum default complying envelope for the over station development.

## Land Application

This Guideline applies to the land identified in Figure 1: Land Application and Hunter Street station sites. The over station development is located in the northern part of Central Sydney and comprises two sites referred to as the eastern site and the western site.

The eastern site is located on the corner of O'Connell Street, Hunter Street and Bligh Street, shown in yellow. The western site, is located on the corner of George and Hunter Street, and includes De Mestre Place, shown in red.



**Figure 1:** Land Application and Hunter Street station sites

The Sydney Metro West Hunter Street station and associated over station development related to the following addresses:

### Eastern site

28 O'Connell Street, 48 Hunter Street, and 37 Bligh Street, Sydney.

### Western site

296 George Street, 300 George Street, 312 George Street, 314-318 George Street, 5010 De Mestre Place (Over Pass), 5 Hunter Street, 7-13 Hunter Street, 9 Hunter Street and De Mestre Place, Sydney.

# Design Guideline

## Public domain and publicly accessible spaces

### Objectives

1. Recognise the important role that Central Sydney's public spaces, streets and their amenity play in a global city.
2. Incorporate high quality public spaces within and around the over station development sites.
3. Ensure new development promotes and maintains diverse and active street frontages that contribute to the vibrancy, diversity and function of the streetscape.
4. Improve permeability, pedestrian movement and connectivity with the provision of generous retail activated through site links.
5. Ensure new publicly accessible spaces provide for equitable, safe and accessible pedestrian movements.
6. Expand the public open space of Richard Johnson Square to align with the building alignment at 31 Bligh Street and improve the urban quality and active use of the space.
7. Supports any future pedestrianisation of the west end of Hunter Street by not providing parking for private vehicles on the western site that may cause potential conflicts with pedestrians.
8. Ensure footpath awnings are located to enhance pedestrian amenity and provide weather protection.
9. Provide a safe environment and minimise opportunities for criminal and anti-social behaviour.
10. Ensure development increases urban vegetation in Central Sydney.

### Guidance

1. The building fronting Richard Johnson Square shall match the alignment of the former NSW Club building at 31 Bligh Street and expand the public open space of Richard Johnson Square, which shall be open to the sky.
2. Best endeavours to ensure publicly accessible space is not divided with bollards, instead may be placed at building or station entries.
3. All street frontages and through-site links be activated through fine grained retail spaces in separate tenancies, as indicated on Figure 2: Eastern site layout - through site-links, retail activation and access and Figure 3: Western site layout - through site-links, retail activation and access.
4. Active street frontages shall be maximised by minimising building services, vehicle entries and commercial lobbies, and the main part of the commercial lobbies are to be located at a building floor level above ground floor level.
5. Ground floor level awnings are to be provided as shown in Figure 2: Eastern site layout - through site-links, retail activation and access and Figure 3: Western site layout - through site-links, retail activation and access.
6. Awnings are to be located between the ground and first floors to maximise weather protection. The height of an awning may vary between 3.2m and 4.2m above the footpath. The height of the awning must ensure continuity in appearance with adjacent awnings and to relate to any distinctive features of the building.
7. Through-site links shall be designed to:

- a. Provide a publicly accessible, equitable and safe path for pedestrians at all times.
  - b. Have a minimum clear height of 6 metres.
  - c. Include clear sight lines from end to end.
  - d. Integrate with the surrounding existing and future pedestrian network.
  - e. Provide intuitive wayfinding across city blocks.
  - f. Resolve the level changes to adjoining land using best endeavours to work with neighbouring landowners.
8. Publicly accessible spaces within the site are to demonstrate Crime Prevention Through Environmental Design (CPTED) principles, with surveillance from streets.
  9. Provision of green roofs, terraces and walls are encouraged.
  10. The City's arborists and Greening Sydney Strategy is to be considered with regard to tree species selection to maximise canopy and respond to changing climate.



**Figure 2:** Eastern site layout - through site-links, retail activation and access



**Figure 3:** Western site layout - through site-links, retail activation and access

## **Tower Massing, Setbacks and Envelopes**

### **Objectives**

1. The over station development is to be designed to integrate with the Hunter Street Sydney Metro Station so as not to compromise the operation or functionality of the Metro.
2. Towers are to be appropriately located to ensure good separation between tall buildings, across streets, maintain views to key heritage items, to the sky and create a sense of openness in the street.
3. Towers are to be designed to achieve comfortable street environments with high levels of daylight, appropriate scale and comfortable wind conditions.
4. Towers are to be designed to ensure the satisfactory distribution of built form and floor space
5. Variation to the maximum envelope described in this guide must demonstrate equal or better daylight and wind conditions in surrounding public places.

### **General Guidance**

1. Variation to setbacks may be permitted where:
  - a. a high quality urban design outcome will be achieved, through the preparation of a detailed urban design and options analysis, which demonstrates how the proposed massing is compatible with the context, and
  - b. equivalent or improved wind comfort, wind safety and daylight levels are achieved in adjacent Public Places (i.e. variation to massing is governed by achieving equal or better performance to the massing described in this Guideline), as detailed in Appendix A.
  - c. should the podium exceed the envelope defined in:
    - i. Figure 4: Western site – envelope setbacks, and
    - ii. Figure 6: Eastern site – envelope setbacksto accommodate station infrastructure or otherwise, the floor space ratio of the tower shall be adjusted accordingly and equivalent or improved wind comfort, wind safety and daylight levels are to be achieved in adjacent Public Places, as detailed in Appendix A
2. The final building design must be appropriately massed within the planning envelope, which is detailed to scale in Appendix C – Proposed Planning Envelope Drawings
3. The scale, massing and articulation of tower forms is to respond appropriately to the streetscape context, in particular heritage items.
4. Tower buildings are to enhance views to the sky and access to natural daylight from the surrounding public domain.
5. Side and rear boundaries are to include a minimum setback of 2 metres (clear to the top of the building), unless the façade does not feature windows or materials that require regular maintenance, or an easement exists for maintenance access over the adjoining land or the façade is accessible from a public place.
6. Any blank walls visible from the public domain are to be minimised, or screened with landscape or sculptural elements and encouraged to incorporate public art.

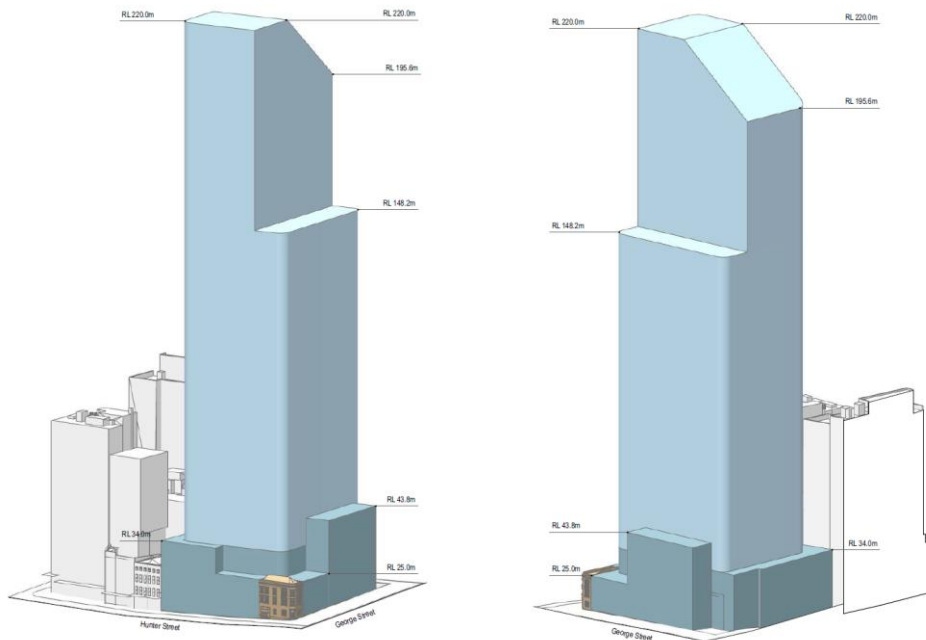
### **Guidance - Western Site**

1. Building massing, height, footprint and setbacks are to be consistent with Figure 4: Western site – indicative envelope setbacks. This envelope massing is the maximum permissible extent of the building form, the final building design must be appropriately massed wholly within this envelope.





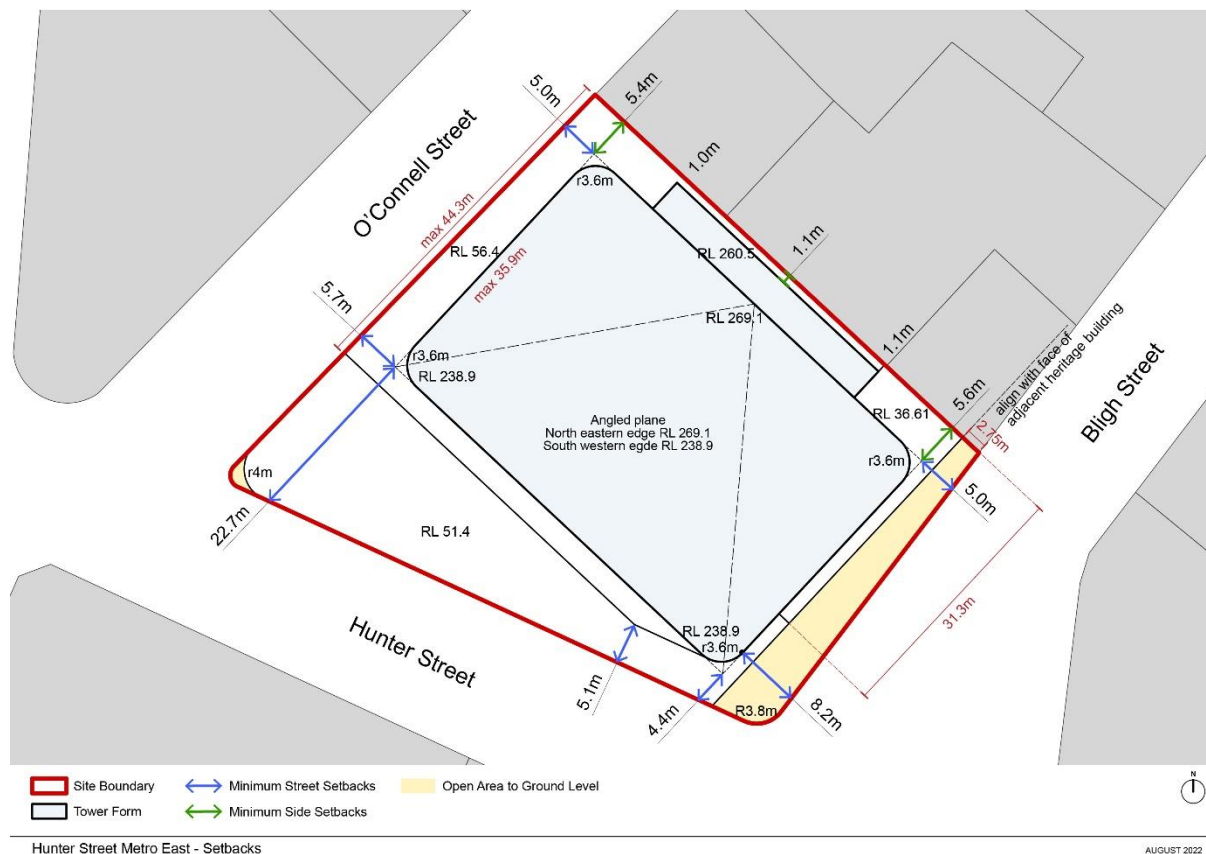
**Figure 4:** Western site – envelope setbacks



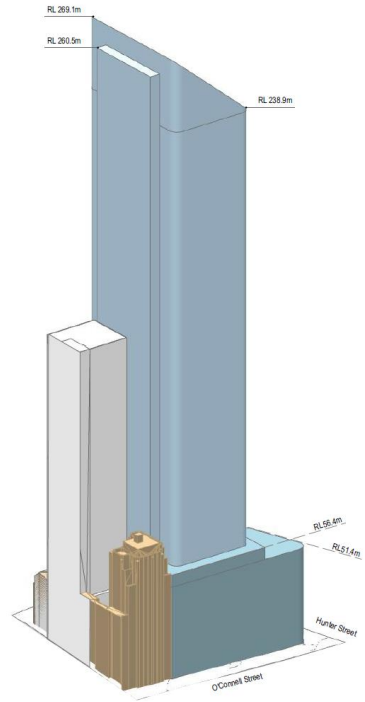
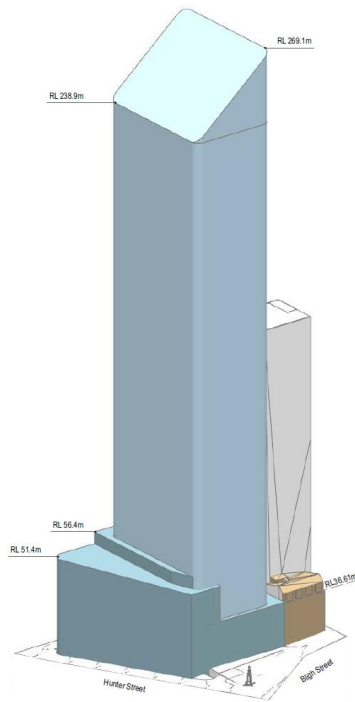
**Figure 5:** Western site – envelope massing (left – view from north west, right – view from south west)

### Eastern Site

1. Building massing, height, footprint and setbacks are to be consistent with Figure 6: Eastern site – envelope setbacks. This envelope massing is the maximum permissible extent of the building form, the final building design must be appropriately massed wholly within this envelope.
2. The tower setback on Hunter Street for the Hunter Street East development is to improve East – West visual connection with the sky and maintain the visibility of Australia Square (heritage item) as a tower in the round.



**Figure 6: Eastern site – envelope setbacks**



**Figure 7:** Eastern site – envelope massing

## Wind

### Objectives

1. Over station development is to deliver safe and comfortable wind conditions in surrounding public places.
2. The design of the over station development is to mitigate adverse wind conditions.

### Guidance

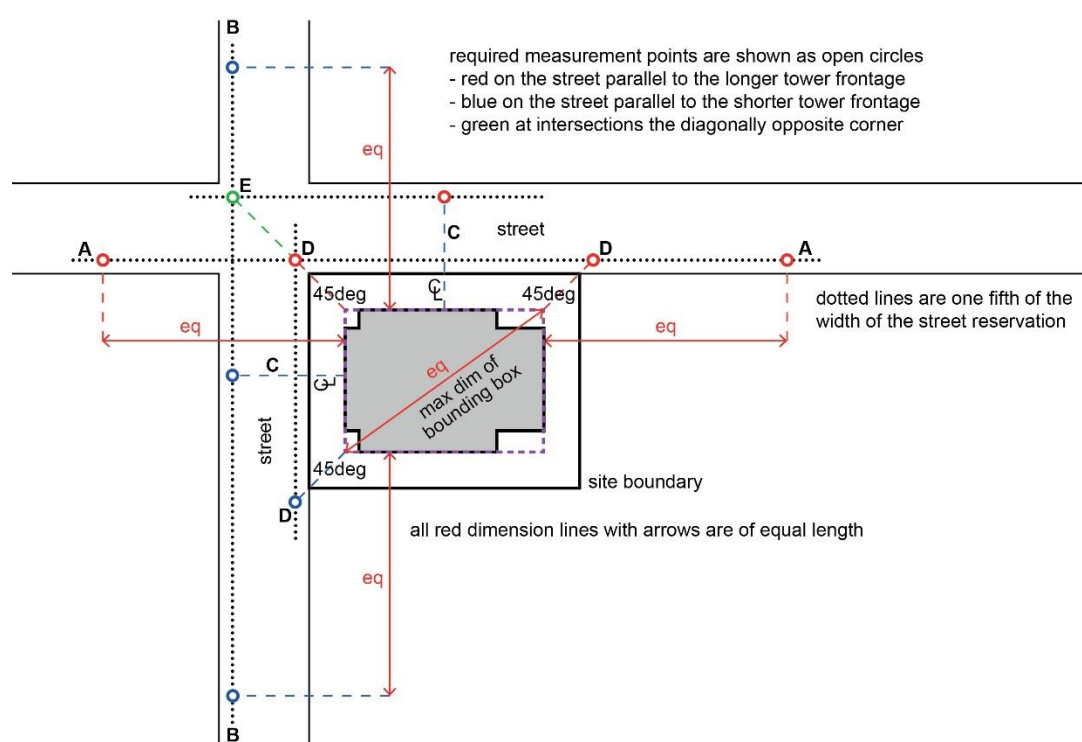
1. Development must create a comfortable wind environment that is consistent with the existing use or future intended use of the public domain, or wind comfort standards for sitting and standing.
2. Development must not:
  - cause a wind speed that exceeds the Wind Safety Standard, the Wind Comfort Standard for Walking and the Wind Comfort Standard for Sitting in Parks except where the existing wind speeds exceed the standard.
  - worsen, by increasing spatial extent and/or frequency and/or speed, an existing wind speed that exceeds the Wind Safety Standard, the Wind Comfort Standard for Walking and the Wind Comfort Standard for Sitting in Parks
3. The development application shall include a quantitative wind effects report must not exceed, or worsen an existing exceedance, of the relevant wind standards for the use of the adjacent public place as shown in Table 1: Relevant wind safety standards and criteria for adjacent public place uses.
4. A quantitative wind effects report must contain wind speed data:
  - a. for the existing built form, proposed built form, and any other options tested;
  - b. as tested at the least favourable locations. This may be subject to a peer review to confirm the least favourable locations have been selected;
  - c. as tested in areas such as bus stops, outdoor dining areas, major pedestrian crossings, building entries and other areas used by large numbers of people; and
  - d. subject to the geometry and orientation of the site, from wind testing points in accordance with Figure 8: Location of wind testing points.
5. The quantitative wind effects report is to present all wind testing data in a comprehensive table, containing:
  - a. existing, proposed and other building envelope wind conditions;
  - b. the wind comfort and wind safety conditions for each wind testing location; and
  - c. the wind speed that is exceeded for 5 per cent of relevant hours and the peak annual gust speed respectively; and
  - d. drawings of the options tested to scale with dimensions.
6. The quantitative wind effects report must include and test a development option that demonstrates compliance with the wind standards. Any wind mitigation measures cannot include tree plantings, vertical screens or other structures in public places. Consent will not be granted in circumstances where the wind report does not show compliance or notes potential compliance based on untested mitigation measures.

Adjacent public place use	Standard	Criteria
Any public place	Wind Safety Standard	Annual maximum peak 0.5 second gust wind speed in one hour measured between 6am and 10pm of <b>24 m/s</b>

Walking (e.g. footpath)	Wind Comfort Standard for Walking	Hourly mean wind speed, or gust equivalent mean wind speed (whichever is greater) for no more than 292 hours per annum measured between 6am and 10pm of no more than <b>8 m/s</b>
Standing (e.g. bus stops, retail, active frontages)	Wind Comfort Standards for Standing	Hourly mean wind speed, or gust equivalent mean wind speed (whichever is greater) for no more than 292 hours per annum measured between 6am and 10pm of no more than <b>6 m/s</b>
Sitting (e.g. outdoor dining, parks) note: Applies for development subject to a Sun Access Plane or No Additional Overshadowing controls	Wind Comfort Standards for Sitting	Hourly mean wind speed, or gust equivalent mean wind speed (whichever is greater) for no more than 292 hours per annum measured between 6am and 10pm of no more than <b>4 m/s</b>

**Note:** 292 hours is 5 per cent of all hours between 6am and 10pm each day over a year.

**Table 1:** Relevant wind safety standards and criteria for adjacent public place uses



**Figure 8:** Location of wind testing points

**Key:**

- A – Parallel to the longest faces of the tower component of the development
- locate wind testing points on the near side of the street (along line marked as A)
  - set wind testing points at a distance from the tower equal to the longest diagonal dimension of the tower, or half its height, whichever is greater in both directions along the street.
- B – Parallel to the shorter faces of the tower component of the development

- locate wind testing points on the far side of the street (along line marked as B)
  - set wind testing points at a distance from the tower equal to the longest diagonal dimension of the tower, or half its height, whichever is greater in both directions along the street.
- C – At the centre line of each face of the tower component of the development locate wind testing points on the far side of the street at the extension of the tower centreline (along line marked as C)
- D – Locate wind testing points at 45 degrees from each corner of the tower component of the development on the near side of each surrounding street (at areas marked as D)
- E – If the testing locations above span across any street intersections locate a wind testing point on the far corner of the intersection that is diagonally opposite the corner closest to the subject site (marked as E)

**Terminology:**

- Near side of the street means points located one fifth of the overall width of the street reservation from the same side of the street.
- Far side of the street means points located one fifth of the overall width of the street reservation from the opposite side of the street.

## Heritage Objectives

1. The tower and podium are to be designed to respond to and protect the heritage significance of surrounding heritage items.
2. Podium alignments and datums are to match adjacent heritage items, where possible or when not achievable visual impacts of blank walls to be mitigated.
3. The tower and podium design are to maintain visual connections for adjacent heritage items and protect important heritage vistas.
4. Provide for the conservation and sympathetic adaptive reuse of the former Skinner Family Hotel building.

## Guidance

1. Tower forms are to enhance views from public places to significant heritage items.
2. The scale, massing and articulation of the tower and podium should respond to the context of the surrounding streetscape, particularly adjacent heritage items.
3. The facades of tower elements with a close relationship to nearby heritage items must be responsive in terms of facade depth, modulation, proportion and articulation, to reinforce the character of the heritage building and the continuity of the streetscape.
4. Podiums are to be predominantly masonry in character.
5. The development application is to be informed by consultation with Sydney Water and Heritage NSW to minimise any impacts on the Tank Stream.
6. A work method statement shall be prepared, which outlines the careful management of any works directly affecting or in the vicinity of the Tank Stream, this must include a heritage induction for all contractors and trades working on construction for the duration of the project.
7. A conservation management plan for the former Skinner Family Hotel shall be prepared by a suitable qualified heritage practitioner prior to the lodgement of a development application to inform any works to the State heritage item.
8. No new openings are to be made in the south and east walls of the former Skinner Family Hotel unless they will result in no reduction to heritage significance.
9. Any new insertions to service the former Skinner Family Hotel (such as lifts, fire egress, building services and plant equipment) shall be informed by the conservation management plan. Such insertions and additions must be detailed by an appropriately qualified heritage architect and located in areas of minimal significance to as to result in minimal heritage impact.
10. Development will provide a heritage interpretation overlay that will enhance the interpretation of the heritage of the site, including pre-colonial, colonial and post-colonial history.
11. Interpretative overlays within the over station development are to be provided in conjunction and integrated with other public domain overlays such as Public Art, landscape, wayfinding, and placemaking.

## **Public Art Objectives**

1. Ensure public art is integrated and cohesive with the design of the station, over station development and public domain, and recognise former uses, heritage character and first nations knowledge.
2. Deliver sustainable and essential infrastructure in creative and innovative ways through the use of public art.

## **Guidance**

1. Public Art is to be provided in accordance with the City of Sydney Guidelines for Public Art in Private Development and the Public Art Policy.
2. Any development application for new development on the site is to be accompanied by a Public Art Strategy consistent with the City of Sydney's Public Art Strategy, Public Art Policy, Guidelines for Public Art in Private Developments and Guidelines for Acquisitions and Deaccessions.
3. Incorporate high quality public art in publicly accessible locations, such as the through-site links and building lobbies to contribute to the identity and amenity of the over station development.
4. Where appropriate, public art should reference the history of the site, recognise former uses, heritage character and detail first nations knowledge.
5. Integrate public art into ecological sustainable and essential infrastructure.
3. Interpretative overlays within the over station development are to be provided in conjunction and integrated with public art and public domain overlays such as placemaking, wayfinding and landscaped elements.
4. Development is to include an overarching conceptual approach / curatorial rationale for the selection, commissioning and delivery of public art as part of future development applications in a way that ensures the strategic intent, vision, artistic integrity and quality of all public artworks is maintained throughout the process.



## **End of Journey, Cycle and Pedestrian Network Objectives**

1. Publicly accessible spaces are to prioritise pedestrians.
2. Prioritise pedestrian and bicycle movements in accordance with the station modal access hierarchy established by Transport for NSW.
3. To encourage the use of alternatives to private motor vehicles, such as public transport, walking or cycling.
4. Support the efficient distribution of additional patronage of Sydney Metro by creating opportunities for the dispersement of pedestrian traffic around the site.
5. Improve pedestrian movement and connectivity in the area with the provision of high quality, retail activated and safe through site links.

## **Guidance**

1. The entries to the over station development are to provide direct, sheltered (from rain and sun) and equitable access for pedestrians.
2. End of trip facilities and bicycle parking that is weather protected, secure and of an appropriate scale is to be provided for employees and visitors of the over station development.
3. End of trip facilities are to have separate street access that will not obstruct the safe passage of pedestrian from the station and over station development.
4. The entrance to the end of trip facilities on each site are not to be located on George Street or adjacent to the Metro station entry.
5. Bike parking for visitors is to be provided in an accessible location near a major public entrance to the development and is to be signposted.
6. Pedestrian modelling of surrounding footpaths is to use the NSW Walking Space Guide.

## Vehicle Access

### Objectives

1. Prioritise pedestrian movements to and around the sites.
2. Minimise conflict with pedestrians by consolidating site access for vehicles servicing the station and over station development.
3. Provide vehicle servicing areas to meet the needs of the over station development and station.
4. Encourage public transport use, walking or cycling in preference to private vehicles.
5. Provide limited, co-ordinated and managed vehicle access that contributes to the activation of the public domain and ensures pedestrian priority.
6. Deliver limited private vehicle parking on the eastern site.

### Guidance

1. Due to the sites' location with high accessibility by public transport services and strong connections to the walking and cycling network, on site car parking provision for the western site should consider any future pedestrianisation of the west end of Hunter Street by not providing parking for private vehicles on the western site that may cause potential conflicts with pedestrians.
2. Sufficient space is to be provided for on-site servicing, loading and waste collection before space is allocated for private vehicle car parking, specifically:
  - a. 20 servicing and loading spaces for the Eastern site, and
  - b. 18 servicing and loading spaces for the Western site.
3. Future development application shall be accompanied with a loading dock management plan detailing how a loading dock management system and manager will be employed in future development to ensure service vehicle movements will be allocated outside of peak pedestrian periods. This is to include consideration of off-site freight consolidation and supply chain management.
4. The vehicle access point to each site is to be located in accordance with Figure 2: Eastern site layout - through site-links, retail activation and access and Figure 3: Western site layout - through site-links, retail activation and access. Vehicle access points shall be located away from intersections and key public spaces and utilise the natural topography to minimise the impact on the public domain and station.
5. Vehicular access is to be designed and managed to give priority pedestrian movement and to protect pedestrian safety.
6. Vehicle access and egress is to be designed as a single lane crossing the footpath with a maximum width of 3.6 metres and designed to ensure any queuing is contained internally within the site so vehicles do not queue across footpaths.
7. A minimum of 1 car share scheme space per 25 on-site car parking spaces is to be made available.
8. Car share parking spaces are to be provided in addition to the maximum number of car parking spaces permitted in the development.

## Water and Flood Management

### Objectives

1. Minimise risk to life from flooding due to development
2. Minimise risk of flood damage to property and infrastructure
3. Encourage the creation of active frontages to buildings that are resilient to flood impacts and maximise streetscape amenity.
4. Reduce extent of damage and support resilience and recovery from flooding events
5. Ensure development minimises the impact of stormwater and flooding on existing or planned development and the public domain both during and after a flood event.
6. Ensure stormwater is managed to minimise flooding.
7. Ensure an integrated approach to water management across the City by using water sensitive urban design principles.
8. Encourage sustainable water management practices that protects flora and fauna.
9. Ensure stormwater is managed to reduce the effects of pollution on waterways.
10. Ensure development on flood prone land does not adversely impact upon the aesthetic, recreational and ecological values of waterways.
11. Ensure water captured on-site is fit for purpose.

### Provisions

#### Flood planning levels

1. Development must provide floor levels at entries that comply with the minimum flood planning levels specified in Table 2.

Development Description		Flood planning level
Commercial Premises	Business premises	Minimum 1% AEP flood level Flood compatible materials below 1% AEP or below 1% AEP plus 0.5 m, where 1% AEP flood depth is greater than 0.25m
	Office Premises or places where valuables are stored	Minimum 1% AEP flood level Flood compatible materials below 1% AEP plus 0.5 m, where 1% AEP flood depth is greater than 0.25m
	Retail Premises	Minimum 1% AEP flood level Flood compatible materials below 1% AEP plus 0.5 m, where 1% AEP flood depth is greater than 0.25m Notwithstanding the above, without increasing risk to life, a reasonable balance between flood protection and urban design outcomes for the street must be demonstrated.
Critical Facilities	Critical Facility Floor Levels	1% AEP flood level + 0.5m or the PMF, whichever is higher
	Access to and from critical facility within development site	1% AEP flood level
Basement Areas	Basement Area car park – more than two car spaces	1% AEP flood level + 0.5m or the PMF (whichever is higher)
	Non-car park uses in basement areas	1% AEP flood level + 0.5m or the PMF (whichever is higher)

**Table 2:** Relevant flood planning levels by development type

**Note:** Where more than one flood planning level applies, the higher requirement prevails.

**Note:** For below ground development, including basements and car parks, the flood planning level control means the minimum level at each access point and any openings where flooding ingress could occur.

### Design to reduce risk and hazard

#### *Electrical and mechanical services*

1. Electricity supply and metering equipment is to be located above the designated flood planning level.
2. Electrical supply must be able to be fully isolated at the main switchboard.
3. All wiring, switches and connections are to be located above the flood planning level unless they are designed for continuous underwater immersion.
4. Building sections below the flood planning level are to be provided with separate light and power circuits.
5. Earth leakage circuit-breakers (core balance relays) or residual current devices are to be installed.
6. Only submersible type splices are to be used on circuits below the flood planning level.
7. All electricity conduits are to be designed to be self-draining.
8. The circuitry in the building shall be designed to ensure that there is no risk to life in flood events up to and including the PMF.

#### *Heating and air conditioning systems*

1. Heating and air conditioning systems are to be installed in areas and spaces above the flood planning level.
2. Heating systems using gas or oil as a fuel are to have a manually operated valve located in the fuel supply line to enable fuel cut-off.
3. The heating equipment and related fuel storage tanks are to be mounted on and securely anchored to a foundation pad of sufficient mass to overcome buoyancy and prevent movement that could damage the fuel supply line.
4. Fuel tanks are to be vented above the flood planning level.
5. All ductwork below the flood planning level is to be provided with openings for drainage and cleaning and include a closure assembly operated from above the flood planning level when ductwork passes through a water-tight wall or floor.

#### *Active or moving flood control devices or systems, including flood doors and barriers*

1. Flood control devices or systems are not permissible except where:
  - a. all other passive structural flood mitigation options, including design, have been explored and documented and council is satisfied that none of the options can be implemented;
  - b. where other options cannot be implemented and it is required to satisfy a mandatory planning and/or construction code requirement, so the development may proceed; and
  - c. the area requiring the protection of a devices or system is to be minimised through design, for example, changes to internal layout, reduced parking or floor levels.
2. Flood controls devices or systems will not be approved for the primary purpose of protecting parking areas.
3. Flood control devices or systems must be designed to withstand flood-related forces including hydrostatic load and dynamic load and impacts in a probable maximum flood event.

4. Flood control devices or systems must be certified by an appropriately experienced engineer registered on the National Engineers Register (NER).
5. Flood control devices or systems are required to be integrated into relevant openings of a building to descend from above or ascend from below to exclude floodwater.
6. Automatic closure of flood control devices or systems is required, together with an anti-opening mechanism to prevent them from being opened in a flood event.
7. Appropriate safety measures are required to support the operation of the flood control devices or systems, including, but not limited to:
  - a. an independent back-up power supply, to be used in the event of a power failure;
  - b. audible and visual alarm systems to warn of the operation of the flood doors and barriers. The alarm system must be linked to the building management system which indicates the status of the failsafe operation and back-up supply power;
  - c. flood sensors linked to the alarm system to provide information on the status of the operation of the flood control devices or systems; and
  - d. passenger lift programming is to ensure that the lift is deactivated when flood doors and barriers are activated.
8. A Plan of Management is required to accompany an application that includes flood control devices or systems. The plan must be assessed and approved concurrently with the application.
9. The Plan of Management is to:
  - a. provide comprehensive details about the flood control devices or systems, including, but not limited to, all safety measures as required by this DCP;
  - b. the site and locality details in relation to the risk of flooding, including appropriate maps;
  - c. location and operation of flood sensors
  - d. emergency plan for egress in the event of a flood event which includes:
    - i. a map directing users of the building to a suitable location;
    - ii. describe the alarm systems, details and location of flood sensors; and
    - iii. operation of lifts if they are located in a flood affected area of the building;
  - e. a plan for the how the flood control device or system is to be appropriately maintained and managed over the life of the development;
10. If approved a condition of consent will require compliance with the approved Plan of Management.

#### Drainage and stormwater management

1. Drainage systems are to be designed so: (a) stormwater flows up to the 5% annual exceedance probability event are conveyed by a minor drainage system; and (b) stormwater flows above the 5% annual exceedance probability event are conveyed by a major drainage system.
2. Development must demonstrate how the major drainage system addresses any site-specific conditions and connects to the downstream drainage system.
3. Development must demonstrate upstream and downstream natural flow paths are maintained to existing conditions.
4. Major drainage systems are to be designed so that ensures that public safety is not compromised.
5. Minor drainage flows from the development site are to be designed to comply with the Sydney Streets Technical Specification.

6. Where the proposed development is located on a floodplain, high level overflows are permitted for roof drainage systems where the overflow is set above the 1% annual exceedance probability level.
7. Discharge to the kerb and gutter is to be in accordance with the Sydney Streets Technical Specification.
8. Connection to existing stormwater infrastructure is not to reduce the capacity of that infrastructure by more than 10%, otherwise an on-site stormwater detention or retention system is to be provided.
9. The post development run-off from impermeable surfaces (such as roofs, driveways and paved areas) is to be managed by stormwater source measures which:
  - a. contain frequent low-magnitude flows;
  - b. maintain the natural balance between run-off and infiltration;
  - c. remove some pollutants prior to discharge into receiving waters;
  - d. prevent nuisance flows from affecting adjacent properties; and
  - e. enable appropriate use of rainwater and stormwater.
10. Post-development stormwater volumes during an average rainfall year are to be:
  - a. 70% of the volume if no measures were applied to reduce stormwater volume; or
  - b. the equivalent volume generated if the site were 50% previous, whichever results in the greater volume of detention required.
11. Stormwater detention devices are to be designed to ensure that the overflow and flow path have sufficient capacity during all design rainfall events, discharge to the public stormwater system without affecting adjoining properties, and are free of obstructions, such as fences.
12. Where infiltration and bio-retention devices are proposed, they are to be designed to capture and provide temporary storage for stormwater.
13. Car parking areas and access aisles are to be designed, surfaced and graded to reduce run-off, allow stormwater to be controlled within the site, and provide for natural infiltration of stormwater runoff through landscaping.

#### Stormwater quality

1. A stormwater quality assessment must be undertaken to demonstrate the development will achieve pollutant load standards indicated below:
  - a. reduce the baseline annual pollutant load for litter and vegetation larger than 5mm by 90%;
  - b. reduce the baseline annual pollutant load for total suspended solids by 85%;
  - c. reduce the baseline annual pollutant load for total phosphorous by 65%; and
  - d. reduce the baseline annual pollutant load for total nitrogen by 45%.

#### Water re-use, recycling and harvesting

1. Development proposals that seek to re-use water runoff from paved surfaces for irrigation and wash down purposes are to incorporate measures into the design of the development that will treat the water to ensure that it is fit for this purpose
2. Where there is a commitment to provide a recycled water network, it is recommended the over station development is constructed to be capable of providing a dual reticulation water system for water services and be capable of fully connecting to a non-potable recycled water network and configured to supply all toilets, washing machine taps, car wash bays, cooling towers and irrigation usage.

## Waste Management

### Objectives

1. Reduce the amount of construction and demolition waste going to landfill and maximise reuse of materials for construction.
2. Ensure sufficient space is provided for the separation, management and storage of waste to maximise resource recovery.
3. To minimise the amount of waste generated in the operation of a development from going to landfill and maximise resource recovery.
4. Ensure waste from within developments can be collected and disposed in a manner that is healthy, safe, efficient, minimises disruption to amenity, and is conducive to the overall minimisation of waste generated.
5. To meet and exceed NSW Government and City of Sydney resource recovery and waste avoidance targets.
6. To meet and exceed the City of Sydney's *Guidelines for Waste Management in New Developments*.
7. To enable the safe and efficient collection and transport of waste and recycling from the precinct.
8. To embed and deliver circularity in the use of resources and materials.
9. To support building longevity beyond their original intended use.

### Guidance

1. All developments must comply with the City of Sydney's *Guidelines for Waste Management in New Developments*.
2. Development is to provide adequate space within buildings for onsite waste infrastructure, source separated streams, including general waste, recycling, organics, bulky and problem waste and accessibility for the safe and efficient transfer and collection of waste.
3. A Waste and Recycling Management Plan is to be submitted with any Development Application and will be used to assess and monitor the management of waste and recycling during construction and operational phases of the proposed development. This plan is to be prepared in accordance with the City of Sydney's *Guidelines for Waste Management in New Developments*.
4. The Waste and Recycling Management Plan must include the following with regard to the management of demolition and construction waste:
  - Details regarding how waste is to be minimised during the demolition and construction phase.
  - Estimations of quantities and types of materials to be re-used or left over for removal from the site.
  - Details regarding the types of waste and likely quantities of waste to be produced.
  - A site plan showing storage areas away from public access for reusable materials and recyclables during demolition and construction and the vehicle access to these areas.
  - Targets for recycling and reuse.
  - Nomination of the role responsible for ensuring targets are met and the person responsible for retaining waste dockets from facilities appropriately licensed to receive the development's construction and demolition waste.
  - Confirmation that all waste going to landfill is not recyclable or hazardous.
  - Measures to reuse or recycle at least 90% of construction and demolition waste.
5. The ongoing/occupation Waste and Recycling Management Plan is to address and include:

- (a) Estimates of waste and recycling that will be generated and the number of bins and collection frequency to manage the waste generated;
  - (b) Plans and drawings of the proposed development that show:
    - i. The location and space allocated to the waste and recycling management systems;
    - ii. The nominated waste collection point/s for the site; and
    - iii. The path of access for users and collection vehicles.
  - (c) Details of the ongoing management of the store and collection of waste and recycling, including responsibility for cleaning, transfer of bins between storage areas and collection points, maintenance of signage, and security of storage areas; and where appropriate to the nature of the development, a summary document for tenants and residents to inform them of waste and recycling management arrangements.
  - (d) Development is to include a separate space in a room or screened area for the storage and management of bulky waste (this can include furniture, mattresses and stripout waste) and problem waste (this can include lightbulbs and electronic waste) for recycling collection.
6. Development is to provide a loading area, vehicle access and parking adequately sized to meet servicing needs of all buildings/developments served by the loading facilities.
  7. Development is to identify and consider building and or precinct-scale solutions to maximise resource recovery including onsite separation of food waste.

#### Waste Collection and loading

1. Waste collection and loading is wholly accommodated onsite.
2. Any waste collection and loading point is designed to:
  - a. Allow waste collection and loading operations to occur on a level surface away from vehicle ramps;
  - b. Provide sufficient side and vertical clearance to allow the lifting arc for automated bin lifters to remain clear of any walls or ceilings and all ducts, pipes and other services
3. Vehicle access for waste collection and loading provides for:
  - a. at a minimum, a 9.25m Council garbage truck and a small rigid delivery vehicle
  - b. minimum vertical clearance of 4.0 metres clear of all ducts, pipes and other services, depending on the gradient of the access and the type of collection vehicle
  - c. collection vehicles to be able to enter and exit the premises in a forward direction. Where a vehicle turntable is necessary to meet this requirement, it is to have a capacity of 30 tonnes
  - d. maximum grades of 1:20 for the first 6m from the street, then a maximum of 1:8 with a transition of 1:12 for 4m at the lower end
  - e. a minimum driveway width of 3.6m
  - f. a minimum turning circle radius of 10.5m
4. Where vehicle access is via a ramp, design requirements for the gradient, surface treatment and curved sections are critical and must be analysed at an early stage in the design process.

#### Circular economy and materials

1. Development seeks to maximise re-used material or material from a renewable source in construction.



2. Development is capable of delivering a low-emissions approach to the construction of the precinct and its embodied carbon impacts.
3. Buildings are designed to be capable of accommodating alternative future uses beyond conventional office-based workplaces.
4. The development must provide space for circular economy infrastructure.

## Environmentally Sustainable Design (ESD)

### Objectives

1. Minimise energy and water use and waste generation
2. Maximise on-site renewable energy generation, water re-use and waste recycling.
3. Contribute towards the establishment of an integrated transport hub that contributes towards improved connectivity.
4. Reinforce Sydney's global standing through significant improvements to public transport accessibility.
5. Ensure development is consistent with best practice performance benchmarks for ecologically sustainable development, minimises embodied and operational carbon emissions, delivering net zero energy operation.

### Guidance

1. Development is to achieve the following minimum ratings:
  - 6 star Green Star Buildings rating – Climate Positive Pathway
  - 6 star NABERS Energy for Offices – without GreenPower
  - 4.5 star NABERS Water for Offices
2. All development is to be designed to maximise passive design approaches including provision of balanced window to wall ratios and high levels of external sun shading.
3. Developments must provide a sustainability strategy that considers the Planning for net zero energy buildings and its guidance on embedding energy efficiency measures and supplying on-/ off-site renewable energy to set a path to net zero.
4. Commercial development is to deliver a 40% reduction in annual water consumption.
5. The consent authority must be satisfied that office development is capable of achieving net zero energy for the base building prior to commencing use through achievement of:
  - a. 6.5 Star NABERS Energy Commitment Agreement + 25%; or
  - b. certified Green Star Buildings rating with a "credit achievement" in Credit 22: Energy Use; or
  - c. a maximum of 45 kWh/yr/m<sup>2</sup> of GFA and
  - d. renewable energy procurement for a period of at least 5 years equivalent to "net zero energy":

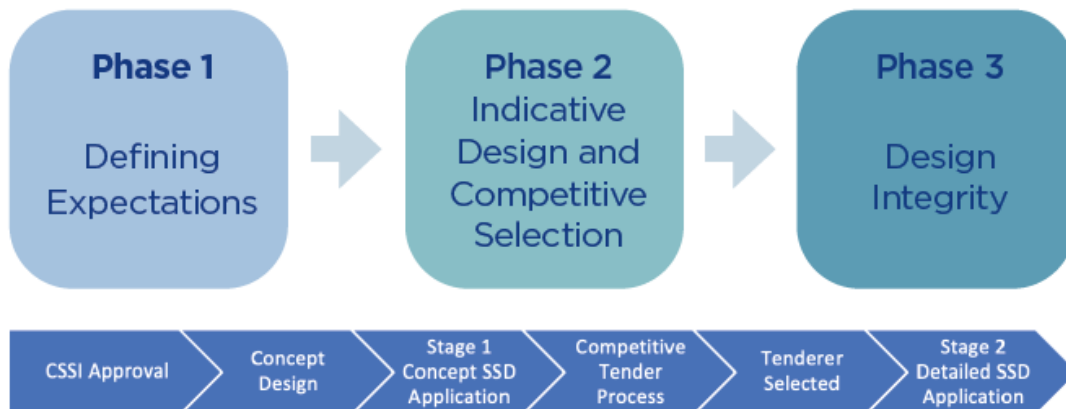
For clarity, development must be demonstrated to be capable of achieving (d) and either (a), (b) or (c).

6. In this sub-section:
  - a. net zero energy means the development consumes no more energy than is provided by a combination of:
    - i. renewable energy generated on-site, and/or
    - ii. renewable energy sourced/procured from off-site sources. In this definition, energy includes gas, electricity and thermal energy, and excludes diesel used for emergency back-up generation. Other emissions, such as those from refrigerants, are not included.
  - b. renewable energy means energy that comes from natural resources such as sunlight, wind and rain that are renewable (naturally replenished).
7. The development is to be designed to include the following environmental performance and features:
  - a. GreenStar Building – achieves 6 star;

- b. only electrically powered plant and equipment be used for all parts of the existing and proposed development including replacement of all existing plant and equipment except for back-up generators;
  - c. all plant and equipment to use only natural refrigerants where possible or refrigerants with global warming potential (GWP) of not more than 10 for central chilled water generating plant, or not more than 700 for unitary equipment;
  - d. electricity sub-metering metering is to be provided for light, air conditioning and power within each floor and/or tenancy;
  - e. integrated façade photo-voltaic panels where feasible;
  - f. operational and embodied carbon emissions – provide an operational and embodied carbon emissions integrated design options report that demonstrates how operational and embodied carbon emissions have been minimised over the lifecycle of development through options analysis, including but not limited to, structural optimisation to reduce material volumes relative to a tower with an 8m structural grid, optimisation of use of low embodied carbon materials and optimisation of external shading and window to wall ratios (benchmarked against a 50% ratio with high levels of shading, high R value and low embodied carbon wall construction);
  - g. include space allocation and infrastructure to enable daily management of all on-site organic waste including separation, storage and either onsite composting or collection and transfer to organic waste processing facility.
8. Design and performance and features in (1) and (3) are to be referenced in City of Sydney *Design for Environmental Performance Template* submitted with the detailed development application.
  9. Minimal private vehicle car parking on the eastern site and zero car parking spaces on the western site is strongly encouraged.

## Design Excellence

This site-specific over station development design guideline complements the Sydney Metro West Design Excellence Strategy (the Strategy), which includes Hunter Street Station. Integrated station development and station designs are very complex and must be tightly integrated below, above and at ground level. Designs also need to respond to site constraints including location, topography and configuration. The over station development above the station will be integrated with critical state significant station infrastructure below. This design guideline outlines the process future OSD must follow to demonstrate that design excellence has been achieved for the development.



**Figure 9:** Design Excellence Strategy for Integrated Station Developments

The Sydney Metro West Design Excellence Strategy follows a three-phase process and is comprised of the following elements:

- **Sydney Metro Design Advisory Panel (DAP):** The DAP guides the preparation of precinct masterplans, concept designs for the station infrastructure and integrated property developments and reference designs for CSSI, planning proposals and concept SSD applications for integrated station development.
- **Design Review Panel (DRP):** The DRP provides independent, design review advice of stations and interchange areas, ancillary facilities and integrated station development throughout procurement and delivery stages of stations and development. The DRP will be reconvened after the competitive selection process has been completed. The DRP will provide on- going design review advice of the station design and over station development in the Design Integrity phase.
- **Design Excellence Evaluation Panel (DEEP):** The DRP will delegate the responsibility of design review/evaluation during tender and procurement to the DEEP. The DEEP will be established to provide an independent evaluation of the Hunter Street integrated station development proposals to support design excellence. The DEEP provides advice to tenderers on the capability of achieving design excellence and informing the decision making process.

## Objectives

1. The over station development is undertaken in accordance with the Sydney Metro West Design Excellence Strategy.
2. Establish a competitive selection process that ensures:

- a. the development will exhibit design excellence;
  - b. the Sydney Metro design excellence approach delivers high quality architectural, urban and landscape design outcomes and a structured process ; and
  - c. procedural fairness for competitive tenderers.
3. Provide consistency of design excellence approach across the Sydney Metro West line, notwithstanding the specific local government area that each station may be located within.

## Process

1. Sydney Metro establishes a Design Advisory Panel (DAP) to embed design excellence and introduce rigour in design development across the Sydney Metro West Hunter Street sites.
2. The DRP must be established prior to the commencement of the competitive selection process. The role of the Sydney Metro West DRP is to provide independent design review advice of stations and interchange areas, ancillary facilities and integrated station development throughout procurement and delivery stages of stations and development. The constitution of the DRP, including panel, size and membership, and terms of reference is to be determined in consultation with Government Architect NSW. The DRP is to include a member nominated by the City of Sydney.
3. The DEEP must be consulted in the preparation of the competitive tenders for the Hunter Street integrated station development. DEEP members will comprise design experts who are recognised as advocates for design excellence and may be drawn from members of the DRP. The DEEP will be chaired by GANSW or their nominee and will include a member nominated by the City of Sydney.
4. In considering the tender submissions for the Hunter Street integrated station development the DEEP must evaluate whether each competitive tender submission demonstrate the capability to achieve design excellence in accordance with the relevant matters for consideration in clause 6.21C of the Sydney Local Environmental Plan 2012.
5. The advice and/or recommendations of the DEEP on the final competitive tender submissions must be documented in a Design Excellence Report. The report will provide a summary of each tender's design including an overview of the assessment and design merits. Should the potential to achieve design excellence not have been demonstrated through one or more competitive tender submissions, the DEEP must identify the areas in which the proposal is deficient and why these matters cannot foreseeably be resolved.
6. Prior to the lodgement of any detailed design of OSD for the land, the applicant must prepare a Design Integrity Report that is by the DRP, that demonstrates how the advice of the DRP and the DEEP has been incorporated into the proposed development and that design excellence can be achieved on the site.
7. No additional floor space or building height under Clause 6.21D(3) or Clause 6.21E of the Sydney Local Environmental Plan 2012 is to be awarded as a result of this competitive selection process.
8. In addition to and separate from the City of Sydney nominated member of the DRP, the City of Sydney may nominate an observer(s) to the Design Review Panel.
9. Tender submissions are to support diversity of design teams and city making opportunities by including design teams with:

- a. demonstrated capability in design excellence by being the recipient of an Australian Institute of Architects (AIA) award or commendation, or in the case of overseas design teams, the same with their equivalent profession.
  - b. a breadth of local, international, small scale, medium scale and emerging architectural firms.
- 10. Sydney Metro will encourage partnering of non-TAO firms with TAO firms to enable participation of a wide range of design firms with diverse design approaches, representing design excellence in fields outside of rail development.
- 11. Each Hunter Street Metro site (east and west) must be designed by a different architectural firm.
- 12. Successful tenderers are to retain their design team through to delivery.

## **Appendix A**

### **Schedule 12 of the Sydney Development Control Plan 2012**

Variations to setbacks detailed in Figure 4: Western site – envelope setbacks, Figure 5: Western site - envelope elevations, Figure 7: Eastern site – indicative envelope setbacks and Figure 8: Eastern site – envelope setbacks may be permitted where:

- a. a high quality urban design outcome will be achieved, through the preparation of a detailed urban design and options analysis, which demonstrates how the proposed massing is compatible with the context, and
- b. equivalent or improved wind comfort, wind safety and daylight levels are achieved in adjacent Public Places (i.e. variation to massing is governed by achieving equal or better performance to the massing described in this Guideline), as detailed in Procedure B.

#### **Procedure B:**

#### **Equivalent or improved wind comfort and wind safety and daylight levels in adjacent Public Places**

Procedure B is used for demonstrating compliance in regards to varying Minimum Street Setbacks, Side and Rear Setbacks, Street Wall Height, Building Form Separations and Tapering provisions.

While usually a base case model is prepared which meets all the requirements set out for Procedure B, in this context the base case is determined to be the envelopes provided for in these Guidelines. It should be noted that these envelopes have been tested in their preparation to be equivalent to the base case model that was tested to establish the minimum performance benchmarks for daylight levels (or sky view factor) and wind comfort and safety in public places adjacent to the site. The alternative building envelopes are tested for equivalence against these performance benchmarks.

The base case model (envelopes contained in these Guidelines) and any proposed alternative building envelopes are tested, with the results of this performance benchmark equivalence testing used to demonstrate that the proposed alternative envelopes perform better than the base case in relation to daylight levels (or sky view factor) and wind performance. This informs the suitability of proposed variations to the setbacks, street wall height, building form separation and tapering controls in relation to measurable daylight (or sky view factor) and wind performance.

Any proposed building envelope needs to demonstrate that a high quality urban design outcome will be achieved through the preparation of a detailed urban design and options analysis that demonstrates how the proposed massing is compatible with the context, and is in accordance with all the relevant controls.

#### **1. Model Testing**

The wind and daylight testing of the base case model and alternative building envelopes are to include measurements in public places for a distance of at least 50m and no more than 100m from the site boundary. The tests must exclude any elements within a Public Place (e.g. trees and awnings) and must satisfy the following requirements for wind and daylight (or sky view factor):

- a. Wind: wind speeds are defined by Section 5.1.9 Managing Wind Impacts, Sydney DCP 2012 for comfort and safety.

Wind speeds must be measured within the existing city form and be distributed evenly across the surrounding public places and include testing locations in areas where wind speeds are likely to change as determined by a wind report.

- b. Daylight Factor: the average annual daylight level (which may be approximated by the average Sky View Factor) and should be measured on a 1m grid.
  - i. Daylight Factor is the percentage of available daylight, on a daily basis, throughout the year.

Daylight Factor is weighted by the daily availability of light (assuming an open environment), to account for variations in amount of light throughout the year, rather than an average annual quantum of daylight.

To calculate the Daylight Factor: simulate the available direct and diffuse illuminance that reaches the ground level of the adjacent public places each day for a typical year for the base case and alternative building envelopes and express them as daily percentages of the maximum available daylight in an equivalent open environment for each day. The daily percentage factors are then averaged to give a single Daylight Factor value for each option. These Factors can then be compared.

The daylight calculations are to include consideration including the directionality of sunlight, diffuse daylight access, seasonal weather variation, and typical luminance variation of the sky.

- ii. Sky View Factor (SVF) is the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the point. SVF is calculated as the proportion of sky visible when viewed from the ground (as an abstract horizontal surface) up. SVF is a dimensionless value that ranges from 0 to 1. A SVF of 1 denotes that the sky is completely visible to the horizon in all directions; for example, in a flat terrain. When a location has topography or buildings blocking view to any part of the sky, it will cause the SVF to decrease proportionally.

Because SVF measures the whole sky hemisphere and only a small fraction of the sky will be subject to change as part of a development the SVF must be resolved at a high resolution to detect the change. This is an inherent feature of the SVF measure. This means that the sky must be subdivided into more than 5000 equal areas for final SVF calculations but also that the difference in SVF may appear small particularly when averaged over a large area.





**Figure 12.1.10** Sky View Factor means the extent of sky observed above a point as a proportion of the total possible sky hemisphere above the point

## 2. Equivalence reporting

All data that is relied on for equivalence testing must form part of the report including individual data points as tables and model geometries for the base case and alternative building envelopes. These must be described with sufficient dimensions to allow for the equivalent model to be created by a third party for checking.

- a. For wind: the 5% exceedance comfort wind speed values in metres per second must be averaged and compared. The comfort categories are not relevant in demonstrating equivalence.

**Note** that the proposed alternative building envelopes must both demonstrate equivalence and also not cause wind speeds that exceed comfort or safety standards or cause worsening of existing exceedances.

**Note:** if the equivalence testing shows new or worsened exceedances of the comfort or safety standards, additional wind tunnel testing will be required to show how these exceedances can be mitigated. This testing may include modelling of awnings consistent with DCP requirements.

- b. For daylight (or SVF): the factors are averaged and the single resultant values compared.

In this document “equivalent” wind speed and daylight/SVF is to be understood as very slightly “better than” at a high level of accuracy. For example a SVF of 0.10001 is equivalent to a SVF of 0.10000 by being very slightly better than it.

Authors of equivalence reports must note that while daylight and wind equivalence is essential, any proposal must still be supported by a detailed urban design and options analysis to demonstrate that a high quality urban design outcome will be achieved, and the proposed massing is compatible with the context.

## Appendix B

### Definitions

*Annual Exceedance Probability (AEP)* means the chance of a flood of a given or larger size occurring in any one year, usually expressed as a percentage. 1% AEP flood is approximately equal to 1 in 100-year Average Recurrent Interval (ARI) flood event (or simply 100-year flood). It has 1% chance to occur in a given year.

*Basement Areas* means the space of a building which is partially or entirely below the adjacent finished ground level and enclosed from four sides. Basement Areas are areas where the means of drainage of accumulated water from the lowest point in the basement to the street drainage system is not possible.

*Critical Facilities* means hospitals and ancillary services, communication centres, emergency services organisation, major transport facilities, sewerage system plant, electricity generating works, any installations containing critical infrastructure control equipment, and any operational centres for use in a flood.

*Design Flood (or designated flood or flood standard)* means a flood of specified magnitude that is adopted for land use planning or any other flood risk mitigation purposes. Selections should be based on an understanding of flood behaviour and the associated flood risk, and take account of social, economic and environmental considerations. There may be several design floods for an individual area depending on the requirement.

*Enclosed Car Park* means a ground level hard stand area located off-street that is constrained or fenced along some or all of its perimeter and may or not be open to the sky and is designed for the temporary storage of motor vehicles.

*Flood* means a relatively high stream flow that overtops the natural or artificial banks in any part of a stream, channel, river, estuary, lake or dam, and/or Local Overland Flooding associated with major drainage as defined by the NSW Floodplain Development Manual (FDM) before entering a watercourse, and/or coastal inundation resulting from super-elevated sea levels and/or waves overtopping coastline defences excluding tsunami.

*Floodplain* means the area of land which is subject to inundation by floods up to and including the probable maximum flood (PMF) event.

*Flood prone land* means land that is subject to mainstream or local overland flow flood risk.

*Flood Planning Area (FPA)* means the area of land below the flood planning level (FPL) and thus subject to flood related development controls.

*Flood planning level (FPL)* means the combinations of flood levels and freeboards selected for floodplain risk management purposes, as determined in flood studies and floodplain risk management studies and plans.

*Floodplain Risk Management Plan (FRMP)* means a plan prepared for one or more floodplains in accordance with the requirements of the FDM or its predecessor.

*Freeboard* means a factor of safety expressed as the height above the design flood level. Freeboard provides a factor of safety to compensate for uncertainties in the estimation of flood levels across the floodplain, such as wave action; localised hydraulic behaviour and impacts that are specific event related, such as levee and embankment settlement;

cumulative impacts of fill in floodplains and other effects such as changes in rainfall patterns as a result of climate change.

*Local Overland Flooding* or *Local Overland Flow Path* occurs where the maximum cross-sectional depth of minor flooding in the local overland and adjacent to the site is less than 0.3 metres for the 1% AEP.

*Mainstream Flooding* means inundation of normally dry land occurring when water overflows the natural or artificial banks of a drainage channel, piped trunk drainage system, stream, river, estuary, lake or dam. Mainstream flooding occurs where the Local Overland Flow Path criteria cannot be satisfied.

*Open Car Park* means a ground level hard stand area located off-street that has an unconstrained or unfenced perimeter and is designed for the temporary storage of motor vehicles.

*Probable Maximum Flood (PMF)* means the largest flood that could conceivably occur at a particular location, usually estimated from probable maximum precipitation.

## **Appendix C**

### **Proposed Planning Envelope Drawings – Hunter Street Over Station Development**