

ICoE Building - Planting Plan

The proposed Indigenous Centre of Excellence includes a total landscape area of 7,555m².

The permeable surface area, including planted areas, is measured at 6,990m². Planting types include the following as shown on the planting plan:

- Internal Planting Mix
- Site Edges Mix
- Dedicated Indigenous Garden Planting
- Dedicated Sensory Garden Planting
- Planting for Water/Wet Areas

INTERNAL PLANTING MIX

SITE EDGES MIX

DEDICATED INDIGENOUS GARDEN PLANTING

DEDICATED SENSORY GARDEN PLANTING

PLANTING FOR WATER/WET AREAS



ICoE Building - Preliminary Plant Schedule

BOTANICAL NAME	COMMON NAME	MATURE HEIGHT (M)	BOTANICAL NAME	COMMON NAME	MATURE HEIGHT (M)	BOTANICAL NAME	COMMON NAME	MATURE HEIGHT (M)	NOTES
TREES			SITE EDGES			SENSORY PLANTS			
Acacia implexa	Hickory Wattle	10-12	Small trees			Boronia pinnata	Pinnate Boronia	1.5	aromatic leaves when crushed
Angophora floribunda	Rough Barked Apple	15-20	Acacia implexa	Hickory Wattle	5-12	Boronia saefrolifera	Saefrole Boronia	1	aromatic leaves when crushed
Angophora subvelutina	Broad-leaved Apple	20	Melaleuca decora	White Feather Honey Myrtle	7	Casuarina glauca	Swamp She-oak	0.2	wind makes pleasant sound through the foliage
Casuarina glauca	Swamp She-oak	8-20	Melaleuca linearfolia	Narrow-leaved Paperbark	6-10	Darwinia citriodora	Lemon-scented Darwinia	1.5	lemon scented foliage
Eucalyptus acmenoides	White Mahogany	50	Tall dense shrubs			Dichelachne micrantha	Short Hair Plume Grass	1.2	soft, fluffy seed heads
Eucalyptus amplifolia	Cabbage Gum	30	Acacia longifolia	Sydney Golden Wattle	6	Homoranthus darwinoides	Fiary Bells	1.5	aromatic leaves when crushed
Eucalyptus crebra	Narrow-leaved Ironbark	35	Bursaria spinosa	Sweet Bursaria	10	Indigofera australis	Native Indigo	2	soft leaves
Eucalyptus fibrosa	Red Ironbark	35	Dodonaea triquetra	Common Hop bush	2-4	Mentha australis	Native River Mint	0.3	aromatic leaves
Eucalyptus globoidea	White Stringy Bark	30	Ozothamnus diosmifolius	Rice Flower	2	Plectranthus graveolens	Bush Basil	1.5	aromatic leaves when crushed
Eucalyptus tereticornis	Forest Red-gum	50	Persoonia linearis	Narrow Leaved Geebung	3	Prostanthera incisa	Native Thyme	2	aromatic leaves when crushed
Melaleuca quinquenervia	Broad-leaved Paperbark	8-15	Pultenaea villosa	Egg and Bacon Pea	2	Prostanthera scutellarioides	Mint Bush	2.5	leaves are highly aromatic
Melaleuca styphelioides	Prickly Paperbark	20	Other			Stackhousia monogyna	Creamy Candles	0.7	aromatic flowers, prickly leaves
INTERNAL LANDSCAPE			PLANTS FOR WATER			PROVIDER PLANTS			
Low shrubs			Aristida vagans	Threeawn Speargrass	0.8	Acacia implexa	Hickory Wattle	5	seeds made into flour, bark used as a medicine and to make fish poison
Billardiera scandens	Apple Berry	1.5	Bothriochloa macra	Red Grass	1	Acacia longifolia	Sydney Golden Wattle	3	seed pods can be steamed and eaten
Daviesia ulicifolia	Gorse Bitter-pea	2	Capillipedium spicigerum	Scented Tops	1.2	Arthropodium milleflorum	Vanilla Lily	0.6	tubers can be roasted or eaten raw, edible flowers
Einadia hastata	Red Berry Saltbush	0.7	Vittadinia gracilis	Wooly New Holland Daisy	0.4	Casuarina glauca	Swamp She-oak	0.2	wood used to make weapons and other implements, groves used as a place of shelter
Lissanthe strigosa	Peach Heath	1	Xanthorrhoea minor	Small Grass Tree	0.6-0.8	Eustrephus latifolius	Wombat Berry	3m long	new shoots and fruit can be eaten raw
Leucopogon juniperinus	Long-Flower Beard-Heath	1	Shallow water			Juncus continuus	Rush	1	stem and leaves used for fibre to make string, fishing line, rugs, and baskets
Grasses			Nymphoides geminata	Yellow Snowflake	0.15	Juncus usitatus	Common Rush	1.2	stem and leaves used for fibre to make string, fishing line, rugs, and baskets
Aristida vagans	Threeawn Speargrass	0.8	Omduffia reniformis	Running Marsh-flower	1.0	Lomandra longifolia	Matt Rush	1.2	stem bases can be eaten raw or boiled.
Dianella revoluta	Blue Flax Lily	0.6	Lythrum salicaria	Purple Loosestrife	1.5	Marsilea mutica	Banded Nardoo	0.2	sporocarp can be ground into flour and made into cakes
Dichelachne micrantha	Short Hair Plume Grass	1.2	Marginal/periodic inundation			Mentha australis	Native River mint	0.3	tea made from leaves
Juncus continuus	Rush	1.4	Persicaria decipiens	Slender Knotweed	0.3	Pelargonium australe	Native Geranium	0.5	tap root can be cooked and eaten
Lomandra confertifolia	Mat Rush	0.7	Marsellia mutica	Banded Nardoo	0.2	Persoonia linearis	Narrow Leaved Geebung	3	berries can be eaten
Microleana stipoides	Dancing Grass	0.3	Marsilea drummondii	Nardoo	0.3	Tetragonia tetragonoides	Warrigal Greens	0.2	foliage can be eaten once boiled
Opismenus aemulus	Australian Beard Grass	0.3	Myriophyllum propinquum	Spiked Water Milfoil	0.6	This preliminary selection of plant species will form a basis for a developing planting strategy that will ideally be collaboratively curated by specialist horticulturists and Indigenous knowledge keepers. Any variance from endemic species to include locally native and native species would be done so for educational purposes only. The selection of these species are to be guided and reviewed by Darug Custodians, local Elders and Traditional Knowledge Holders.			
Themeda australis	Kangaroo Grass	1.2	Villarsia Exaltata	Yellow Marsh Flower	0.15				
Groundcovers			Zannichellia palustris	Horned Pond Weed					
Billardiera scandens	Apple Berry	sprawling				The long term viability of the planted environment can be assisted by establishing a focused and informed planting supply brief, combined with ongoing guidelines for future procurement. And by developing grow-on arrangements with nurseries who are able to supply or acquire local provenance species.			
Dichondra repens	Kidney Weed	<0.1	Juncus usitatus	Common Rush	1.2				
Goodenia hederacea	Forest Goodenia	0.8	Brachyscome paludicola	Swamp Daisy	0.2-0.5				
Glycine microphylla	Small-leaf Glycine	scrambling	Baloskion tetraphyllum	Tassel Cord Rush	1.8				
Tetragonia tetragonoides	Warrigal Greens	0.2	Blechnum indicum	Swamp Water Fern	1				
Veronica plebeia	Trailing Speedwell	0.1	Eleocharis pallens	Pale Spikerush	0.2				
Wildflowers			Gahnia clarkei	Tall Saw-sedge	1.5-3				
Arthropodium milleflorum	Vanilla Lily	0.6	Philydrum lanuginosum	Frog Mouth	1				
Brunoniella australis	Blue Yam	0.3	Ranunculus inundatus	River Buttercup	0.5				
Pelargonium australe	Native Geranium	0.5	Schoenus brevifolius	Zig-zag Bog-rush	1				
Vittadinia muelleri	New Holland Daisy	0.2	Pratia pedunculata	White Star Creeper	groundcover				
Walenbergia communis	Tufted Bluebell	0.5	Melaleuca decora	White feather honey myrtle	8				
			Melaleuca linearfolia	Narrow leaved Paperbark	10				

Trees



Angophora floribunda



Angophora subvelutina



Casuarina glauca



Eucalyptus acmenoides



Eucalyptus amplifolia



Melaleuca styphelioides

ICoE Building - Preliminary Plant Schedule

Internal

low shrubs



Daviesia ulicifolia



Einadia hastata



Lissanthe strigosa

grasses



Dianella revoluta



Microlaena stipoides

wildflowers



Pelargonium australe



Walenbergia communis

groundcover



Goodenia hederacea

Site Edges

small trees



Acacia implexa



Melaleuca decora

tall dense shrubs



Persoonia linearis



Ozothamnus diosmifolius

Plants for water

deep water (30-80cm deep)



Ornduffia reniformis



Lythrum salicaria

shallow water (<30cm)



Marsilea drummondii



Nymphoides geminata

Plants for water

marginal



Ranunculus inundatus



Pratia pedunculata

Sensory plants



Boronia saefrolifera



Darwinia citriodora



Dichelachne micrantha



Indigofera australis



Mentha australis



Stackhousia monogyna

Provider plants



Acacia longifolia



Bursaria spinosa



Eustrephus latifolius



Lomandra longifolia



Marsellia mutica



Tetragonia tetragonioides



Juncus continuus



Juncus usitatus

Indigenous Centre of Excellence 53



Wunggurrwil Dhurrung - REALM Studios

Materials should be of Country, and in the interest of caring for Country they should be sourced locally where possible. All materials should have a lesser impact on the supply chain - it is possible to use recycled and repurposed materials in both hard and soft landscape:

- crushed quarry waste, recycled aggregates and crushed waste concrete, brick and tile for soft paved surfaces and concrete aggregates
- soils created from waste materials - compost and recycled fines
- and stone offcuts (such as roughback sandstone) on the ground, rather than new made or milled stone paving units
- felled trees from the broader site or other Western Sydney University properties as informal furniture, play, and animal habitat

- The source of available offcut material that is of the place will be investigated in the next phase of design.
- Lighting outdoors should be minimised to facilitate nighttime use of specific areas. It should be selected to have low impact on the night sky, and on insects and bird life. Lighting with warmer colour temperature and colour rendition to minimise blue spectral irradiance.
- permeable surfaces will increase the absorption of water into the ground, and combined with significant areas of planting this will help reduce urban heat across the site.
- The material selections that are of Country must be guided by Darug Elders to ensure adherence to local protocol. Particular care is required for culturally sensitive materials such as sandstone and clay.



Sandstone 'roughbacks' - an inexpensive waste material that is often less desirable and therefore overlooked



Roughbacks as paving material in private garden



Rural Australia - render by Andrew Svanberg Hamilton



National Gallery Sculpture Garden



Seating made from felled trees



Stone seat wall - Spirit Level Design

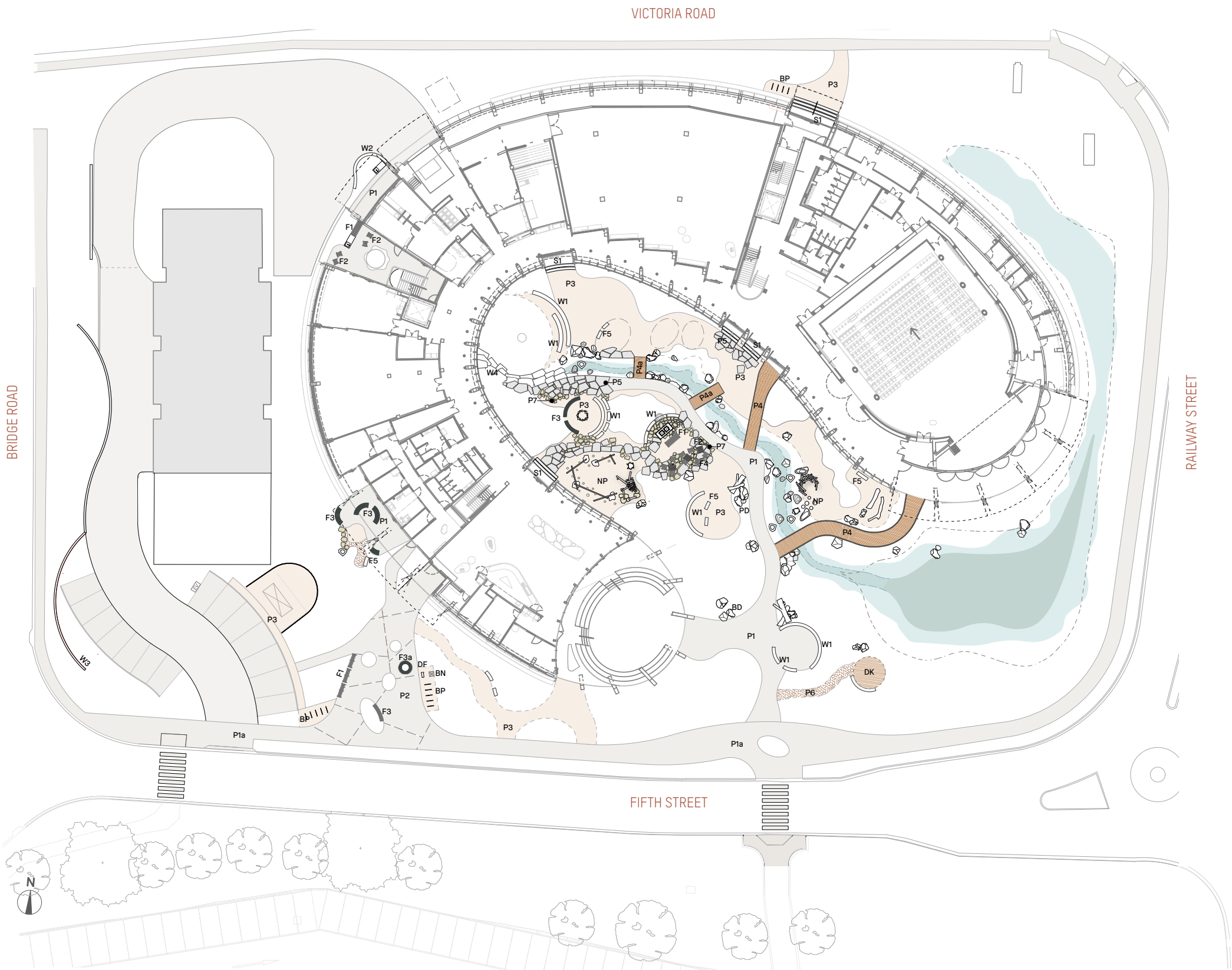
ICoE Building - Materials Plan

P1	CONCRETE PATH insitu concrete	DK	DECKING hardwood timber viewing platform
P1a	CONCRETE PATH to match existing footpath	NP	NATURE PLAY various play items made from recycled materials
P2	INTERPRETIVE PAVING decorative sawcut and /or pattern concrete	BP	BICYCLE RACKS to WSU standard specification
P3	GRAVEL crushed sandstone	DF	DRINKING FOUNTAIN to WSU standard specification
P4	RAISED WALKWAY hardwood timber	BN	GARBAGE BIN to WSU standard specification
P4a	BRIDGE hardwood timber	EV	ELECTRIC VEHICLE charging station to future specification
P5	LARGE FORMAT STEPPERS - stone roughback pieces	F1	TABLE large
P6	INFORMAL PATH - mulch surface	F2	TABLE small
P7	LARGE FORMAT STEPPERS - stone roughback pieces	F3	SEATING curved seat
S1	STEPS pre cast concrete	F3a	SEATING circular seat
S2	STEPS stone	F4	SEATING single chair
W1	RAMMED EARTH WALL curved seating wall from local material	F5	SEATING stone
W2	STONE WALL random rubble sandstone retaining wall	CO	COOKING FACILITIES BBQs and alternative cooking via firepit/place, ensure potable water supply to area
W3	BRICK WALL freestanding brick wall to match existing		
W4	STONE WALL stacked sandstone roughback shelves		
BD	BOULDERS AND NATURAL STONES re-used/recycled stone		
W	WATER swale/creek bed/wetland		

Notes:

Non-permeable surface materials are limited to insitu concrete unit paving and is measured at 565m².

All sandstone is to be from reclaimed or salvaged sources.



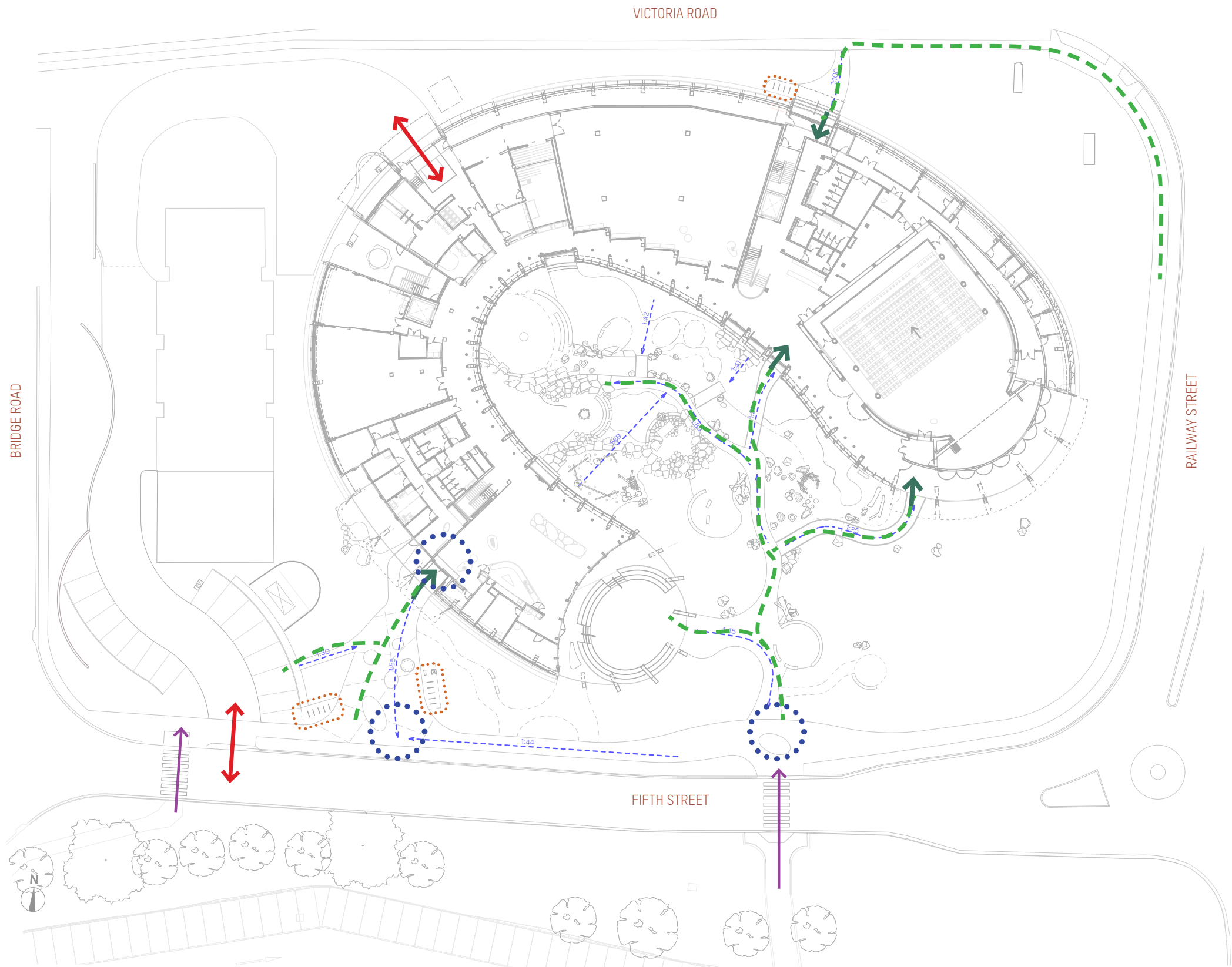
Overall Access & Movement

Pedestrian access throughout the site is designed to be simple and open. Paths are provided to direct users to crucial areas, however exploration is encouraged via informal routes.

Accessible routes are provided to key building entries via elevated walkways, and the central landscape is able to be reached from within the building, the site, and the surrounding path network.

A total of 28 bicycle spaces are proposed.

- INDICATIVE PROPOSED PATH GRADE - subject to detailed design
- PRIMARY SITE ENTRY
- ACCESSIBLE BUILDING ENTRY
- BICYCLE PARKING
- ACCESSIBLE CONNECTION
- VEHICLE ENTRY
- EXISTING CONNECTION FROM CAMPUS



ICoE Building - Levels

The site is relatively flat, however the internal landscape and some other areas adjacent the building are set lower than the floor level to facilitate flood storage (refer also to SSDA drawings, and flood reporting by GRC Hydro).

Falls across the landscape are gentle but allow for the internal landscape to drain into the central swale.

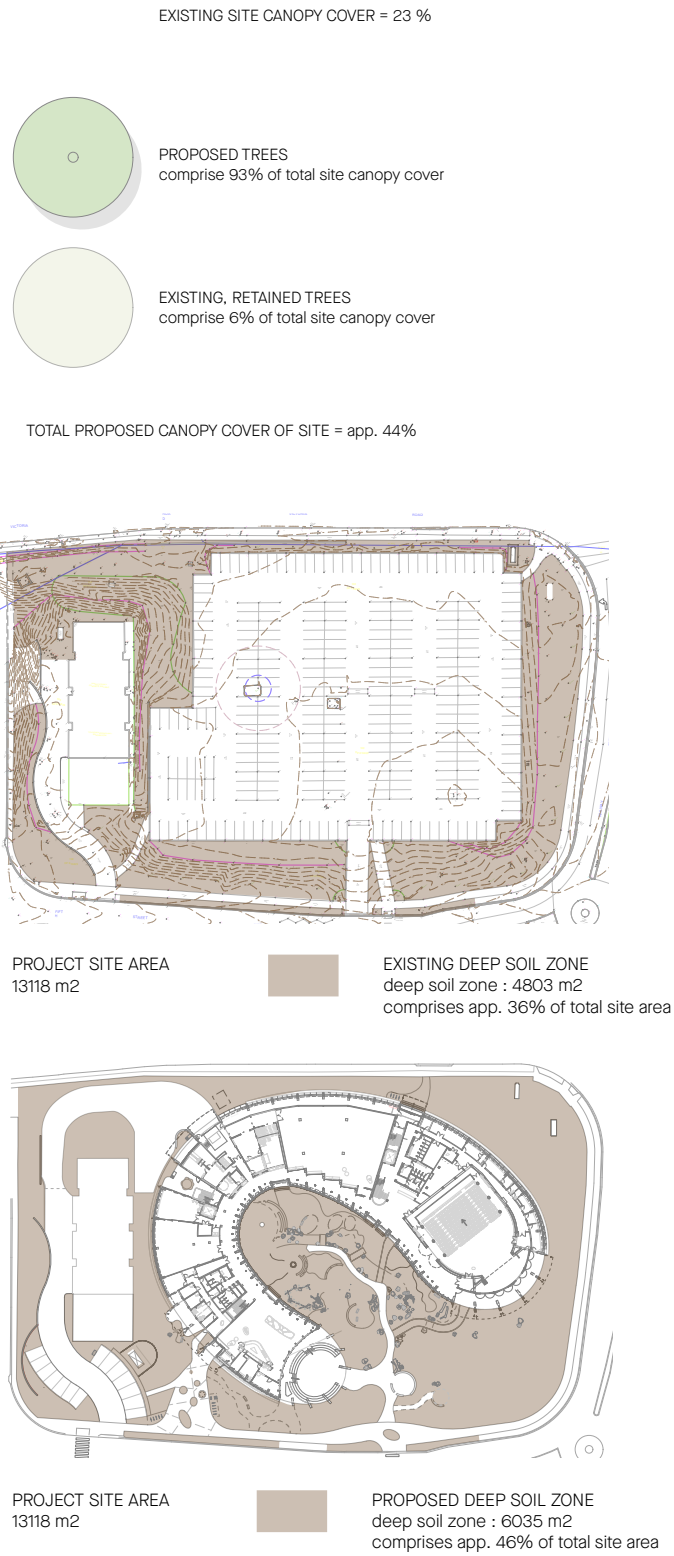
Elevated walkways are used to cross water where necessary and to connect to building entries.

- +EL33.00 EXISTING LEVEL - to be retained
- RL33.00+ PROPOSED LEVEL
- ELEVATED WALKWAY



ICoE Building - Canopy

The proposal represents a significant increase in canopy cover for the site. Layered planting of trees, shrubs, and groundcovers using appropriate locally occurring species will mitigate urban heat by shading the ground and providing evapotranspiration.

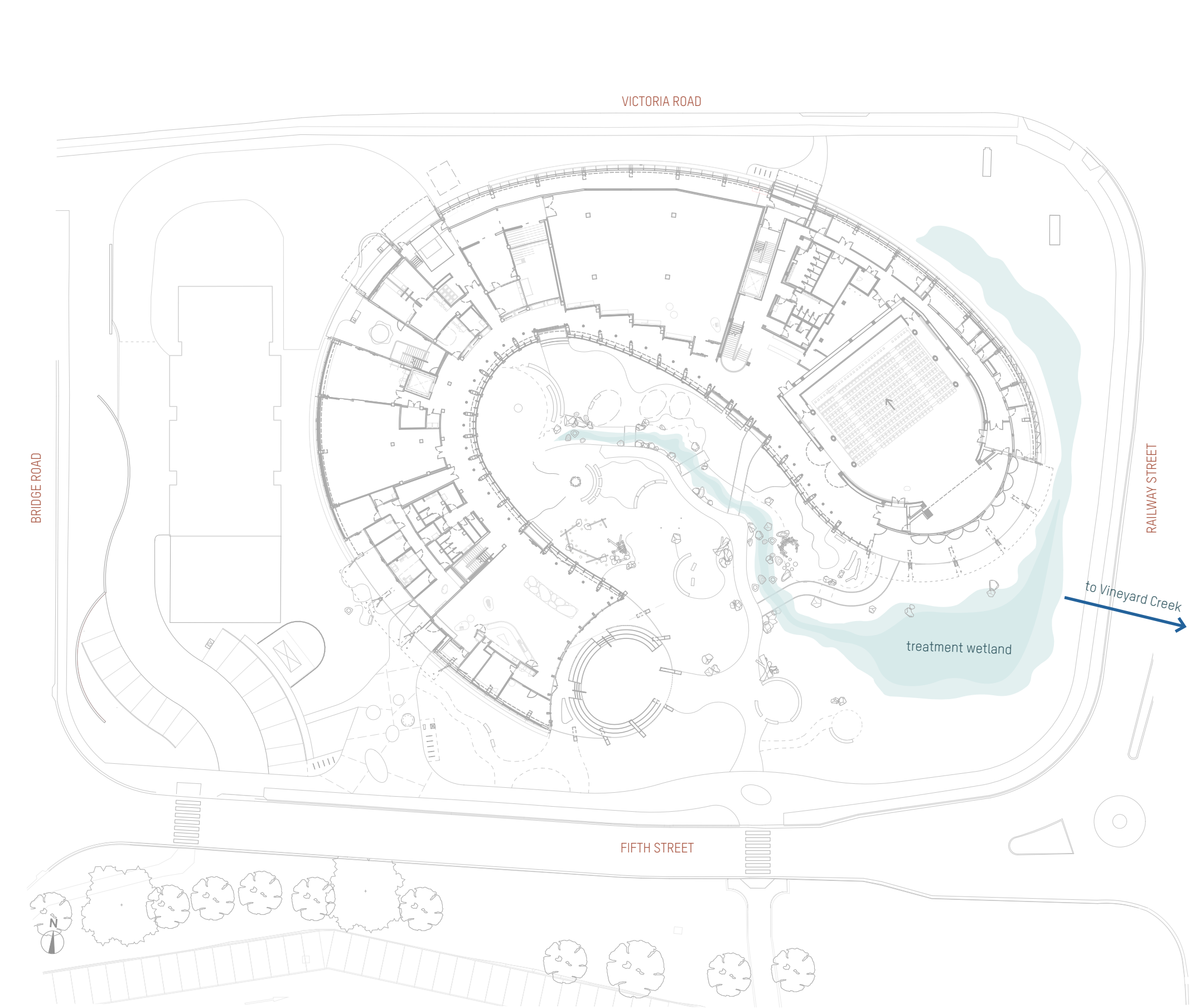


ICoE Building - Water Strategy

Water connects and provides; this project seeks to reveal and celebrate the story of water across the site by allowing for an expression of water through the landscape. In rain events a fold in the ground, reminiscent of a creek bed, will direct flows to a treatment wetland. From here we look to obtain a confluence with Vineyard Creek - connecting the new landscape to the ancient systems of Country.

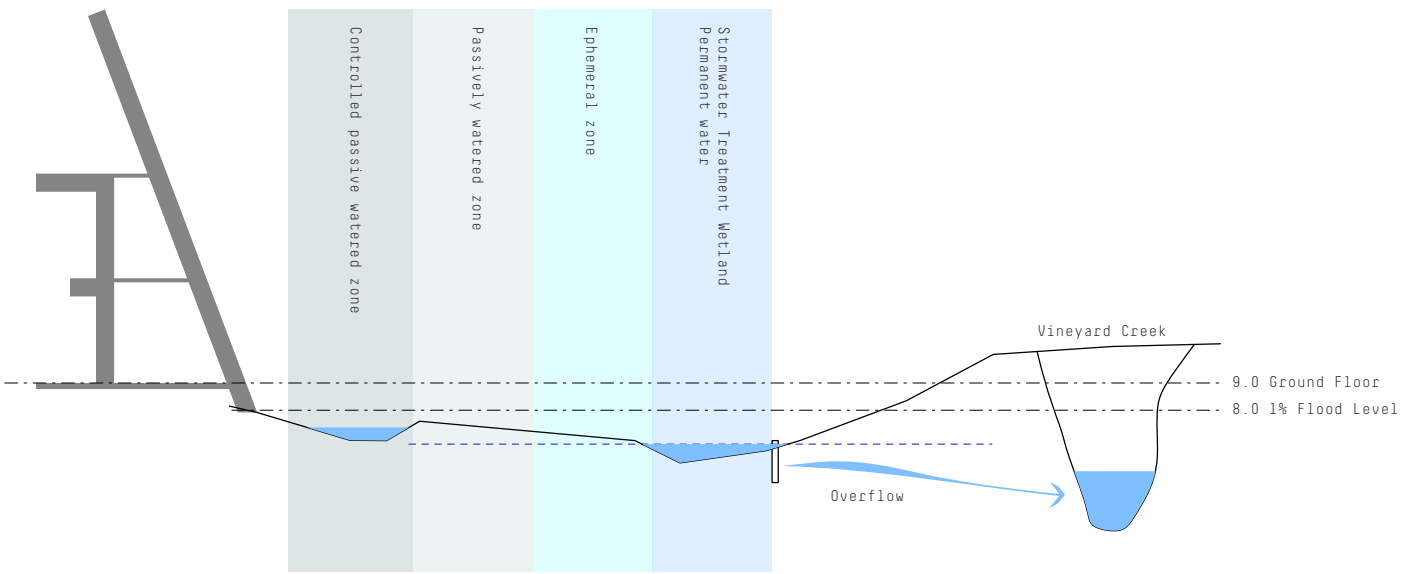
Permeable materials on the ground plane ensure water falling on the site is directed into the ground to improve the conditions for plant growth, prioritise infiltration, and reduce heat.

It is hopeful that this project can help to inspire a restoration approach to Vineyard Creek, an important part of the Country that surrounds the site and is suffering from neglect in parts.





Design Development Render



Drainage and landscape integration, refer to Appendix for more information

Operational Efficiency

The design accommodates the spatial requirements for services throughout the building to ensure efficiency in operations. Services corridors to the perimeter of the building make use of shallower structural depths of primary structure made possible by the shorter perimeter span. Plant and equipment will be located above the Probable Maximum Flood level to avoid damage to systems in flood events.

The design will not be connected to gas and will seek to use natural refrigerants for air conditioning compressors and heat pumps. Both will contribute to significant greenhouse gas emissions reductions over the life of the building, and the latter will protect against premature redundancy of plant and equipment due to the regulated phase-down of HFCs. The building will fully comply with Section J. Whilst the organic form will test the application of Section J, expert judgment will be relied upon to navigate.

Nothing in the design challenges the Green Star certification process, and the design will be developed to maximise the credits achieved through the inherent design qualities of the buildings and minimise reliance on credits that are not directly aligned with the project's core sustainability brief. The team considers a 6-star rating as probable given the design, the sustainability brief, and Western Sydney University's commitment to 100% renewable energy.

Due to the site's exposure to flood paths associated with a major drain and riverine flooding, the consultant team have elevated the floor level to limit disruption to the flood path and adversely displace flood waters. In addition, adequate freeboard will be provided, to allow conveyance of flood water around the building.

Landscape and civil will collaborate to ensure sustainability objectives are recognised through the site. This will include but not be limited to harness site runoff for passive irrigation and the inclusion of traditional water sensitive elements to ensure stormwater treatment objectives are achieved whilst complementing the structural form.

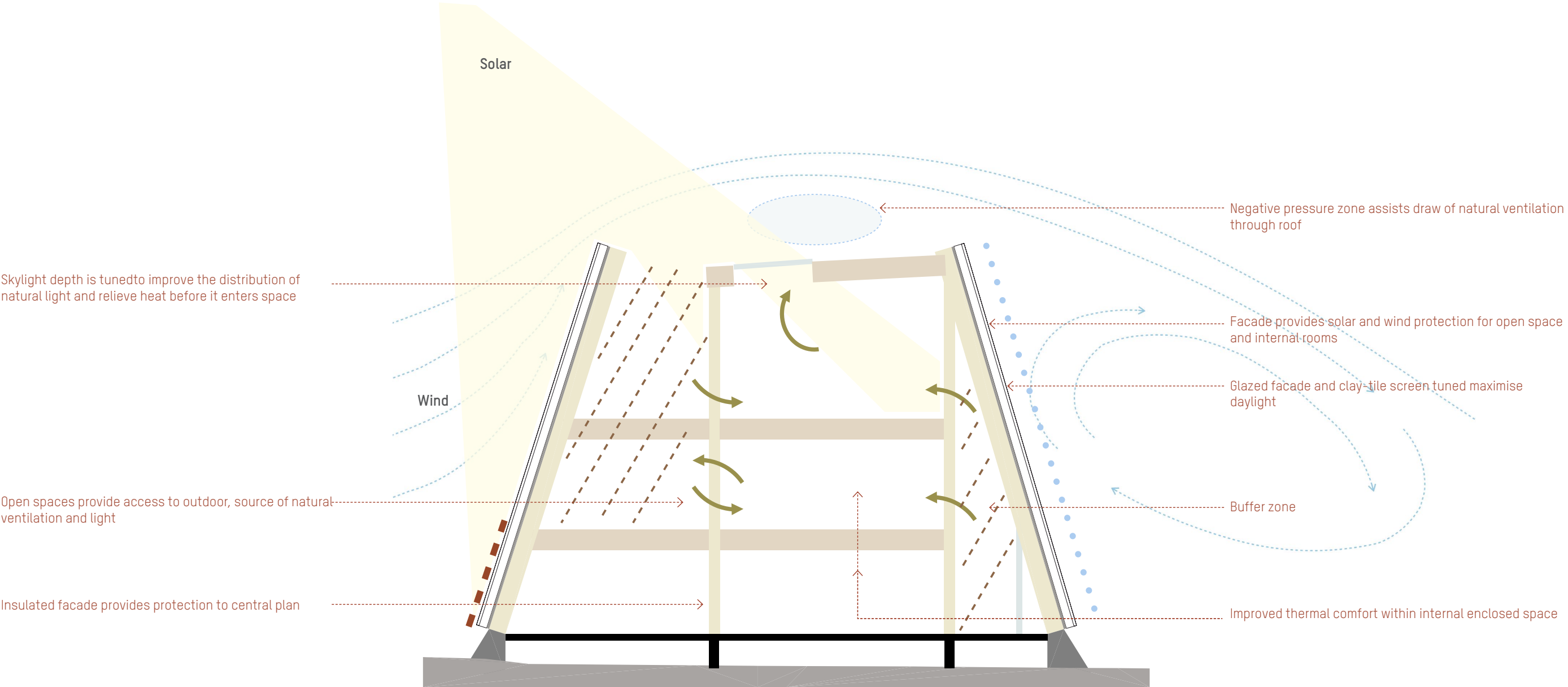
ICoE Building - Proposed Systems

The proposed Indigenous Centre of Excellence will house a diversity of uses with a ESD brief focusing on connection to nature, passive systems, health and well-being and resilience. Innovative solutions have been developed to realise the aspirations of the brief. Our proposed solutions offer a holistic vision requiring close collaboration between the design team, stakeholders, and client. A singular façade system has been conceived to accommodate two modes: a quiet façade and a protected façade. The façade has two functions: a quiet façade that allows permeability and multi-sensory connections to the outdoor environment, and a protected façade that buffers noise and air pollution from the central plant and Victoria Road.

The facade allows permeability and erosion of enclosure towards the central court. The outer skin provides openings and sun protection determined by the physical relationship of the building to its surrounding environment. The inner layer will deliver the benefits of control to the occupants over windows, air movement and privacy. This provides the control where it is most intuitive and beneficial for users. Skylights and upward views from public areas through the facade provide a connection to the sky.

A mass timber structure best demonstrates how natural sourcing can contribute to sustainability. The selection of finishes will prioritise local sourcing. A 'do no significant harm' approach to specification will also ensure the project will not use materials harmful to humans or ecosystems in its procurement. This will include no use of material that uses scheduled carcinogens in their manufacturing process. A mixed approach to air containing is proposed. Public areas adjacent to the central Internal landscape will be naturally ventilated. Heat may be required through the slab to temper the floor for occupants.

Various spaces will be air-conditioned, with a priority placed upon zoning to provide control, efficient operation, and the opportunity to use natural ventilation. Natural ventilation pathways will be developed and are likely to include chimneys integrated into the walls of the protected facades. The main performance space will be air-conditioned with air through the floor or at a low level to provide efficient conditioning of the large volume. Natural ventilation will still be provided and will provide comfort for a large portion of the year when the space is not in performance mode.



ICoE Building - Proposed Systems

The Gallery and associated spaces will be provided with AA control, briefed and protected by buffer spaces and positive air pressure to avoid uncontrolled air and moisture ingress. Fresh air for the mechanical systems will be sourced from the roof level significantly reducing harmful pollutants from the surrounds, including CO and NOx. Air handling units will allow the installation of HEPA filters so they can be introduced during bushfire events.

The approach to the health and comfort of the spaces will consider the user. In spaces inherently 'unowned' by the users, the automatic control will ensure the optimum strategy for maintaining conditions (such as the gallery) or optimising efficiency (such as mixed mode in the exhibition space).

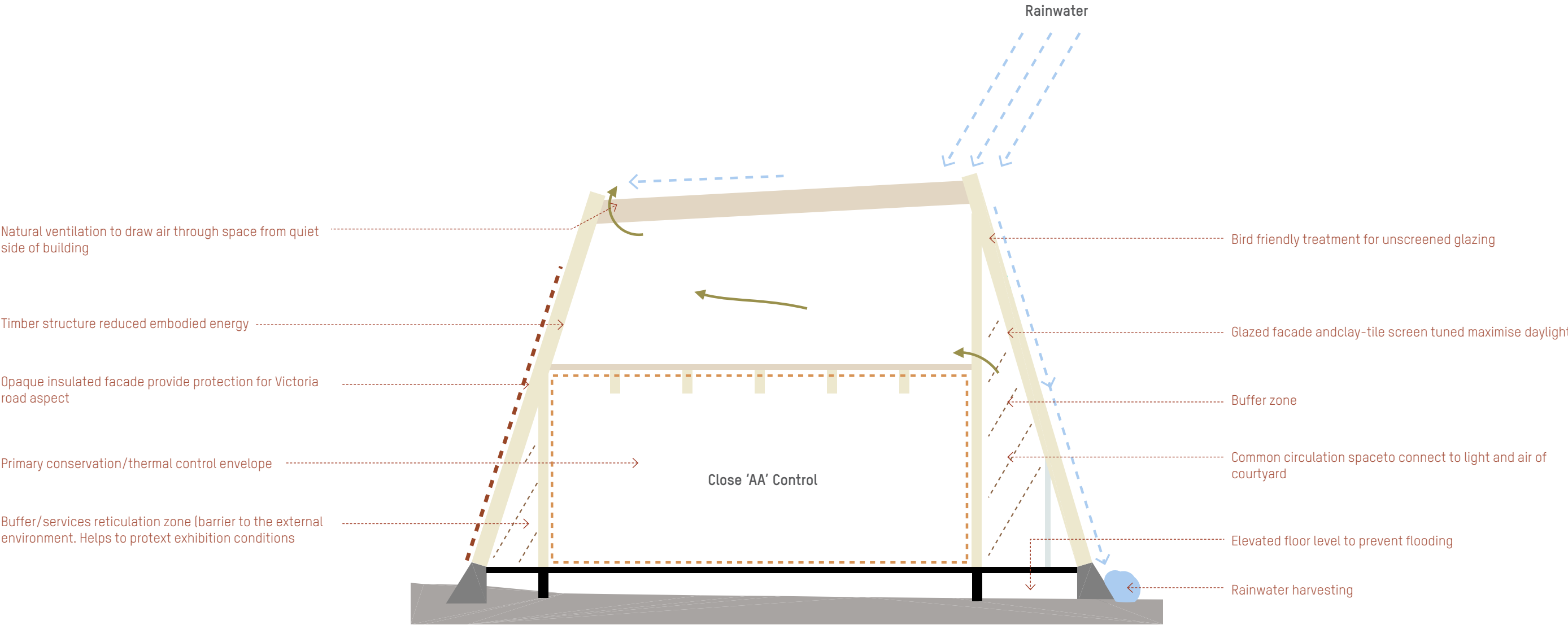
In other spaces, access to natural light air will be provided through the design, and the 'owners' will have the benefit of choice to control their environment, including switching off the A/C, opening the window, or closing the shading to moderate glare and provide privacy.

The design approach to the outer skin provides much flexibility to tune the treatments to each part of the facade depending on aspect and internal function. In public areas where more relaxed environmental control is preferred, this can include dematerialisation to let in sun, light and air.

In other areas, light and visual connection can be achieved through glazing to protect the internal environment. External solar shading can be varied to suit orientation and exposure. The right balance between all these issues takes time and will be progressed as the design is developed.

Water conservation will be achieved through the elimination of cooling towers and the use of water-efficient fittings. Water from the roof will be collected for reuse for non-human contact needs through dual piping throughout the building. Water in the landscape will be retained to reduce the flow of pollutants off the site and to meet irrigation demands. The volume of stormwater flow leaving the site is restricted to those required to sustain the nearby creek ecosystem.

Building design resilience will be improved by resolving passive treatments and mechanical systems in a 2050 RCP8.5 climate context. Retaining moisture in the landscape, shade, and the selection of materials will mitigate urban heat. The resolution of the outer facade will also minimise the heat entering the landscape by avoiding highly reflective surfaces, including spectrally selective low-e glass. Photovoltaic array shall be located at roof level either over enclosures or as a sun-shading solutions to outdoor roof terraces.



Temporary Carpark

Construction of temporary carpark to the south of the proposed development site with hardstand paving and line marking to accommodate a temporary parking solution with two parts:

- 107 spaces proposed in the temporary western car park on the western side of Bridge Street, adjacent to the existing oval, and
- 181 spaces proposed in the temporary eastern car park on the southern side of Fifth Street, adjacent to the new ICoE.

Access & Movement

- 1:23 INDICATIVE PROPOSED PATH GRADE - subject to detailed design
- PRIMARY SITE ENTRY
- VEHICLE ENTRY
- EXISTING CONNECTION FROM CAMPUS

Canopy

Three (3) trees are proposed for demolition to enable the optimum set out for the temporary car park.

- Removed Trees

Site Permeability

Site Area of Temporary Carpark	7973m2
Permeable Area	4030m2 - 50.5%
Non-Permeable Area	3943m2 - 49.5%

Surface Materials

- P1 - Asphalt Pavement
- P2 - Concrete Pavement
- P3 - Turf Cell
- P4 - Grassed Berm

