

06. Cammeray Facilities

The facilities at Cammeray are the largest surface intervention of the project scope and will be a visual landmark for the Western Harbour Tunnel.

The design, through its form, patterns, and colours, pays homage to the distinctive sandstone geography of the region.





Figure 84: Artist's impression of the Cammeray ventilation facilities (existing context shown indicatively, trees and landscape shown at 5 years maturity)

6.0 Cammeray facilities

Minimise the physical footprint and visual impact of these structures while ensuring they are designed as high quality pieces of well integrated architecture.

Motorway facilities, vent outlets and motorway control centres principles, EIS Appendix V



Figure 85: Artist's impression - aerial view of the Cammeray ventilation facilities (existing context shown indicatively, trees and landscape shown at 5 years maturity)

6.1 Overview

6.1.1 Scope

The Cammeray ventilation facilities host the necessary equipment and controls to exhaust air from the tunnels to ensure the safe operation of the WHT on the north side of Sydney Harbour. The components encompass:

- Cammeray ventilation outlet
- WHT ventilation building
- WHT water deluge facility (including shared tanks)

Public access to the ventilation facilities is restricted. However, adopting a sensitive urban design approach is crucial, given the substantial size and prominent visibility of the constructed elements, as well as the sensitivity of the surrounding setting.

Ancillary facilities will be screened from the public domain through planting and screening, tying into the adjacent screening provided on the Ernest Street Bridge by the WFU contractor. Facilities that are visible from the public domain are designed as a cohesive package. A unified façade approach has been deployed across the Cammeray ventilation outlet, the WHT ventilation building, and the main tunnel portal feature ensuring a common architectural language.

6.1.2 Site context

With the exception of the ventilation outlet, the facilities will be located in a compound along the eastern side of the Warringah Freeway alignment, on a portion of land formerly part of the Cammeray Golf Club. The compound is securely enclosed to prevent public access, accomplished through a combination of barriers, including fencing, retaining walls, and landscaping, which encircle the perimeter. The ventilation outlet will be located in the median of Warringah Freeway, accessed via a service walkway from Ernest Street Bridge. The predominant urban form in the surrounding area consists of brick faced residential buildings and open spaces bisected by a contrasting busy highway corridor. The Cammeray ventilation facilities will serve as a backdrop to both the Cammeray Golf Course and the proposed Cammeray Park. The key sensitive receivers are indicated in [Figure 86](#).



Sensitive receivers

- 1 Miller Street residences
- 2 Morden Street/Warringah Road residences
- 3 Anzac Park users and adjacent residences
- 4 Ernest Street residences

Figure 86: Location of ventilation facilities and sensitive receivers around the site

6.1.3 Design principles

The Cammeray facilities serve as prominent visual landmarks along the journey, yet their significance is magnified by their proximity to residential areas and parklands, rendering them highly sensitive in nature. Consequently, the design team has dedicated immense attention to the buildings' appearances from various viewpoints. The overarching vision is to ensure these structures make a positive and harmonious contribution to the surrounding urban environment.



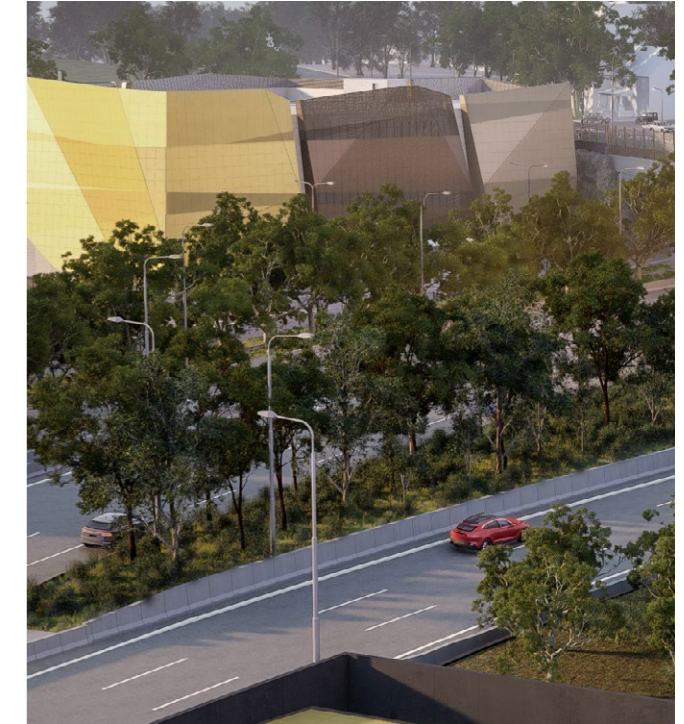
Integrated and elegant form

- Reduce the bulk by creatively articulating the façade
- Ensure visual cohesion between the key built elements including, façade cladding, main tunnel portal feature and landscape features



Responding to the place

- Act as a pleasing and distinctive landmark along the travel while blending to the context
- Respond to the local character in terms of materiality and design, also align with the design features of WFU
- Develop façade patterns and colours through Designing with Country process



Integrate planting

- Maximise the open spaces and planting opportunities by effective site planning
- Effectively integrate landscape design to soften the structures.

6.2 Siting and massing

The compound will house the ventilation building to service WHT at the southern end of the site and the water deluge facility adjacent. The centre of the site, which was earlier planned as a placeholder for the now cancelled Beaches Link Project facilities, will feature a public open space. The northern third of the site will be landscaped, with the vision that it be a public green space in future.

The ventilation facilities have been optimised from the EIS design through the design development process, allowing the reduction of the building footprints. This has allowed for the reconfiguration of the site, with ancillary facilities organised within the consolidated compound, visually screened from the public domain by the topographic conditions. This frees up land formerly required at the south-eastern corner of the compound for the addition of a new public park.

Deluge tanks servicing the tunnel are situated next to the pump room within the Cammeray ventilation building. Four cylindrical metal tanks, approximately matching the height of the cutting and retaining wall, are strategically placed. To shield them from public view, the tanks are screened by changes in levels, metal screens along the Ernest Street Bridge, and landscaping.

The structure of the buildings and associated infrastructure within the ventilation facility are governed by strict requirements of the mechanical and electrical equipment, and overall tunnel alignment. As the structure and associated infrastructure of the buildings is set because of a technical and engineering reason, these elements are not subject to change.

- 1 WHT ventilation building
- 2 WHT ventilation outlet
- 3 Future Beaches Link ventilation building (cancelled)
- 4 Deluge tanks
- 5 Access road
- 6 Cammeray Park subject to future community consultation
- 7 Ernest Street Bridge
- 8 WHT main tunnel portal
- 9 Residual park subject to future community consultation

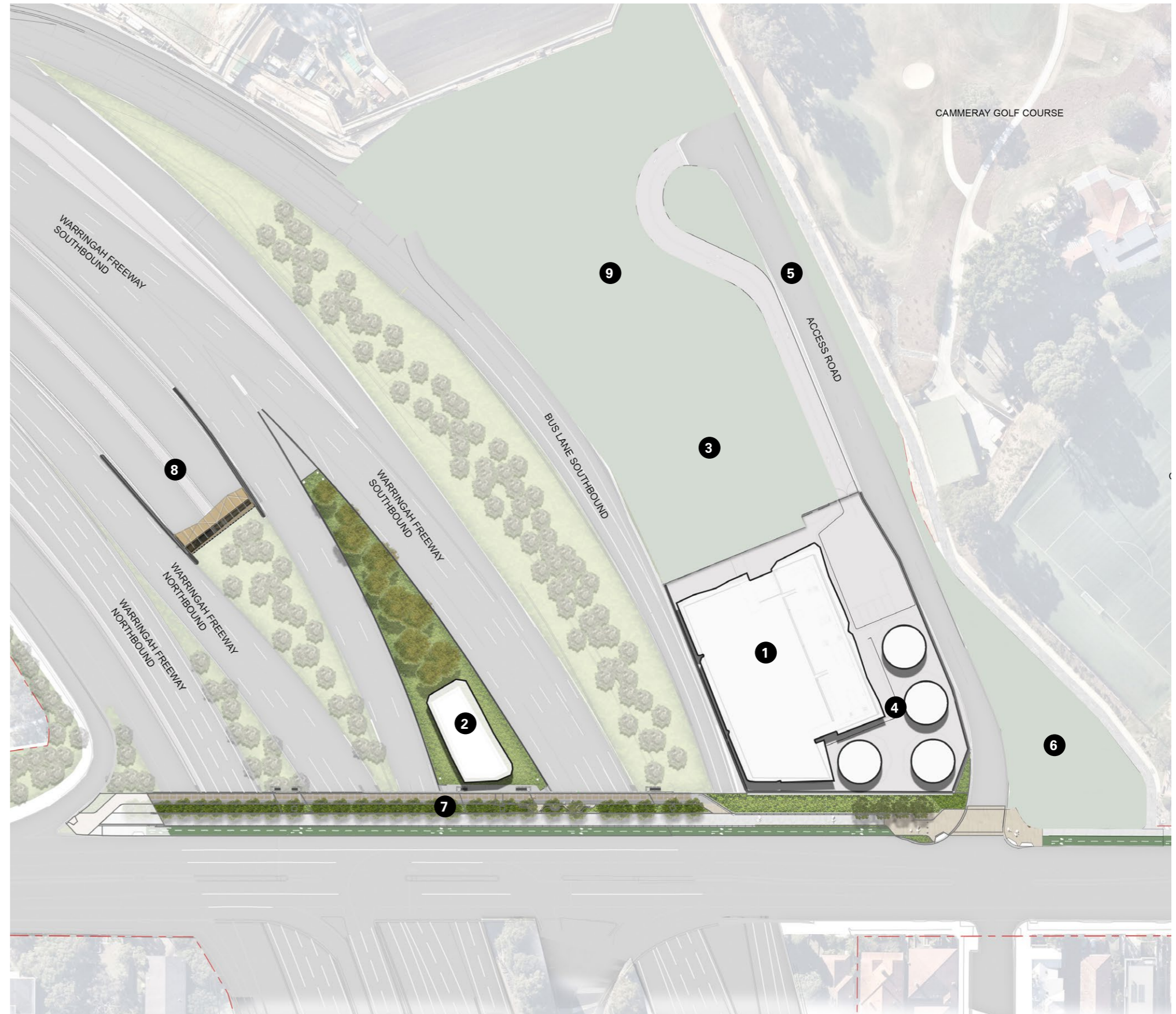


Figure 87: Cammeray ventilation facilities site plan

6.3 Façade strategy

The scale of the buildings and proximity to the Warringah Freeway, local roads and public parks demands a treatment that decreases visual bulk and relates the buildings to the existing and future context. The façade approach was developed with these ambitions at the core, referencing Country and geology while breaking down the form of the masses.

The structures will be clad in robust aluminium panels arranged to form large triangular faces angled from the structure of the building to provide depth to the structure. The façade will be divided into two zones. The lower zone will echo the solid sandstone rock base found along the Warringah Freeway alignment, tying the buildings to the land, while the upper portion of the façade will express the landscape form of the region through geometric abstraction, featuring perforations to allow the building to blend with the sky at the top, breaking down the mass of the buildings.

Overall, the materials and form of the building, in addition to reducing the visual bulk, contribute to the sound attenuation of the structures to eliminate the need for noise walls at the compound and acknowledge maintainability and serviceability considerations. The materials assist in integrating the structures into their surroundings through breaking down of scale and coordinated material and landscaping with surrounding parks and the Ernest Street Bridge.

6.3.1 Design inspiration

Drawing inspiration from the geological features of the area, the approach intricately weaves the natural world into design. The faceted form of the structures seeks to mirror the rugged elegance of the rocks and boulders in the local context, capturing their essence.

The intricate cracks and patterns found in these rocks are meticulously translated into the façade design, creating a captivating interplay between nature and the buildings. This effect is achieved by employing aluminum cladding panels featuring varying percentages of perforations, creating a layered pattern on the façade (Refer to the building elevations and views in the following chapters for visual representation)

Furthermore, the colour palette is thoughtfully curated to seamlessly blend with the hues and tones of the surrounding rocks, ensuring that the design becomes an integral part of the landscape. This philosophy not only yields visually striking results but also fosters a deep sense of connection between the built elements and the natural character.



Figure 88: Images of Hawkesbury stone, Sources: Step Inc Sydney, PocketOz, Nation Rock Garden

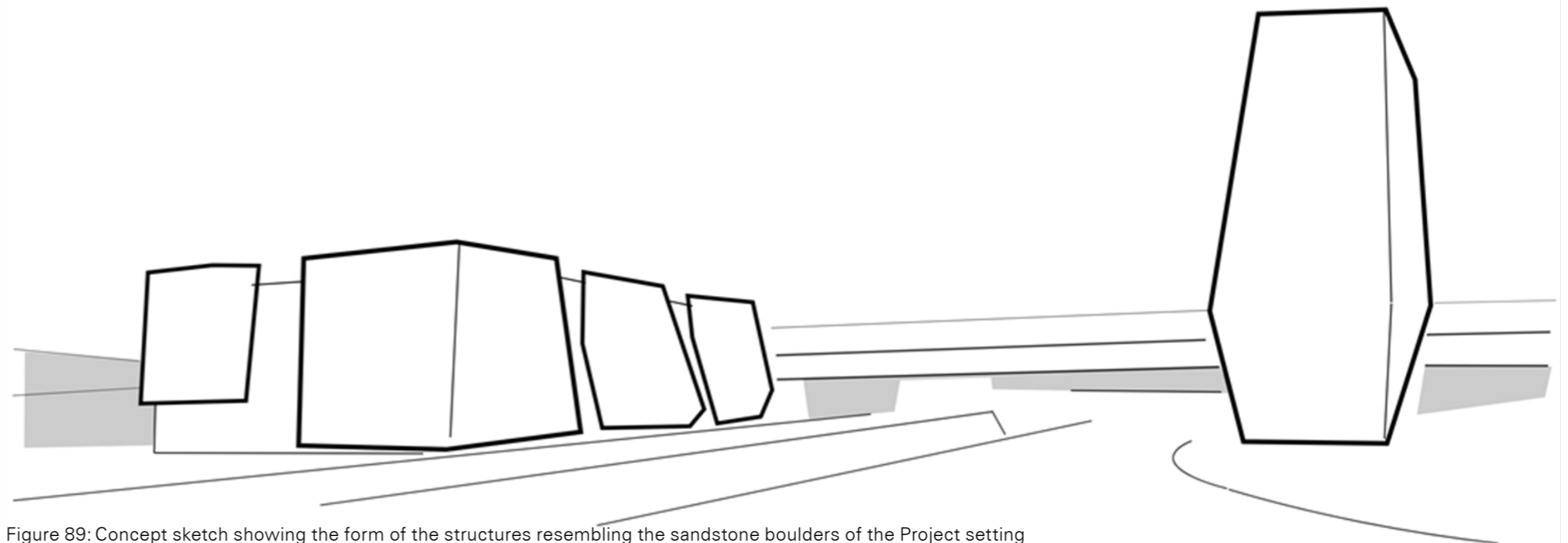


Figure 89: Concept sketch showing the form of the structures resembling the sandstone boulders of the Project setting

6.3.2 Designing with Country

The legibility of layering in the design not only reflects the geological formations like rock sedimentation but also symbolises layers of stories and cultural heritage.

Moreover, the use of colours aligned with the sandstone found on site embraces the natural hues of the Country, enriching the cultural and environmental narrative of the project



“The use of colours aligning with the sandstone found on site has been embraced as exposing the natural colours of Country”



6.3.3 Materials and finishes

The choice of façade colours is a significant factor, especially when taking into account the size of the structure and its contextual sensitivity. A meticulous and thorough on-site analysis has been conducted to carefully determine the appropriate colours for the façade.

The color scheme is carefully selected to match the colours of the rocks from the site. It also matches with the colours from WFU project to ensure visual cohesion. The final colours chosen are: Maroochy Sand, Summer Maize, Portland Stone, Jamacian Chocolate.

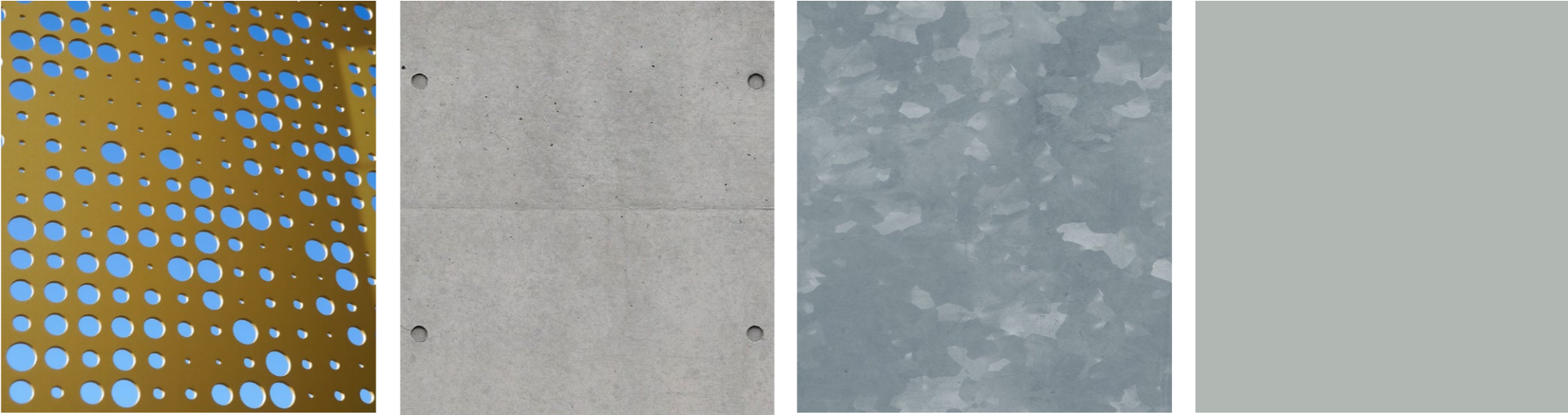
Façades are designed to follow the principle of low maintenance. The finishes are selected to be of high durability, UV, and weather resistance.

Structure

The façade will be supported off the structural concrete walls of the building / ventilation outlet. The structure will be designed to prevent reaction between dissimilar metals with bracing provided at the joints.

Lighting

The primary objectives of the lighting strategy are to enhance security and visibility around the buildings while minimising light spillage. The building façade to the ventilation facilities will be lit by feature lighting placed around the Cammeray building compound, outlet compound and adjacent Ernest Street Bridge. The design of the facilities will permit a transformation from day to night, with the perforation pattern of the panels allowing the structures to glow, further revealing the natural motif. Lighting will be located along the base of the building veils, casting upward on the structural walls of the building, providing a back-lit effect as illustrated in [Figure 84](#).



Perforated aluminium panels
(Indicative pattern and colour)

Off-form concrete - natural finish

Hot dip galvanised steel - Natural finish

Shale grey - door leaf paint

Façade colours:



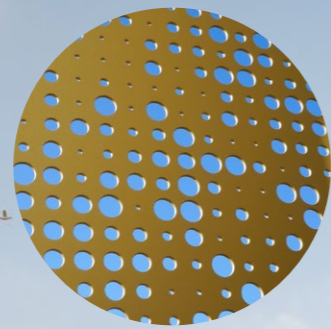
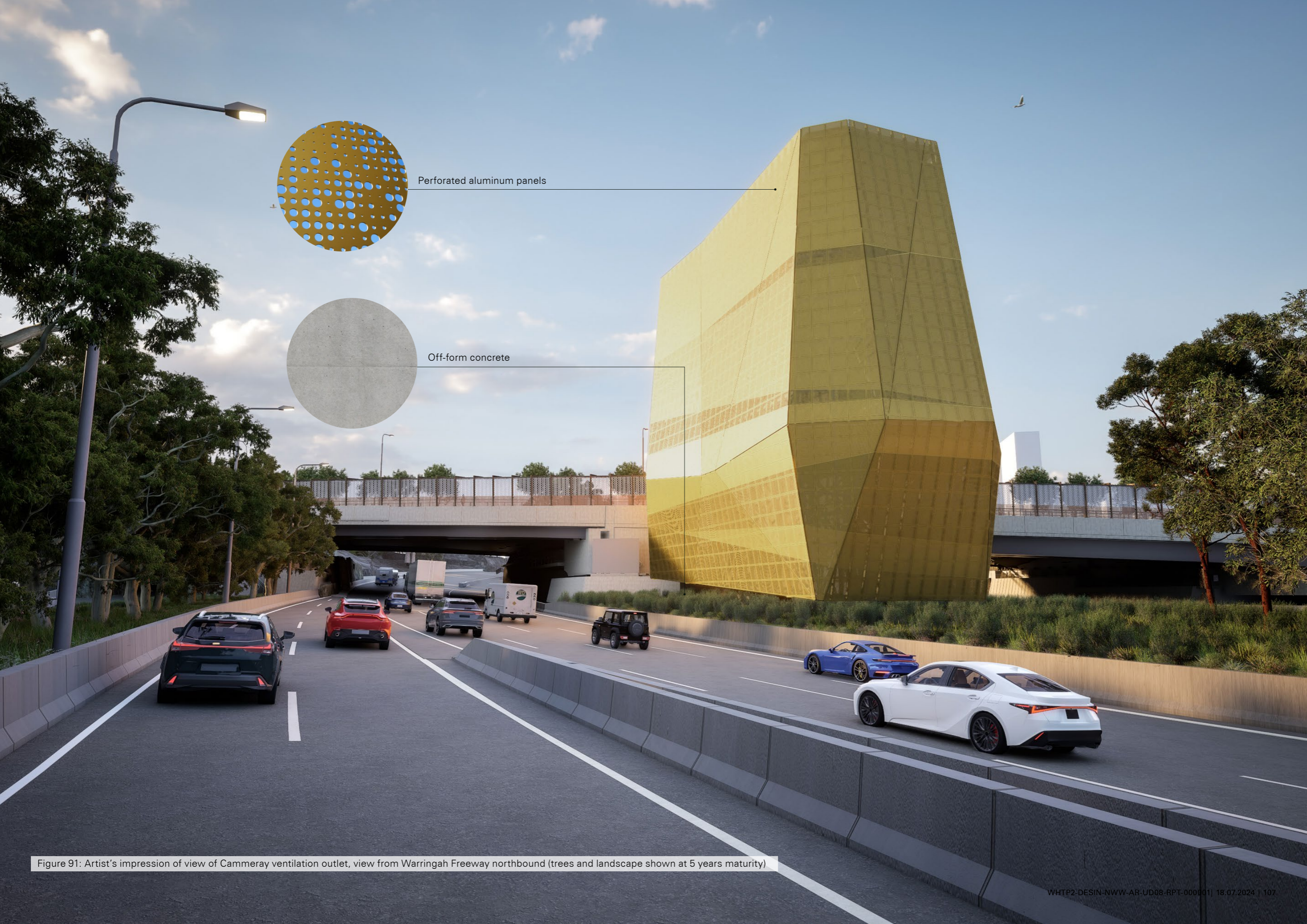
Jamacian Chocolate

Portland Stone

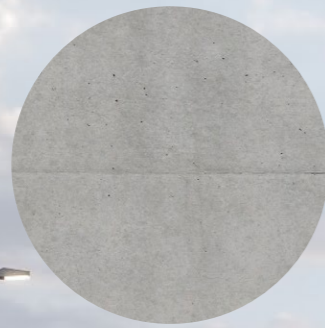
Summer Maize

Maroochy Sand

Figure 90: Materials and colours for the ventilation outlet



Perforated aluminum panels



Off-form concrete

Figure 91: Artist's impression of view of Cammeray ventilation outlet, view from Warringah Freeway northbound (trees and landscape shown at 5 years maturity)



Cammeray ventilation outlet

Ernest Street Bridge

Figure 92: Artist's impression of the Cammeray ventilation facilities, view from Ernest Street (existing context shown indicatively, trees and landscape shown at 5 years maturity)

Cammeray ventilation building



6.4 Cammeray ventilation outlet

The ventilation outlet will exhaust air from the tunnels. The structure sits on grade between the northbound and southbound carriageways of the Warringah Freeway, in the cutting excavated by the WFU contractor. The structure is approximately 30m in height, making it a commanding structure when viewed from Warringah Freeway. The positioning on site and orientation, overall mass and scale, and structural material of the structure was determined by the function of the facility. The structure, complemented by the portal feature, serves as a welcoming element to the tunnel when seen from the main entrance ramp.

Service access is thoughtfully integrated, with testing hatches dispersed across various levels, accessible through a secure elevated walkway connected to the Ernest Street Bridge.

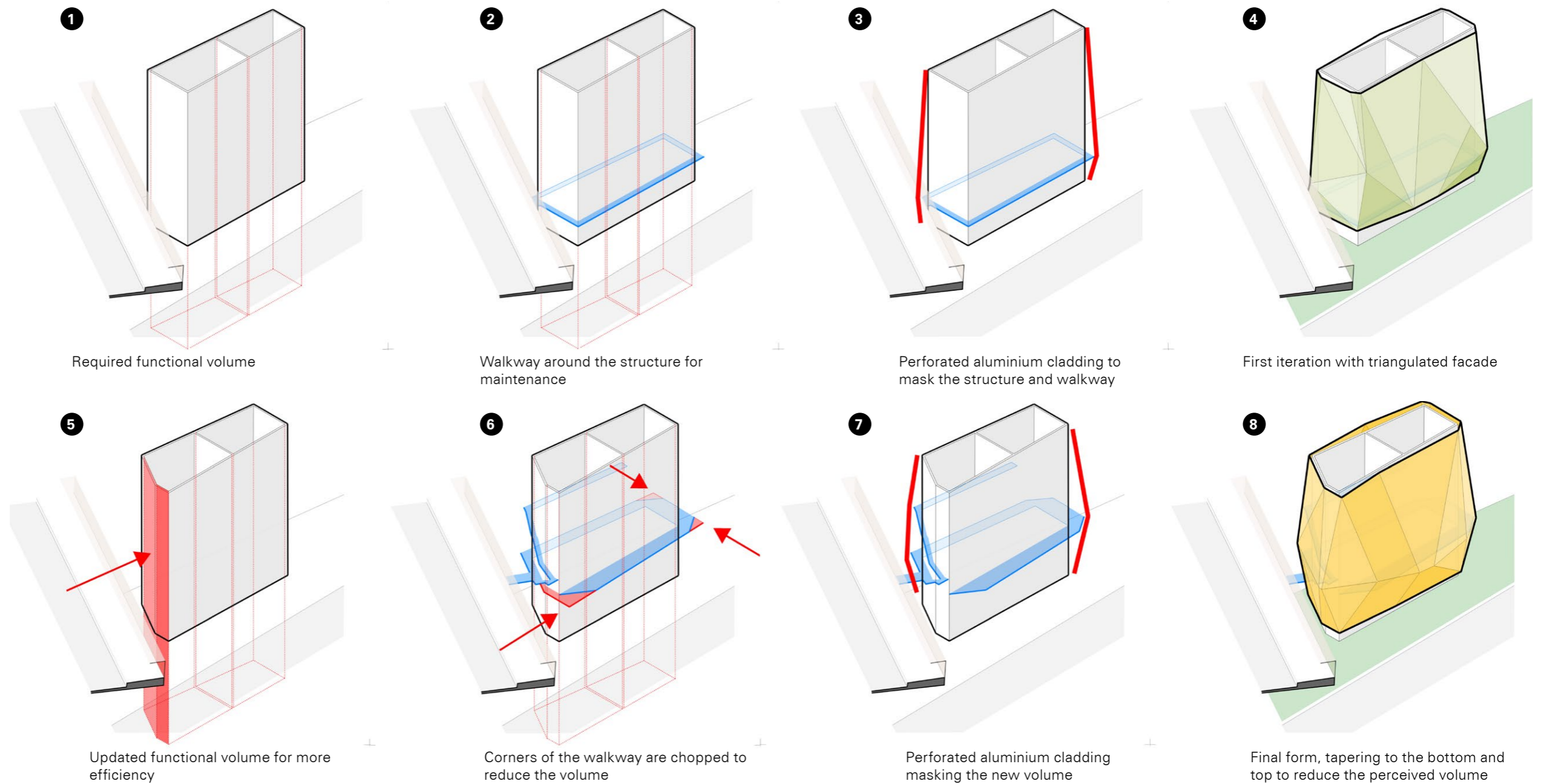


Figure 93: Cammeray ventilation outlet form evolution diagram

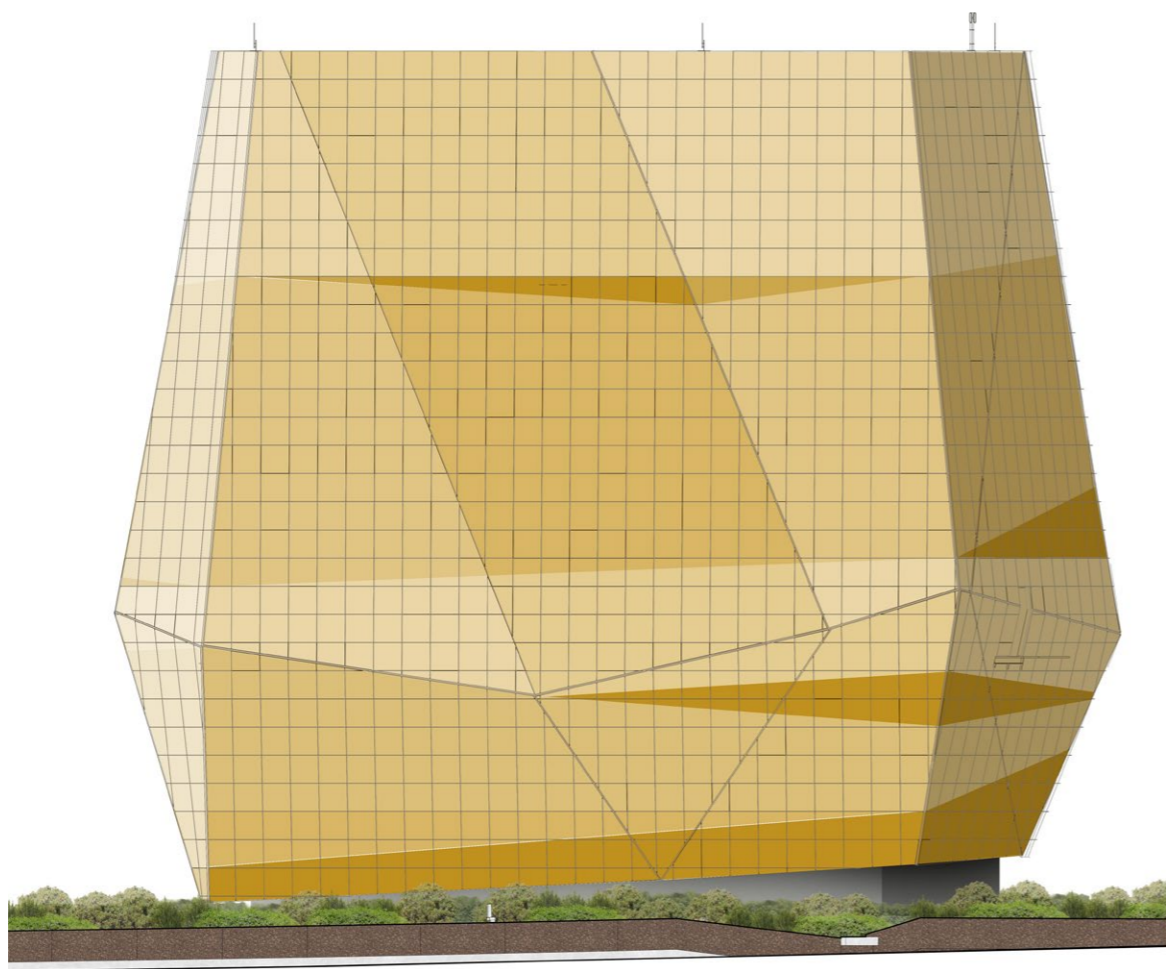


Figure 94: Cammeray ventilation outlet west elevation

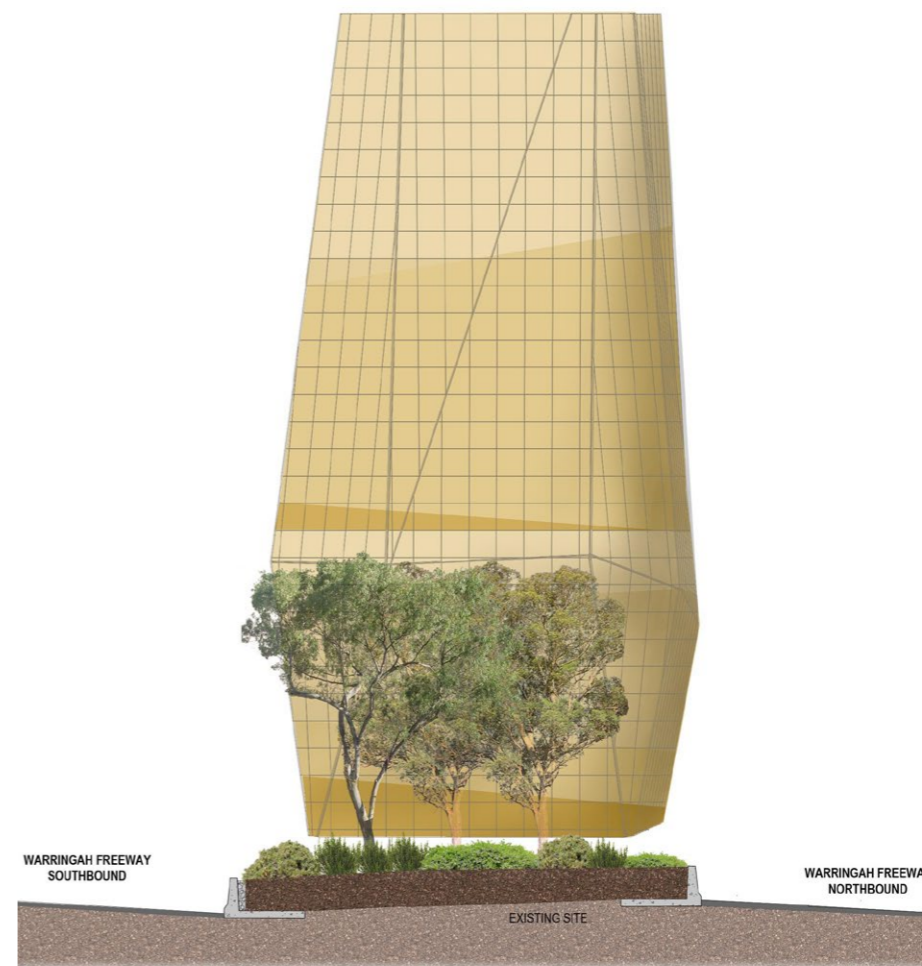


Figure 95: Cammeray ventilation outlet north elevation

6.4.1 Landscape integration

Landscaping around the Cammeray ventilation outlet relies on reinforced medium concrete road barriers to be backfilled for tree plantings. 1m of soil depth is proposed behind the concrete barriers, which batters to a maximum of 1.2m towards the centre. Trees are to be located only where there is a minimum of 1m of soil depth.

Towards the northern and southern ends of the site, landscaping is intended to tie into the existing WFU levels. A 300mm high concrete hob is proposed to achieve 150mm of topsoil for low planting, where it then batters to tie into proposed levels of the planter. Grassed swales have been introduced to aid surface runoff to the eastern and western barriers, and drained into WFU stormwater system.

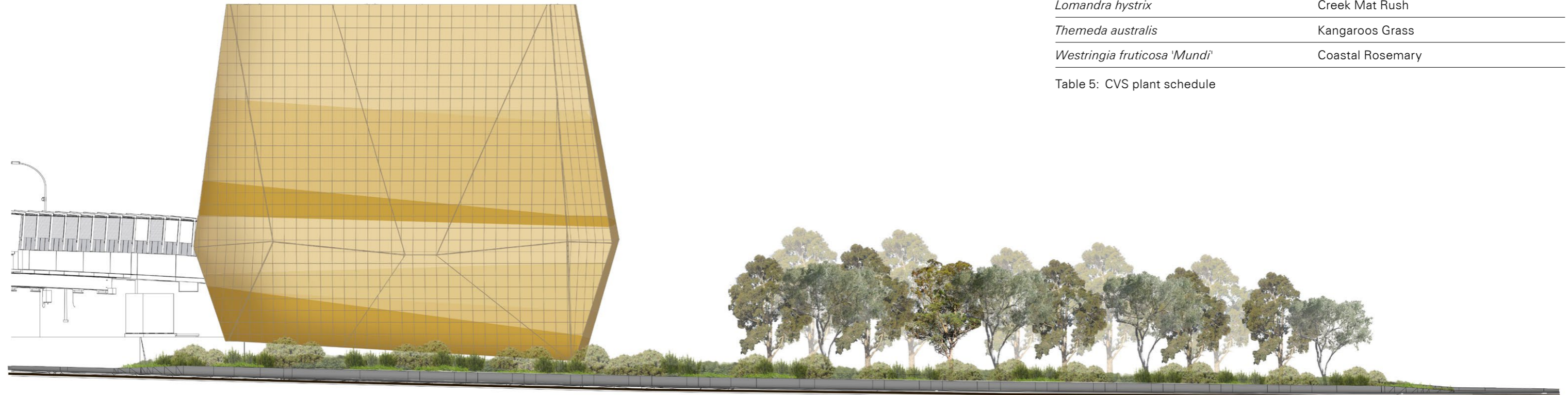


Figure 96: Cammeray ventilation outlet east elevation

Plant and material schedule

Botanical Name	Common Name
TREES	
<i>Angophora costata</i>	Sydney Red Gum
<i>Cupaniopsis anacardiodes</i>	Tuckeroo
<i>Eucalyptus haemastoma</i>	Scribbly Gum
<i>Eucalyptus saligna</i>	Sydney Blue Gum
<i>Lophoestemon confertus</i>	Brushbox
MIX A: NATIVE SHRUB AND GROUNDCOVER MIX	
Shrubs	
<i>Correa reflexa</i>	Native Fuchsia
<i>Grevillia lineriaefolia</i>	White Spider Flower
<i>Grevillia speciosa</i>	Red Spider Flower
<i>Hakea dactyloides</i>	Broad-leaved hakea
<i>Kunzea pomifera</i>	Muntries
<i>Westringia fruticosa</i>	Coastal Rosemary
Grasses & groundcovers	
<i>Carpobrotus glaucescens</i>	Pigface
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Themeda australis</i>	Kangaroos Grass
<i>Westringia fruticosa</i> 'Mundi'	Coastal Rosemary

Table 5: CVS plant schedule

Botanical Name	Common Name
MIX B: NATIVE GROUNDCOVER / GRASS SWALE MIX	
<i>Carpobrotus glaucescens</i>	Pigface
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Goodenia ovata</i>	Hop Goodenia
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Poa affinis</i>	Tussock Grass
<i>Themeda australis</i>	Kangaroos Grass
<i>Westringia fruticosa 'Mundi'</i>	Coastal Rosemary



Sydney Red Gum



Tuckeroo



Brushbox



Pigface



Native Fuchsia



White Spider Flower



Coastal Rosemary



Creek Mat Rush



Pigface



Knobby Club Rush




Kangaroos Grass



Tussock Grass



Figure 97: Artist's impression of the Cammeray ventilation outlet - driver's perspective from Warringah Freeway southbound (trees and landscape shown at 5 years maturity)

An architectural rendering of a highway interchange. On the left, a large building with a golden, faceted facade is partially visible. A multi-lane highway curves through the scene, with several cars driving. An elevated walkway or bridge structure with a decorative metal railing spans across the highway. In the foreground, a concrete barrier separates the road from a landscaped area with trees and a tall, slender light pole. The sky is blue with scattered clouds.

The ventilation facilities are perceived as sculptural objects within the landscape, possessing inherent artistic characteristics.

6.5 Cammeray ventilation building

The WHT ventilation building will provide ventilation and support services to WHT. The building will be delivered as part of the phase 1 works. The building design has been developed with the Structural and Mechanical & Electrical teams.

The building sits on grade at the eastern side of the Warringah Freeway, in the cutting excavated by the WFU contractor. The building design has been refined to decrease its footprint to create operational efficiencies and to allow for preservation of green space at the northern end of the site. The building is two storeys tall, with approximately one storey fully visible at Ernest Street. In addition to the ventilation facilities, the building will house a pump room—connected to deluge tanks—a mobile room, a bulky item store, and electrical rooms. The positioning on site and orientation, overall mass and scale, and structural material of the building was determined by the function of the facility.

The building was flagged by the DRP as looking too bulky in its initial design development stage. As a way to reduce the bulkiness, the façade was broken up vertically into smaller sections. The following diagrams (Figure 98) illustrate the form evolution and façade articulation:

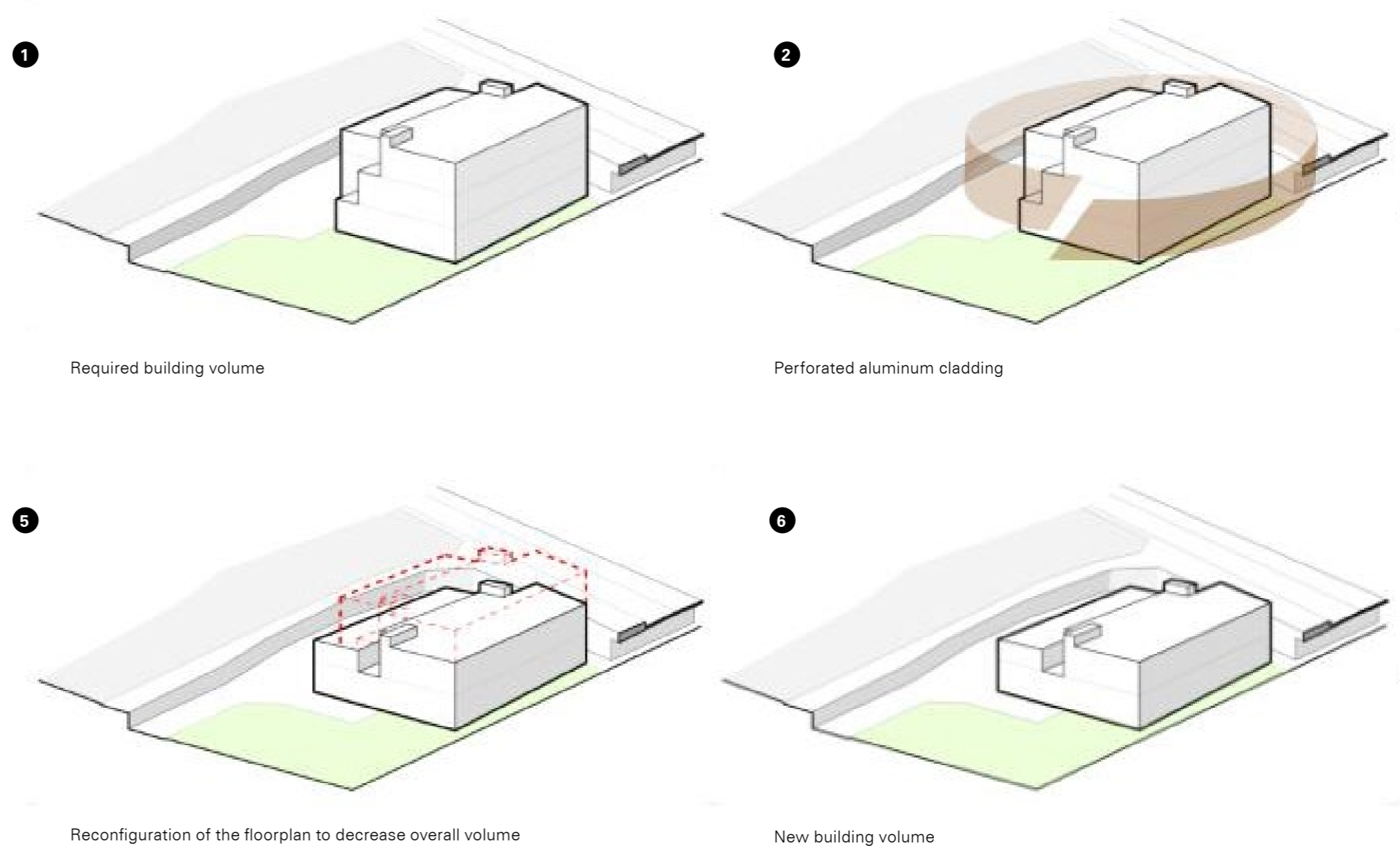
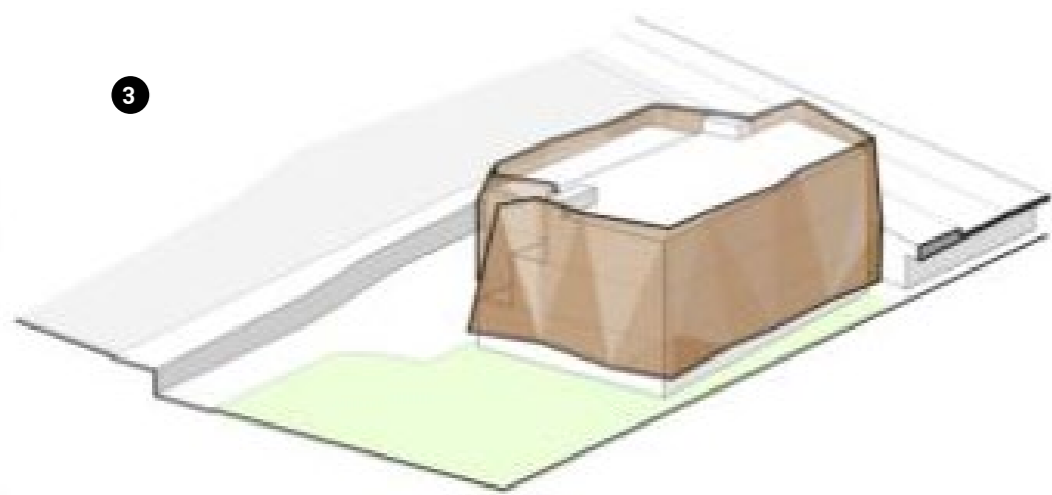


Figure 98: Design evolution diagrams



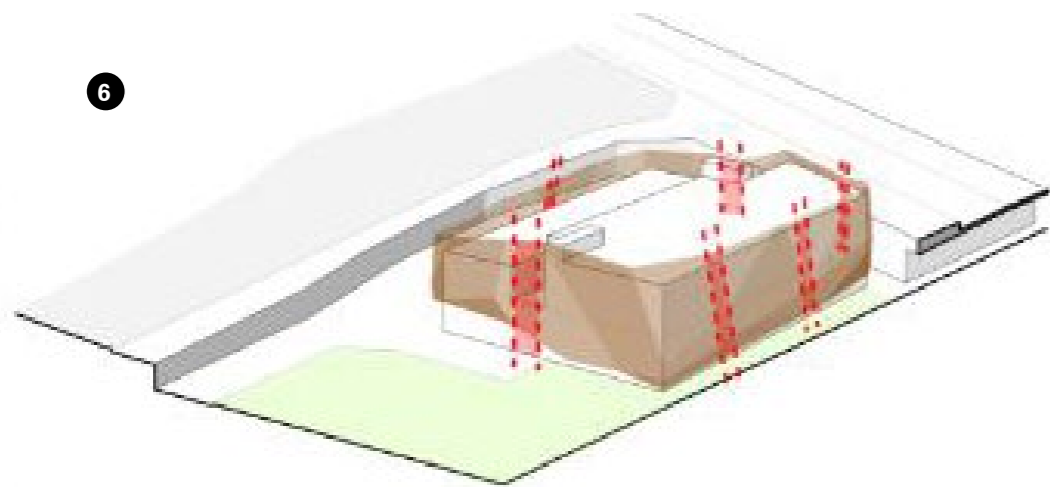
3

Tessellated form responding to the Connecting with Country concept



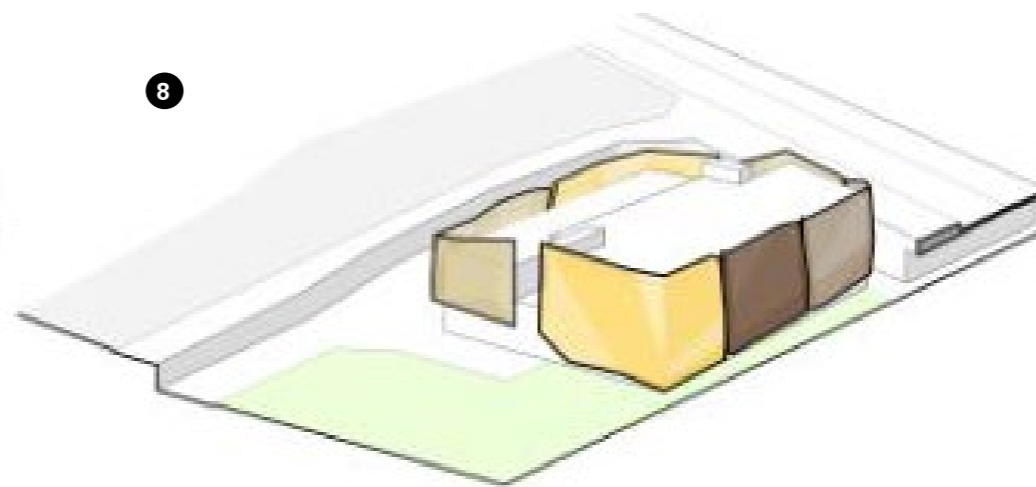
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The building's form appears overly substantial in its current configuration



6

Segmentation of the building façade to further diminish the perceived mass of the structure



8

New hues and tones of the surrounding rocks



Figure 99: Artist's impression of Cammeray ventilation building, view from Warringah Freeway southbound (trees and landscape shown at 5 years maturity)

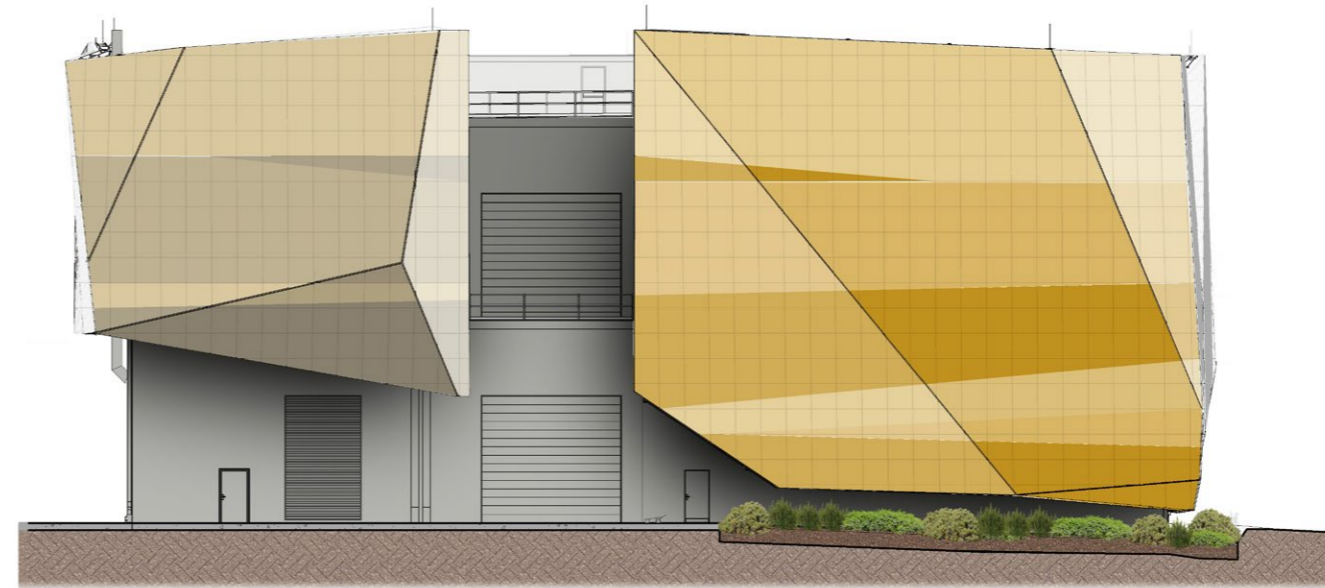


Figure 101: Cammeray ventilation building north elevation

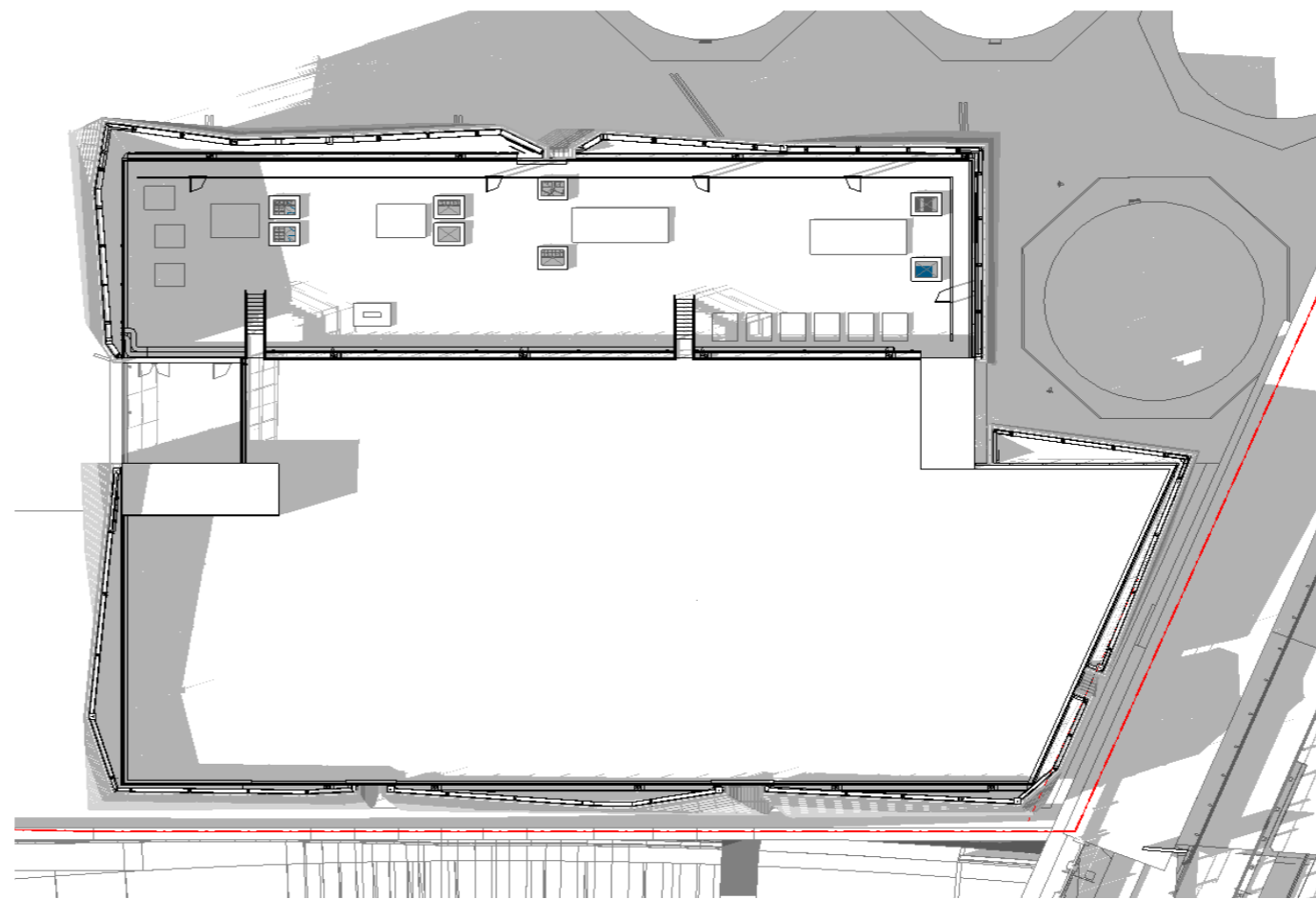


Figure 100: Cammeray ventilation building roof plan

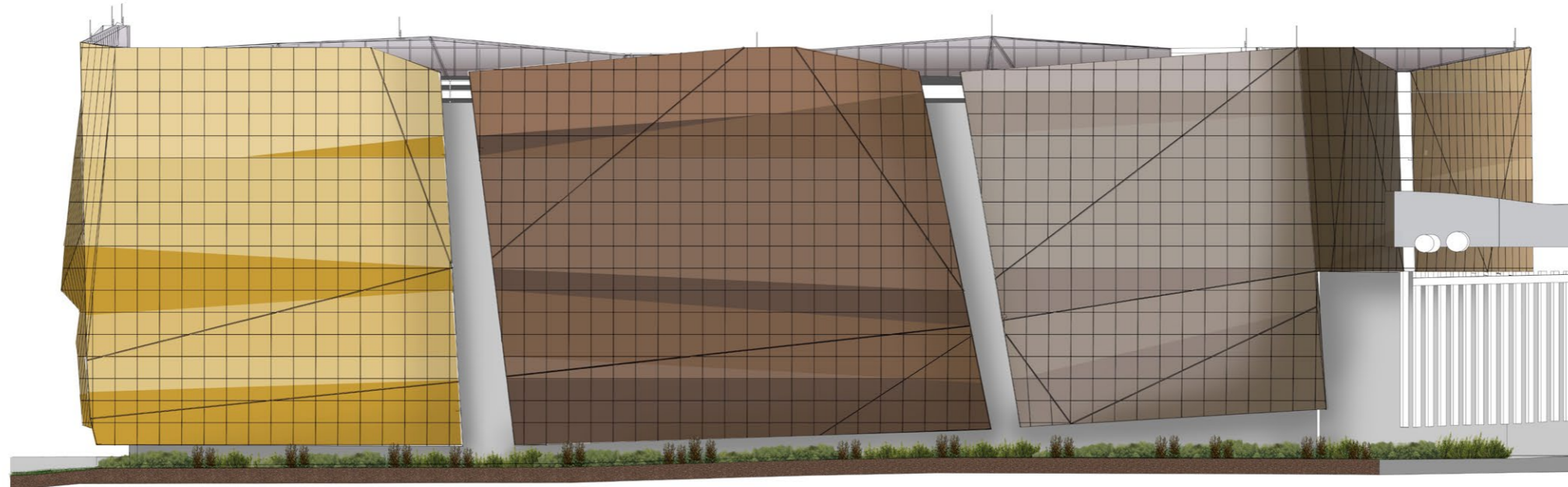


Figure 102: Cammeray ventilation building east elevation



Figure 103: Cammeray ventilation building west site section

6.5.1 Landscape integration

Tree planting with native understorey will be limited to the periphery of the Northern end of the compound with exotic turf proposed towards middle. To allow for tree planting above the existing sandstone, the landscape is to be mounded where there is less than 1m of usable soil. To prevent ponding from the proposed mounds, grassed swales are introduced towards the northern end to facilitate surface run-off.

Soft landscaping consisting of low shrubs, grasses and groundcover has also been proposed to the western end of the ventilation building. It sits next to a 1.5m wide strip of decomposed granite, and will provide softening to the western face of the building.



Sydney Red Gum



Tuckeroo



Brushbox



Pigface



Native Fuchsia



White Spider Flower



Coastal Rosemary



Creek Mat Rush



Broad-leaved hakea



Knobby Club Rush



Kangaroos Grass



Mondo Grass

Plant and material schedule

Botanical Name	Common Name
TREES	
<i>Angophora costata</i>	Sydney Red Gum
<i>Cupaniopsis anacardioides</i>	Tuckeroo
<i>Eucalyptus saligna</i>	Sydney Blue Gum
<i>Lophoestemon confertus</i>	Brushbox
EXOTIC GRASS TURF PLANTING	
<i>Zoysia japonica</i>	Zoysia 'Empire'
MIX A: NATIVE SHRUB AND GROUNDCOVER MIX	
Shrubs	
<i>Banksia spinulosa</i> 'Birthday Candles'	Banksia
<i>Correa reflexa</i>	Native Fuchsia
<i>Grevillia lineriaefolia</i>	White Spider Flower
<i>Hakea dactyloides</i>	Broad-leaved hakea
<i>Kunzea pomifera</i>	Muntries
<i>Westringia fruticosa</i>	Coastal Rosemary
Grasses & groundcovers	
<i>Carpobrotus glaucescens</i>	Pigface
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Themeda australis</i>	Kangaroos Grass
<i>Westringia fruticosa</i> 'Mundi'	Coastal Rosemary
MIX B: SHADE TOLERANT MIX	
<i>Goodenia ovata</i>	Hop goodenia
<i>Hibbertia scandens</i>	Guinea Flower
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Ophiopogon japonicus</i>	Mondo Grass
MIX C: GRASS SWALE MIX	
<i>Carpobrotus glaucescens</i>	Pigface
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Themeda australis</i>	Kangaroos Grass
<i>Westringia fruticosa</i> 'Mundi'	Coastal Rosemary

Table 6: CVB plant schedule

6.6 Cammeray facilities design response to project principles

PROJECT PRINCIPLE	KEY DESIGN MOVE
Objective 1 - Designing with Country	
Design built elements to acknowledge and celebrate the deep history and unique culture of the place, and the enduring connection of Aboriginal people to the land	<ul style="list-style-type: none"> The colours, patterns and the form of the structures pay homage to the historic character and geology of the area
Communicate to motorway users that they are entering and travelling through the land of the Cammeraygal and Wangal people	<ul style="list-style-type: none"> The buildings have been designed to acknowledge the Cammeraygal Country, by using colours and textures that draw on the natural environment and its history
Care for Country through reciprocal relationships between landscape, flora and fauna and people	<ul style="list-style-type: none"> The landscape design supports caring for environment by providing habitat for native fauna
Objective 2 - Identity and user experience	
Adopt a cohesive and simple design language for the motorway elements including tunnel panels, walls, screens, building façades and portals to create consistency and avoid visual clutter	<ul style="list-style-type: none"> All built elements in the vicinity, including the main tunnel portal, CVB, CVS, and ESB, are meticulously designed to form a cohesive package
Ensure awareness of the geographic location while travelling by referencing the specific natural and cultural characteristics of the places the corridor is passing through	<ul style="list-style-type: none"> The patterns on the building façade, along with the chosen colours and plant species, are carefully selected to reflect the natural and cultural essence of the area.
Story telling - develop design themes around the historic and geographic significance of the place and articulate it through integration of arts and design elements to create interest and provide a distinctive travel experience for the users	<ul style="list-style-type: none"> The façade of the ventilation facilities is conceived as a canvas for cultural expression. Furthermore, the form of these facilities pays homage to the distinctive geography of the area
Enhance the overall experience by using high-quality, durable and functional materials throughout the corridor	<ul style="list-style-type: none"> All materials employed are of superior quality, chosen with a focus on durability and minimal maintenance needs
Create an intuitive journey with the careful design and positioning of the urban design elements, street furniture and signage	<ul style="list-style-type: none"> The structures themselves, owing to their size and distinctive forms, serve as prominent landmarks along the journey
Objective 3 - Integrated design	
Ensure a smooth transition to and from the adjacent road corridors including WestConnex and Warringah Freeway, considering their general visual appearance and material palettes	<ul style="list-style-type: none"> The colours and façade treatment of the ventilation facilities complement the design elements of the ESB. Additionally, the colours and design of these facilities are harmonised with the rock cuttings along WF
Take inspiration from and draw reference to the natural and built features of the surrounding area including the landform, geology, flora and fauna	<ul style="list-style-type: none"> The façade design draws inspiration from the natural landforms of the area. Landscape incorporates native plantings, enhancing the integration of the built environment with the local ecology
Ensure the surface structures at Cammeray are sensitive to the adjacent uses and have a strong visual and spatial relationship with the existing features	<ul style="list-style-type: none"> The form of the facilities is designed to be visually recessive, allowing them to blend into the surroundings Landscape treatments are strategically employed to soften the structures
Integrate the landscape design seamlessly with the existing vegetation	<ul style="list-style-type: none"> Native planting is integrated and is designed as a continuation of the surroundings

PROJECT PRINCIPLE	KEY DESIGN MOVE
Objective 4 - Connectivity and legibility	
Enhance the legibility within the tunnel through the sequence of tunnel events that refer to the geographic locations	<ul style="list-style-type: none"> This principle is specific to the in-tunnel experience, not the above-ground facilities. However as a whole the facilities design is part of a family of structures that support broad wayfinding and respond to their geographic location
Ensure clear wayfinding through the corridor with the clever use of design elements, viewpoints and signage	<ul style="list-style-type: none"> The ventilation facilities serve as key landmarks along the journey, aiding in wayfinding
Provide active transport facilities where feasible and tie them in with existing and future networks and improve links from Cammeray Park	<ul style="list-style-type: none"> This principle is not specifically relevant to the ventilation structures. However, the ventilation facilities are part of a larger approach to site planning which enable and supports active transport links next to them
Ensure visual consistency with the cohesive design language and material palette along the corridor	<ul style="list-style-type: none"> The ventilation facilities along with the main tunnel portal employs same material palette
Objective 5 – Urban renewal and liveability	
Develop open spaces as high-quality urban places accessible for the entire community	<ul style="list-style-type: none"> Subject to future community consultation, areas around the ventilation site (including Cammeray Park) will be available to the community as a new public open space
Utilise public art opportunities and landscape design to enhance the appearance and experience of the place	<ul style="list-style-type: none"> The façade of the facilities serves as expansive canvases for artistic expression
Ensure the surface structures, including the ventilation buildings and portals, are designed to contribute to the existing character of the surrounding environment and have high visual quality	<ul style="list-style-type: none"> The ventilation facilities are designed to have high visual quality and complements the existing character
Improve street connectivity and provide safe and shaded shared paths tying in with existing routes active transport routes and the broader green network	<ul style="list-style-type: none"> This principle is met by the Ernest Street Bridge
Incorporate Crime Prevention Through Environmental Design (CPTED) principles, particularly passive surveillance and clear, legible connections in the public domain, to increase safety and the perception of safety for people	<ul style="list-style-type: none"> The facilities' open areas within the compound are fenced off to prevent public access Efficient lighting is integrated to eliminate dark spots Graffiti and vandalism-resistant materials are utilised for enhanced durability.

PROJECT PRINCIPLE	KEY DESIGN MOVE
Objective 6 – Living Environments	
Where possible, protect existing vegetation and increase tree cover	– The WFU project has resulted in clearing of some vegetation. This project, through landscaping of areas including around the ventilation buildings, introduces new trees
Promote opportunities for habitat creation	– Open spaces within the complex have consolidated areas of new vegetation that will provide habitat
Incorporate Water Sensitive Urban Design (WSUD) principles to reduce reliance on reticulated water supply, for example through re-use of stormwater and plant selection of drought-resistant species	– WSUD measures including grassed bio-swales are incorporated in the landscape design
Incorporate appropriate built form and site planning to ensure minimum building footprint	– The massing and site planning prioritise minimising the environmental footprint, leading to the addition of a new public park (Cammeray Park)
Replace and restore the affected landscape	– This project, through landscaping of areas including around the ventilation buildings, introduces new trees
Objective 7 – Sustainability	
Maximise planting opportunities adjacent to the corridor and within service compounds	– The planting opportunities are maximised with effective site planning and massing, within the constraints of functional requirements
Use robust, durable materials that contain recycled content and that are recyclable at the end of life	– The main structures are concrete, with aluminium cladding which is recyclable
Consider whole-of-life and circular economy in the selection of materials	– Materials are long lasting and durable. Aluminium cladding is anodised rather than powder coated in consideration of whole of life
Provide active transport links across the corridor	– This principle is met by Ernest Street Bridge
Implement strategies and measures aimed at reducing the impact of the urban heat island effect	– Maximising tree canopy, use of larger tree stock adjacent to hardstand areas for quicker growth and coverage