



QANTAS FLIGHT TRAINING CENTRE
KING ST, MASCOT

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01.01

Site Location and Introduction

This report has been prepared in accordance with the technical requirements of the Secretary’s Environmental Assessment Requirements (SEARs), and in support of the SSD 10154 for the development of a new Flight Training Centre at 297 King Street, Mascot.

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 Ground plus four levels.

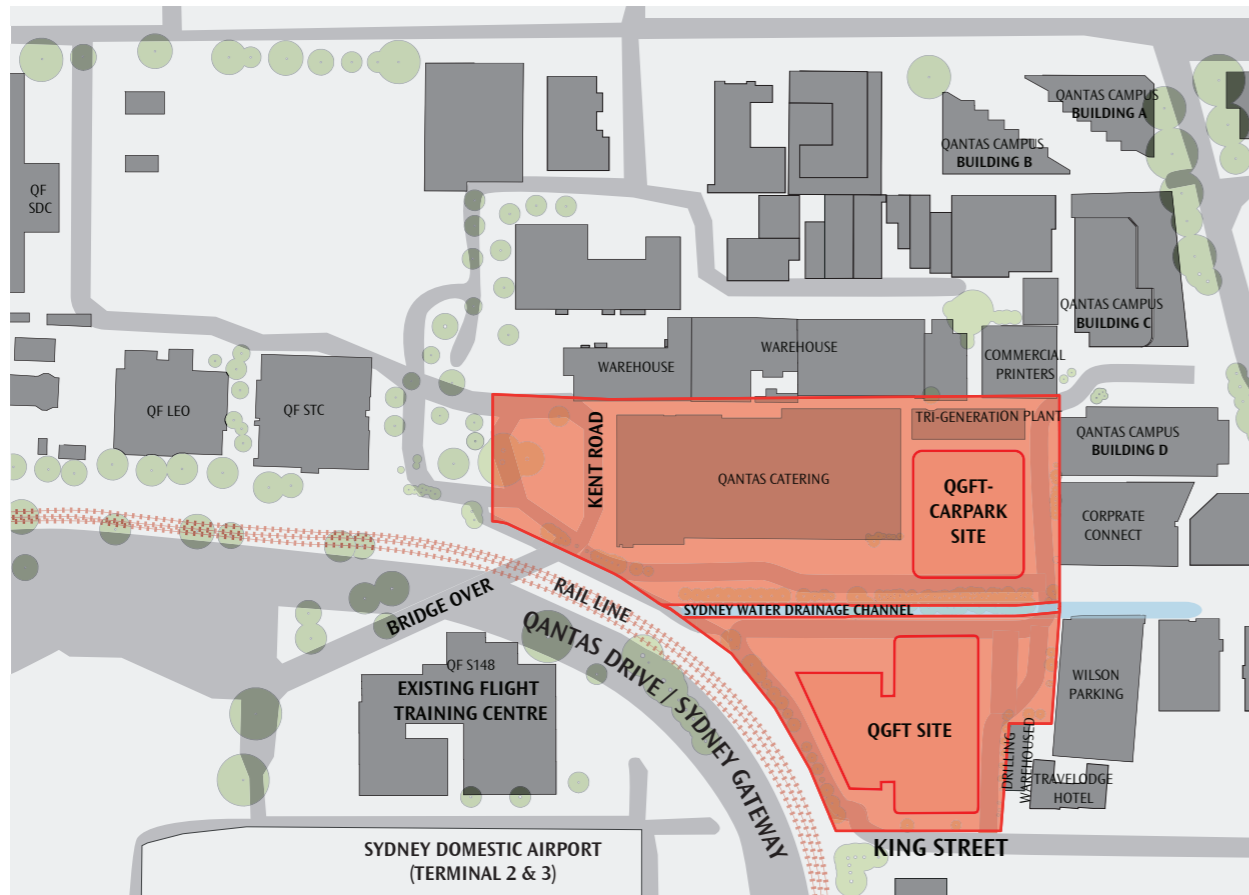


Figure 1. Location Plan



Figure 2. Photo: Location

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

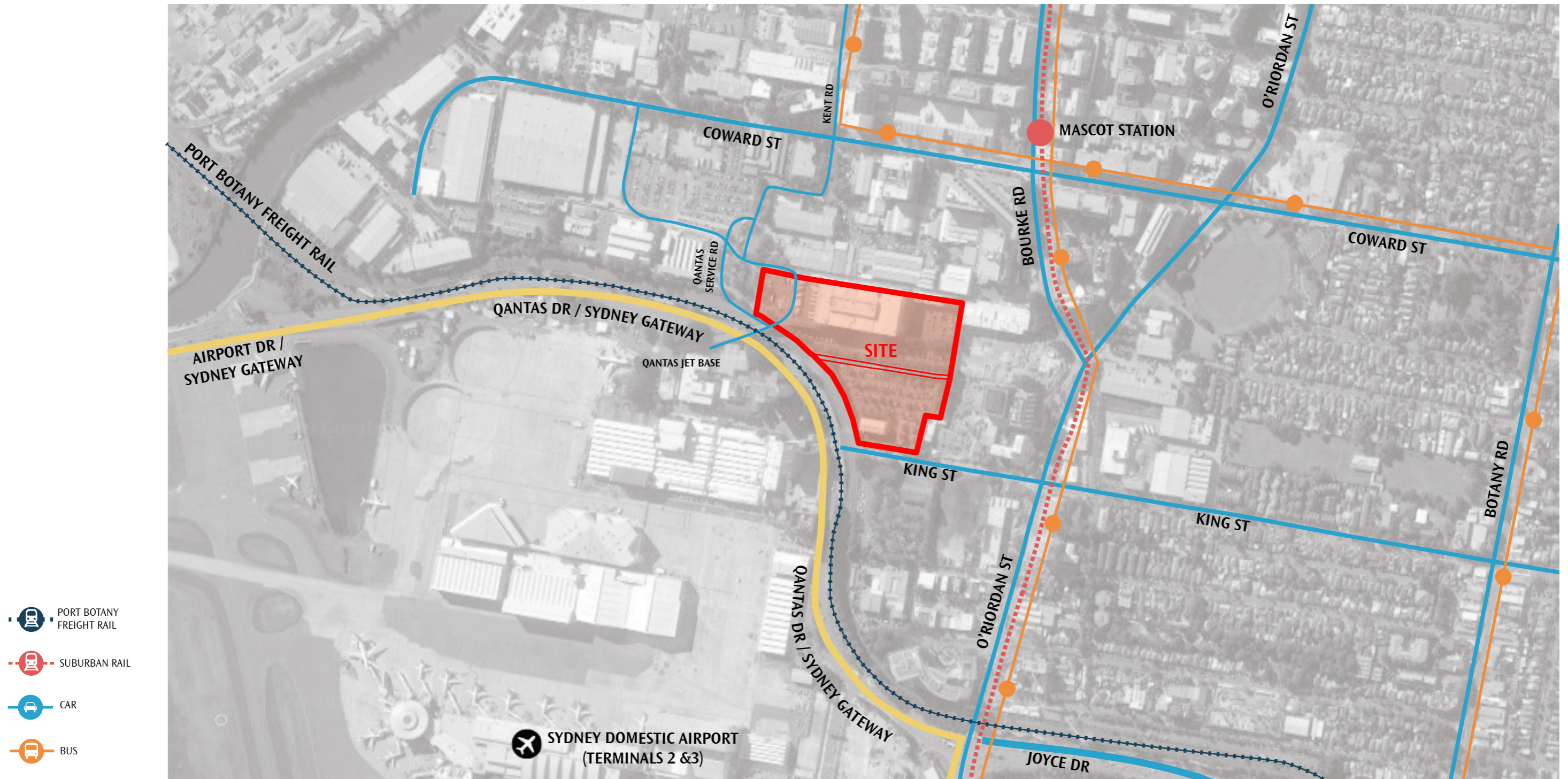


Figure 3. Transport Network

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 trees 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.

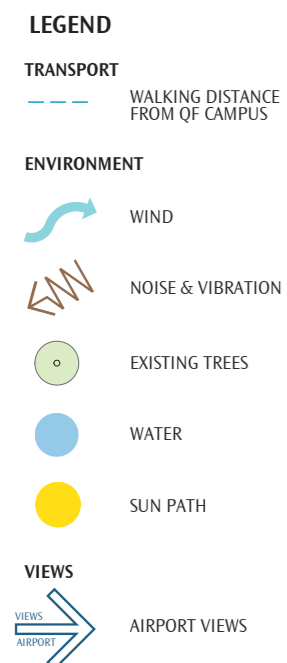
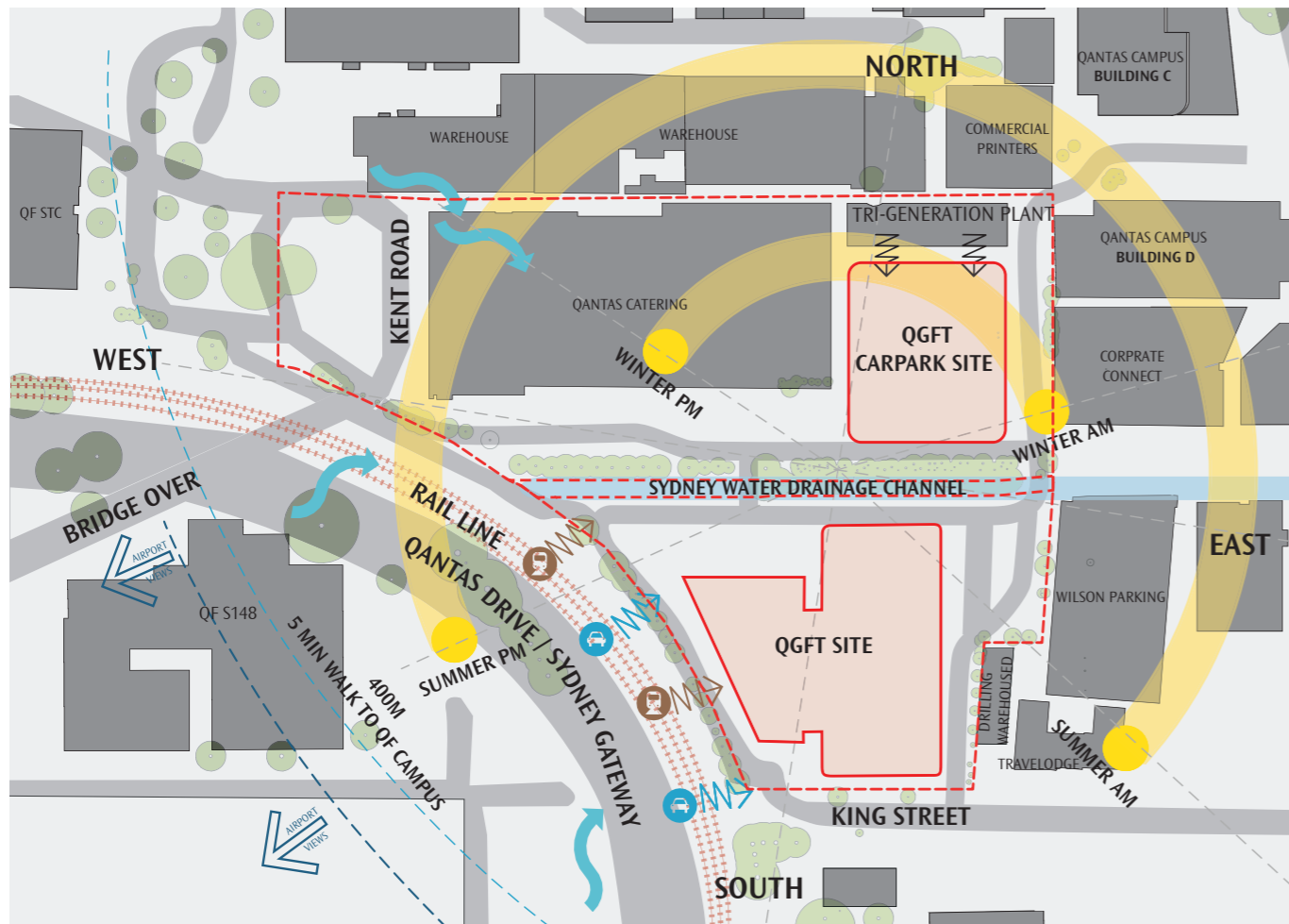


Figure 4. Site Analysis

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

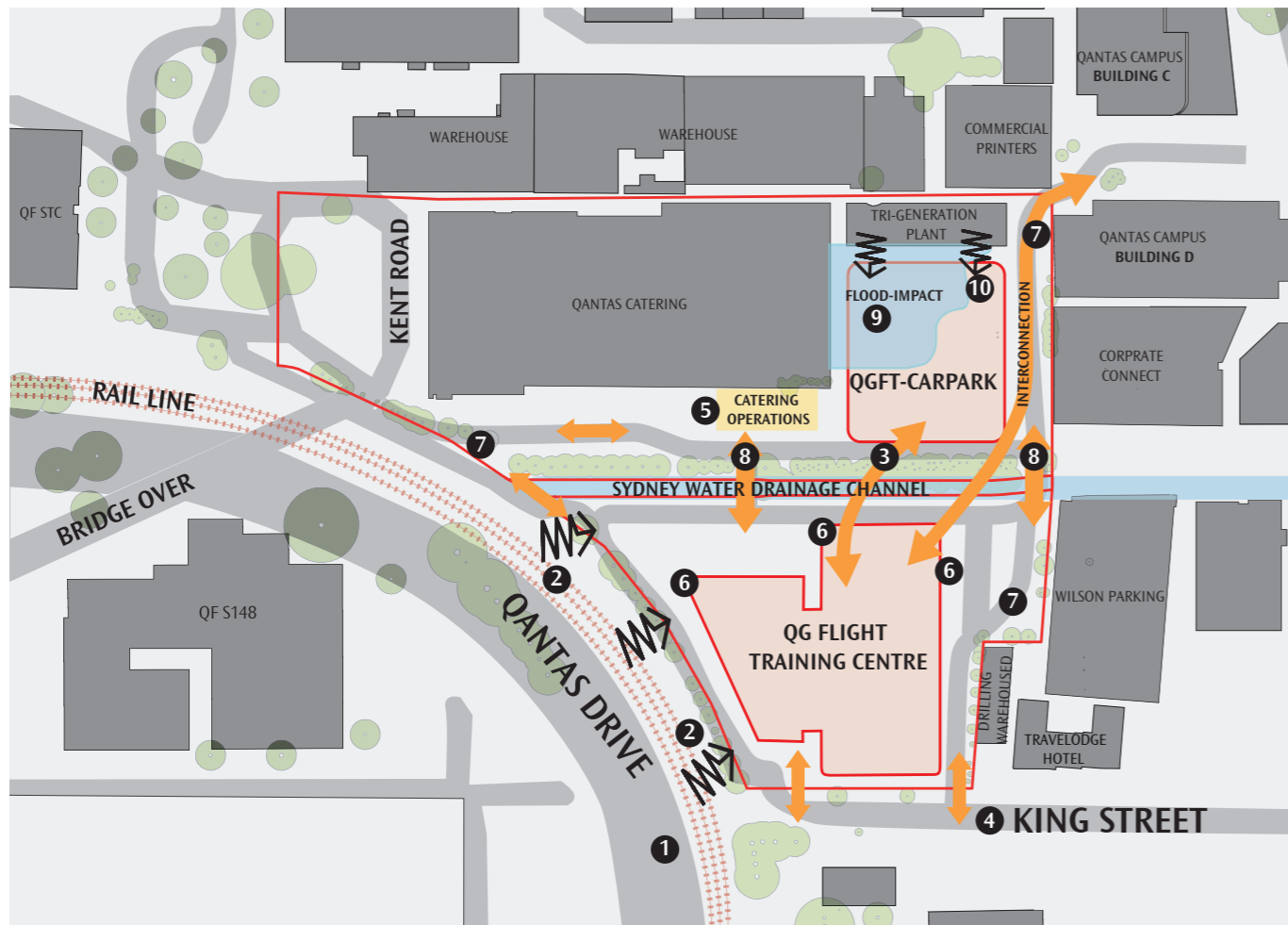


Figure 5. Opportunities and Constraints

Industrial Character - The Area and Qantas Landholdings

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.

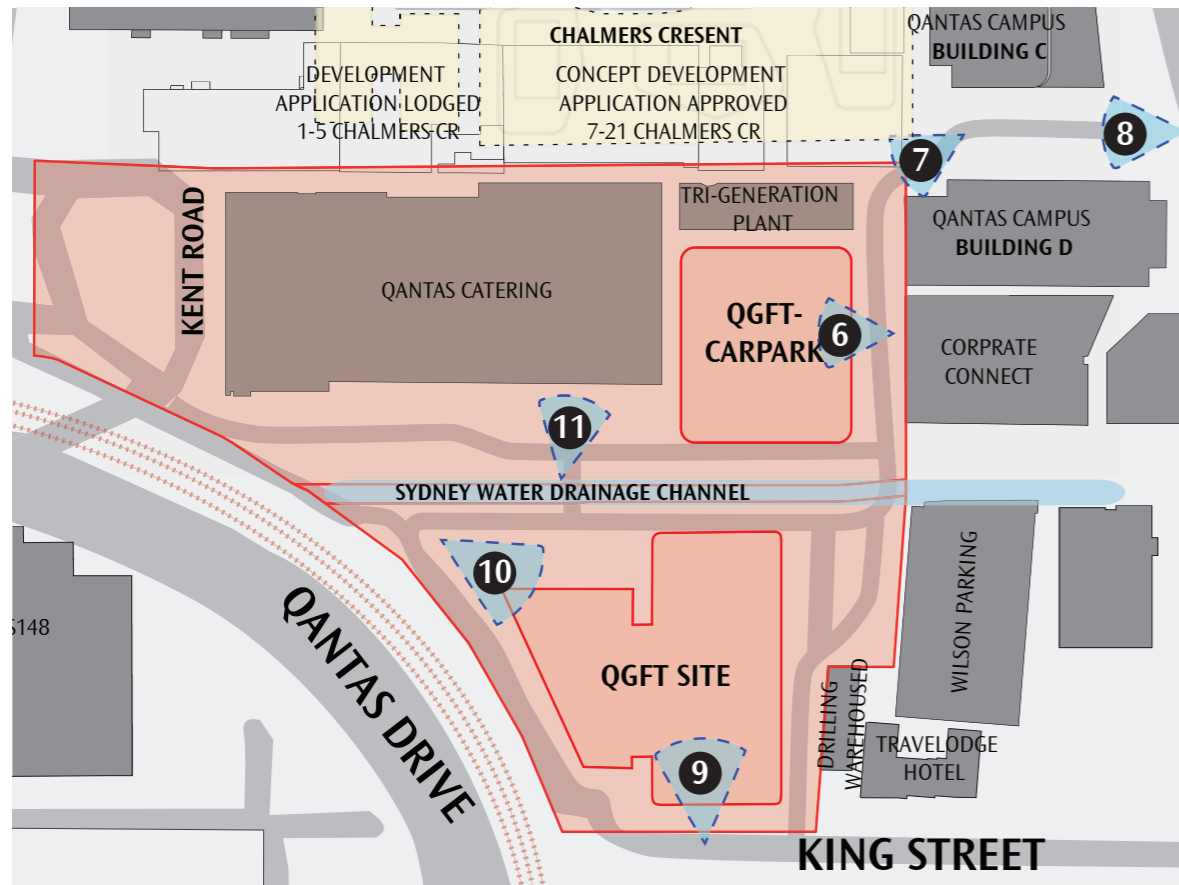


Figure 12. Site photo key plan



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

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Key Design Challenges

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

Strategic issues;

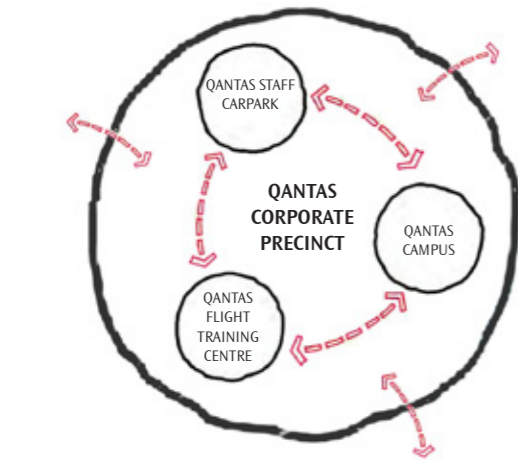
- Co-location of key Qantas facilities
- Rationalisation of precinct-wide car parking strategy
- Creating of inter-connected Qantas Campus with new Flight Training Centre
- Rationalise vehicle access to improve general circulation and connectivity
- Regenerate existing under utilised strategic Qantas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

Operational Issues;

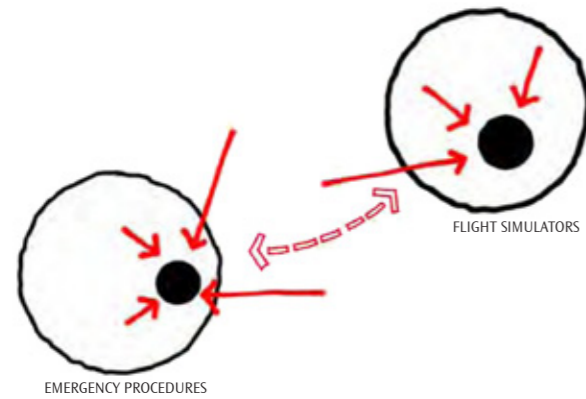
- Provide new Flight Training Centre with Flight Simulators, Emergency Procedure Hall and Training facilities
- Provide new staff carparking with suitable access and egress
- Impact of Gateway
- Provide maintenance access for the Flight Simulators and other operational training facilities
- Provide operational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

Site constraints;

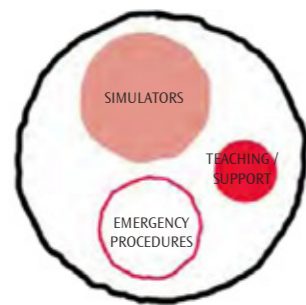
- Noise and vibration from:
 - Aircraft and airport operations
 - Port Botany Freight Rail Line
 - Gateway
 - Tri-generation Plant
- Accommodate the existing Sydney Water drainage channel acknowledging limited dual bridge access
- Access through site to unify site divided by Sydney Water Drainage Channel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



QANTAS CORPORATE PRECINCT
INTER-CONNECTIVITY



FLIGHT TRAINING
COMMUNITY AND AMENITY



FLIGHT TRAINING CENTRE
TRAINING AND INNOVATION PRECINCT

Figure 13. Key Design Challenges

03.01

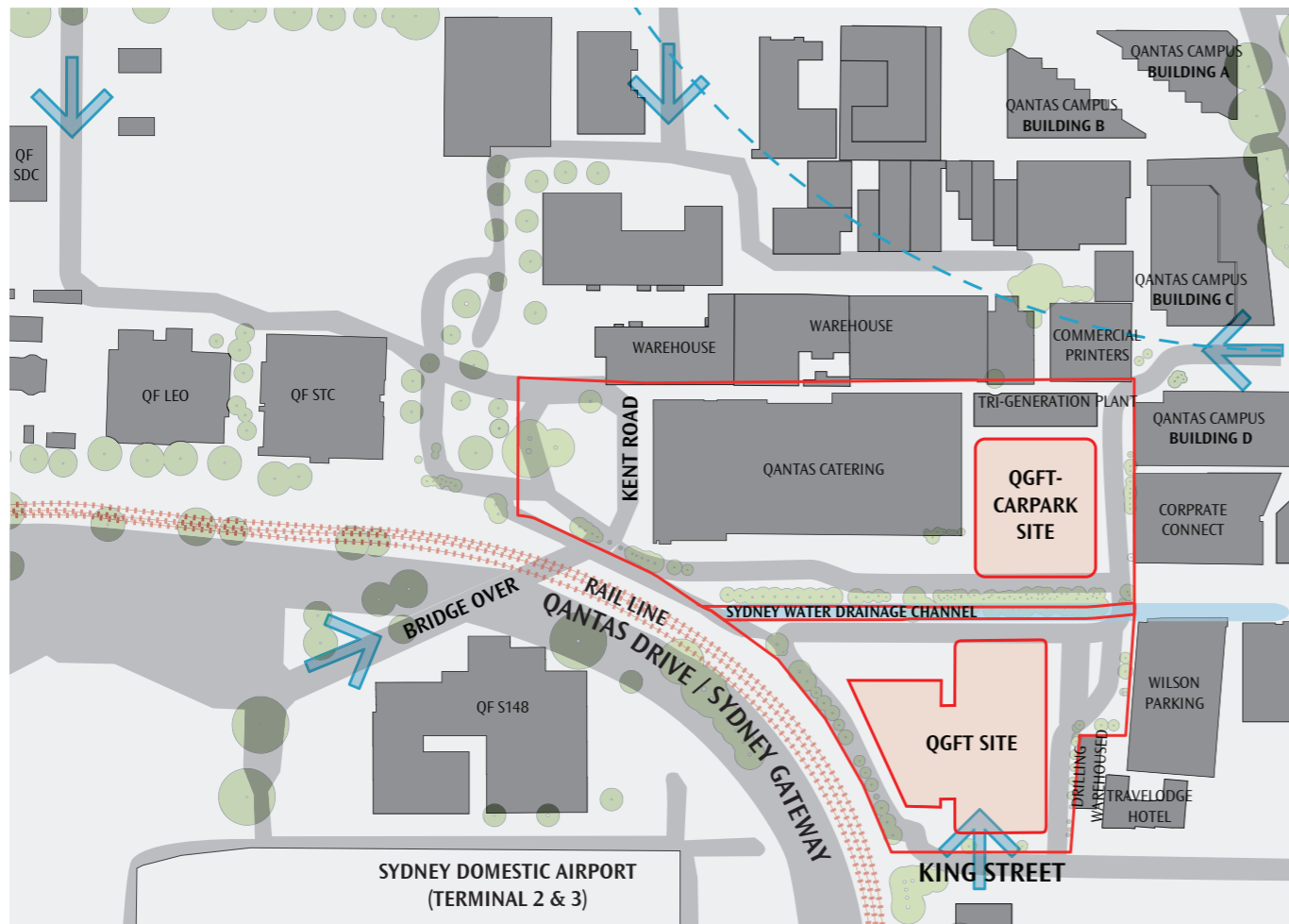
Botany Bay Local Environmental Plan 2013 Clause 6.16 Design Excellence

Figure 14. Site Plan

- (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.

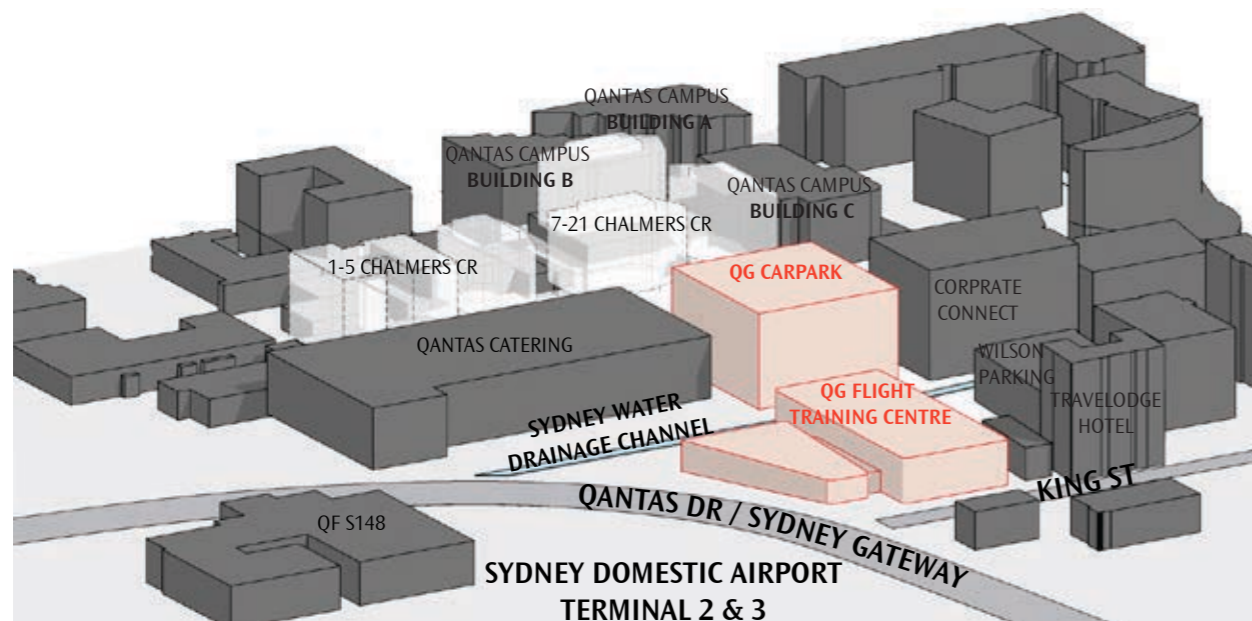


Figure 15. 3D Site Massing Diagram

The 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 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. 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.

The existing Trigeration 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.

Environmental design principles are adopted within the building design generally, addressing thermal performance, amenity, durability and performance. 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.

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.

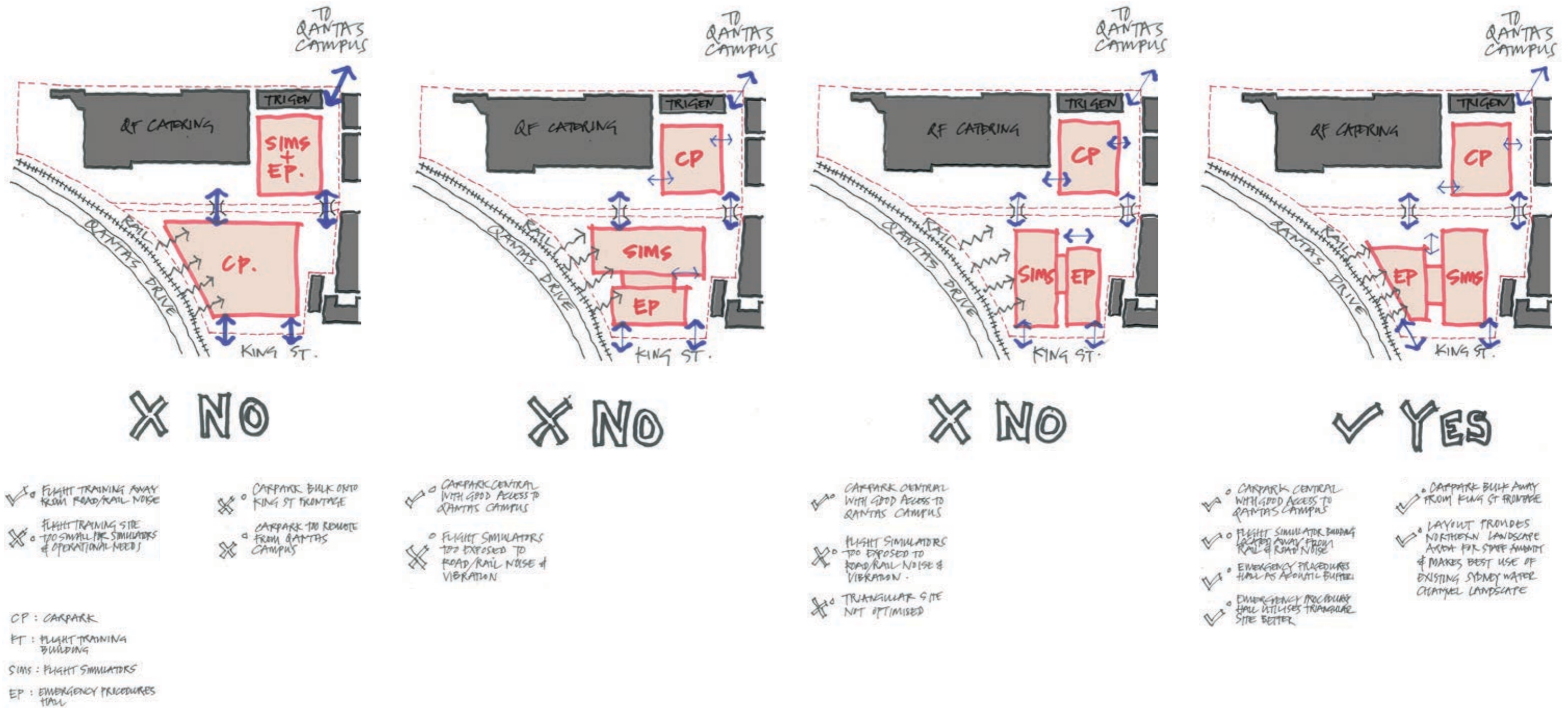


Figure 16. Design Option Studies

Design Principles

Following detailed investigation of 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;

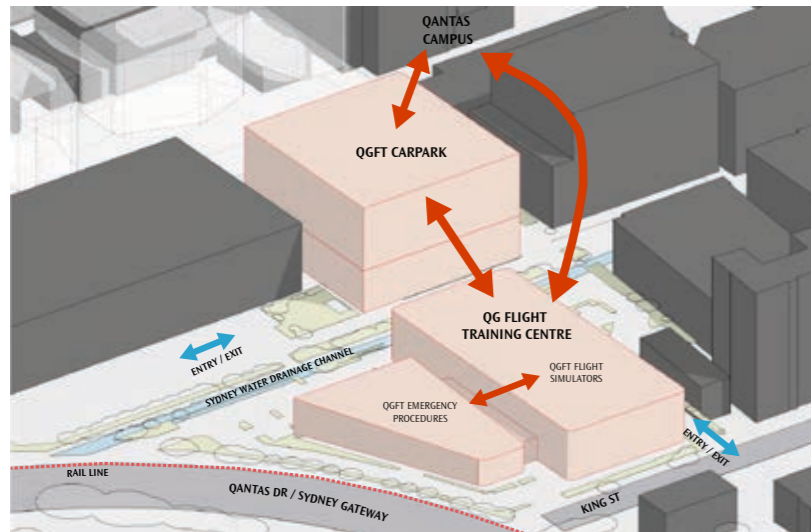
- A new Qantas Corporate Precinct
- A linked collective; Qantas Campus, + Qantas Flight Training + Qantas carpark
- An operational hub for airport operations within an industrial precinct
- Activate and connect the industrial precinct
- World class facilities

Ground Plane;

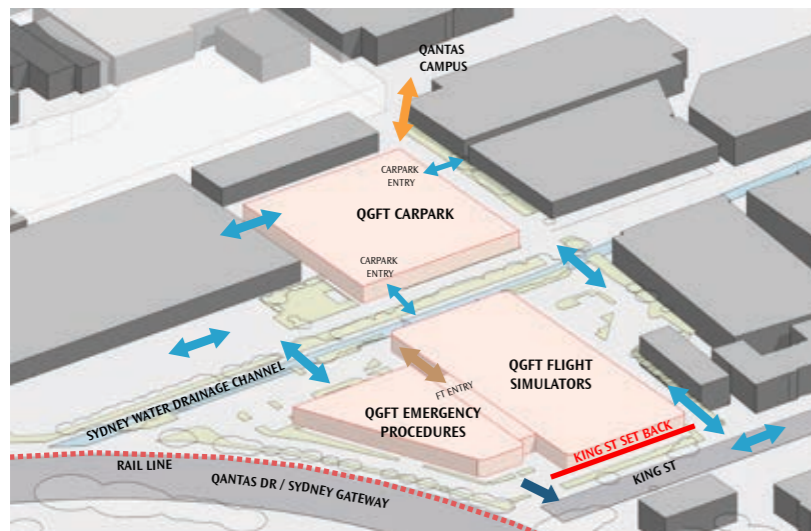
- Respond to the adjacent sources of noise and vibration
- Use the regenerated Sydney Water drainage channel to create a newly landscaped green artery through the site
- Optimise inter connectivity within Qantas facilities with Qantas Bus, staff cars, pedestrians and operational vehicles
- Utilise landscape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

Distinct elements;

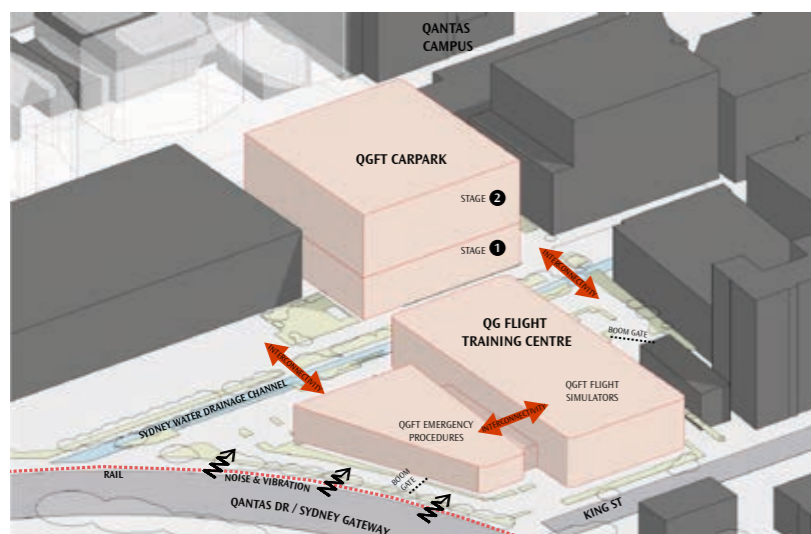
- Design in response to Benchmarking of other world class facilities
- Design from within; respond to the differing operational requirements of the facilities
- Respond to the noise and vibration from the airport, road and rail networks
- Link and connect distinct elements for optimal efficiency
- Address 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



Precinct



Ground Plane



Distinct Elements

Figure 17. Design Principles



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



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 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 its perceived bulk and mass.

The carpark base is wrapped in a perimeter of landscape climbers serving to animate the Ground Plane. The Stage 2 rooftop deck is wrapped in perimeter planters and pergola element to articulate and 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 ground plus 13 storeys 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.

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 reduced setback is offset by the significantly reduced height of the building as illustrated in *Figure 22 King Street Response* and *Figure 23 King Street set back*.

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*.

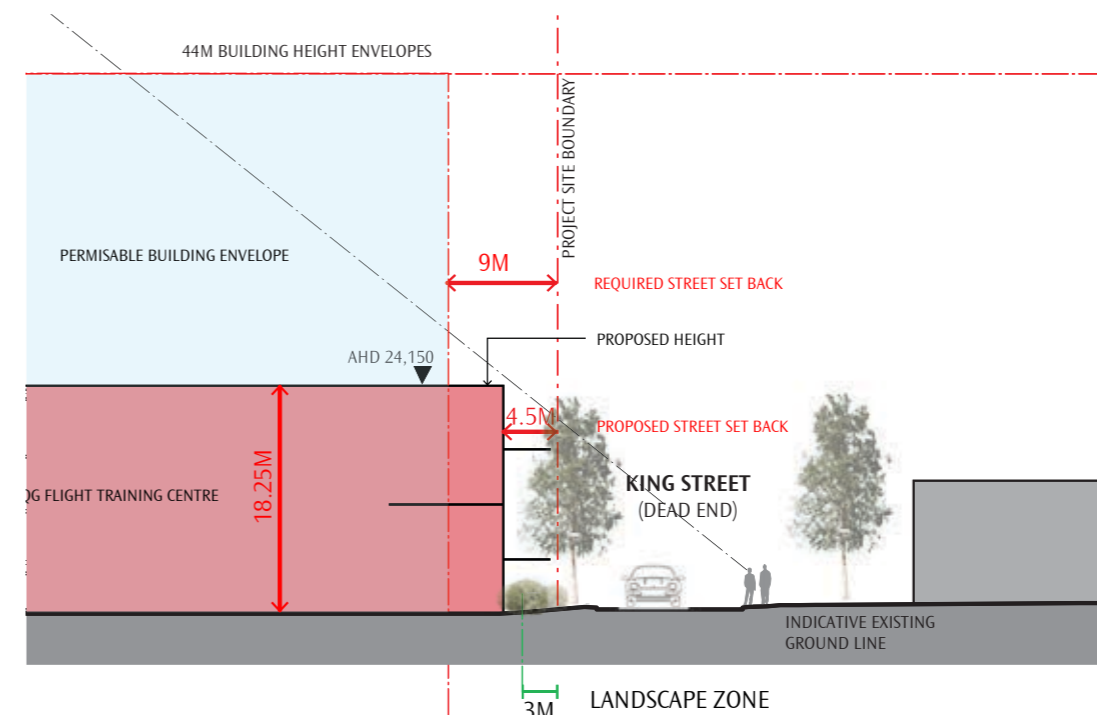


Figure 23. King Street set back

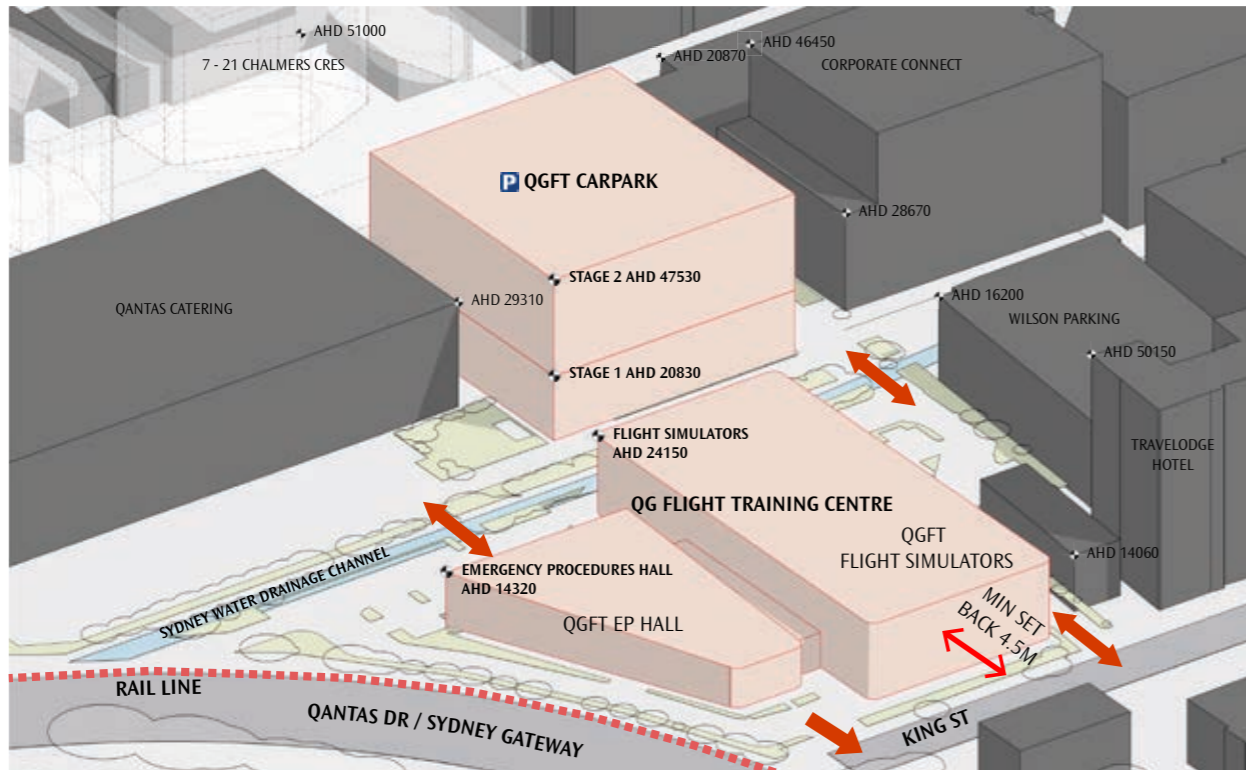


Figure 21 Final Design Response

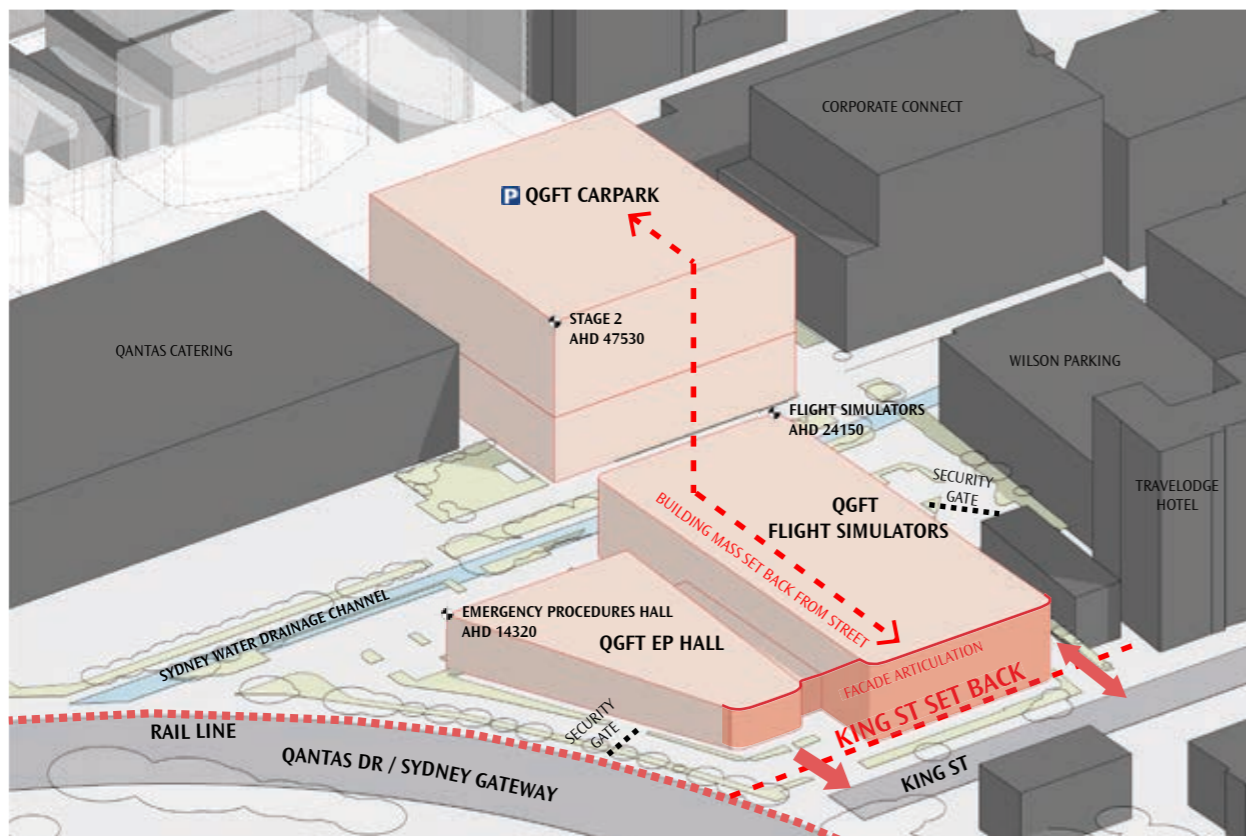


Figure 22. King Street Response

Ground Plane Response

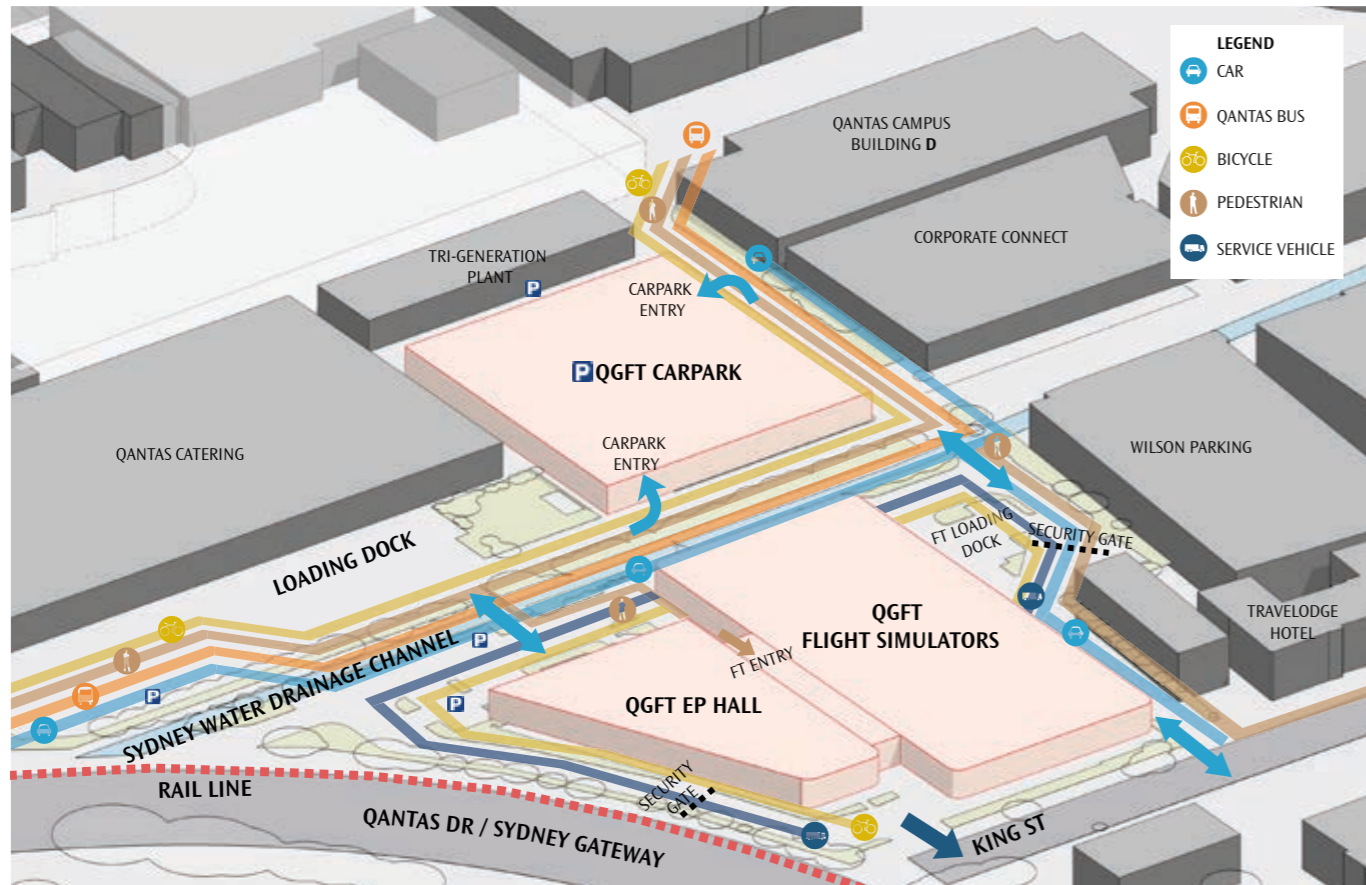


Figure 24. Ground Plane Response

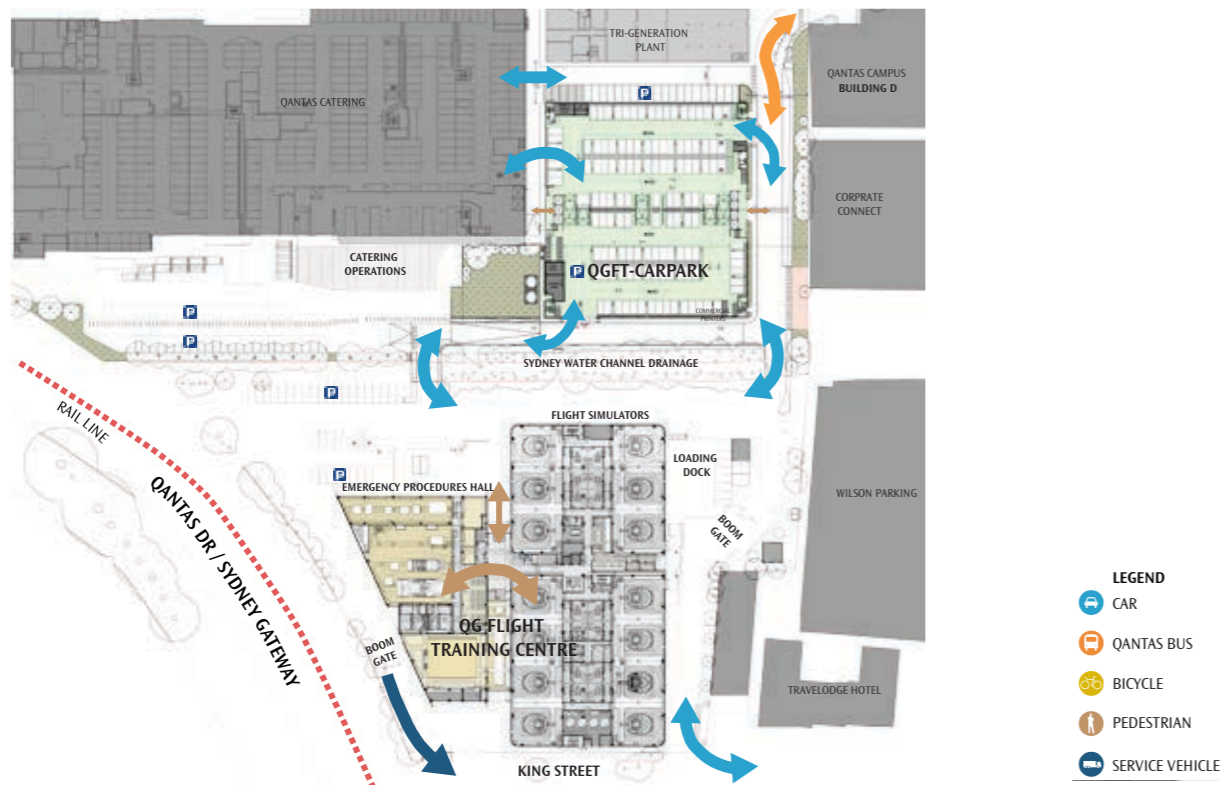


Figure 25. Internal Campus Design

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.

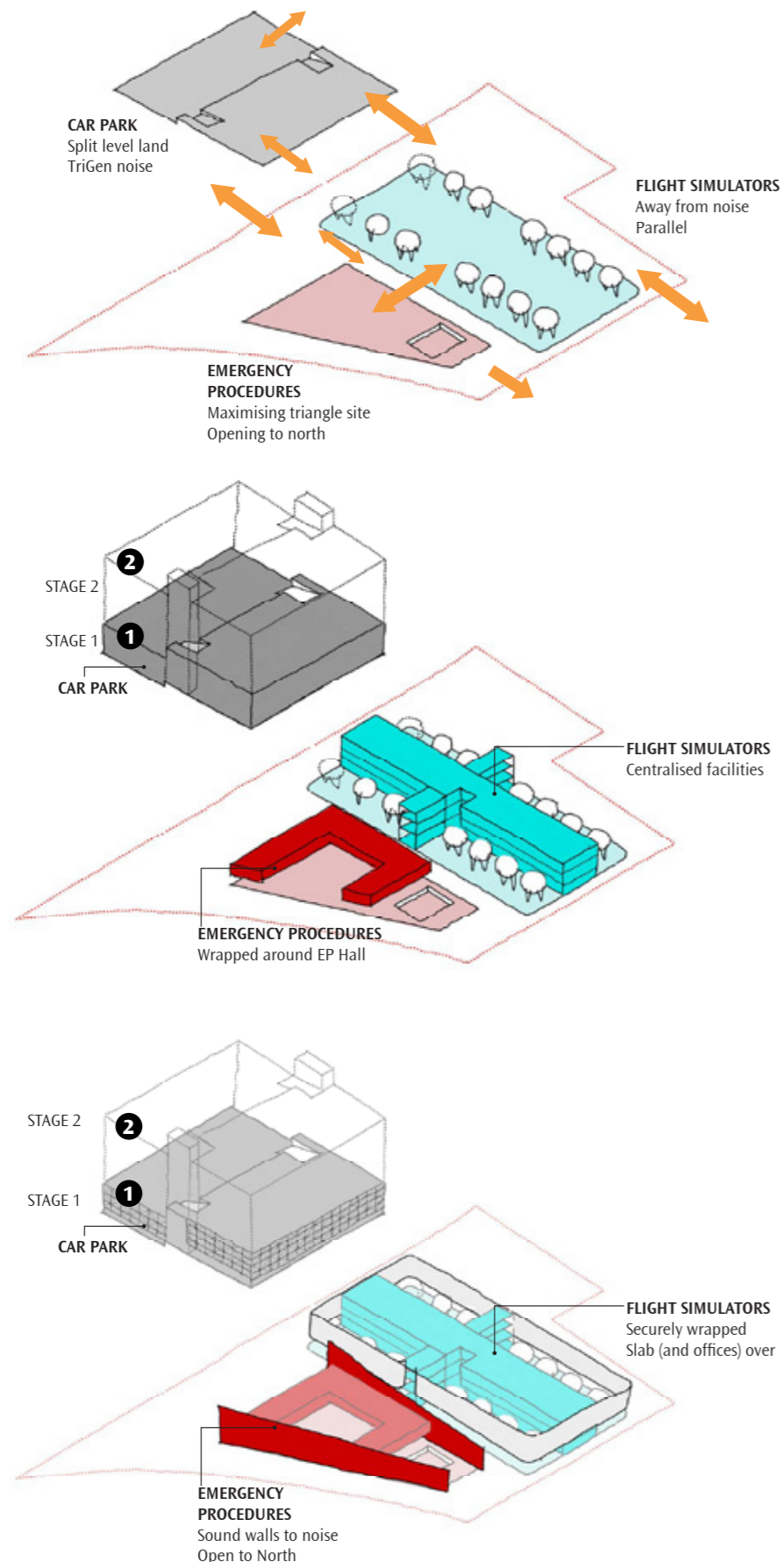
The primary external access is from King Street which provides a newly created tree lined avenue for staff access to both the Flight Training Centre and the staff carpark further to the north. This entry also facilitates vital maintenance access around the Flight Training Centre and to the Loading Dock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

Emergency Procedure Hall and Flight Simulators



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.

Figure 26. Flight Training Centre

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 Ground plus 4 levels. The Stage 2 carpark provides 2059 spaces (including Stage 1) for Qantas staff on Ground plus 13 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 Façade 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



Sydney Airport DOM - Car Park P2



Wilson Carpark Mascot



Corporate Connect



Corporate Connect Carpark



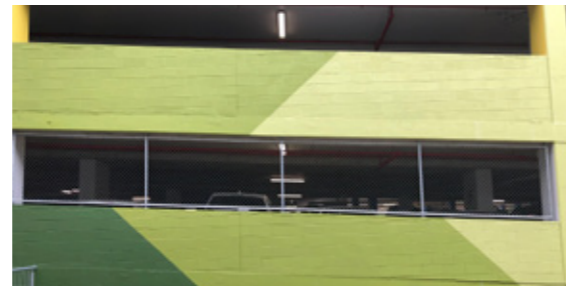
Qantas Catering Carpark



Park & Fly Carpark



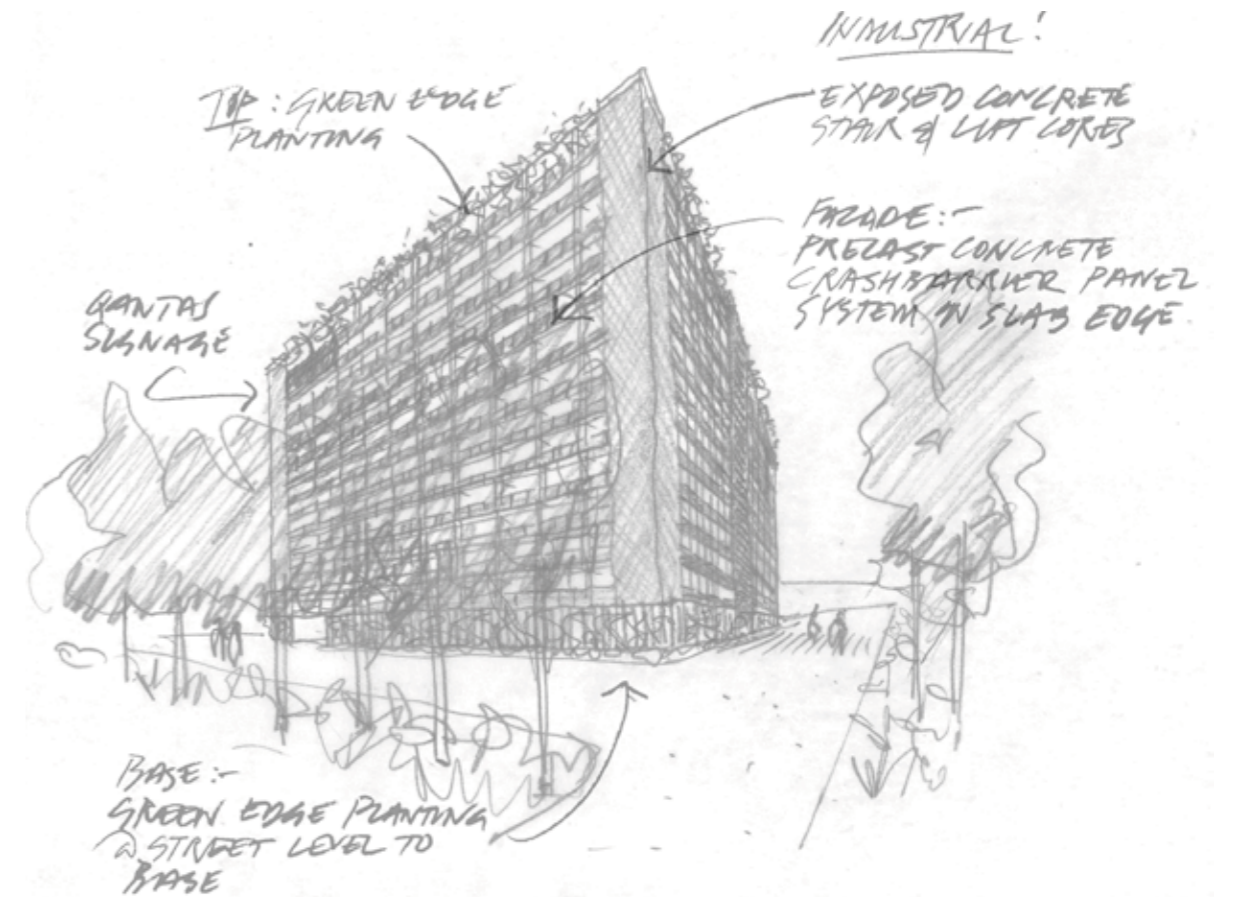
5-11 Ewan St Carpark



5-11 Ewan St Carpark

Figure 26.6; Surrounding Context; Carparks

Option 01



Facade Study

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

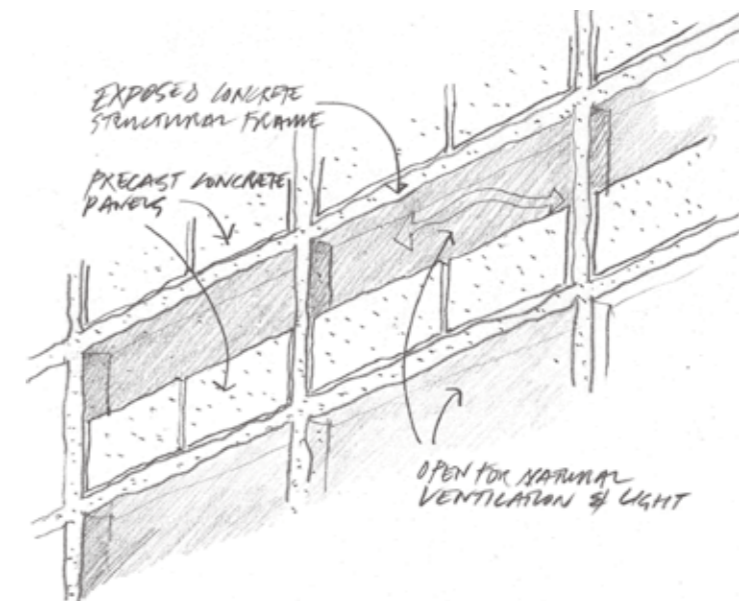
Environmental Strategy;

- Naturally ventilated



Material Reference

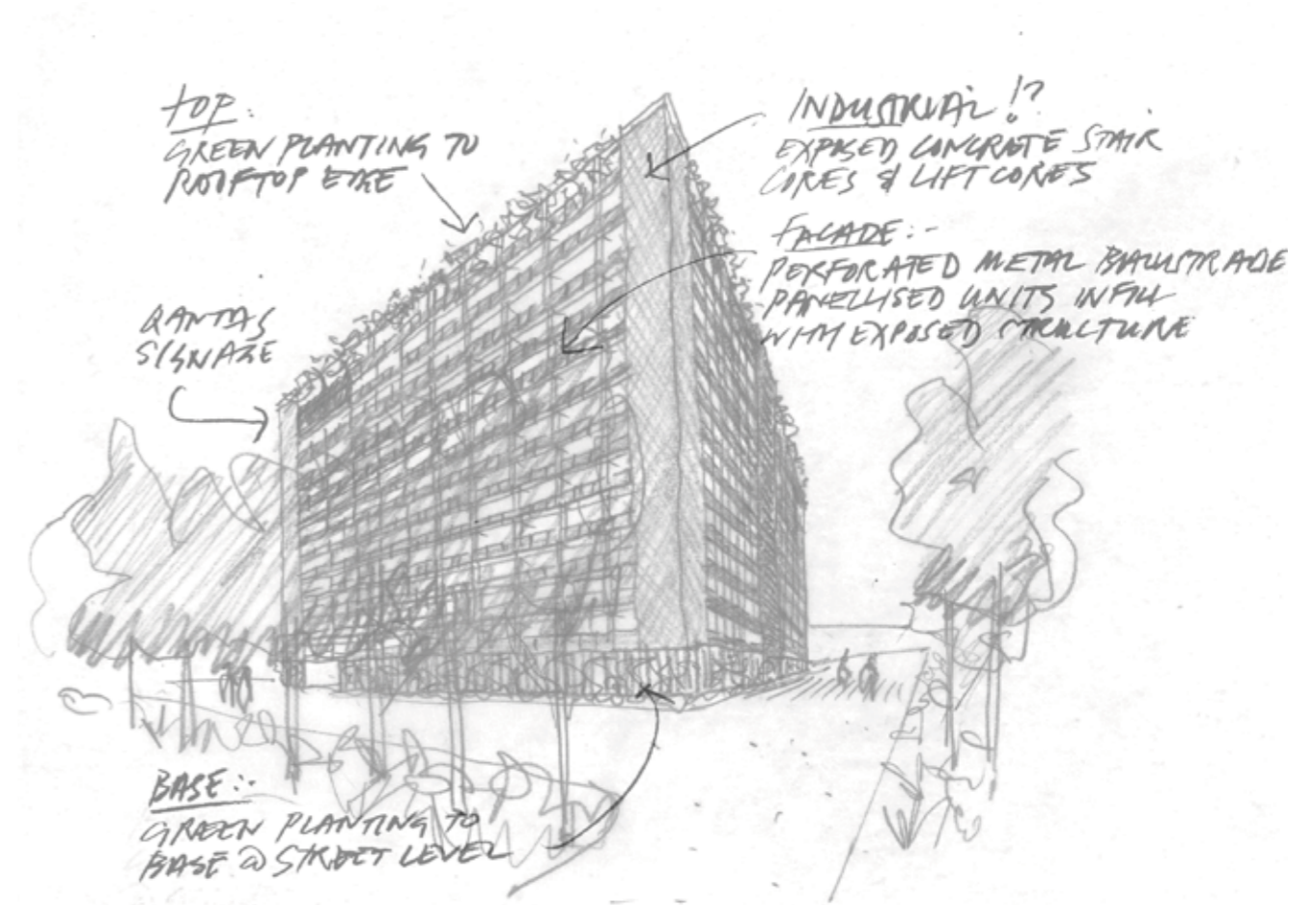
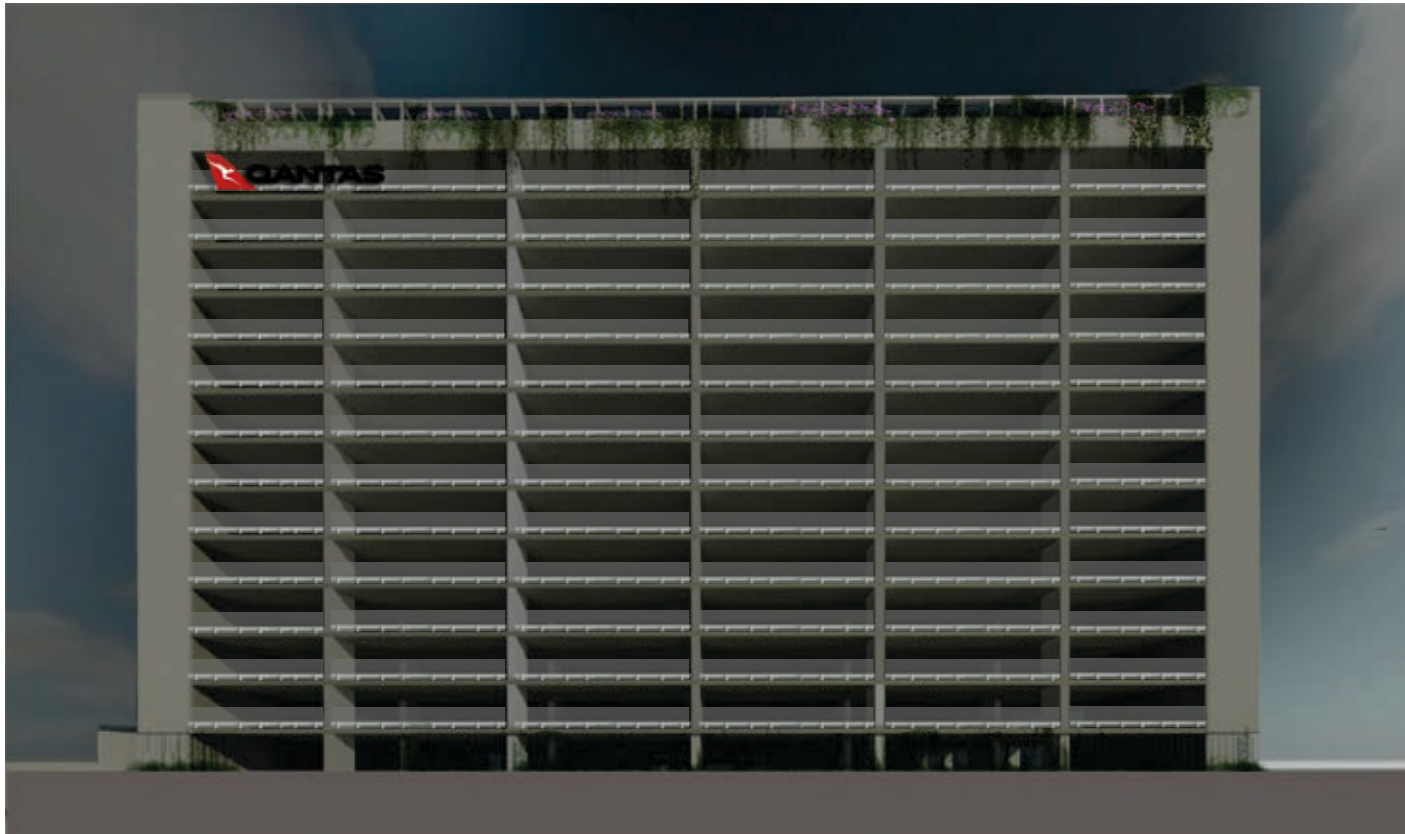
Low level pre-cast concrete panels with integrated crash rail



Facade Detail Study

Figure 26.1 Carpark Facade Study; Option 01

Option 02



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

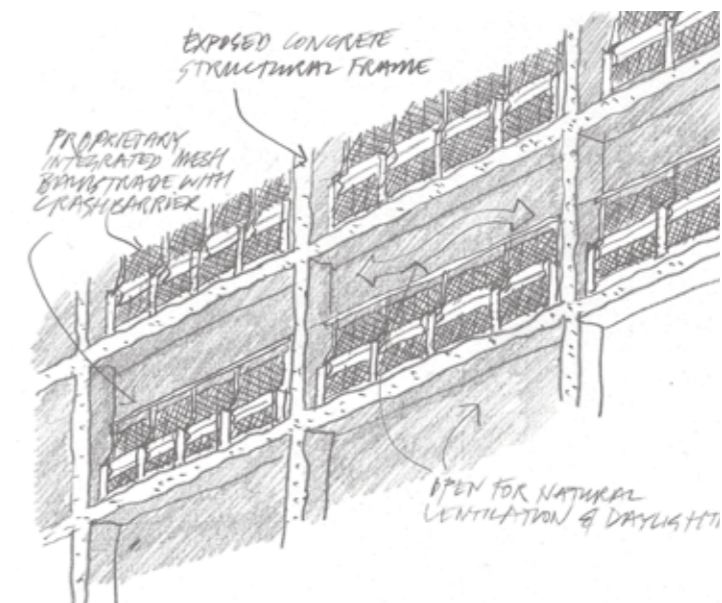
Environmental Strategy;

- Naturally ventilated



Material Reference
Low level proprietary metal panel

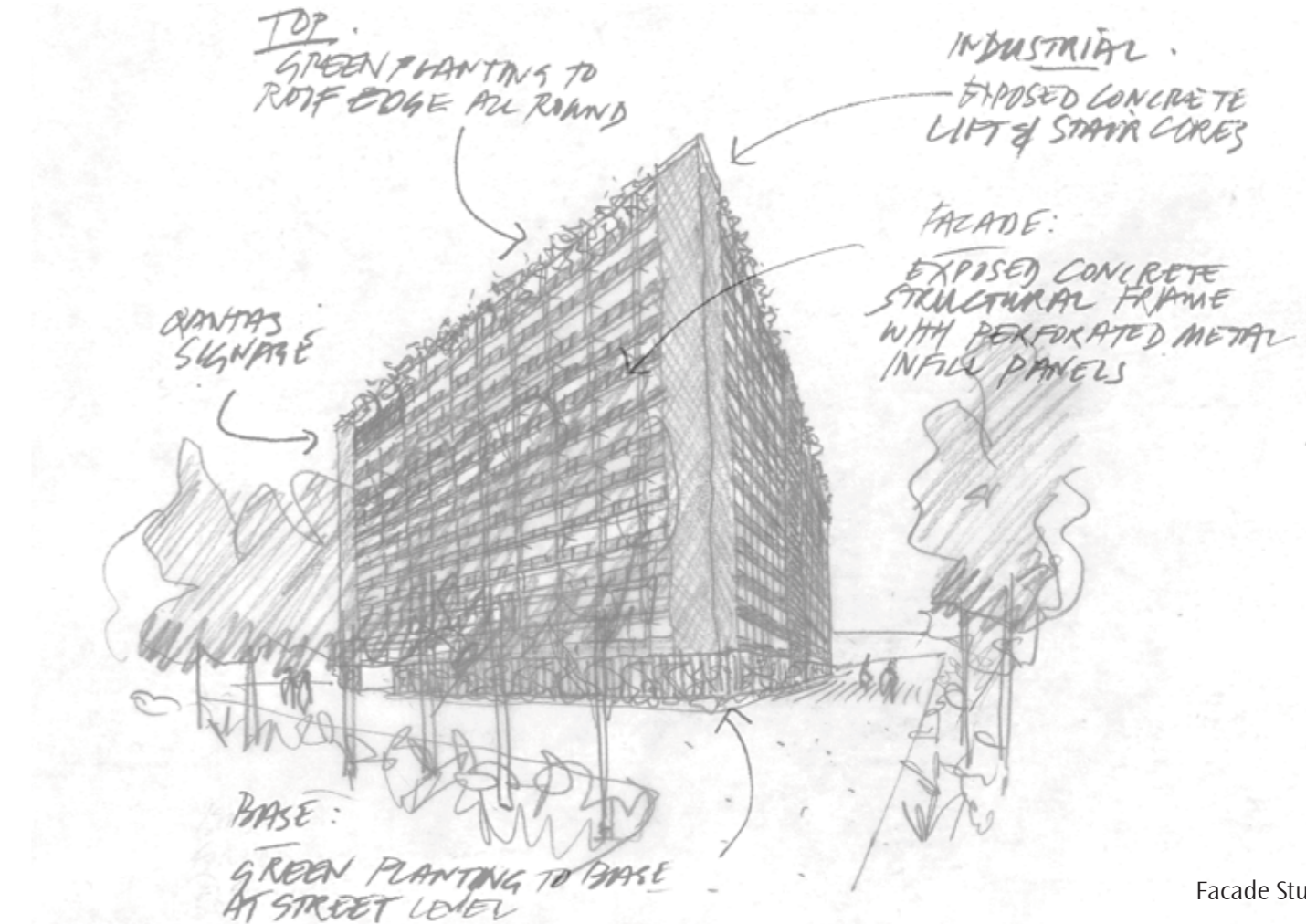
Facade Study



Facade Detail Study

Figure 26.2; Carpark Facade Study; Option 02

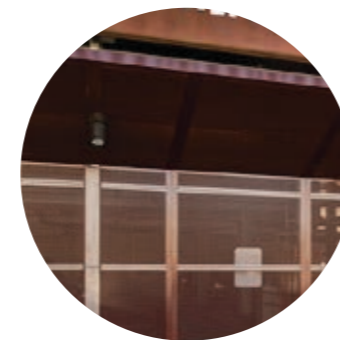
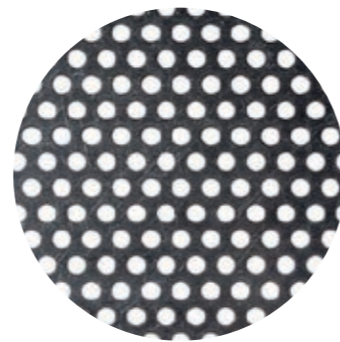
Option 03



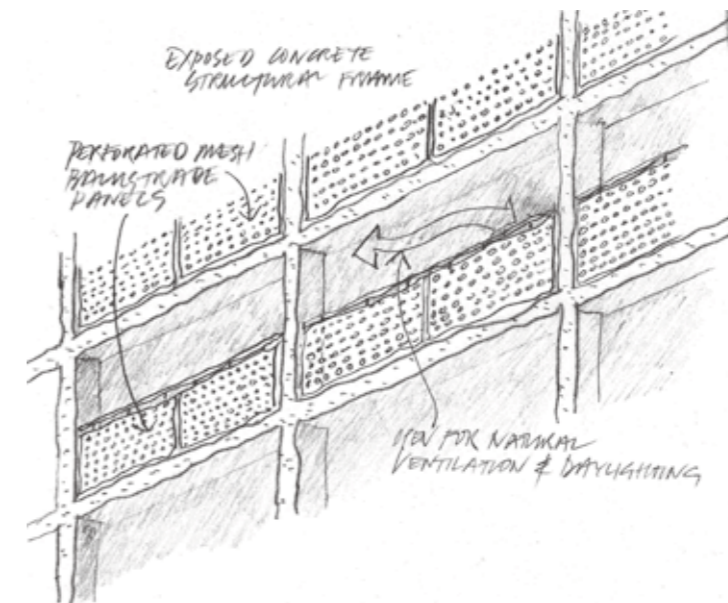
Facade Study

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



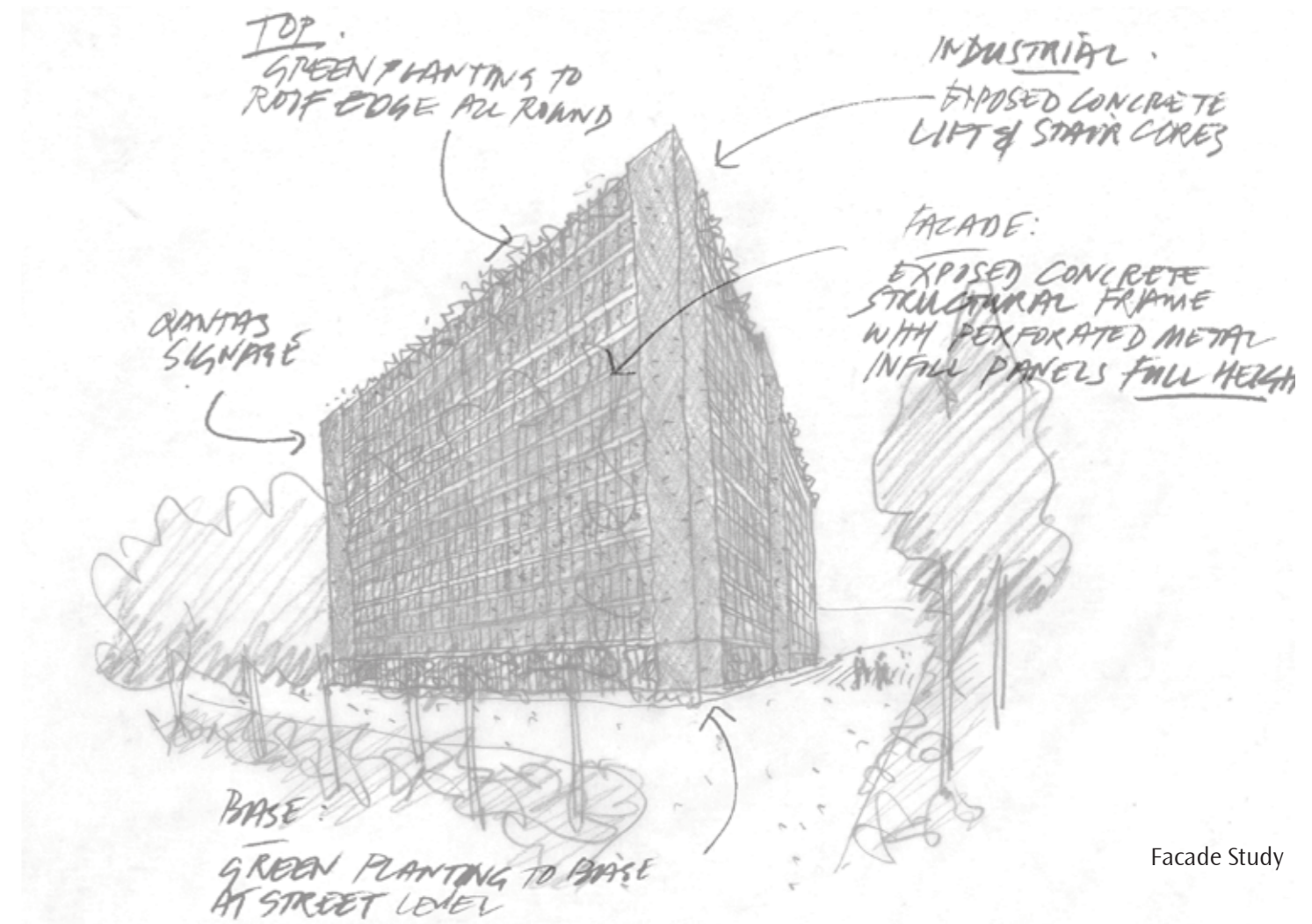
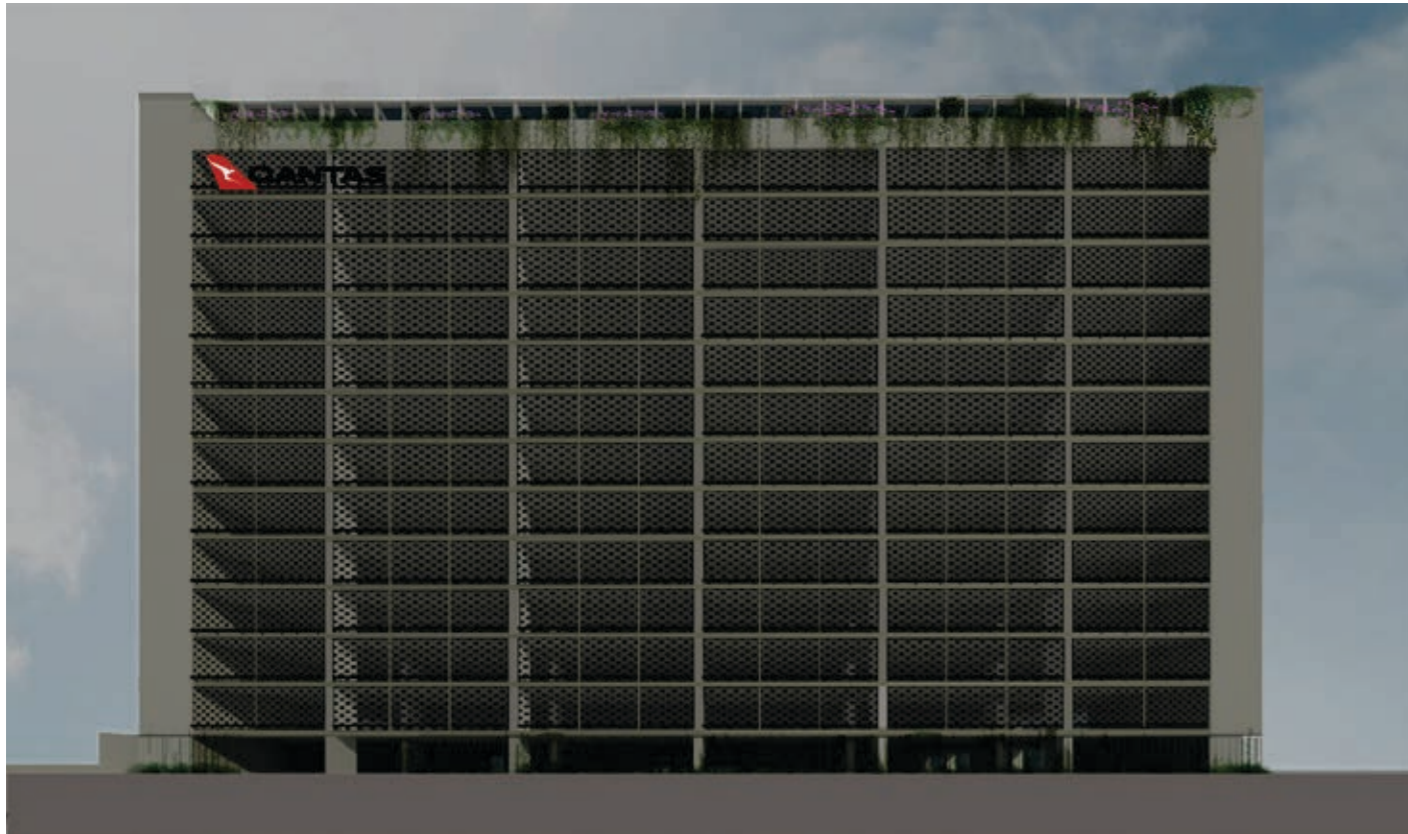
Material Reference
Low level proprietary metal panel



Facade Detail Study

Figure 26.3; Carpark Facade Study; Option 03

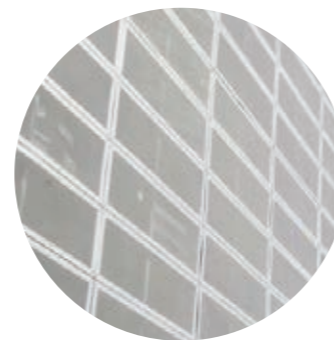
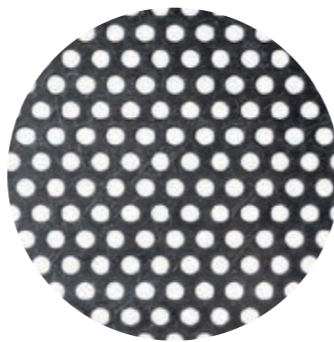
Option 04



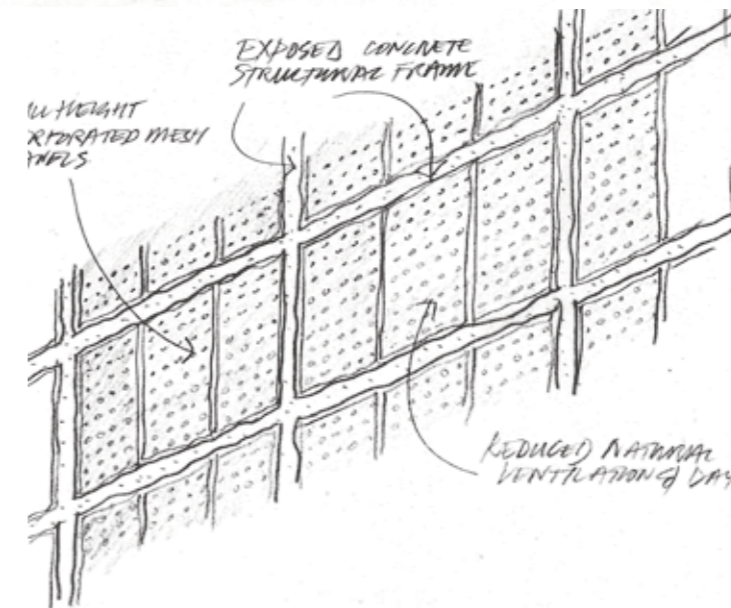
Facade Study

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)



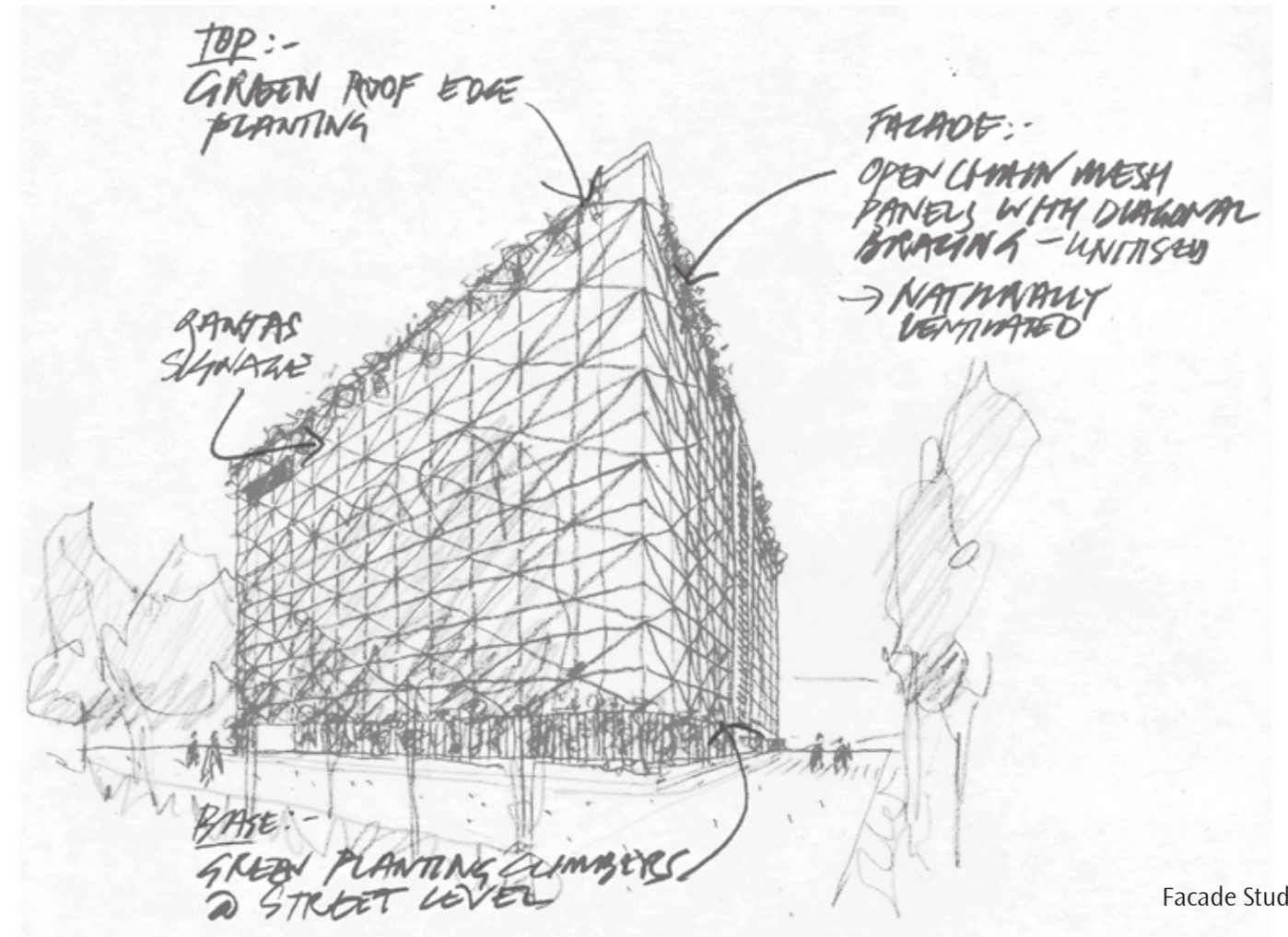
Material Reference
Floor to floor perforated metal panels



Facade Detail Study

Figure 26.4; Carpark Facade Study; Option 04

Option 05



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;

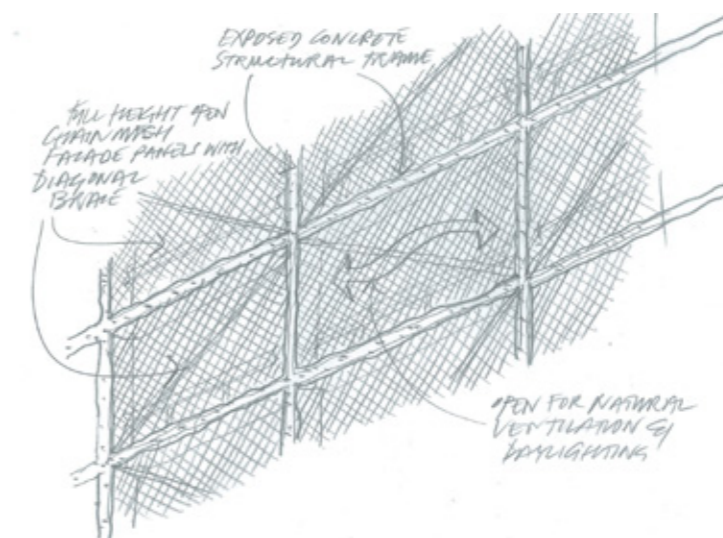
- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated



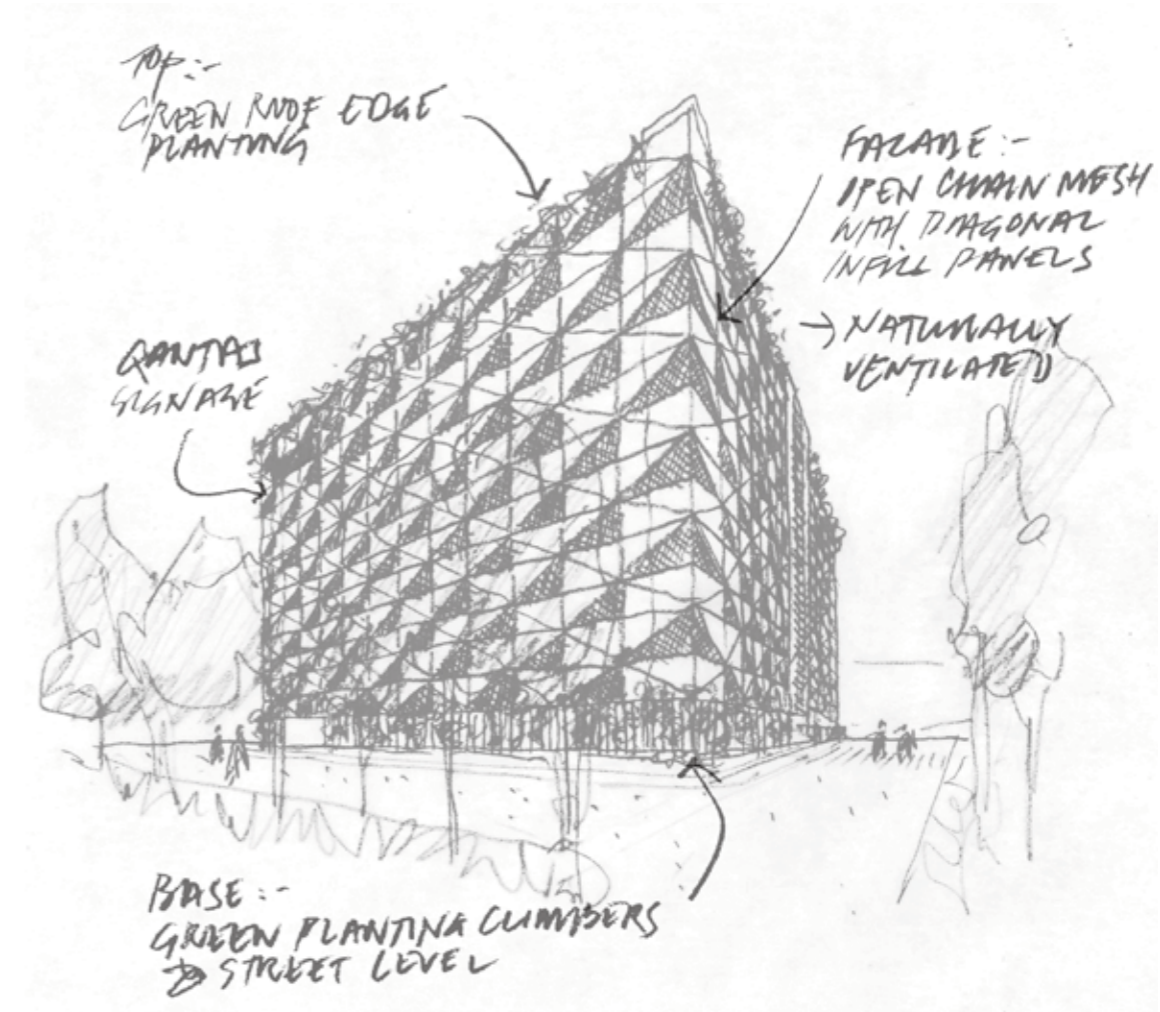
Material Reference
Floor to floor panelised galvanised steel chain wire



Facade Detail Study

Figure 26.5 Carpark Facade Study; Option 05

Option 05.01



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;

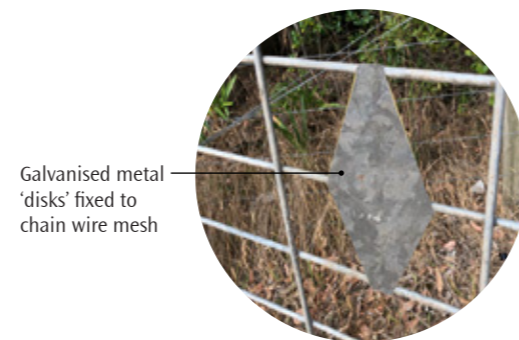
- Structural galvanised steel pergola with perimeter landscape planting

Ground Plane;

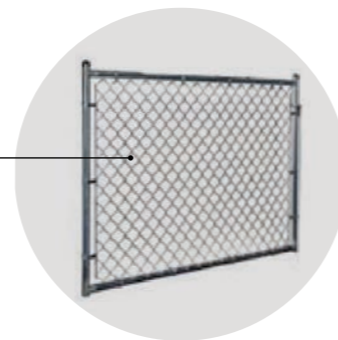
- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated

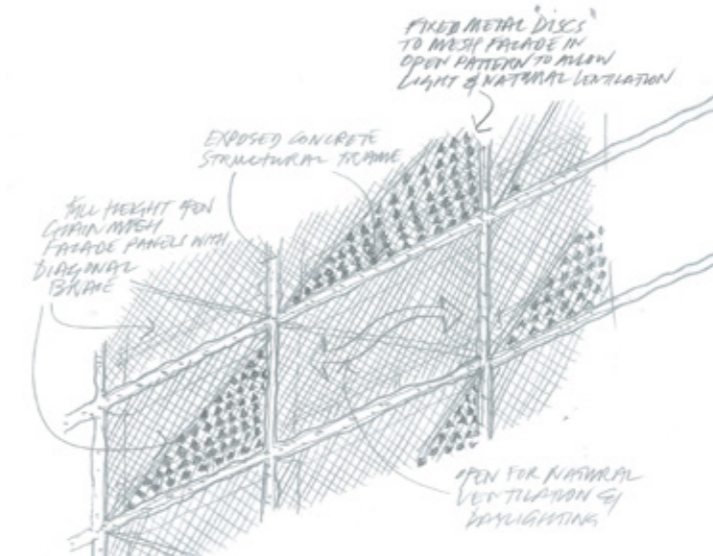


Galvanised metal 'disks' fixed to chain wire mesh



Galvanised steel chain wire mesh panels

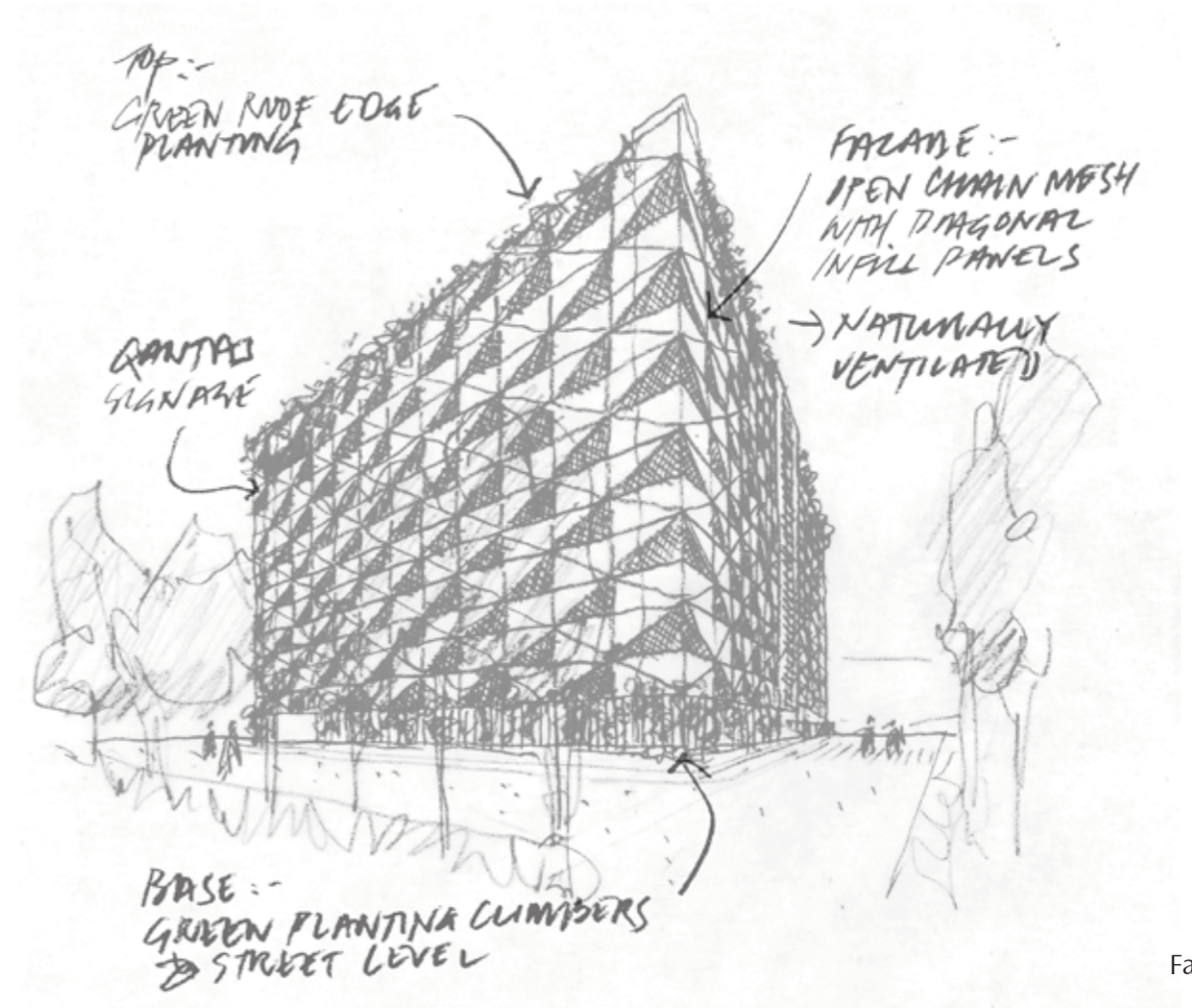
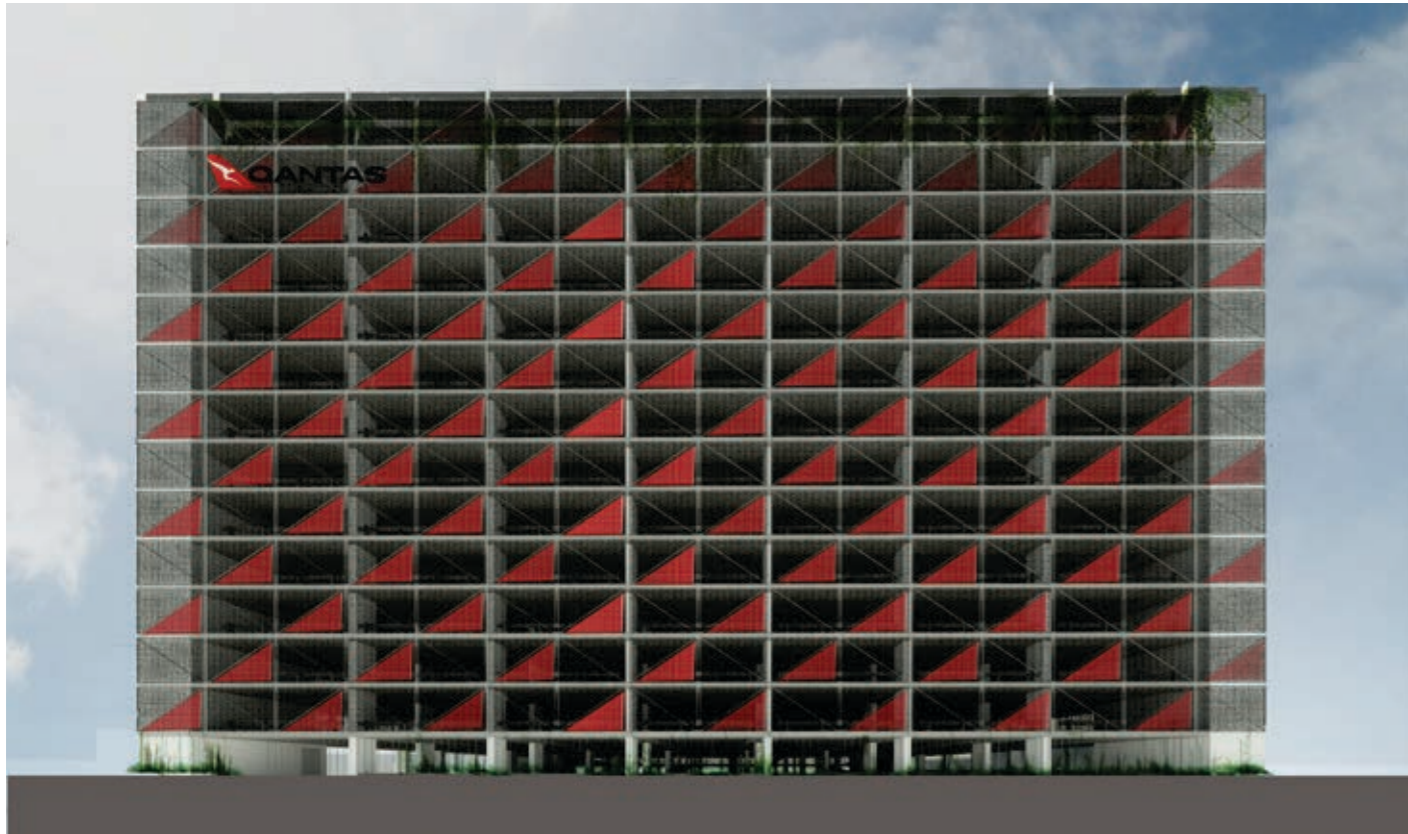
Material Reference
Floor to floor galvanised steel chain wire mesh panels



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;

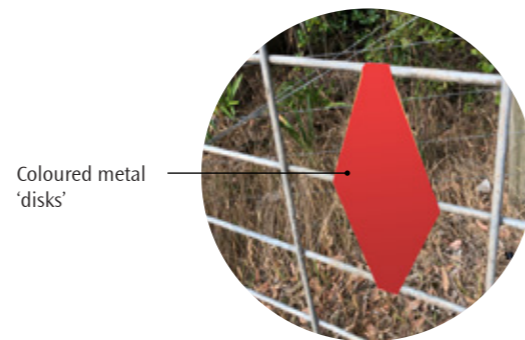
- Structural galvanised steel pergola with perimeter landscape planting

Ground Plane;

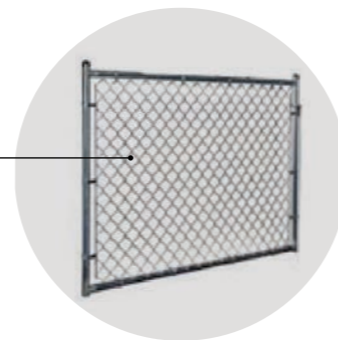
- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated

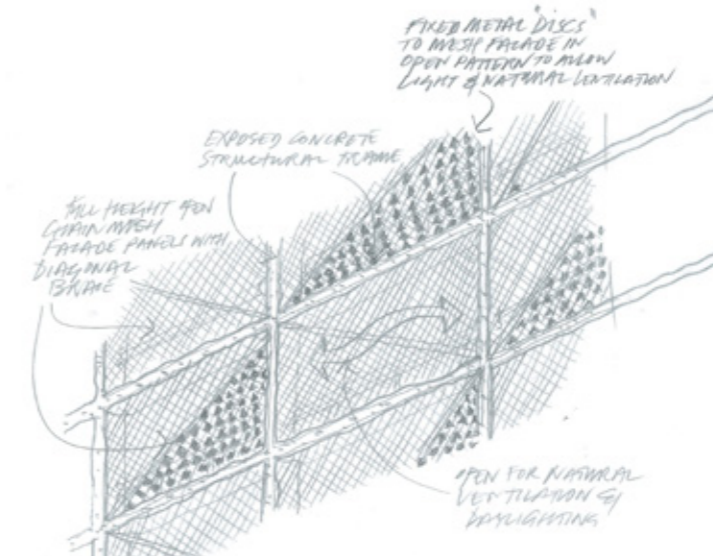


Coloured metal 'disks'



Galvanised steel chain wire mesh panels

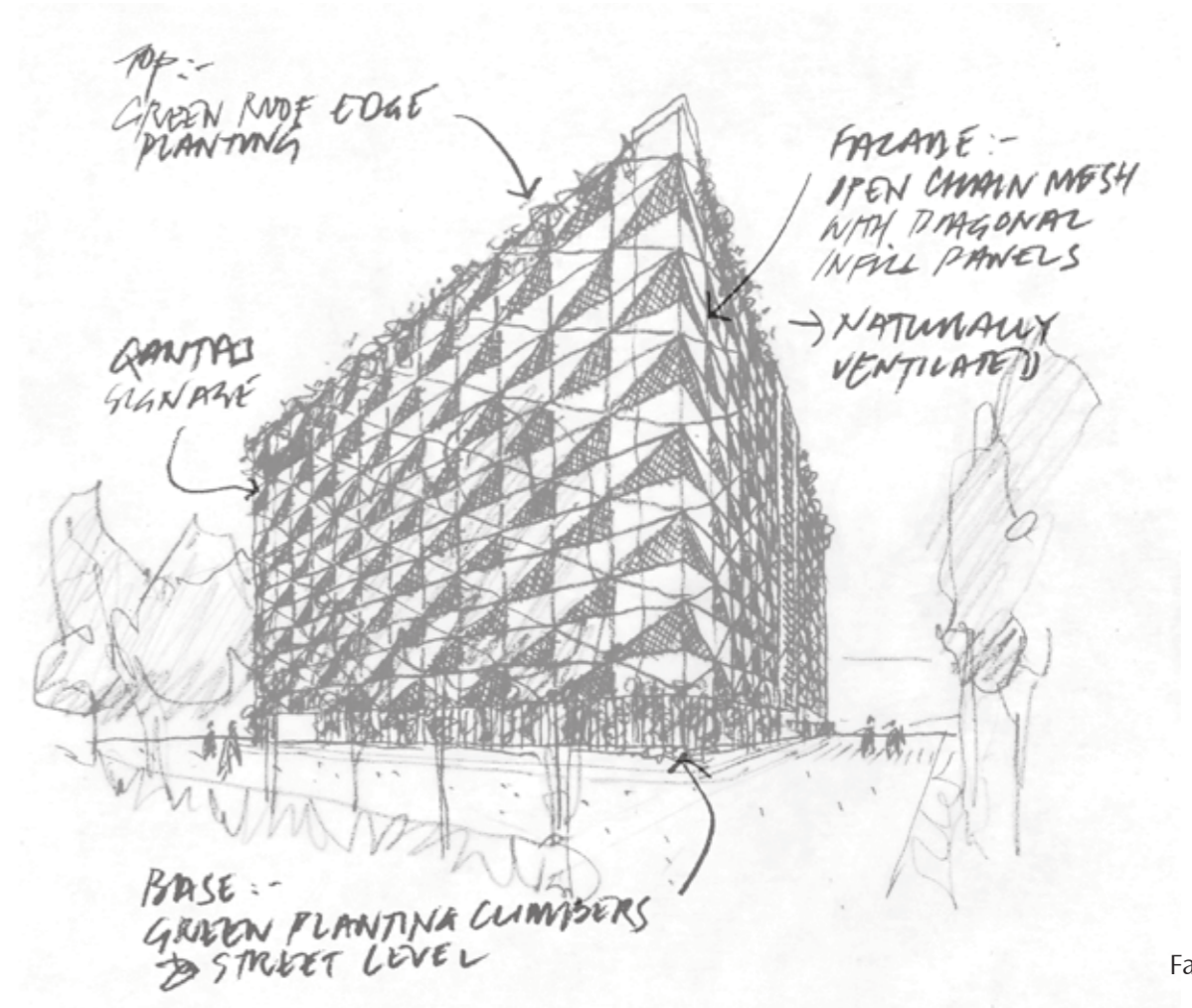
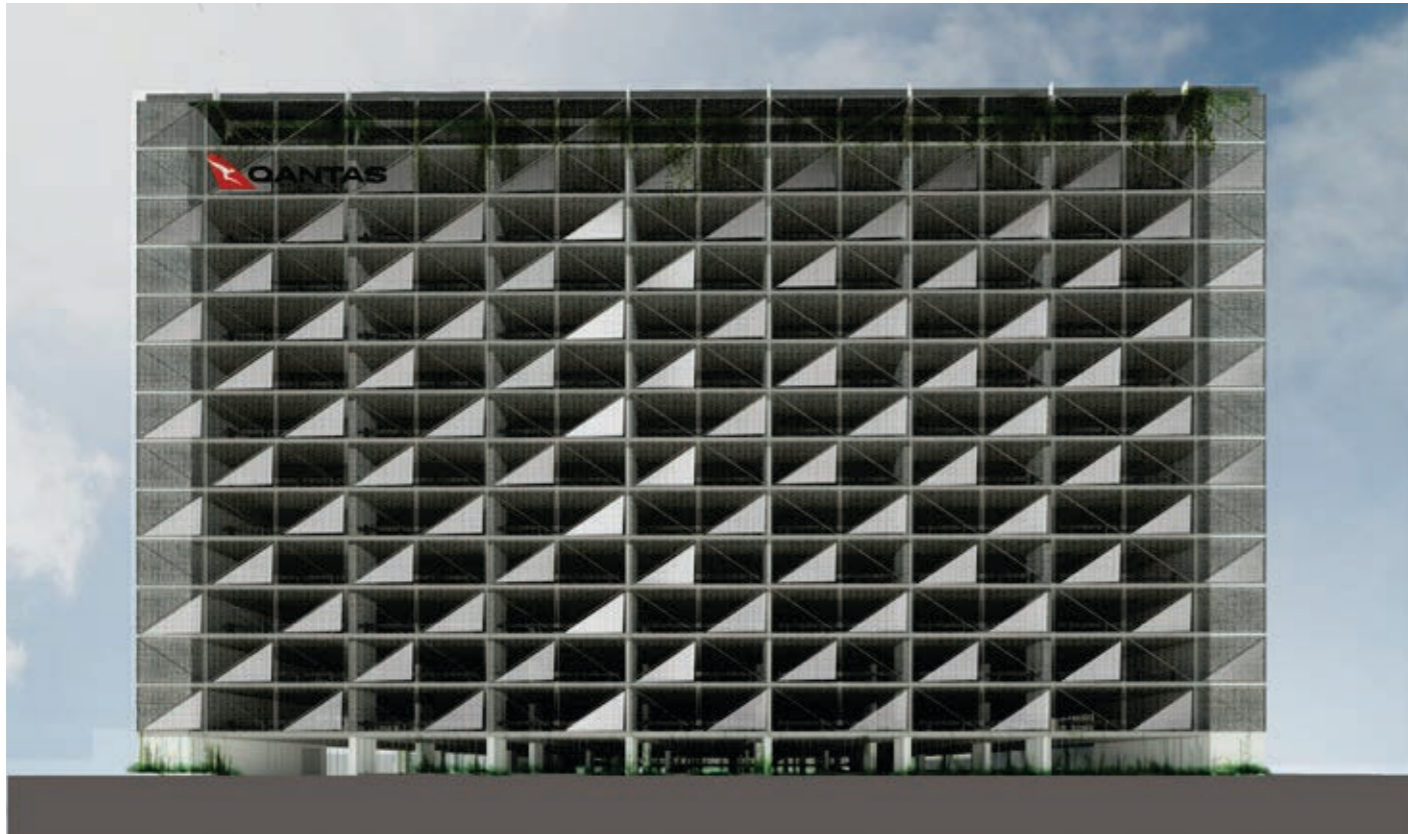
Material Reference



Facade Detail Study

Figure 26.5.2; Carpark Facade Study; Option 05.02

Option 05.03



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;

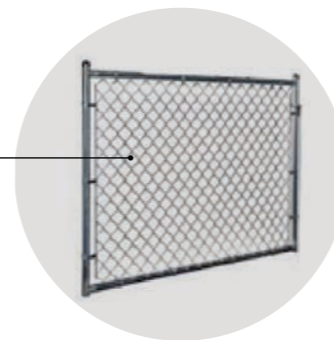
- Tension wires with perimeter landscape planting

Environmental Strategy;

- Naturally ventilated

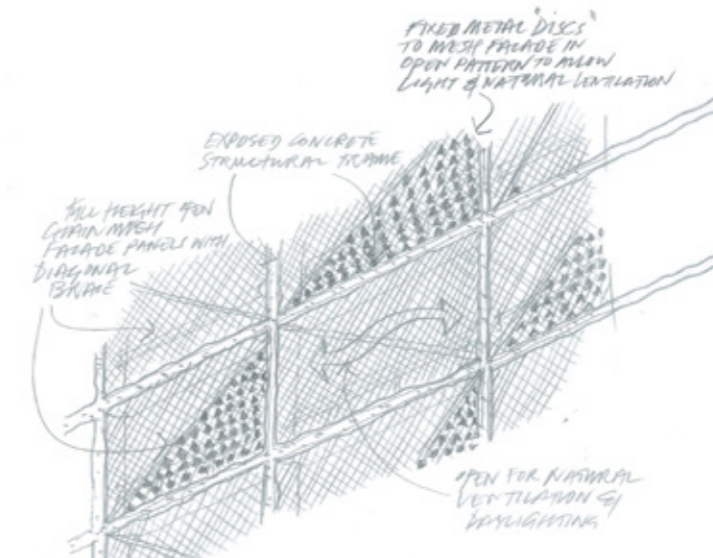


Colorbond Surfmist 'disks'



Galvanised steel chain wire mesh panels

Material Reference



Facade Detail Study

Figure 26.5.3; Carpark Facade Study; Option 05.03



Figure 20.1 Artists Impression; View of Carpark

Carpark Preferred Option

Option 05.03 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.

The façade 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 'discs' 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. The combination of mesh, bracing and metal 'discs' provides permeability and lightness whilst providing an animated facade which reduces building bulk and mass.

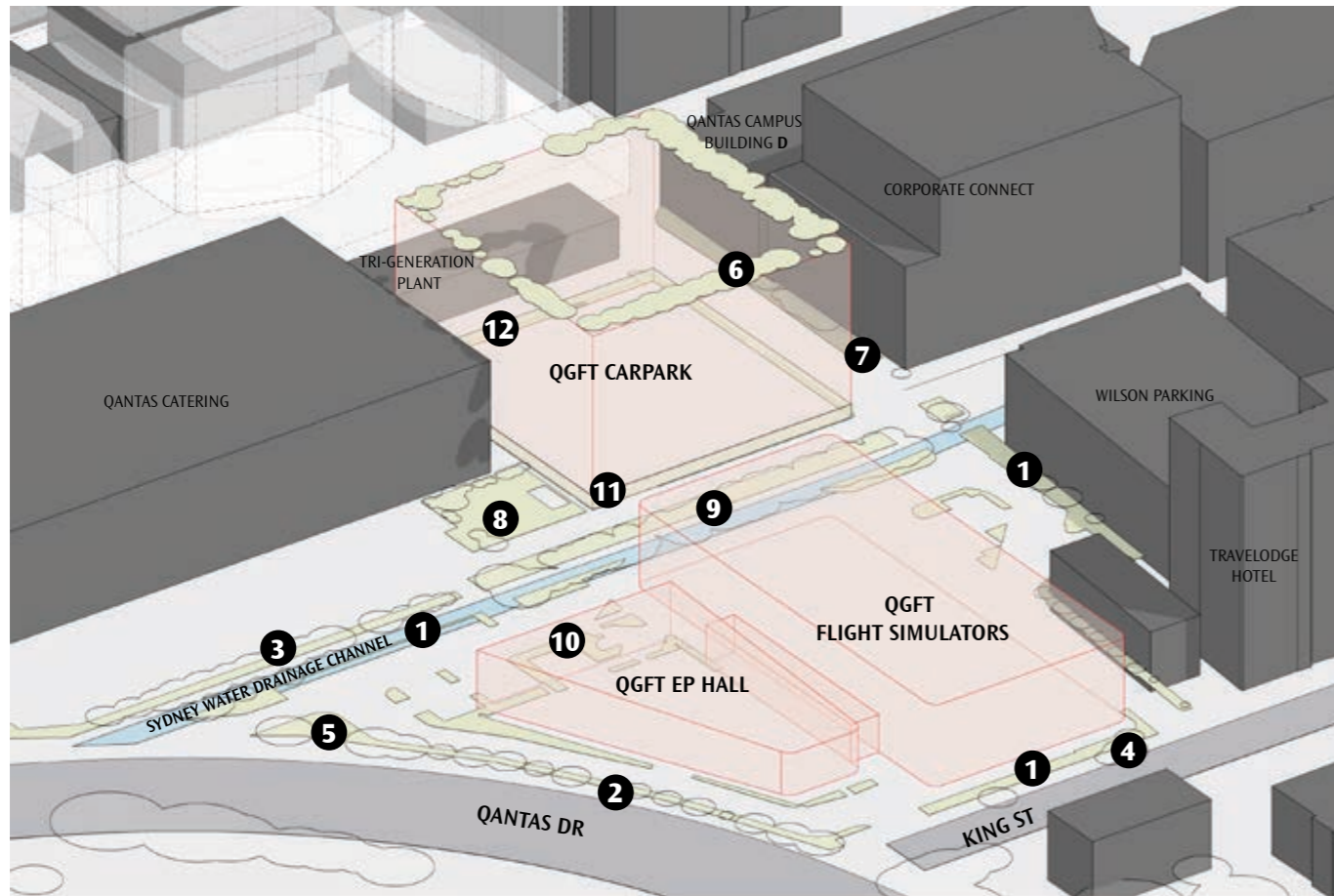
Landscape Solution

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.

Landscape has been integrated into the built form where feasible with the inclusion of low level vertical green walls to both the carpark perimeter and parts of the Flight Training Centre. Stage 2 of the Carpark development includes a significant perimeter planter and pergola design to soften the built form.

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



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

Figure 27. Landscape

Materials

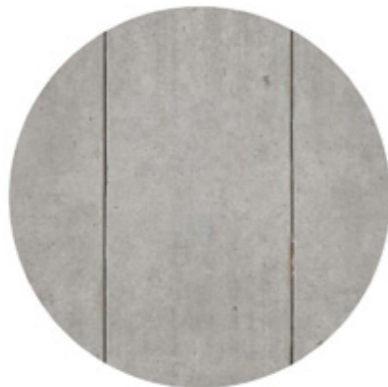
FLIGHT TRAINING CENTRE



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

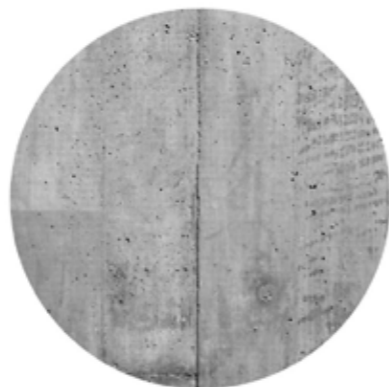
CARPARK



Carpark : Vehicle Crash Barrier
Colour; Galvanised finish



Carpark : Chainwire Mesh Facade
Colour; Galvanised finish



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

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'.

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 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

Figure 28. Facade Materials

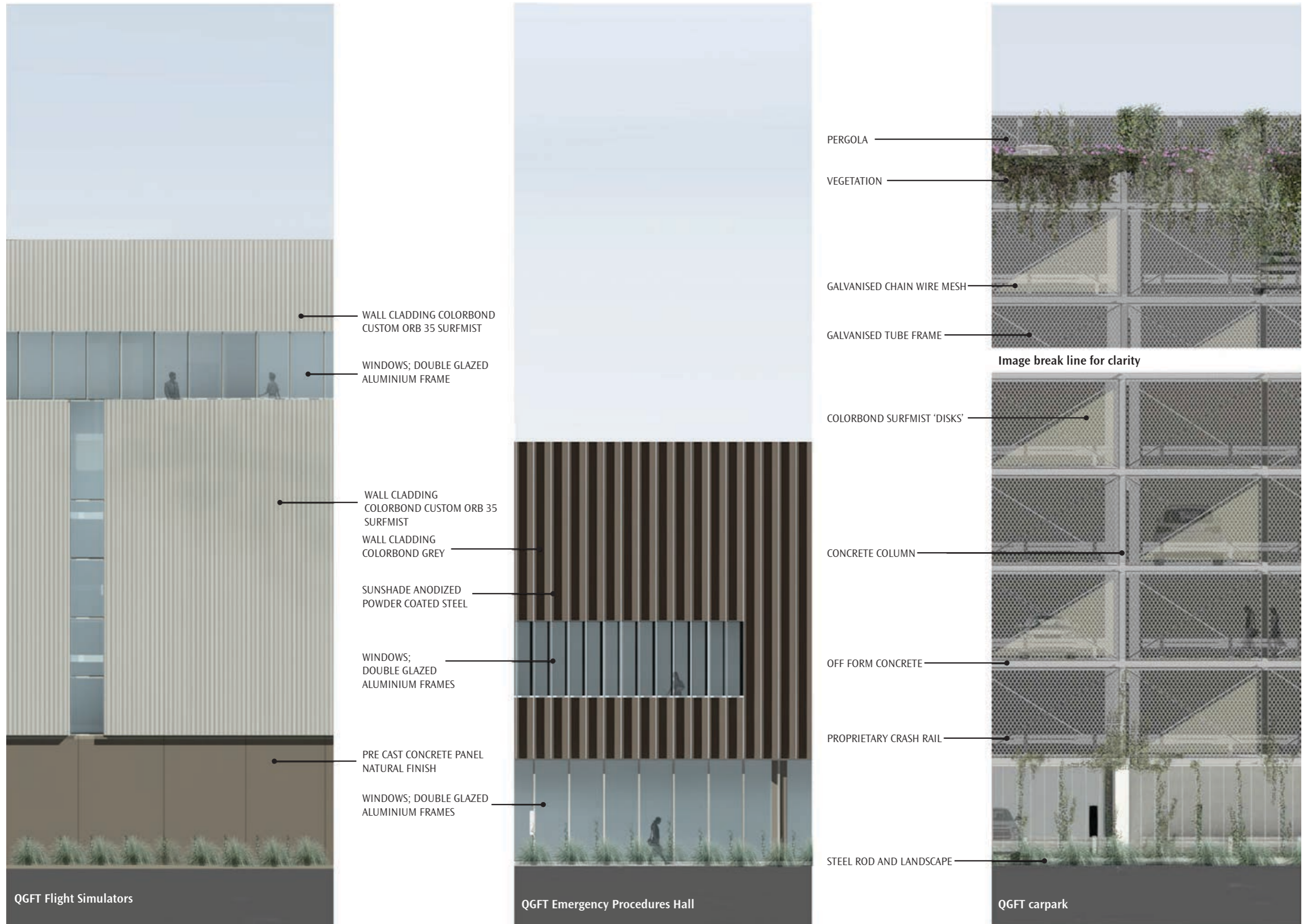


Figure 29. Facade Studies

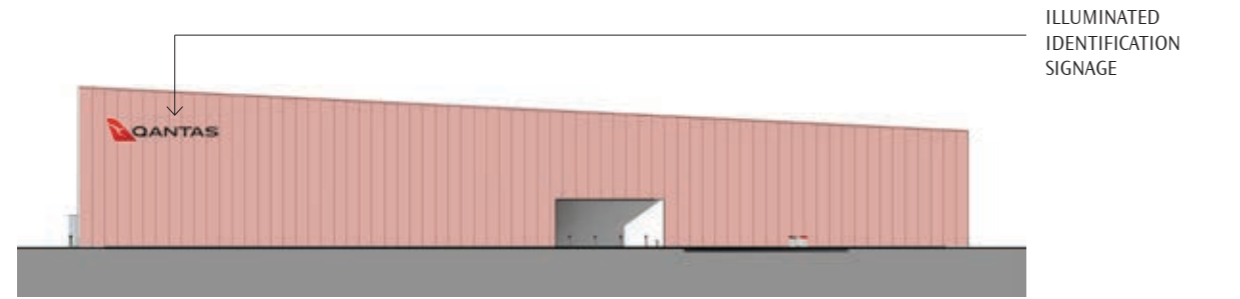
Signage

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.

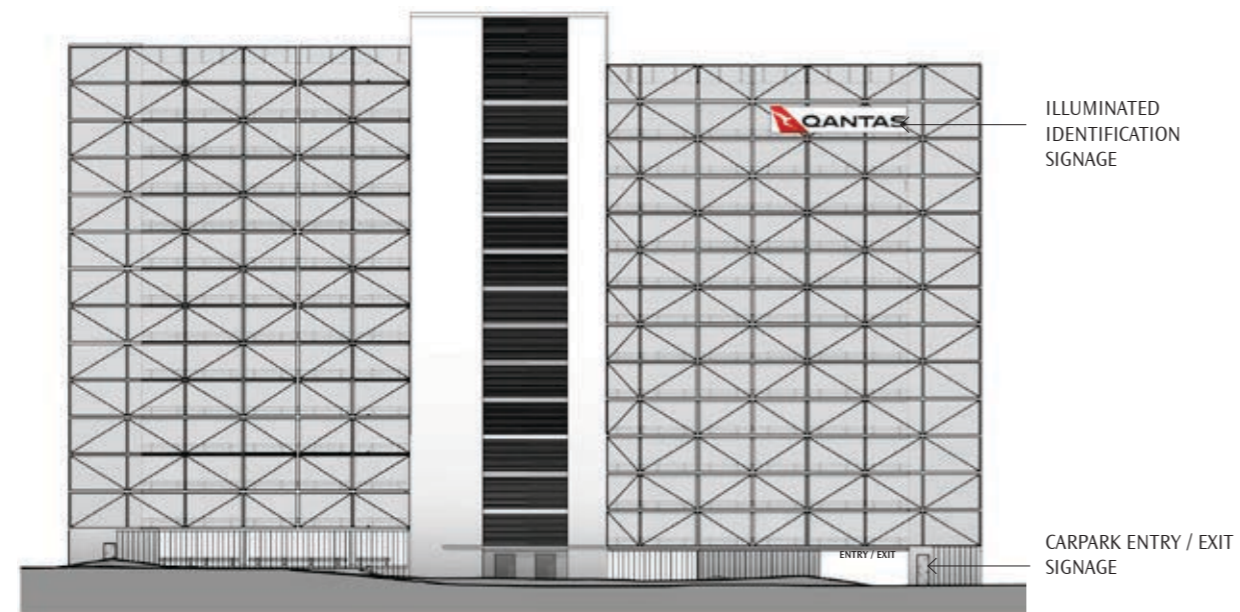
The Flight Training Centre will have a single internally illuminated Qantas identification sign on the upper portion of the west façade facing Qantas Drive. A secondary Entry sign will be located on the inset northern Entry facade, facing the staff carpark to reinforce the entry to assist visitors.

The multi-deck staff carpark will have two similar internally illuminated Qantas identification signs on the upper levels, one each on the eastern and southern facades. Secondary low-level Entry/Exit signs to assist users will be located above both carpark entries being on the east and west elevations.

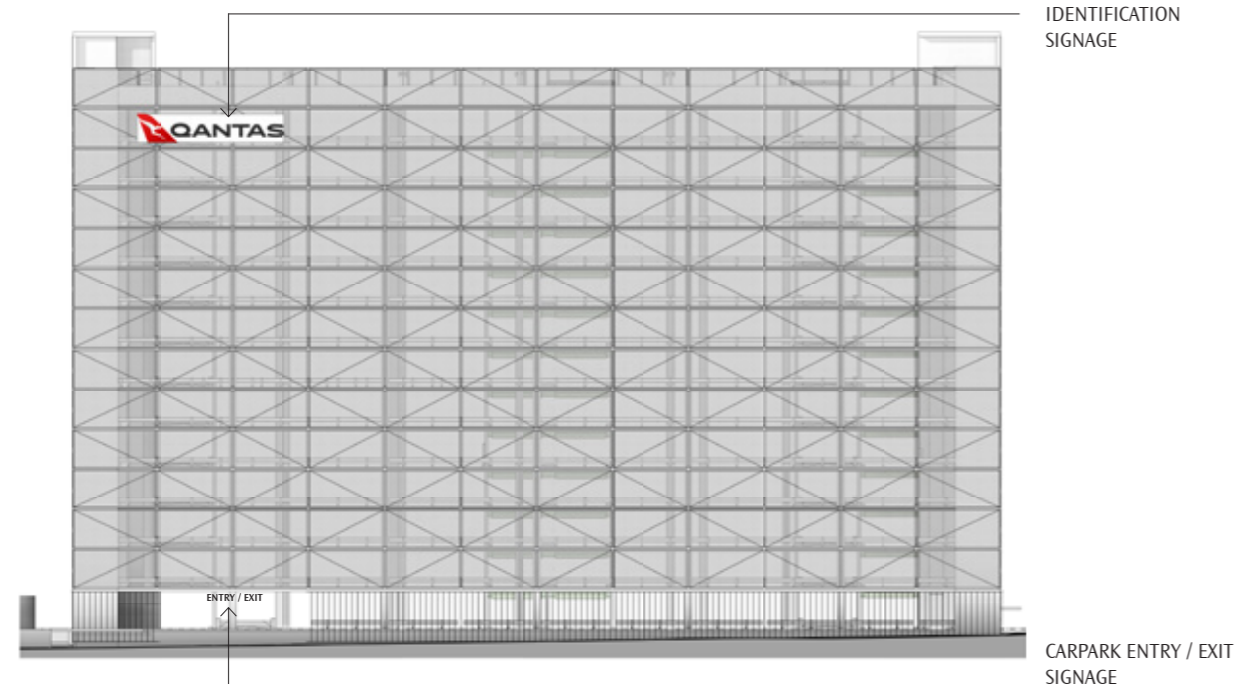
Refer to Figure 30. Signage Locations and Figure 31. Signage Types.



Flight Training Centre - EP Hall West Elevation

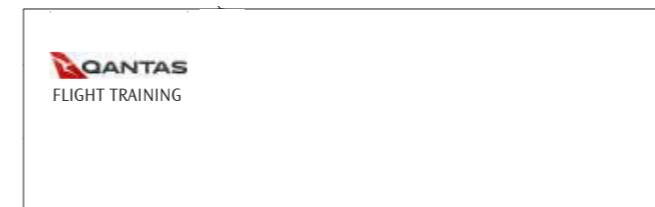


Carpark - East Elevation



Carpark - South Elevation

Figure 30. Signage Locations



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

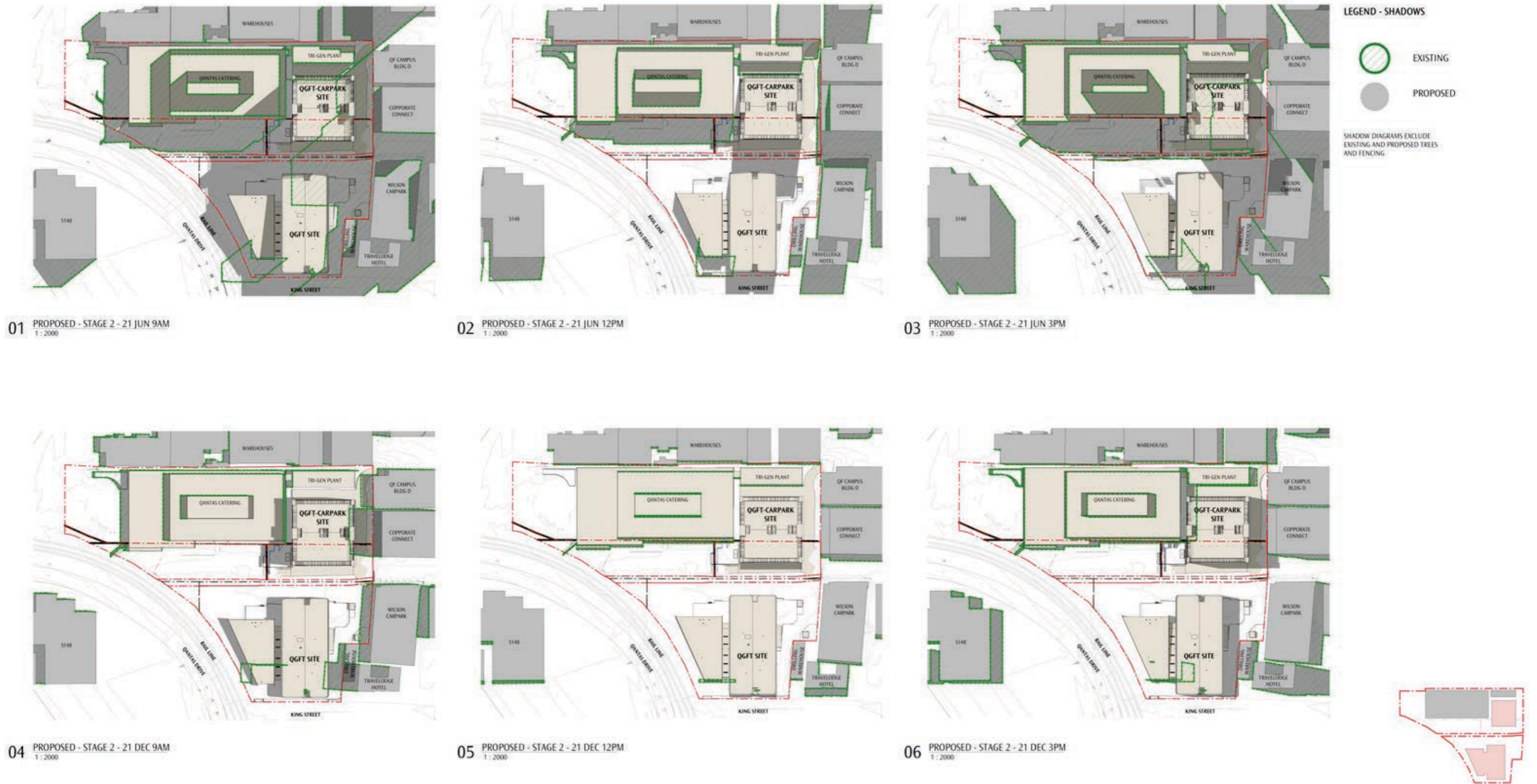


Figure 32; Shadow Diagrams

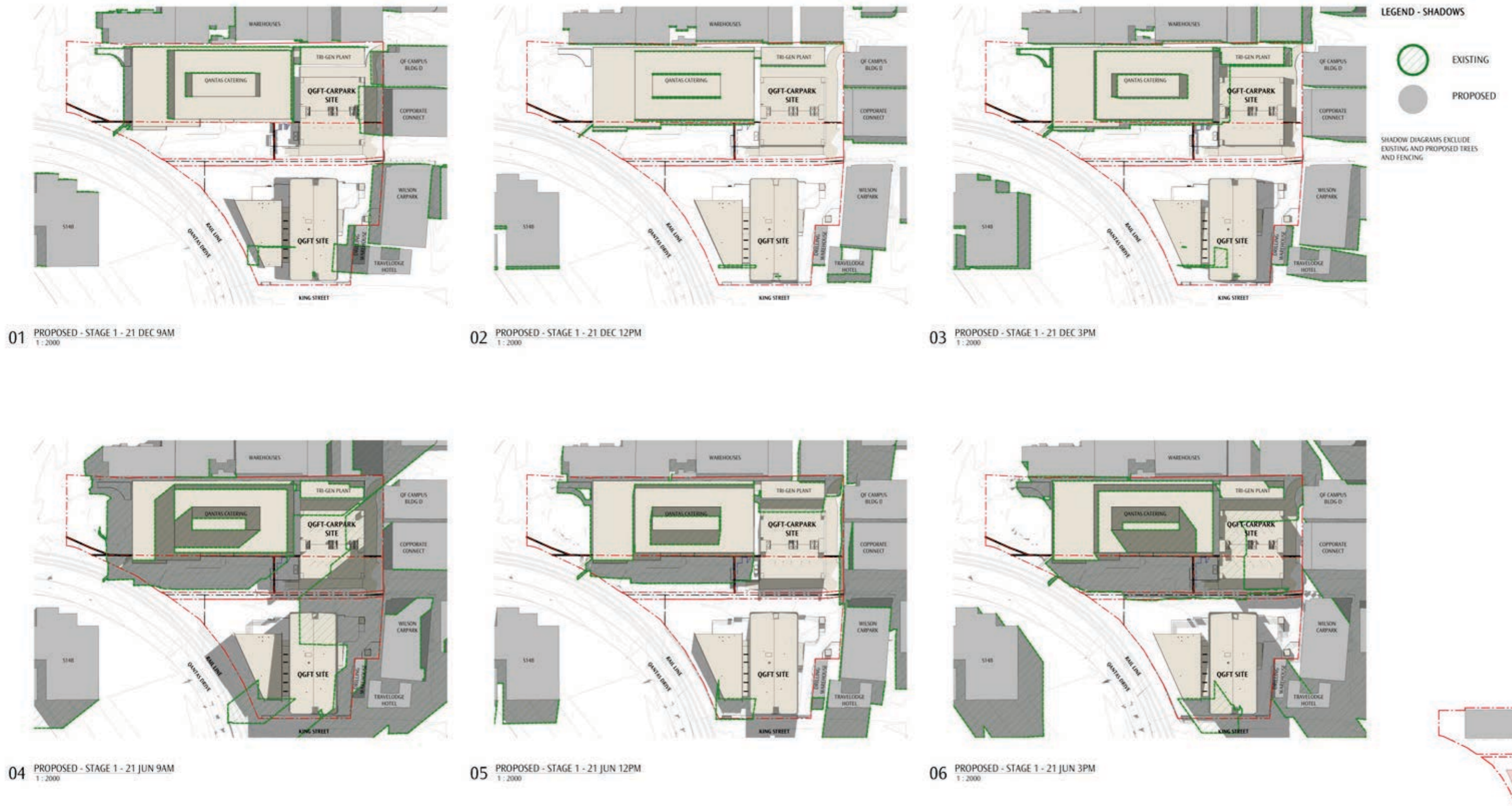


Figure 33; Shadow Diagrams

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



Figure 20.1 Artists Impression; View of Carpark

04.02 *Architectural Drawings*