
QANTAS

# QANTAS FLIGHT TRAINING CENTRE
# KING ST, MASCOT

ARCHITECTURAL DESIGN STATEMENT | Version 2.0

| Version | Date | Author | Status |
|---|---|---|---|
| 1.0 | 28.05.2019 | JNO | SSD APPLICATION |
| 2.0 | 13.08.2019 | JNO | SSD APPLICATION |

All amendments to document are identified in blue for ease of review. Ground floor is included when describing the number of levels throughout the report.

- p.3 — 01.01; Updated Text
- p.4 — 01.02; Updated Diagram
- p.5 — 01.02 ; New Diagrams
- p. 11/12/13 — 03.01; Updated Text
- p.17 — 03.04; Updated Text
- p.18 — 03.05; Updated Text
- p.19 — 03.05; Figure 23. Updated Diagram
- p.31/32 — 03.08; Carpark Landscape Planters Figure 34,35,36,37 New Text and Diagrams
- p.33 — 03.08; Carpark Preferred Option Updated Text
- p.34 — 03.09; Updated Text
- p.35 — 03.10; Updated Text Updated Diagram
- p.36 — 03.10; Figure 29. Updated Diagrams
- p.37 — 03.11; Figure 30. Updated Diagram and Text
- p.38/39 — 03.12 ; Figure 32,33 Updated Diagrams

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01.01 ***Site Location and Introduction***

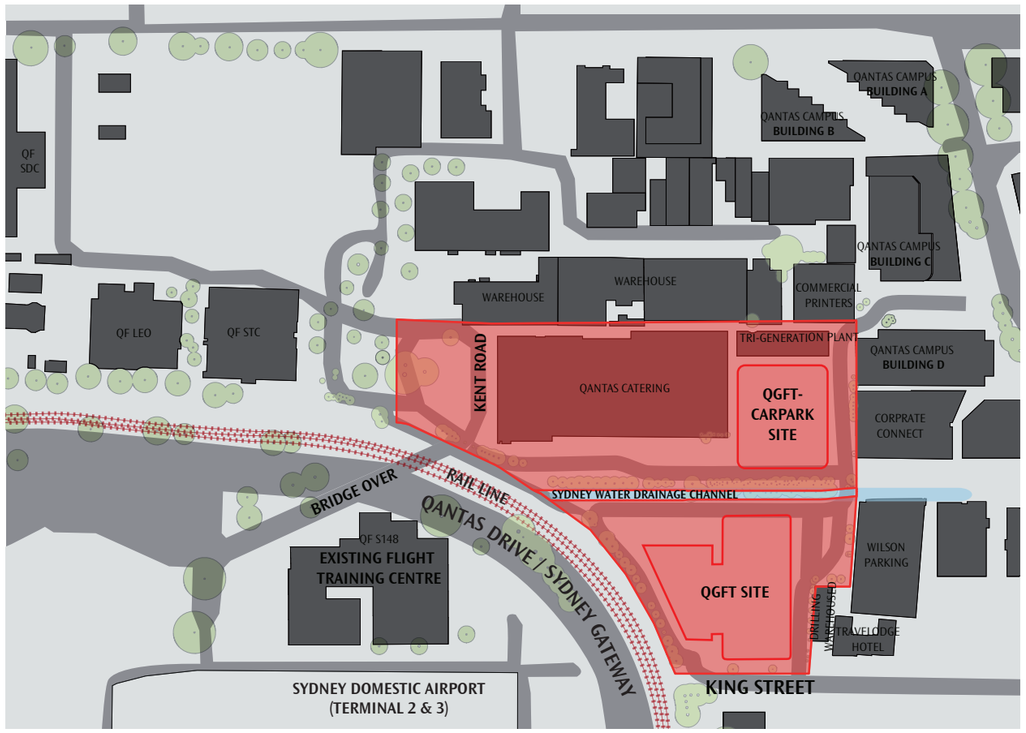



*Figure 1. Location Plan*


*Figure 2. Photo: Location*

This report was prepared in accordance with the technical requirements of the Secretary's Environmental Assessment Requirements (SEARs), and has been updated to address comments arising in Agency and stakeholder submissions received during the public exhibition of the SSD 10154 for the development of a new Flight Training Centre at 297 King Street, Mascot. The following table (Table 1) illustrates Agency and stakeholder comments that have been addressed in this report:

| Author | Category | Topic | Author | Category | Topic |
|---|---|---|---|---|---|
| AMP | Building Design | Illuminated Signage | DPIE | Traffic | Interim MGMT |
| | Building Design | Carpark facade | | Design and built form | Green wall |
| Bayside Council | Building Design | Green roof / Gardens / Walls | | Design and built form | ESD |
| | Building Design | Materials and facades | | EIS | Project detail |
| | Building Design | Options analysis | | Landscaping | Landscaping |
| | Building Design | Setbacks | | | |
| | Building Design | Solar access and overshadowing | EES (Former OEH) | Building Design | Green roof / Garden walls |
| | Landscape | Landscaping | | | |
| | Landscape | Permeable or porous pavers | Travelodge | Building Design | Setback |
| | Public domain | Public domain | | | |
| | Traffic | Traffic impacts | | | |

*Table 1; Selected agency and stakeholder submissions addressed in Architectural Design Statement*

Safety is Qantas' first priority. The Flight Training Centre is a key pillar of this value. The facility enables pilots and flight crews to undertake periodic testing to meet regulatory requirements by simulating both aircraft and emergency procedural environments.

The Project seeks consent for the construction and operation of a new Flight Training Centre, and associated uses including a multi-deck carpark. The Project's primary objective is to ensure business continuity for Qantas, by constructing a new Flight Training Centre to replace their existing Flight Training Centre located in Building 148 (identified in *Figure 1 Location Plan and 2 Photo Location)* that is within the Jetbase at Sydney Kingsford Smith Airport and will be demolished as part of RMS' Sydney Gateway Project. The site is located within an industrial precinct in the Bayside LGA at 297 King Street, Mascot and is identified in *Figure 1 Location Plan*.

Design Feasibility process was undertaken by Qantas and Noxon Giffen Architects in 2018 to explore site options and functional requirements for a new Flight Training Centre with associated ancillary uses including an adjacent multi-deck staff carpark. Extensive review of multiple sites resulted in the selected site being identified as the most suitable location for both the new Flight Training Centre and carpark, placing the facilities at the heart of Qantas Campus and operations in a consolidated new Qantas Corporate Precinct.

The proposed Flight Training Centre will present as a single building comprised of two distinct but complimentary elements (Flight Training Wing and Emergency Procedures Wing) connected via a central spine which will serve as the entrance to the facility from the landscaped forecourt. A detailed description of the proposed development is included in section 03.07.
The Project also proposes to revise the existing internal road network within the site to link the facility to the campus more broadly. Located on the adjacent site to the north of the Sydney Water drainage channel, the proposal includes a new multi-deck staff carpark with spaces for 2059 cars to be built over two stages, Stage 1 providing 748 cars over five levels in addition to 38 at grade carparks on the Flight Training Centre site.

01.02 ***Transport network***

The site is well served by a mix of road, rail and bus transport networks allowing private vehicle and public transport access from multiple directions. *Refer to Figure 3 Transport Network*

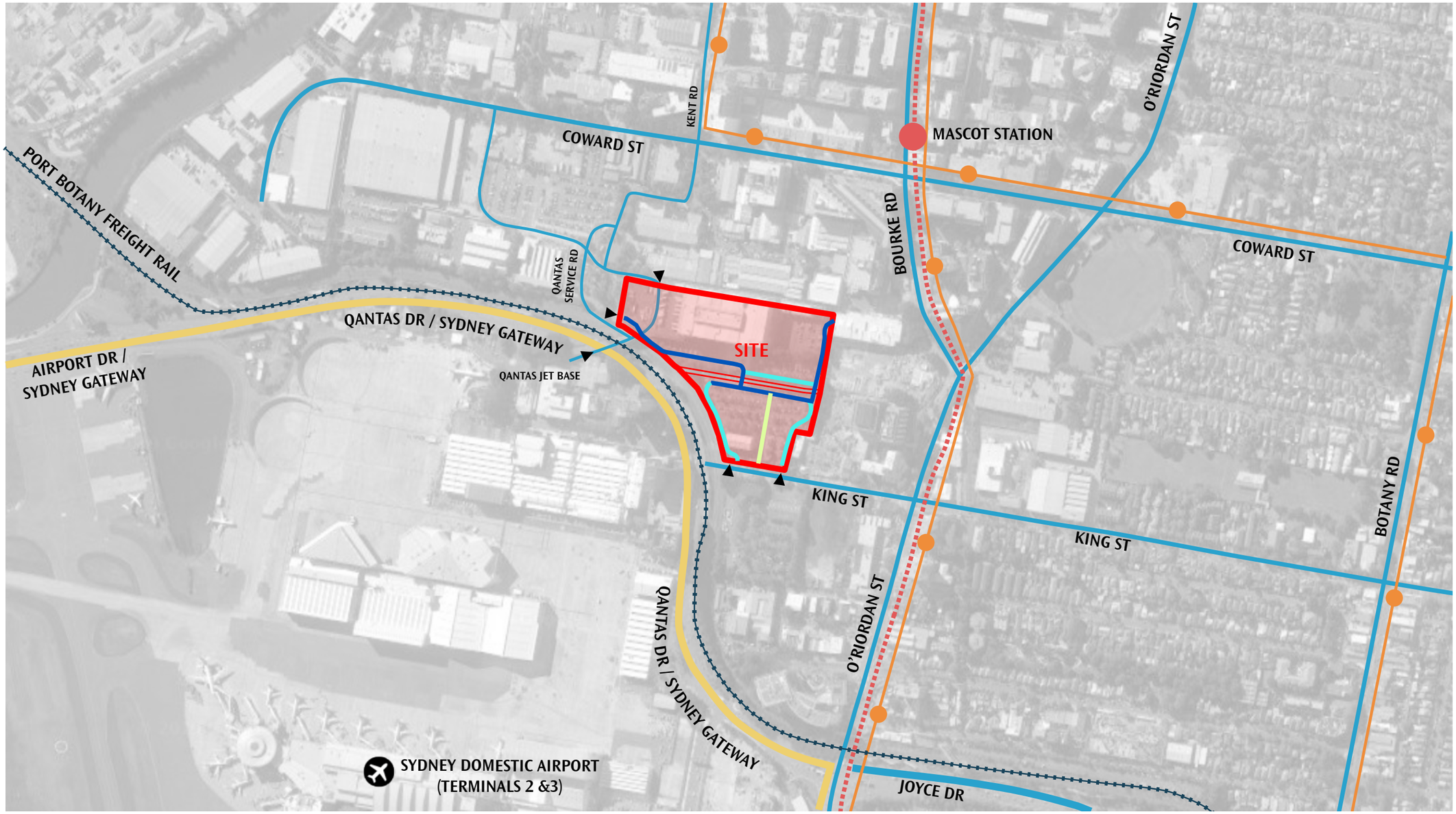
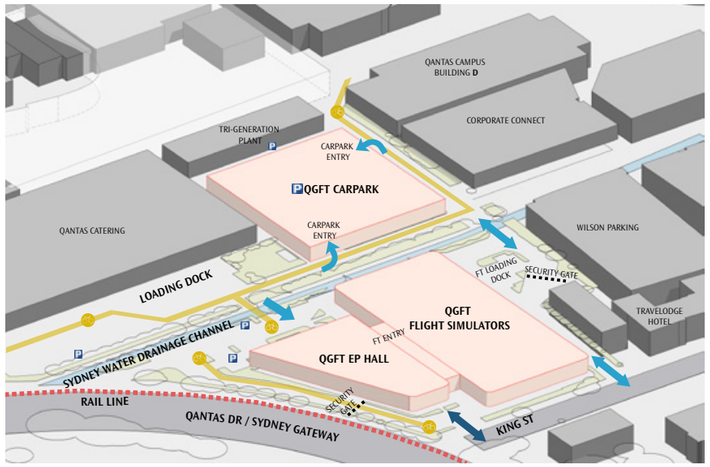
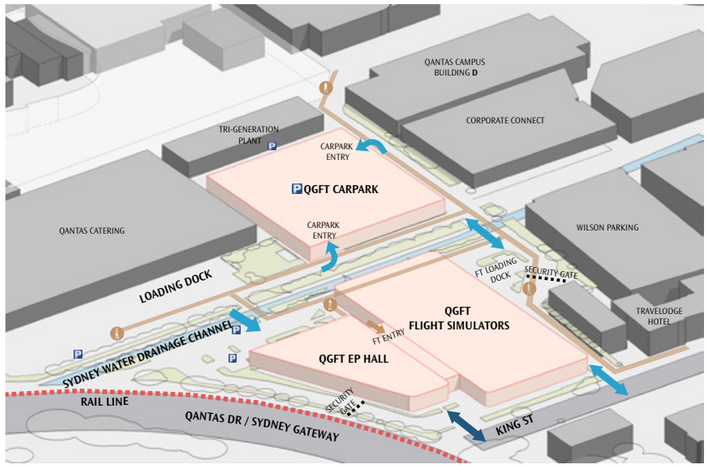


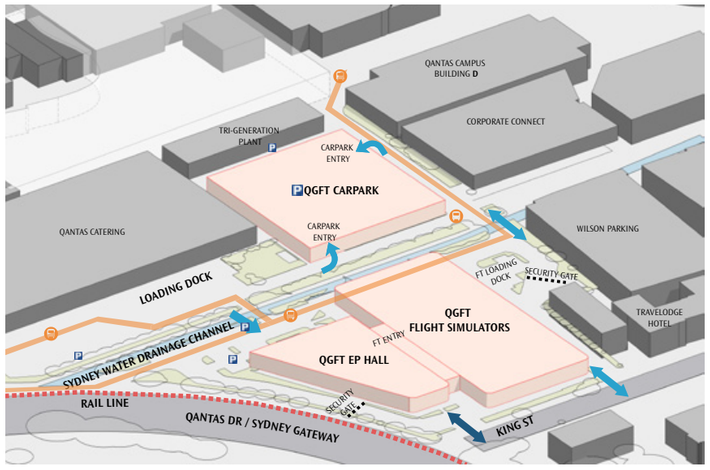

*Figure 3. Transport Network*



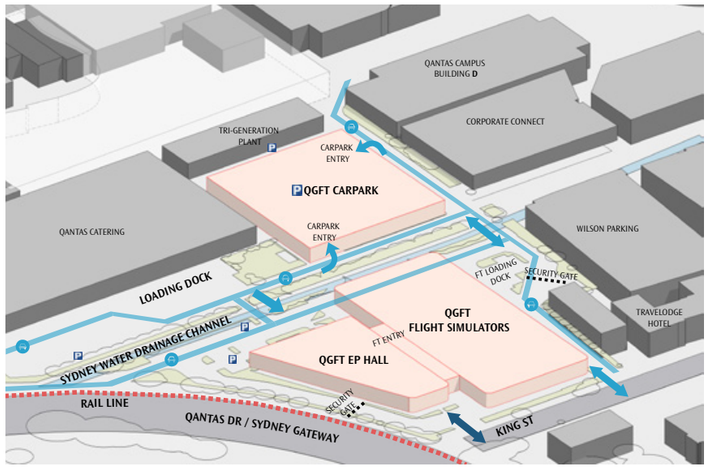

Bicycle Access




Pedestrian Access



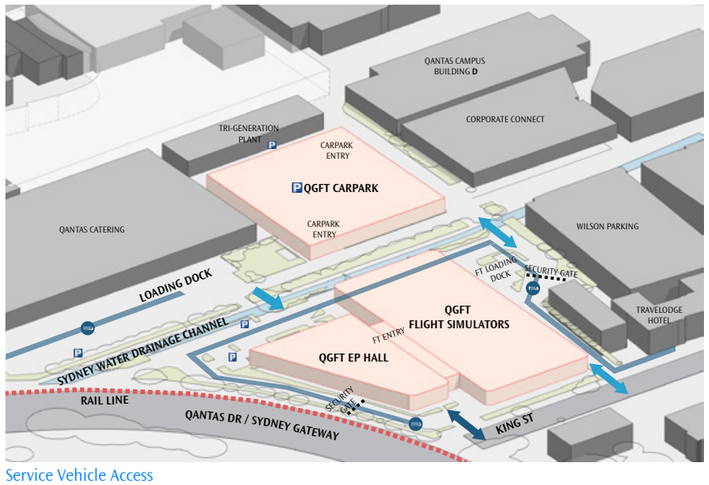

Qantas Bus Access




Car Access

**LEGEND**

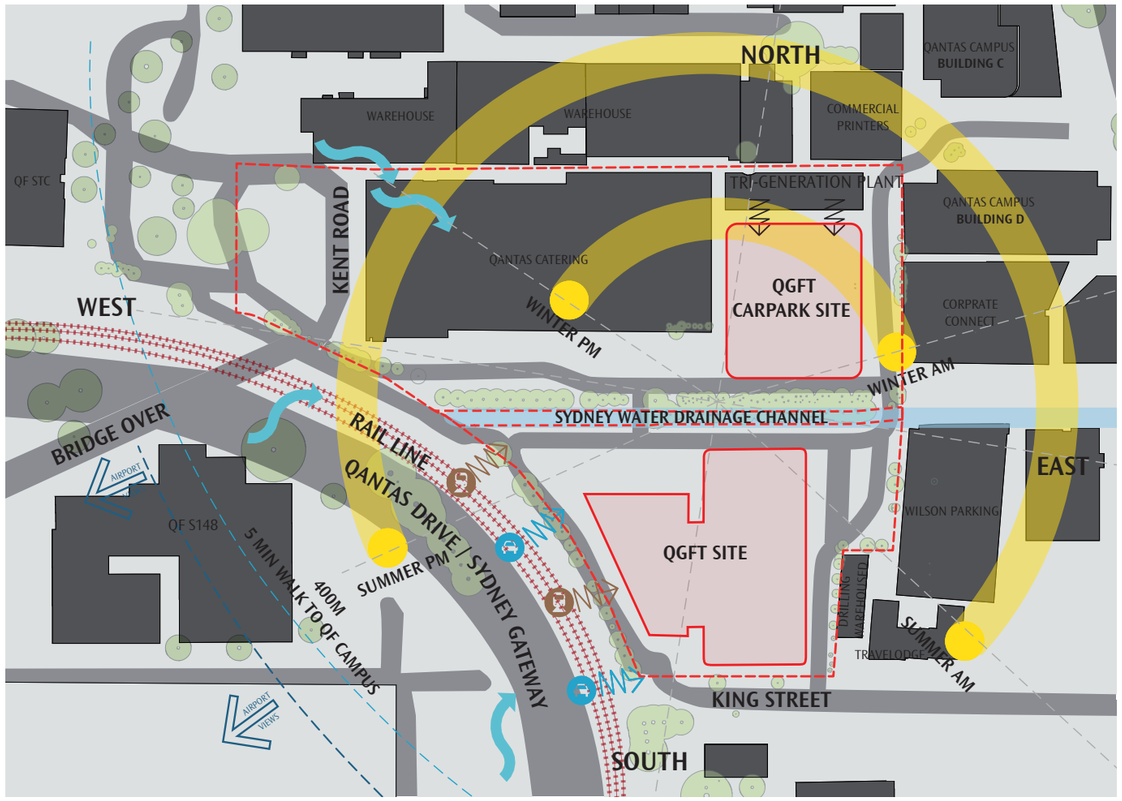
- CAR
- QANTAS BUS
- BICYCLE
- PEDESTRIAN
- SERVICE VEHICLE




Service Vehicle Access

*Figure 38. Modes of Transport Diagram*

## *Site Analysis*




**LEGEND**

**TRANSPORT**

WALKING DISTANCE FROM QF CAMPUS

**ENVIRONMENT**

WIND

NOISE & VIBRATION

EXISTING TREES

WATER

SUN PATH

**VIEWS**

AIRPORT VIEWS

*Figure 4. Site Analysis*

The immediate site context is predominantly industrial and commercial with a varied mix of large-scale facilities serving airport operations. Neighbouring commercial and industrial uses adjoining the eastern and northern sides of the site include multi-storey offices, carparks and hotels.

The north of the site lies partially within a floodplain which has informed the carpark design and floor levels. For further detail refer to the Flood Report by NDY.

Key features of the proposed Flight Training Centre and carpark site are as follows:

- The site is approximately 5.417ha and is an irregular shape. It is approximately 240m in length and maintains a variable width of between approximately 321m in the northern portion of the site and approximately 93m along the King Street frontage *Refer to Figure 4 Site Analysis.*
- The site possesses a relatively level slope across the site. An open Sydney Water drainage channel bisects the northern portion of the site in an east-west direction. There are some isolated changes in level immediately adjacent to this channel. A Site Survey Plan accompanies the application which details the topographic characteristics of the site.
- Multiple mature Plane Trees are scattered throughout the site. A variety of native and exotic tress and vegetation also exist around the perimeter of the site which help screen the site from surrounding uses and these are generally to remain as part of the proposal.
- Site improvements include at-grade carparking for Qantas staff, an industrial shed to store spare aviation parts, a substation, a disused gatehouse, a Sydney Water Asset with two driveways over it, the Qantas Catering facility and Qantas Tri-generation plant.
- The site forms part of a larger land holding under the ownership of Qantas that generally extends between Qantas Drive to the west, Ewan Street to the south, Coward Street to the north, with the Qantas “Corporate Campus” fronting Bourke Road *Refer to Figure 2 Photo Location*.
- Vehicular access to the site from the local road network is available from King Street. The site has intra-campus connections along the northern boundary in the form of two connecting driveways in the north-eastern and north-western corner of the site along the northern boundary which link it to the broader Mascot Campus.

## *Opportunities and Constraints*

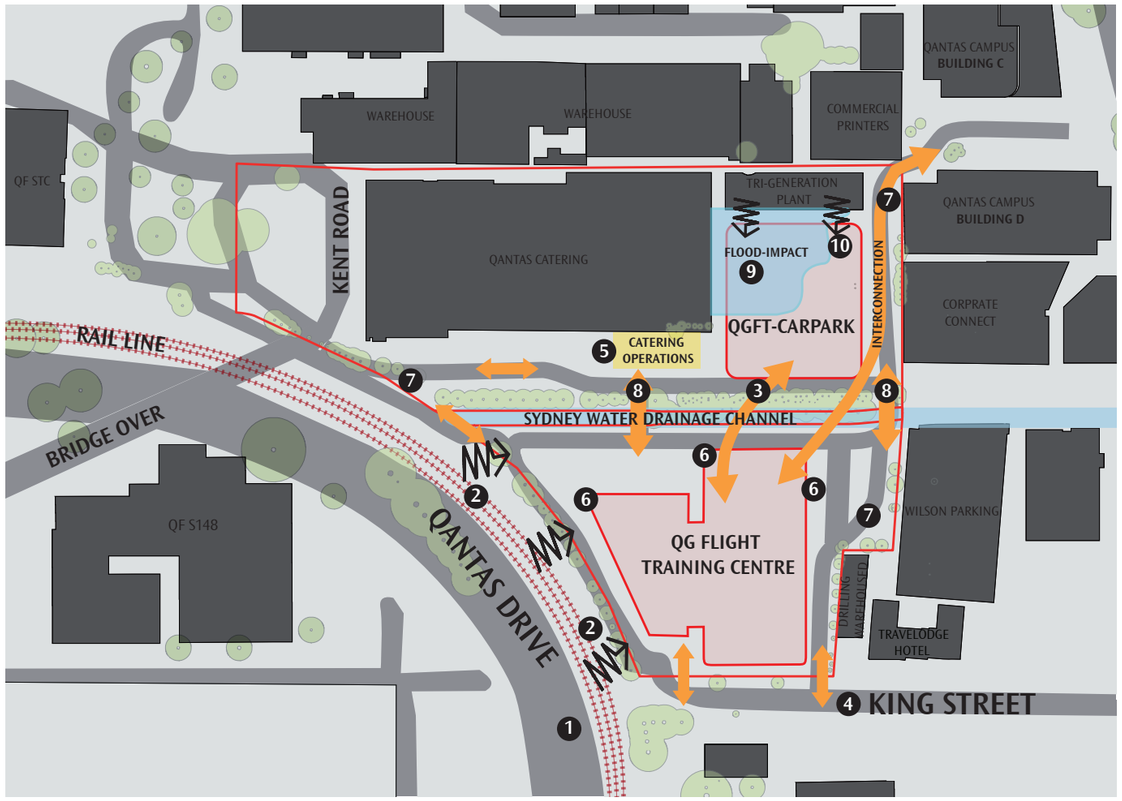



*Figure 5. Opportunities and Constraints*

Key site opportunities and constraints were identified and investigated in order to inform the design and are shown in *Figure 5 Opportunities and Constraints.*

Key constraints include;

1. Sydney Gateway Project; noise and vibration
2. Botany Freight Rail Line; noise and vibration
3. Sydney Water Drainage Channel; Bisects site with only two crossover points
4. Limited site access; For construction and ongoing maintenance from King Street
5. Qantas Catering; avoid operation clash with QF Catering
6. Full perimeter building service access road requirement for Flight Training Centre
7. Maintain site access thoroughfares to ensure ongoing vehicle serviceability across adjacent Qantas facilities
8. Maintain connection over Sydney Water Channel
9. Flood plain requirements to the north portion of the site
10. Tri-generation plant noise and vibration

Key opportunities include;

- Co-location of key Qantas facilities
- Rationalisation of precinct wide car parking strategy
- Creating of inter connected Qantas Campus with new Flight Training Centre
- Rationalise vehicle access to improve general circulation and connectivity
- Regenerate existing under utilised strategic Qantas site

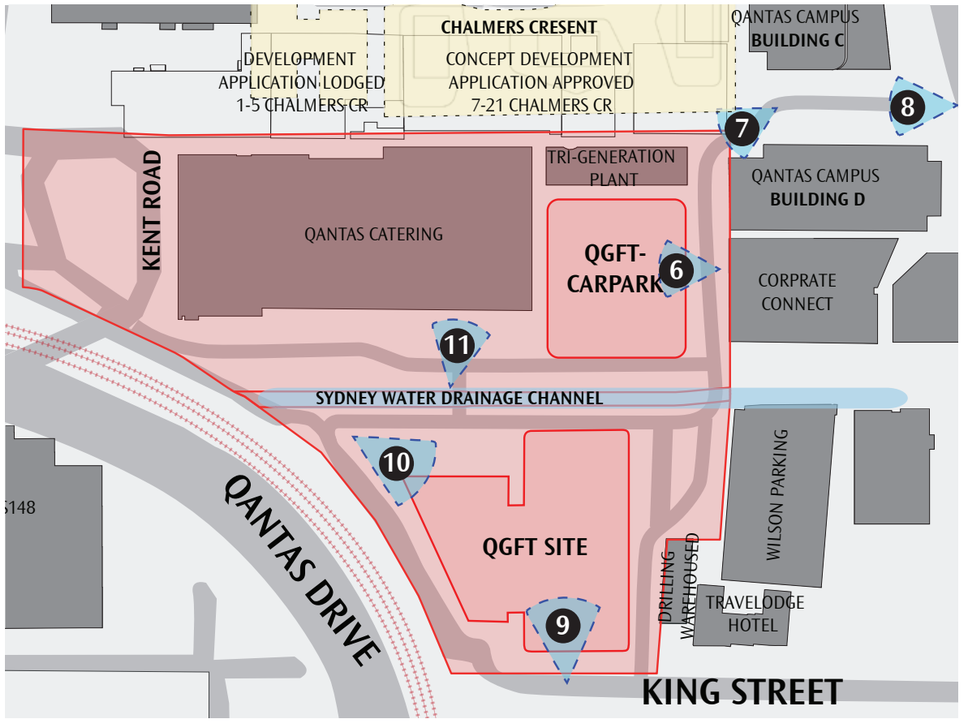



*Figure 12. Site photo key plan*

The key features of the locality are:

**North:** The site is bounded to the north by low scale industrial development, beyond which is Coward Street. Further north of the site is the Mascot Town Centre which is characterised by transport-oriented development including high density mixed-use development focussed around the Mascot Train Station.

**East:** The site is bordered to the east by commercial development including the Corporate Connect development owned by Goodman and AMP and a newly completed Travelodge hotel which includes a commercial carpark. Additional commercial development to the east includes the Ibis Hotel and Pullman Sydney Airport fronting O'Riordan Street.

**South:** The site is bounded to the south by King Street, beyond which is Qantas owned at-grade car parking and other industrial uses. Further south is the Botany Freight Rail Line and Qantas Drive beyond which is the Domestic Terminal at Sydney Airport.

**West:** The site is bordered to the west by the Botany Freight Rail Line and Qantas Drive, beyond which lies the existing Flight Training Centre, Sydney Kingsford Smith Airport and the Qantas Jetbase.

Two Development Applications are noted on adjoining sites in Chalmers Crescent, Mascot as follows;

- Development Approval lodged for 1-5 Chalmers Crescent Mascot; Multi-storey commercial Development. The proposed development has a maximum height of RL47.750 AHD. *Refer Figure 12 Site photo key plan.*
- Concept Development Application for 7-9, 14-18,19-21 Chalmers Crescent Mascot. The proposed development has a maximum height of RL51.000 AHD *Refer Figure 12 Site photo key plan.*

For further detail refer to the *Landscape and Visual Impact Assessment Report* by Scott Carver.

*Figure 9. Existing King Street view to North*

*Figure 6. Qantas Catering*

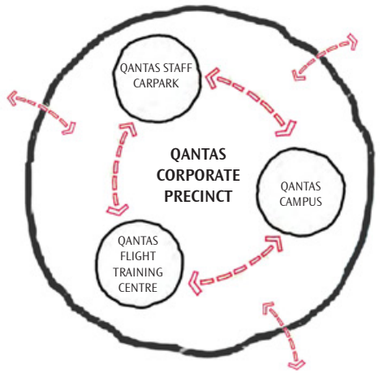
*Figure 7. View west from Qantas Campus Building C*

*Figure 10. Existing carpark view to south*

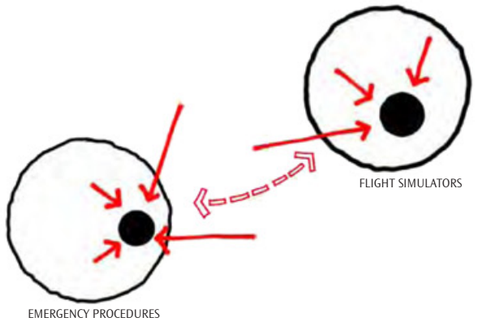
*Figure 11. Catering Loading Area*


*Figure 8. Existing Bourke Road view to West*

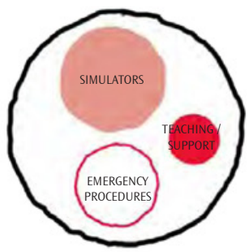
02.01 ***Key Design Challenges***




**QANTAS CORPORATE PRECINCT**
INTER-CONNECTIVITY




**FLIGHT TRAINING**
COMMUNITY AND AMENITY




**FLIGHT TRAINING CENTRE**
TRAINING AND INNOVATION PRECINCT

In providing a new Flight Training Centre and multi-deck staff carpark the design strategy will address various key issues;

Strategic issues;

- Co-location of key Qantas facilities
- Rationalisation of precinct-wide car parking strategy
- Creating of inter-connected Qantas Campus with new Flight Training Centre
- Rationalise vehicle access to improve general circulation and connectivity
- Regenerate existing under utilised strategic Qantas site

Operational Issues;

- Provide new Flight Training Centre with Flight Simulators, Emergency Procedure Hall and Training facilities
- Provide new staff carparking with suitable access and egress
- Impact of Gateway
- Provide maintenance access for the Flight Simulators and other operational training facilities
- Provide operational security and limit public access
- Benchmarking against other word class facilities

Site constraints;

- Noise and vibration from:
  - Aircraft and airport operations
  - Port Botany Freight Rail Line
  - Gateway
  - Tri-generation Plant
- Accommodate the existing Sydney Water drainage channeL acknowledging limited dual bridge access
- Access through site to unify site divided by Sydney Water Drainage Channel
- Limited Site access with single street frontage at King Street
- Flood plane impacting northern portion of the site

*Figure 13. Key Design Challenges*

03.01

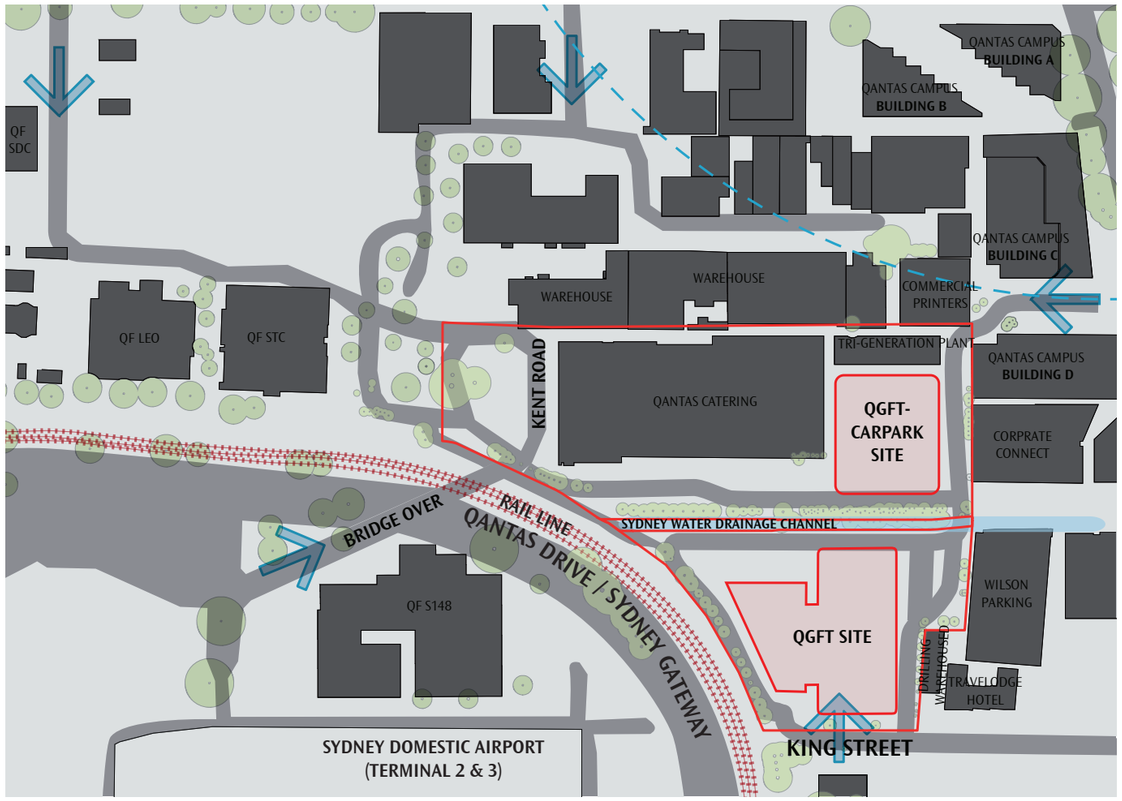



*Figure 14. Site Plan*

***Botany Bay Local Environmental Plan 2013 Clause 6.16 Design Excellence***

*(1) The objective of this clause is to deliver the highest standard of sustainable architectural and urban design*

*(2) This clause applies to land at Mascot Station Precinct, as shown edged heavy pink, and the BATA site at Eastgardens, as shown edged heavy orange, on Key Site Map.*

*(3) Development consent must not be granted to development involving the construction of a new building or to external alterations to an existing building on land to which this clause applies unless the consent authority considers that the development exhibits design excellence.*

*(4) In considering whether the development exhibits design excellence, the consent authority must have regard to the following matters:*

*(a) whether a high standard of architectural design, materials and detailing appropriate to the building type and location will be achieved,*

The site is located within an industrial precinct in the Bayside LGA at 297 King Street, Mascot and is identified in *Figure 14 Site Plan*. The proposed Flight Training Centre and associated carpark represent a considered design solution to a series of complex technical and functional requirements associated with the operation of a Flight Training Centre. The industrial precinct is characterised by similar operational facilities and the new Flight Training Centre and multi-deck carpark respond appropriately to this context and typology.

The site location adjacent to the Airport, Sydney Gateway and Freight Rail Line impose significant noise and vibration issues, particularly for the Flight Simulators. Critically, the Simulators are set back from the rail and road noise sources.
The functional and technical requirements of the buildings is appropriate to the industrial context whilst the buildings and the materiality have been designed to respect and celebrate their primary function as operational facilities within an industrial precinct. The materials and finishes of both the Flight Training Centre and carpark are generally self finished and durable. Materials are integrated to the architectural language in response to both the industrial site context and building types being operational and infrastructure facilities.

*(b) whether the form and external appearance of the development will improve the quality and amenity of the public domain*

Building forms respond to both the site geometries and operational requirements. Materials and composition articulate the buildings to meet technical requirements whilst addressing the broader public realm.

The new Flight Training Centre is located at the southern portion of the site fronting King Street whilst the larger Carpark is set back located at the northern part of the site across the Sydney Water Drainage canal adjacent to Qantas Campus. Both buildings occupy areas currently used as at-grade carparking. The two buildings provide essential new facilities and services at the heart of Qantas operations and are located around the Sydney Water drainage channel and new landscaped forecourt to enhance the existing site and create a new landscaped precinct.

The Flight Training Centre comprises two distinct elements being Flight Training and Emergency Procedures. In response to the site context and functional brief, the building is enveloped in a mix of precast concrete, colorbond steel cladding, glazing, metal louvres and sun shading. The distinctly separate volumes are articulated and animated with glazing, setbacks and rebates.

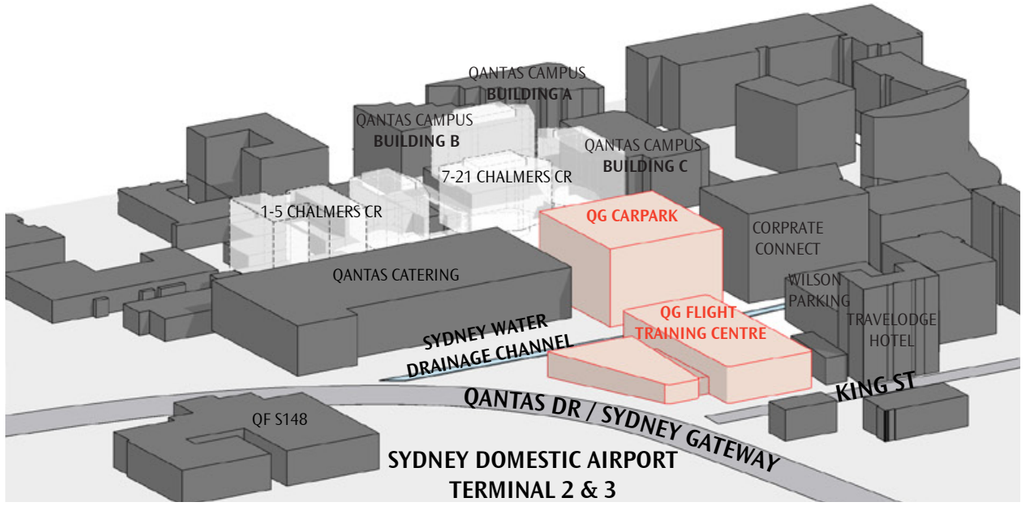



*Figure 15. 3D Site Massing Diagram*

The Flight Training Centre has a proposed 4.5m setback to King Street, less than the 9m setback outlined in the Botany Bay Development Control Plan 2013 due to site access requirements relating to the Flight Simulators. Critically, for operational requirements, the Flight Simulator Bays need full perimeter access for installation and maintenance. The required linear arrangement of the Simulator Bays results in a building geometry with limited access on the northern side of the site fronting the Sydney Water drainage channel. This results in pushing the building south for northern site access, thereby reducing the King Street setback.

Options were explored to achieve a 9m King Street setback based on the preferred linear Simulator building arrangement. These outcomes were deemed as unacceptable for Qantas operations and result in a reduced amenity within the site.

- Vehicle access around the site for Simulator installations would be constrained, in particular the exit from the Service Yard to the internal road in order to circulate and exit the site.
- Staff bus stops on each side of the internal road to service in and out bound buses would no longer be accommodated at the northern end of the site and 12.5m buses would be required to turn around to suit the single bus stop arrangement.
- The northern footpath which provides the main, accessible, pedestrian path to the entry from King Street and Qantas HQ, would need to be reduced in width. The current width of approximately 2m provides two way pedestrian movement, including passing space for wheelchairs or staff with luggage to comfortably pass.

The proposal acknowledges the objectives of the DCP Part 6.3.5 Setbacks;

- The proposed King Street facade is clearly articulated. Bulk and scale is reduced due to exceeding site setbacks, some front setback, and the significantly lower height of the building in its entirety (when compared with permissible heights of adjacent buildings).
- The site sits at a unique section of King Street, terminated by the railway.

Objective 01;  To minimise the impact of development and buildings on the surrounding areas;

- The side setbacks are minimum 12.5m (four times the required 3m).  The Emergency Procedures Hall front setback is 18.5m. The Flight Simulator building constitutes less than 50% of the overall frontage length and is less than 50% of the permissible height. A 44m high building, with a fully compliant setback, would have a greater impact on both neighbours to the east.

Objective 02; To create a pleasant environment within and external to the site

- The 3m Landscaping Setback is achieved; it contributes to the streetscape, maintaining deep soil planting and retaining existing street trees or otherwise replacing trees, where incompatible with access points, at 1:1 along King Street. As a result of the above setbacks and decreased height the impact on the street, both in terms of bulk and overshadowing, will be significantly less than a compliant, higher building.

Objective 03; To ensure setbacks to Alexandra Canal and the Mill Pond

- No impact.

Public amenity is further enhanced though improvements to existing site access, including improved pedestrian access at the eastern end of the King Street frontage, improving proximity to O'Riordan St bus routes and upgrading the access point at the boundary to be accessible. New footpaths along the King Street frontage are proposed by the project, completing the existing footpath on the northern side of King Street, which currently terminates at the project site.

The proposed Flight Training Centre represents a significant under-development of the site both in terms of building height and side set backs as illustrated in *Figure 22 King Street Response* and *Figure 23 King Street set back*. The diagram studies of *Figure 22 King Street Response* and *Figure 23 King Street set back* illustrate the proposed King Street set back from axonometric, plan, section and elevation views. The facility is significantly within the permissible, heights, and side and rear setbacks.

The location of the Flight Training Centre at the dead end of King Street further reduces the buildings visual impact from King Street. Within the context of the streetscape which is a variety of heights and densities, the Flight Training Centre is considered consistent within the context of the street and a positive contribution to an industrial precinct.

The proposed multi-deck staff carpark structure is located to the north of the site and consolidates several disparate Qantas facilities around the airport into one centralised facility adjacent to both Flight Training and The Qantas Campus.

Located internally within the site away from street frontages and linked by new landscaped avenues, the carpark structure is expressed as light open carpark decks with optimised transparency to minimise bulk and maximise staff safety and passive surveillance. The expressed concrete decks are wrapped in galvanised mesh that optimises safety whilst creating a light 'veil' to articulate the facility. The concrete and galvanised steel are industrial self-finished materials suited to the industrial precinct whilst extensive Ground plane, carpark facade planters and rooftop landscaping will articulate and soften the building in the industrial context.

*(c) whether the development detrimentally impacts on view corridors,*

The new facilities provide a dramatically improved and centralised precinct for staff with Flight Training and Qantas Campus co-located and serviced by a new consolidated centralised carpark facility accessibly located within the site.

The building mass of the carpark and Flight Training Centre steps back from King Street to minimise public domain impacts. The relatively low scale Flight Training Centre is well below the permissible building envelope thereby minimising the impact on King Street and the public domain. Operational requirements of the Flight Simulator Wing necessitate a reduced set back to King Street, however this is offset by the significantly reduced building height.

The proposed buildings meet key site criteria by complying with height and FSR development controls and as such are of appropriate size and scale to surrounding buildings within the precinct. The existing views to the south and east of the site are not iconic given they are over industrial roofscapes, the proposed carpark which sits appropriately within the existing industrial context does not lessen current vistas and view corridors. Furthermore, the proposed landscape facade planters provide greenery in an otherwise industrial environment. Views impacted from Qantas Corporate and proposed Chalmers Street development occur over a southern boundary, the impact of which would be deemed less significant. Refer to *Landscape and Visual Assessment Report* by Scott Carver.

*(d) the achievement of the principles of ecologically sustainable development.*

Ecologically sustainable design principles have been considered throughout the design process and in the final design resolution.

The site has been planned around the landscaped Sydney Water Drainage Channel thereby rejuvenating an existing environment and creating a new open domain at the heart of the Qantas Corporate Precinct.

Environmental design principles are adopted within the building design generally, addressing thermal performance, amenity, durability and performance. Measures to further improve the greenhouse gas and energy efficiency include:

- Building fabric thermal performance that meets or exceeds the Deemed to Satisfy Requirement of Section J of the National Construction Code (NCC) 2016
- Mid-tone coloured roofing with solar absorbance less than 0.6 to the Simulator Building and EP Hall (light colours avoided to reduce risk of glare)
- Office areas have been planned to provide access to daylight and workstations are to be within 15m of perimeter glazing
- Office areas incorporate external sun shading and internal blinds to manage glare.
- Rainwater reuse with a 10,000L water tank for irrigation and toilet flushing
- Sanitary fixtures and tapware shall be WELs rated
- High efficiency and area specific mechanical systems to provide effective and energy efficient solutions
- Energy efficient lighting (typically LED) with lighting controlled by motion and/or daylight sensors
- Energy efficient equipment selections
- Controls measures to ensure equipment is switched off after hours
- Open deck naturally ventilated carpark strategy to avoid mechanical ventilation

The existing Tri-generation Plant has been utilised to provide 100% of the power requirements for the project, whilst 100% of the heating and cooling are sourced from heated and chilled water from the Tri-generation Plant. By connecting to the Tri-generation plant, the proposed building has avoided a significant amount of embodied energy from large mechanical plant (chillers, boilers) and avoided introducing refrigerants to the building that typically have Ozone Depleting Potential (ODP) and Global Warming Potential (GWP).

The efficiency that the building achieves from the Tri-generation plant will exceed the efficiency that can be gained if the building installed dedicated chillers; a building of this size can only justify installing air cooled chillers that are not as efficient *as water cooled chillers. Any measures that replicate the provisions already proposed to be utilised from the existing Tri-generation plant would be considered unnecessary duplication.*

There are significant benefits from district level cooling and this should be encouraged through the planning process. Connection of the Flight Training Centre will benefit the Tri-generation plant by adding significant base load and improving the efficiency of the plant. Refer to Figures 18,19,20 Artists Impressions.

The project addresses the Ecologically Sustainable Development principles by following a holistic approach of design initiatives and benchmarking against the Green Star Design & As Built v1.2 framework. Whilst a formal rating is not currently targeted, the project intends to achieve the design intent of a number of credits. The Project is targeting 5 Star Green Star equivalency with 6 Star aspiration.

*Refer to ESD Report by NDY.*

This report has been prepared in parallel with other specialist consultants. For further detail refer to separate specialist reports which establish the quality and suitability of the project. *Refer to Figures 18,19,20 Artists Impressions. Note :Figure 20.1 Artists Impression; View of Carpark does not demonstrate facade planters.*

## *Possible Design Solutions*

A detailed design process has been undertaken which involved the investigation of a number of different design strategies. Numerous design options were explored and tested against operational requirements of the Client Brief and the opportunities and constraints of the site context. *Refer to Figure 16; Design Options Studies.*

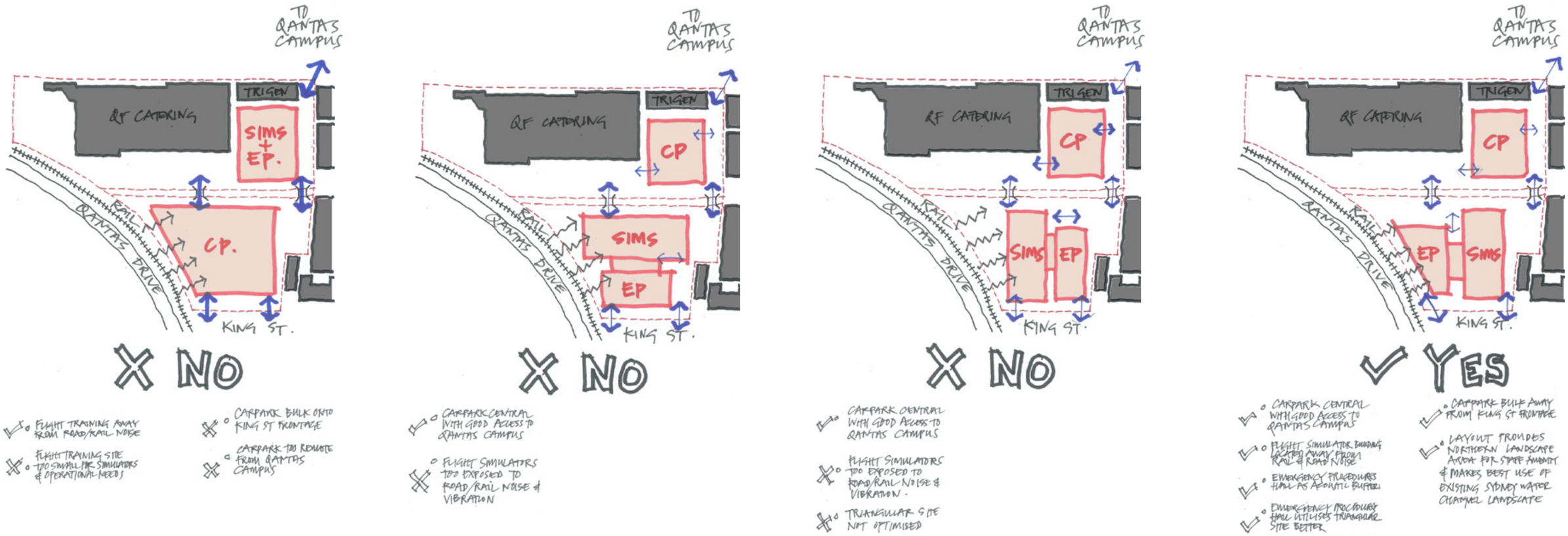
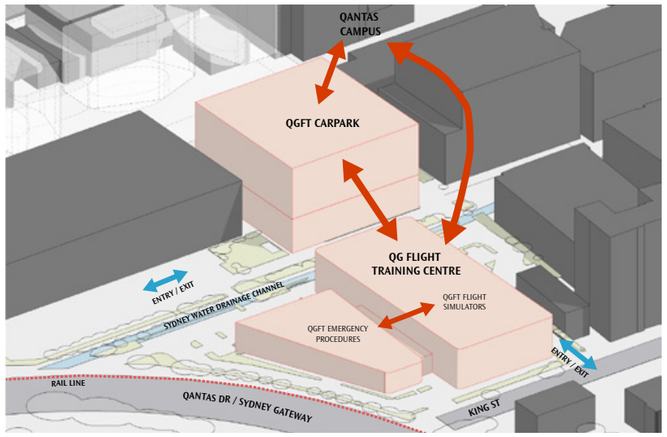
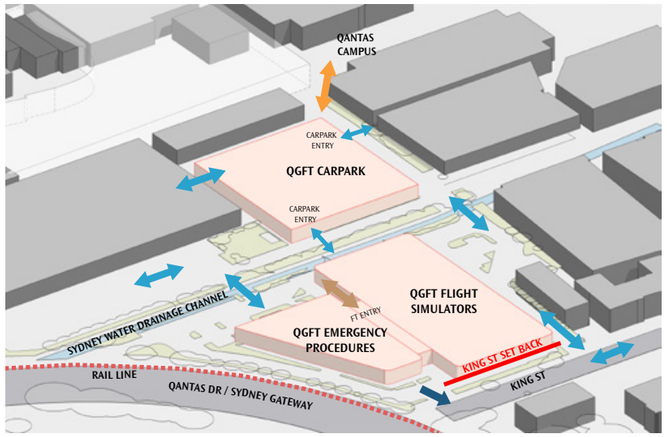


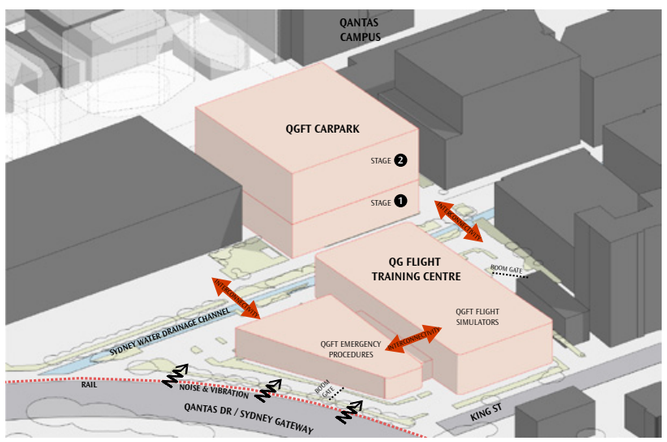

*Figure 16. Design Option Studies*




**Precinct**




**Ground Plane**




**Distinct Elements**

*Figure 17. Design Principles*

Following detailed investigation of the the site context and operational requirements a number of key design principles have been established. These principles underpin the design solution. *Refer to Figure 17; Design Principles.*

A Precinct;

- A new Qantas Corporate Precinct
- A linked collective; Qantas Campus,+ Qantas Flight Training + Qantas carpark
- An operational hub for airport operations within an industrial precinct
- Activate and connect the industrial precinct
- World class facilities

Ground Plane;

- Respond to the adjacent sources of noise and vibration
- Use the regenerated Sydney Water drainage channel to create a newly landscaped green artery through the site
- Optimise inter connectivity within Qantas facilities with Qantas Bus, staff cars, pedestrians and operational vehicles
- Utilise landscape to regenerate the site and connect the elements whilst softening the boundaries and interface
- Address the public domain and King Street

Distinct elements;

- Design in response to Benchmarking of other world class facilities
- Design from within; respond to the differing operational requirements of the facilities
- Respond to the noise and vibration from the airport, road and rail networks
- Link and connect distinct elements for optimal efficiency
- Address the unique operational security and safety needs
- Optimise the site location of each building element to address the site and operational requirements
- Consolidate car parking
- Accommodate a two Stage carpark development strategy


*Figure 18. Artists Impression; View from Sydney Gateway*


*Figure 19 Artists Impression; North View of Flight Training Centre*

The proposed Qantas Flight Training Centre and Carpark offer a clear, pragmatic and informed response to the site, the industrial context and a unique set of functional operational requirements. The Flight Training Centre is defined by two related but distinct forms reflecting the differing functional requirements within the building.

The design response creates a new strategic centre for airline operations, within a new Qantas Corporate Precinct which brings together the existing Qantas Campus, new Flight Training Centre and consolidated staff car parking. The precinct is activated and connected through the regeneration of a unified Ground Plane linking distinct and separate building elements within the site.

The building form and design addresses the urban design constraints of the site and the functional requirements of the facilities. The critical operational and regulatory requirements regarding safety training and emergency procedures have driven the building design 'from within', whilst a clear understanding of the industrial context and site parameters has influenced an appropriate contextual design response.

The site strategy responds to the accessible street frontage from King Street to the south. The Flight Training Centre is located within this accessible area of the site for optimal staff and maintenance access. The staff Carpark is located away from the public domain to the north of the site, between the new Flight Training Centre and the existing Qantas Campus.

The proposed Floor Space Ratio (FSR) of both the Carpark and Flight Training sites meet the objectives of an acceptable bulk and scale consistent with the industrial precinct and surrounding development. Further, architectural design initiatives outlined in the report further minimises impact on the streetscape and adjoining development in accordance with the proposed FSR are as follows; The Flight Training Centre site FSR is 0:86:1 and the Carpark FSR is 0.6:1.

**Flight Training Centre**

In response to design research and lessons learnt through detailed benchmarking analysis of other world-class facilities, the Flight Training Centre has been designed as two distinct elements joined around a unifying common Entry spine. The two operational elements defining the building are the Flight Simulator Wing and the Emergency Procedures Wing. Both elements have distinctly different requirements, characters and expression.

**Flight Training Wing**

The Flight Simulator Wing consists of a layered volume containing Flight Simulator bays organised in the required linear arrangement around a central spine with essential infrastructure, service and support spaces. Above the Simulator bays are teaching spaces and the top level is solely administration and staff offices. This wing is expressed both in a material and colour sense as a lighter 'air' element, with a layered ribbon expression of natural concrete base, sinusoidal pale colorbond middle, topped with a ribbon of glazing for the offices. The perimeter glazing to the upper office level optimises user amenity and animates the building, whilst vertical glazing slots punctuate the perimeter.
The critical need to provide acoustic and vibrational isolation as dictated the location of the Flight Simulator wing in a central location away from airport, road and rail noise.

**Emergency Procedures Wing**

The Emergency Procedures Wing is a grounded low-level wing with a grounded 'earth' expression being protectively wrapped in full height earth toned precast concrete walls. These walls open to the north in a more permeable open façade mix of colorbond and glazing offering light and aspect from the Emergency Procedures Wing and classrooms within. The Emergency Procedures Wing is located to the west of the site adjacent the Airport, Gateway and Freight Rail, thereby acting as an important acoustic 'buffer' for the Flight Simulator wing.

*Figure 20 Artists Impression; View from King Street with existing trees*

*Figure 20.1 Artists Impression; View of Carpark*

**Carpark**

The multideck staff carpark is located north of the Sydney Water drainage channel, placing it centrally between existing Qantas Campus and the new Flight Training Centre. The carpark serves both the Flight Training Centre to its south and the Qantas Group Campus more broadly, providing a consolidation and upgrade to a critical staff facilities at the heart of the site and Qantas operations.

The carpark is located internally within the site and well back from the King Street thereby limiting any impacts on the public domain. The construction detailing is utilitarian, functional and durable with self-finished materials of concrete and galvanised steel. Open weave galvanised mesh façade panels envelop the expressed concrete structure. The open and light façade treatment optimises permeability thus avoiding the need for mechanical ventilation whilst the building's transparency reduces it's perceived bulk and mass.

The carpark base is wrapped in a perimeter of landscape climbers serving to activate the Ground Plane. In addition, a series of facade landscape planters articulate the North, East and South facades adding a dynamic array of sculptural green elements. The shadows and depth created by the planters enrichen the facade whilst also enhancing the landscape strategy through three dimensional garden aspects which can be viewed from the neighbouring sites. The Stage 2 rooftop deck is wrapped in perimeter planters and pergola element to soften the structure.

The collective Flight Training Centre and carpark are located around the central landscaped Sydney Water drainage channel running through the site. Additional soft and hard landscape treatments along this landscape spine ensure this is an integrated and vital new staff facility for Qantas operations and the heart of the a new Qantas Corporate Precinct.

The proposed carpark and Flight Training buildings are compliant with the maximum building height guidelines.

The Flight Training Building is a lower scale development with a maximum height of RL24,150 AHD, being 4 storeys at 19m above existing ground level.

The carpark has a Stage 2 upper Deck Level of RL42,430 AHD, with a maximum height of RL47,530 AHD at the top of the lift overrun. The fourteen levels have a maximum building height of 43.8m above existing ground level. The Stage 1 carpark maximum building height is RL20,830 AHD, 18m above existing ground level.

Neighbouring commercial developments along the eastern boundary have existing heights higher than the proposed Flight Training and carpark with levels as follows; The Travelodge Hotel RL50,150 (at maximum height of 50m above existing ground level) Wilson Parking Carpark RL16,200 (at maximum height of 10m above existing ground level) Corporate Connect RL46,450 (at maximum height of 40m above existing ground level) and Qantas Campus Building D RL20,870 (at maximum height of 14m above existing ground level). *Refer to Figure 20; Final Design Response.*

The building design addresses perceived bulk and scale through façade materials, building articulation, height and setbacks. These strategies combine to minimise the bulk and scale of the proposed development whilst creating an integrated new Qantas Corporate Precinct.
Refer to Visualisations;
*Figure 18 Artists Impression; View from Sydney Gateway*
*Figure 19 Artists Impression; North View of Flight Training Centre*
*Figure 20 Artists Impression; View from King Street*
*Figure 20.1 Artists Impression; View of Carpark.*
Refer to Appendix for larger scale visualisation images.

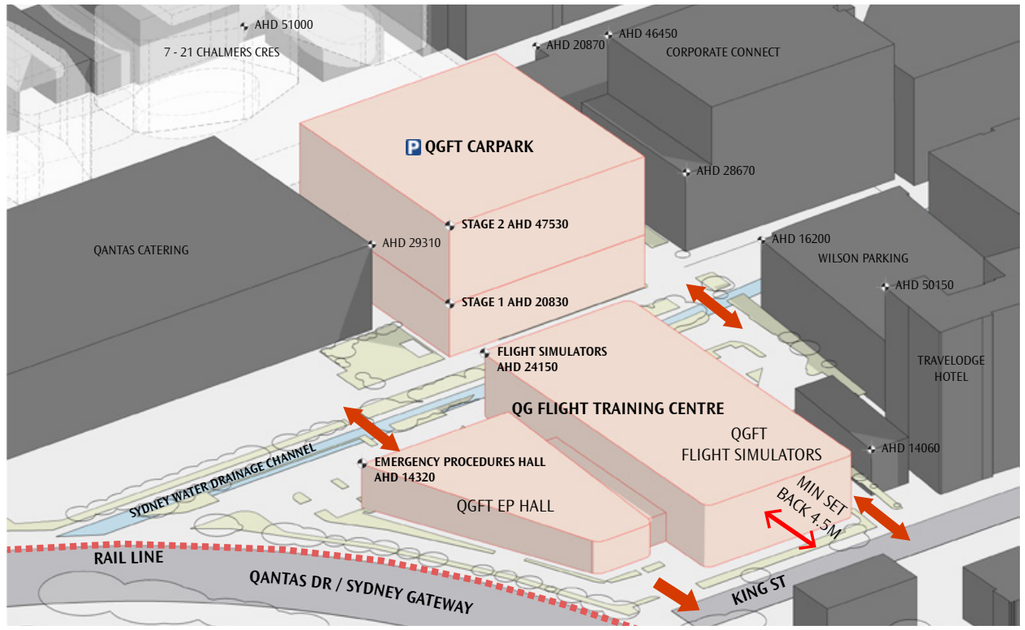



*Figure 21 Final Design Response*

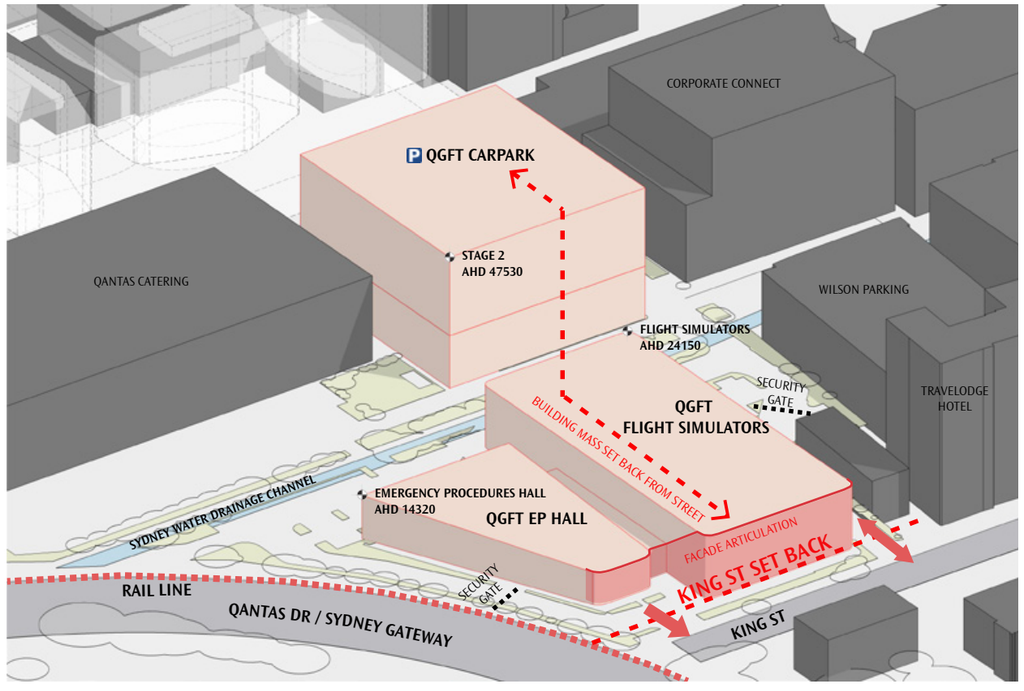



*Figure 22. King Street Response*

The Flight Training Centre has a proposed 4.5m setback to King Street, less than the 9m setback outlined in the *Botany Bay Development Control Plan 2013* due to site access requirements relating to the Flight Simulators. Critically, for operational requirements, the Flight Simulator Bays need full perimeter access for installation and maintenance. The required linear arrangement of the Simulator Bays results in a building geometry with limited access on the northern side of the site fronting the Sydney Water drainage channel. This results in pushing the building south for northern site access, thereby reducing the King Street setback. The proposed Flight Training Centre represents a significant underdevelopment of the site both in terms of building height and side set backs as illustrated in *Figure 22 King Street Response* and *Figure 23 King Street set back*.

The diagram studies of *Figure 22 King Street Response* and *Figure 23 King Street set back* illustrate the proposed King Street set back from axonometric, plan, section and elevation views. The facility is significantly within the permissible heights, and side and rear setbacks. The relatively low scale is considered substantially less intrusive than the permissible larger scale development at a potential 44 metre height. The location of the Flight Training Centre at the dead end of King Street further reduces the buildings visual impact from King Street. The Flight Training Centre is considered consistent within the context of the streetscape which has a variety of heights, densities and setbacks.

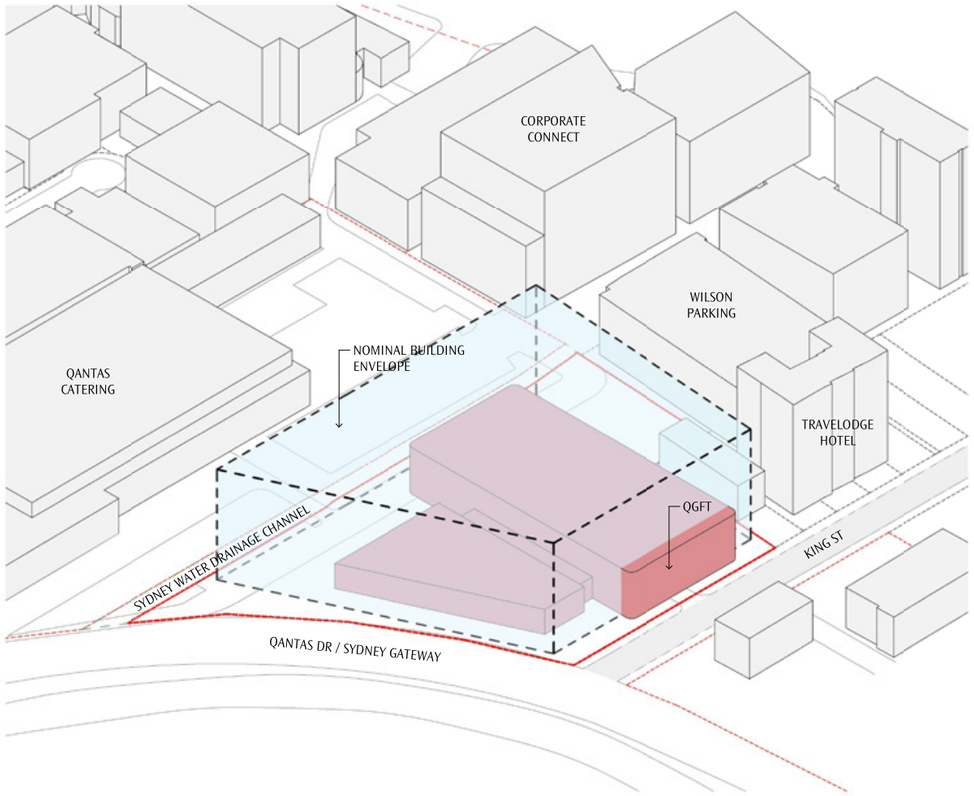
The architectural treatment addresses King Street by breaking the Flight Training Centre into two distinct elements being Emergency Procedures on the west and Flight Training on the eastern side, thereby offering articulation and reduced scale. The Flight Simulator volume is further articulated by vertical slot windows punctuating the linear element topped by a lighter glazed ribbon of office space above achieving security requirements and providing animation to the street.

The tree lined avenue to the east provides staff entry to the site, connecting King Street to Flight Training and the staff Carpark to the rear of the site.

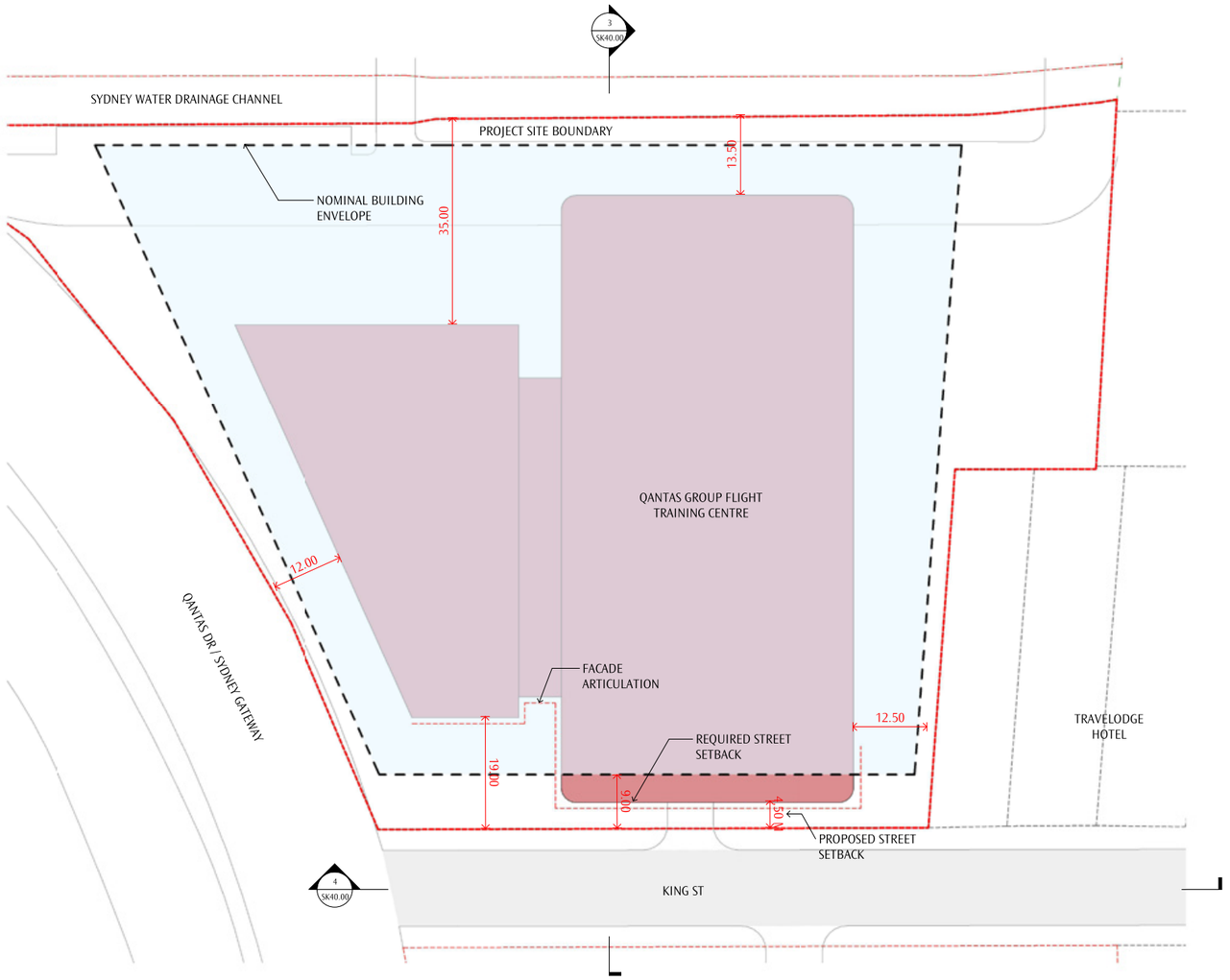
The project site has levels of security to ensure the facilities are accessible to Qantas Staff and authorised personal only. Vehicle entry to the site is managed from King Street by security pass access through controlled boom gates. Operational requirements necessitate a security fence line along King Street which is integrated with a perimeter landscape zone to the King Street frontage.

King Street will retain a degree of existing landscape that partially screens the new Flight Training Centre whilst the relatively low level scale and articulation of the proposed Flight Training Centre assists in making a positive and improved streetscape.

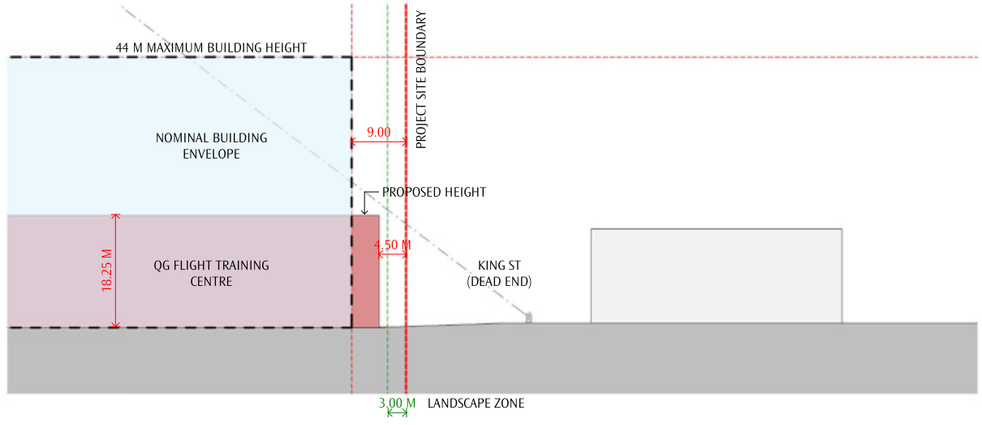
For further detail refer to the *Traffic Report by CBRK and the Landscape and Visual Impact Report* by Scott Carver.



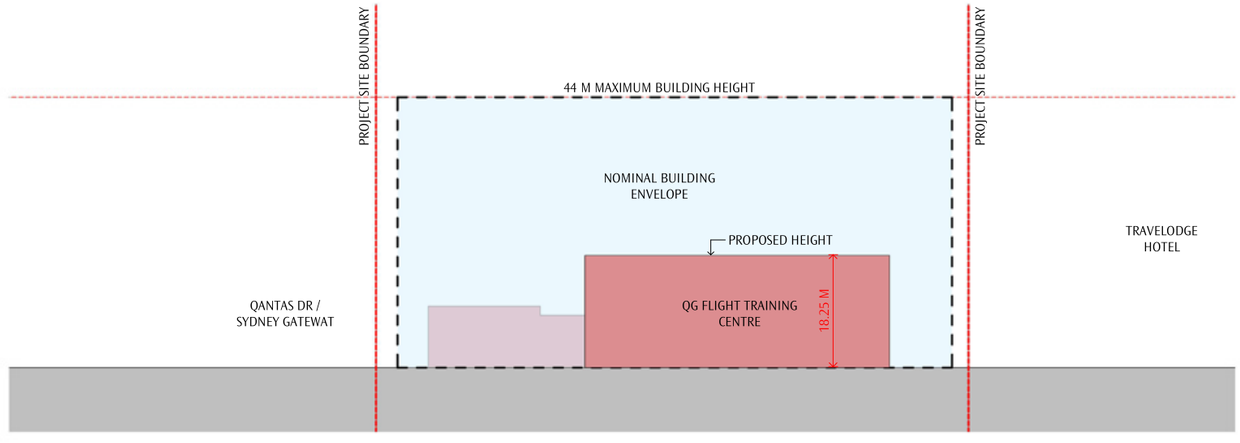

1 AXONOMETRIC VIEW




2 FLOOR PLAN
1 : 500




3 KING ST SECTION
1 : 500




4 KING ST ELEVATION
1 : 500

*Figure 23. King Street set back*

| 1:500@A1, 50%@A3

## *Ground Plane Response*

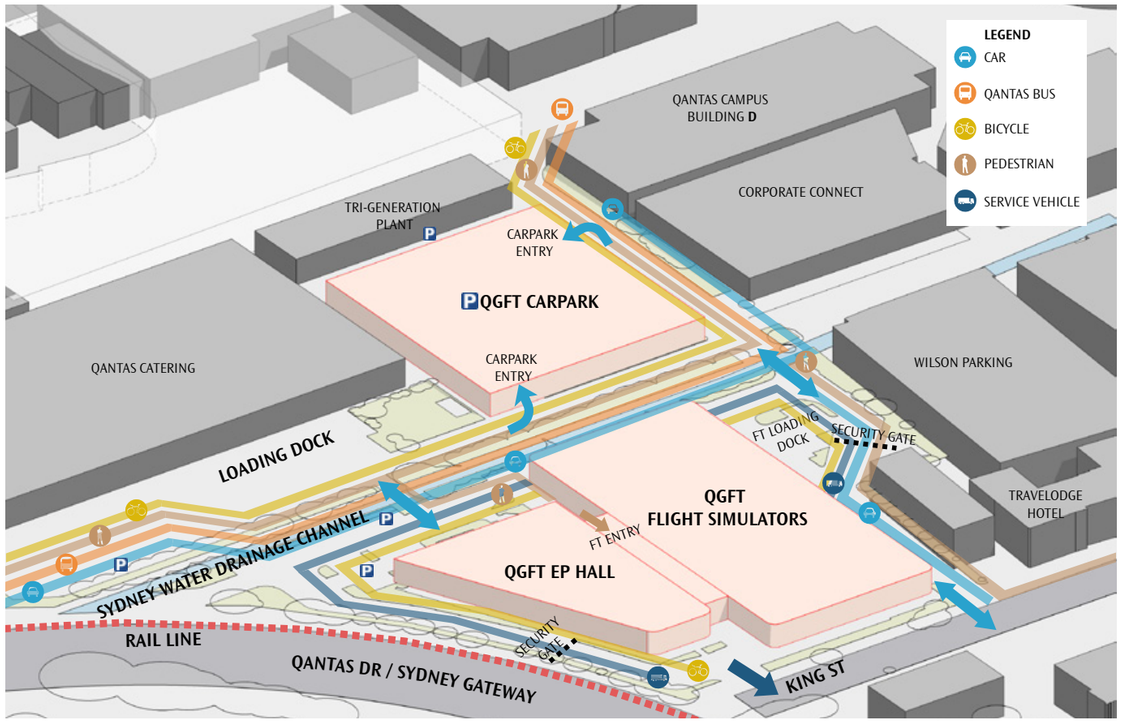



*Figure 24. Ground Plane Response*

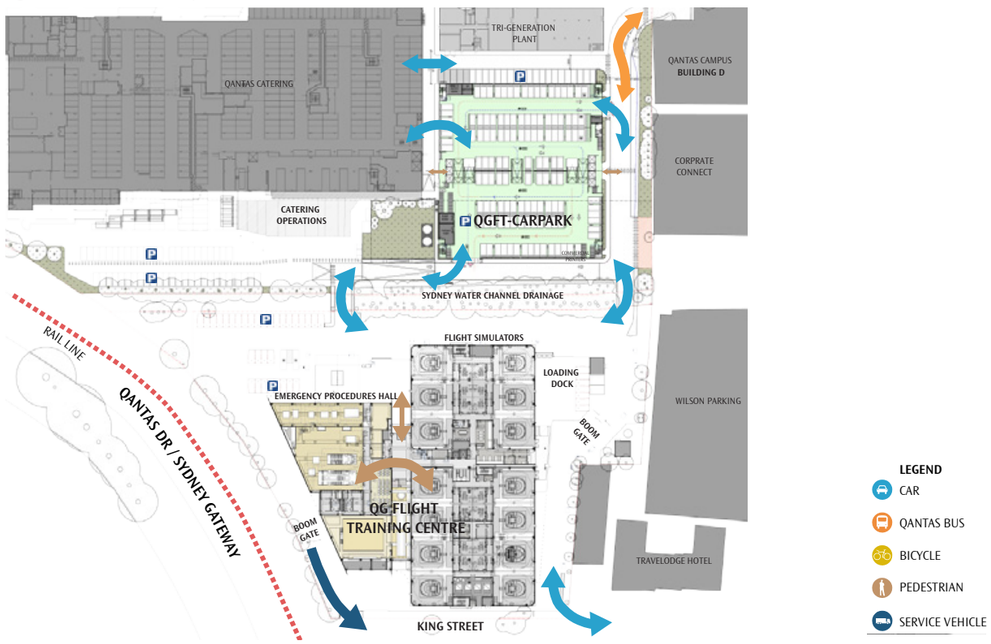



*Figure 25. Internal Campus Design*

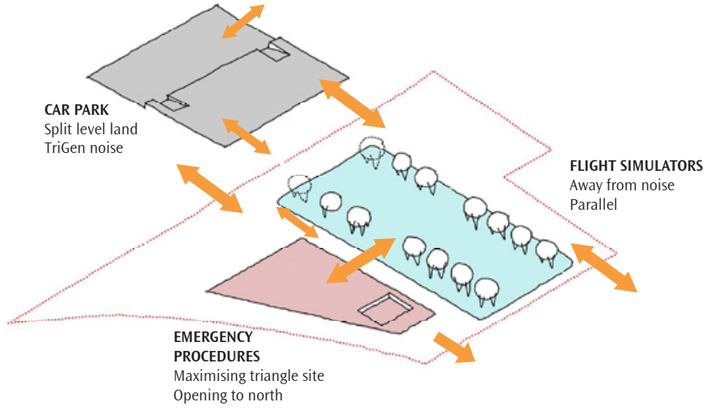
The centralised nature of the site and the large-scale industrial scale of the precinct results in a network of private internal access roads, bus routes and pedestrian links between existing Qantas facilities. The Project has been considered around a rationalised grouping of interrelated Qantas facilities within a newly created Qantas Corporate Precinct with improved intra-site links. *Figure 24; Ground Plane Response* illustrates precinct wide access and connectivity, whilst *Figure 25; Internal Campus Design* shows the detailed building elements with localised intra-site connectivity and key new links between the Project and the existing Qantas Campus. This co-location results in improved connectivity for staff and operations across the site.

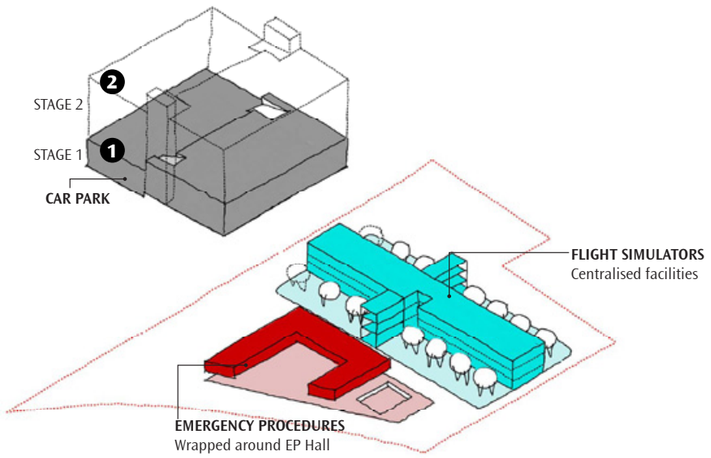
The primary external access is from King Street which provides a newly created tree lined avenue for staff access to both the Flight Training Centre and the staff carpark further to the north. This entry also facilitates vital maintenance access around the Flight Training Centre and to the Loading Dock and Simulator Bays.

The site is serviced by the Qantas staff bus which shuttles staff between the Domestic and International Terminals at the Airport, Qantas Campus and several facilities including the proposed Flight Training Centre and carpark. The Project has resulted in a rationalised Qantas bus route with two new bus stops provided to the north of the Flight Training Centre, adjacent to the Sydney Water drainage channel. The Qantas staff bus, staff and maintenance vehicles also utilise an existing service road providing access from the western side of the site connecting the Flight Training Centre with Kent Road, Coward Street and Qantas Drive. *Refer to Figure 24; Ground Plane Response and Figure 25; Internal Campus Design.*

An existing pedestrian and bus link connect the site to Qantas Campus to the north. Whilst vehicular and pedestrian connection is provided to Qantas Campus and Bourke Road, there is no external vehicle access/egress from north-east of the site however the pedestrian link is reinforced and improved.

Detailed specialist Traffic assessment has been undertaken within the site and more broadly across the precinct. Refer to *Traffic Report* by CBRK.



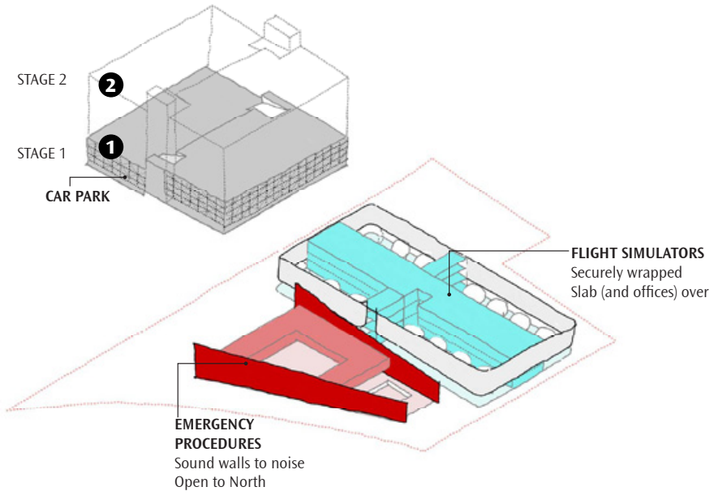




*Figure 26. Flight Training Centre*



Safety is Qantas' first priority. The Flight Training Centre is a key pillar of this value. The facility enables pilots and flight crews to undertake periodic testing to meet regulatory requirements by simulating both aircraft and emergency procedural environments. The Project seeks consent for the construction and operation of a new Flight Training Centre, and associated ancillary uses including a multi-deck carpark. The Project is comprised of the following uses:

**Flight Training Centre;**
The proposed flight training centre will occupy the southern portion of the site. It is a building that comprises 4 core elements as follows:

***Flight Training; Emergency Procedures***
An emergency procedures hall that contains;
- an evacuation training pool,
- door trainers,
- fire trainers
- slide descent towers,
- security room,
- aviation medicine training and equipment rooms.

***Flight Training; Flight Simulators;***
A flight training centre that contains:
- a flight training hall with 14 bays that will house aircraft simulators,
- Integrated procedures training rooms, computer rooms, a maintenance workshop, storerooms, multiple de-briefing and briefing rooms, pilot's lounge and a shared lounge.

***Teaching Space;***
Teaching Space that contains;
- training rooms,
- classrooms and two computer based exam rooms.

***Office Space;***
Office space that contains;
- Office space for staff and associated shared amenities including multiple small, medium and large meeting rooms, think tank rooms, informal meeting spaces, a video room and lunch/tea room.

***Ancillary Space;***
- Ancillary spaces including the reception area at the ground floor, toilets, roof plant and vertical circulation. The external ground floor layout will include a loading dock, at-grade Flight Training Centre staff and visitor car parking for 39 spaces and a bus drop-off zone at the northern site boundary.

The Flight Training Centre operations have specific security requirements and this is achieved through a combination of façade design, bollards and perimeter fencing. Access to the building is security pass controlled within the Entry. The building has been designed with a robust solid concrete base and there are a limited number of security-controlled entry/egress points.

For operational and safety reasons the Simulator Bays are required to be physically and visually isolated from the public domain.

*Sydney Airport DOM - Car Park P2*

*Wilson Carpark Mascot*

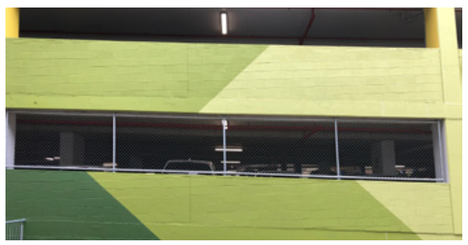
*Corporate Connect*

*Corporate Connect Carpark*

*Qantas Catering Carpark*


*Park & Fly Carpark*

*5-11 Ewan St Carpark*



*5-11 Ewan St Carpark*

*Figure 26.6;Surrounding Context; Carparks*

The proposed multi-deck carpark will be located to the north-east of the Flight Training Centre and adjacent the existing Qantas Catering facility and Tri-generation plant.

The proposed Stage 1 carpark provides 748 spaces for Qantas staff on five levels. The Stage 2 carpark provides 2059 spaces (including Stage 1) for Qantas staff on fourteen levels. Vehicle access to the carpark will be provided via King Street, Kent Road and from Qantas Drive via the existing catering bridge. Refer to *Figure 21; Final Design Response*.

The proposed carpark design is a result of a detailed options analysis which considers the local industrial context , environmental strategies and the performance requirements of key infrastructure. The proposed design is paired with the adjacent Flight Training Centre, using similar design strategies and materiality.

A review of several alternative façade strategies was undertaken and these are illustrated included in Section 03. Carpark Facade Options .

The options study identified several key design principles for the carpark;

**Environmental sustainable design;**
To optimise environmental and sustainable design principles within the carpark infrastructure by;

- Optimising natural ventilation to avoid mechanical ventilation (Requires a minimum of 50% free permeable facade area)
- Minimising the need for additional services and sprinklers where possible (Requires a minimum of 50% free permeable facade area)
- Optimising natural lighting thereby reducing need for additional artificial lighting
- Maximising use of landscape elements where practicable
- Minimising the use of applied finishes

**Urban context;**
Respond to the industrial context and minimise apparent bulk and scale by;

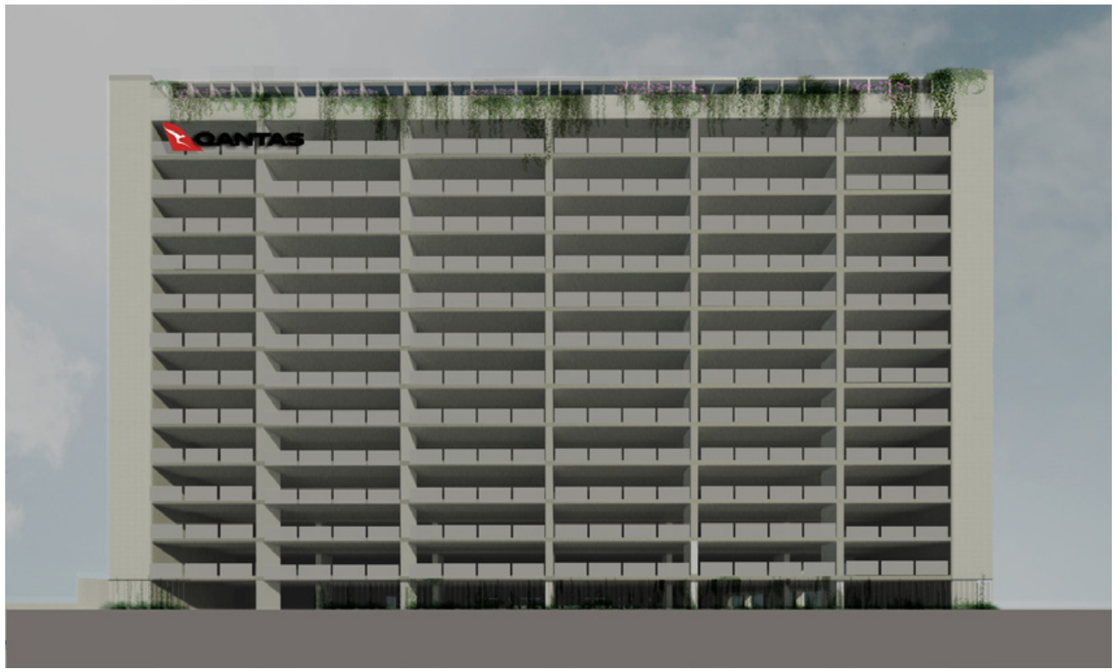
- Use appropriate urban and industrial materials and design strategies to link the carpark to the Flight Training Centre
- Optimise transparency and permeability within the design where possible to reduce bulk and scale
- Use landscape elements where possible to connect the carpark to adjacent landscape and improve the landscape amenity

**Staff amenity and safety;**
Optimise staff safety and security within the carpark infrastructure by;

- Use full height carpark façade to envelope carpark floors for optimal user safety
- Use open floor plate design with maximum day lighting and permeability for user safety and passive surveillance

**Design excellence;**
Achieve design excellence through durable design strategies by;

- Optimising functional performance with minimal elements for durability and longevity
- Utilise self finished materials suited to the industrial precinct where possible to minimise unnecessary maintenance
- Minimise services and design elements that require unnecessary maintenance
- Minimise bulk and scale
- Visual amenity and quality




## Option Study ; Design Strategy

Structure;

- Exposed structural concrete frame

Stair and Lift Cores;

- Exposed structural concrete

Facade;

- Low level pre-cast concrete panels with integrated crash rail to nominal 1300mm high

Roof;

- Structural galvanised steel pergola with perimeter landscape planting

Ground Plane;

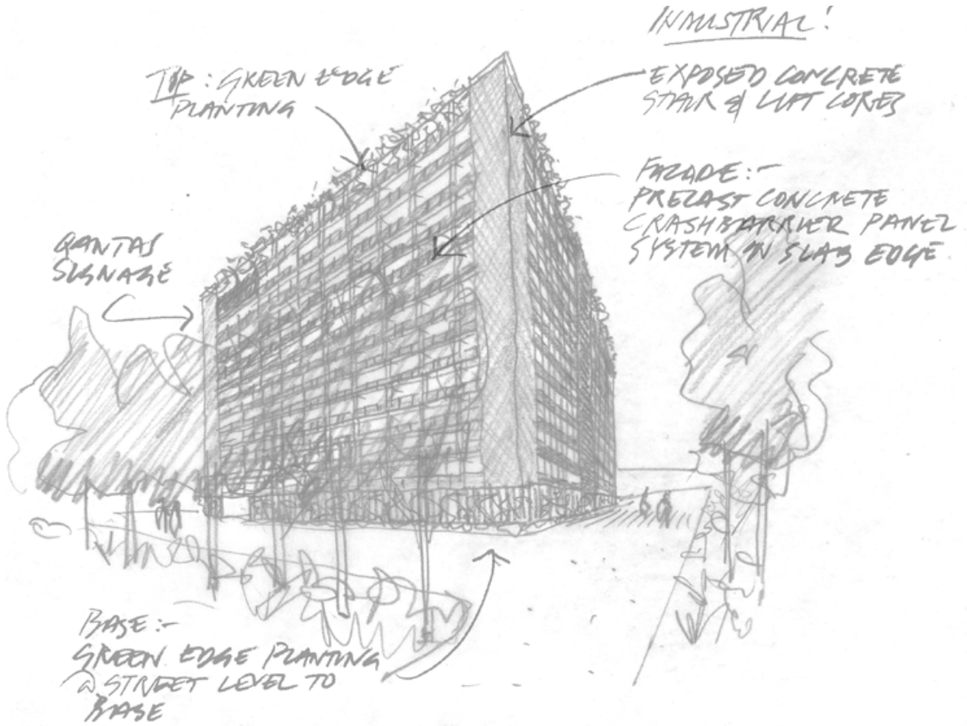
- Tension wires with perimeter landscape planting

Environmental Strategy;

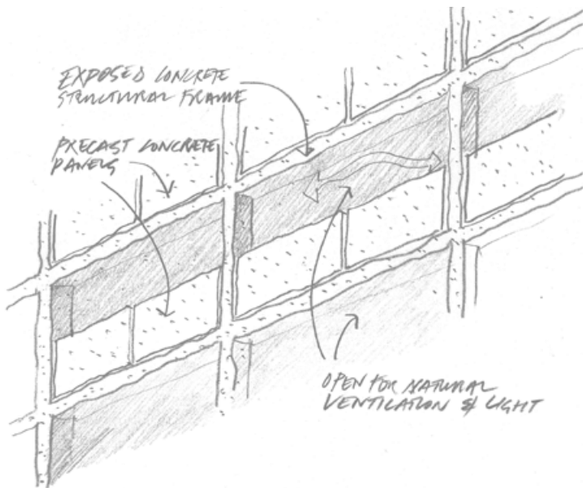
- Naturally ventilated

Material Reference
Low level pre-cast concrete panels with integrated crash rail

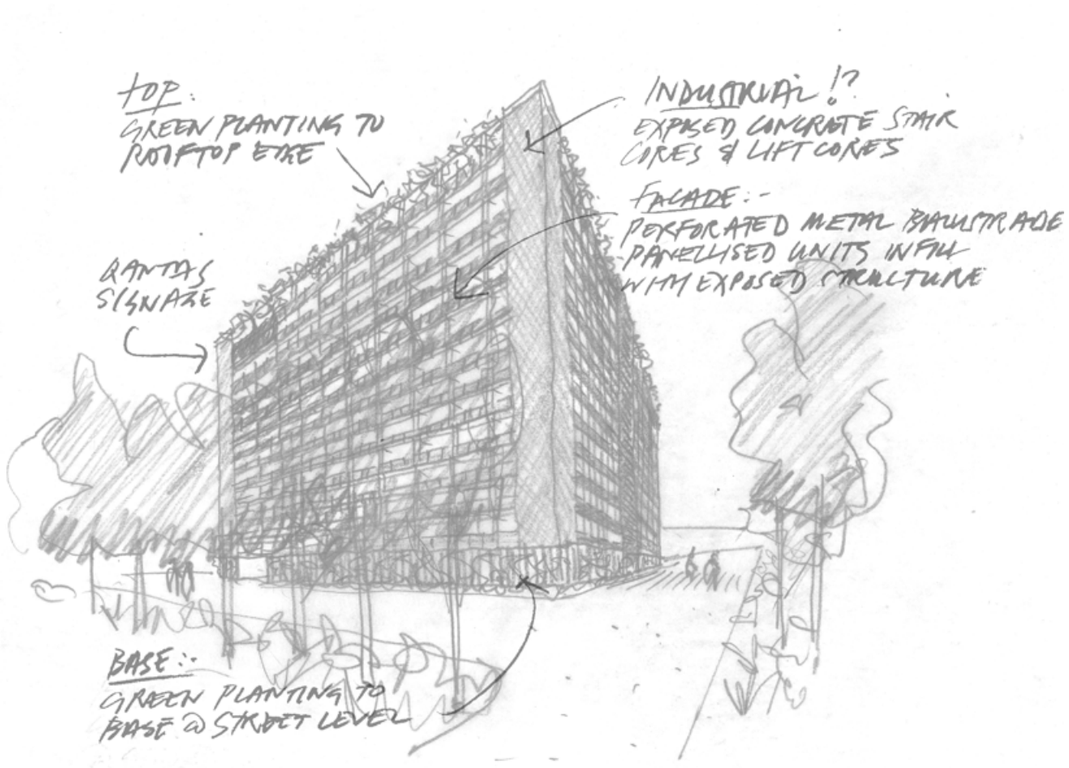
*Figure 26.1 Carpark Facade Study; Option 01*




Facade Study




Facade Detail Study


Facade Study

## Option Study ; Design Strategy

Structure;

- Exposed structural concrete frame

Stair and Lift Cores;

- Exposed structural concrete

Facade;

- Low level proprietary perforated metal balustrade with integrated crash rail system to nominal 1300mm high

Roof;

- Structural galvanised steel pergola with perimeter landscape planting

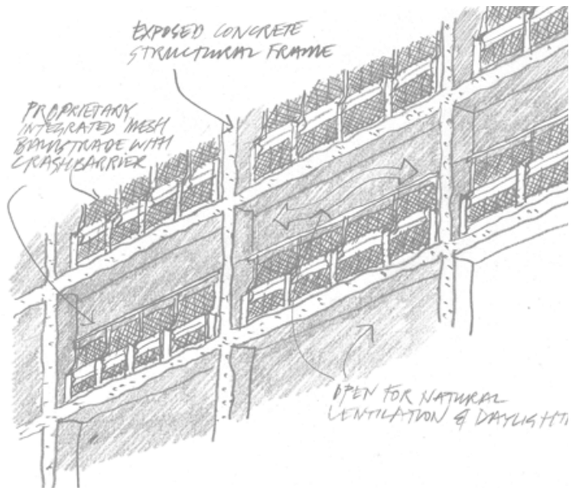
Ground Plane;

- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated

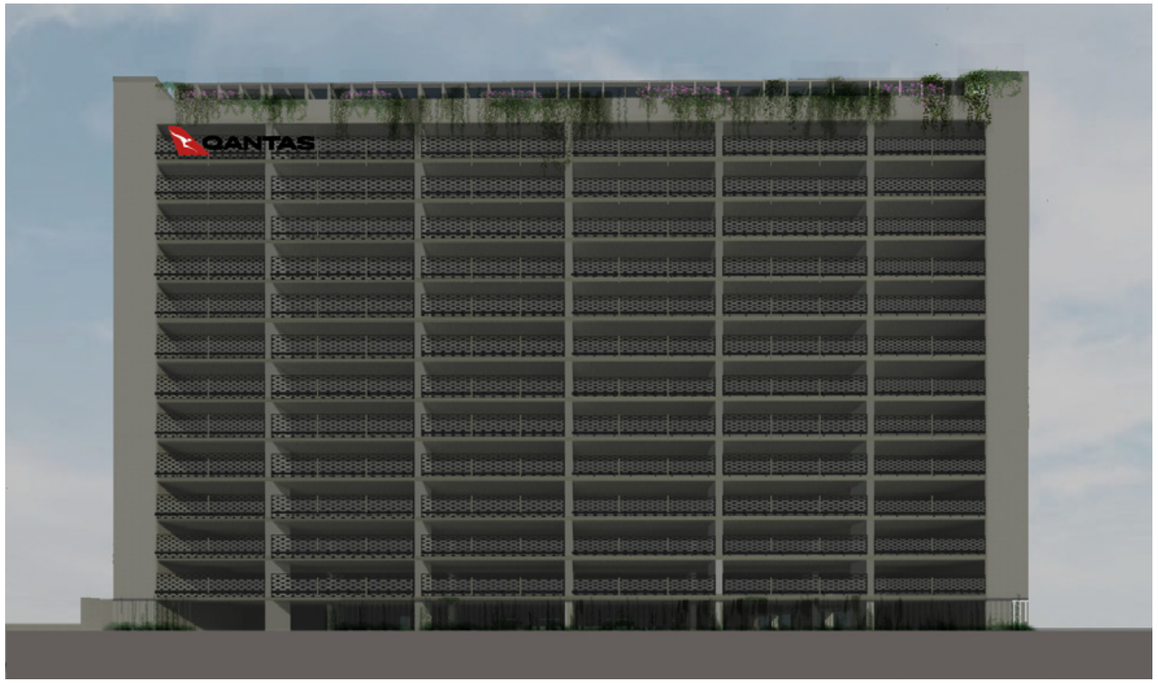
Material Reference
Low level proprietary metal panel

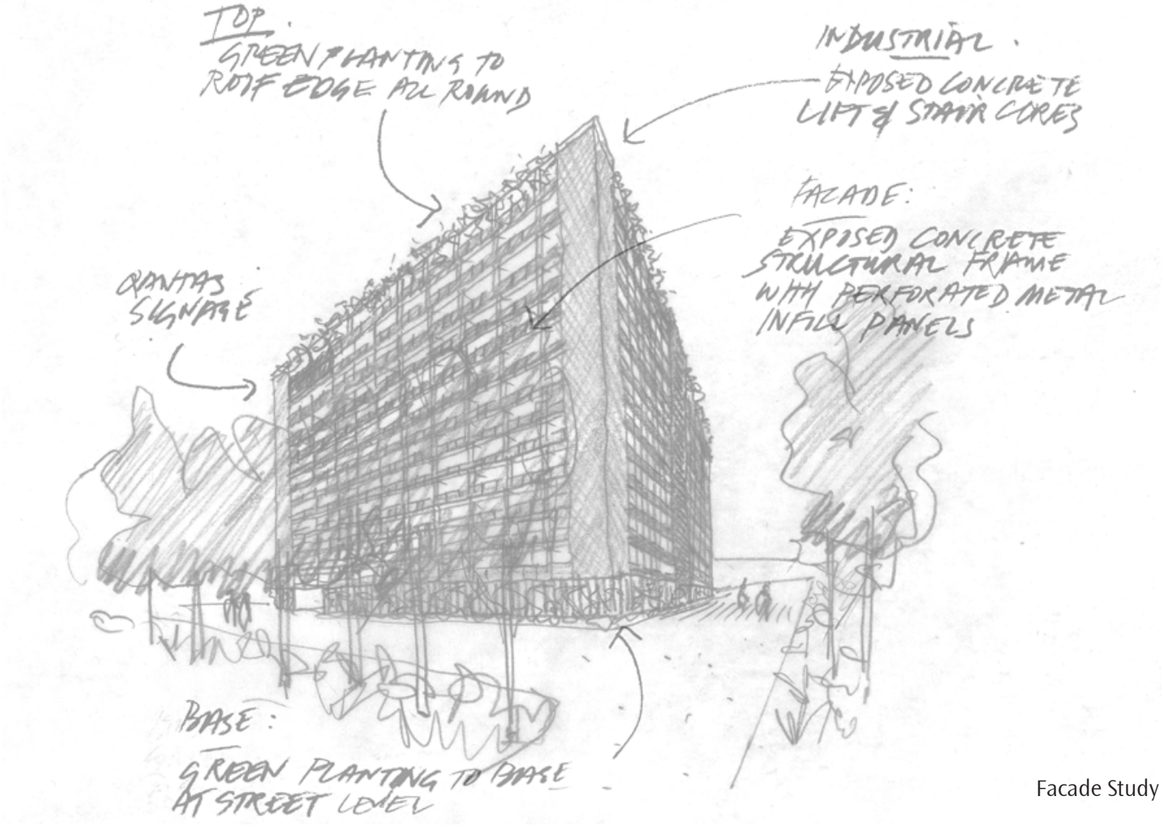



Facade Detail Study

*Figure 26.2; Carpark Facade Study; Option 02*

*Option 03*




Facade Study

## Option Study ; Design Strategy

Structure;

- Exposed structural concrete frame

Stair and Lift Cores;

- Exposed structural concrete

Facade;

- Low level proprietary perforated metal panel balustrade system with separate crash rail system to nominal 1300mm high

Roof;

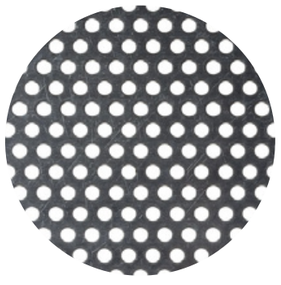
- Structural galvanised steel pergola with perimeter landscape planting

Ground Plane;

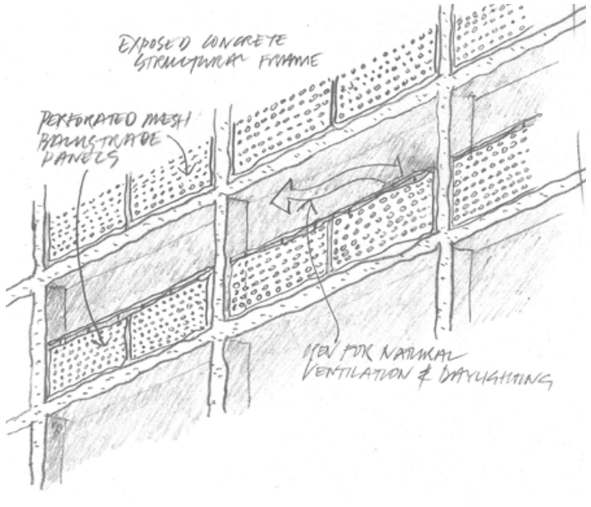
- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated

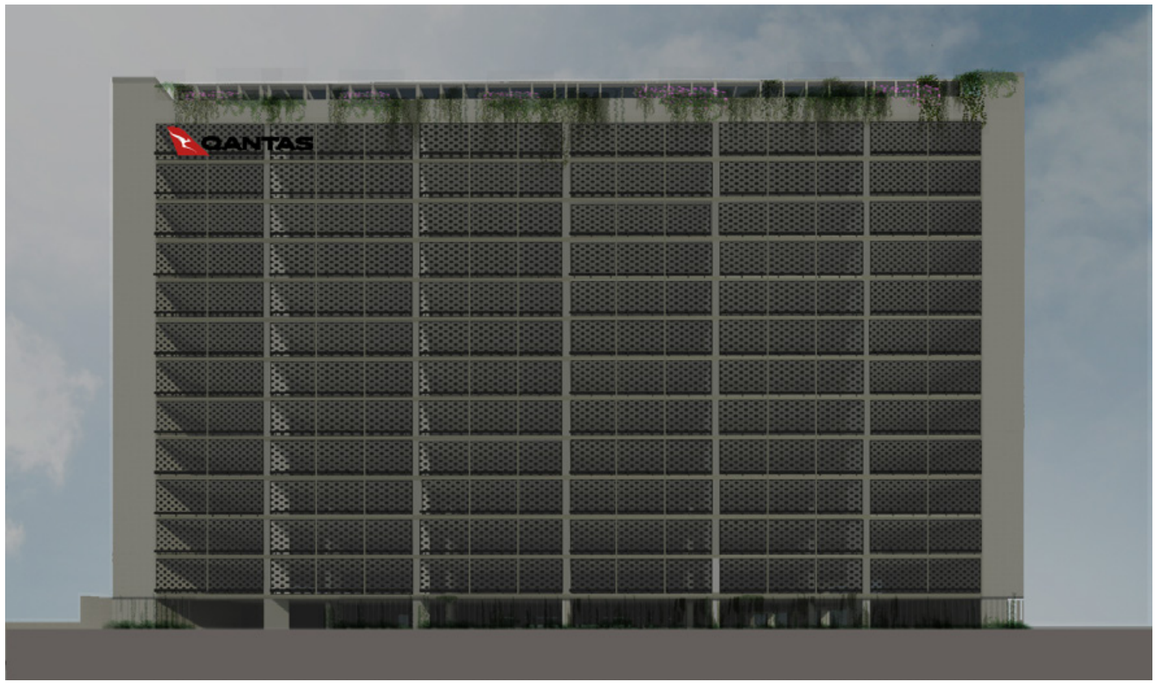


Material Reference
Low level proprietary metal panel




Facade Detail Study

*Figure 26.3; Carpark Facade Study; Option 03*




## Option Study ; Design Strategy

Structure;

- Exposed structural concrete frame

Stair and Lift Cores;

- Exposed structural concrete

Facade;

- Floor to floor proprietary perforated metal panels system with separate crash rail system

Roof;

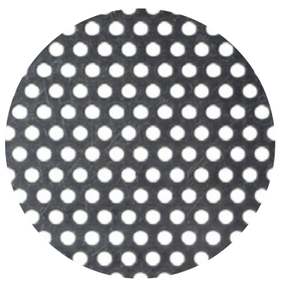
- Structural galvanised steel pergola with perimeter landscape planting

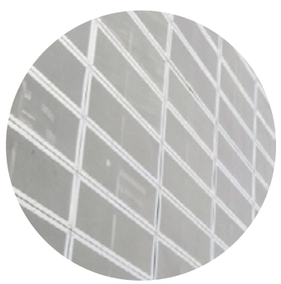
Ground Plane;

- Tension wires with perimeter landscape planting

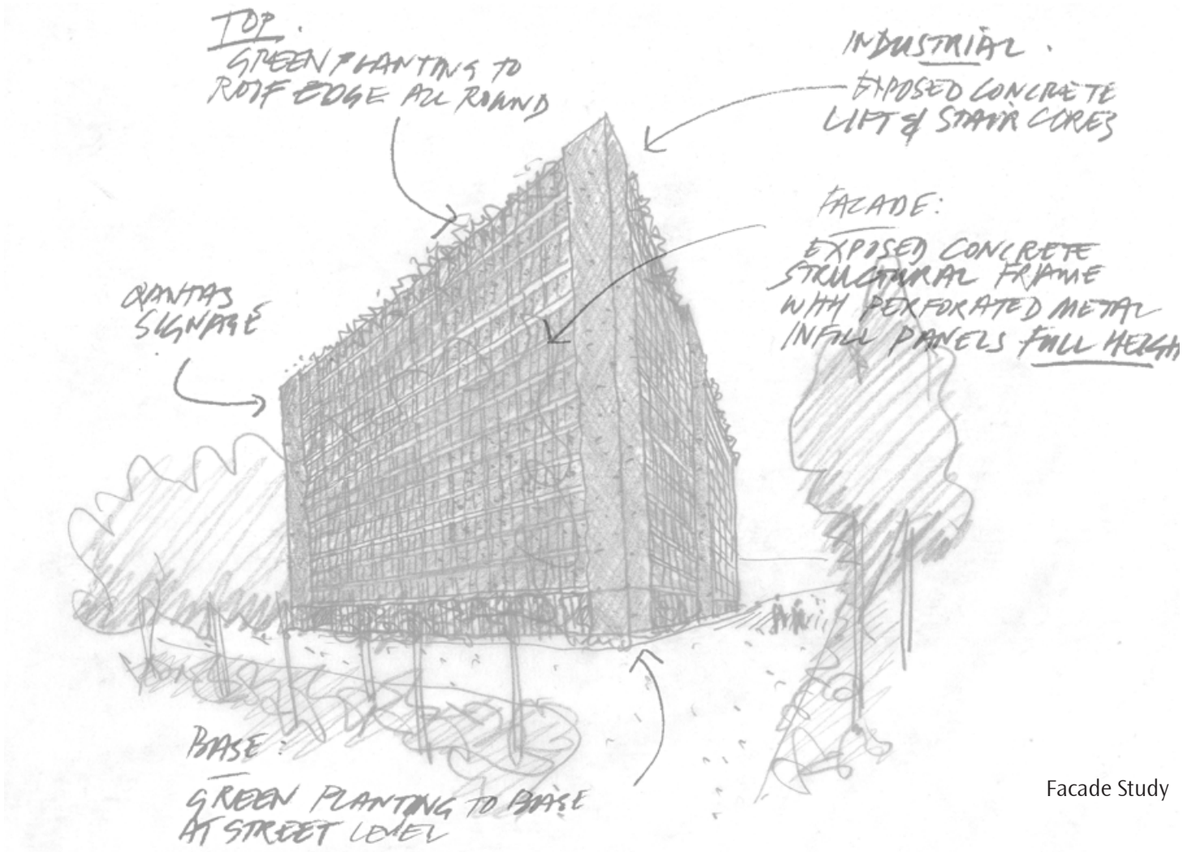
Environmental Strategy;

- Naturally ventilated (potentially reduced ventilation)

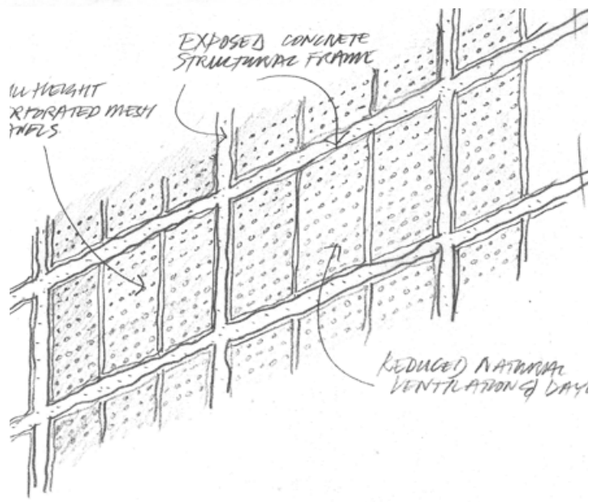




Material Reference
Floor to floor perforated metal panels

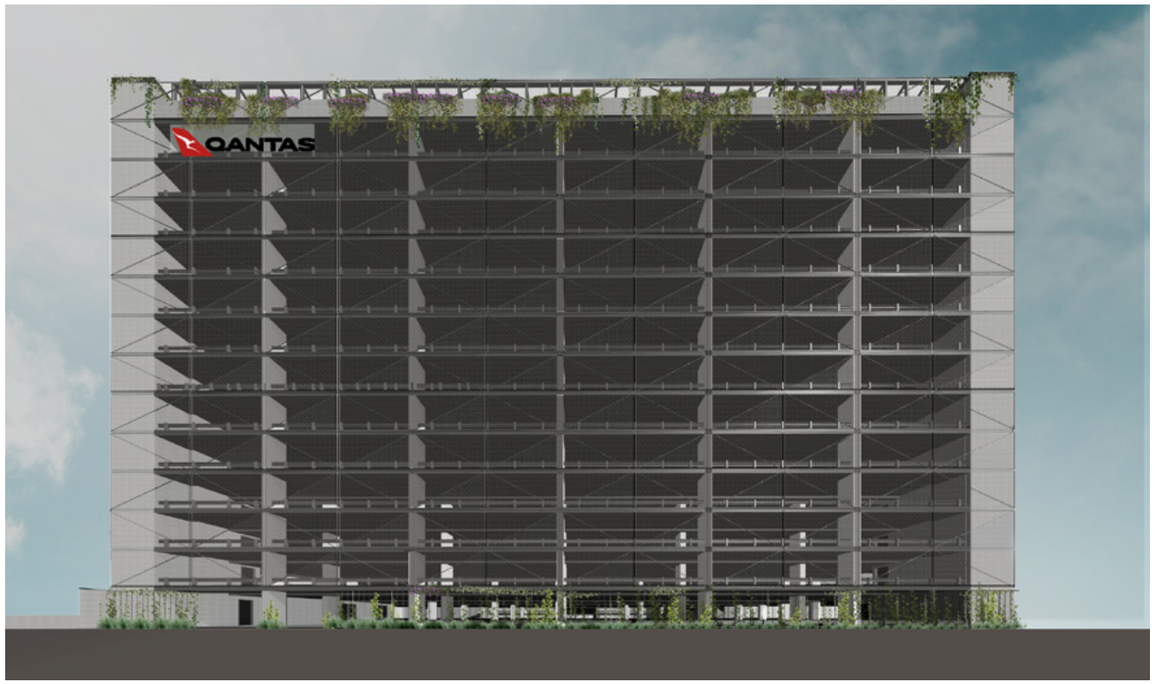


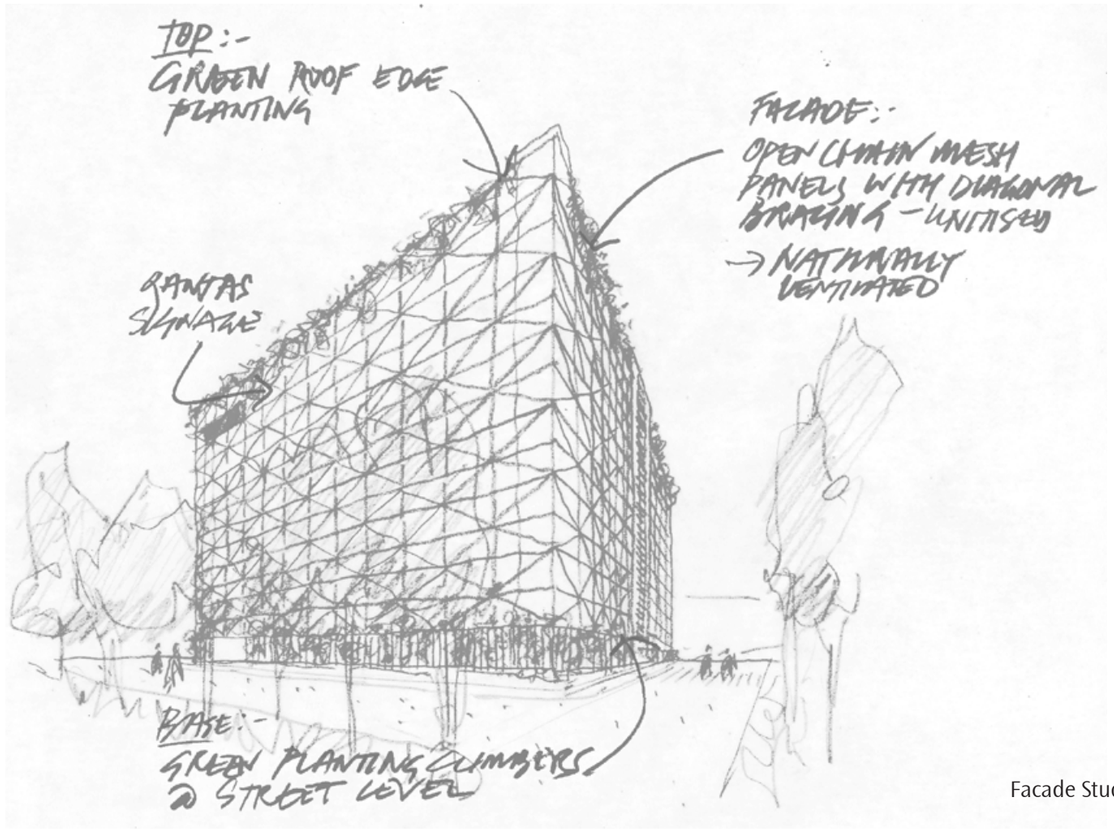

Facade Study




Facade Detail Study

*Figure 26.4; Carpark Facade Study; Option 04*




Facade Study

## Option Study ; Design Strategy

Structure;

- Exposed structural concrete frame

Stair and Lift Cores;

- Exposed structural concrete
- Partial coverage of stair cores with facade panel system

Facade;

- Floor to floor panelised galvanised steel chain wire mesh with tubular galvanised steel frame and bracing

Roof;

- Structural galvanised steel pergola with perimeter landscape planting

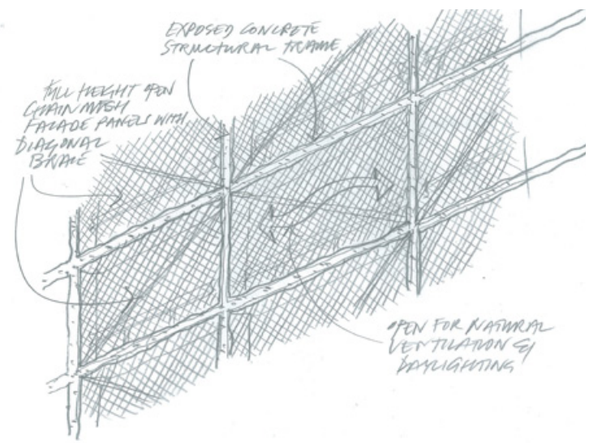
Ground Plane;

- Tension wires with perimeter landscape planting

Environmental Strategy;

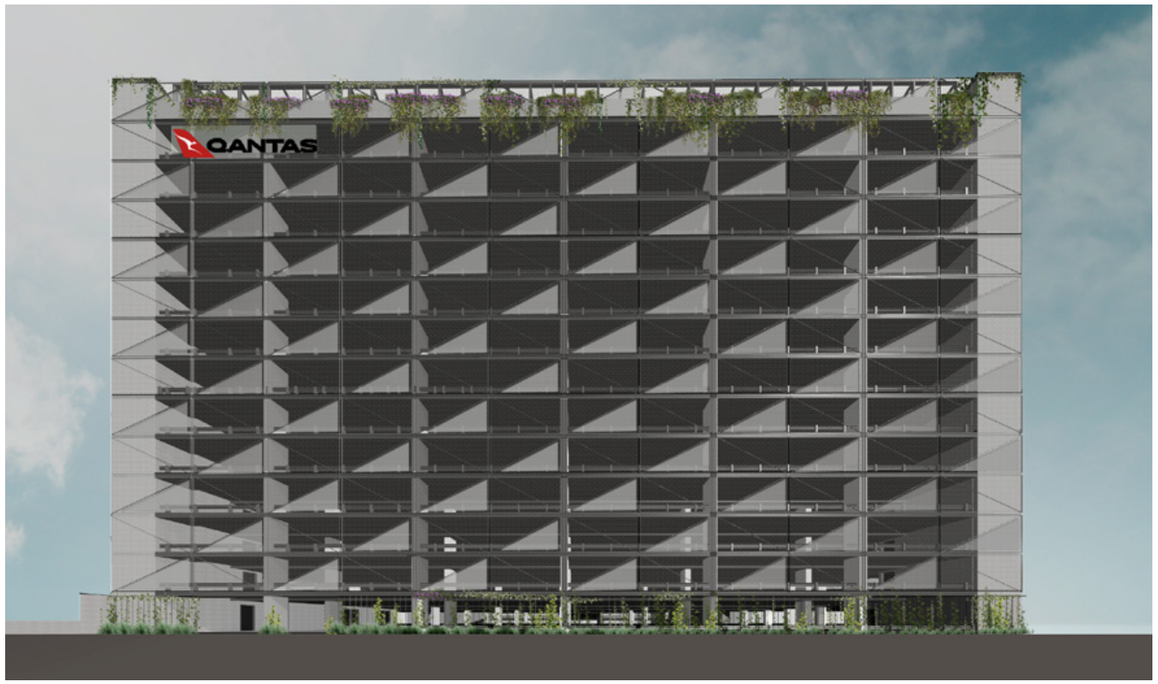
- Naturally ventilated

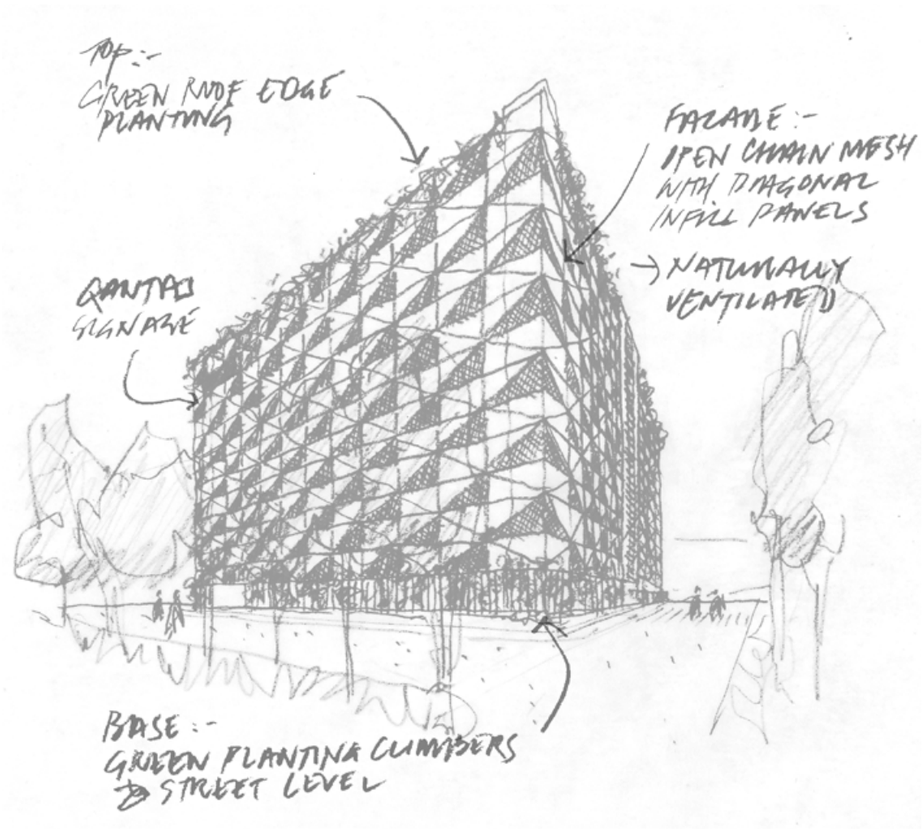
Material Reference
Floor to floor panelised galvanised steel chain wire




Facade Detail Study

*Figure 26.5 Carpark Facade Study; Option 05*




Facade Study

## Option Study ; Design Strategy

Structure;

- Exposed structural concrete frame

Stair and Lift Cores;

- Exposed structural concrete
- Facade panel system wraps around stair cores

Facade;

- Floor to floor panelised galvanised steel chain wire mesh with tubular galvanised steel frame and bracing
- Galvanised metal ‘disks’ in hit and miss pattern for optimised natural ventilation and daylight

Roof;

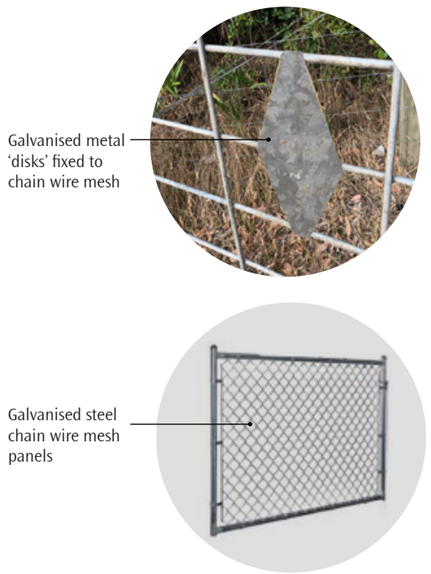
- Structural galvanised steel pergola with perimeter landscape planting

Ground Plane;

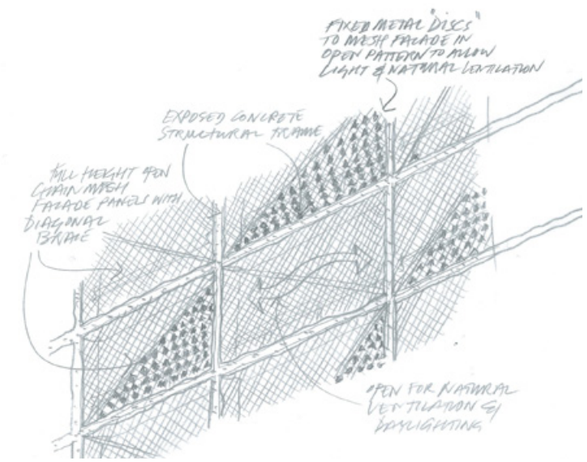
- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated



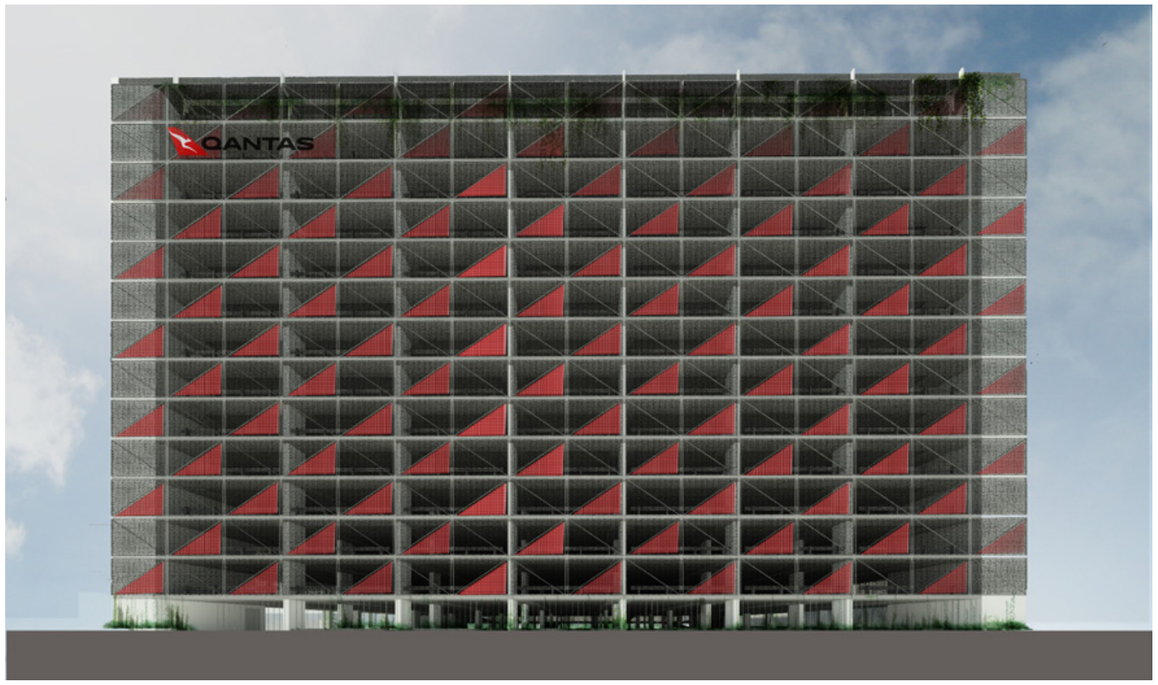

Material Reference
Floor to floor galvanised steel chain wire mesh panels

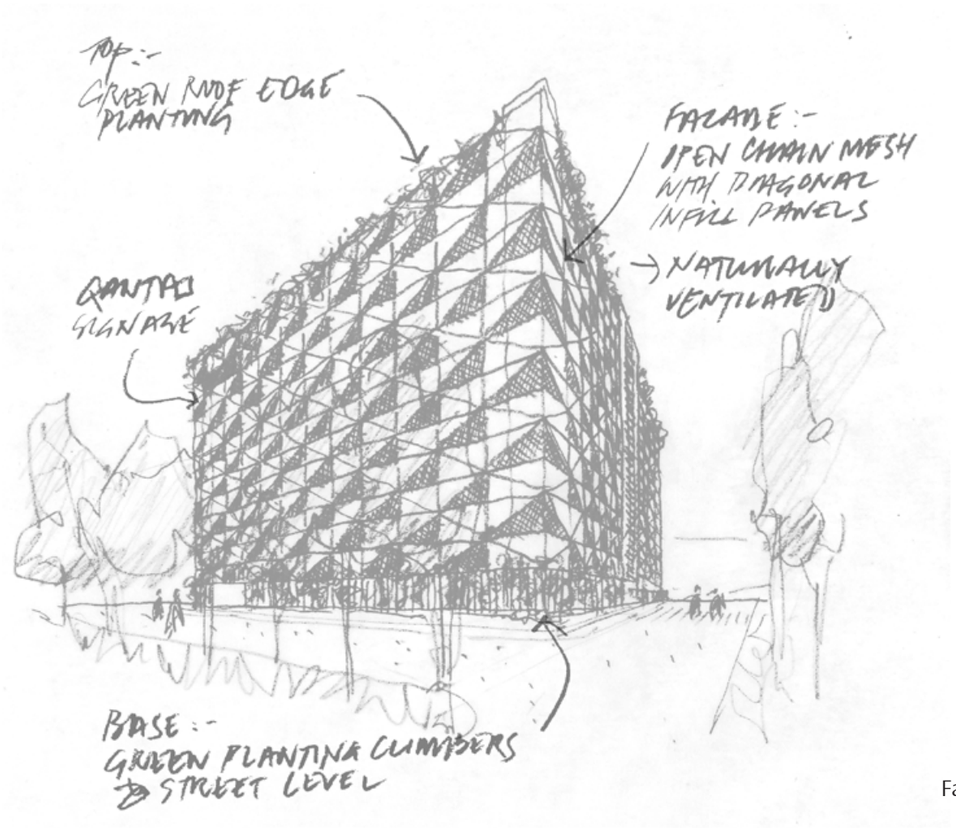



Facade Detail Study

*Figure 26.5.1; Carpark Facade Study; Option 05.01*

*Option 05.02*




Facade Study

## Option Study ; Design Strategy

Structure;

- Exposed structural concrete frame

Stair and Lift Cores;

- Exposed structural concrete
- Facade panel system wraps around stair cores

Facade;

- Floor to floor panelised galvanised steel chain wire mesh with tubular galvanised steel frame and bracing
- Colour option study metal ‘disks’ in hit and miss pattern for optimised natural ventilation and daylight

Roof;

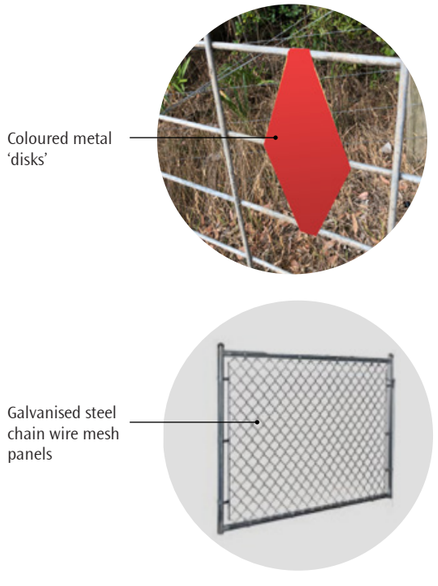
- Structural galvanised steel pergola with perimeter landscape planting

Ground Plane;

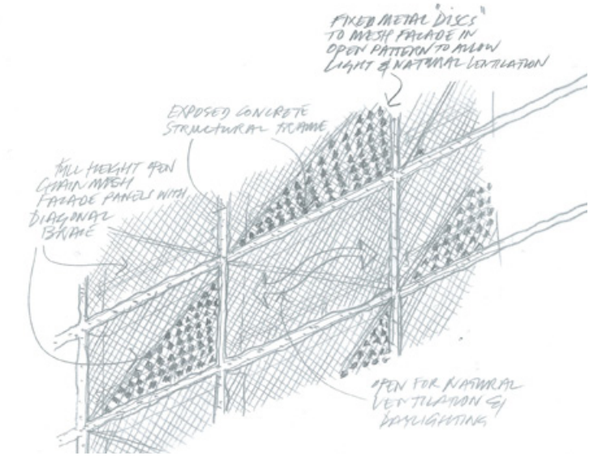
- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated

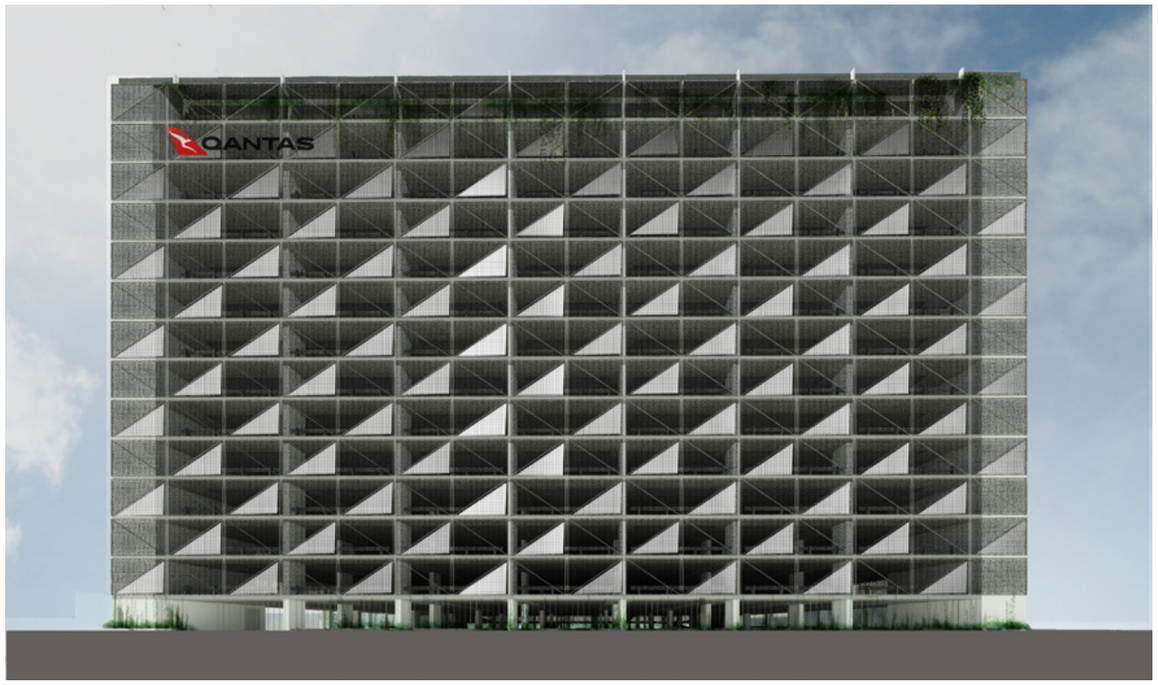


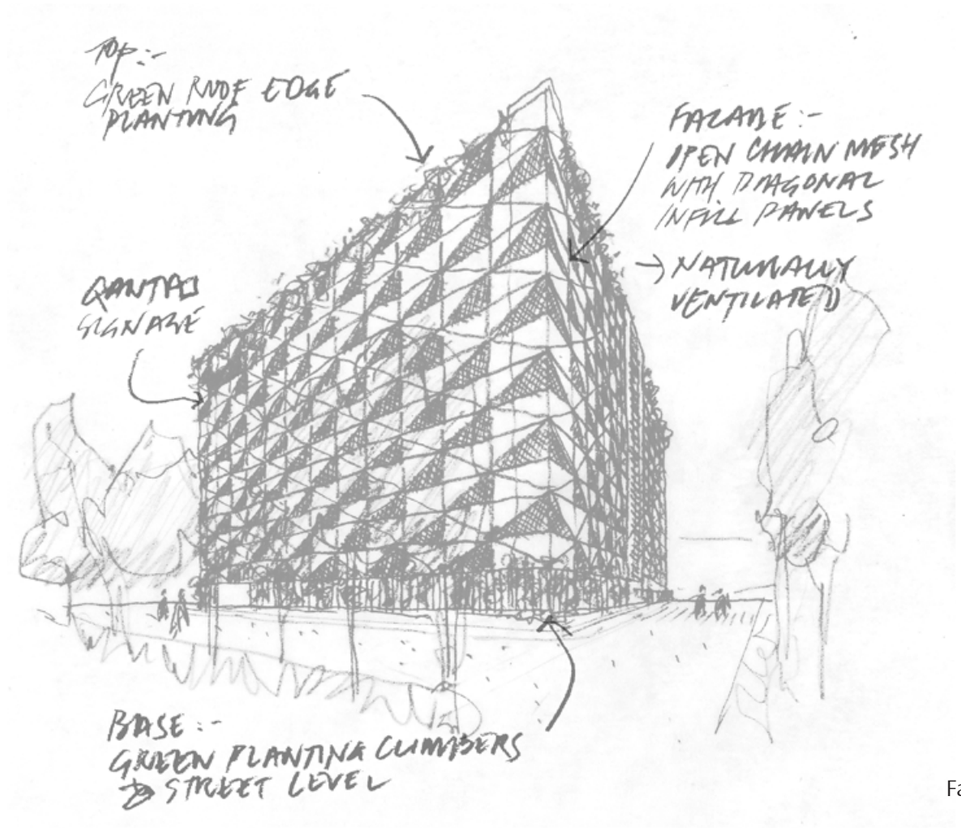

Material Reference




Facade Detail Study

*Figure 26.5.2; Carpark Facade Study; Option 05.02*




Facade Study

## Option Study ; Design Strategy

Structure;

- Exposed structural concrete frame

Stair and Lift Cores;

- Exposed structural concrete
- Facade panel system wraps around stair cores

Facade;

- Floor to floor panelised galvanised steel chain wire mesh with tubular galvanised steel frame and bracing
- Colorbond ‘surfmist’ metal ‘disks’ in hit and miss pattern for optimised natural ventilation and daylight

Roof;

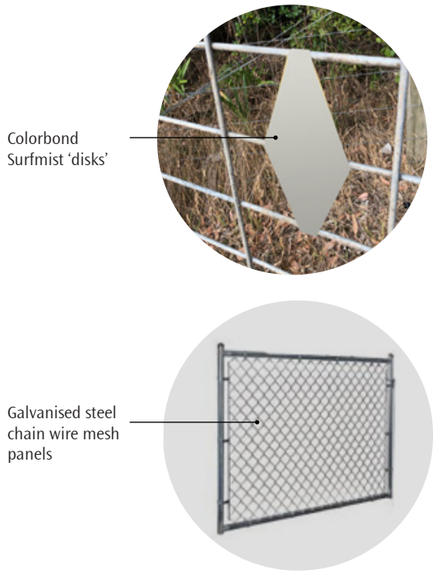
- Structural galvanised steel pergola with perimeter landscape planting

Ground Plane;

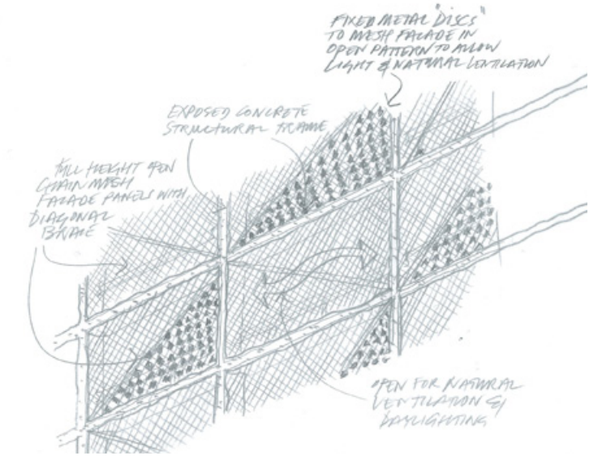
- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated




Material Reference



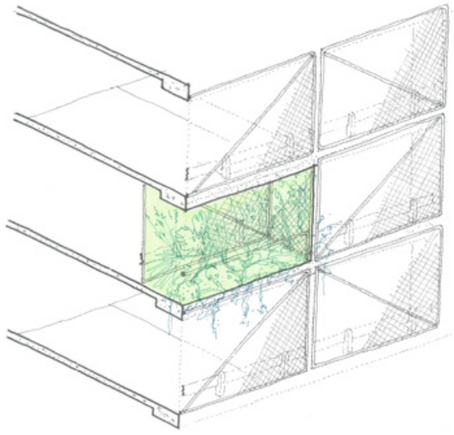

Facade Detail Study

*Figure 26.5.3; Carpark Facade Study; Option 05.03*

## *Carpark Landscape Planters*

While maintaining the same repeated façade patterns, planters are formed from cantilevered sections of the carpark slab. The cantilever allows for increased natural sunlight and rainwater to service the planter, whilst drawing focus to the landscape from the surrounds. The carpark facade is articulated through the patterning and shadows cast by the extruded planters.

The chain mesh sides, top and front which wrap around the planters continue the material palette whilst also allowing easy and safe maintenance from inside the carpark deck.



X NO

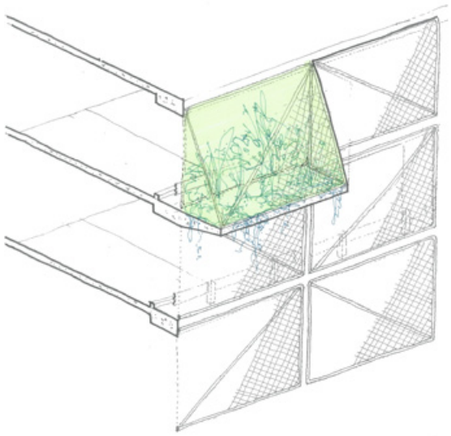
### *Option A ; Rebate planter*

Pros :

- Mesh facade enclosure enables easy maintenance access from within carpark
- Number of planters are limited to ensure the requirements of open deck, naturally ventilated carpark are met
- Retains existing structure

Cons:

- Insufficient visual impact value due to recessive location
- Limited rain water access for plants
- Limited solar access for plants
- Limited three dimensional impact
- Fall arrest still needs to be provided
- Loss of carpark spaces



X NO

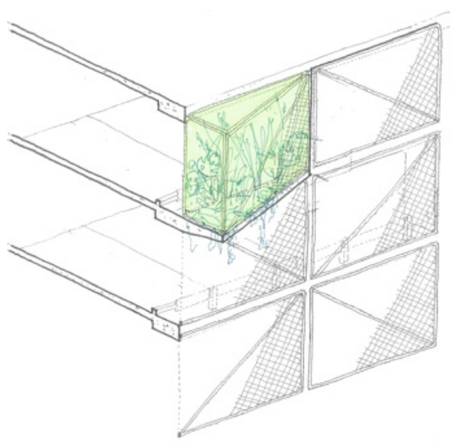
### *Option B ; Triangular Planter*

Pros :

- Projected form articulates facade with sculptural form and shadow
- Improved rain water access for plants
- Improved solar access for plants
- Number of planters are limited to ensure the requirements of open deck, naturally ventilated carpark are met
- Mesh facade enclosure enables easy / low risk maintenance access from within carpark
- Increased visibility from oblique view point (along pedestrian path)
- No loss of carpark spaces

Cons:

- Triangular geometry limits plant growth
- Triangular geometry does not optimise planter's volume and visual amenity
- Requires custom panels



X NO

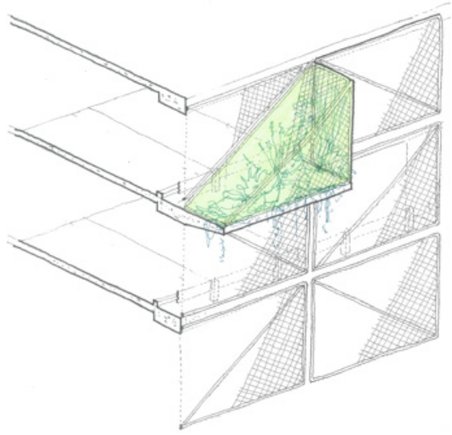
### *Option C ; Triangular Planter*

Pros :

- Projected form articulates facade with sculptural form and shadow
- Improved rain water access for plants
- Improved solar access for plants
- Number of planters are limited to ensure the requirements of open deck, naturally ventilated carpark are met
- Mesh facade enclosure enables easy / low risk maintenance access from within carpark
- No loss of carpark spaces

Cons:

- Triangular geometry limits plant growth
- Triangular geometry does not optimise planter's volume and visual amenity
- Requires custom facade panels



X NO

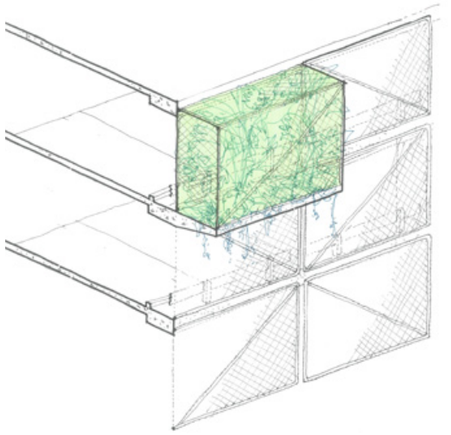
### *Option D; Triangular Planter*

Pros :

- Projected form articulates facade with sculptural form and shadow
- Improved rain water access for plants
- Improved solar access for plants
- Number of planters are limited to ensure the requirements of open deck, naturally ventilated carpark are met
- Mesh facade enclosure enables easy / low risk maintenance access from within carpark
- No loss of carpark spaces

Cons:

- Triangular geometry limits plant growth
- Triangular geometry does not optimise planter's volume and visual amenity
- Requires custom facade panels



✓ YES

### *Option E*

Pros :

- Projected form articulates facade with sculptural form and shadow
- Improved rain water access for plants
- Improved solar access for plants
- Rectangular geometry optimises potential for plant growth
- Rectangular geometry optimises three dimensional visual impact
- Increased visibility from oblique view point (along pedestrian path)
- Number of planters are limited to ensure the requirements of open deck, naturally ventilated carpark are met
- Mesh facade enclosure enables easy / low risk maintenance access from within carpark
- Uses standard facade panels
- No loss of carparks

*Figure 34; Carpark Landscape Planters Option Analysis*

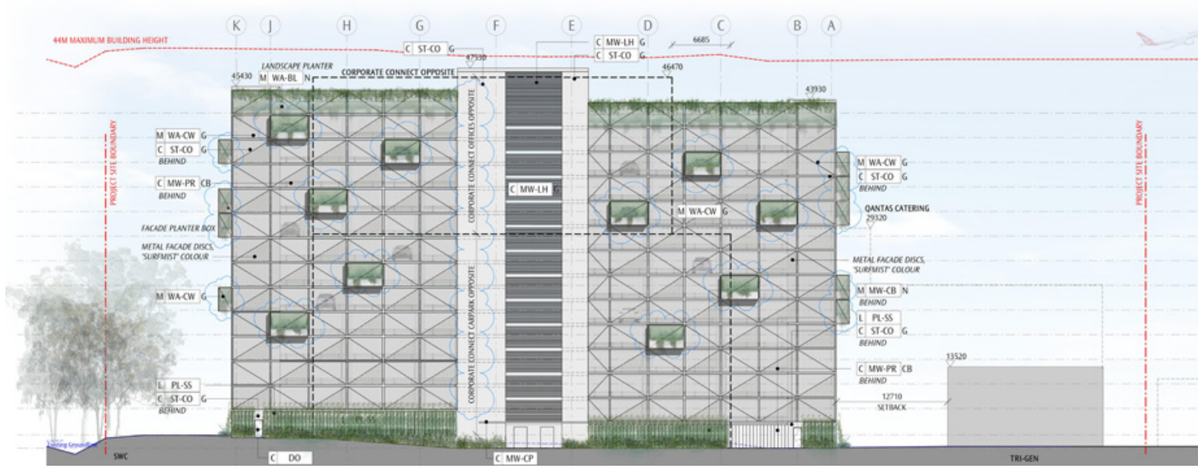



*Figure 35; Carpark Landscape Planters East Elevation*

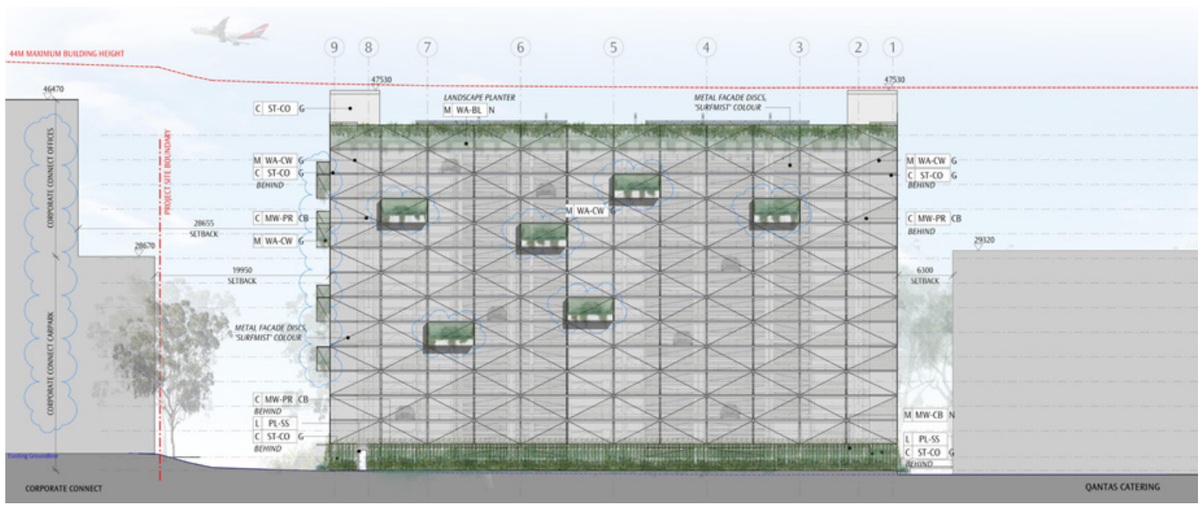



*Figure 36; Carpark Landscape Planters North Elevation*

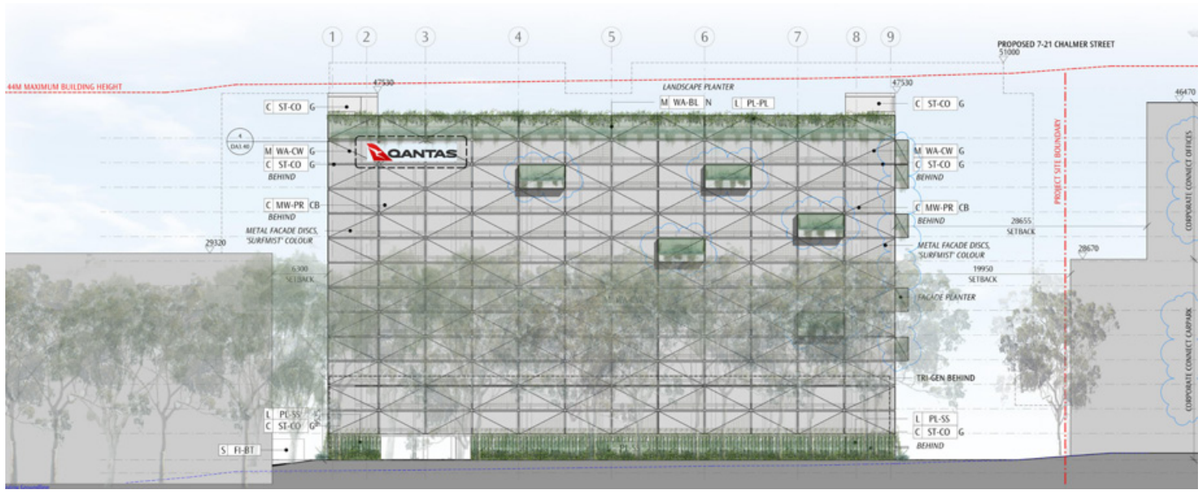



*Figure 37; Carpark Landscape Planters South Elevation*

*Figure 20.1 Artists Impression; View of Carpark*

***Carpark Preferred Option***

Two key facade option studies have been undertaken for the carpark being :

1. Facade Design - Materiality options
2. Facade Design - Landscape planters

*1. Facade Design - Materiality options*

Option 05.03 of the facade studies is the preferred and recommended option as it best meets the established key design principles.

Option 05.03 provides a dynamic yet utilitarian facility within the industrial context. Importantly, the selected façade option achieves the required minimum of 50% free area thereby ensuring the building requires no mechanical ventilation or fire sprinklers.

This façade options consists of a panelised open weave galvanised chain mesh contained within a galvanised tubular steel frame with diagonal bracing. The panel system envelopes the façade, optimising natural ventilation and daylight whilst providing user safety from within. The open mesh provides visual transparency and 'lightness' whilst the diagonal bracing is rotated thereby creating a dynamic facade pattern and texture.

A layer of Colorbond metal discs are fixed to a portion of the steel chain wire mesh panels in a triangulated pattern to articulate movement in the facade. In reviewing the disk colour options, Option 05.03 Colorbond Surfmist has been adopted to reflect the Qantas 'air' element in parallel to the Flight Training Centre. The Surfmist 'disks' will create a visual connection with the sky and clouds, thereby minimising the visual bulk and mass of the carpark.

The disc panels form a diagonal pattern across the facades and are applied in an open 'hit and miss' pattern, thereby allowing permeability of natural ventilation and daylight. The triangular panels are an abstract reference to the tail of an aircraft, whilst the diagonal pattern across the façades evoke movement and flight.

*2. Facade Design - Landscape Planters*

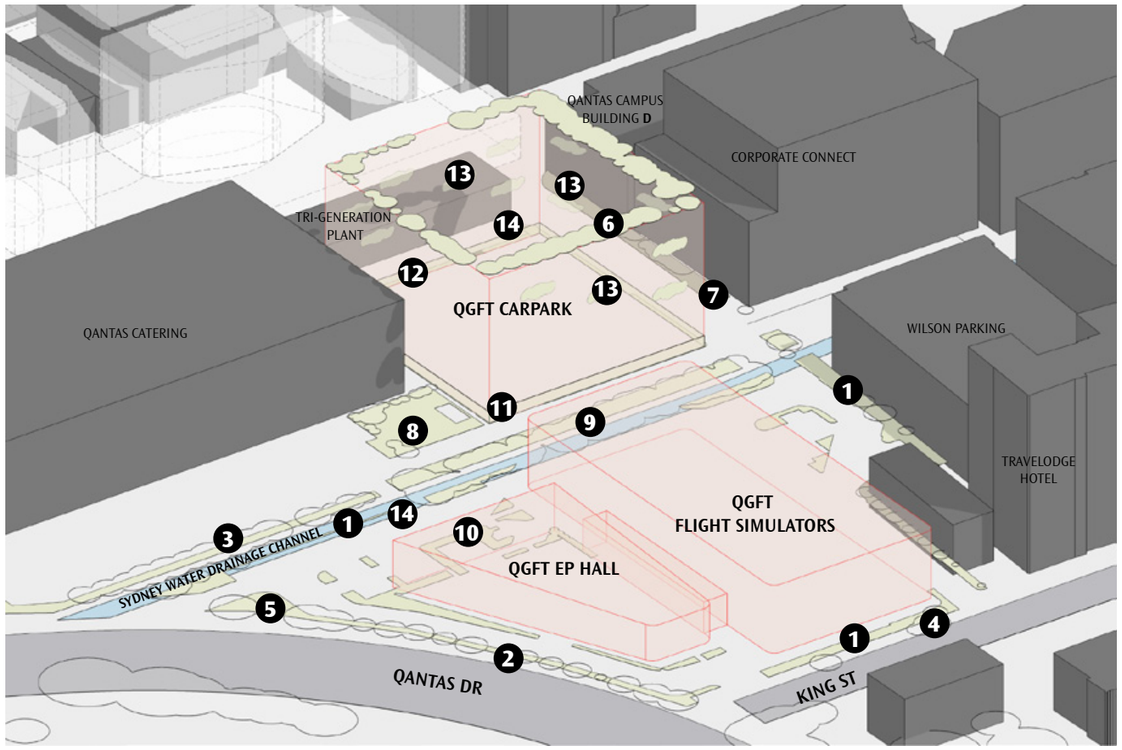
Option E of the landscape planters studies is the preferred design as it optimises both the visual impact value for the site and the potential for plant growth.

The rectangular planters project from the building in an array across the North, East and South Elevations to address comments received through consultation, Agency and stakeholder submission. The projecting enclosures provide a three dimensional sculptural form and enhanced landscape provision to the Carpark.

Planters are placed on the selected facades to accentuate views along service roads and particularly from neighbouring properties to the North and East. Refer to *Figure 34; Carpark Landscape Planters, Figure 35; Carpark Landscape Planters East Elevation, Figure 36; Carpark Landscape Planters North Elevation , Figure 37; Carpark Landscape Planters North Elevation* and the *Landscape and Visual Impact Assessment Report by Scott Carver.*

The use of facade landscape planters are restricted by the critical need to maintain a minimum of 50% free area across the Carpark facade to meet the open deck natural ventilation requirements and to avoid the use of mechanical ventilation systems. Further, planters are deliberately separated to prevent dense facade-wide growth which is deemed a fire risk.

*Note :Figure 20.1 Artists Impression; View of Carpark does not demonstrate facade planters.*




**EXISTING**

1. Sydney water drainage channel
2. Qantas Drive trees
3. Sydney Water drainage channel trees
4. King Street south trees

**PROPOSED**

5. Qantas Drive landscape
6. Carpark roof garden
7. Carpark east landscape
8. Carpark entry landscape
9. Carpark south landscape
10. Flight Training north landscape
11. Carpark ground floor green wall
12. Carpark north landscape
13. Carpark Landscape Planters
14. At Grade Parking Landscape Permeable Pavers

*Figure 27. Landscape*

The integration of landscape is a key site strategy which has emphasised and added to the existing Sydney Water drainage channel landscape ribbon through the site.

Existing perimeter landscape has been retained to the west fronting Gateway, King Street to the south and along the eastern boundary adjoining commercial neighbours. Where possible the existing landscape has been extended to create an urban canopy thereby enhancing the local environment and improving amenity. Additional landscape initiatives include:

- Permeable paving has been introduced to reduce storm water run-off from paved areas. The area has been maximised, limited by service vehicles (bus, simulator installations) or where the existing trees roots impact the viability of permeable paving
- Additional landscape area has been achieved, including removal of an at grade parking space on the Flight Training Centre site to further increase areas
- Trees are proposed to achieve one tree for every 5 car spaces to the Flight Training Centre site

In addition to the deep soil planning achieved throughout the site, landscape has been integrated into the built form where feasible;

- Vertical green climbers to the 'base' of the carpark perimeter soften the pedestrian pathway whilst maintaining surveillance through to the carpark.
- Carpark facade landscape planters
- Feature wire climbers and garden bed to the Flight Training Centre entry highlight and enhance the arrival to the facility
- Climbers to the Heat Exchange outbuilding, softening the visual impact of the single storey structure
- Green roof to the bus stop elevates the bus stop structure and contributes to the landscape area
- Stage 2 of the Carpark development includes a significant perimeter planter and pergola design to soften the built form.

Additional landscaping has been achieved with a focus on areas such as the Carpark, deep soil planting on the Flight Training Centre site, and achieving in excess of 1:1 replacement of trees, so that alternative, green roof treatments that add unnecessary and unacceptable risk to the Simulator Building have not been further pursued.

The simulators are highly sensitive to external noise, vibration, dust and moisture and the simulator hall has been designed accordingly as a controlled, stable environment. Simulators are arranged in a hall arrangement with up to four simulators operational within a hall; any failure of the building fabric has the potential to impact multiple simulators. The risk of damage resulting from moisture from roof planting cannot be eliminated and has been deemed unacceptable to the continuity of Qantas operations.

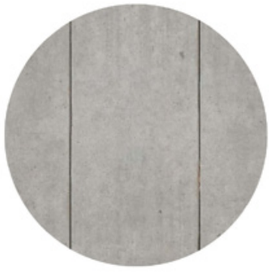
The roof safety strategy has been developed to minimise roof services and plant has been located where possible within enclosed Plant Rooms. The ongoing maintenance and operational risks for working at heights that is introduced by a green roof is not consistent with this approach to roof safety.

Refer to *Figure 27. Landscape* for a summary of landscape initiatives and the *Landscape and Visual Impact Report by Scott Carver.*

## FLIGHT TRAINING CENTRE

Flight Training : EP Hall Walls
Pre-cast Concrete Panels
Colour; Red Finish

Flight Training : Simulator Wall Cladding
Colorbond Custom Orb 35
Colour; Surfmist



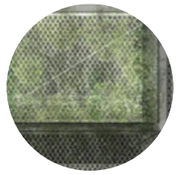
Flight Training : Simulator Bay Walls
Pre-cast Concrete Panels
Colour; Natural finish

## CARPARK

Carpark : Vehicle Crash Barrier
Colour; Galvanised finish

Carpark : Chainwire Mesh Facade
Colour; Galvanised finish

Carpark : Pre-cast Concrete Structure and Walls
Colour; Natural finish



Carpark : Landscape Facade Planters

+

Carpark : Colorbond Surfmist disks
Colour; Surfmist

*Figure 28. Facade Materials*

## *Materials*

The Flight Training Centre is defined by two related but distinct forms reflecting the differing functional requirements within the building.

The material expression of the Flight Training Centre responds to the Qantas' identity as the national carrier. Earth inspired elements reflect the red earth of the Australian soil, air inspired elements reference aviation and the sky.

Emergency Procedures is a singular earth inspired wing, solid and grounded with an earth toned concrete protective acoustic skin to shield against the noise of the neighbouring train line, Qantas Drive and Airport beyond. The vertical precast panels are coloured to provide an identity for the Flight Training Centre when viewed from Gateway and the public domain. The Emergency Procedures north façade is more open and transparent, providing daylight to the Door Training area and Classrooms within. Vertical louvred sunshade louvres add depth and shadow. This openness provides animation and articulation to the Entry forecourt and exterior staff amenity areas.

The Flight Simulator Wing is a lighter 'air' element in appearance, being a layered and articulated singular form expressing combinations of Simulator Hall, training Rooms and offices facilities above. The Sinusoidal colorbond 'wrap' has an enlarged profile to accentuate depth and shadow across the facade and is Surf Mist in colour to blend into the sky and clouds and reduce apparent bulk. The building has a secure protective base of self-finished concrete whilst the top level staff offices are enveloped in a perimeter ribbon of glazing emphasising the horizontality of the building and articulating the building 'top'.

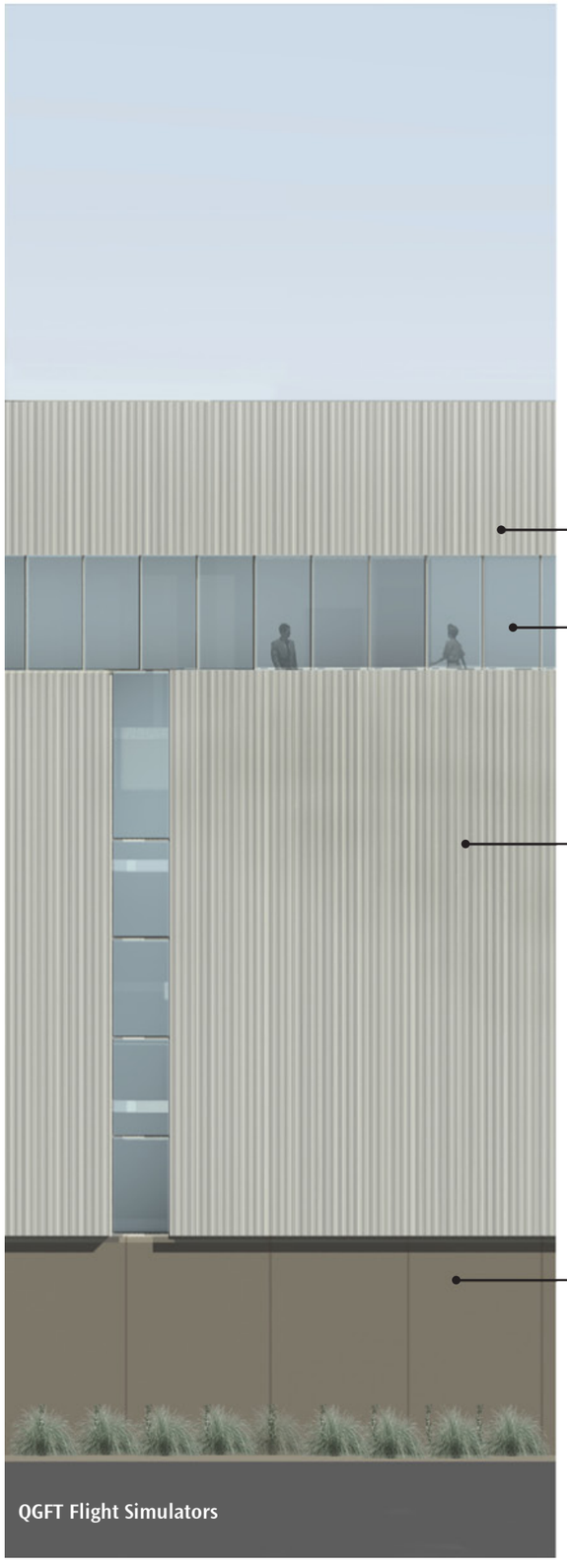
Expanding on Qantas' identity and co-location of the new facilities, both buildings are composed of strong horizontal layers defined by a site-wide datum and layered expression of a base, middle and top. The layers of the Flight Training Centre are made up of a concrete base, Colorbond Surfmist clad middle and a glazed top. The Carpark has a green base (steel rods and landscape), Colorbond Surfmist disks middle and a landscape pergola top. The two buildings use a shared material palette, whilst their layers enhance a sense of visual continuity and connection. *Refer to Figure 28. Facade Materials*

The industrial context and functional requirements of the carpark have led to a clear expression of the concrete structure and floor plates, broken by vertical concrete lift cores to the East and West facades. The entire carpark is wrapped in a veil of prefabricated galvanised steel mesh panels that optimise daylight and natural ventilation to the carpark. The open weave mesh achieves a minimum 50% permeability thereby avoiding the need for mechanical ventilation to the carpark. The open and light façade reduces apparent building bulk and mass. A ribbon of landscape at the base will create a street level green veil of climbing plants to improve the ground level streetscape, The mid-level contains landscape facade planters which soften the exposed concrete and mesh facade. The top level is wrapped in a permitted landscaped planter and pergola which will provide a green articulated 'top' and allow some landscape to tumble down the facade offering visual relief and articulation to the upper level. Anti-graffiti treatment is provided to approximately 3m height on all concrete facades.

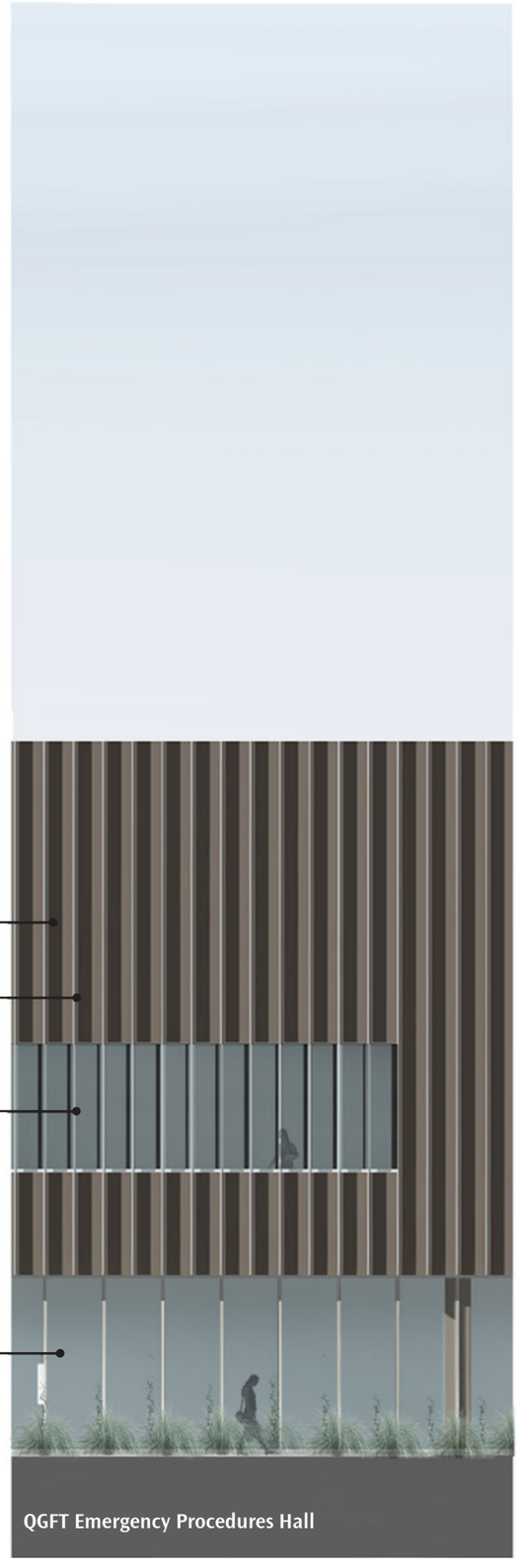
*Refer to Figure 28. Facade Materials and Figure 29. Facade Studies.*

RED EARTH
Authentic

AIR
Calm




QGFT Flight Simulators




QGFT Emergency Procedures Hall

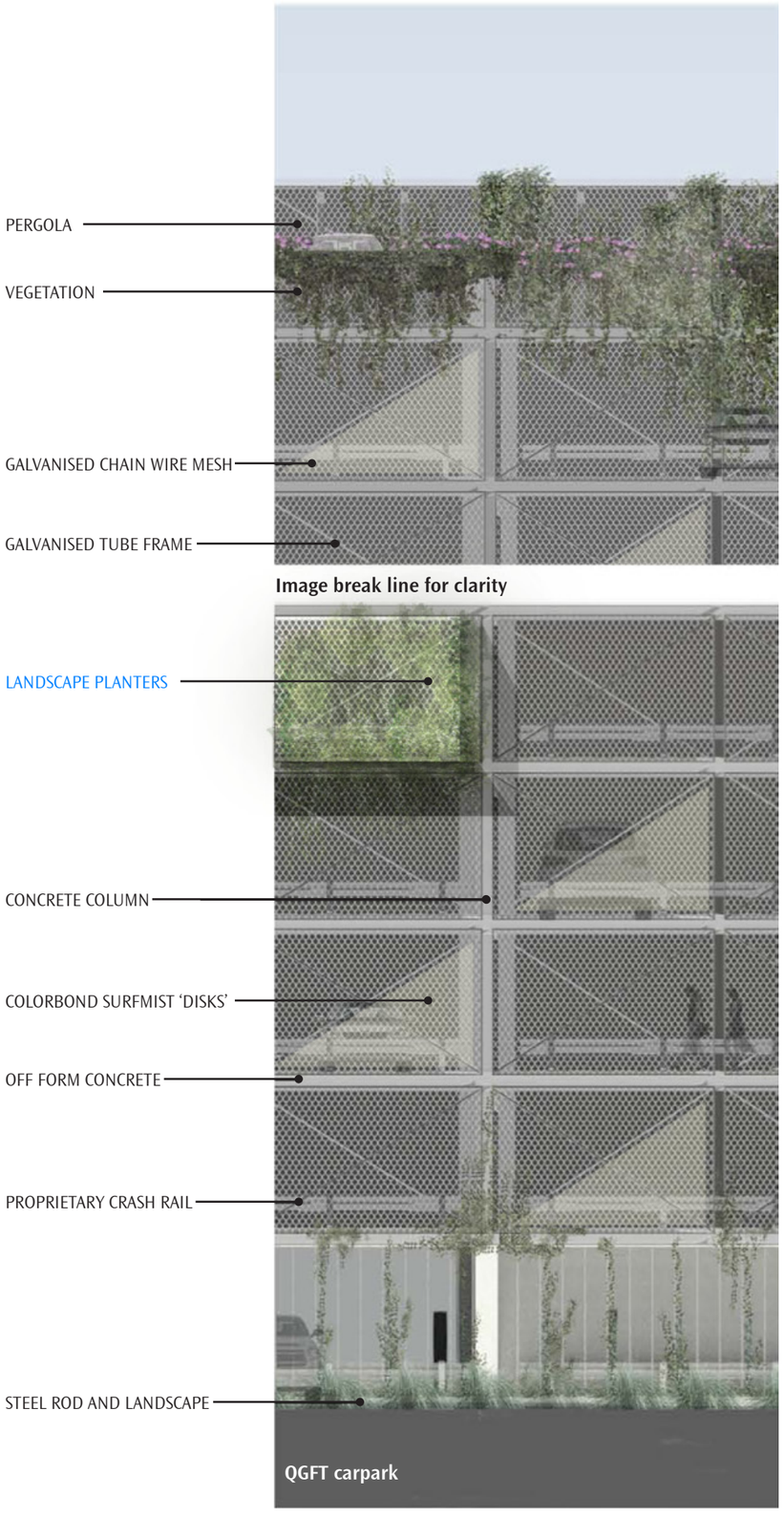
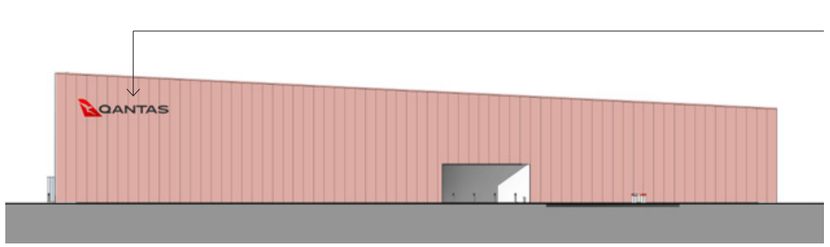



Image break line for clarity

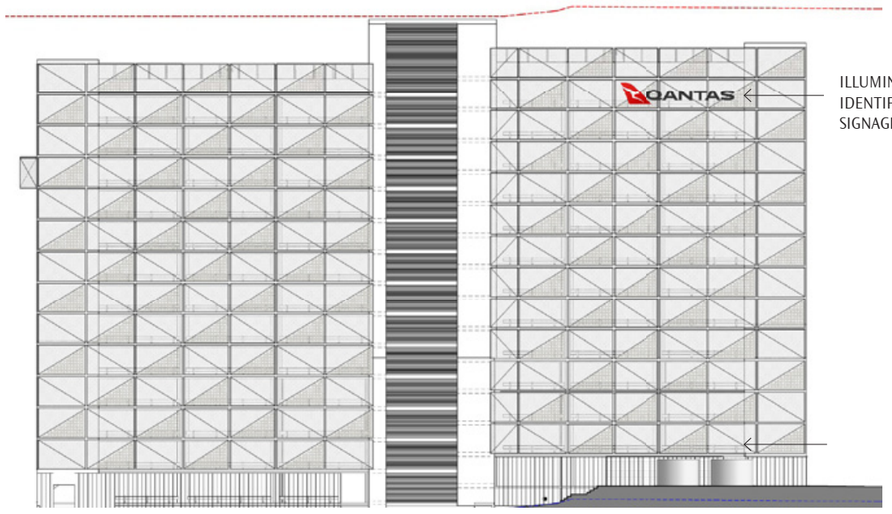
QGFT carpark

*Figure 29. Facade Studies*

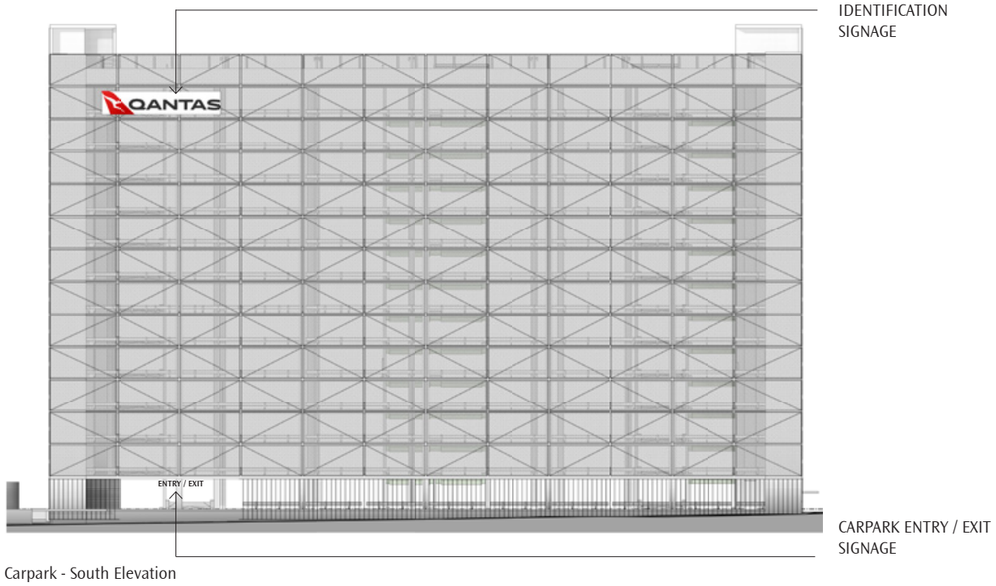
## *Signage*




Flight Training Centre - EP Hall West Elevation




Carpark - West Elevation




Carpark - South Elevation

*Figure 30. Signage Locations*

Signage proposals for both the Flight Training Centre and carpark buildings will be in accordance with the requirements of the Botany Bay Development Control Plan 2013 Part 3D.5 Building Identification Signage and State Planning Policy No. 64 - Advertising and Signage.

The Flight Training Centre will have a single internally illuminated Qantas identification sign on the upper portion of the west façade facing Qantas Drive. A secondary Entry sign will be located on the inset northern Entry facade, facing the staff carpark to reinforce the entry to assist visitors.

The multi-deck staff carpark will have two similar internally illuminated Qantas identification signs on the upper levels, one each on the western and southern facades. Illuminated signage previously located on the eastern facade has been relocated to the west thus avoiding any potential intrusion towards the eastern neighbouring sites. The western elevation signage will be visible from the Sydney Gateway. Secondary low-level Entry/Exit signs to assist users will be located above both carpark entries being on the east and west elevations.

*Refer to Figure 30. Signage Locations and Figure 31. Signage Types.*


Flight training signage

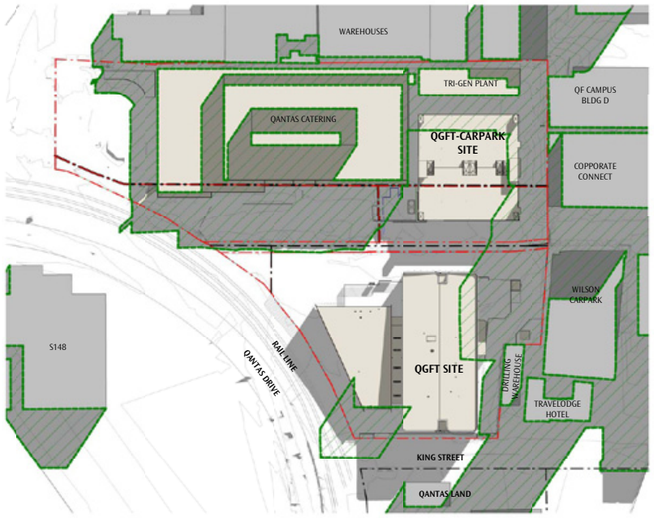

Flight training and deliveries signage


Flight training staff parking and deliveries signage

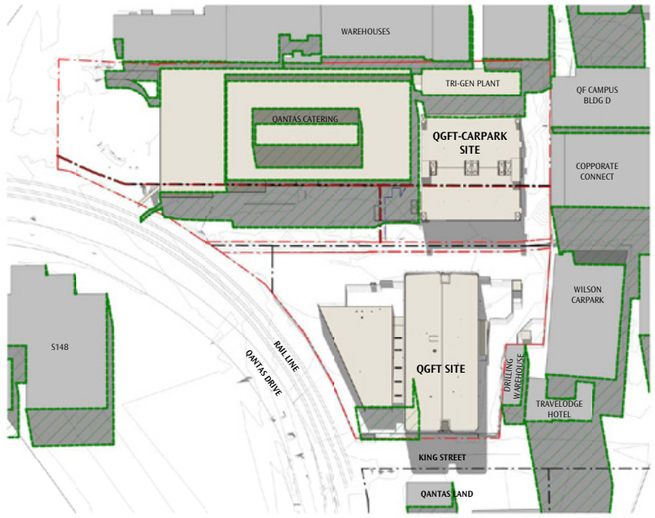
Building Identification and directional signage


Identity Signage

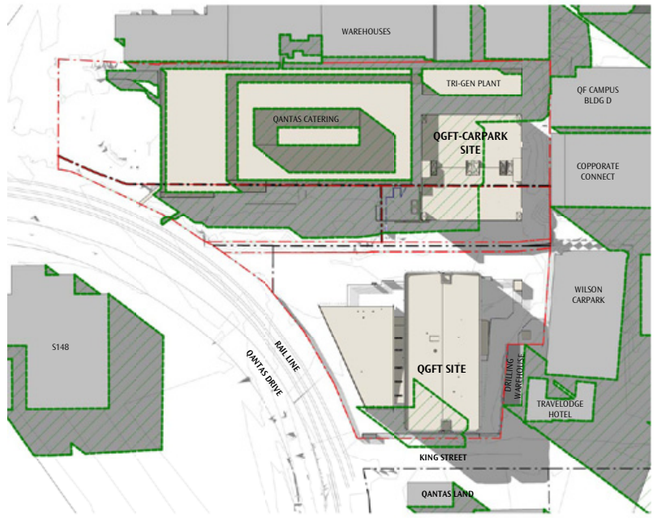
*Figure 31. Signage Types*




01 PROPOSED - STAGE 1 - 21 JUN 9AM
1 : 2000




02 PROPOSED - STAGE 1 - 21 JUN 12PM
1 : 2000



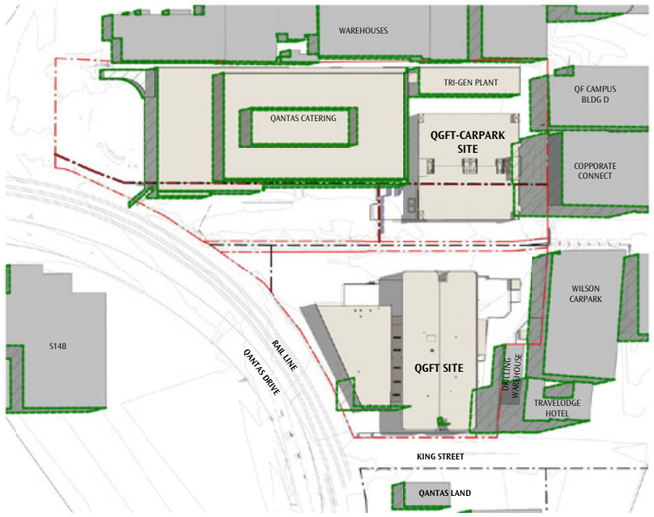

03 PROPOSED - STAGE 1 - 21 JUN 3PM
1 : 2000

**LEGEND - SHADOWS**

EXISTING

PROPOSED

SHADOW DIAGRAMS EXCLUDE EXISTING AND PROPOSED TREES AND FENCING




04 PROPOSED - STAGE 1 - 21 DEC 9AM
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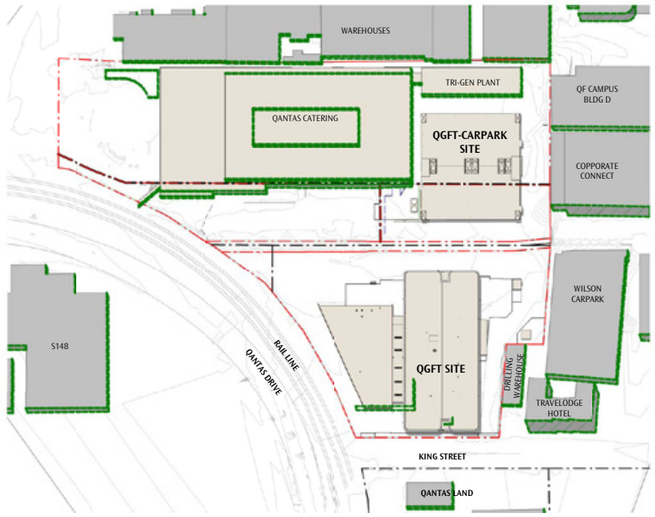


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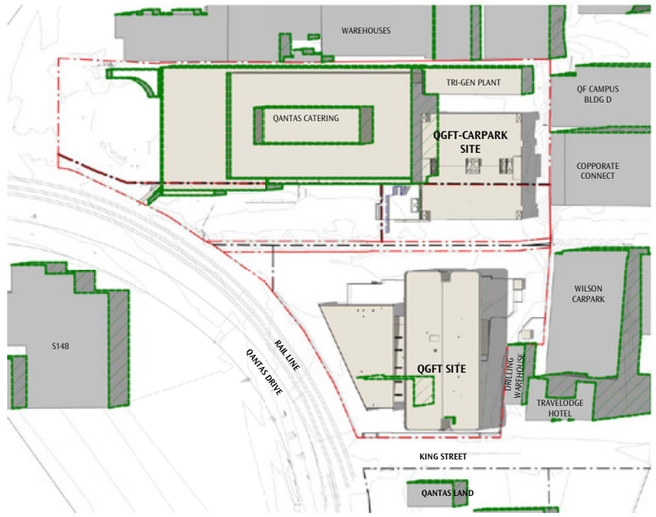



06 PROPOSED - STAGE 1 - 21 DEC 3PM
1 : 2000

A2 *-VIEWS EXTENDED SOUTH OF KING ST.*

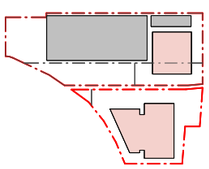
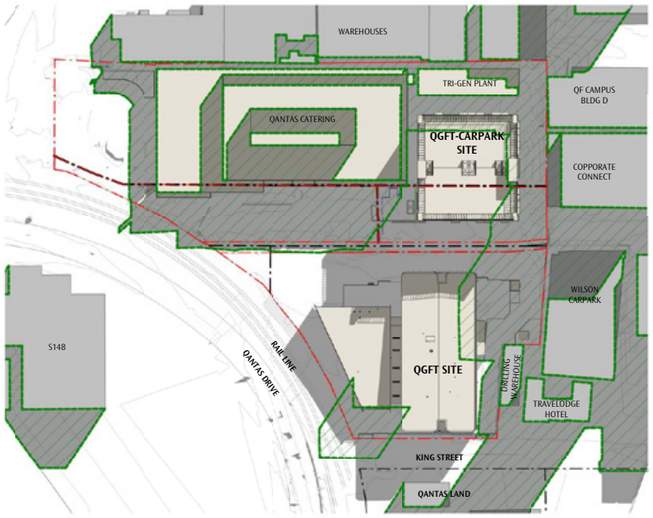


*Figure 32; Shadow Diagrams*




01 PROPOSED - STAGE 2 - 21 JUN 9AM
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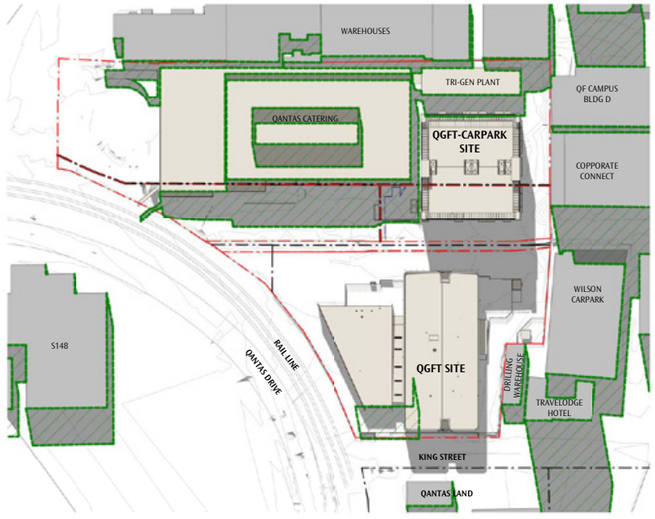


02 PROPOSED - STAGE 2 - 21 JUN 12PM
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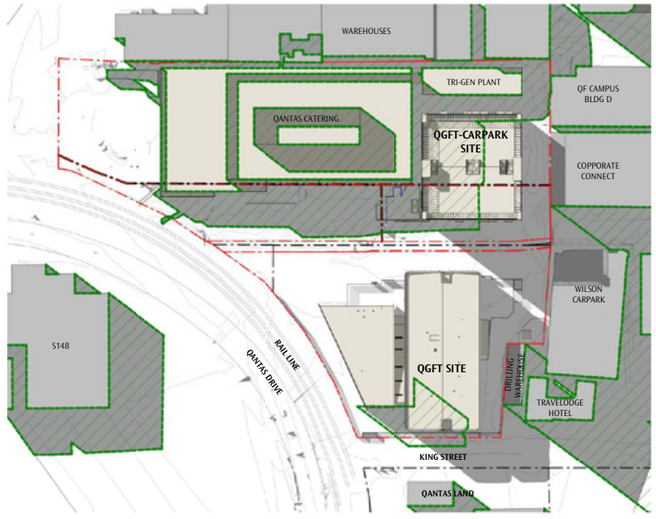


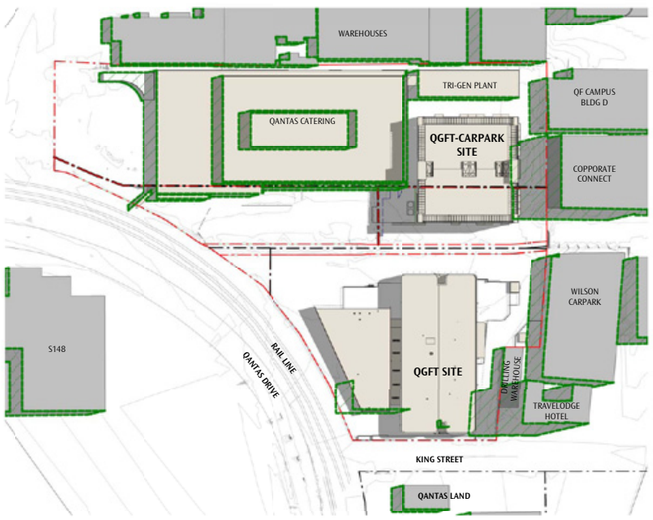

03 PROPOSED - STAGE 2 - 21 JUN 3PM
1 : 2000

**LEGEND - SHADOWS**

EXISTING

PROPOSED

SHADOW DIAGRAMS EXCLUDE EXISTING AND PROPOSED TREES AND FENCING




04 PROPOSED - STAGE 2 - 21 DEC 9AM
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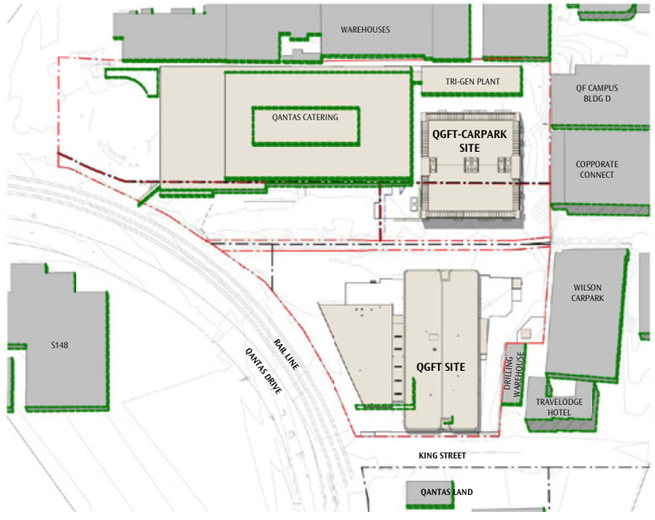


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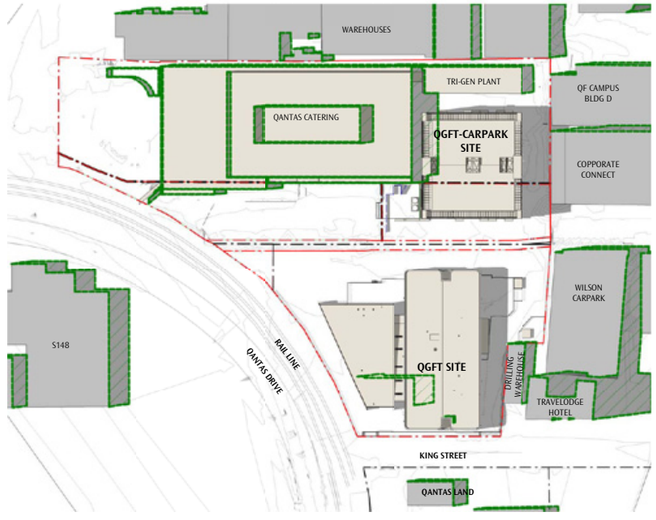


06 PROPOSED - STAGE 2 - 21 DEC 3PM
1 : 2000

A2 *-VIEWS EXTENDED SOUTH OF KING ST.*

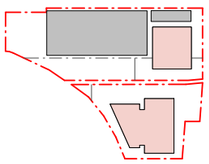

*Figure 33; Shadow Diagrams*

## 04.01 *Artists Impressions*


*Figure 18. Artists Impression; View from Sydney Gateway*


*Figure 19. Artists Impression; North View of Flight Training Centre*

*Figure 20 Artists Impression; View from King Street with existing trees*

*Figure 39 Artists Impression; View from King Street with existing and proposed trees*

*Figure 20.1 Artists Impression; View of Carpark*