James Cook University

Cairns Campus Master Plan 2019

Version 1.0
3 February 2020

ACKNOWLEDGMENTS

The James Cook University Cairns Campus Master Plan 2019 acknowledges the traditional owners of the land including the Djabugay, Yirrganygji and Gimuy Yidinji people.

DOCUMENT DETAILS

JAMES COOK UNIVERSITY
CAIRNS CAMPUS MASTER PLAN 2019

Version: **1.0**
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Date of Issue: **3 February 2020**

CLIENT

Estate Directorate
James Cook University

CONTACT

Deputy Director & Head of Planning and Development
Estate Directorate

PROJECT TEAM

KIRK
Lead Consultant Architect, Master Planning and Project Management

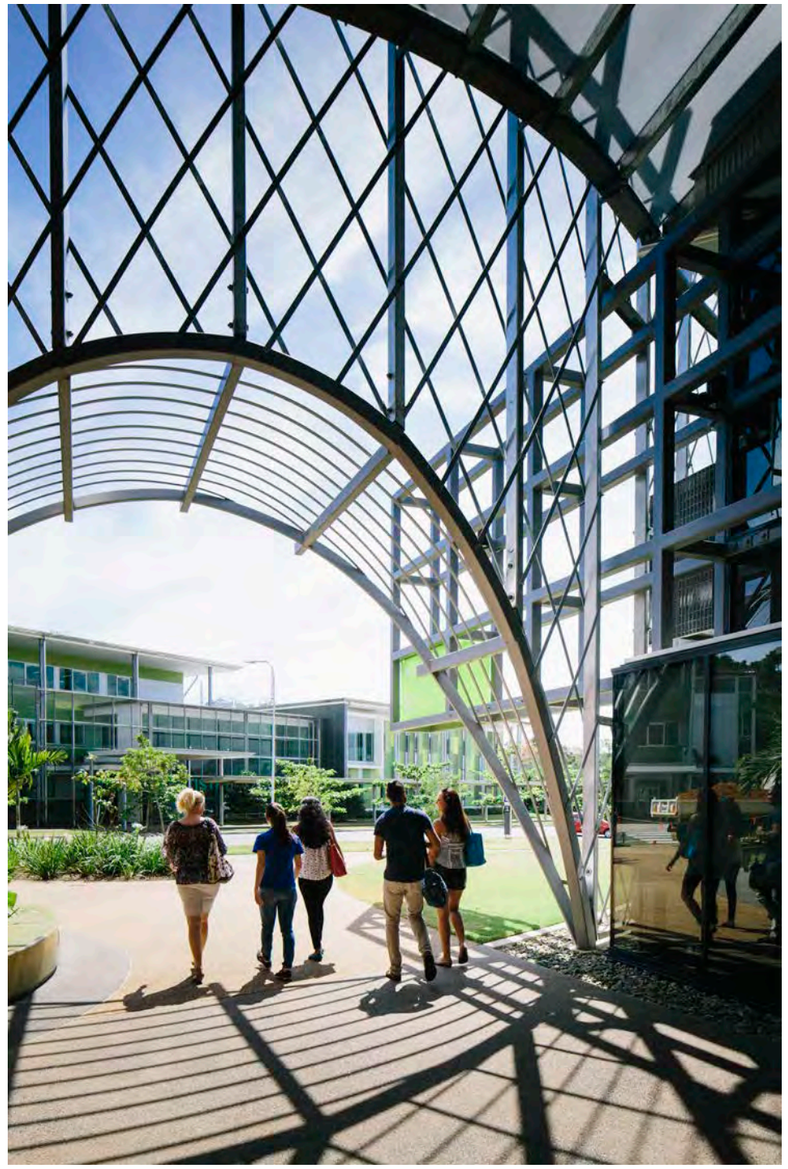
SASAKI
Futurist & Campus Planning Consultation

CWA
Local architect

RPS
Landscape architecture

AECOM
Infrastructure Analysis

Cardno
Town Planning



JCU STUDENTS WALKING TOWARDS JCU CAIRNS DENTISTRY FROM THE CAIRNS INSTITUTE

Estate Directorate
James Cook University
JCU Townsville | Douglas | Building 57 | Room 100
1 James Cook Drive Townsville QLD 4811 AUSTRALIA
JCU.EDU.AU

“Creating a brighter future for life in the Tropics world-wide through graduates and discoveries that make a difference.”

FOREWORD

I am delighted to present James Cook University’s (JCU) Cairns Campus Master Plan 2019 which will shape the future development of a world-class, sustainable and uniquely tropical campus experience for all users.

JCU is a major economic driving force of the Cairns local government area, with an estimated $183M per annum economic impact contributing in excess of 2% of the Gross Regional Product.*

In the past decade, JCU has invested over $200M in 8 major capital developments on its Cairns Campus, most recently the $40M John Grey Hall of Residence and the $30M JCU Ideas Lab due for completion in 2020. Successful industry partnering will spawn further investment on the campus, including the recently announced Newman Catholic College, a much anticipated vertical school for 800 secondary students.

Magnificent settings demand bespoke and innovative planning. JCU’s expansive 88 hectare campus is truly unique, with its World Heritage rainforest backdrop, proximity to the Great Barrier Reef and award winning tourist delights such as the Skyrail Rainforest Cableway, and our iconic bungy jumping neighbour, AJ Hackett Cairns.

The Master Plan deeply acknowledges the traditional owners, and in Professor Martin Nakata’s words, ‘strives to achieve an engagement plan that is respectful of Indigenous people and their understandings of place, and to be inspired into a design process that delivers a campus environment for all campus users to find their special place at JCU’.

Comprehensive stakeholder consultation has informed the development of the Master Plan, contributing to the creation of fifty initiatives (key transformative projects). The place-making framework is especially exciting, reflecting the extensive international experience of the planning team.

JCU has grand plans for its Cairns Campus, and pivotal projects such as the Exchange will support the campus to host a multitude of events. The Hub, which is proposed to be developed concurrently with JCU Square, an iconic ceremonial urban civic space activating the Campus Heart, will also provide excitement, learning and vibrancy for all campus users.

We are embedded in the Cairns community, and continue to grow and invest in this wonderful city. I would like to thank stakeholders for their contributions, JCU’s Estate planning team and their consultants, and the senior management representatives for guiding the development of this truly inspiring and aspirational Master Plan.

Professor Sandra Harding AO
Vice Chancellor and President

*2018 JCU Economic Impact and Human Capital Report

LOOKING WEST TO SADDLE MOUNTAIN RAINFOREST BACKDROP

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- UPDATED FOOD & BEVERAGE STRATEGY
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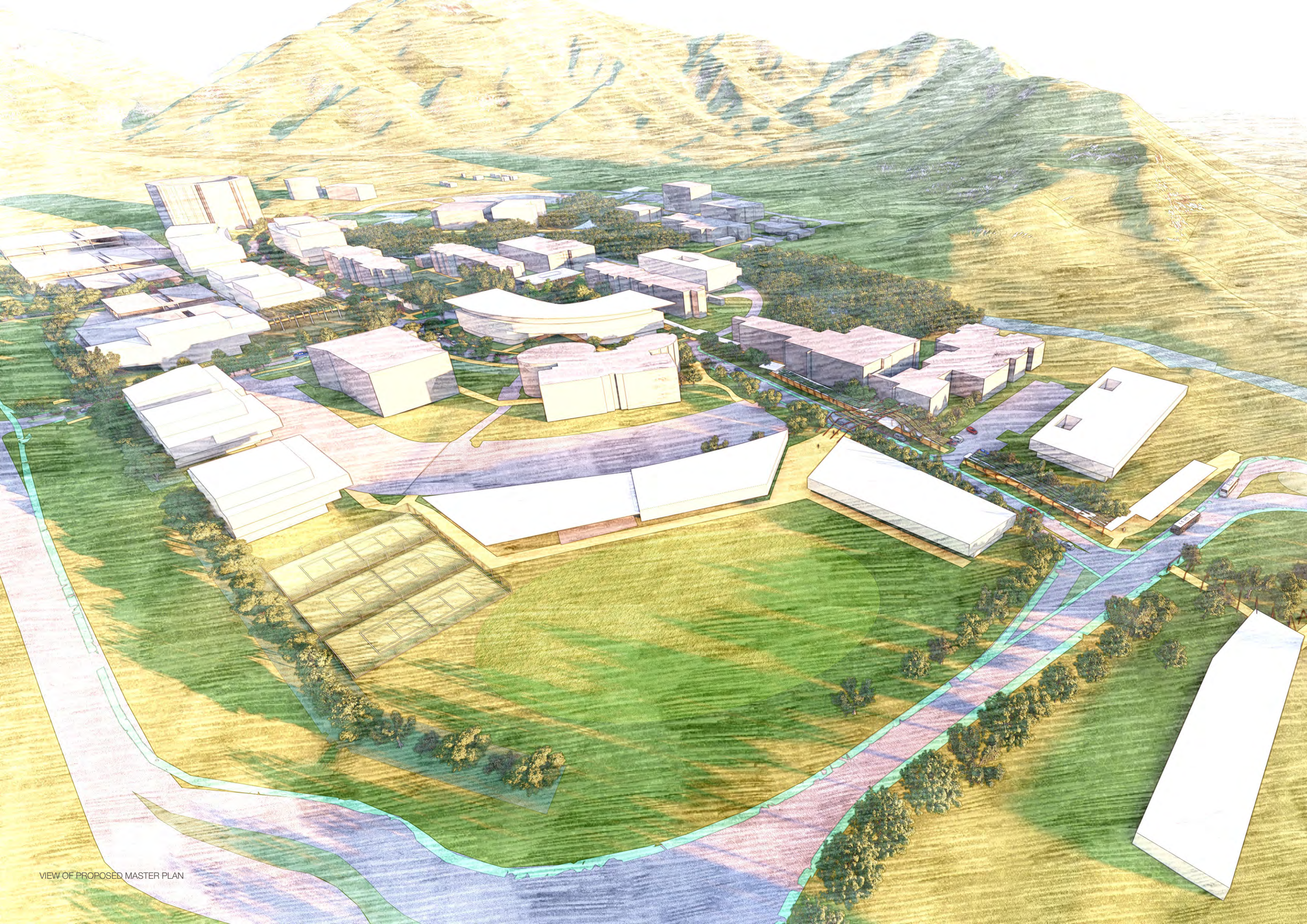
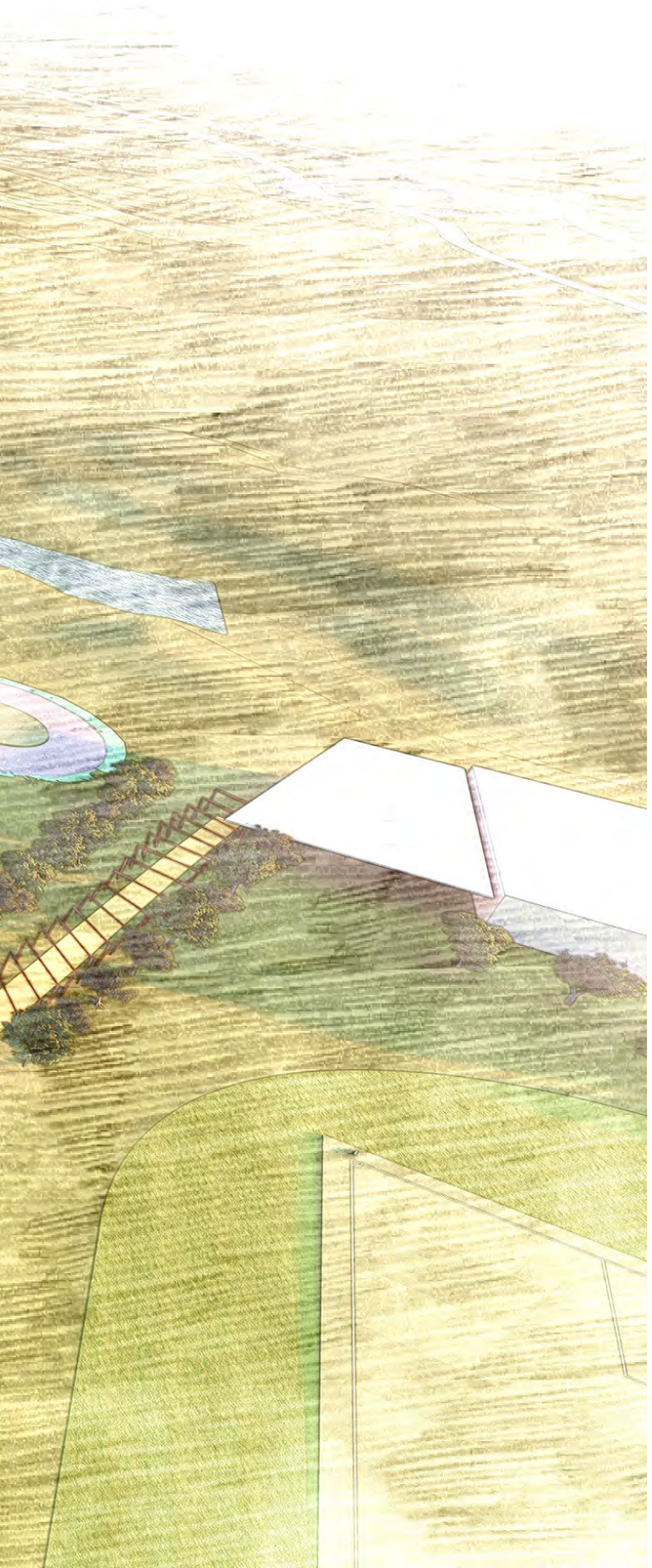
- CAMPUS WIDE SUSTAINABILITY PLAN
- SERVICES INFRASTRUCTURE PLAN
- TRANSPORTATION DEMAND MANAGEMENT STRATEGY
- REFRESHED CRC & JCU MOU
- OPERATIONAL BUSINESS CASE (UTILISATION)



VIEW OF PROPOSED MASTER PLAN



EXECUTIVE SUMMARY

JCU CAIRNS CAMPUS MASTER PLAN 2019

The Cairns Campus Master Plan 2019 will...

Engage with and mobilise the campus ambassadors (students and staff)

Advance the vision for the campus

Re-purpose what was done before and develop it for what is appropriate now

Establish a campus planning framework

Identify development parcel opportunities

Provide a road-map for the development of the campus

EXECUTIVE SUMMARY

PURPOSE

The JCU Cairns Campus Master Plan 2019 (The Master Plan) establishes a decision making tool for the evolution of the campus. The Master Plan has been developed through careful site analysis by a multidisciplinary team, comprehensive stakeholder and user engagement, and the use of advanced urban climate analysis to address the unique environmental challenges of the wet tropics.

The Master Plan expands and supersedes the 2010 Cairns Master Plan. Specifically, it focusses on defining optimum development parcels and outlines key principles in their subsequent development.

The Master Plan should provide an implementation tool for the University and should be regularly updated (every 5 years) to ensure relatability to the changing context of JCU and Cairns. The Master Plan focusses on the short, medium and long term horizons.

The Master Plan features a structured sequence of parameters including goals, principles, frameworks and initiatives. The holistic integration of all parameters through future campus development should allow the Cairns Campus to achieve The Master Plan vision.

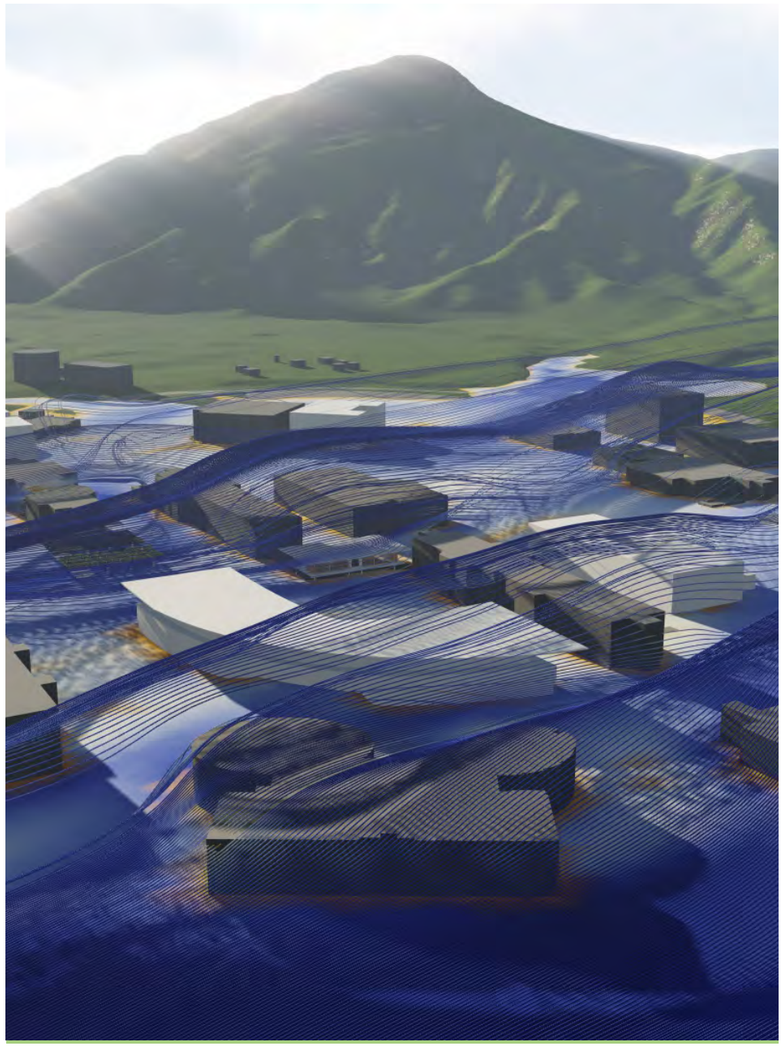
Factors impacting and influencing the Master Plan include the current University planning framework, previous studies for the campus, its context and climate, along with comprehensive consultation with the University community.

GLOBAL TROPICAL CONTEXT

JCU Cairns Campus is a significant campus for the University and is uniquely located between two World Heritage Areas - The Wet Tropics of Queensland and The Great Barrier Reef Marine Park. Cairns is one of the most popular tourist destinations in Australia and is within easy reach to nearby resort regions including Port Douglas and Mission beach, as well as the Atherton Tablelands and outback Queensland.

JCU boasts a suite of campuses across two countries with its largest campus located in Townsville, and another successful campus located in Singapore, providing the potential for JCU students to experience studying across different locations. Other campus locations include Mt Isa, Thursday Island, Mackay and Brisbane.

CAIRNS CONTEXT - LOCAL TROPICAL LANDSCAPE



CAIRNS CAMPUS MASTER PLAN 2019 COMPUTATIONAL FLUID DYNAMICS WIND ANALYSIS

SITE CONTEXT & CHARACTER

The unique setting of the campus, nestled in amongst the rainforest not only provides a picturesque backdrop but also features world class mountain bike trails.

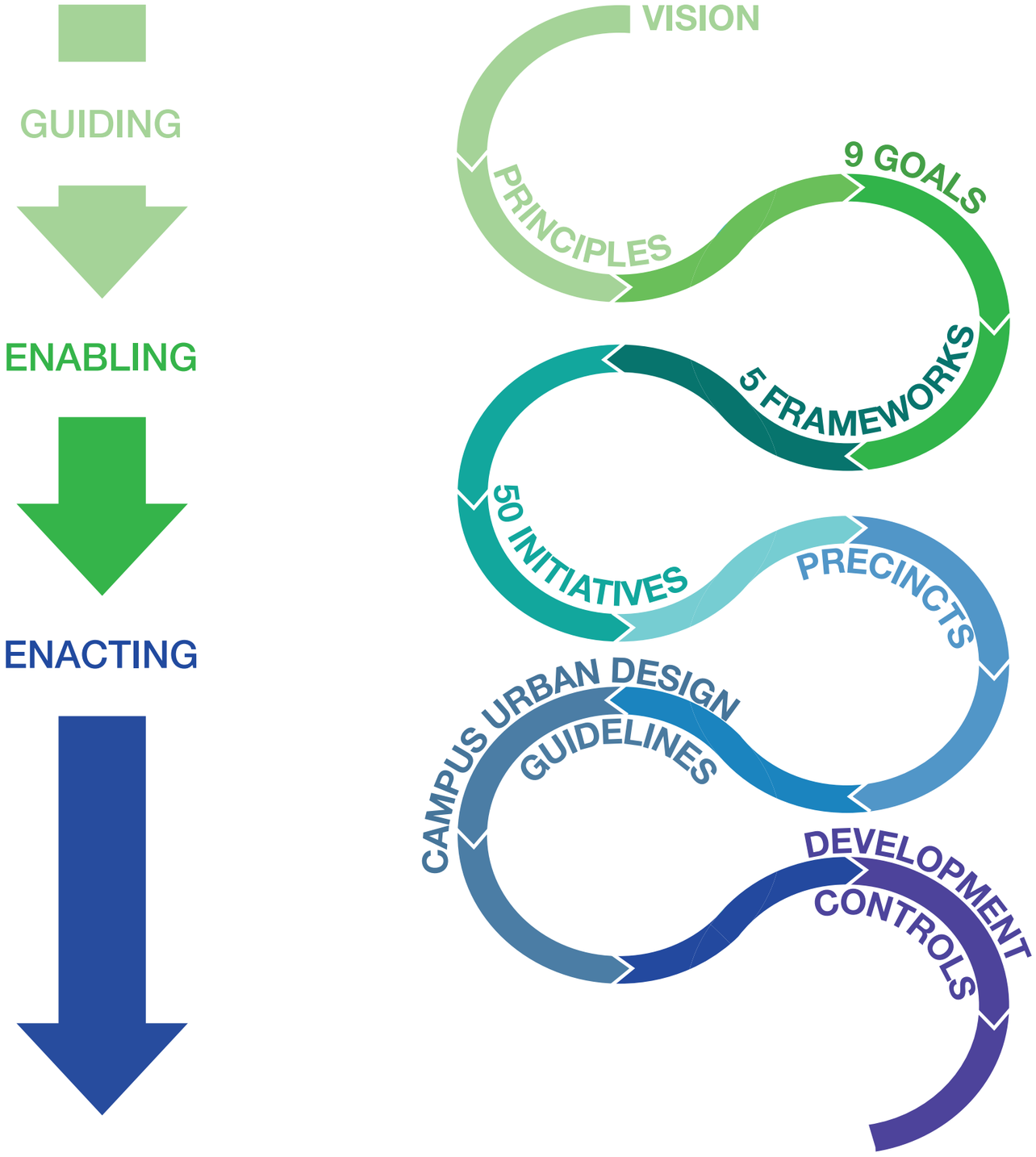
The natural environment and Atika creek flows through the campus, providing a shaded retreat for campus users and native flora and fauna. The creek is bridged by covered walkways that connect the outer precincts of the campus back to the compact core (within a 2 minute walk). The campus is located 17km from Cairns City and has an overall site area of 88 hectares. The campus features on-site student accommodation, cafes, state-of-the-art research and teaching facilities, sporting facilities, and is within easy reach to retail and food outlets.

CLIMATE ANALYSIS

As part of the Cairns Campus Master Plan 2019 (Master Plan), microclimate analysis was undertaken to highlight areas of concern and opportunities for future planning. Microclimate analysis combines extensive weather data with advanced analysis processes which can assist and inform design thinking.

Computation Fluid Dynamics was utilised to analyse the air movement patterns across campus to guide the development of the Master Plan. It is vital for any future developments on campus to mitigate air movement stagnation by increasing permeability at all lower levels and allow for breezeways by reorienting building form to the prevailing S/SSE wind direction.

To align with JCU sustainability goals, future development should first aim to maximise utilisation of existing buildings to minimise embodied energy.



CAIRNS CAMPUS MASTER PLAN 2019 STRUCTURED SEQUENCE OF PARAMETERS

MASTER PLAN VISION

The vision for the Cairns Campus Master Plan 2019 (Master Plan) is to enhance the student experience on campus through consolidating and densifying the campus core to create an active campus heart and hub of excitement, learning and vibrancy for all campus users. The Master Plan aims to create a world-class, sustainable and uniquely tropical campus experience for all users.

The Master Plan includes eight principles that complement the goals and are addressed by the 50 initiatives proposed by the Master Plan. The principles include:

_Walkable compact campus - an infill and upgrade approach
_Optimise land utilisation - conserve for the future
_Logic of campus life to be vibrant and enriching
_Align sustainability program with the University Plan
_Place-making identity - character informed by wet tropical landscape
_Memorable social spatial framework - primacy of the public realm
_Develop built form typology that responds to the tropical climate
_Interdisciplinary/Multi-disciplinary pedagogy

The nine Master Plan goals are identified to enable future development and campus growth and to ensure the vision is achieved. The goals include:

1. Enhanced Entrances
2. Campus Heart
3. Consolidation
4. Tropical Urbanism
5. Enhanced Indigenous Engagement
6. Vibrant Social Fabric & Student Life
7. Interdisciplinary
8. Pedestrian-Orientated Campus
9. Sustainability

1. ENHANCED ENTRANCES

The Master Plan reinforces the unique identities of the two major campus entrances. The campus Access road is enhanced to function as the ceremonial and iconic campus entrance for students, colleges, staff, and visitors. New development, large tropical shade trees and open spaces encourage pedestrian, cyclist and vehicular connections off McGregor Road, while street trees, an arbour and site improvements around D precinct, close to the University Bus Station, redefine the Boulevard gateway.

2. CAMPUS HEART

The Master Plan creates a well-defined campus heart at the crossroads of the main campus access road and the Boulevard. The campus heart includes two significant spaces including development parcel 6 (DP6) and the new JCU Square, a landscaped ceremonial space, similar to the scale of Harvard Yard.

An existing on-grade parking lot (P3) is relocated from the open space enabling its transformation. Landscape and architectural interventions transform the crossroads into an active, iconic, open, shaded space that reinforces the tropical identity of the University.

LIBRARY FORECOURT

3. CONSOLIDATION

There is an overarching goal to urbanise the Cairns Campus. The intention of the Master Plan is to consolidate the campus into A Precinct. This should ensure the vibrancy of the campus by consolidating the student activity on campus but also locates development within the greatest capacity zone for servicing.

Consolidation also seeks to improve the walkability of the campus as a means to respond to the heat stress levels of the wet tropical climate of Cairns and to address the future impact of climate change of rising temperatures.

4. TROPICAL URBANISM

The Cairns Campus Master Plan 2019 (The Master Plan) focusses on student experience and enhancing the physical and visual connections between indoor and outdoor environments. Development parcel principles suggest a transparent and open architectural expression to engage with the unique setting, while circulation and active uses such as student-life programs are brought to the edges of buildings to promote student activation around the campus.

Transformative projects are strategically situated within the A-precinct to urbanise and activate the campus heart and improve the transition between indoor and outdoor spaces.

5. ENHANCED INDIGENOUS ENGAGEMENT

The Master Plan recognises the traditional owners of the land including the Djabugay, Yirrganygji and Gimuy Yidinji people, and outlines an indigenous engagement strategy to ensure meaningful collaboration between the local traditional owners and the future development of the campus.

The engagement strategy deliberately avoids a location or method for the recognition of indigenous cultural heritage of place and country. Instead, the Master Plan acknowledges the benefit of holistic and continuous engagement across all levels of the university to ensure the culture of the traditional owners is a core element in the further development of the campus that should contribute to its unique identity.

6. VIBRANT SOCIAL FABRIC & STUDENT LIFE

The Master Plan seeks to create opportunities for increasing the social and recreational functions to create a vibrant campus. Strategic locations have been identified to provide generous and spatially memorable social and informal student centric spaces as well as a significant increase in land set aside for active and recreational sport.

7. INTERDISCIPLINARY

The Master Plan supports the merging of academic disciplines and is encouraged through building and land use, strategic architecture and open space interventions. The Master Plan considers programmatic adjacencies and provides flexible venues that encourage collaboration and interdisciplinary interaction. Interdisciplinary nodes are designed as centres for academic colleges that foster an open and collegial atmosphere for college and student engagement.

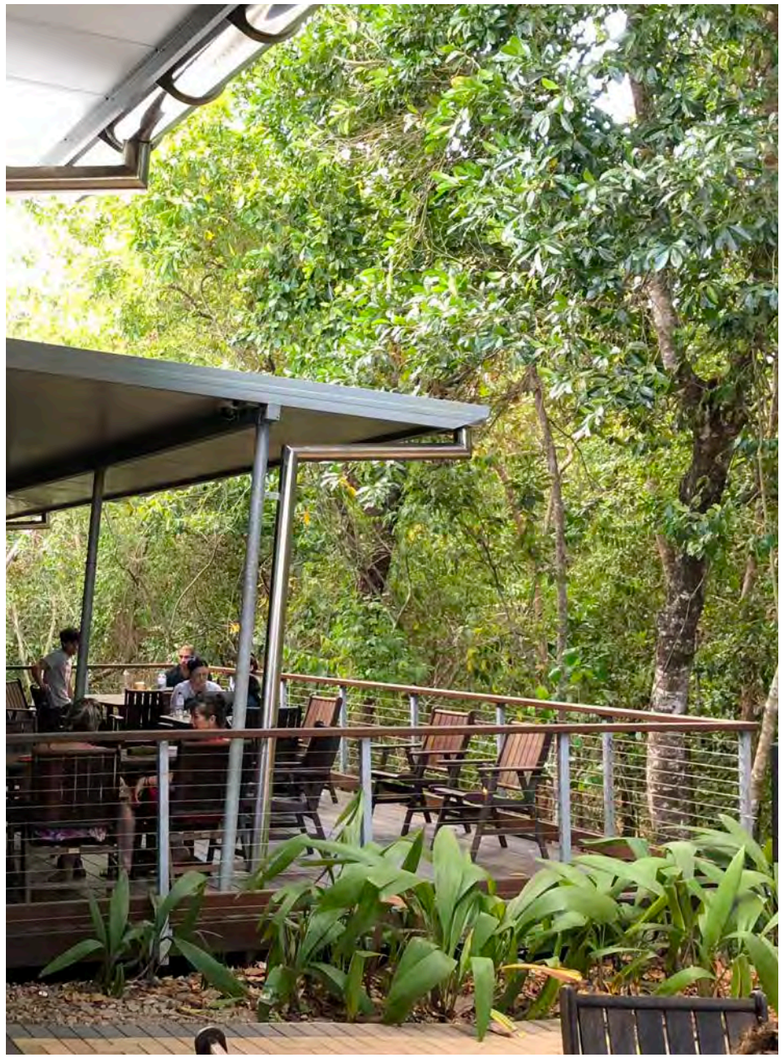
University colleges are currently spread across the Cairns campus resulting in fragmentation and missed opportunities in collaboration. Closer proximity of colleges in a dense urbanised campus core should assist in supporting cross-pollination of colleges. The scale of buildings and the disconnect between them, creates challenges for colleges. Enhanced integration on campus should facilitate an interdisciplinary campus to maximise potential collaboration between the University's researchers, staff and students.

8. PEDESTRIAN-ORIENTED CAMPUS

The Master Plan preserves and enhances the pedestrian experience on the campus through improvements to the pedestrian and cyclist network. It concentrates student-oriented purposes around the academic core of the campus and situates other uses along the periphery.

9. SUSTAINABILITY

The Cairns Campus Master Plan 2019 (The Master Plan) builds upon the University's commitment to sustainability through environmental, economic, and social sustainability goals articulated in the University Plan (2018-2022). The Master Plan addresses sustainability with strategies that include working landscapes with integrated stormwater management benefits, transportation demand management strategies that promote alternate forms of transportation, and promotes achievement of the University's LEED targets for new developments. Computational Fluid Dynamics were utilised to measure the performance of the existing campus conditions, providing important insights into the Master Plan for the campus.



JCU CAIRNS CAMPUS - THE BOATHOUSE DECK ALLOWS FOR A SHADED AREA TO ENGAGE WITH THE NATURAL CAMPUS LANDSCAPE

OPEN SPACE & LANDSCAPE

The existing natural features of the campus, namely the world heritage listed area - the Wet Tropics of Queensland rainforest backdrop, Atika creek, and the close proximity of the Great Barrier Reef provide a unique experience that no other university in Australia, or perhaps globally can replicate.

The campus landscape and open space framework functions as a working landscape that responds to the climate and natural conditions of the site, working with its features to maximise their functional qualities.

The Cairns Campus Master Plan 2019 strengthens the existing landscapes and introduces new civic and gathering spaces at key locations. It establishes a sense of hierarchy and identity, improves connections between open spaces, and integrates stormwater management strategies through water sensitive urban design (WSUD), such as bioswales along primary access routes.

ACCESS & CIRCULATION

The University Plan (2018-2022) sets significant goals for sustainability that champions a circulation system for the campus that integrates pedestrian, bicycle, transit, vehicular, and parking networks.

The Master Plan prioritises pedestrian movements and facilitates effective circulation through compact development, well-defined pathways, and logical connections between indoor and outdoor environments. Outdoor circulation networks are rationalised and strategically integrate new development at key pedestrian entrances, while indoor circulation builds upon the University's existing building network.

The Master Plan recommends a business case process to consider the introduction of a shuttle bus to link the two campus locations (City & Smithfield), and reduce reliance on automobiles between the two locations. The shuttle proposition requires a high frequency and environmentally responsible transport shuttle system.

The Master Plan transforms both the access road entrance and boulevard entrance into shaded, tropical landscaped pedestrian gateways that can also accommodate bicycle movement. Bicycle networks are introduced on campus to encourage cross-campus connectivity and provide access to adjacent mountain bike trails through on-street and dedicated campus bike paths. The Master Plan proposes a pedestrian and bicycle overpass for access across Captain Cook Highway.

Enhancements to the existing road network promotes cross-campus connectivity, better defines the ring road, and creates a more legible circulation network on campus. The Master Plan redefines the historical university gateway (access road) to clarify wayfinding, circulation patterns and enhance the overall entrance experience to be uniquely tropical.

The existing surface grade carparking is the most visually dominant element on the campus. They are also fragmented, further complicating wayfinding and campus legibility. The Master Plan proposes to consolidate the carparks into built structures over the long term horizon to allow stacking and therefore establishing the key movement system through the campus by defining the arrival and departure points for campus visitors.

MASTER PLAN FRAMEWORKS

The Cairns Campus Master Plan 2019 (The Master Plan) addresses the eight principles through five frameworks: Place-making, Open space and Landscape, Building and Land Use, Access and Circulation & Services. The frameworks are connected and should be considered holistically for future development.

PLACE-MAKING

The place-making framework highlights key areas within the building and land use, open space and landscape and access and circulation frameworks for congregation, student exchange, interaction and activity and become significant way-finding elements for the campus. These include:

_ The Exchange
_ The Square
_ The Campus Village
_ Active Play Zone
_ Atika Creek Study Pods
_ The Sports Piazza
_ The Engagement Zone
_ The Walk of Discovery
_ The Hub

LAND & BUILDING USE

The campus includes a variety of land and building uses whose organisation and function create a sense of tropicality, enhance the academic atmosphere, and promote varied and rich learning environments.

The Master Plan allows for up to 63,000m^2 GFA of new development to support long-term growth to a target of 10,000 EFTSL by 2031 and a total area of 130,000m^2 GFA within the University Centre Zone (supported by the 2012 Ministerial Designation). This growth target aligns with the JCU 2010 Cairns Campus Master Plan.

The Master Plan emphasises the strategic re-purposing of existing facilities over building new structures in order to improve utilisation and efficiency. In particular, the A-precinct buildings are primed for refurbishment to improve the connection to place and be transformed into an inviting, open and vibrant hub of student activity.

Academic buildings are situated to enhance existing academic precincts and define open spaces, while interdisciplinary nodes are distributed throughout the campus and provide areas for informal studying, socialising, resting, and gathering. The Master Plan seeks to enhance student life in all areas of the campus, and builds upon the strong existing pattern of internal walkways.

The student accommodation strategy achieves the University's goal of housing 900 students as its total student population on campus. The Master Plan locates the student accommodation along the ring road to create an active, vibrant street, increase passive surveillance on campus, and reduce the distance to the bus stop.

The placement of two additional student accommodation sites on either side of the Ring Road West creates a distinctly urban condition which serves to reinforce campus identity and legibility. The sites also complete a compact "student life" zone on the campus that is distinct and well integrated into the academic core of Precinct A.

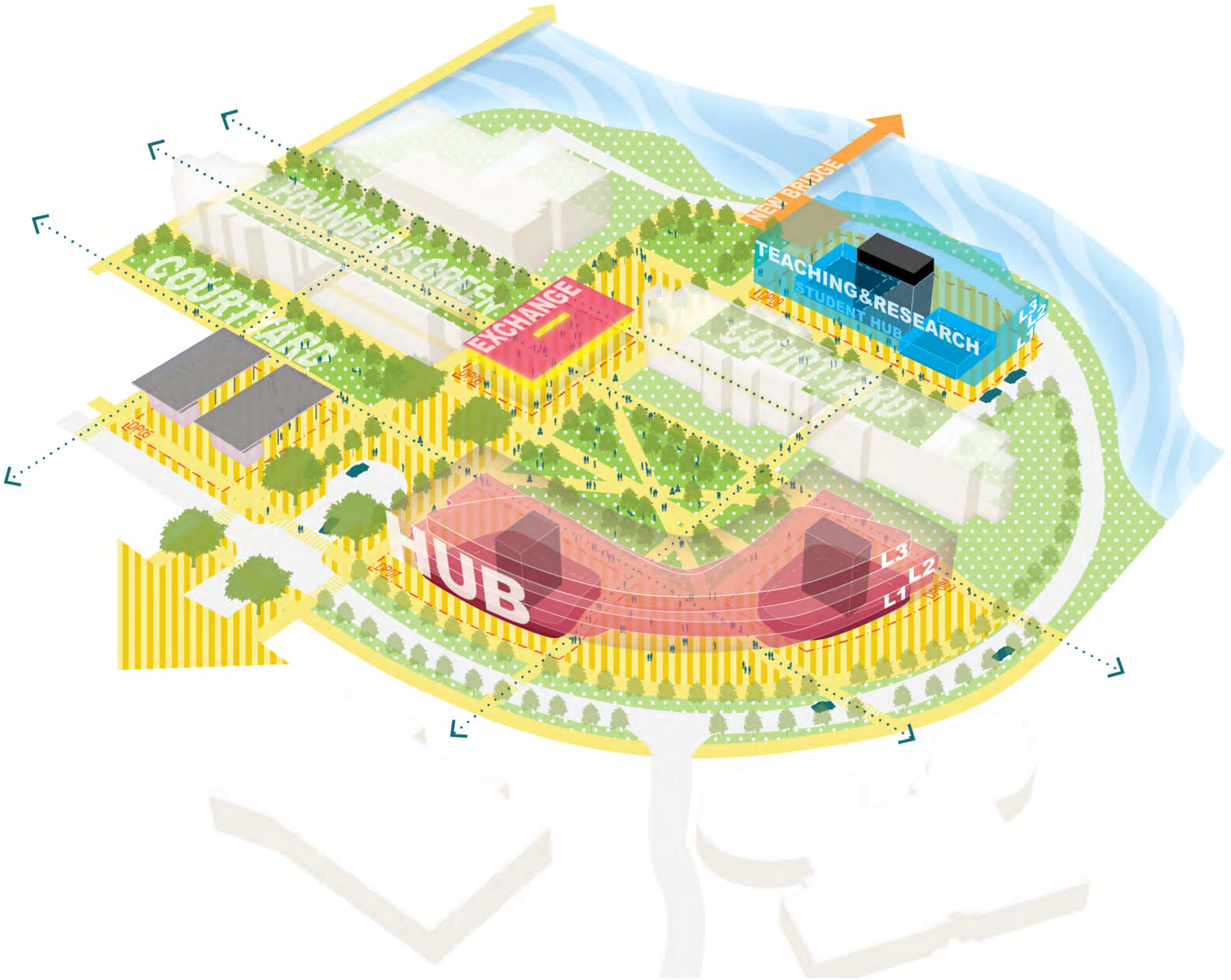
JCU CAIRNS CAMPUS MASTER PLAN INITIATIVE - ENHANCE CAMPUS ENTRANCE

INITIATIVES

The Master Plan relies upon the momentum of key transformative projects to initiate development and transform the campus in a short period, aligning with the University Plan's measurable outcomes. These projects are called **INITIATIVES** and they include interventions within all frameworks: place-making, open space and landscape, building and land use, and access and circulation. There are 50 initiatives that have been grouped thematically under the following categories:

1. Landscape Interventions
2. 'A Precinct' Modifications
3. Campus Connectivity
4. Campus Amenity
5. Sports & Recreation
6. Sustainability
7. Community Focus

Significantly, key initiatives are located in the campus heart in A-Precinct and strive to enhance indoor and outdoor connections, densify the campus core, increase the vibrancy of the campus and inspire and attract staff and students.



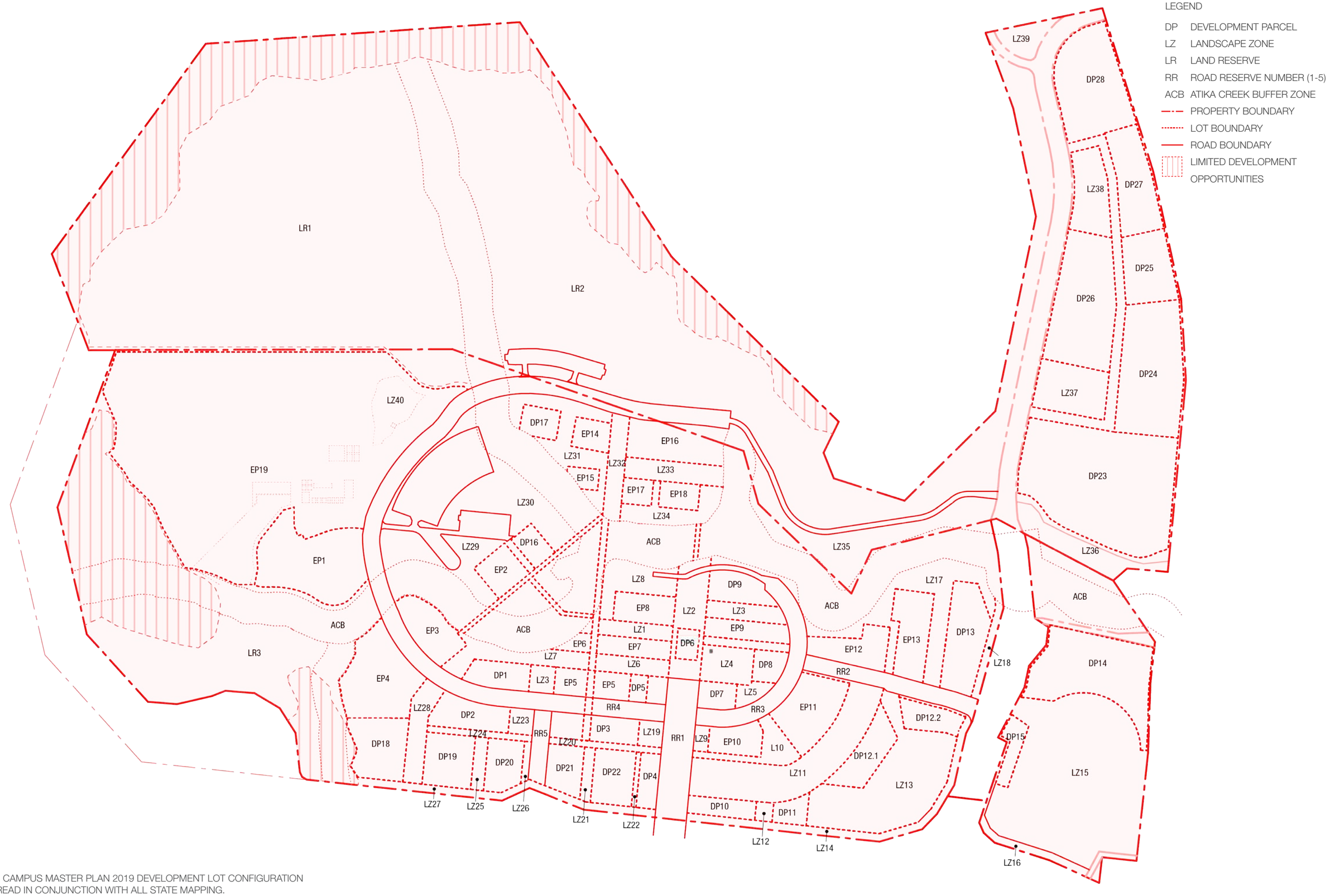
EXAMPLE CAMPUS URBAN DESIGN GUIDELINES FOR DEVELOPMENT PARCEL 7 AND 8

CAMPUS URBAN DESIGN GUIDELINES

The Master Plan provides Campus Urban Design Guidelines to inform future development and to ensure the Master Plan vision is achieved.

The campus includes a variety of land and building uses whose organisation and function create a sense of collegiality, enhance the academic atmosphere, and promote rich learning environments. The Campus Urban Design Guidelines provide detailed guidance on a few key development parcels along with streetscape sections that demonstrate how a tropical landscape campus identity can be achieved and integrated with underground services.

The guidelines are designed to minimise energy use and associated greenhouse gas emissions, and optimise daylighting opportunities, create comfortable outdoor micro-climates while achieving a strong sense of place on campus.



CAIRNS CAMPUS MASTER PLAN 2019 DEVELOPMENT LOT CONFIGURATION
TO BE READ IN CONJUNCTION WITH ALL STATE MAPPING.
NATURAL BOUNDARY AND BUFFER TO ATIKA CREEK SUBJECT TO CHANGE.

ZONING CHARACTER	LOT	PARCEL AREA (m²)	SUGGESTED HEIGHT (FLOOR LEVELS)*	STREET ADDRESS	SUGGESTED OPTIMAL GFA (m²)	KEY CONSIDERATIONS
	DP1	2,180	6	Ring Rd West	8,500	DP1 & DP2 generate a cluster of student life around the existing student accommodation, generating street activation and vibrancy.
	DP2	3,270	6	Ring Rd West	9,500	
	DP3	3,000	4	Ring Rd West	7,100	DP3 is a key linking building located on a primary pedestrian network axis. Permeability is critical for the success of the site.
	DP4	1,540	4	Access Road	3,200	DP4 has the potential to create a university village entrance to the campus, spilling onto LZ19.
	DP5	630	3	Ring Rd West	300	DP5 extends EP5 towards the ceremonial drop-off. Built form in this zone should be permeable.
	DP6	875	2	Campus Cross-roads	400	DP6 is an open, landscaped pavilion structure conceived to enhance gathering outdoor spaces and engage with the unique tropical setting.
	DP7	1,350	4	Ring Rd East	3,700	DP7 & DP8 are landmark sites and should support one high-value building that considers the significance of its connection to the campus and community.
	DP8	1,460	4	Ring Rd East	3,100	
	DP9	2,060	4	Ring Rd East	6,500	DP9 should engage sensitively with the Riparian zone and support multi-disciplinary functions for research and academic purposes.
	DP10	1,650	4	McGregor Rd	4,500	DP10 & DP11 are community focussed sites. DP10 should celebrate the pedestrian entrance to the campus.
	DP11	1,100	4	McGregor Rd	3,500	
	DP12.1 DP12.2	3,250 2,050	4 4	Boulevard	3,900	DP12.1 & DP12.2 should support sporting activities to engage with the University Green.
	DP13	5,390	6	Boulevard	4,900	DP13 is a landmark site that should celebrate the arrival to the campus.
	DP14	11,090	6	Panguna St	6,400	DP14 is a landmark site that should address the campus identity due to its high visibility from Capt. Cook Highway & adjacency to the community.
	DP15	1,370	4	Panguna St	1,500	DP15 is a support site to the University sports oval.
	DP16	1,350	4	Ring Rd West	3,900	DP16 should celebrate the surrounding riparian zone.

** IF FUTURE BUILT FORM PROPOSALS DO NOT ACHIEVE SUGGESTED DEVELOPMENT PARCEL HEIGHT, AN ANALYTICAL PROCESS OF THE DEVELOPMENT WITHIN THE CAMPUS WILL BE REQUIRED.*

DEVELOPMENT PARCEL SCHEDULE

DEVELOPMENT CONTROLS

The development lot configuration provides direction and guidance for building placement, site organisation, and placemaking decisions, and expresses the overall character of the campus.

Development Parcel guidelines facilitate the implementation of the Master Plan. Development Parcel guidelines are intended to assist architects, planners, and campus designers in the design of future facilities and renovations.

Development Parcels have been identified along with dedicated open space allotments (Landscape Zones) to ensure air movement across the campus is encouraged. Development parcels have built-in setbacks to adjacent lots, therefore no additional setback guidelines have been assigned.

Development controls provide key criteria for each development parcel including:

- Site area
- Zoning character
- Suggested number of floor levels
- Street Address
- Key considerations

Development Principles around site cover are also provided to allow for air movement across development parcels and to encourage visual transparency across the campus. As a general campus rule, all development parcels should target 40% built form site cover at ground level and all built form should shade the ground plane. All proposed developments should provide analysis to ensure visual transparency and air movement is maintained through the site and surrounding campus.

FIGURE 1: ILLUSTRATIVE CAIRNS CAMPUS MASTER PLAN 2019 (REFER PAGE 54-55 FOR FULL LEGEND)

The Cairns Campus Master Plan 2019 aims to invigorate a tropical campus experience and boost campus activation for all users: students, staff, community and industry partners."

01 INTRODUCTION

The JCU Cairns Campus Master Plan 2019 (The Master Plan) establishes a decision making tool for the evolution of the campus. The Master Plan has been developed through careful site analysis by a multidisciplinary team, comprehensive stakeholder and user engagement, and the use of advanced urban climate analysis to address the unique environmental challenges of the wet tropics.

The Master Plan expands and supersedes the 2010 Cairns Campus Master Plan (CCMP), however, does not depart significantly from the 2010 CCMP to require an update to the Ministerial Designation (2012). Specifically, it focusses on defining optimum development parcels and outlines key principles in their subsequent development.

The Master Plan should provide an implementation tool for the University and should be regularly updated (every 5 years) to ensure relatability to the changing context of JCU and Cairns. The Master Plan focusses on the short, medium and long term horizons.

FIGURE 1.1: JCU CAIRNS AITHM LANDSCAPE FORECOURT

1.1 MASTER PLAN PURPOSE

The Cairns Campus Master Plan 2019 (The Master Plan) goals aim to deliver on University mission statements outlined in the approved University Plan (2018-2022) and Academic Plan (2018-2022), along with the project brief. These are summarised below:

_Create a “sticky campus”

_Be a catalyst for incubating strategic partnerships with key stakeholders

_Promote sustainability and enhance education and research in the tropics

_Engage with the campus community, including local Djabugay, Yirrganygji & Gimuy Yidinji people, the traditional owners

_Embrace development potential to support a mixed use knowledge community

_Student centric and embrace and invigorate the student experience

_Activate campus life

_Urbanise the campus core

_Improve the learning and research environs and integrate academic and residential life

_Move vehicles to the periphery to the extent possible and facilitate safer and more efficient mobility and walkability for the University Community

_Transform JCU’s Estate from a suburban campus to a more urban form, while maintaining the attraction of natural assets that enhance the student experience

_Facilitate vibrancy, wellbeing, social connections and stimulating places

_Integrate and celebrate the surrounding natural landscape of the campus

1.2 MASTER PLAN TEAM

The Cairns Campus Master Plan 2019 team was appointed in June 2018 and brings together a unique skillset that provides a scientific approach to campus analysis and specialist expertise in:

_ Educational and workspace planning
_ Local knowledge
_ Unparalleled university campus master planning (over 500 academic institution commissions globally)
_ Advanced Buildings & Cities - Microclimate analysis to develop new sustainability benchmarks for the tropics.

PROJECT TEAM:

KIRK

Lead consultant, Master Planning, Project Management, Microclimate Analysis

(Advanced Buildings & Cities)

SASAKI

Futurist & Campus Planning

CWA

Local architect (Charles Wright Architects)

RPS

Landscape Architecture

AECOM

Infrastructure Analysis

CARDNO

Town Planning

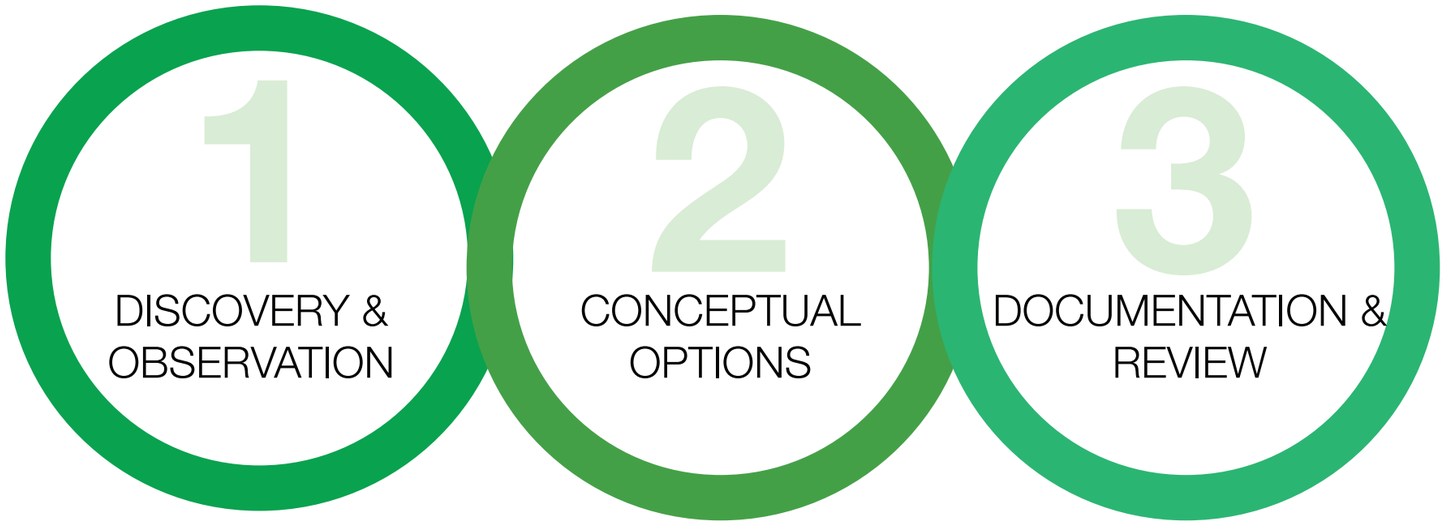
“Grand in its thinking, but easy to implement.”

JCU DVC TRICIA BRAND: IN CONTEXT OF MASTER PLAN GOALS

FIGURE 1.2: DESIGN TEAM MEETING WITH CAIRNS REGIONAL COUNCIL MAYOR: CR BOB MANNING OAM

FIGURE 1.3: EXISTING 3D PRINTED CAMPUS MODEL WITH JCU IDEAS LAB (2020 COMPLETION)

FIGURE 1.4: CAIRNS CAMPUS MASTER PLAN 2019



- Comprehensive review of background material
- Analysis of existing conditions including climate data and computational fluid dynamics analysis, walk through of campus facilities and assessment of infrastructure capacity.
- Extensive consultation with University and Community stakeholders to identify key issues, concerns and ideas for the Master Plan.

The Master Plan team explored concepts for future campus development. The options explored urban design, land use organisation, open space and landscape structure, circulation throughout the campus for vehicles, pedestrians and cyclists, as well as analysing potential options for community engagement.
Analysis of the campus infrastructure network and existing conditions observed in phase 1 assisted the development of conceptual options for the campus.

Final documentation of the Master Plan (Page 60)

- Articulated vision for the campus
- Defined a structure and roadmap for future development
- Outlined a landscape strategy and framework plan for the campus

1.3 MASTER PLAN PROCESS

The Master Plan plan was fundamentally developed over a 6 month period, beginning in June 2018. The planning process consisted of three stages: Discovery & Observation, Conceptual Options and analysis and Documentation.

1.3.1 STAKEHOLDER CONSULTATION

The Master Plan process involved comprehensive stakeholder consultation which included University and community stakeholders. The process involved individual and group meetings and interviews, workshops, student urban design studios, surveys and community presentations. Process of the Master Plan was published on JCU's website.

The following stakeholder groups participated in the process:

_Advance Cairns CEO
_Cairns Campus Master Plan 2019 Project Control Group
_Cairns Chamber of Commerce
_Cairns Mountain Bike Club
_Cairns TAFE
_Cairns Regional Council Mayor & Local Councilor
_Cairns Regional Council Transport, Infrastructure and Development Staff
_Cairns Regional Council Planning & Environment
_Deans of University Colleges, Institutes and Centres Groups
_University Vice Chancellor
_University Deputy Vice Chancellors
_University Chair of the Academic Board
_University Estate Directorate
_Local Traditional Owners
_University Librarian & Staff
_UniLodge
_Principal of Smithfield State High School
_Queensland State Department of Transport and Main Roads
_Queensland Department of State Development, Manufacturing, Infrastructure & Planning
_JCU Cairns Campus Students & Staff
_Queensland Health Cairns Hinterland Health and Human Services
_JCU Cairns Campus Founders

The process included workshops with University stakeholders broken into the following groups:

_Place-Making & Student Life
_Landscape, Environment & Sustainability
_Circulation & Infrastructure

LEGEND

1 'GREEN CONCOURSE'
2 RING ROAD CONNECTING SPINE
3 PLACE-MAKING LANDSCAPE
4 TRANSFORMATIVE PROJECT
5 BOULEVARD
6 UNIVERSITY GREEN

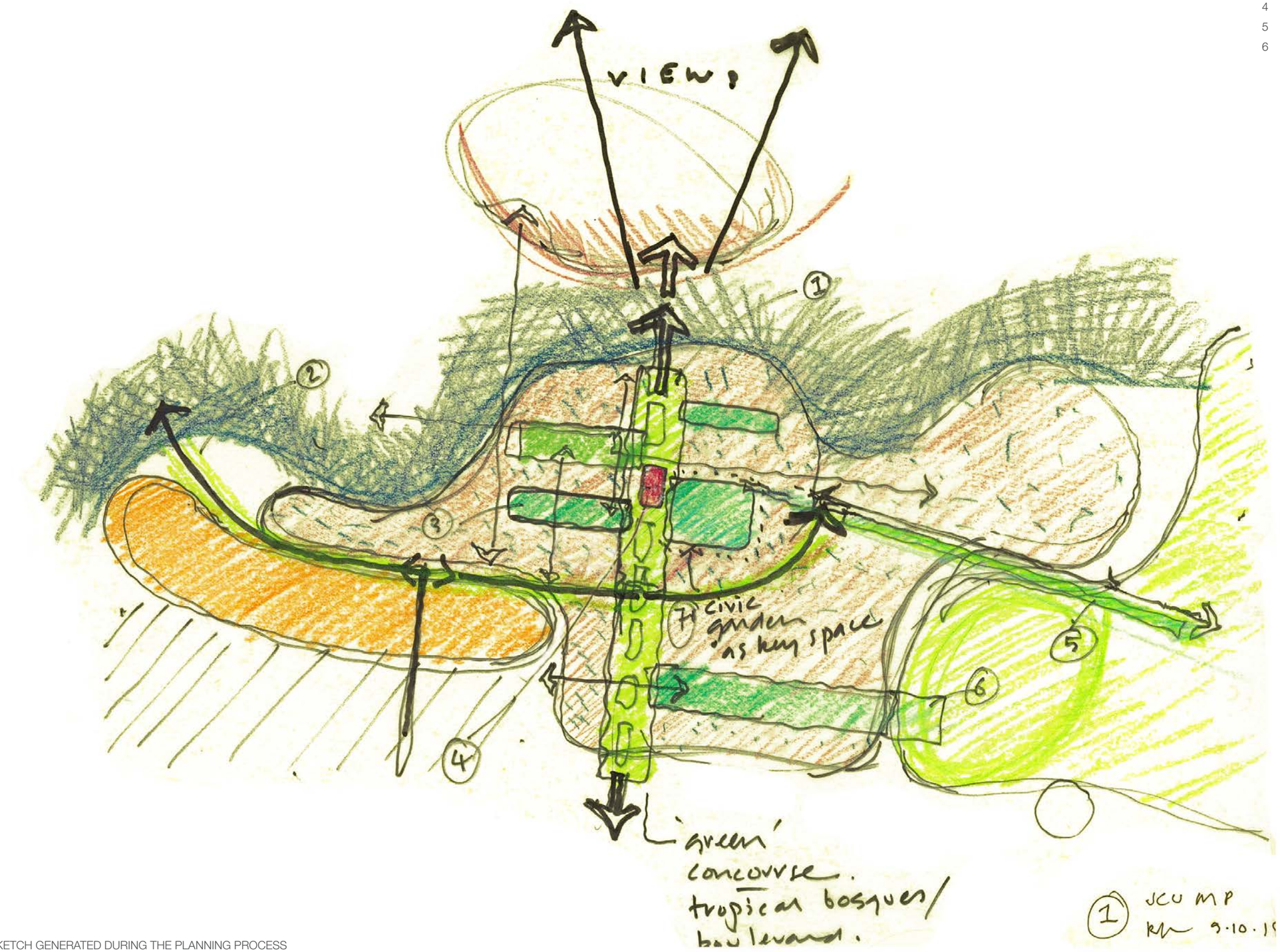


FIGURE 1.5: CONCEPT SKETCH GENERATED DURING THE PLANNING PROCESS

FIGURE 1.6

FIGURE 1.7

FIGURE 1.8

FIGURE 1.9

FIGURE 1.6_JCU Founders Meeting
FIGURE 1.7_Interview with Cr Jesse Davidson, CRC
FIGURE 1.8_Community Presentation
FIGURE 1.9_User Group Workshop

MISSION AND ACADEMIC PRIORITIES

The University is a global institution with a national and international focus. The existing campus and building structure reflects traditional academic silos with autonomous space. There are opportunities to improve the campus to better support interdisciplinary collaboration among colleges.

SUSTAINABILITY

The beautiful setting of the campus could be further enhanced by a strong sustainable focus. Sensitive water urban design strategies (SWUD) and initiatives around Atika creek have the potential to create new educational options for staff and students, as well as the Cairns community. Existing JCU groups, such as TropECO and the Tropical Urbanism and Design Lab (TUDLab) are developing additional community groups to address sustainability across the campus.

CAMPUS LIFE

The vibrancy and activity on the JCU Cairns campus was a popular topic, focussed around the immense potential of facilities JCU could offer staff and students. Outdoor covered, multi-purpose spaces to allow for gathering, active play, student life activities and amenities, along with programmed activities are needed to create a stronger sense of campus community. The University has established the goal to grow the residential population to 900 beds to increase student density and facilitate campus life.

CHARACTER & IDENTITY

The campus would benefit from a cohesive identity, campus heart, unifying architecture, or strong sense of place. The sense of place and beauty of the surrounding wet tropical rainforest environment can be celebrated and engaged with more as a campus. The Master Plan creates the opportunity to improve the relationship between buildings and landscape, and to better define open spaces, the campus heart and the connections between.

The campus would benefit from a stronger engagement with the traditional owners and local indigenous community to create a campus of knowledge and unique heritage and place. Engagement suggested within the Master Plan should be read in conjunction with the University's Reconciliation Action Plan.

BUILDINGS & SPACE

Some of the original campus buildings have been noted as out-dated, energy inefficient and not entirely suited for current pedagogical models. Upgrades to some of the original building stock is a crucial requirement that the Master Plan addresses through modifications of A-precinct buildings as consolidation is a key focus of the Master Plan. Prioritising development within A-precinct should encourage density and consolidation within the campus core.

ACCESS & WAYFINDING

The campus does not have a clearly defined front door, and wayfinding can be difficult. Overall, there is a need to improve pedestrian and vehicular circulation as well as connections with other neighbouring community facilities. Because of the harsh wet tropical summer climate, the indoor pedestrian network is critical and must be integrated with the outdoor network. The campus currently has an extensive covered walkway network that provide a consolidated pedestrian flow, allowing spontaneous interactions to occur.

1.4 STAKEHOLDER FEEDBACK THEMES

A number of planning themes arose from the stakeholder consultation process, the analysis of the campus conditions, University Plan (2018-2022) and Academic Plan (2018-2022). The themes include:
_ Landscape
_ Mission and Academic Priorities
_ Sustainability
_ Campus Life
_ Character and Identity
_ Buildings & Space
_ Access & Wayfinding

The consultation process highlighted a desire for enhanced engagement between the community, industry partners and the University.

Overarching campus opportunities and challenges highlighted throughout the University's community feedback are listed below and provide inspiration for Master Plan initiatives.

OPPORTUNITIES:
_ Compact, mostly walkable campus
_ Unique tropical landscape setting
_ Sufficient infrastructure for growth
_ Cairns is a tourism destination
_ Existing A-Precinct buildings can be readily modified
_ Robust covered walkway system

CHALLENGES:
_ Lack of central memorable space
_ Lack of breakout spaces for groupwork/socialising
_ Buildings lack tropical identity
_ Buildings perform poorly in terms of energy and spatial quality
_ Limited public transport
_ Distance from CBD*
_ Lack of sense of arrival
_ Lack of strong landscape identity on campus
_ Campus overwhelmed by surface car parking
_ New build funding more available than funding for refurbishment works
_ Wet season weather conditions

*Also an opportunity

LANDSCAPE

The existing campus landscapes are generally comprised of groundcover planting species with some larger trees and a mix of hard and soft surfaces. Shade trees with significant canopy growth are minimal. Opportunities for seating within the landscape are underutilised due to lack of shade which is not conducive with outdoor interaction in a tropical landscape. There is potential for the campus to enhance its tropical identity and provide shade through landscape.

The arboretum walk along Atika creek provides information on some natural features of the ecosystem and is a positive addition to the campus, allowing staff and students a natural entrance experience, or a retreat away from work or study.

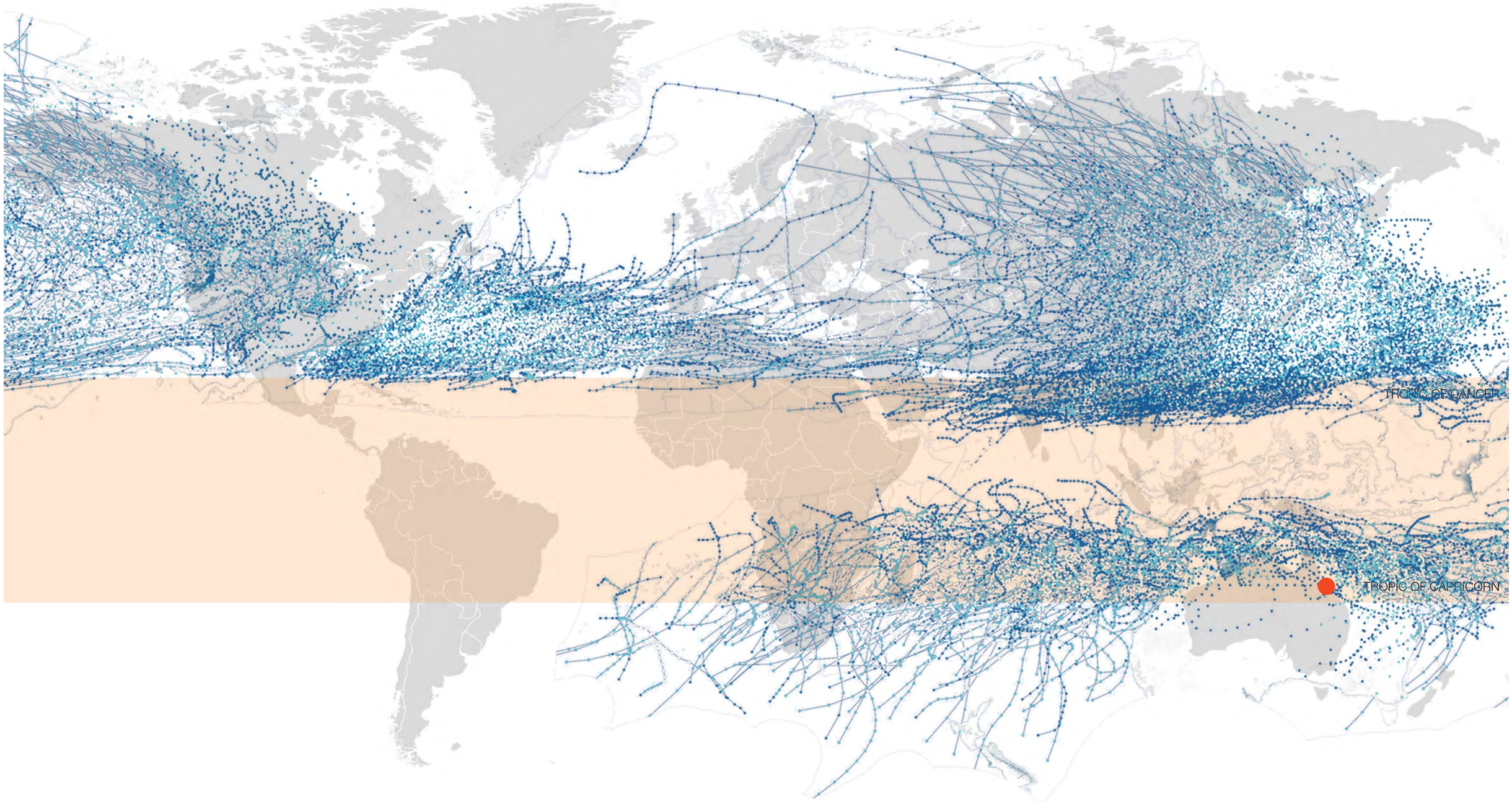


FIGURE 2: GLOBAL CYCLONIC CONTEXT

JCU is a vibrant institution offering excellence in teaching and research across multiple campuses."

02 CONTEXT

Contextual analysis of existing conditions is vital to understand the factors influencing and impacting the JCU Cairns campus. The conditions are analysed from a global scale, through to regional and local scale to identify key opportunities and challenges the JCU Cairns Campus Master Plan 2019 should consider.

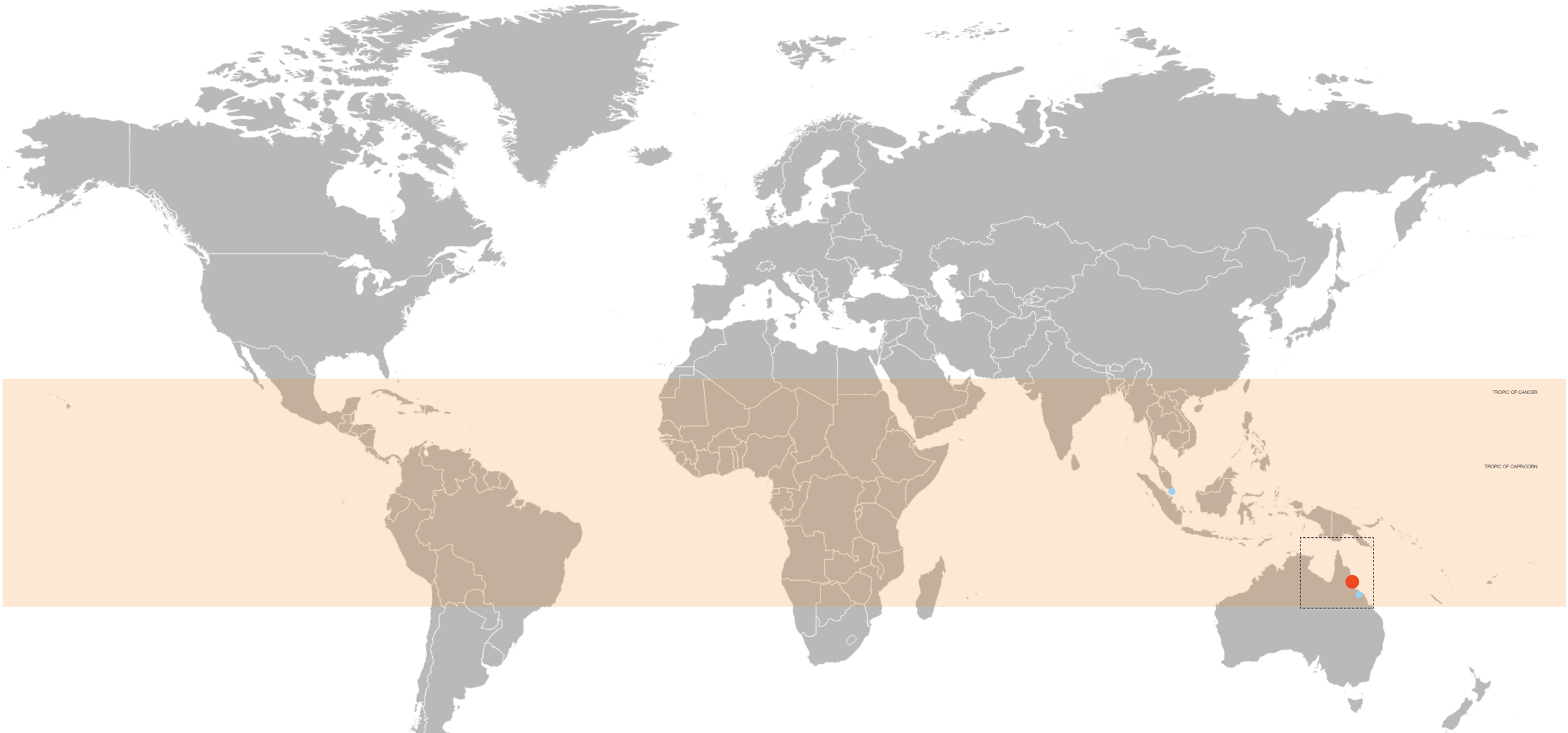


FIGURE 2.1: CAIRNS IS LOCATED WITHIN THE GLOBAL TROPICAL ZONE
JCU TROPICAL CAMPUS LOCATIONS: CAIRNS
JCU TROPICAL CAMPUS LOCATIONS: SINGAPORE & TOWNSVILLE

"The Tropics is our place: a vast geographic area that Aristotle called the Torrid Zone. Our three campuses are complemented and extended by regional and remote study centres and research stations"

UNIVERSITY PLAN (2018-2022), 'Our Strategic Intent'

2.1 GLOBAL

FIGURE 2.1.1: SOUTH-EAST ASIA REGION
JCU has a successful campus located in Singapore

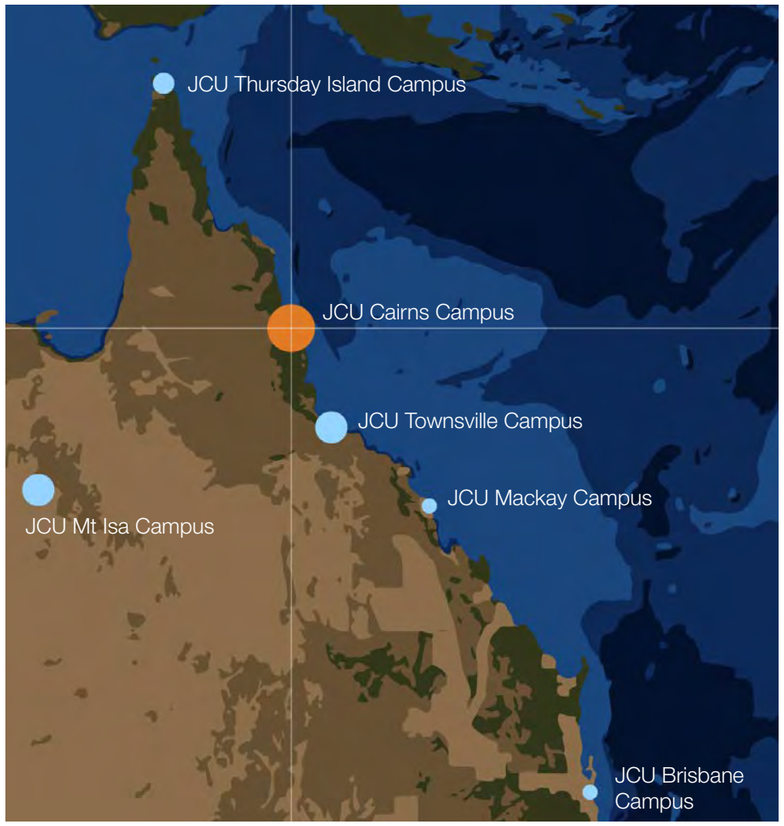


FIGURE 2.1.2: QUEENSLAND REGION
JCU has campuses located across Queensland including Cairns, Townsville, Brisbane, Mount Isa, Mackay and Thursday Island.

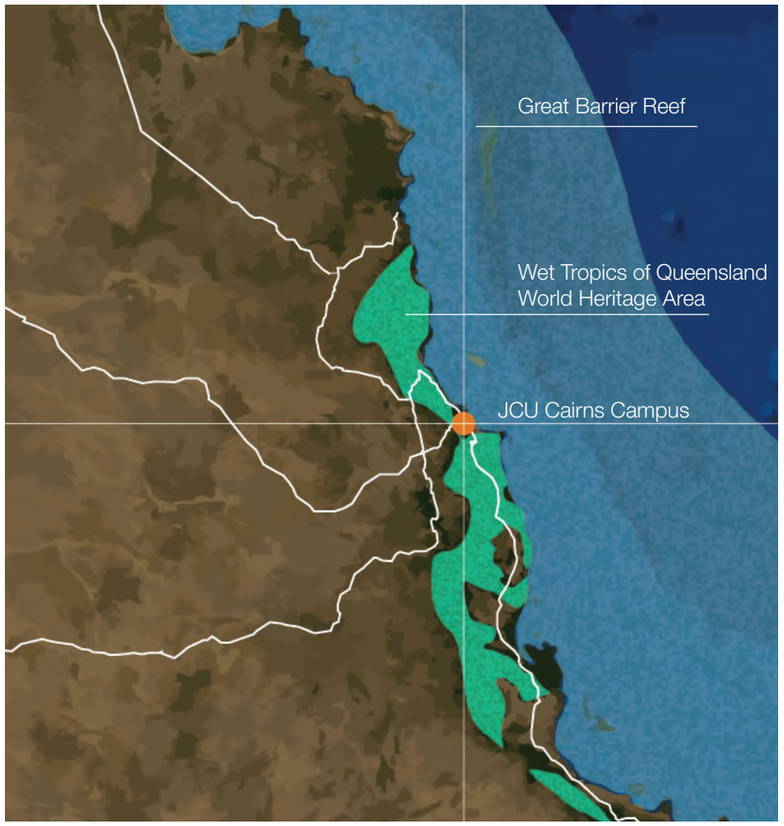


FIGURE 2.1.3: TROPICAL NORTH QUEENSLAND REGION
JCU Cairns Campus is uniquely located between the world heritage listed areas, the Great Barrier Reef and the Wet Tropics of Queensland.

"CAIRNS AIRPORT IS THE CLOSEST ENTRY POINT INTO QUEENSLAND FOR BOTH ESTABLISHED AND EMERGING SOURCE MARKETS IN ASIA", PROVIDING AN OPPORTUNITY FOR AN INCREASE IN INTERNATIONAL STUDENTS AT JCU CAIRNS.

CRC, STRATEGIC INDUSTRY SECTORS

"CAIRNS IS ONE OF AUSTRALIA'S MOST POPULAR CHOICES FOR STUDY TOURISM AND INTERNATIONAL EDUCATION IS WELL PLACED TO BECOME ONE OF [CAIRNS] CITY'S LEADING ECONOMIC DRIVERS"

CAIRNS MAYOR: CR BOB MANNING OAM, 2017, STUDY CAIRNS

JCU GLOBAL RANK:

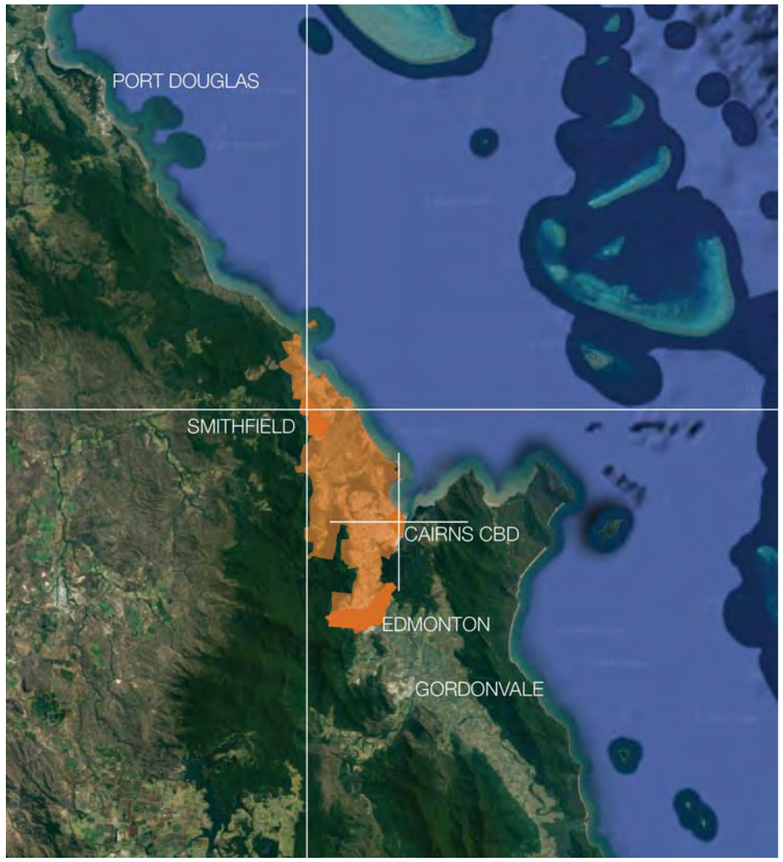
TOP 2%

JCU IS RANKED IN THE TOP 2% OF UNIVERSITIES IN THE PRE-EMINENT GLOBAL RANKINGS SYSTEM, THE ACADEMIC RANKING OF WORLD UNIVERSITIES.

ARWA 2016

JCU NO. 1 IN THE WORLD FOR MARINE & FRESHWATER BIOLOGY + NO. 2 FOR BIODIVERSITY OBSERVATION

2017 CWUR



CAIRNS REGION

CAIRNS FOCAL CITIES

FIGURE 2.1.4: CAIRNS CATCHMENT

Cairns has a catchment area stretching up to Port Douglas and beyond to Far North Queensland and the Torres Strait Islands.

“Cairns is the major commercial, business and service centre for FNQ, Cape York, The Gulf of Carpentaria and Papua New Guinea. Cairns accommodates key regional infrastructure such as an international airport, seaport, HMAS Cairns naval base and a campus of James Cook University.”
Far North Queensland Regional Plan 2009-2031

GREEN ZONE (CONSERVATION, RURAL, OPEN SPACE)

AIRPORT

CBD

FIGURE 2.1.5: CAIRNS DEVELOPMENT

Cairns is a linear city, sandwiched between the Wet Tropics of Queensland to the west, and the Great Barrier Reef Marine Park to the east; Two World heritage listed areas.
The large amount of conservation areas, rural zoning and open space zoning limits the amount of available land for development and growth.
Smithfield is especially ‘land-locked’ between the green zones, and is dislocated from the Cairns CBD due to the large green belt.

FIGURE 2.1.6: CAIRNS TRAVEL DISTANCES

JCU Cairns campus in Smithfield is between a 22-30 minute drive, sometimes longer in heavy traffic. This isolation from the CBD is a challenge that the campus will need to overcome through building density around the Smithfield area.

2.1 REGIONAL

FIGURE 2.1.7: TRAFFIC NETWORK

JCU Cairns campus in Smithfield features a long 1km highway frontage. The Captain Cook highway is a significant challenge for JCU Cairns as it divides the adjacent communities from the campus and restricts seamless connectivity. The proposed Smithfield Bypass reduces the campus highway frontage and restricts the visibility of the campus entrance. The Bypass aims to reduce travel times between Smithfield and Cairns City.

The Master Plan suggests a pedestrian/cyclist overpass linking the University with the adjacent communities across the Captain Cook Highway should help to alleviate the impacts of the bypass. The overpass should also provide JCU with significant signage potential.

Refer to Appendix F for further infrastructure analysis.

FIGURE 2.1.8: SURROUNDING FACILITIES

The JCU Cairns campus in Smithfield is in close proximity to sporting fields and local schools, the closest being Smithfield State High School. The relationship between JCU and Smithfield State High School exists within the Tropical North Learning Academy where two excellence programs are currently in place: the Global Tropics Future (GTF) (STEM enrichment and enhancement opportunities for students) and the James Cook University Learning Academies (to include Trinity Beach State School).

The nearest shopping centre for the region is the Smithfield Shopping Centre, where the two major grocery stores are collocated, along with various other businesses. JCU Cairns is surrounded by attractions for international visitors and students. These include the world class mountain bike tracks, the bungee (AJ Hackett), Cairns Wake Park, Skyrail Rainforest Cableway, Tjapukai Aboriginal Cultural Park and the Cattana Wetlands.

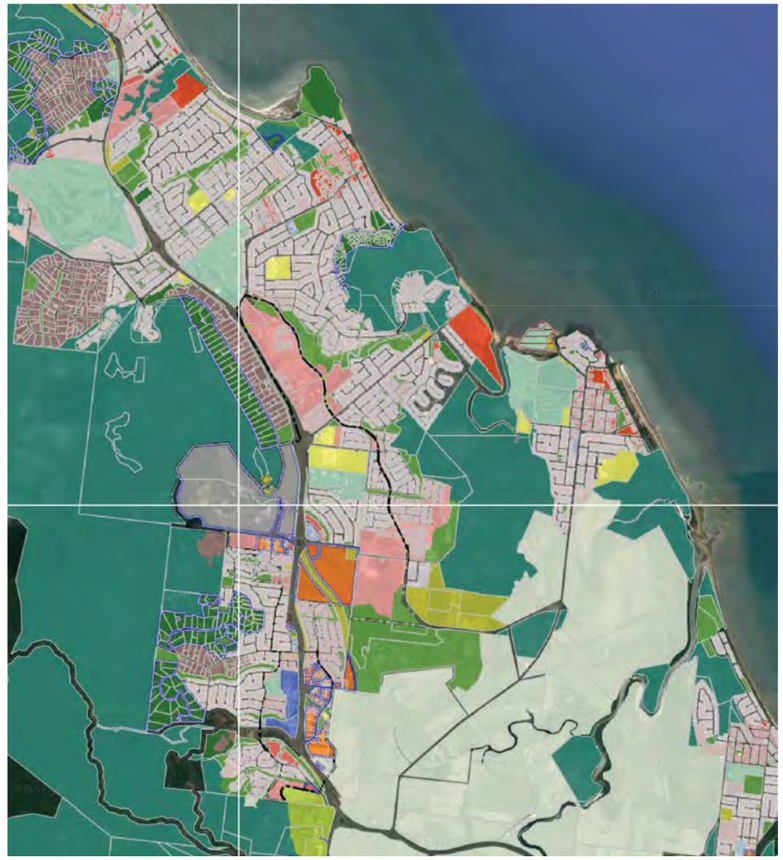


FIGURE 2.1.9: CAIRNS REGIONAL COUNCIL CITY PLAN

The zoning around JCU Cairns campus in Smithfield is generally low density residential, with some mixed use and student accommodation. On a regional scale, there is a significant amount of land zoned for conservation, open space and rural.

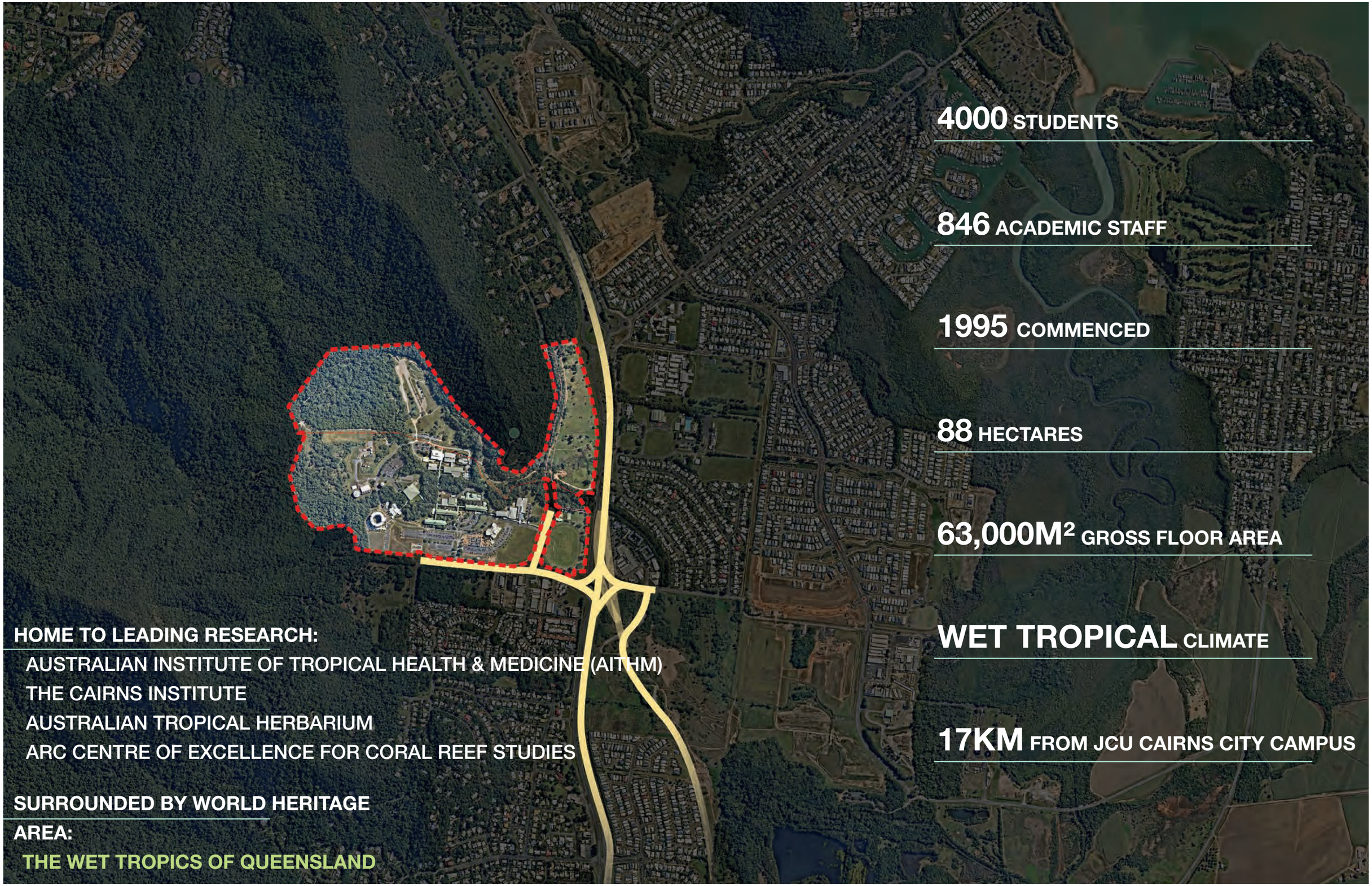


FIGURE 2.1.10: JCU CAIRNS SITE SUMMARY

FIGURE 2.1.11: AERIAL IMAGE OF THE JCU CAIRNS CAMPUS, SMITHFIELD (19, AUGUST 2019)

FIGURE 2.2: VIEW FROM TOP LEVEL OF JCU CAIRNS STUDENT ACCOMMODATION - JOHN GREY HALL OF RESIDENCE

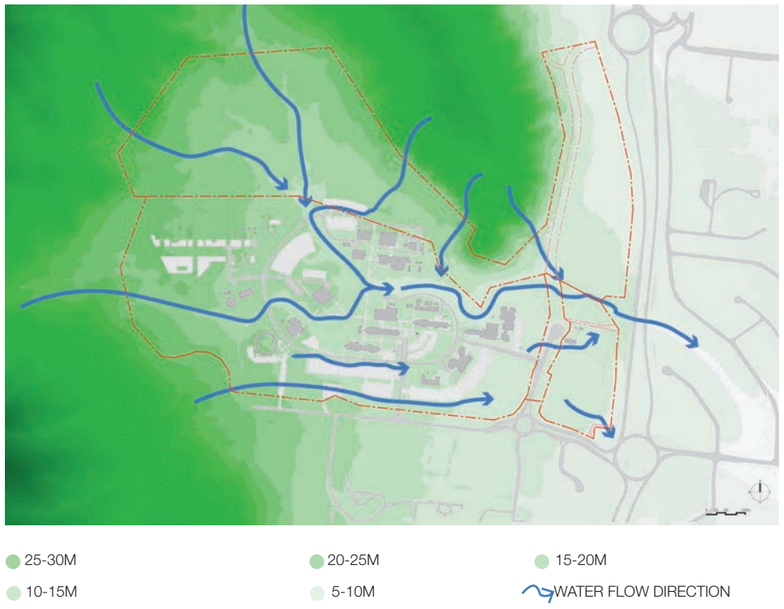
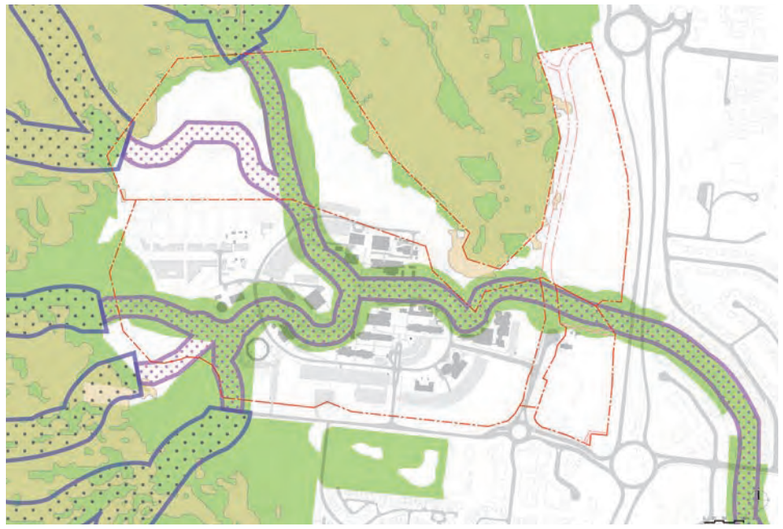


FIGURE 2.2.1 - TOPOGRAPHY & HYDROLOGY

Topography information sourced from JCU CAD model.

2.2 SITE

The existing JCU Cairns campus is compact and features an expansive network of covered walkways, protecting the campus users from the tropical weather conditions. The natural features surrounding the campus provide an impressive backdrop to the campus and allow for campus integration with the tropical landscape.



POTENTIAL LANDSLIP HAZARD
BIODIVERSITY AREAS
NON-URBAN WATERWAY 'A' TRIGGER
URBAN WATERWAY TRIGGER (CRC) REGULATED VEGETATION (CATEGORY R) (STATE)

FIGURE 2.2.2 - NATURAL AREA CONSTRAINTS

JCU Cairns has a significant constraint and opportunity throughout the campus - Atika Creek. Despite the division it creates, Atika creek provides a unique shaded zone for campus users to retreat, study or socialise.

The non-urban and urban waterway triggers apply to any development within that zone that is not consistent with the 2010 Master Plan and ministerial designation. It is JCU's intent to maintain a 15m offset from the creek on either side to preserve the creeks natural ecosystem. Future development on the JCU Cairns Campus will need to be referred to the State Government. Refer to Appendix G for State Mapping Overlays within the Town Planning Report.

Information sourced from the State Planning Policy and Cairns Regional Council Interactive Mapping System.

BASED ON AVERAGE WALKING SPEED OF 1.4 METRES PER SECOND

2.2.3 - WALKING DISTANCES

The existing Cairns campus in Smithfield is relatively compact and the large network of covered walkways provides protected and shaded circulation routes for campus users.

There is potential to densify the campus core within the 2 minute walking zone to reduce walking distance times between ends of the campus. Opportunities for upgrades to the covered walkway network were identified within the stakeholder consultation process and include music integration and acoustic treatments to improve reduce reverberation.

LIBRARY
SPORTS / RECREATION
LECTURE THEATRE
STUDENT LIFE
TEACHING
SUPPORT & SERVICES
COMMUNITY / INDUSTRY
RESEARCH
STUDENT ACCOMMODATION
CHANCELLERY

FIGURE 2.2.4 - BUILDINGS BY USE & STUDENT LIFE

The existing building uses are scattered across campus, creating a challenge for University colleges as staff are increasingly dispersed.

Student life facilities are also scattered around the periphery of the campus, reducing the student density within the centre of the campus. To strengthen the density and vibrancy of the campus, student life activities and amenities should be focussed around the campus heart.

Enhancements in the landscape within the campus heart that create shade should provide comfortable and welcoming areas for informal learning or social interactions between staff and students. to occur.

CAMPUS ENTRY SIGNAGE

ACCESS ROAD

RING ROAD EAST

OFF-SITE CAR PARKING OFF MCGREGOR ROAD

❶ JCU ENTRANCE SIGN AND FLAGS
❷ MCGREGOR ROAD ENTRANCE
❸ PANGUNA STREET ENTRANCE
SITE CIRCULATION
PRIMARY ACCESS
PRIMARY CYCLE ACCESS

FIGURE 2.2.5: CAMPUS ENTRANCES

PRIMARY COUNCIL ACCESS ROAD
ROAD ADEQUATE FOR CAMPUS CAPACITY
ROAD UNDERSIZED AT 5M WIDE IN PARTS
DIRT ROAD
SERVICE ROAD

FIGURE 2.2.6: VEHICULAR CIRCULATION

EXISTING BIKE PARKING FACILITIES - UNDERUTILISED

EXISTING BIKE PARKING FACILITIES - SHADED AND WELL UTILISED

KEY PLAN

FIGURE 2.2.7: CAMPUS PARKING NETWORK

2.2 SITE

2.2.5 CAMPUS ENTRANCES

The current entry experience at the JCU Cairns campus could be significantly enhanced with landscape to signify the arrival at a unique tropical university campus. The continuation of tropical landscaping along McGregor road to Access Road could further assist in creating a memorable entry statement.

A second entrance to the campus was introduced with the construction of Panguna Street bus station, including the upgrades to Panguna street bicycles paths. The transit upgrades have created a popular pedestrian and cyclist entrance to the campus.

2.2.6 VEHICULAR CIRCULATION

Vehicular circulation plays a key role in campus wayfinding, campus identity and arrival. There is significant potential for tropical tree-lined streets throughout the campus to enhance the wayfinding and micro-climate of the campus.

At a 5m width, the Ring Road are undersized and not suitable for two-way traffic without significant control measures such as the 20km/h speed limit and regular traffic calming measures. Upgrades to the ring road (e.g. widening) are required for future campus growth.

This is an opportunity for shaded pedestrian, cyclist and vehicle friendly streets that enhance user experience, but also shade the road and reduce the heat island effect that exposed hard surfaces can create.

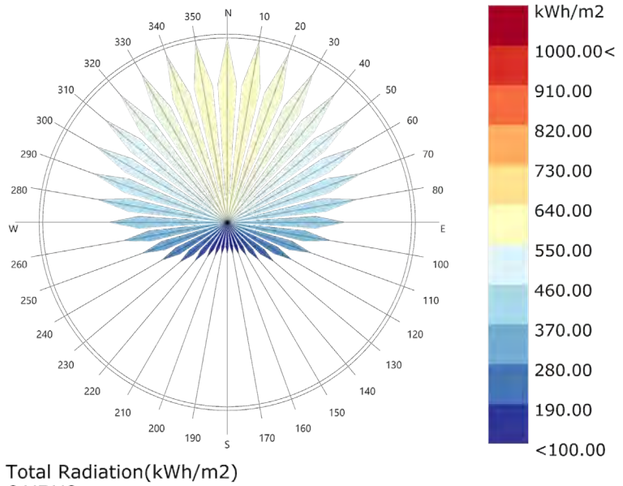
2.2.7 CAMPUS PARKING NETWORK

On-grade car parking dominates the JCU Cairns campus and creates a sense of arrival similar to that of a shopping centre. Convenient dispersed car parking throughout the campus can reduce from the potential foot traffic and density desired through the campus core.

For future growth, vertical car parks are proposed to consolidate on-grade surface carparks and maximise land utilisation for more appropriate uses for the University and its community.

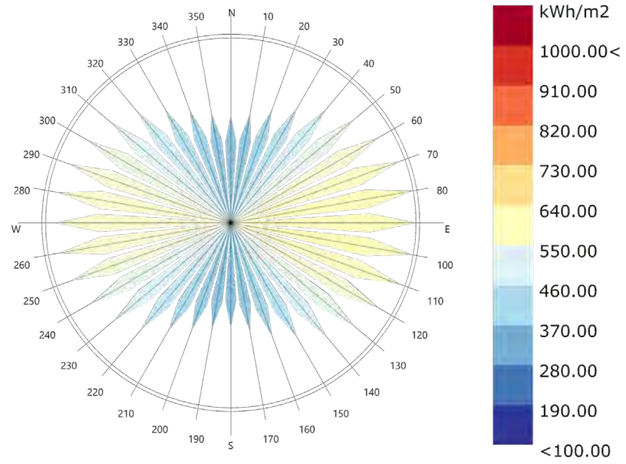
To mitigate off-site car parking in undesirable locations off McGregor road, it has been suggested that JCU engage with Cairns Regional Council about some street carparking along McGregor Road.

Bicycle parking is provided throughout the campus and is in good condition, however, most are exposed to weather. An increase in protected bicycle parking facilities would be of benefit.



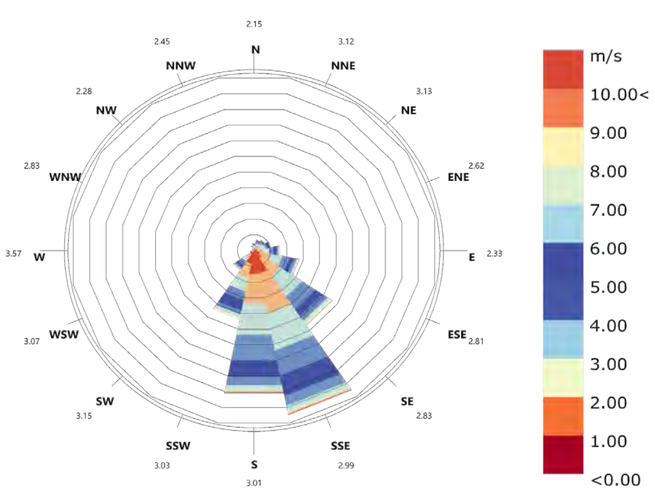
Total Radiation(kWh/m2)
CAIRNS
1 MAY 5:00 - 30 SEP 20:00

FIGURE 2.3.1: SOLAR RADIATION - WARM DRY SEASON



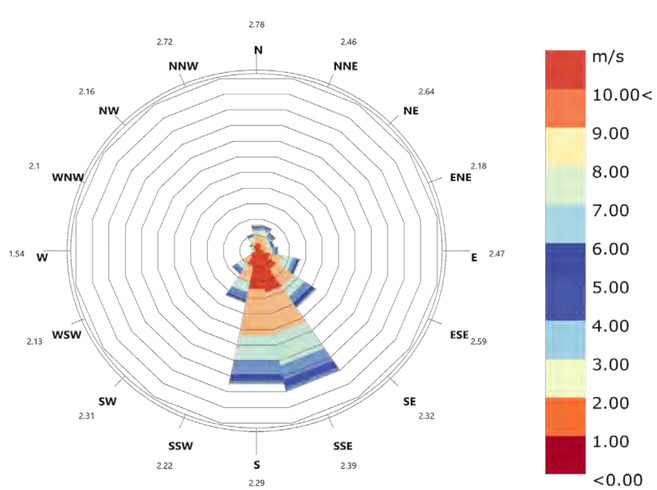
Total Radiation(kWh/m2)
CAIRNS
1 OCT 5:00 - 30 APR 20:00

FIGURE 2.3.2: SOLAR RADIATION - WET SEASON



Wind-Rose
CAIRNS
1 MAY 5:00 - 30 SEP 20:00
Hourly Data: Wind Speed (m/s)

FIGURE 2.3.3: WIND ANALYSIS - WARM DRY SEASON



Wind-Rose
CAIRNS
1 OCT 5:00 - 30 APR 20:00
Hourly Data: Wind Speed (m/s)

FIGURE 2.3.4: WIND ANALYSIS - WET SEASON

2.3.1 CAIRNS CLIMATE CONTEXT

The JCU Cairns campus in Smithfield should continue to celebrate its beautiful setting and create comfortable outdoor spaces for its users to gather and engage in the surrounding environment.

Cairns has a wet tropical climate where the seasons are identified as a wet, hot and humid monsoon season (summer) and a warm dry season (winter).

The prevailing winds are South to South-Easterly, with the strongest winds most frequently occurring during April and August.

Dominant solar radiation comes from the East in the wet season and North-East in the dry season.

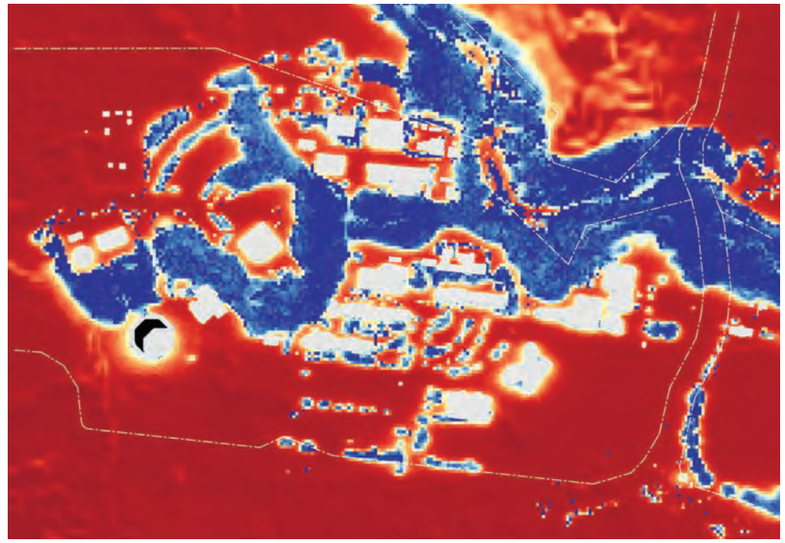


FIGURE 2.3.5: SOLAR RADIATION ANALYSIS

*Weather Source: NatHERS Climate and Weather files (Compiled from BOM data)
http://www.nathers.gov.au/nathers-accredited-software/nathers-climate-zones-and-weather-files

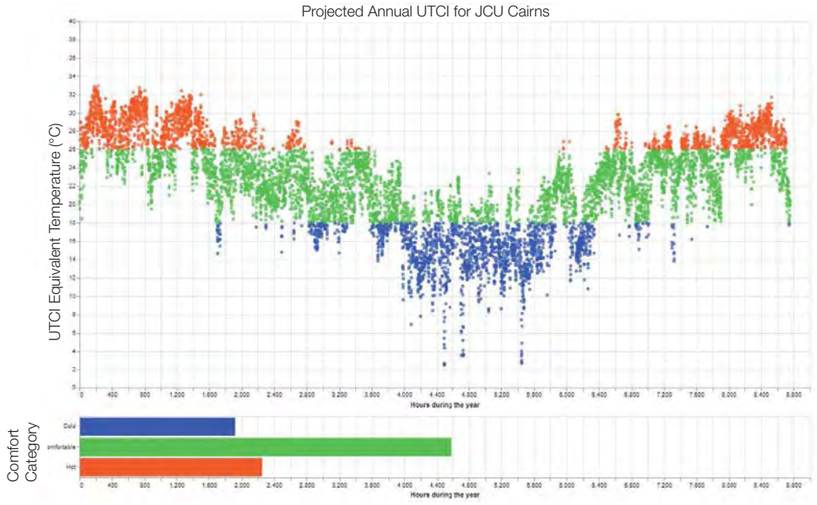


FIGURE 2.3.6: UTCI COMFORT CHART - CURRENT CLIMATE

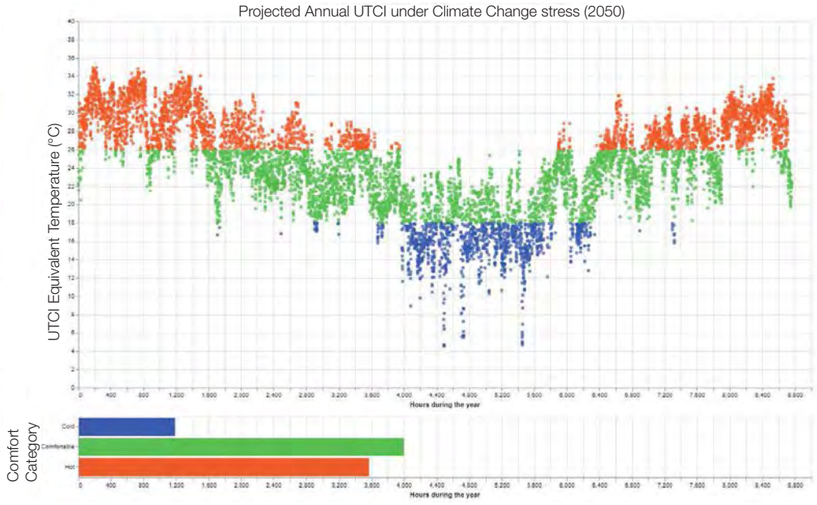


FIGURE 2.3.7: UTCI COMFORT CHART - CLIMATE CHANGE 2050

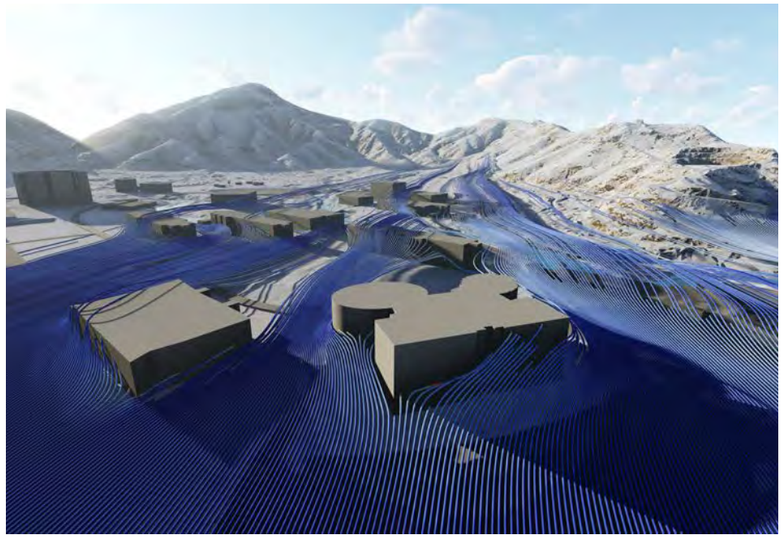


FIGURE 2.3.8: COMPUTATIONAL FLUID DYNAMICS - WIND ANALYSIS

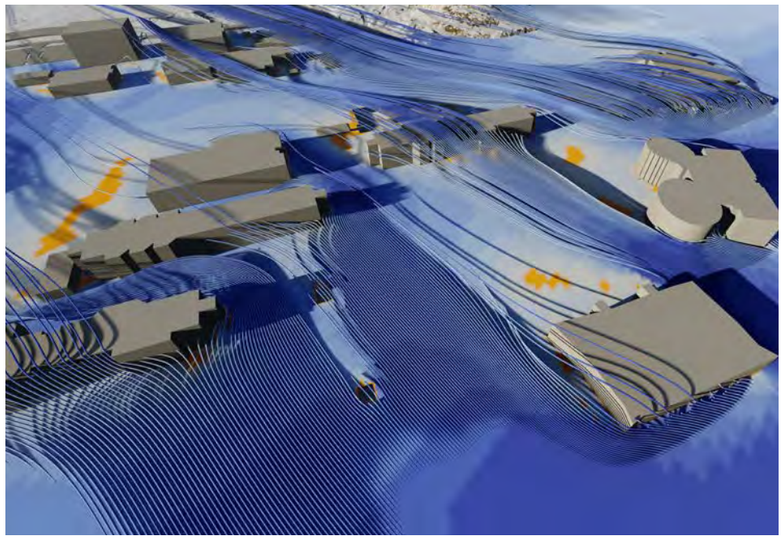


FIGURE 2.3.9: COMPUTATIONAL FLUID DYNAMICS - WIND ANALYSIS

2.3 CLIMATE

2.3.2 MICROCLIMATE ANALYSIS

As part of the Cairns Campus Master Plan 2019 (The Master Plan), microclimate analysis was undertaken to highlight areas of concern and opportunities for future planning.

Microclimate analysis combines extensive weather data with advanced analysis processes which can assist and inform design thinking.

The analysis highlights problem areas where buildings obstruct airflow. Buildings can be formed and positioned purposefully to enhance air movement, increasing velocity and comfort. The 'wind shadows' present opportunities for locating development parcels within the Master Plan.

The Universal Thermal Climate Index (UTCI) comfort chart allows for the analysis of thermal stress. The UTCI is a measure for human occupancy comfort based on a combination of meteorological inputs (Air Temperature, Radiation, Humidity, Wind) and a physiological model of an average human.

Urban form, density and materiality of a place/campus/city will affect thermal comfort.* This phenomenon is known as the urban heat island (UHI) effect. An understanding of this effect is critical to inform a well-design and comfortable campus in the tropics.

A key consideration for future planning and sustainability of the campus is climate change. Current projections for 2050 show average temperatures rising by 2 degrees, wind speeds increasing by ten per cent, solar radiation increasing by three per cent and humidity decreasing by one per cent.**

2.3.3 ANALYSIS OVERVIEW

Wind speeds within the range of 0.3m/s to 8m/s can greatly increase thermal comfort.

The orientation of current buildings obstruct airflow except for the position of A4 against A1. The stepped location allows for southerly breezes to penetrate the courtyard between.

North facing buildings receive the most solar radiation.

Comfortable spaces generally occur along the southern edge of buildings where there is adequate air movement.

SSE prevailing winds can be used to passively improve the comfort of open spaces when shaded correctly.

UTCI comfort analysis of the Cairns climate shows 52.4% of days falls within the thermal comfort zone (TCZ: 18-26°C).

Wind can be shaped by buildings to increase velocity, increasing comfort through:
- Building Form
- Building Proximity

*Urban Microclimate Analysis, Sustainable Cities and Societies 2015

**Climate Change in Australia, Australian Government Department of the Environment

2.3.4 UTCI MICROCLIMATE ANALYSIS - CURRENT CONDITIONS

The existing campus layout and building orientation is problematic in its creation of air movement shadows where there is little to no air movement. These air movement shadows, when combined with the urban heat island effect, create areas of heat stress on campus.

Asphalt and concrete decrease comfortable conditions by 15 per cent where as irrigated vegetation on site increases comfort by 25-30 per cent.

At present, campus outdoor public spaces are comfortable for only 55-65 per cent of the time.

The zones outlined in figure 2.3.10 demonstrate a lack of shade and adequate air movement, leading to the creation of heat stress zones. These heat stress zones are comfortable less than 40% of the time, as an annual average.

It is vital for any future developments on campus to mitigate air movement stagnation by increasing permeability at all lower levels.

Allow for breezeways by reorienting building form to the prevailing S/SSE wind direction.

To align with JCU sustainability goals, future development must first aim to maximise utilisation of existing buildings to minimise embodied energy.

All future development must consider the full potential of the climatic conditions to strive towards carbon neutrality and align with University Strategic plan targets.

FIGURE 2.3.10: UTCI MICROCLIMATE ANALYSIS - CURRENT CLIMATE CONDITIONS (2019)
YEARLY THERMAL COMFORT IN % OF COMFORTABLE DAYS

Potential further reduction of 15% in thermal comfort due to ground surface material

Insufficient shading along building edges resulting in a 30% reduction of thermal comfort

The data above was primarily focussed on the central core of the campus, therefore not all surface area of the campus was analysed. New developments should consider the effects built form, surface materials and shade, along with the Campus Urban Design Guidelines set out in section 8 of the Master Plan.

FIGURE 2.3.11: UTCI MICROCLIMATE ANALYSIS - CLIMATE CHANGE PROJECTION (2050)
YEARLY THERMAL COMFORT IN % OF COMFORTABLE DAYS

Reduction of 20-25% in thermal comfort due to ground surface material

The data above was primarily focussed on the central core of the campus, therefore not all surface area of the campus was analysed. New developments should consider the effects built form, surface materials and shade, along with the Campus Urban Design Guidelines set out in section 8 of the Master Plan.

2.3.5 UTCI MICROCLIMATE ANALYSIS - 2050 CLIMATE CHANGE

The Master Plan insists that all future developments are designed and constructed to handle the changing climatic conditions to support their longevity.

Current projections for climate change suggest a dramatic increase in discomfort for the campus, unless action is taken as a matter of urgency.

Action should be taken not only for new developments, but also for encouraging green transportation methods such as supporting a safe and connected bicycle network and comfortable, shaded pedestrian network.

If no action is taken urgently, the vulnerable region of the tropics, and the rest of the globe, faces significant impacts including increasing drought periods, a spike in the number of extreme heat days, increasing rainfall intensity and a rising number of extreme events like floods, cyclones and bushfires.*

The Master Plan aims to reinforce JCU's commitment to address climate change in signing up to the UN Sustainable Development Goals and set new benchmarks for a sustainable campus.

A strong focus on sustainability can foster innovation on campus between researchers, staff, students and the broader Cairns community to address the changing climate.

The temperature increase in the current conditions may reduce thermal comfort across the entire campus by 20-30 per cent.

If the current state of the campus remains unchanged. An increase of 2 degrees, as predicted, should result in very poor comfort conditions, and create uninhabitable zones across the campus.

The Master Plan development zones set up air movement corridors and prescribed built form rules to ensure adequate air movement for the future campus. Strategic tropical landscaping to shade exposed surfaces should also assist thermal comfort levels.

Building Cities for a Changing Climate, A.Hurlimann, G. Warren-Myers

2.1 Integrated Indigenous Knowledge Centre JCU Cairns
As part of connecting JCU's research focus with Indigenous education and knowledge, there is potential for the development of an Indigenous Knowledge Centre. An engaging space:

- For traditional knowledge holders to impart and enculturate language, customs and traditions with the younger generations;
- For intellectual exchanges between expert tropical landscape and climate knowledge - e.g. plight of the forest, ranger programs, fisheries, customary rights, development agendas & sustainability of communities;
- For sharing knowledge with all JCU staff, domestic and international students, and broader community members;
- To learn traditional Indigenous languages;
- To enhance professional career opportunities that relate to Indigenous people;
- To be a hub for the FNQ Indigenous community and relationships with industry people;
- For Indigenous leadership and thinktank gatherings; and
- Strong storyline from the white rock to the Great Barrier Reef - history of the evolution of the Great Barrier Reef (David Attenborough used this).

There is potential to enhance JCU's symbolic notion of Place with Indigenous traditions of Place and the reference points that extend from cultural links to the land to reference points in the stars.

There is potential for the Centre to be a point of interest for the domestic and international tourist en route to the north, west and east to the reef if there were ferry departure points at Palm Cove.

"The JCU Cairns Master Plan 2019 strives to achieve an engagement plan that is respectful of Indigenous people and their understandings of place, and to be inspired into a design process that delivers a campus environment for all campus users to find their special place at JCU"

Martin Nakata, Pro Vice Chancellor, Indigenous Education & Strategy

2.4 INDIGENOUS ENGAGEMENT

With over 48,000 Indigenous students north of Cairns, there is immense potential for JCU to provide quality education, student life and amenity to a larger population of Indigenous students.

The JCU Cairns Campus Master Plan 2019 suggests an Indigenous engagement plan to build on the strong existing relationship JCU has with the traditional owners. The stakeholder consultation process highlighted key ideas for future developments and enhancements to the campus, found below. The following suggestions should be read in conjunction with the JCU Reconciliation Action Plan:

1.0 A bespoke indigenous engagement program to be developed by JCU's senior Aboriginal and Torres Strait Islander staff members in collaboration with the Indigenous community.
_ The intent is to develop a relevant and contemporary engagement program that goes beyond the physical; and
_ The program would provide opportunities for knowledge throughout the campus for the Indigenous history of the site and the local community and could be showcased through landscape and urban design strategies.

2.0 Connect JCU's strong research focus with indigenous knowledge
_ There are more than 60 Traditional Owner groups in Far North Queensland region and they constitute 14% of the local population. The potential is there for JCU to be positioned strategically in the development of communities and the work to protect ancient cultural traditions and languages;
_ The UN has agreements among nation states on a list of protections for Indigenous intellectual property rights (e.g., Declaration on the Rights of Indigenous peoples, Convention on Biological Diversity, Nagoya Protocol, etc.). The potential is there for JCU to tap further into global relationships with Indigenous people in the Tropics and the UN;
_ Guides around the campus & potential Indigenous Trail connection and for time to be spent in Country (instead of walking on concrete); and
_ Opportunities for Indigenous histories of the site and the traditional communities to be demonstrated through landscape and urban design strategies.

3.0 Create a community for Indigenous Staff and Students
_ Attract the greater community by providing a sense of ownership and community on campus for staff and students to bring their families;
_ Provide childcare or creche facility for all campus users;
_ Increased social engagements space;
_ Engage with traditional landowners;
_ Increased security;
_ Job opportunities on campus (i.e. mentoring, hospitality, teaching, retail, research etc.); and
_ Residential solution opportunities for Indigenous students (i.e. catered student housing).

4.0 Whole of Life Learning
_ Outreach centre to share ancient knowledge and traditions;
_ Learning on Country, Caring for Country;
_ Engaging young people, building self-confidence, and future leaders; and
_ Alumni programs for social engagements and to engage JCU network of expertise to benefit Indigenous communities.

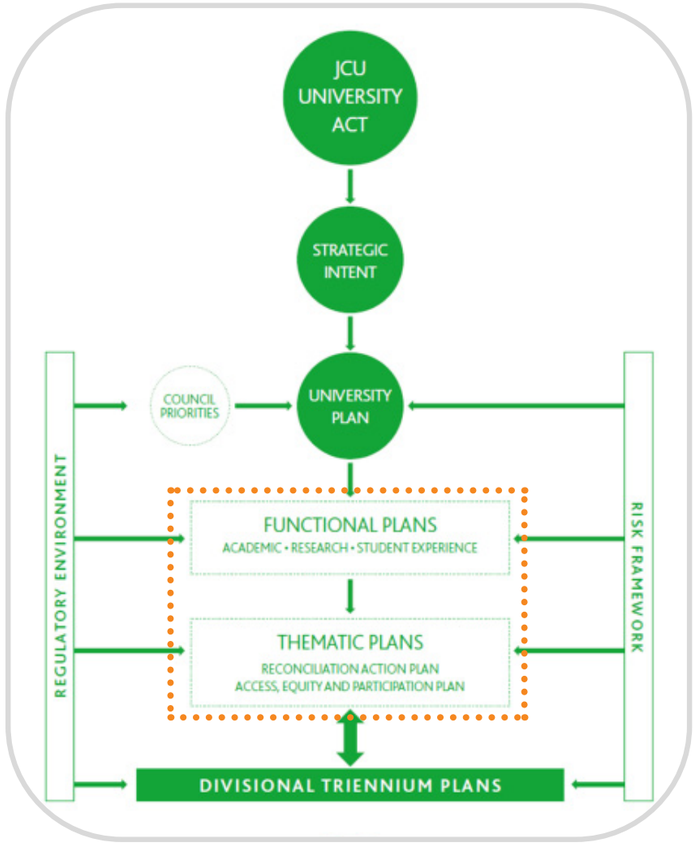


FIGURE 2.5.1: 2018-2022 JCU UNIVERSITY PLAN DOCUMENT HIERARCHY CHART

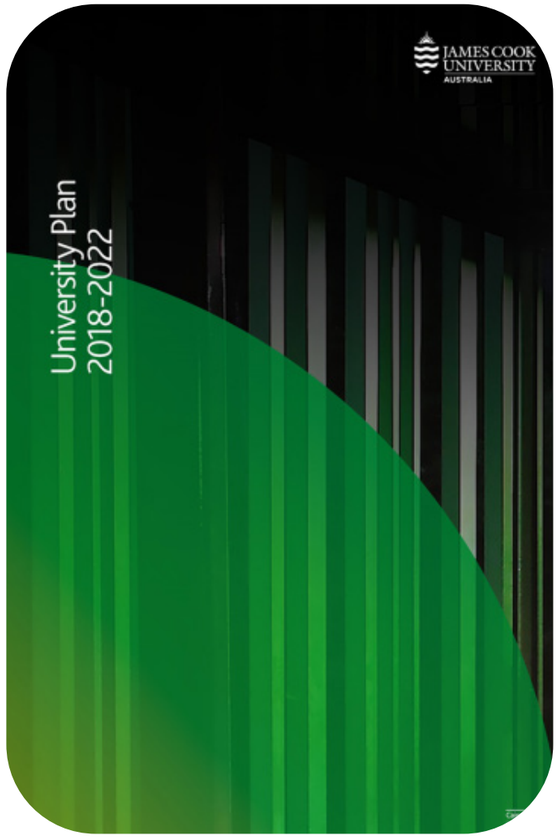


FIGURE 2.5.2: 2018-2022 JCU UNIVERSITY PLAN

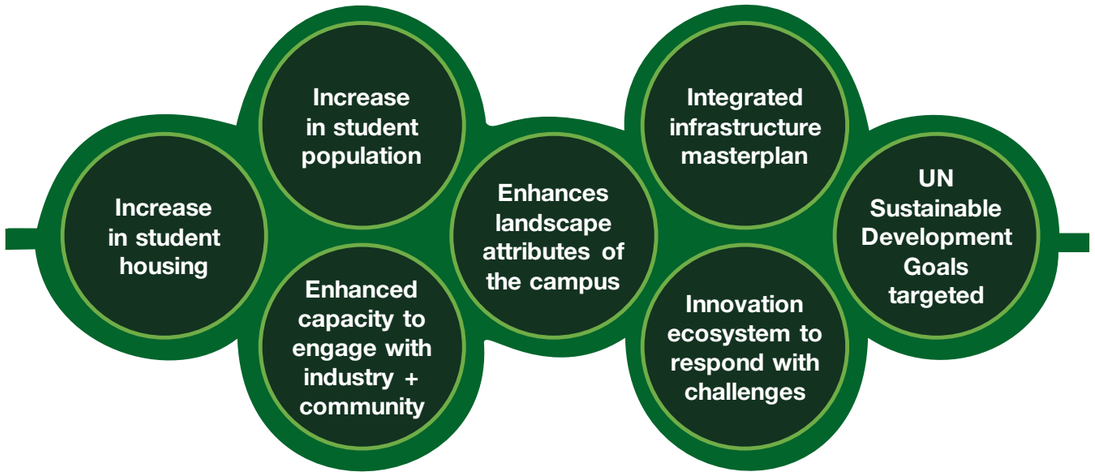


FIGURE 2.5.3: 2018-2022 JCU UNIVERSITY PLAN SUMMARY OF GOALS

2.5 PLANNING FRAMEWORK

The Master Plan was built upon the following recent university planning initiatives, publications and planning topics.

Key changes and impacts to the Cairns campus and the Master Plan are:
- 2010 Master Plan (August 2010)
- Several precinct studies produced in response to specific conditions/issues
- Establishment of the city campus (February 2017)
- University Plan 2018-2022
- Academic Plan 2018-2022
- Smithfield Bypass (ongoing)

2.5.1 UNIVERSITY PLAN (2018-2022)

The University Plan is recent and aligns with the Master Plan horizon. Critically, the existing 2010 Cairns Campus Master Plan pre-dates the University Plan.
The strategic intent of the University Plan is summarised below:

_Students are at the heart
_Comprehensive but focussed
_Place is powerful
_Diversity and Reconciliation
_Sustainability

The Functional Plans and Thematic Plans are key drivers for the Master Plan of the Cairns Campus. The Master Plan aims to deliver on the functional and thematic plans in physical terms.

The Cairns Campus Master Plan 2019 should be the physical enabler of the following University Plan identified challenges:

_improving the accessibility
_boosting engagement
_promoting the tropics

The University Plan Measures of Success become the key drivers for the Master Plan. These include:

_Increased commencing and total student load
_Improved student experience and student retention
_Improved participation of under-privileged students and Australian Aboriginal and Torres Strait Islander Students
_Improved satisfaction and opportunities for our workforce
_Attractive, functional and sustainable tropical campuses

Importantly, sustainability acts as the most significant driver for the Cairns campus and should influence all other drivers. This is because:

_Tropical regions may be significantly affected by climate change
_Climate is a major driver of the Tropics given the population growth and higher density population models currently utilised
_It is a JCU research and curriculum focus
_The University Plan targets the highest order of sustainability: UN Sustainable Development Goals. These should guide and influence the Master Plan.

FIGURE 2.5.4: JCU UNIVERSITY PLAN TARGETS THE UN SUSTAINABLE DEVELOPMENT GOALS

FIGURE 2.5.5: PARIS AGREEMENT

FIGURE 2.5.6: USGBC LEED

FIGURE 2.5.7: LEED CRITERION

2.5.2 UN SUSTAINABILITY DEVELOPMENT GOALS

By targeting the UN sustainable development goals, JCU acknowledges the importance of meeting these targets. Goal 13, in tandem with the Paris Agreement aims to limit the global increase of temperature to 1.5°C.* Australia's commitment to the Paris Agreement is to reduce carbon emissions by 50-52%**

The LEED Campus Guidance and the LEED Platinum certification is aimed at reversing the effects of climate change. (35% of credit points is on climate change alone).

It is suggested that JCU adopt a system that is similar to LEED Campus Guidance, which is a framework for sustainable planning. The Master Plan proposes that all new developments achieve the University's LEED targets to meet the UN Sustainable Development Goals.

*Paris Agreement, UNFCCC 2015

**Australia's 2030 climate change target, Australian Government Department of the Environment

2.5.3 ACADEMIC PLAN (2018-2022)

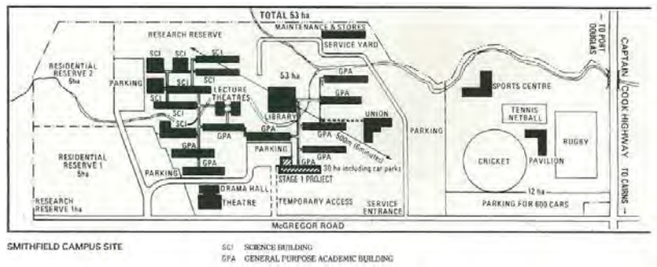
The JCU Academic Plan is a companion document to the University Plan and provides a direction for its teaching and research over the period of 2018 to 2022. The JCU Foundation Act outlines a clear role in delivering educational programs to benefit the region – namely the tropics and Northern Australia.

JCU acknowledges the rich culture of the Indigenous people with the JCU catchment having over 40% of Queensland's Aboriginal and Torres Straits Islander people. The Academic Plan acknowledges the challenges facing transformation of the workforce and the need for agility.

The Academic Plan outlines 3 Focus Areas:

1.0 Create and sustain opportunities for those living in the Tropics, to participate in further education and contribute to the community, global workforce and the attainment of the UN Sustainable Development Goals;
2.0 Inspire students and the wider community with the importance of the Tropics and underserved populations; and
3.0 Be a catalyst for innovation and connection, using international networks, research with impact and continuous learning opportunities to connect northern Australia to the global economy.

> *"We will remain 'human scale' but target opportunities for growth."*
>
> ACADEMIC PLAN (2018-2022), On growth & scale



1991

2012

FIGURE A1
CONCEPT PLAN

2010

2015

2.5.4 2010 CAIRNS CAMPUS MASTER PLAN

The 2010 Cairns Campus Master Plan is the nominated plan for the Ministerial Designation. Large zonal building/development sites have been identified, however, a further level of planning detail for implementation is required.

The document stated the following objectives:
_Parking consolidation
_Ring Road completion
_Commitment to high-density and reduced footprint of developed land
_Anticipated growth to 10,000 students by 2031
_New tree-lined boulevard
_Sports field “University Green”
_Exercise track “Green Arrow”
_Student accommodation (300 beds completed in 2018)

2.5.5 2012 CAIRNS CAMPUS PRECINCT PLANNING

The 2012 precinct planning study was commissioned to understand how the 2010 growth targets might be achieved, as well as exploring the potential of collocating a school on the Smithfield campus and the siting of The Cairns Institute and Dental Clinic.

Key Features:
_Development study into Community Enterprise Zone for a new school
_Signature buildings identified along new boulevard
_Pedestrian access and view corridor from McGregor Road roundabout into campus heart
_Removal of library development (from 2010)
_Increased surface grade car parking
_Aligns with new Panguna Street Bus Stop and Cairns Transit Network

2.5.6 2015 CAIRNS CAMPUS MASTER PLAN CONSIDERATIONS

The purpose of the 2015 Master Plan considerations document was to collate the precinct planning studies of previous years in the one plan.

Key Features:
_Development study into Community Enterprise Zone - Hospital
_Large green ‘vista’ from McGregor Rd roundabout to campus heart
_Consolidated car parking at campus perimeter (suggested multi-storey carparks)
_ERC & E-precinct planning studies included
_Potential Multi-storey car parks identified

CAIRNS CAMPUS OPENS
1987

CAIRNS UNIVERSITY CAMPUS PLAN DEVELOPED
1991

CAIRNS CAMPUS RELOCATES TO SMITHFIELD
1995

CAIRNS CAMPUS MASTER PLAN DEVELOPED
2010

CAIRNS CAMPUS MINISTERIAL DESIGNATION
2012

PRECINCT & ZONING STUDIES COMPLETED
2012-2015

JCU CAIRNS CAMPUS MASTER PLAN 2019
2018-2019

JCU CAIRNS CAMPUS MASTER PLAN UPDATES
2025, 2030, ...

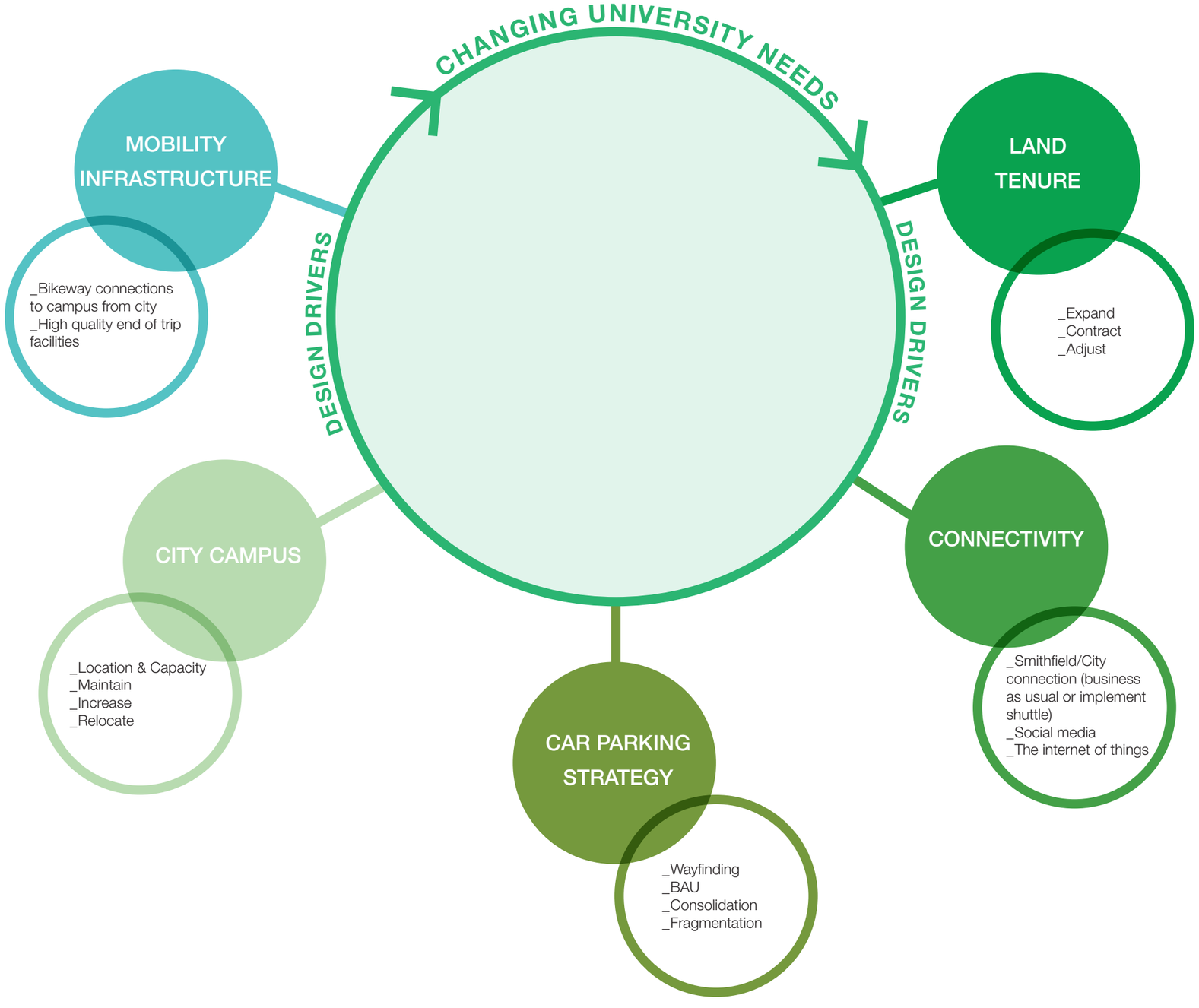


FIGURE 2.6: DESIGN DRIVERS DIAGRAM

2.6 DESIGN DRIVERS

Growth in campus gross floor area (GFA) isn't always in response to growth in student numbers but can also be in response to changing needs such as specific research facilities and the development of more sustainable and pedagogical responsive facilities.

The design drivers for the JCU Cairns Campus Master Plan 2019 should consider the changing needs of the University (Figure 2.4). An understanding of the design drivers influence development opportunities across the campus and allow for a focussed strategic direction for the JCU Cairns campus. These design drivers may also be impacted by contextual issues and University documentation as listed below.

2.6.1 ADDITIONAL SUPPORTING DOCUMENTATION

_1997 Certificate of Designation (Prior to Lot 13 acquisition)
_2002 Valuation of Lot 13 dated March 2002 (Acval)
_2005 James Cook University - Smithfield Campus Certificate of Designation
_2010 Cairns Campus Master Plan 2010 (FCG and Cox Architects)
_2011 Food and Beverage Master Plan (Brain and Poulter)
_2011 Statutory Framework Options Paper (FCG)
_2011 James Cook University Campus Wayfinding Package
_2012 Final Assessment Report - Ministerial Designation (FCG)
_2012 Minister for Education and Training Letter of 13 November 2012
_2012 Government Gazettal of Ministerial Designation (Lot 13 acquisition)
_2012 Eastern Academic Core Precinct Plan (Cox Architects)
_2014 E Precinct Planning Study (m3)
_2014 TSFC Siting study and plan (m3)
_2015 Sport and Recreation Master Plan Cairns Campus (SGL)
_2015 Space Utilisation Audit and Report (m3)
_2015 Strategic Asset Management Plan (Estate Directorate)
_2015 Aerial Photographs and LIDAR (10cm Lidar)
_2015 JCU Cairns Flood Study March 2015
_2017 Road Closure Application (RPS)
_2017 Cairns Innovation Complex Siting Study (Cox Architects)
_2017 Smithfield Bypass Project
_2017 JCU Development Assessment Framework (Milford Planning)
_2017 JCU Cairns Transport Survey - Cairns Summary
_2018 JCU Natural Asset Management Plan (DRAFT)

PERTINENT LEGISLATION AND PLANNING INSTRUMENTS

_James Cook University Act 1997
_JCU Statement of Strategic Intent
_JCU Design Guidelines
_JCU Academic Plan 2018-2022
_JCU Strategic Plan 2018-2022

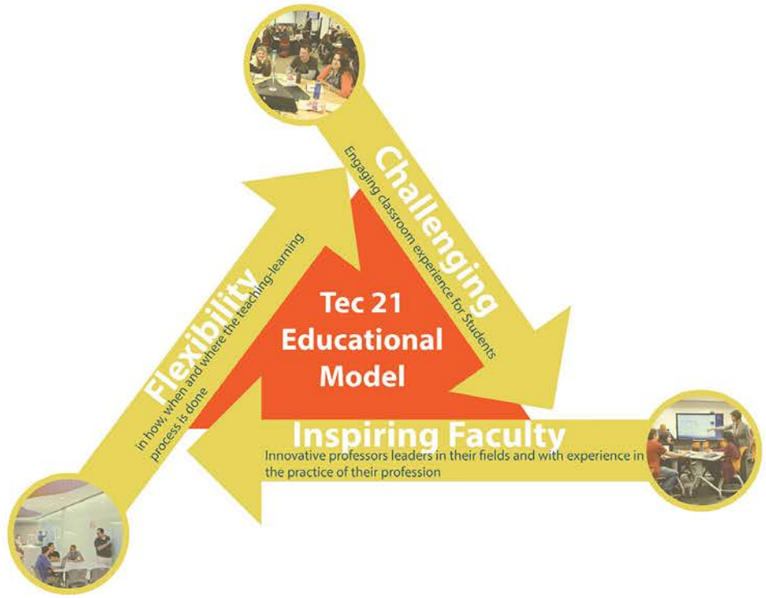


FIGURE 2.7.1: A HUMANITARIAN WORLDVIEW AND TEAM-BASED APPROACH TO PROBLEM-SOLVING IS KEY TO TEC 21
SOURCE: SASAKI, TEC 21

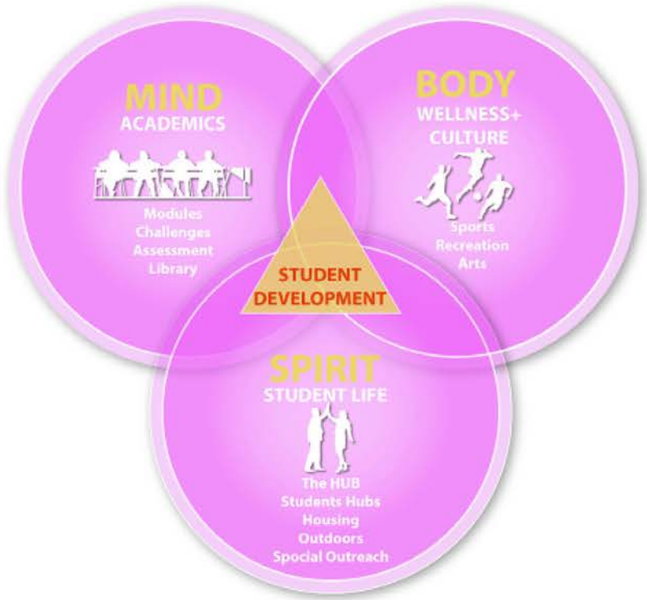


FIGURE 2.7.2: MIND, BODY & SPIRIT ALL CONTRIBUTE TO STUDENT DEVELOPMENT
SOURCE: SASAKI, TEC 21

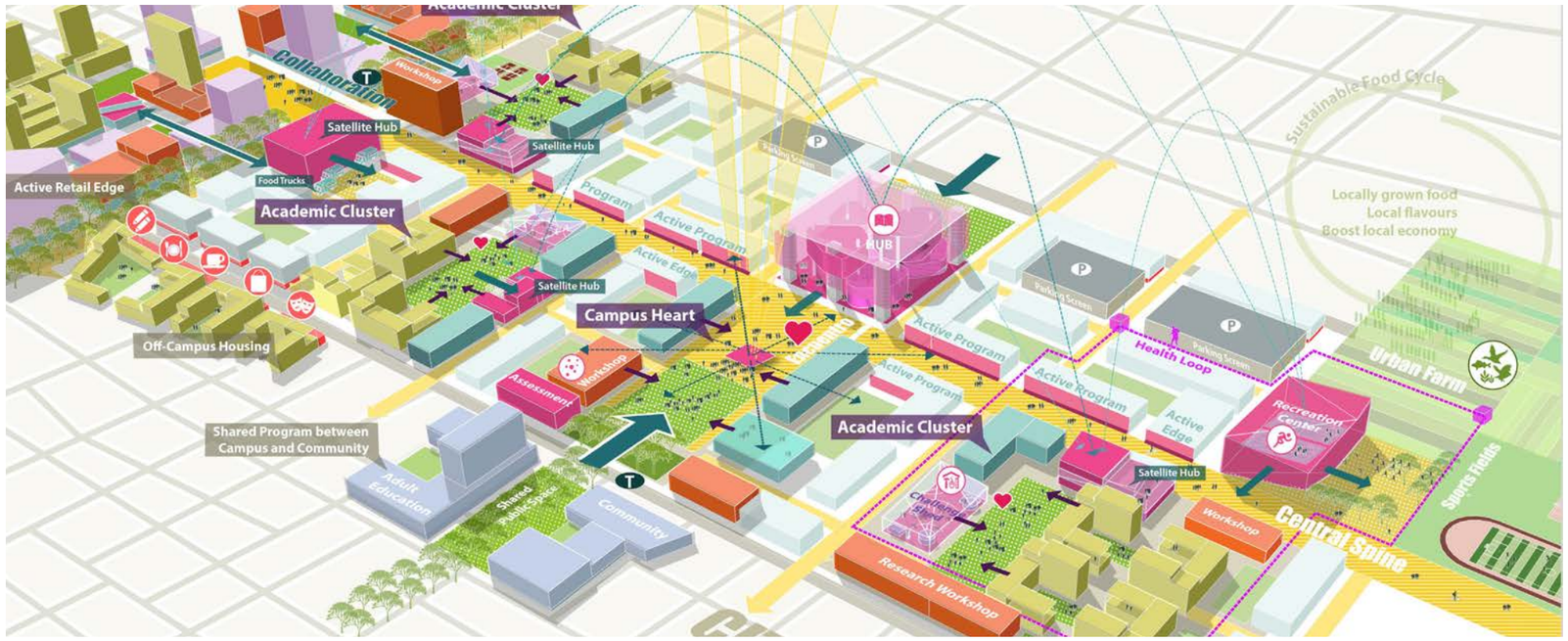


FIGURE 2.7.3: AN IDEAL CAMPUS - THE CHALLENGE SHED AND ASSESSMENT PAVILION BECOME CENTRAL FEATURES OF CAMPUS, PHYSICALLY AND PEDAGOGICALLY
SOURCE: SASAKI, TEC 21

2.7 THE 21ST CENTURY CAMPUS

Key members of the Master Plan team, Sasaki Principal Dennis Pieprz and Senior Associate Romil Sheth, have completed extensive research on Inventing the 21st Century Campus. With the Instituto Tecnologico de Monterrey (Instituto Tec), Mexico's largest private university, Sasaki embarked on an ambitious program called the Tec 21 Educational Model, which seeks to rethink and consider the implications of teaching and learning methods for the entire university system.

The Tec 21 program is a direct response to emergent approaches to learning, and the prominence of digital tools in education in an effort to strengthen those skills. Tec 21 seeks to develop a pedagogical structure that contributes to the formation of extraordinary professionals who have a deep commitment to society, are rooted in a humanitarian worldview, and have a keen appreciation of interdisciplinary and collaborative learning.

As part of the consultation process, Sasaki Principal produced an online presentation on the 21st Century Campus for the JCU Cairns community, as well as presenting to the Cairns community on the global campus trends. This presentation was held at the Cairns City campus on Shields street.

2.7.1 KEY DRIVERS OF SPATIAL REALISATION (TEC 21)

1.0 Re-imagining Student Life:
- Library transforms into a hub of support for academic life.
- Central dining facility re-imagined as a flexible amenity that also functions as a multi-disciplinary collaborative learning and experimentation space.
- Series of smaller hubs permeate the entire campus creating an accessible and vibrant public realm with multiple opportunities for gathering, socialising, learning and campus events.

2.0 Creating a Mixed-Use, Collaborative Environment:
- Break down insular structure and integrate allied industry, student entrepreneurship, and research spaces within academic and student life buildings.
- Vibrant mixed-use precinct that integrates graduate housing, research and academics with existing allied industry and the high school.

3.0 Creating a Culture of Knowledge Exchange:
- Open exchange and flow of ideas and information internally within the campus and across the entire university system.
- The "place of encounter" - located in the heart of the campus and forms a place of gathering, and a common ground for the entire university community.
- Supports formal and informal events and connects the Tec 21 community to the outside world - physically and technologically.
- Hub for student study and gathering.

4.0 New Spatial Typologies:
- Flexible and adaptive spaces with evolving pedagogical needs.
- Instructional spaces (modules) - equipped with adequate technology, writing surfaces, and movable walls to allow both active learning and collaborative student work.
- Multi-purpose space - flexible seating arrangements for a range of activities: lectures, student presentations, end of semester exhibits, group activities etc.
- "Challenge Shed"- new typology of multi-disciplinary collaborative space, akin to a large flexible shed. This space facilitates experimentation with academic departments on campus and engagement with allied industry and the external community.

2.7.2 THE MASTER PLAN

Key ideas of Tec21 have been embedded into the Master Plan, including a new Hub, Campus Heart, redefined central spine and a series of smaller hubs that permeate the campus.

The Master Plan supports formal and informal events through the creation of The Exchange building that connects the campus to the rest of the Cairns community.

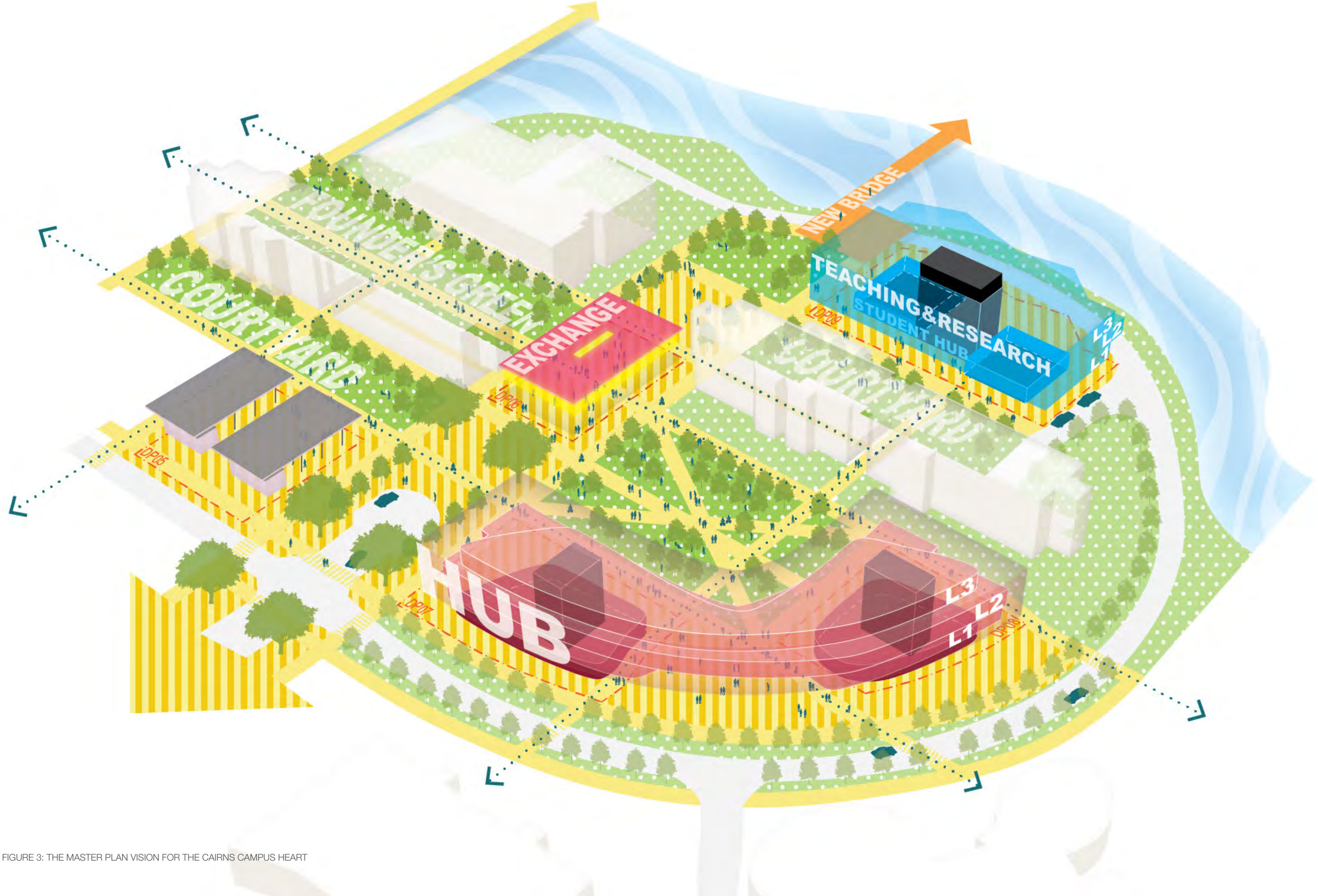


FIGURE 3: THE MASTER PLAN VISION FOR THE CAIRNS CAMPUS HEART

03

VISION

The vision for the Master Plan is to enhance the student experience on campus through consolidation and densification of the campus core to create an active campus heart and hub of excitement, learning and interactions for all campus users.

Enriched engagement with the significant tropical landscape setting through extending the successful covered walkway network and creating comfortable outdoor learning and social spaces to foster curiosity and promote cross-pollination of ideas between campus users.

The Master Plan strives to strengthen campus identity through enhancing the arrival experience and the ceremonial entrance off McGregor Road, and looks at new ways of engaging with the broader campus community.

3.1 MASTER PLAN PRINCIPLES

The eight principles that guide the Cairns Campus Master Plan 2019 (The Master Plan) are aimed at creating a campus environment that creates a sense of belonging for its students, staff and community members. The Master Plan principles aim to strengthen the identity of James Cook University Cairns Campus and provide an immersive experience that celebrates discipline-blurring encounters and increases student and college interactions.

Walkable compact campus - an infill and upgrade approach

- Student centric
- Sustainable

Optimise land utilisation - **conserve** for the future

- Densify
- Consolidate

Logic of campus life to be **vibrant** and enriching

- Multi-layered
- Active

Align **sustainability** program with the University Plan

- Sustainable Tropical Campus

Place-making **identity** - character informed by wet tropical landscape

- Informative & Immersive
- Sense of place

Memorable social spatial framework - primacy of the public realm

- Distinctive
- Tropical Character

Develop built form typology that responds to the **tropical** climate

- Open
- Engaged

Interdisciplinary/ Multi-disciplinary pedagogy

- Cross-pollination
- Foster curiosity

> *"Our purpose is to create a brighter future for life in the Tropics and we achieve this by delivering education, conducting research and engaging with those living in the world's Tropics."*
>
> UNIVERSITY PLAN (2018-2022)

3.2 MASTER PLAN GOALS

1 ENHANCED ENTRANCES

_Reinforce the unique identities of the two major campus entrances.
_Access road is redesigned to function as the tropical ceremonial and iconic campus entrance for students, colleges, staff, and visitors.
_New development and shaded tropical walkways encourage pedestrian and cyclist connections near the University Bus Station.

2 CAMPUS HEART

_Creates a well defined campus heart.
_An existing parking lot is relocated from the open space enabling its transformation.
_Landscape and architectural interventions transform the open space into an active and iconic, tropical space that reinforces the identity of the University.

3 CONSOLIDATION

_Prioritise development within the A-precinct to boost vibrancy, activity and density of the campus core.
_Concentrate academic functions and student life within the campus core.
_Refurbish existing building stock to enhance building performance to better align with sustainability and pedagogy.
_Consolidate campus car parking.

4 TROPICAL URBANISM (INDOOR-OUTDOOR, LANDSCAPE)

_Emphasise physical and visual connections between indoor and outdoor environments.
_Facades are articulated with transparent materials, while circulation is brought to the edges of buildings.
_Student life programs are strategically situated along facades to activate building edges, and negotiate the transition between indoor and outdoor spaces.

5 ENHANCED INDIGENOUS ENGAGEMENT

_Enhance the indigenous engagement strategy to ensure meaningful collaboration between the local traditional owners and the future development of the campus.
_Holistic and continuous engagement across all levels of the university to ensure the culture of the traditional owners is a core element in the further development of the campus that should contribute to its unique identity.

6 VIBRANT SOCIAL FABRIC & STUDENT LIFE

_Create a multi-layered, vibrant campus .
_Concentrate student density within the core to increase interaction between all campus users.
_Support outdoor learning and informal learning through comfortable micro-climate and tropical zones.
_Encourage student life through providing shaded outdoor spaces e.g. market stalls.

7 INTERDISCIPLINARY

_Interdisciplinarity promotes the blending of academic disciplines, fosters intrinsic curiosity and promotes cross-pollination of ideas to give students the edge they need in today's world.
_Provides flexible venues that encourage collaboration and interdisciplinary interaction
_Interdisciplinary nodes are designed as centres for academic colleges that foster an open and collaborative atmosphere for college and student engagement among colleges.

8 PEDESTRIAN-ORIENTED CAMPUS

_Preserve and enhance the pedestrian qualities of the campus
_Concentrates mission-related purposes around the academic core of the campus, and situates other uses along its periphery.
_Enhances pedestrian paths and bicycle routes and improves transit and residential facilities.

9 SUSTAINABILITY

_Builds upon the University’s commitment to environmental, economic, and social sustainability goals articulated in the University Plan.
_Addresses sustainability through working landscapes with integrated stormwater management benefits, promote alternate forms of transportation, and building designs that reduce energy usage, and other strategies.

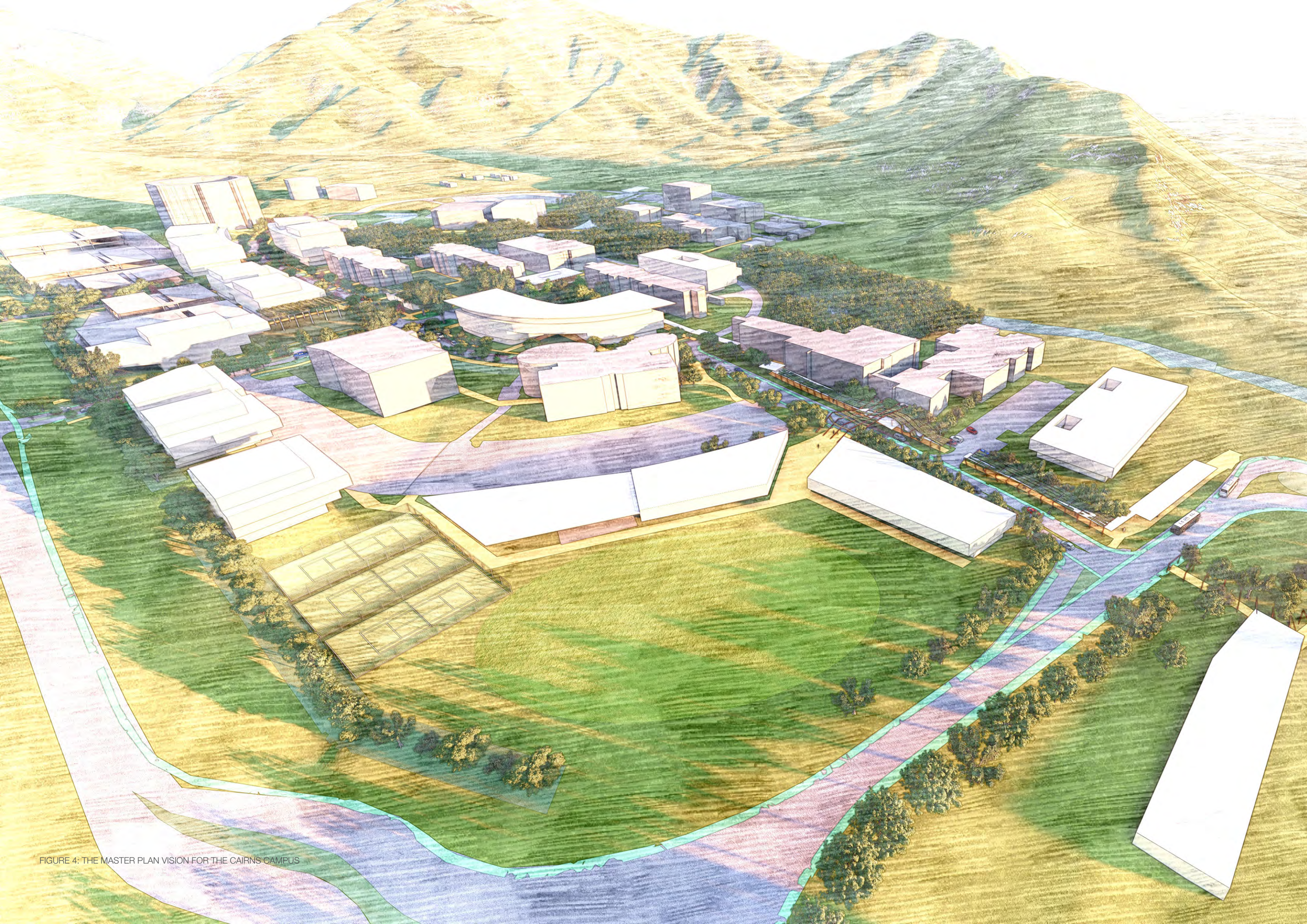
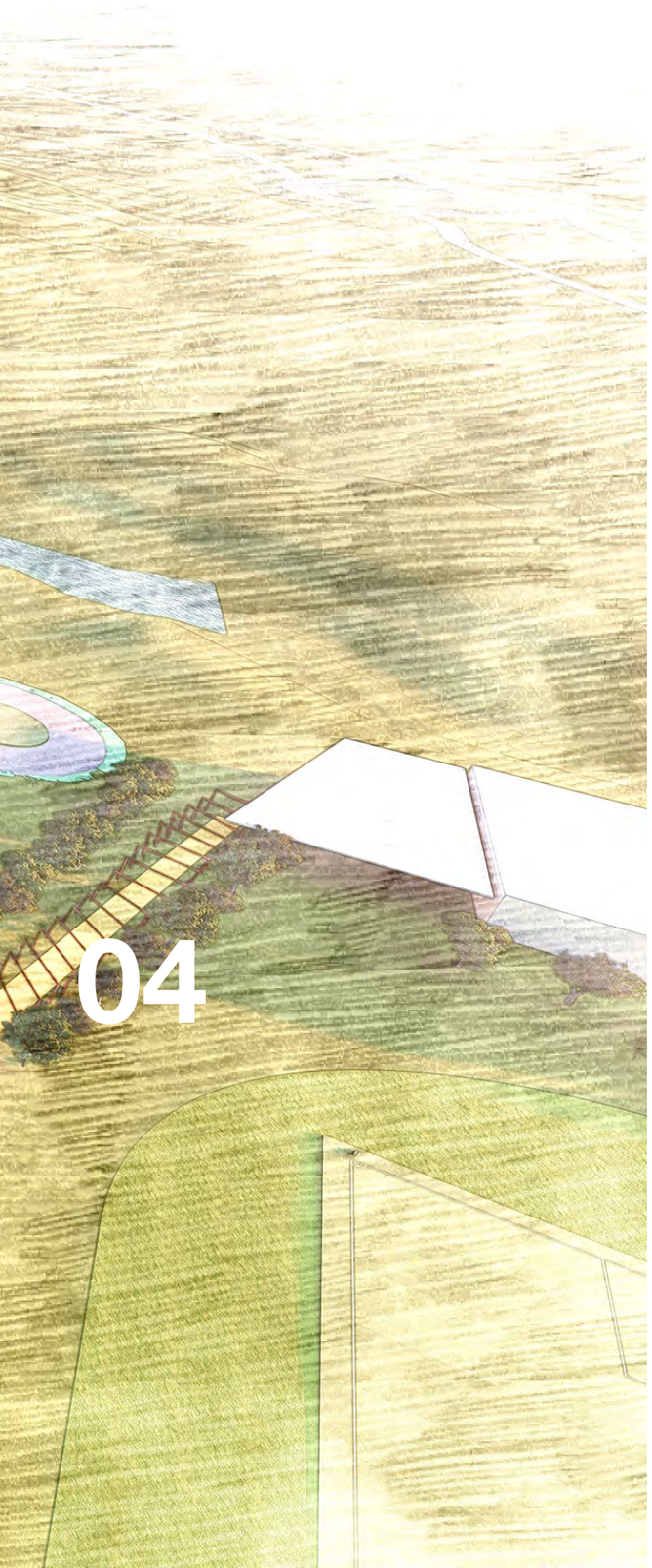


FIGURE 4: THE MASTER PLAN VISION FOR THE CAIRNS CAMPUS



04

MASTER PLAN

The Cairns Campus Master Plan 2019 (Master Plan) enhances the campus vision through redefining campus goals and principles for future development. To achieve the Master Plan vision, goals and principles, four organising principles have been identified that align with the existing campus conditions and reinforce the campus structure.

The organising principles form the basis for The Master Plan frameworks: Place-making, Open Space & Landscape, Building and Land Use, Access and Circulation, & Services.

1

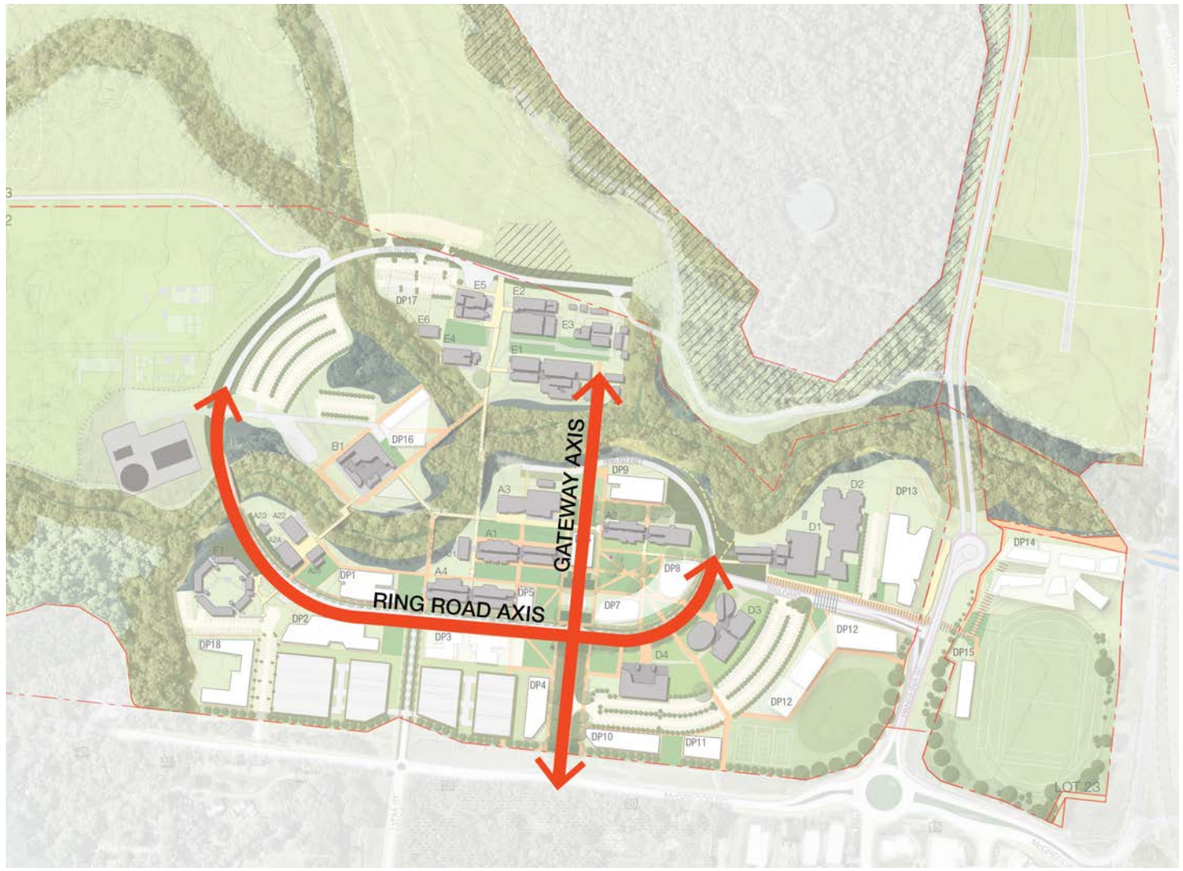


FIGURE 4.1.1: REINFORCE EXISTING MOVEMENT SYSTEMS

_Access Road and Ring road create strong organising principles for future campus development.
_Infrastructure should be addressed before additional development parcels as the existing campus GFA is adequate for student load at present.
_Addressing and enhancing the road network should have the greatest impact for the campus experience.

2

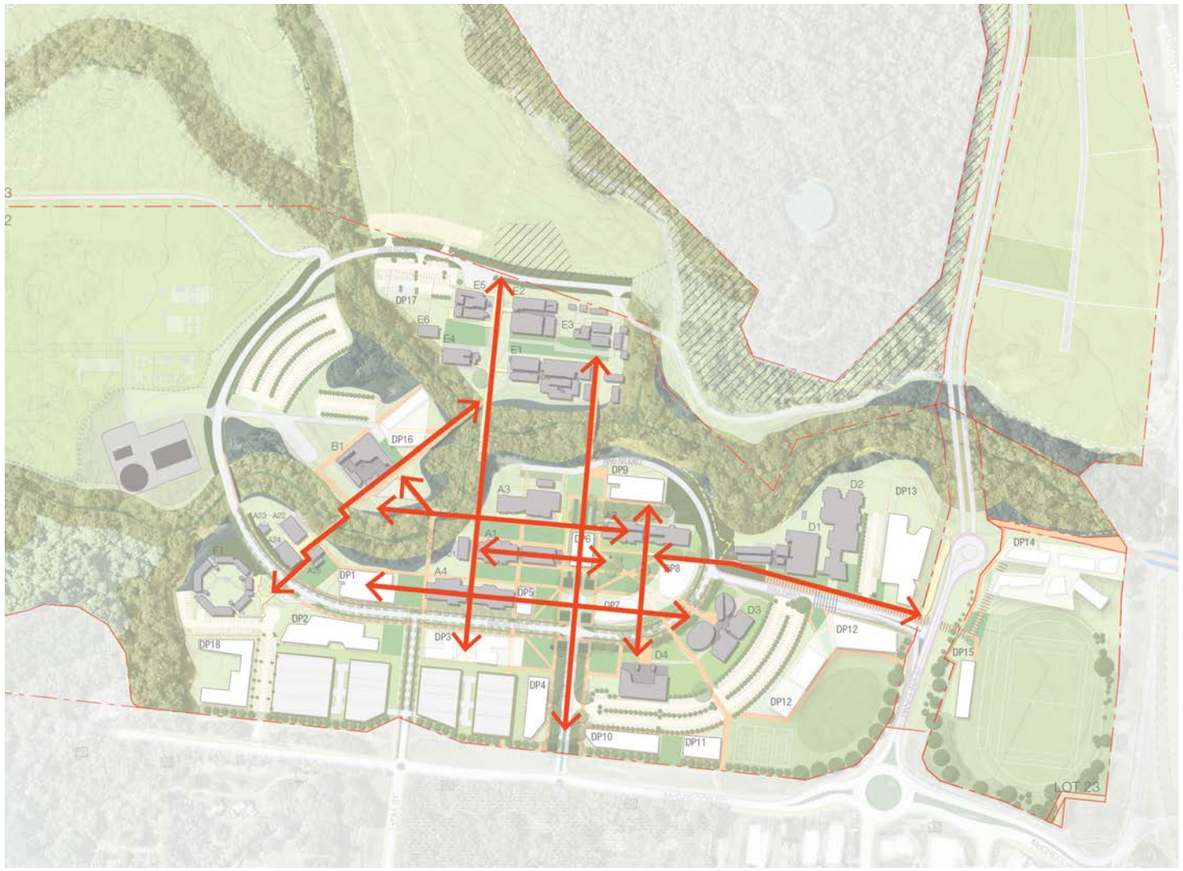


FIGURE 4.1.2: ENHANCE PEDESTRIAN MOVEMENT SYSTEMS

_Existing pedestrian network traverses externally through covered and uncovered walkways and internally through building corridors
_Promote active and shaded walkways

3

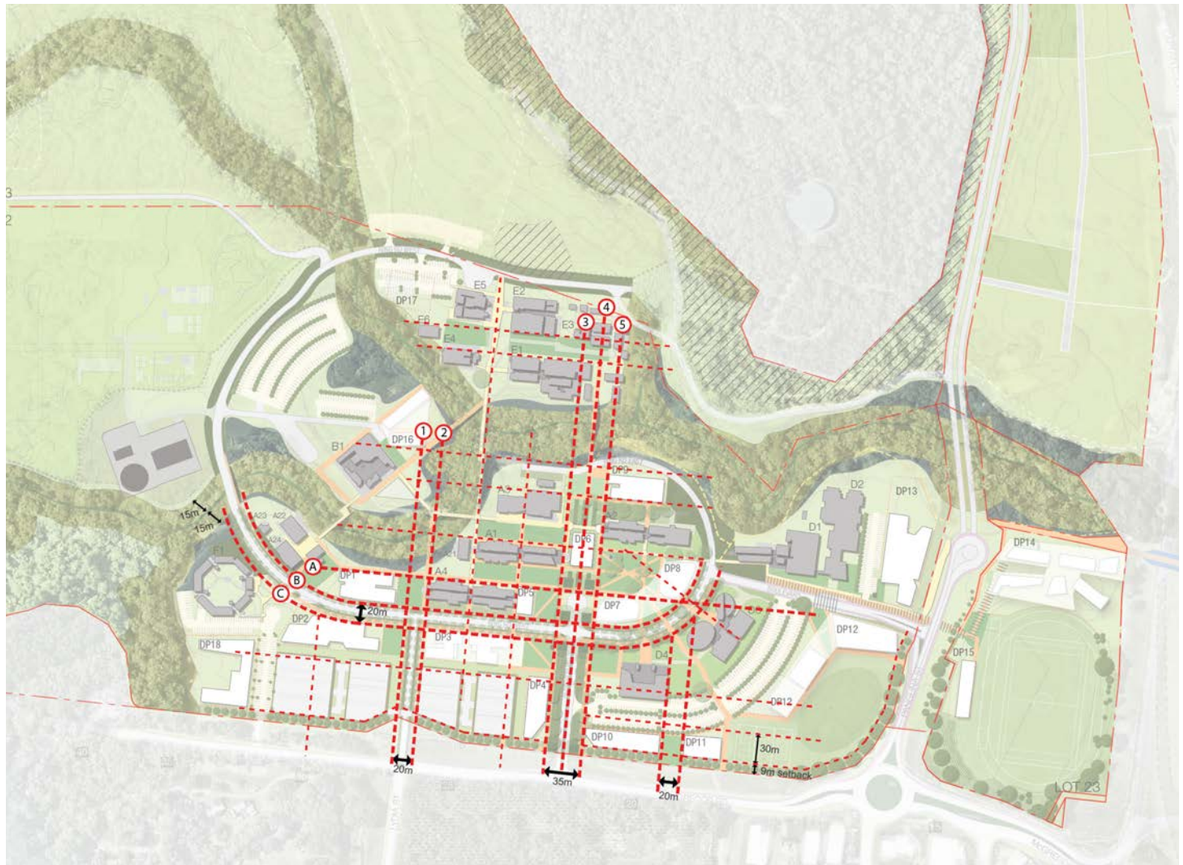


FIGURE 4.1.3: REINFORCE EXISTING BUILDING ORDER

_A campus grid guides future development in an orderly and simple way
_Clear guidelines to future development zones

4

4.1 ORGANISING PRINCIPLES

The four organising principles form the basis of the Master Plan and aim to:
_ Preserve and enhance the pedestrian qualities of the campus
_ Concentrates mission-related purposes around the academic core of the campus, and situates other uses along its periphery.
_ Enhances pedestrian paths and bicycle routes and improves transit and residential facilities.
_ Create an engaging urban campus life to increase student activity and enhance the campus experience.

FIGURE 4.1.4: CREATE A LANDSCAPE STRUCTURE

_Support and strengthen the Atika creek landscape
_Designate key landscape spaces for immediate implementation to allow landscape spaces to mature into a uniquely tropical campus experience.

SMITHFIELD REGIONAL PARK

LOT 13

LOT 22

LOT 13

LOT 23

E1 E2 E3 E4 E5 E6

A1 A2 A3 A4 A21 A22 A23 A24 A25

B1

D1 D2 D3 D4

F1

DP1 DP2 DP3 DP4 DP5 DP6 DP7 DP8 DP9 DP10 DP11 DP12 DP13 DP14 DP15 DP16 DP17 DP18

RING RD EAST

BOULEVARD

RING RD WEST

PARKLAND ST

CAPTAIN COOK HIGHWAY

McGREGOR RD

LYDIA ST

OBRIEN RD

CHEVIOT ST

LEISURE PARK RD

SIOLAW ST

0 20 40 100

FIGURE 4.2: JCU CAIRNS CAMPUS MASTER PLAN 2019

4.2 MASTER PLAN

The Master Plan is a flexible, forward-looking road-map for the development of the campus, but importantly focusses on the short-term opportunities to enhance student and staff experience and community engagement.

Indicative built form representations are provided to demonstrate the potential development of the campus, however, are not fixed. All future campus development should consider the five frameworks (Place-making, Open Space & Landscape, Land & Building Use, Access & Circulation and Services). Future development should also consider the Campus Urban Design Guidelines and Development Controls.

ON CAMPUS

- RIPARIAN ZONE
- THEMED LANDSCAPE ZONE
- STREETSCAPE ZONE
- PROPOSED COVERED WALKWAYS
- EXISTING COVERED WALKWAYS
- UNSUITABLE DEVELOPMENT ZONE
- REGENERATION OF ATIKA CREEK
- SPORTS ARBOUR WALK
- EXISTING CYCLE LANE
- POTENTIAL SIGNAGE FOR BYPASS MITIGATION

1. LOT 13 LAND RESERVE 1A & 1B
2. EXISTING USE ZONE (CMB)
3. LOT 13 POTENTIAL DEVELOPMENT ZONES
4. PROPERTY BOUNDARY
5. MOUNTAIN BIKE TRAILS
6. PLANNED FUTURE RING ROAD COMPLETION
7. FUTURE CRC PANGUNA RD EXTENSION
8. ERC FUTURE EXPANSION ZONE
9. EXISTING COMMUNITY GARDEN
10. CENTRAL ENERGY PLANT
11. LIBRARY GREEN SHADE HOUSE
12. FOUNDER'S GREEN
13. POTENTIAL BRIDGE CONNECTION
14. THE SQUARE
15. ARBORETUM TRAIL
16. BUS EXCHANGE
17. PROPOSED MULTI-STOREY CAR PARK
18. CAMPUS GATEWAY (ACCESS ROAD)
19. SECONDARY ENTRANCE (BOULEVARD)
20. UNIVERSITY GREEN
21. SPORTS PIAZZA
22. UPGRADED SPORTING FIELD
23. ACCESS TO CAR PARKS
24. ACCESS TO STUDENT ACCOMMODATION

DP__ DEVELOPMENT PARCEL NO.___

00 CONTOUR LEVEL

OFF CAMPUS

25. HOLY CROSS PRIMARY SCHOOL
26. SMITHFIELD STATE HIGH SCHOOL
27. COMMUNITY AMENITIES & SPORTS
28. NEIGHBORING RESIDENTIAL
29. STUDENT ACCOMMODATION
30. SMALL RETAIL OFFERING
31. RURAL RESIDENTIAL
32. LOW-MEDIUM DENSITY RESIDENTIAL
33. MIXED USE
34. TRAIL HEAD
35. AJ HACKETT BUNGY JUMPING
36. FUTURE STATE SERVICE ROAD
37. UNDERPASS
38. PROPOSED OVERPASS LINK WITH SIGNAGE
39. FUTURE SMITHFIELD BYPASS

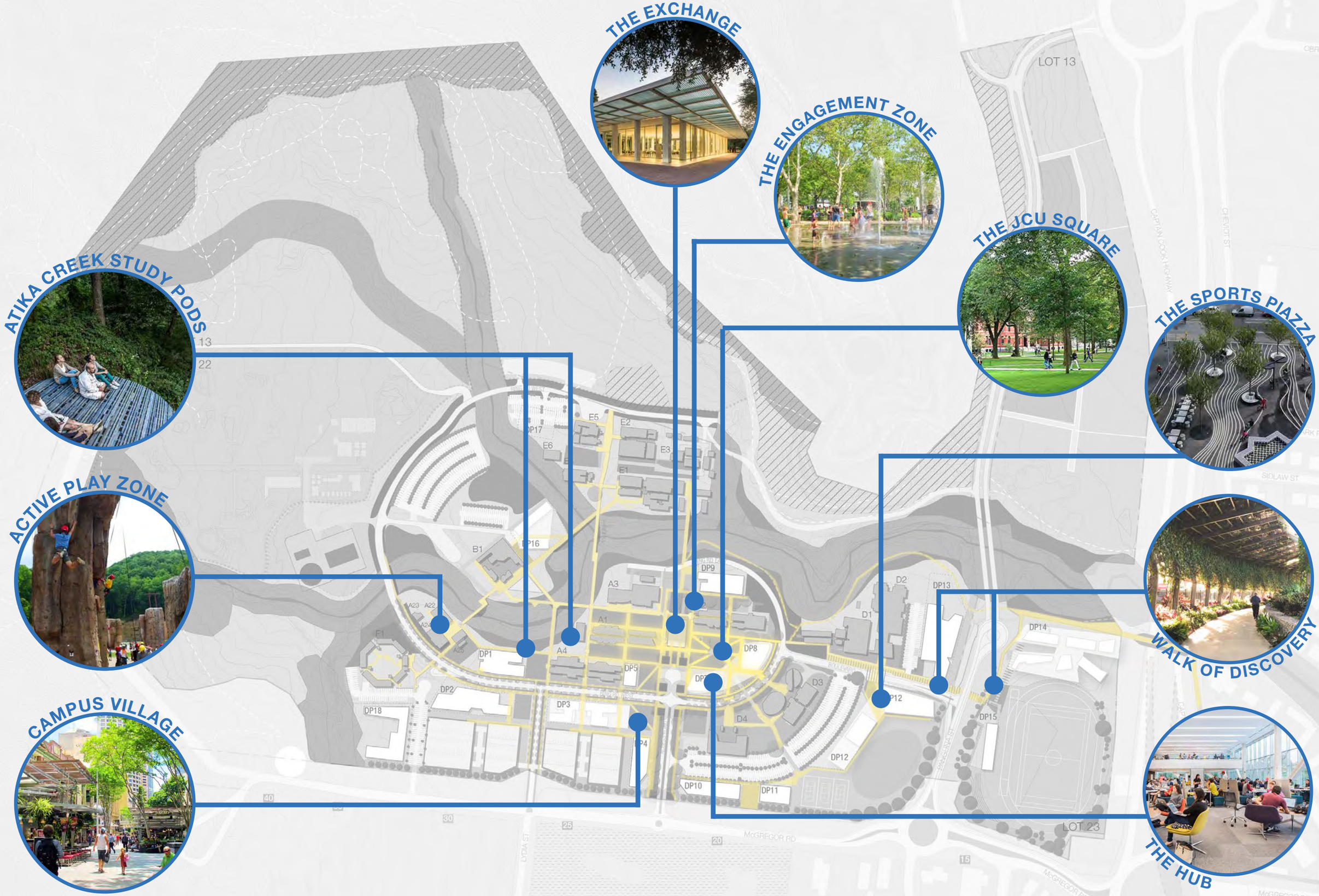


FIGURE 4.3: PLACE-MAKING FRAMEWORK DIAGRAM

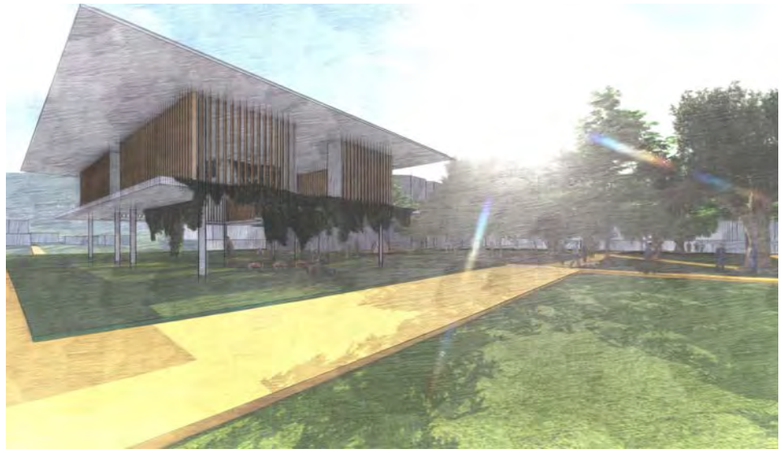


FIGURE 4.3.1: ILLUSTRATION OF POTENTIAL EXCHANGE HUB AT THE CAMPUS HEART

THE EXCHANGE
Located at the campus heart, the crossroads of the two campus entrances, The Exchange should play a key role in campus wayfinding and assist in creating a tropical, sustainable identity and meeting place for the campus.

Heavily landscaped and elevated off the ground to provide shade and air movement through the space, the Exchange creates a flexible weather proof comfortable outdoor room to host a multitude of campus events and activities.

The Exchange should be a pivotal project for the campus and its architecture should reflect the beautiful natural setting of the campus and the JCU's sustainability goals. (Refer DP6 & Initiative 29).

FIGURE 4.3.2: ILLUSTRATION OF POTENTIAL ARBOUR "WALK OF DISCOVERY" WITH BOULEVARD CROSSING

THE WALK OF DISCOVERY
The Walk of Discovery is an important linking strategy from the existing sports oval to the proposed sports plaza and additional sporting and recreational facilities. The walk is proposed to be a shaded arbour structure that builds on the existing covered walkway from the Panguna St bus stop, through to the dentistry building. The arbour crosses over the Boulevard at the sports plaza entry to create a shaded crossing point, and to reinforce to vehicles the shared road zone.
(Refer Initiative 7)

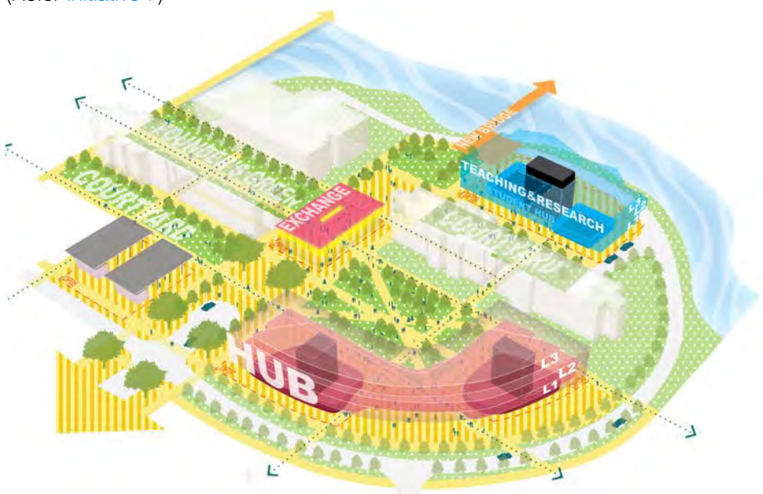


FIGURE 4.3.3: ILLUSTRATION OF POTENTIAL MASSING FOR THE HUB

THE HUB
The Hub is a key transformative project for the Cairns Campus and should be developed in conjunction with The JCU Square. The location aims to boost activation within the campus heart and should provide student life and interdisciplinary functions for both University and Community members.
(Refer Initiative 26).

4.3 PLACE-MAKING FRAMEWORK

4.3.1 PLACE-MAKING ZONES & CHARACTER

The open space and landscape framework, building and land use framework and access and circulation framework all create identifiable networks, zones and characters across the campus. The place-making framework highlights key areas within the frameworks for congregation, student exchange, interaction and activity and become significant wayfinding elements for the campus.

THE JCU SQUARE
A ceremonial University urban civic space, the JCU Square presents the campus with a shaded comfortable outdoor area to socialise, rest, study, collaborate or meet & greet. Large tropical shade trees enhance the character and identity of the campus for all campus users. The shaded zone should also assist in creating a comfortable microclimate for campus users.
(Refer Initiative 5)

THE CAMPUS VILLAGE
The campus village provides a retail offering for campus users during week days and weekends. The village provides opportunities to boost activity within the campus and encourage engagement with weekend users of the campus facilities and world-class mountain bike tracks that surround the campus.
(Refer Initiative 32)

ACTIVE PLAY ZONE
The active play zone hosts areas of small-scale recreational activities for staff and students to utilise during the week days or weekends. Such activities could include rock-climbing and ball sports on a half-court.
(Refer Initiative 39 & 41)

ATIKA CREEK STUDY PODS
The Atika creek study pods provide spaces that are engaged with the sense of place of the campus. Quiet areas for study, retreat or rest for both students and staff provide more opportunities for campus users to stay on campus before or after classes. The study pods could also provide picnic spots for weekend campus users or students that live on campus.
(Refer Initiative 2)

THE SPORTS PIAZZA
The sports plaza is a shaded outdoor space between the proposed development sites of sporting and recreational facilities. Importantly, the open space that the sports plaza provides, allows for air movement through DP11 to reach other areas of the campus. (Refer Initiative 35)

THE ENGAGEMENT ZONE
The engagement zone is an area for spontaneous interactions to take place and to engage with the campus. A water feature within this zone could provide evaporative cooling possibilities for campus users, whilst also providing an area of retreat, rest or fun. An urban designed and sustainable water feature sits along the main axis of the campus and creates opportunities for art installations to be integrated with the design. (Refer Initiative 40)

FIGURE 4.4: ILLUSTRATIVE LANDSCAPE MASTER PLAN 1:5000 @ A3

FIGURE 4.4.1: FOUNDERS GREEN - EXISTING COURTYARD

FIGURE 4.4.2: POTENTIAL CAMPUS RAINFOREST EXPERIENCE

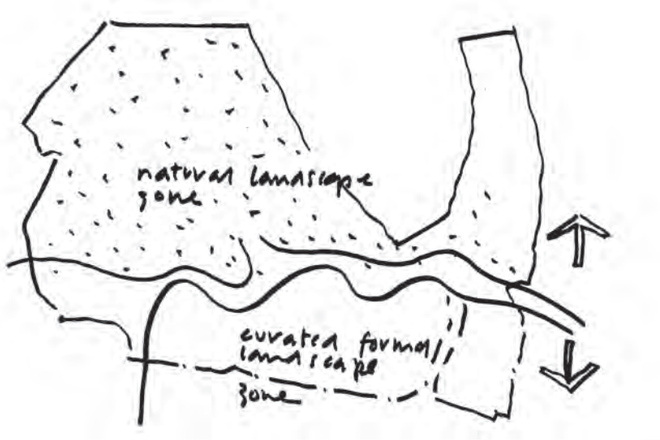


FIGURE 4.4.3: CONCEPT SKETCH OF NATURAL AND CURATED LANDSCAPES

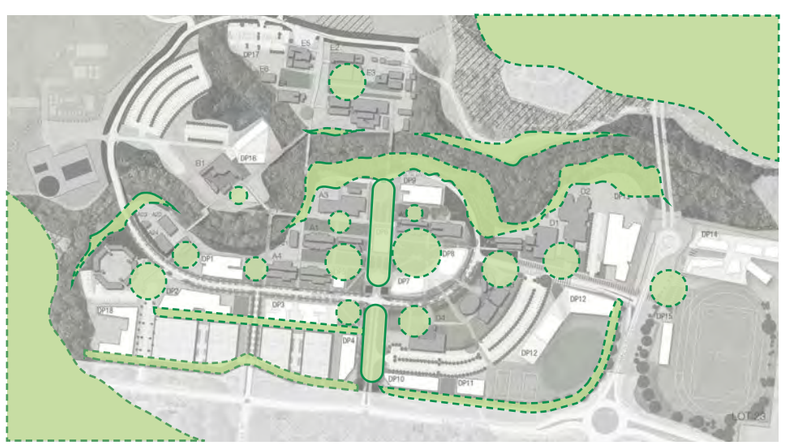


FIGURE 4.4.4: PROPOSED TROPICAL PLANTING THROUGHOUT THE CAMPUS

4.4 OPEN SPACE & LANDSCAPE FRAMEWORK

4.4.1 EXISTING CONDITIONS

The JCU Cairns Campus contains a number of different formal and informal open space and landscape zones where campus users gather and learn. These spaces include pockets around Atika creek (BBQ area outside the Library), Founders Green and building forecourts such as the Cafe at The Cairns Institute and the Boathouse external area by the creek.

The existing campus structure provides courtyard spaces between A precinct buildings and within the E-precinct. There is potential to create a character within each of these courtyards to assist the wayfinding of the campus.

Greater shading within the existing courtyards would allow for better utilisation of the outdoor spaces. The desire for shaded outdoor spaces, for example shade over the B1 southern courtyard was highlighted within the stakeholder consultation process.

4.4.2 LANDSCAPE CONCEPT

TROPICAL PLANTING

The landscape palette for the Cairns Campus Master Plan 2019 (Master Plan) should have a distinctly Cairns feel, taking cues from the surrounding rainforest areas and iconic Cairns landscape, such as the tree lined Cairns Esplanade and the Cairns Botanic Gardens.

NATURAL & CURATED

The campus should utilise the natural form of the creek to differentiate between formal and informal landscape spaces. Curated landscapes within the southern portion of the campus should be informed by building orientation and should highlight points of gathering and building entry points.

To the northern zone beyond Atika Creek, the natural character of the bushland and riparian landscape should filter through the campus to connect to the existing environment.

EXCHANGE

A comfortable external environment should promote and encourage the exchange of ideas and facilitate open and innovative learning. The landscape provides a setting for the architecture that supports thermal cooling through landscape shading and softening and ensures efficiency in built form climate control.

A STICKY CAMPUS

A fundamental principle of JCU campus planning across all locations is the needs to provide an engaging landscape. Whilst a conduit for movement, the landscape needs to facilitate opportunities for lingering, celebrations and exchange of ideas.

AN ICONIC SETTING

The established and renowned landscape of tropical North Queensland provides a distinct setting in which to build a memorable campus landscape. Its unique character should attract students and visitors alike and should be enhanced through opportunities to support learning outcomes related to life in the tropics and the cultural history of the Cairns region.

LEGEND

1. CAMPUS ENTRY FEATURE PLANTING
2. MAIN CAMPUS ENTRY POINT
3. ENTRY BOULEVARD
4. SHADED PEDESTRIAN CROSSING ZONES
5. PANGUNA STREET PRIMARY PEDESTRIAN AND CYCLIST ENTRY
6. REJUVENATE THE RIPARIAN ZONE
7. THE EXCHANGE
8. PEDESTRIAN SHADE ARBOUR TO ENHANCE EXISTING WALKWAY "WALK OF DISCOVERY"
9. ENTRY FORECOURT
10. SHADED RAINFOREST COURTYARD
11. COVERED WALKWAY
12. CREEK HUB - ACTIVATION SPACE
13. CARPARKING
14. BUS EXCHANGE - SHADED ARBOUR WALK
15. SHADED PEDESTRIAN CIRCULATION TO STREET VERGE
16. RECREATIONAL FIELDS
17. JCU SQUARE
18. JCU FOUNDERS GREEN
19. EXISTING ARBORETUM TRAIL

Ring Road

McGregor Road

Lydia Street

Panguna Street

FIGURE 4.4.5: ILLUSTRATIVE LANDSCAPE MASTER PLAN 1:2500

4.4 OPEN SPACE & LANDSCAPE FRAMEWORK

4.4.3 WORKING LANDSCAPE

The proposed open space and landscape system functions as a “working landscape” that embraces, integrates, and embodies design, environmental, and academic values. The working landscape responds to the climate and natural conditions of the site, working with its features to maximise their functional qualities.

Through sustainable design and dedication to environmental responsibility emerge a rigor to placemaking and a commitment to creating vibrant campus environments that activate the landscape spaces and enhance the student experience on campus.

4.4.4 LANDSCAPE TYPES

The landscape and open space framework operates as an integrated overlay that seamlessly links the formal and informal open spaces on campus.

The Master Plan strengthens the existing landscapes, establishes a sense of hierarchy and identity, and improves connections among open spaces.

The campus contains a variety of open space and landscape elements, which are guided by the following landscape design objectives:

_Create a rich and layered landscape
_Integrate the knowledge of the traditional owners into the narrative of the campus landscape, utilising native trees and plants
_Build on existing landscape typologies to create a clear hierarchy of open spaces that enhance the image of the campus
_Create multi-functional places where people can walk, gather, rest, work, and play outdoors
_Enhance the visibility and relationship between indoor and outdoor spaces
_Create clear connections among open spaces that facilitate movement across campus
_Establish places for art on campus - *potential for a holistic campus art plan*
_Ensure that the landscape framework is designed consistently across the campus
_Create an environmentally responsible landscape that embraces sustainable design
_Integrate stormwater and rainwater management practices in the landscape (e.g. bioswales integrated within the streetscape to naturally filter road run-off before entering Atika creek)
_Incorporate experiential learning and opportunities for research within the landscape

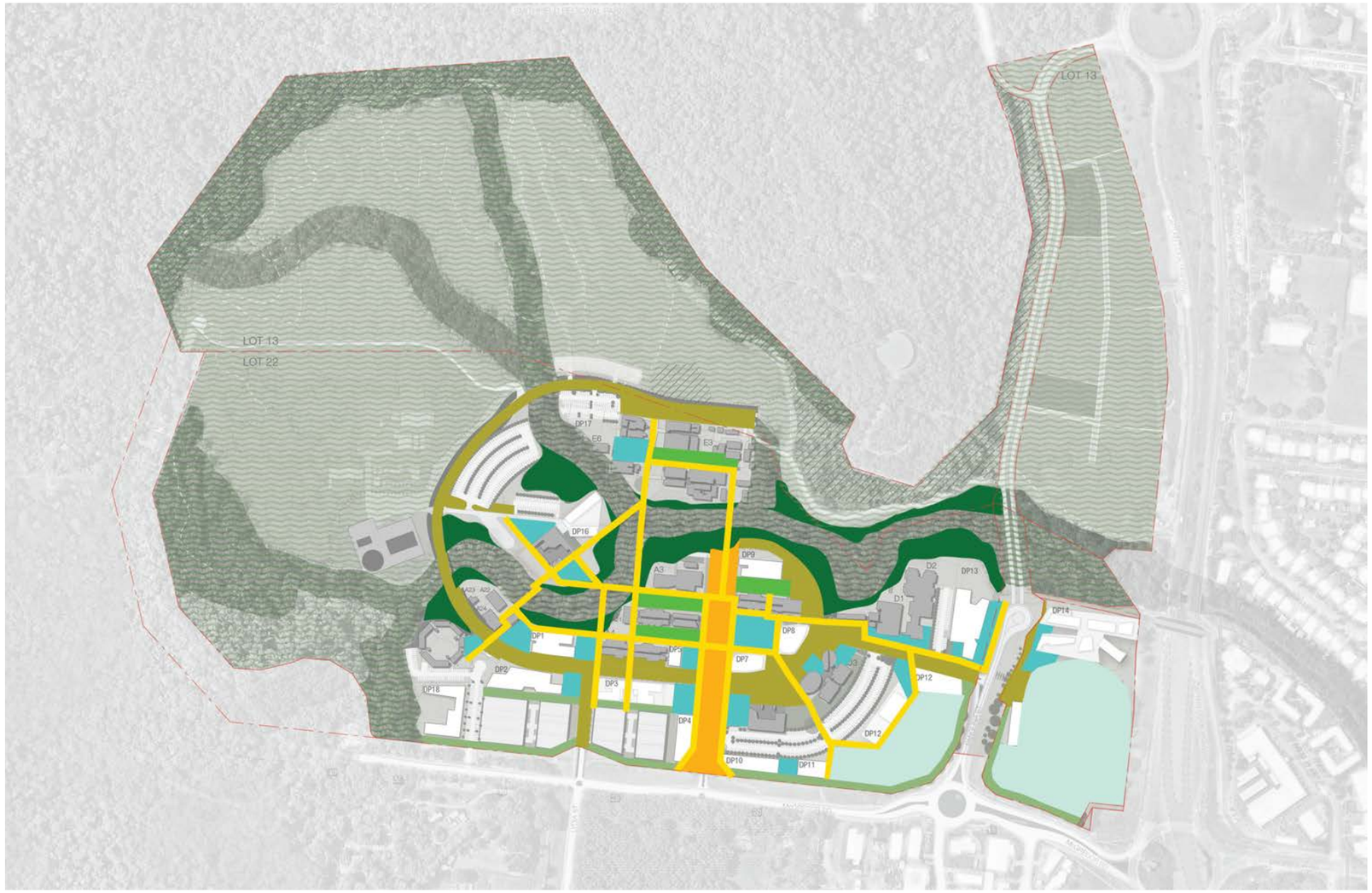
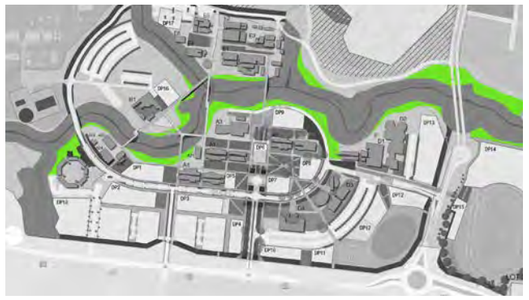


FIGURE 4.4.6: PROPOSED LANDSCAPE ZONES

- CEREMONIAL LANDSCAPE
- RIPARIAN NATURAL AREA
- FORECOURT ENTRY
- SPORTS ZONE
- ENTRY LANDSCAPE
- COURTYARD
- STREETSCAPE
- PEDESTRIAN LINKS
- NATURAL LANDSCAPE



KEY PLAN HIGHLIGHTING RIPARIAN ZONE

4.4.5 RIPARIAN ZONE

_An extension of the established Atika Creek vegetation
_builds on the existing creek character to ensure the narrative of this significant natural and ephemeral element is a prominent campus feature

_The planting palette should comprise of those species already naturally established and thriving within the creek area.
_Opportunities for additional creekside seating and areas of shaded retreat could be considered, as is already provided at the Boathouse.

Refer Initiative 2.

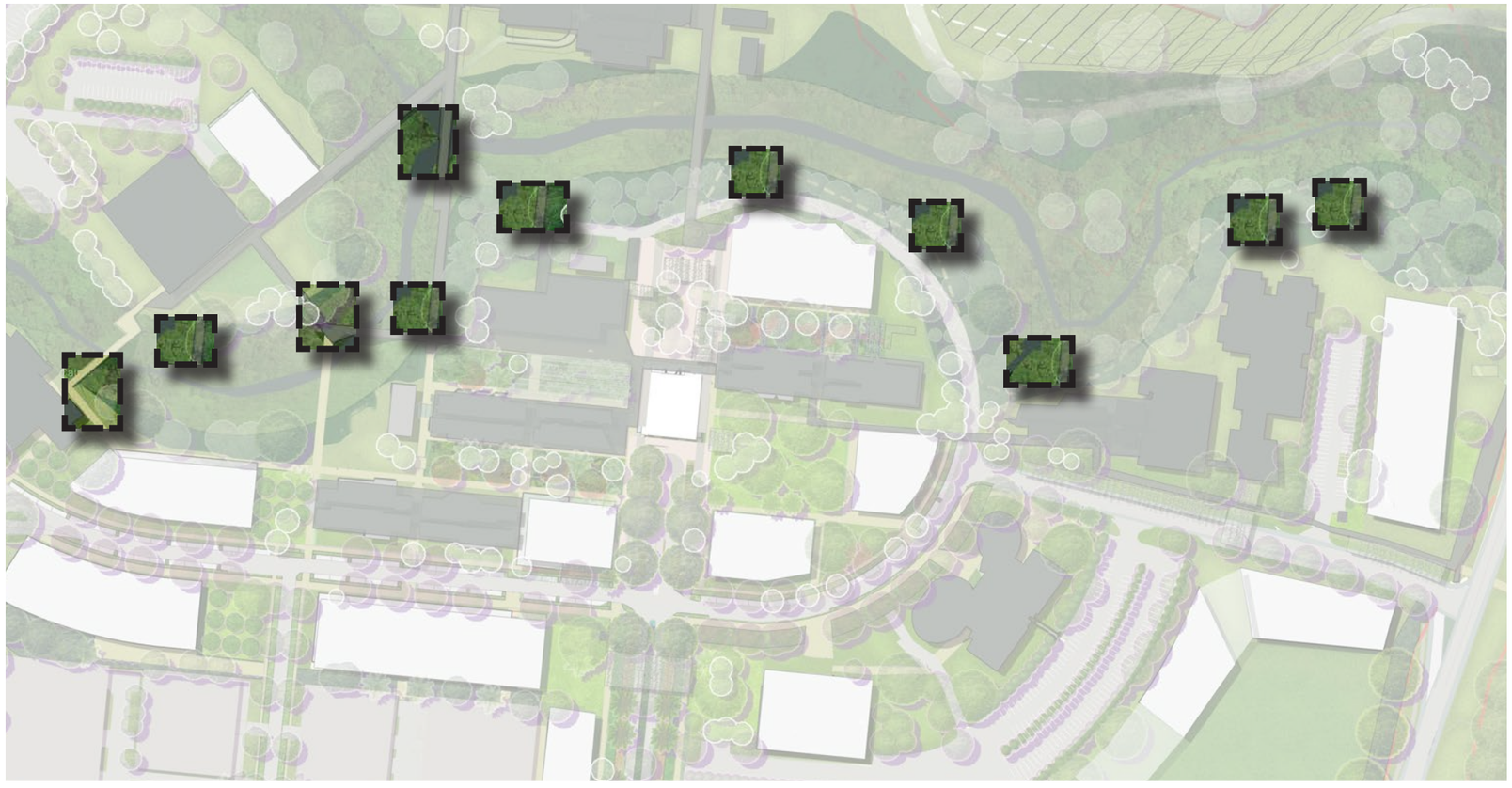


FIGURE 4.4.7: RIPARIAN SEATING OPPORTUNITY POTENTIAL LOCATIONS HIGHLIGHTED

FIGURE 4.4.8: SEATING BY THE CREEK EXAMPLE

FIGURE 4.4.9: SEATING OPPORTUNITY WITHIN THE RAINFOREST EXAMPLE

KEY PLAN HIGHLIGHTING COURTYARD ZONES

4.4.6 COURTYARD VISION

The campus sits on the periphery of the Wet Tropics of Queensland World Heritage Area. The inspiration for the courtyard spaces is to showcase the natural beauty found within all rainforest environments both local and global, from sprawling canopy trees, to a rich forest undergrowth and curtaining vine plants. The courtyards should provide seating opportunities for campus users to gather and engage with the landscape.

4.4.7 COURTYARD LANDSCAPE

_Shaded micro-climates provide space for gathering and outdoor interaction.
_The scale of vegetation should balance and soften the built form that sits to the northern and southern perimeters of the courtyards.
_Planting can be positioned to support cooling and cross breezes within the built form.
_Planting palettes could be used to deter mosquitoes and midges
_Shaded seating to be incorporated

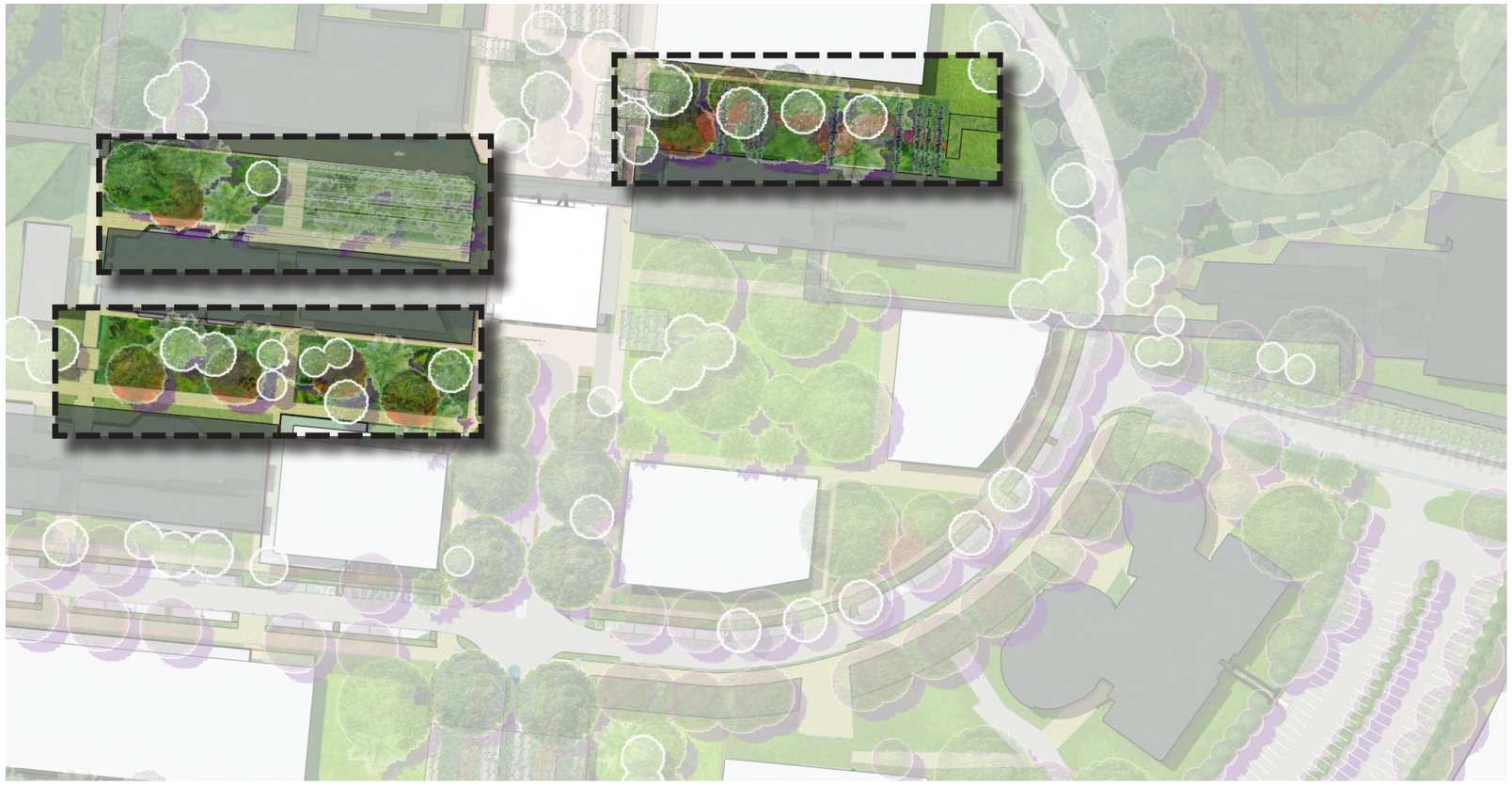


FIGURE 4.4.10: COURTYARD LANDSCAPE ZONES HIGHLIGHTED

FIGURE 4.4.11: INTIMATE LANDSCAPED COURTYARD EXAMPLE

FIGURE 4.4.12: BUILT FORM SHADED COURTYARD WITH LANDSCAPING AND GATHERING ZONE

KEY PLAN HIGHLIGHTING FOUNDERS GREEN - THE FERNERY

4.4.8 THE FERNERY

A sheltered courtyard with elements of retractable shading, The Fernery focusses on distinct groundcover and understorey species of the rainforest. The location of the Fernery is suggested within the Founders Green courtyard.

Retractable shading devices over the courtyard should benefit campus users and the landscaping elements within through creating a shaded micro-climate.

Increased drainage and irrigation to avoid damp conditions affecting the adjacent buildings, along with additional seating opportunities should be considered.

Refer Initiative 1 & 3.

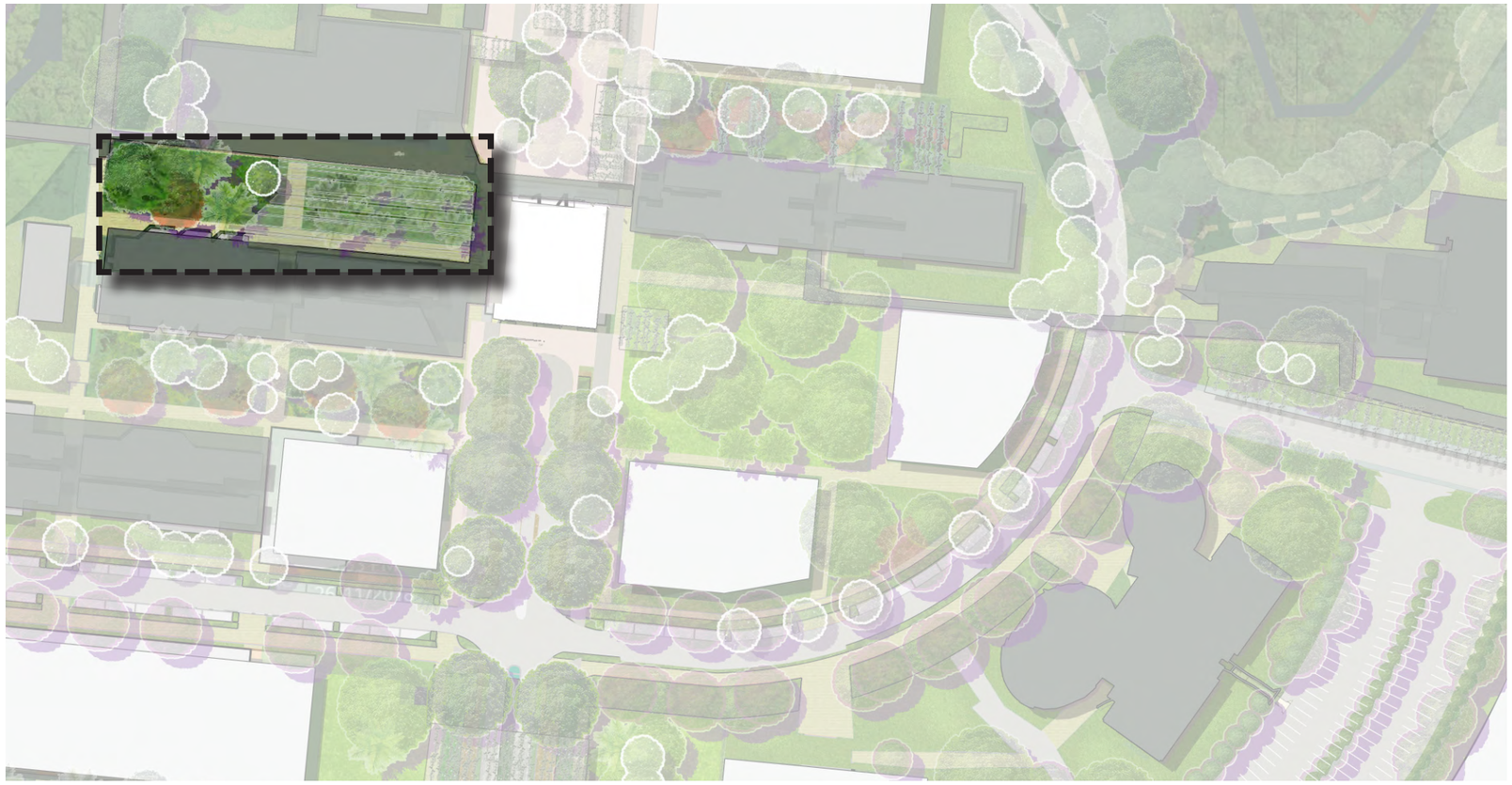


FIGURE 4.4.13: FERNERY COURTYARD (FOUNDERS GREEN) HIGHLIGHTED

FIGURE 4.4.14: RAINFOREST FERNS

KEY PLAN HIGHLIGHTING THE EPIPHYTIC COURTYARD

4.4.9 EPIPHYTIC COURTYARD

Celebrating the mid-storey layer of the rainforest, the display of epiphytes should provide a colourful courtyard that showcases bromiliads, orchards and other plants which do not require roots within the ground surface.

Refer Initiative 3.

FIGURE 4.4.15: THE EPIPHYTIC COURTYARD (BETWEEN A1 & A4) HIGHLIGHTED

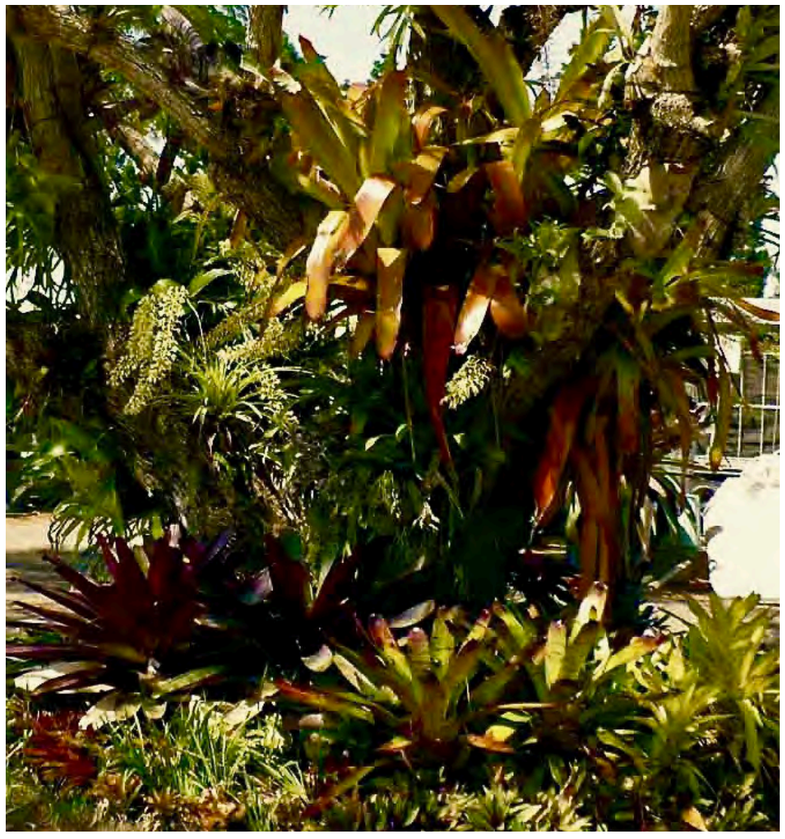


FIGURE 4.4.16: EPIPHYTES EXAMPLE

KEY PLAN HIGHLIGHTING THE VINE COURTYARD

4.4.10 THE VINE COURTYARD

Focussing on the climbers and vines typical of a natural rainforest, the vine courtyard should combine built structures and trees with climbing plants.

Refer Initiative 3.

FIGURE 4.4.17: THE VINE COURTYARD (TO THE NORTH OF A3) HIGHLIGHTED

FIGURE 4.4.18: EXAMPLE OF TROPICAL VINES

KEY PLAN HIGHLIGHTING FORECOURT ZONES

4.4.11 FORECOURT LANDSCAPE

_Compliment student centric built form and significant campus events.
_Forecourt scale should allow for larger gathering spaces
_Shading can be provided through tree bosques or arbour structures and landscape pavilions.

_The forecourt spaces are also intended as campus landmarks, to provide legible points to meet or to highlight important campus buildings for public use.

Refer Initiative 3.

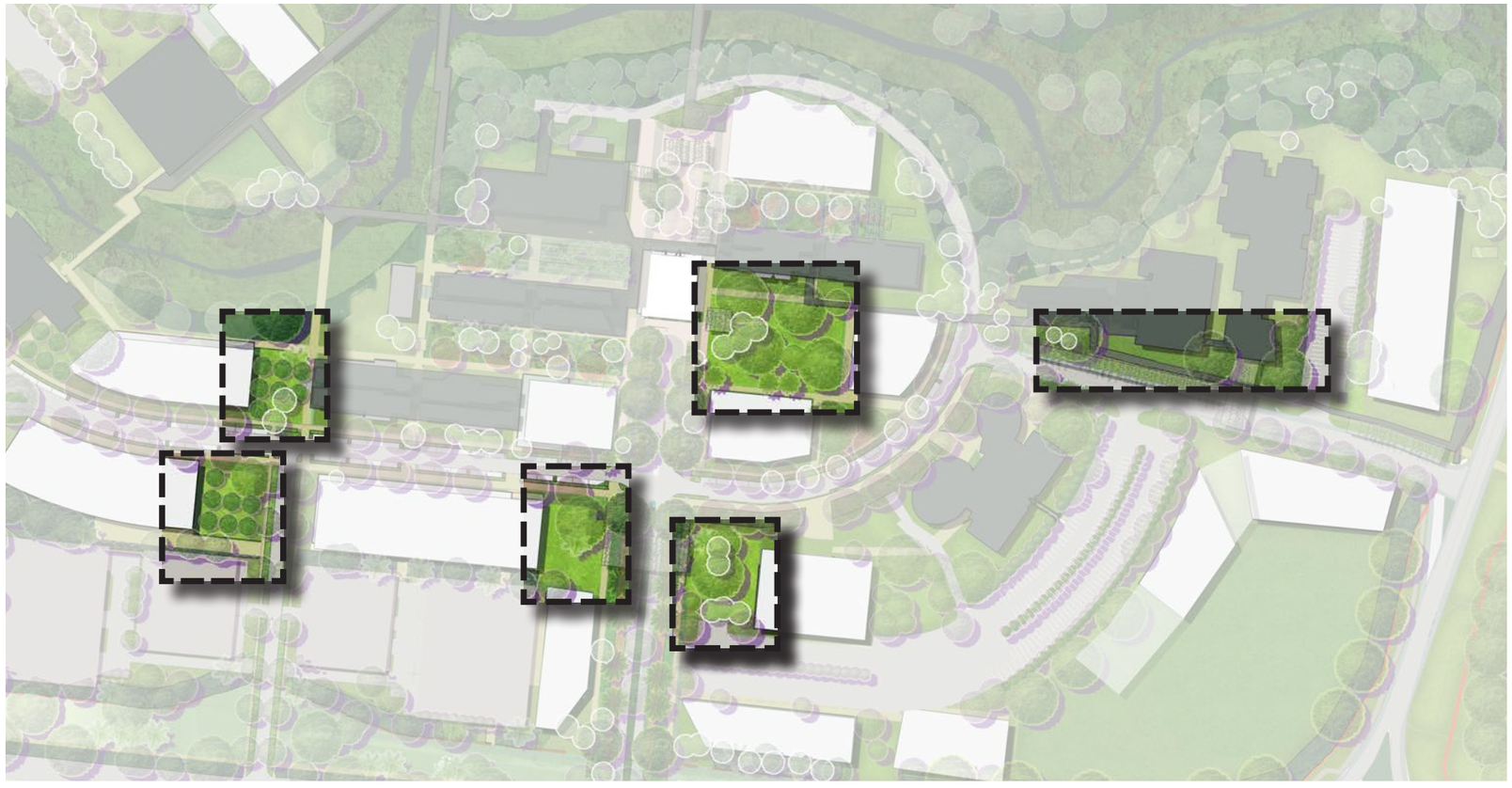


FIGURE 4.4.19: FORECOURT LANDSCAPE ZONES HIGHLIGHTED

FIGURE 4.4.20: SHADED BOSQUE LANDSCAPE TO FORMALISE THE FORECOURT

FIGURE 4.4.21: SIGNATURE TREE TO IDENTIFY THE FORECOURT ZONES

KEY PLAN HIGHLIGHTING ENTRY ZONES

4.4.12 RE-DEFINE THE ENTRY - ENTRY LANDSCAPE

To highlight the McGregor Road and Panguna Street corner, a significant vegetation zone aims to establish and extend the unique character of the campus beyond its central core and commence the arrival experience from the intersection.

The framework transforms the main entrance at Access Road into an iconic and ceremonial point of arrival that welcomes visitors and students alike. The entrance accommodates a formally landscaped open space and nearby 'green parking.' The trees provide shade and shelter for students, staff and visitors near the bus drop-off.

_Shaded micro-climates provide space for gathering and outdoor interaction.
_The scale of vegetation should balance and soften the built form that sits to the northern and southern perimeters of the courtyards.
_Planting can be positioned to support cooling and cross breezes within the built form.
Refer Initiative 14.

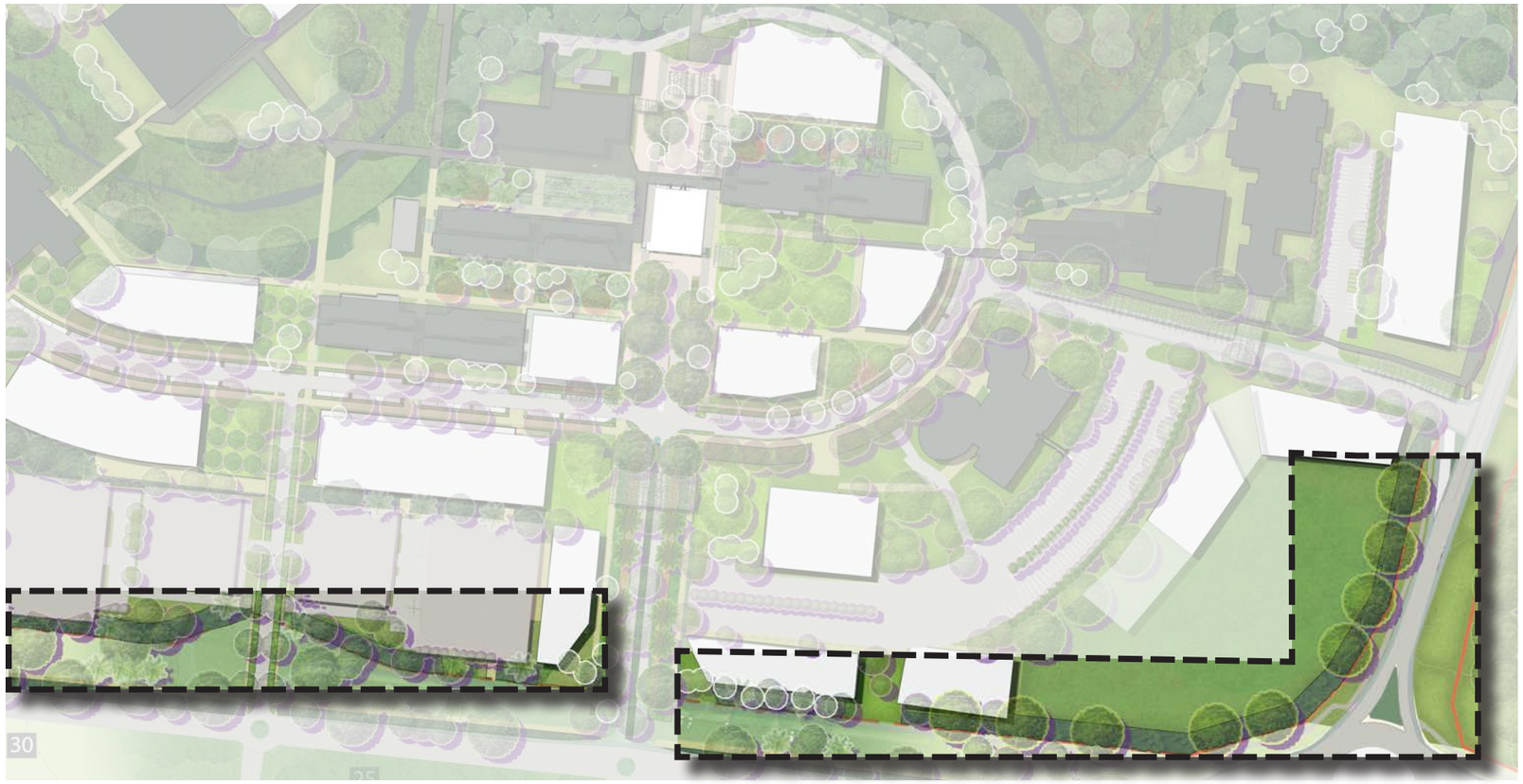


FIGURE 4.4.22: ENTRY ZONES FOR TREE LINED STRUCTURED LANDSCAPE HIGHLIGHTED

FIGURE 4.4.23: CAIRNS ESPLANADE TREE LINED PATHWAY

FIGURE 4.4.24: CAIRNS BOTANIC GARDENS PATHWAY

FIGURE 4.4.25: TREE LINED ROAD EXAMPLE TO CREATE ENTRY AND ARRIVAL STATEMENT

KEY PLAN HIGHLIGHTING PEDESTRIAN BOULEVARD

4.4.13 PEDESTRIAN ZONE - CEREMONIAL LANDSCAPE

The main entry drive into the campus provides a conduit for pedestrian, vehicle and cyclist movement. Feature planting can be established in zones suitable for advanced vegetation.

Where established tree planting is not suitable, arbour structures can be incorporated to ensure that adequate shading is still provided.

Arbour structures can also provide wet weather protection where required.

The zone should respond to a scale appropriate to both pedestrian and vehicular use and should offer grandeur of entry into the campus.

Refer Initiative 3.

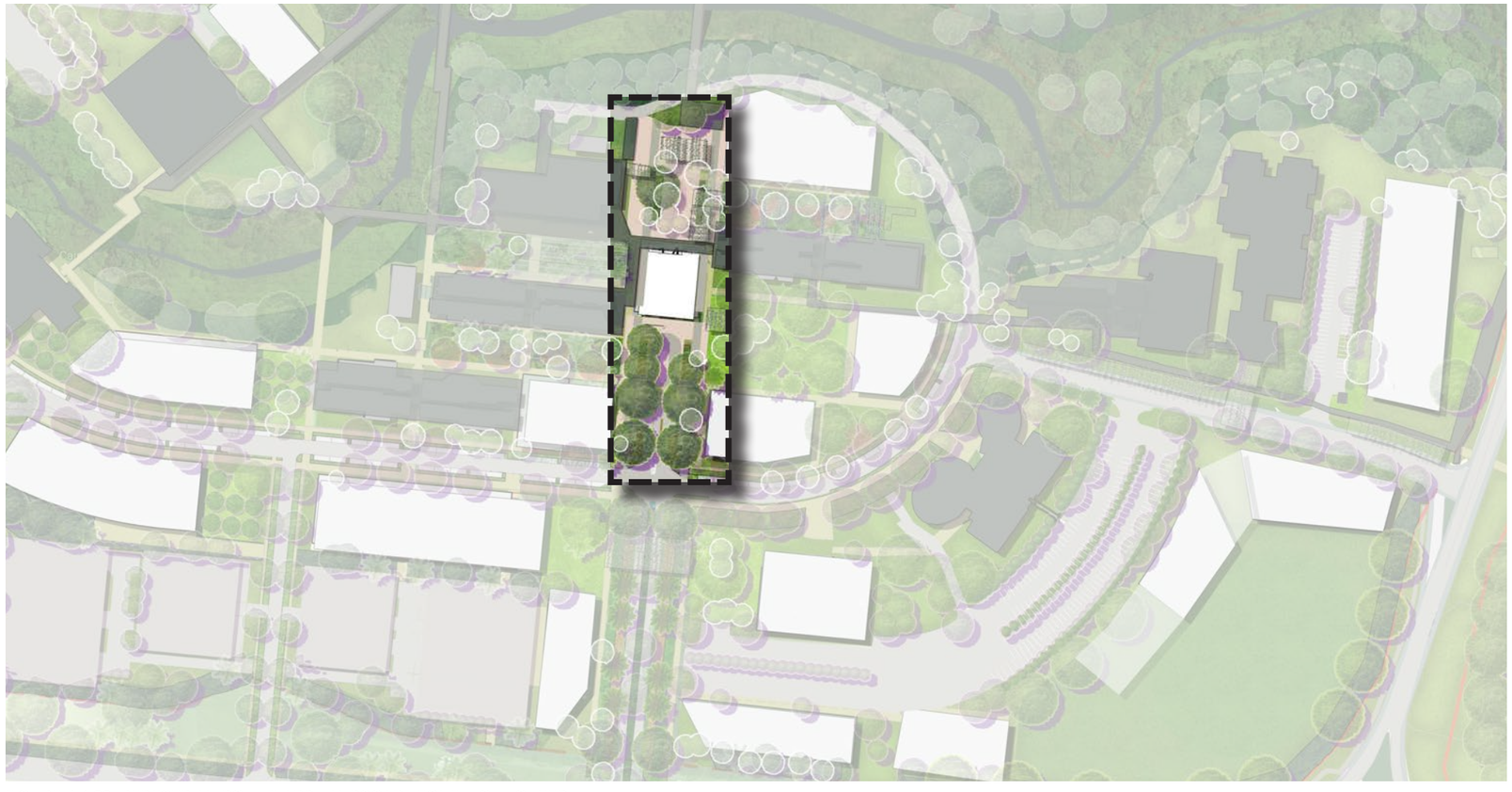


FIGURE 4.4.26: PEDESTRIAN BOULEVARD LANDSCAPE ZONE HIGHLIGHTED

FIGURE 4.4.27: NIGHT LIT PEDESTRIAN SHADED WALKWAY (LOCATION: CAIRNS FORESHORE)

FIGURE 4.4.28: BOSQUE FORMAL GRIDDED LANDSCAPE EXAMPLE WITH WATER FEATURE

KEY PLAN HIGHLIGHTING ACTIVE BUILDING EDGE LANDSCAPE

4.4.14 ACTIVATE BUILDING EDGES - GATHERING SPACES

Gathering spaces function as outdoor rooms and include small courtyards as well as areas for congregating, waiting, socializing, and informal studying.

These spaces negotiate the transition between indoor and outdoor environments and relate to programs in adjacent buildings.

Gathering spaces are dispersed throughout the campus, and function as central organising elements.

Refer Initiative 3.

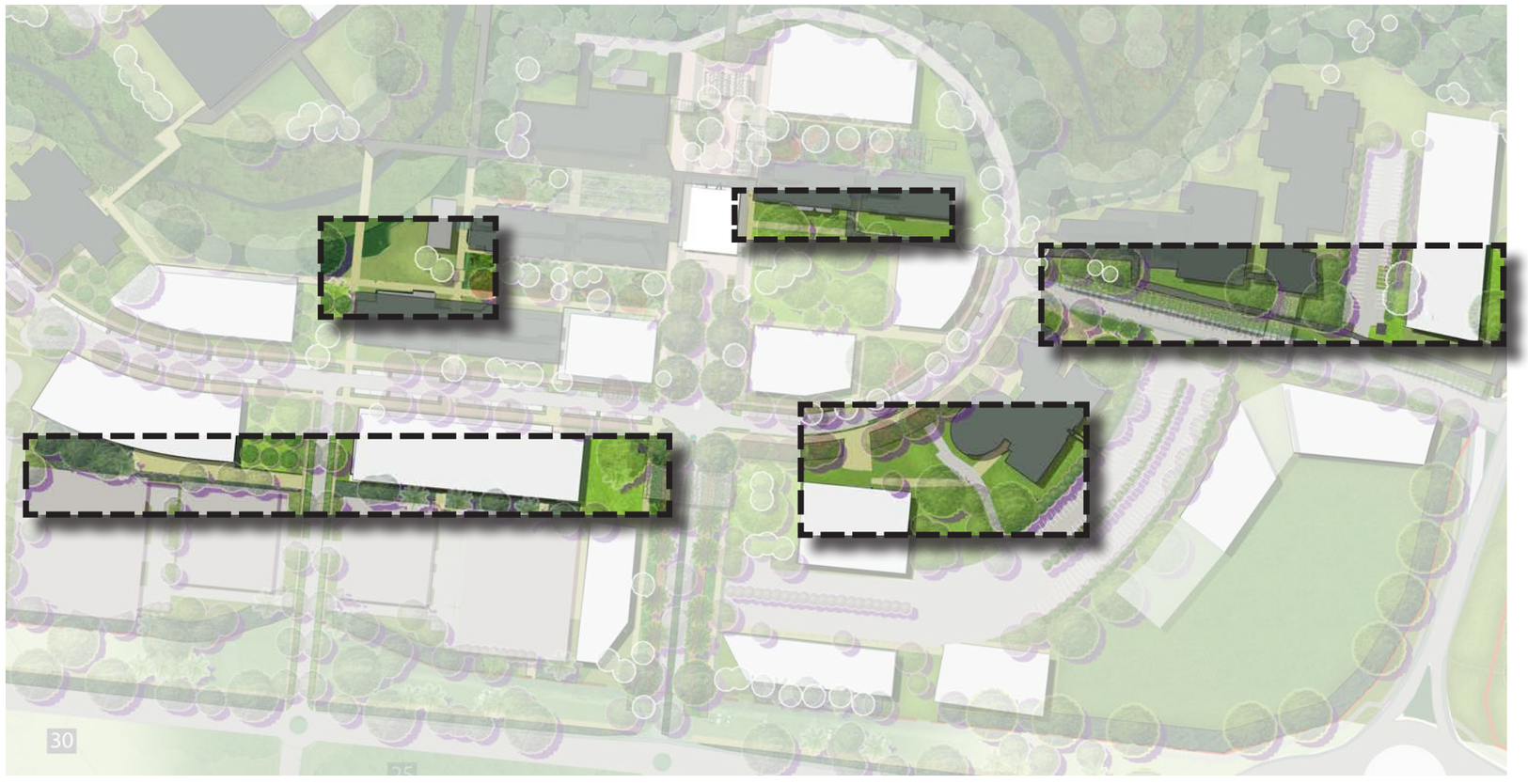


FIGURE 4.4.29: BUILDING EDGE ACTIVATION ZONES HIGHLIGHTED

FIGURE 4.4.30: WATER FEATURE (BIOSWALES) POTENTIAL AROUND BUILDING EDGES

FIGURE 4.4.31: GATHERING ZONES AROUND BUILDING EDGES

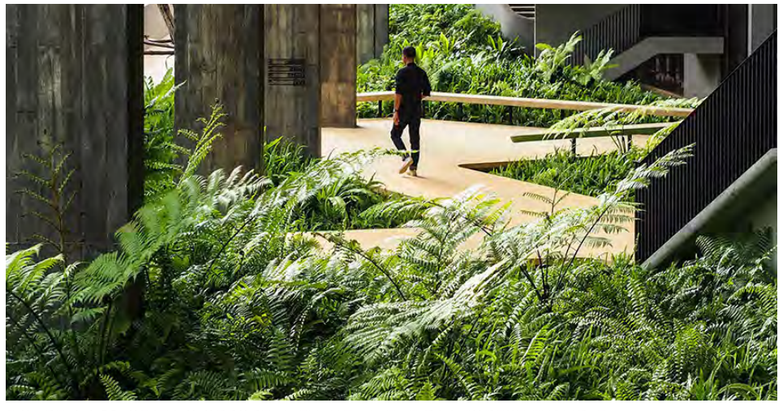


FIGURE 4.4.32: SEATING OPPORTUNITY WITHIN THE RAINFOREST EXAMPLE

KEY PLAN HIGHLIGHTING SIGNIFICANT TREE ZONES

4.4.15 SIGNIFICANT TREES - CEREMONIAL LANDSCAPE

Defining the entry road and providing a landmark for the arrival experience, significant tree planting zones should be allocated along the entry boulevard.

The character of this space should reference the iconic Cairns Foreshore through large shading trees to frame pedestrian walkways.

Refer Initiative 6.

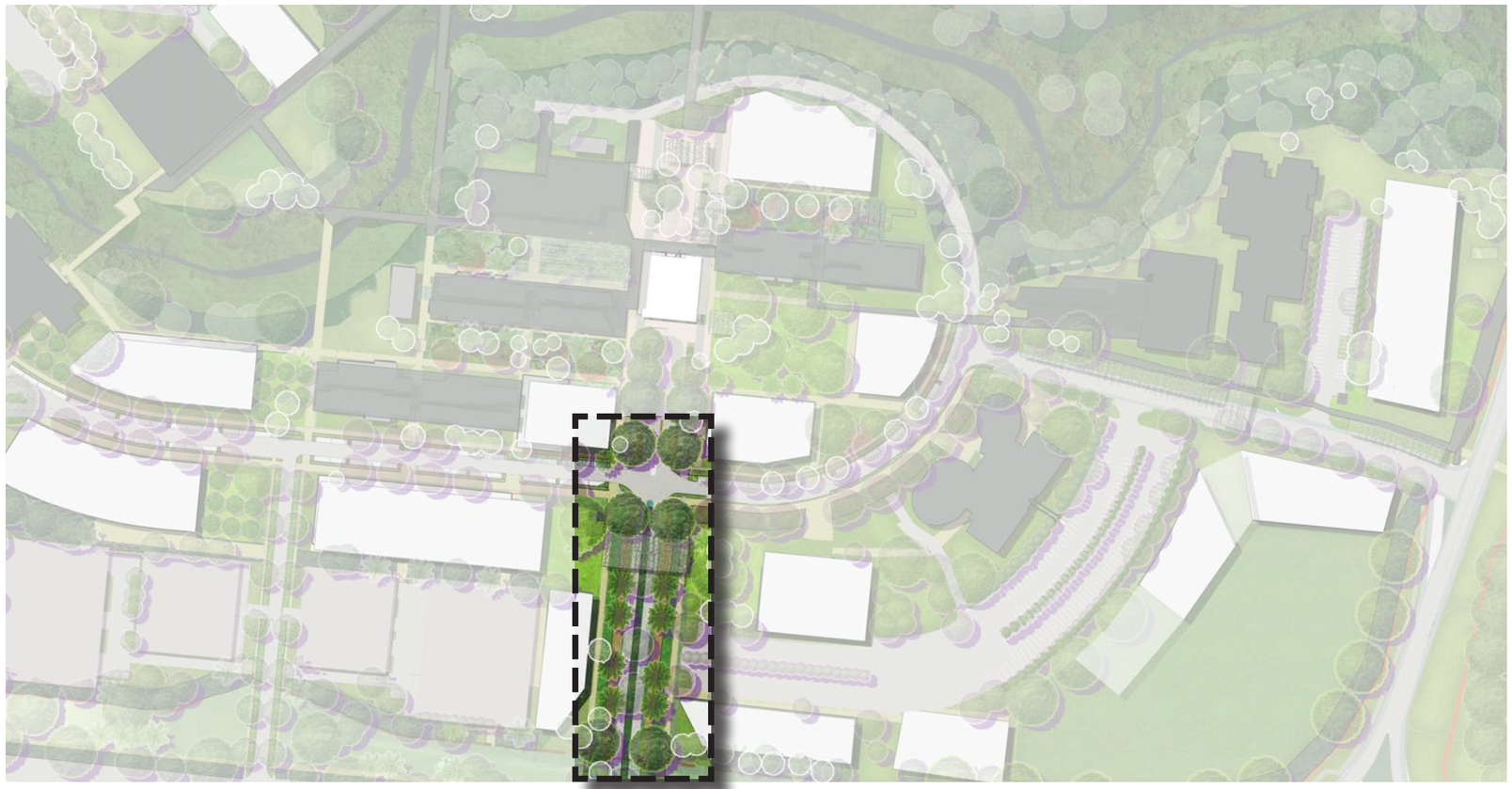


FIGURE 4.4.33: PRIMARY CAMPUS ACCESS WITH SIGNIFICANT TREE PLANTING HIGHLIGHTED

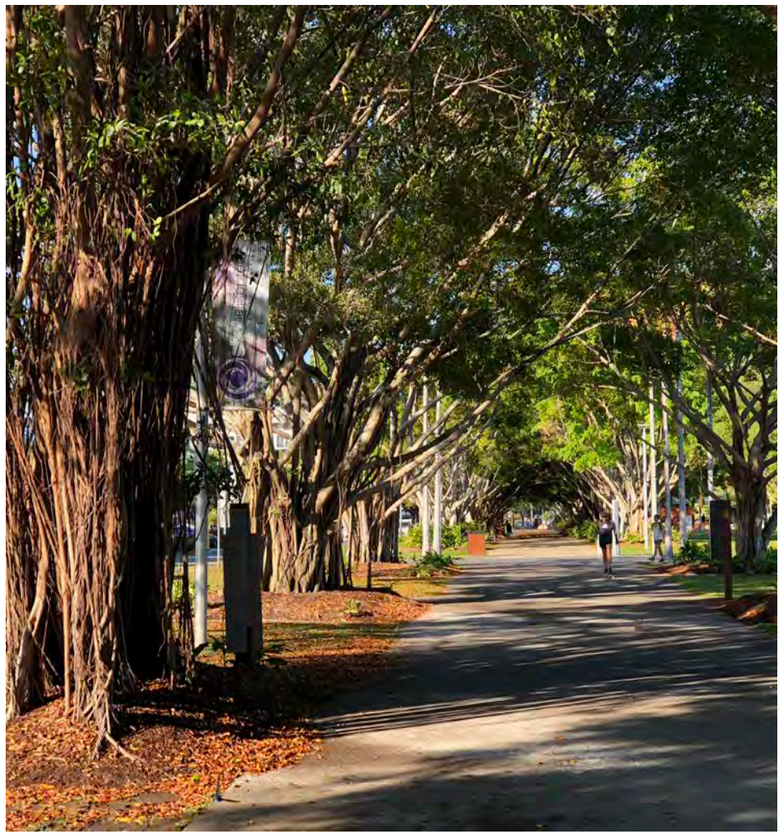


FIGURE 4.4.34: SIGNIFICANT TREE EXAMPLE IN CAIRNS (ESPLANADE)

4.4.16 EXAMPLE PLANTING PALETTE

The suggested plants have been selected based on suitability to achieve the tropical vision and the expected growing conditions of a wet tropical location. Endemic plants are important to the research groups on the Cairns campus, as well as the local traditional owners and holds significant educational value.

Tropical landscapes typically include:
_Different foliage texture, size and shape.
_Foliage colours combined together to create interest.
_Plants with colourful flowers including native flame tree, ginger and heliconia.
_Palms, tree ferns.
_Trees with a spreading canopy such as Fig trees for adequate shade.

TREES


FICUS SP


BAUHINIA BLAKEANA


BRACHYCHITON SP

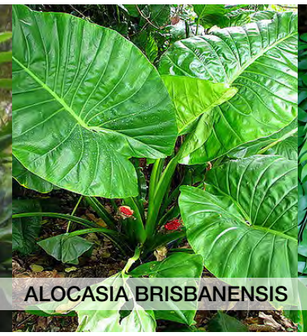

BRACHYCHITON ACERIFOLIUS


BARRINGTONIA CALYPTRATA

LOW SHRUBS


MACROZAMIA MOOREI


ALPINIA MUTICA


ALOCASIA BRISBANENSIS


BOWENIA SPECTABILIS

PALMS


LICUALA GRANDIS

GROUNDCOVERS


BROMELIAD SP.


DENDROBIUM NINDII

FERNS/CYCADS


BLECHNUM INDICA


PLATYCERIUM SUPERBUM

CLIMBERS


HOYA AUSTRALIS


RHAPHIDOPHORA HAYI

CORDYLINE SP


CYATHEA COOPERI

4.4.17 INDICATIVE PLANTING PALETTE

BOTANICAL NAME	COMMON NAME	BOULEVARD-VEHICLE ZONE	BOULEVARD-PEDESTRIAN ZONE	RIPARIAN NATURAL AREA	FORECOURT	ENTRY	RAINFOREST COURTYARDS	GENERAL STREET-SCAPE	PANGUNA STREET-SCAPE
TREES									
Agathis atropurpurea	Blue Kauri	●	●						
Barringtonia calyptrata	Cassowary Pine			●	●	●		●	
Bauhinia blakeana	Hong Kong Orchid				●	●	●		
Brachychiton acerifolius	Flame Tree						●	●	
Castanospermum australe	Black Bean			●			●		
Elaeocarpus reticulatus	Blue Quandong			●		●	●	●	
Ficus benghalensis	Banyan Fig	●	●						
Ficus hispida	Hairy Fig			●			●		
Flindersia ifflaiana	Cairns Hickory			●	●				
Podocarpus dispermus	Brown Pine			●	●	●		●	
Tabebuia palmeri	Pink Trumpet Tree								●
PALMS									
Cyathea cooperi	Tree Fern			●					
Licuala grandis	Ruffled Fan Leaf Palm			●	●		●		
Livistona decora	Weeping Cabbage Palm						●		
Macrozamia moorei	Moore's Cycad				●		●		
Raphis sp.	Lady Palm				●				
Strelitzia nicolai	Giant Bird of Paradise							●	●
LOW SHRUBS									
Alpinia mutica	Dwarf Ginger						●		
Alocasia brisbanensis	Cunjevoi		●		●	●	●		
Bowenia spectabilis	Zamia Fern	●	●		●	●	●		
Cordyline sp.	Lily Palm				●		●		
Dracaena 'Massangeana'	Happy Plant					●	●		
Gardenia ovularis	Native Gardenia					●	●		
Heliconia sp.	Heliconia								

BOTANICAL NAME	COMMON NAME	BOULEVARD-VEHICLE ZONE	BOULEVARD-PEDESTRIAN ZONE	RIPARIAN NATURAL AREA	FORECOURT	ENTRY	RAINFOREST COURTYARDS	GENERAL STREET-SCAPE	PANGUNA STREET-SCAPE
LOW SHRUBS									
Larsenaikia ochreata	Native Gardenia				●	●			
Monstera deliciosa	Swiss Cheese Plant							●	
Philodendron 'Rojo Congo'	Rojo Congo							●	
					●	●			
Xanthostemon verticilatus	Bloomfield Penda								
GROUNDCOVERS									
Alpinia sp	Ginger			●				●	
Bromeliad	Bromeliad							●	
Gardenia psidioides	Gardenia 'Glennie River'	●	●	●		●		●	
Hymenocallis littoralis	Spider Lilly	●	●			●		●	●
Liriope sp	Green and variegated	●	●			●		●	
Lomandra sp.	Mat Rush	●	●	●	●			●	●
Vitex ovata	Roundleaf Chastetree	●	●					●	●
FERNS/CYCADS									
Angiopteris evecta	King Fern			●	●		●	●	
Blechnum indica	Water Fern			●			●		
Calathea sp.	Zebra plant						●		
Lepidozamia peroffskyana	Peroffsky's Lepidozamia					●	●		●
Phyllanthus multiflorus	Fountain Plant			●			●		
Platycerium superbum	Staghorn Fern			●			●		
Platycerium hillii	Staghorn Fern				●		●		
Spathiphyllum sp	Peace Lilly						●		
Strelitzia reginae	Bird of Paradise								
CLIMBERS									
Cissus antarctica	Kangaroo Vine		●				●	●	●
Pandorea pandorana	Wonga Wonga Vine			●			●		
Pothos longpipes	Candle VIne			●			●		
Rhaphidophora hayi	Philodendron		●				●		●
Thunbergia mysorensis	Clock Vine								

FIGURE 4.5.1: PROPOSED BUILDING USE

- RESEARCH
- MIXED USE
- AUDITORIA
- ADMINISTRATION
- STUDENT LIFE
- ACADEMIC/LEARNING SPACES
- RESIDENTIAL
- INTERDISCIPLINARY NODES
- DENTISTRY
- IERC
- SECONDARY SCHOOL
- SPORTS/RECREATION
- SERVICES
- CONSOLIDATED CAR PARK

4.5 LAND & BUILDING USE FRAMEWORK

The campus includes a variety of land and building uses whose organisation and function create a sense of collegiality, enhance the academic atmosphere, and promote rich learning environments.

The land & building use framework provides direction and guidance for campus organisation, which is complemented by campus precincts (refer Section 7 - Precincts), and expresses the overall character of the campus. Uses identified within the plan include academic/learning spaces, interdisciplinary nodes, student life, mixed use, residential, research, sports/recreation and administration.

4.5.1 BUILDING USE

The Master Plan vision of consolidating, densifying and activating the campus heart is enhanced through strategic placement of student life and interdisciplinary nodes within the campus core. Interdisciplinary nodes provide for informal learning spaces, socialising, and dining. They are comprised of both new and renovated built form and aim to blend academic and student life spaces to allow for collaboration and flexibility. The Master Plan also suggests the campus library location should be explored with a potential shift to the campus core.

Enhancing student life facilities across the campus is another key goal of The Master Plan. Student life facilities are concentrated around the campus heart for activation, with smaller facilities located adjacent the residential buildings and within the Northern research precinct. An increase in residential buildings on campus will increase the number of students on campus in the evenings and weekends and generate increased student activity.

FIGURE 4.5.2: JCU CAIRNS D'LISH CAFE INTERIOR - D3

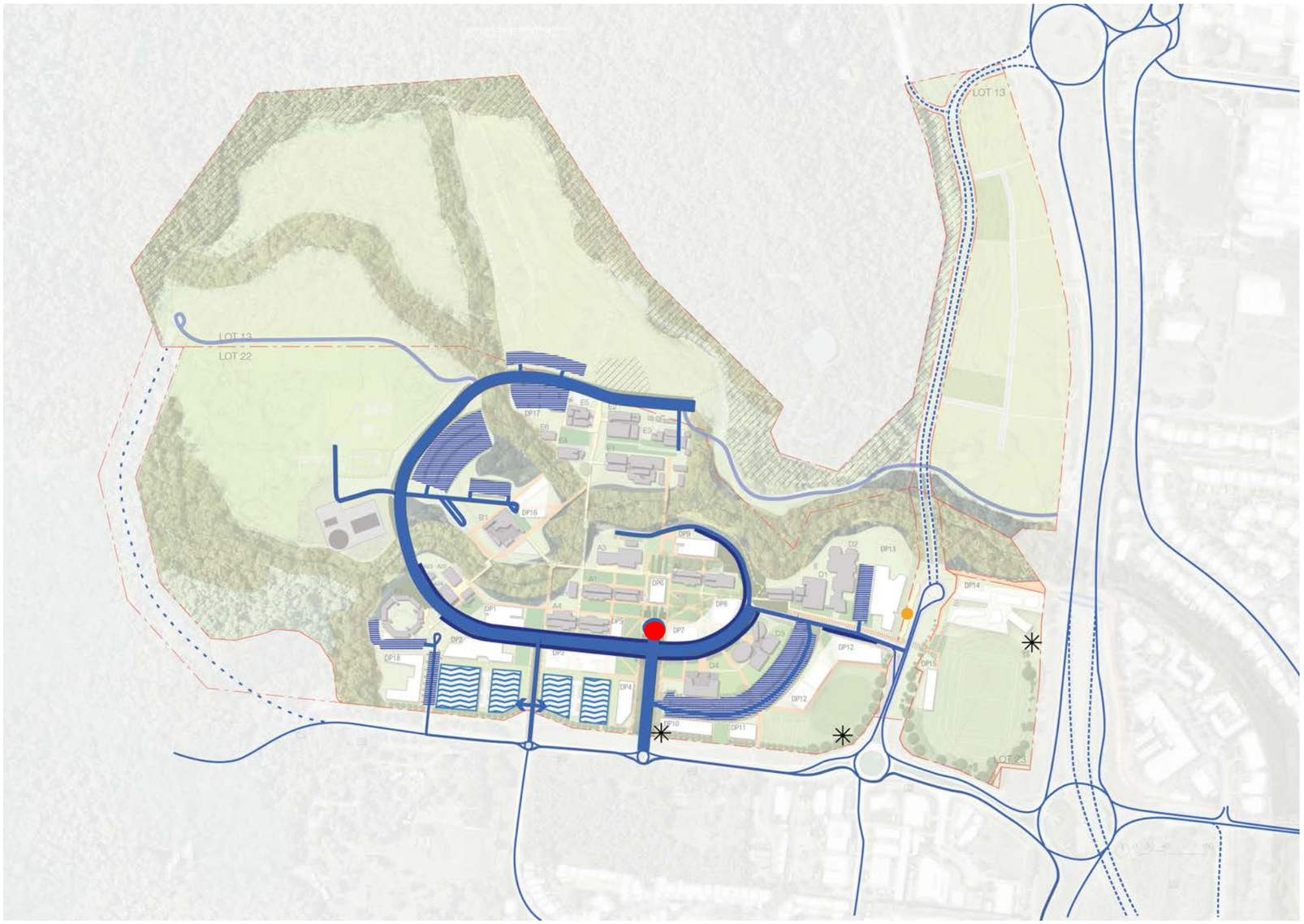


FIGURE 4.6.1: PREDOMINANT EXISTING BUILDING USE

- PRIMARY CAMPUS ROAD NETWORK
- SECONDARY CAMPUS ROAD NETWORK
- PARALLEL STREET PARKING
- EXISTING DIRT ROAD
- ACCESS ROADS TO CAMPUS
- FUTURE STATE ROAD
- STATE ROAD RESERVE
- EXISTING SURFACE PARKING
- PROPOSED STACKED CAR PARK WITH LANDSCAPE EDGES
- CEREMONIAL DROP-OFF ZONE
- BUS STOP

4.6 ACCESS & CIRCULATION FRAMEWORK

The access and circulation framework establishes an integrated circulation system that includes pedestrian, bicycle, transit, vehicular, and parking networks. Fundamental to all of these networks is a goal to reduce vehicle kilometers traveled to and within the campus, an emphasis on efficiency and accessibility, and a commitment to preserve a pedestrian-oriented campus.

To successfully increase transit use and promote pedestrian and bicycle circulation on campus, careful coordination and a unified approach to services that facilitate access to alternative modes of transportation is required.

The framework recommends that the University:

1. Enhance the pedestrian entrance from Panguna Street Bus Station with endemic tropical landscaping supported by a landscaped arbour to extend the existing covered walkway.
2. Increase transportation options between the City and Smithfield campuses (e.g. Introduce a University eco-shuttle or explore alternatives)
3. Increase student accommodation opportunities on and near campus
4. Accommodate bicycles within designated routes and paths on campus
5. Improve services for cyclists (e.g. on-campus bike shop and end-of-trip facilities)
6. Enhance accessibility throughout the campus for all University users.

4.6.1 ROAD NETWORK

The campus road network is a key organising principle of movement through the campus and a key priority of the Master Plan. Enhancements to the Ring Road and access road off McGregor road should dramatically transform the identity and character of the campus into a uniquely tropical campus.

The Master Plan proposes street parking along the Ring Road to maintain the convenience of the existing campus, broken with landscape sections to allow for large-scale shade trees. Shaded roads are important in the tropics to mitigate against the urban heat island effect.

Finalisation of the future expansion of Ring Road West to complete the loop should be possible once the Panguna Street extension is completed.

4.6.2 PARKING

Transit, pedestrian, and bicycle improvements along with an increased supply of student accommodation on and near the campus reduce commuting in single-occupancy vehicles and the overall need for parking on the Smithfield campus.

The Master Plan maintains the existing number of parking spaces for both current and future development levels, consolidates surface lots within landscaped multi-storey car parks, and reconfigures existing surface lots.

These strategies help mitigate the impact of parking on the quality of the campus environment. In general, the parking strategy preserves and concentrates the number of spaces on the Smithfield Campus in a location that maintains accessibility to the campus core.

It is suggested that the multi-storey car parks adopt a landscape approach to its edges in order to maintain the tropical landscape identity of the Cairns campus.

FIGURE 4.6.2: CAMPUS HUB SPACES & WALKWAYS

- EXISTING HUB SPACES & INTERNAL CORRIDORS
- EXISTING SHADED WALKWAYS
- PROPOSED SHADED WALKWAYS
- ARBORETUM TRAIL
- PROPOSED HUB SPACES

4.6.3 HUB SPACES & WALKWAYS

The existing campus features a strong internal corridor network that allows circulation throughout the campus in a climate protected environment. There is an opportunity for small interventions to rejuvenate these internal networks and create large social hub spaces that promotes indoor/outdoor engagement. The original campus buildings, A1, A2 and A4 are primed for such interventions due to their regular grid and planning.

The campus has a strong network of covered walkways, with only a few buildings without undercover connections to the main campus. The covered walkway network is a strength of the campus that could be further enhanced with gathering spaces along the network to encourage student and staff collaboration.

The underpass that connects JCU with Smithfield east of the Captain Cook Highway is unappealing and a key concern of many staff and students of the campus. The Master Plan suggests that a more substantial, safe and open overpass should be considered by Queensland Government Department of Transport & Main Roads and Cairns Regional Council.

FIGURE 4.6.3: SHADED WALKWAY ALONG TRANSPARENT BUILDING EDGES
PHOTO: CIP2, QUT KELVIN GROVE (KIRK)

FIGURE 4.6.4: POTENTIAL ACTIVATION OF WALKWAYS AND ROAD NETWORK FOR MARKETS
PHOTO: TANKS ART CENTRE MARKETS, CAIRNS BOTANIC GARDENS

FIGURE 4.6.5: PROPOSED PEDESTRIAN NETWORK AND INTERDISCIPLINARY NODES

- PRIMARY PEDESTRIAN MOVEMENT NETWORK
- SECONDARY PEDESTRIAN MOVEMENT NETWORK
- ARBORETUM TRAIL
- CENTRAL ACTIVITY ZONE

4.6 ACCESS & CIRCULATION FRAMEWORK

4.6.4 PEDESTRIAN CIRCULATION

The Cairns Campus Master Plan 2019 goal is to create a legible, pedestrian-oriented campus within an integrated and accessible environment.

Pedestrian movements are prioritised and adjusted to facilitate efficient circulation through compact development, well-defined shaded pathways, and logical connections between indoor and outdoor environments. Pedestrian improvements also facilitate community access to the campus.

The existing outdoor circulation network is rationalised and placed alongside building edges, and strategically integrates new development at key pedestrian entrances.

To maximise its utility, the indoor pedestrian network must be made more legible. The University would benefit from an interior wayfinding plan that provides navigation aids throughout the system using maps, signage, and floor markings. Accessibility considerations should be incorporated in future planning efforts, and throughout the implementation of the Master Plan.

4.6.5 TRANSIT NETWORK

The JCU Cairns Campus Master Plan 2019 (Master Plan) suggests the introduction of a campus shuttle that has the potential to improve cross-campus access, connections to the Cairns community & Cairns CBD. This could allow for students to work in the CBD without the reliance of a private car or additional costs of Uber and taxi's.

The campus shuttle would unite the Smithfield campus with the City campus, on a single route and is designed to provide greater accessibility and connectivity for students and staff, as well as the broader Cairns community.

A detailed business case is recommended to assess the viability of an eco-shuttle being implemented.

4.6.6 BICYCLE NETWORK

Bicycle use is encouraged, and can be a significant alternative to driving. The bicycle network facilitates cross-campus connectivity and access to adjacent neighbourhoods through on-street and dedicated campus bike paths.

The Master Plan accommodates several dedicated bike paths in key locations. These paths should be identified for bicycle use through surface treatment or physical separation to ensure pedestrian safety.

FIGURE 4.6.6: CAMPUS CYCLING NETWORK & END OF TRIP FACILITIES

- CAMPUS CYCLE NETWORK
- COUNCIL CYCLE NETWORK
- PROPOSED OVERPASS
- END OF TRIP FACILITIES
- EXISTING BIKE RACKS

IMAGE 4.6.3 - LOCAL CONTEXT - COLLINS AVENUE, CAIRNS BOTANIC GARDENS
SHADED ROAD NETWORK WITH STREET PARKING

FIGURE 4.6.7: LANDSCAPED STACKED CAR PARK SOLUTION - POTENTIAL FOR JCU CAIRNS
PHOTO: SINGAPORE GOVERNMENT HOUSING PRECINCT CARPARK

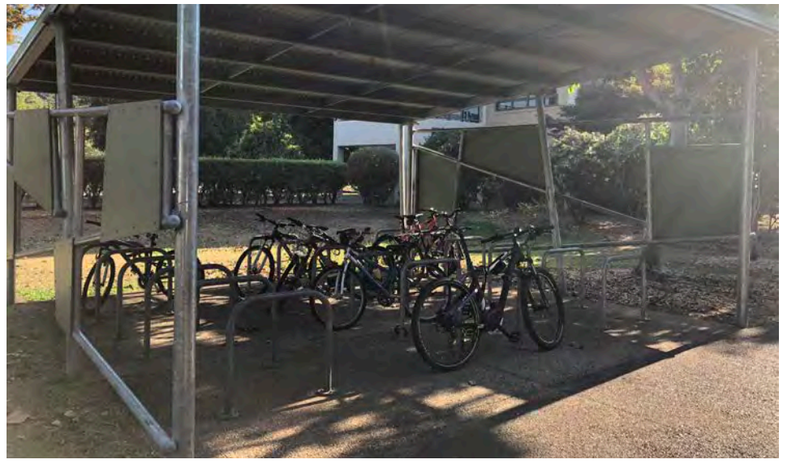


FIGURE 4.6.8: EXISTING SHADED BICYCLE PARKING - WELL UTILISED
PHOTO LOCATION: EAST OF A4

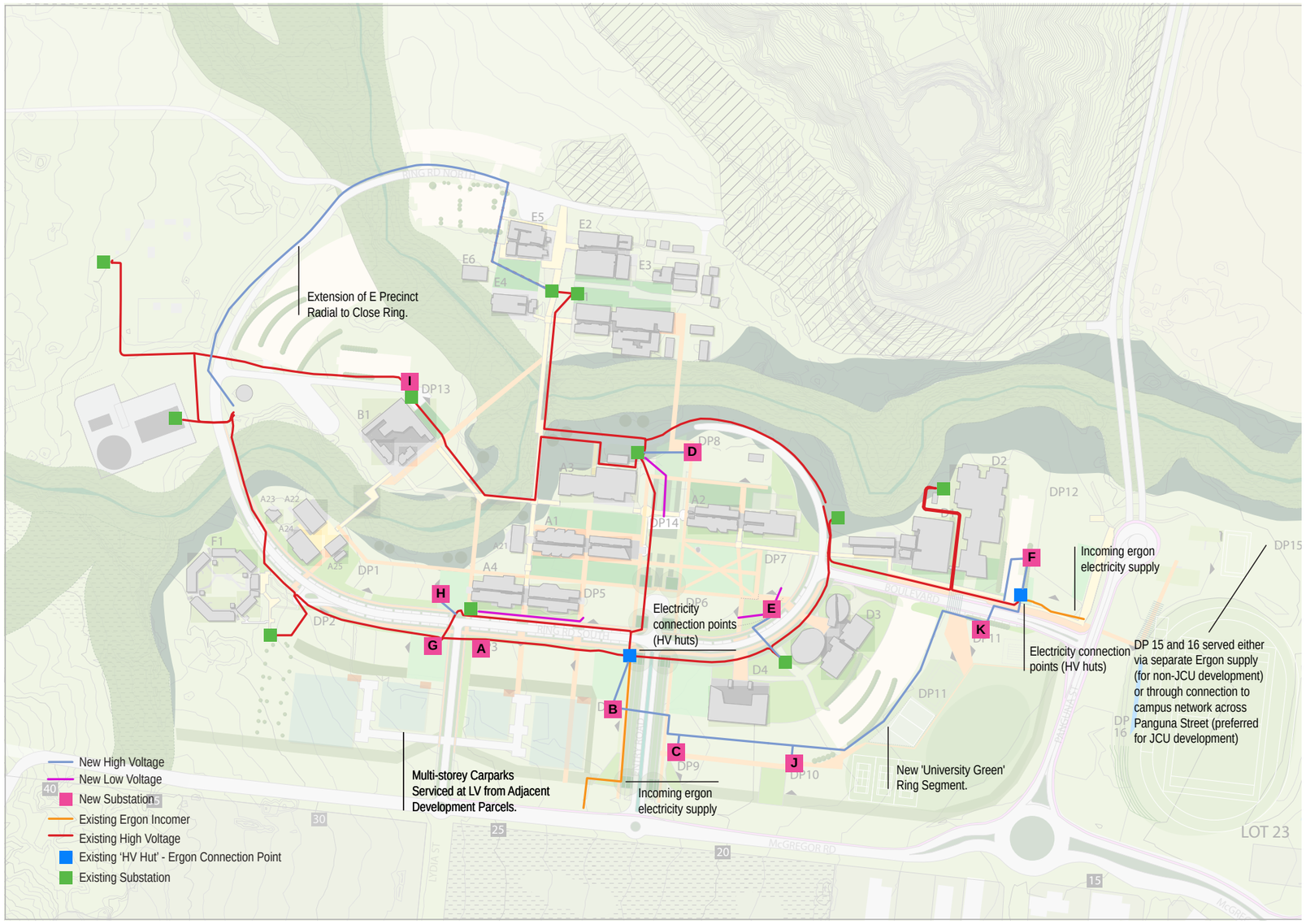


FIGURE 4.7.1: PROPOSED HV ELECTRICAL OVERLAY
REFER TO APPENDIX F FOR FURTHER DETAILS

4.7 SERVICES FRAMEWORK

Campus electricity is sourced from the Ergon network at high voltage on the south boundary of the campus at McGregor Road. Water and sewer connections are made to the Cairns Regional Council network on the East campus boundary at the Captain Cook Highway. A Central Energy Plant and Thermal Energy Storage System located near the Western edge of the campus provides reticulated chilled water district cooling services to air conditioned campus buildings.

Services are distributed to campus buildings using infrastructure owned and operated by the University. Existing services infrastructure networks are concentrated around the original university core within the University Centre Zone (UCZ).

Based on information provided, the existing infrastructure is assessed to be within capacity with each service having varying levels of additional capacity to support future developments. Further information gathering (electricity and cooling metering, surveying, pressure testing and hydraulic modelling) is recommended to confirm these findings and inform future developments.

Electricity and cooling networks inside the university core are generally arranged in ring configuration providing redundant pathways to allow bypass of network segment failures. Networks serving outlying D and E precinct buildings are arranged in radial configuration which presents risk for extended loss of supply in the event of network segment failure. It is recommended that opportunities to extend the radial networks to connect as ring networks be considered.

The proposed concentration of future development in the existing university core locates new development adjacent to existing university ring networks. Benefits of this approach include maximised utilisation of already installed infrastructure and improved resilience in supply to new developments.

Refer to Appendix F for Infrastructure Analysis report for further discussion of services infrastructure capacity and strategic reticulation plan.

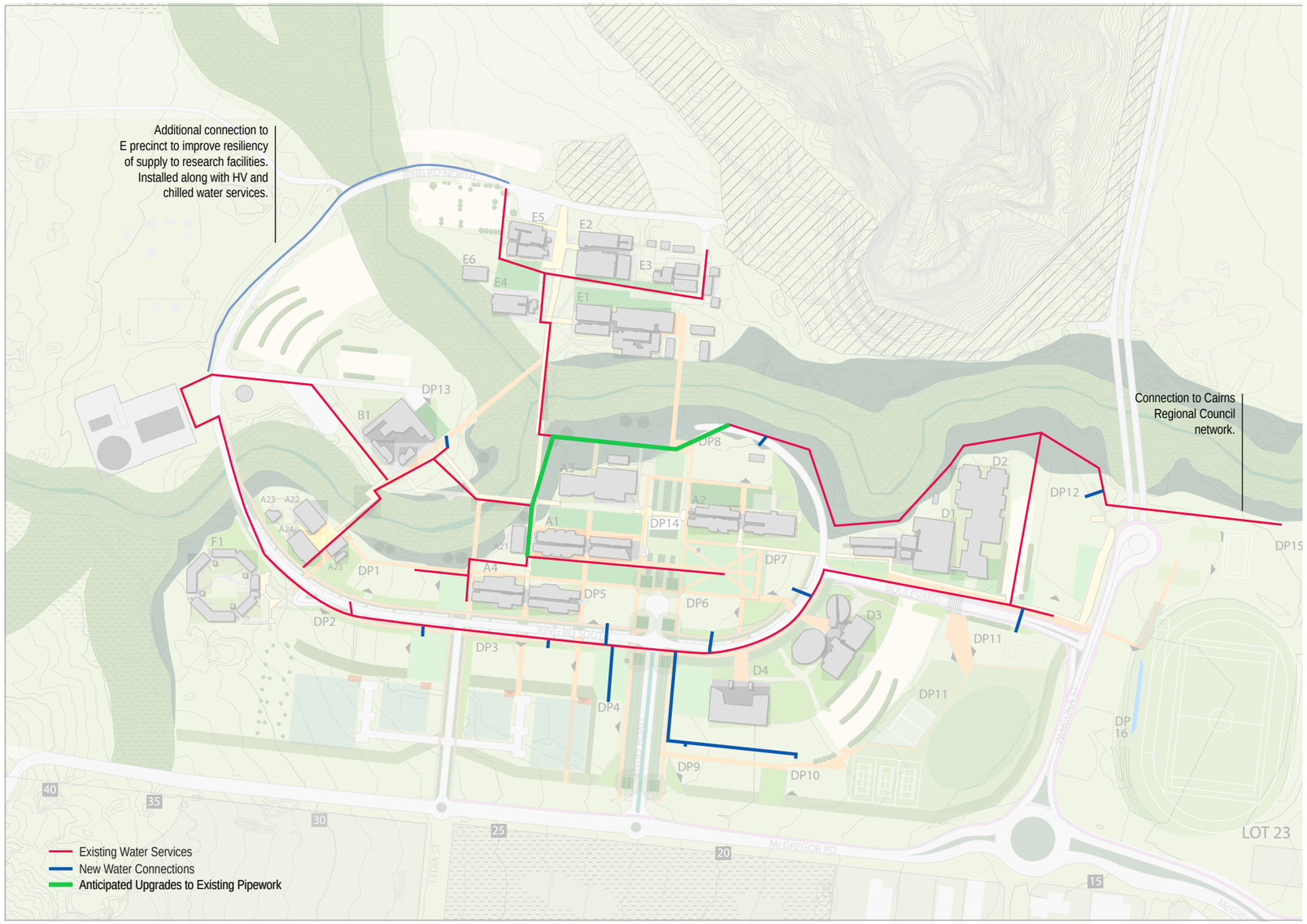


FIGURE 4.7.2: PROPOSED WATER SERVICES OVERLAY
REFER TO APPENDIX F FOR FURTHER DETAILS

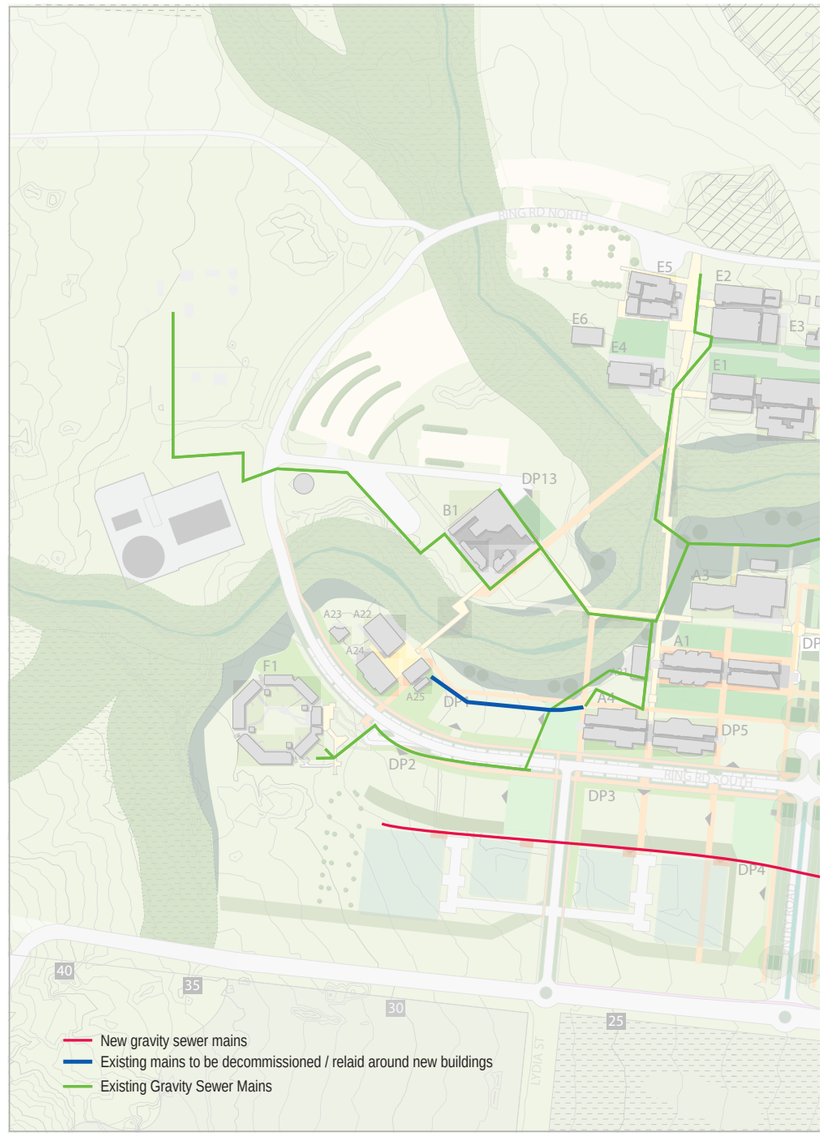
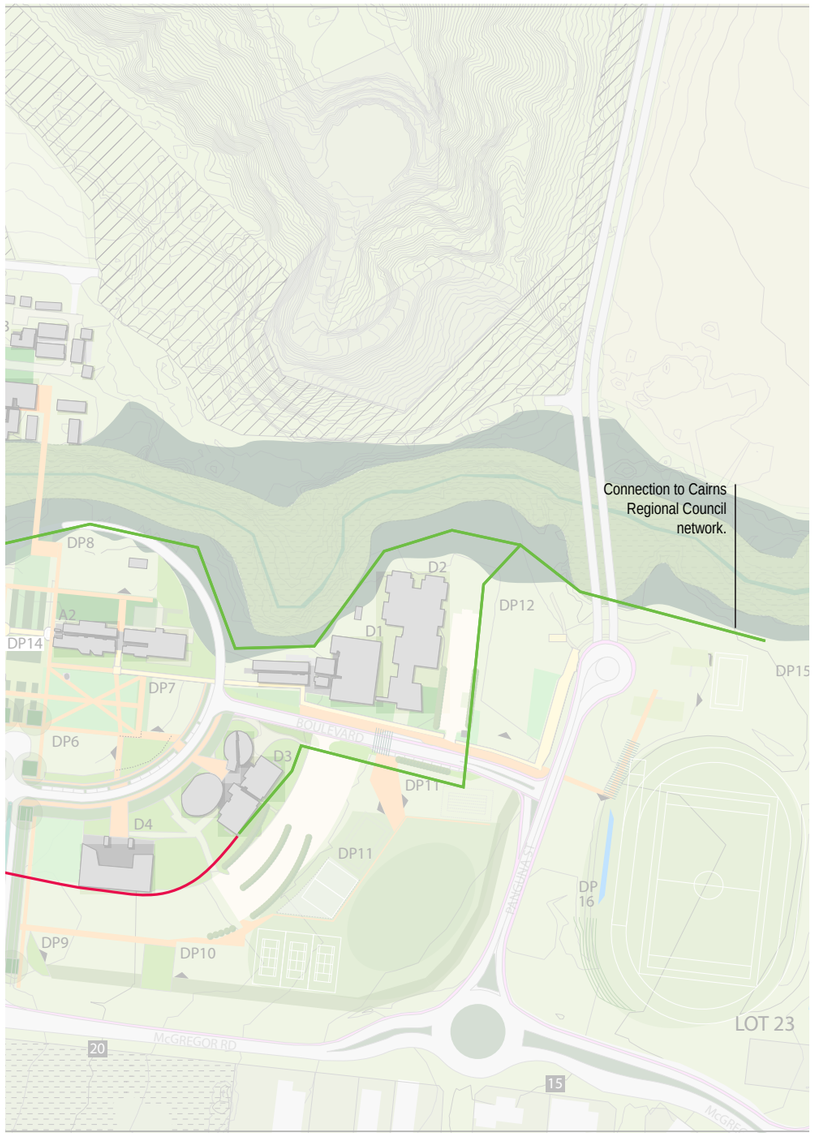


FIGURE 4.7.3: PROPOSED SEWER RETICULATION OVERLAY
REFER TO APPENDIX F FOR FURTHER DETAILS

4.7 SERVICES FRAMEWORK



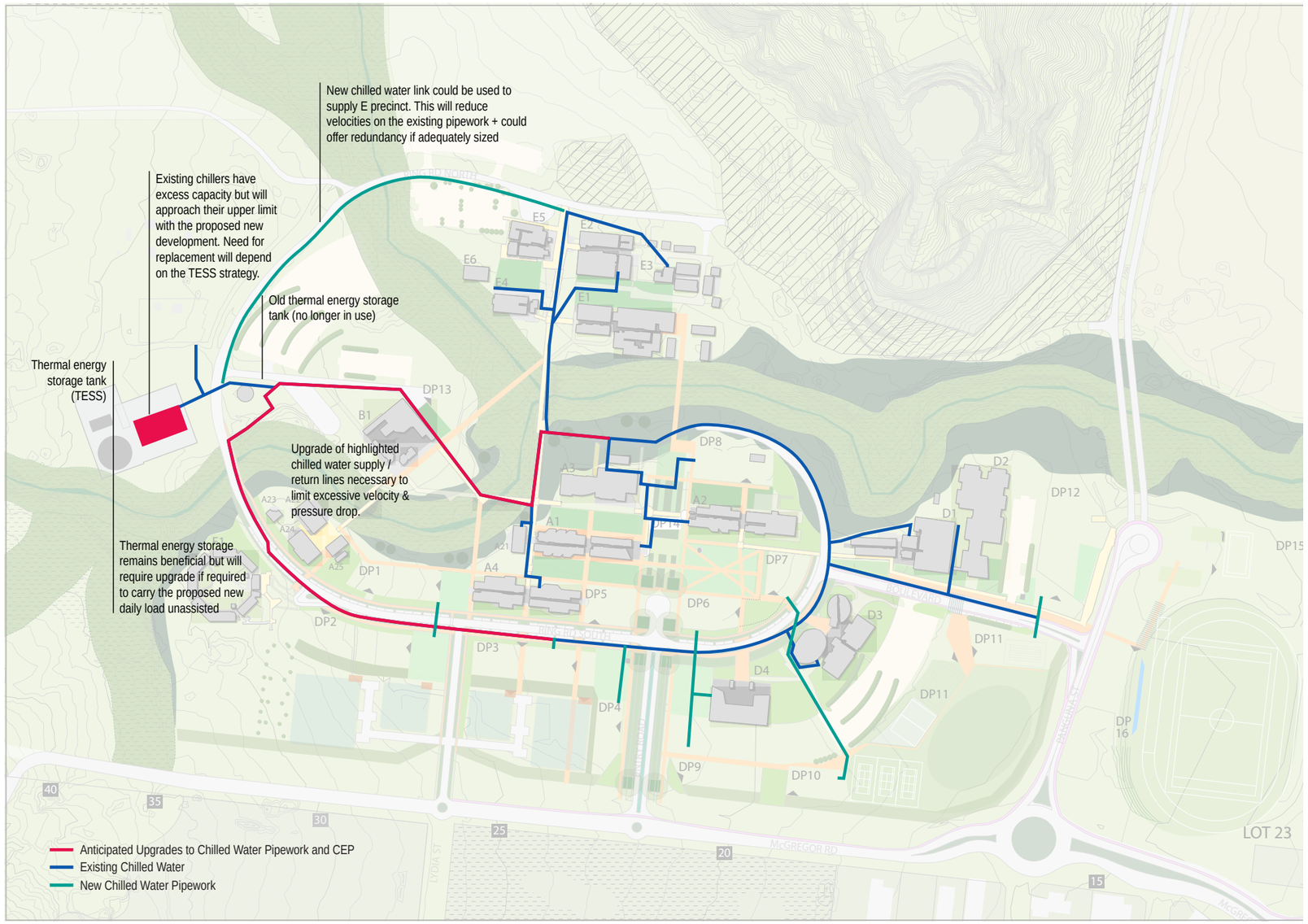


FIGURE 4.7.4: PROPOSED CHILLED WATER OVERLAY
REFER TO APPENDIX F FOR FURTHER DETAILS

“The Smithfield major regional activity centre contains a number of elements, including the James Cook University (JCU) and existing shopping centres and businesses. There are opportunities in the future for additional centre activities, a technology park at JCU and additional industrial land. Integrating these current and future elements to best serve the surrounding communities is a key priority.”

Far North Queensland Regional Plan 2009-2031

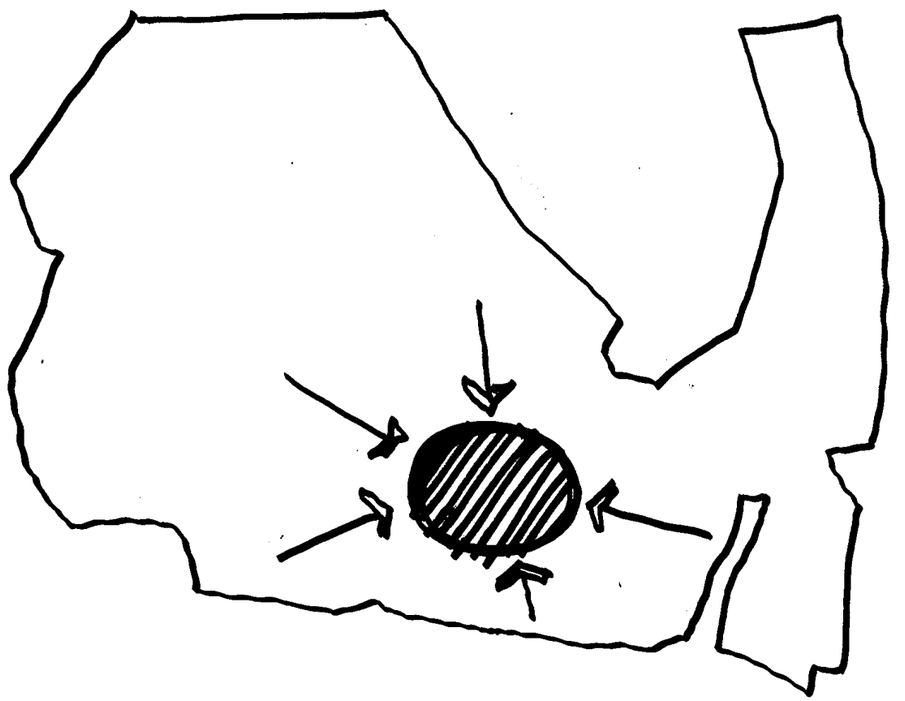


FIGURE 5 - COMPACT CAMPUS

05 PROGRAMMATIC ASPIRATIONS

The Cairns Campus Master Plan 2019 program development outlines the key briefed items that should be addressed within the Master Plan. There are nine key elements and future alternatives for consideration.

FIGURE 5.1: CAIRNS CAMPUS MASTER PLAN 2019 (REFER PAGE 54-55 FOR LEGEND)

KEY FUNCTIONAL BRIEF CONSIDERATIONS

Student Accommodation (additional 600 beds)

Low Carbon Future & Improved Energy Efficiency of Existing & New Buildings

Secondary School College Facility

Establish a tropical landscape character

All-weather, outdoor covered spaces (multi-scale & purpose)

Consolidate Car Parking (Multi-storey)

Academic Accommodation up to 130,000m^2

Create social hub spaces & active play

Additional Sports & Recreational Facilities

5.1 PROGRAMMATIC ASPIRATIONS

The Cairns Campus has a deficit of learning spaces appropriate for the current pedagogical trends, therefore, refurbishment of the original building learning spaces is an important initiative of the Master Plan. To support a student population of 13,000 EFTSL by 2031 as set out in the 2010 Cairns Campus Master Plan, the campus should provide the maximum academic accommodation within the University Centre Zone (UCZ) of 130,000m^2 GFA under the current ministerial designation. The completion of the JCU Ideas Lab in 2020 will bring the total campus GFA to 67,000m^2, therefore, a further 63,000m^2 GFA is assumed within The Master Plan.

The key functional brief items for the Master Plan are listed in the diagram to the left, with additional program considerations* are below in no particular order:

1. Sports and wellness centre (for both university and community users);
2. Enhanced end of trip facilities;
3. New integrated Indigenous Education and Research Centre (IERC);
4. Display the Joseph Banks Collection - appropriately for visitation and display (250th Anniversary in 2019);
5. Adventure Tourism/Recreational facilities (potential for JCU to harness relationship with the world-class mountain bike tracks that surround the campus (e.g. clubhouse, end of trip facilities etc.);
6. Allied public/private research partnership facilities (e.g. translational research, knowledge precincts etc.);
7. Community & Retail facilities (e.g. childcare, community library, service retail/ village hub). Market sounding process should be considered;
8. Engage with Department of State Economic Development team (opportunities exist with JCU as Hi tech facility landlord);
9. Residential Solutions;
10. Disaster Centre; and
11. Large scale health care facility.

*Program considerations above are not necessarily individual buildings but are functional drivers for future projects. Future development should be achieved through functional requirements or Master Plan project initiatives.

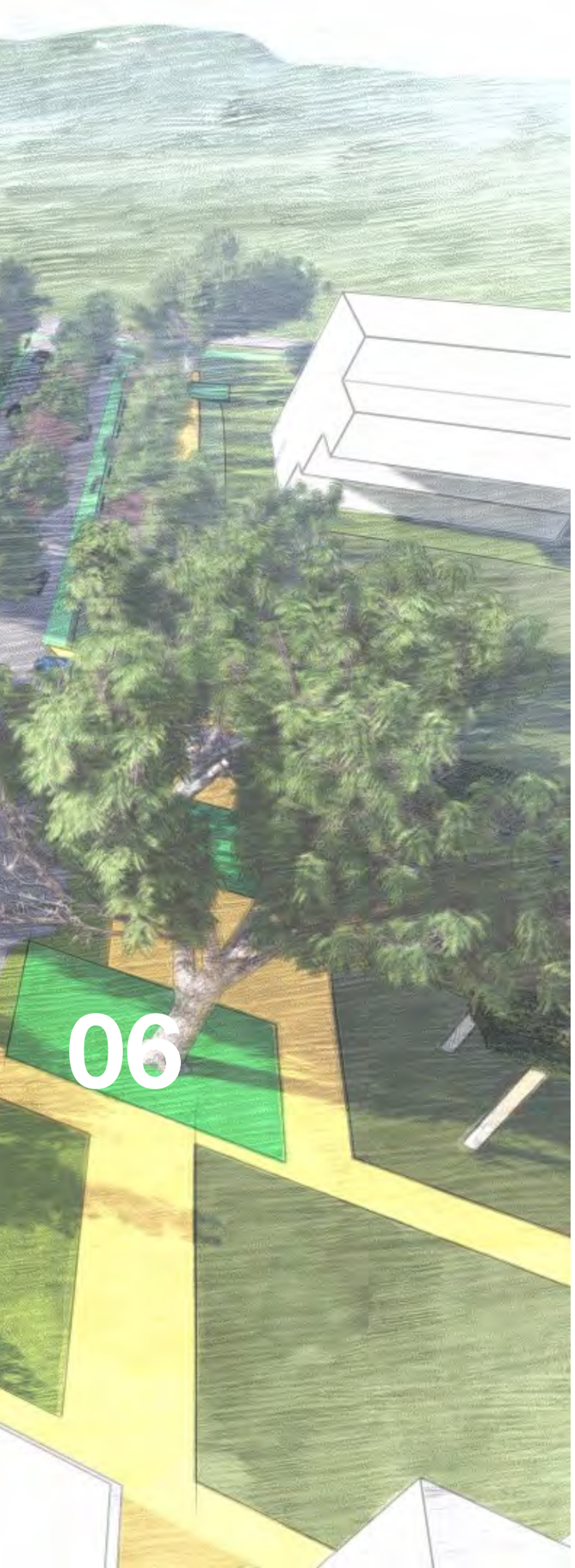
SPORTING FACILITIES

Sporting facilities was frequently raised through the stakeholder consultation both internally and externally. There are opportunities for the Cairns Campus to engage with the neighbouring mountain bike track facilities, as well as providing some essential campus active play amenities for on-site student accommodation.

The JCU Cairns Campus Future Sport and Recreation Priorities were outlined in the July 2015 Sport and Recreation Master Plans for the Cairns campus:
- Increased/better health and fitness (gymnasium) facilities (54.7%)
- Multi-purpose indoor sports hall (42.32%)
- Group fitness classes (34.33%)
- Outdoor swimming pool (31.35%)
- Indoor Swimming pool (30.09%)
- General shaded recreation spaces (23.20%)
- Tennis Courts (16.30%)
- Beach Volleyball Courts (13.01%)

Covered active play areas to include amenities such as a basketball half-court or a volley-ball court could benefit the campus life.

FIGURE 6: CAIRNS CAMPUS MASTER PLAN 2019 ILLUSTRATION OF JCU SQUARE



06

INITIATIVES

The Cairns Campus Master Plan 2019 (The Master Plan) proposes 50 key transformative projects called "**initiatives**" that consist of small to large scale interventions across the campus to significantly improve and activate student life on the Cairns Campus in Smithfield.

Each **initiative** should be understood in association with the Master Plan, the University Plan (2018-2022), the Academic Plan (2018-2022), and the JCU Cairns Sustainability Plan (Due 2019). Importantly, the initiatives should address the eight Master Plan Principles.

Each **initiative** includes a priority level from 1 to 5. Priority 1 suggests implementation action should be initiated within 12-18 months. Priority 5 suggests a time frame of within 10 years. Time frames are suggestive only and subject to feasibility analysis.

FIGURE 6.1: INDICATIVE MAP OF INITIATIVES

6.0 INITIATIVES

The Master Plan initiatives have been grouped thematically and identify key considerations for the implementation of each initiative.

Not all initiatives are site specific, therefore, only the initiatives with indicative locations are shown on the map.

6.1 LANDSCAPE INITIATIVES

1. Create Shade over Founders Green
2. Atika Creek Study Pods
3. Create Landscape Themed Zones
4. Regenerate and Rejuvenate Atika Creek
5. Establish the JCU Square
6. Plant Signature Trees
7. Landscaped "Walk of Discovery"
8. Create Shade over Library Green
9. Enhance and extend Arboretum Trail

6.2 A-PRECINCT MODIFICATIONS

10. Create Hubs on Ground Floor
11. Create new links to improve visual connections
12. Create covered terraces on level 1 & 2 for outdoor learning
13. Improve learning and work spaces to align with new pedagogies

6.3 CAMPUS CONNECTIVITY

14. Upgrade Campus Entrance off McGregor Road
15. Exemplar demonstration of water sensitive urban design
16. Comprehensive Campus lighting solution
17. Ring Road redevelopment
18. Upgrade Wayfinding Strategy
19. Create Stacked Car Parking (CP1 & CP2)
20. Explore connectivity options between City and Smithfield
21. Enable power and water for potential street markets
22. Covered walkway enhancements
23. JCU Overpass
24. Ring Road Completion
25. Create new bridge links

6.4 CAMPUS AMENITY

26. Signature Learning Commons & Student Hub
27. End of Trip (EOT) Facilities
28. Childcare Facility on campus
29. The Exchange - Shade House
30. Amphitheatre Upgrade
31. The University Bar
32. Campus Village
33. Student Accommodation

6.5 SPORT & RECREATION

34. Upgrades to Existing Sports Oval tiered landscape seating
35. Sports Piazza
36. Multi-purpose hall
37. Activate the University Green
38. Create a Sports & Recreation Shade Structure
39. Basketball Half-court
40. Engagement Zone Water Feature
41. Active Play zones
42. Fitness & Wellness Centre

6.6 SUSTAINABILITY

43. Energy Generation
44. Building Energy Efficiency Audit
45. Campus Wide Sustainability Plan

6.7 COMMUNITY FOCUS

46. Campus Art Curation
47. Research on Display
48. Land Reserves for Future Utilisation
49. Secondary School on Campus
50. Integrated Knowledge and Community Centre

01
CREATE SHADE OVER FOUNDERS GREEN

PRIORITY 1

The Founders Green is a significant, formal space for student, staff and campus visitors to gather, meet and socialise.
_Shade structures that can be retracted or easily taken down in the event of a cyclone is the preferred methodology.
_Shading provides a microclimate for rainforest plants to flourish.

Image above: CEPT University in Ahmedabad

02
ATIKA CREEK STUDY PODS

PRIORITY 1

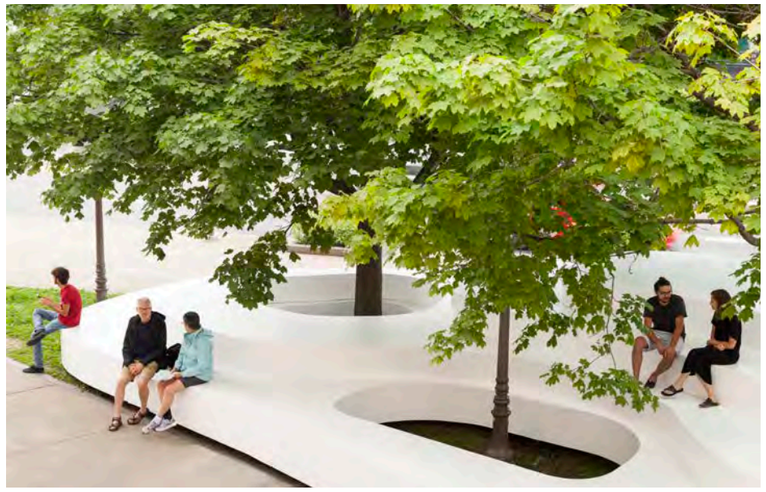
As an engagement initiative to increase awareness and ownership of the campus from staff and students, the Atika Creek study pods allow for a cool, shaded place for interaction, collaboration, rest or retreat.
_The Master Plan has proposed locations for the study pods (Refer to Open Space & Landscape Framework), however, further investigation is required to ensure correct placement of each pod.
_The study pods should consider wifi connectivity, waterproof electricity points and adequate lighting to provide flexibility for activities to occur.
_The study pods have the potential to integrate with the JCU Arboretum trail.

Image above: Potential seating design for Atika creek study pods

6.1 LANDSCAPE INTERVENTIONS

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

03
CREATE LANDSCAPE THEMED ZONES



PRIORITY 1

_Themed zones to be designed in accordance with the Open Space and Landscape Framework.
_Each landscape zone should have a different theme to provide educational value to campus users.
_Plant selection to provide education on indigenous heritage to engage and enhance the student experience.
_Landscape that can provide shade to open spaces is critical.
_Shaded seating to be incorporated in each zone.

Image above: Lush rainforest vegetation

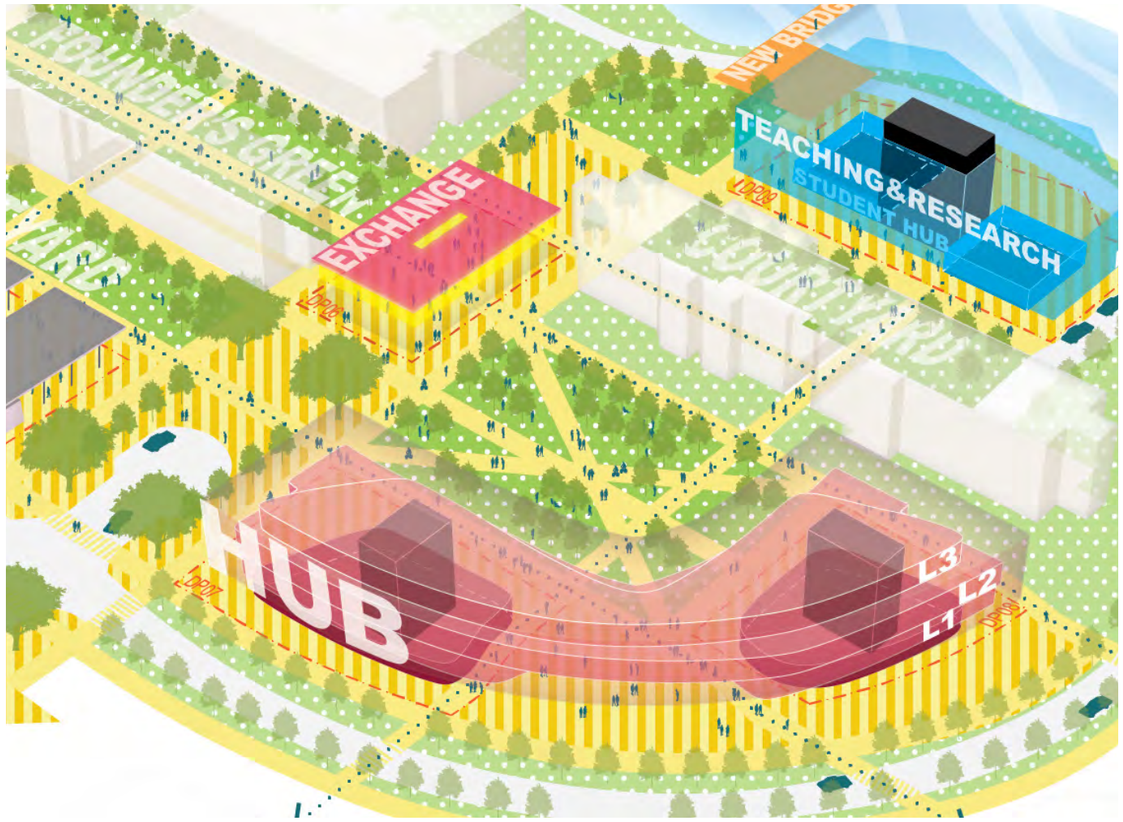
04
REGENERATE & REJUVENATE ATIKA CREEK

PRIORITY 2

_Atika Creek rejuvenation and regeneration projects should be integrated with the educational program of the University as an engagement initiative.
_Campus and community initiative to encourage and promote endemic species on the JCU Cairns campus.

Image above: Julaymba Restaurant at Daintree Ecolodge

05
ESTABLISH THE JCU SQUARE



PRIORITY 1

_Central and ceremonial gathering space.
_Located within the campus heart.
_Provides shade through large trees.
_Lighting and seating provisions to be considered.
_Enhances the identity of the campus.
_Repurposes P3 car park into a tropical campus heart.
_The JCU Square should integrate with surrounding campus circulation networks and proposed initiative 29 'The Exchange' and initiative 26 'The Hub'.

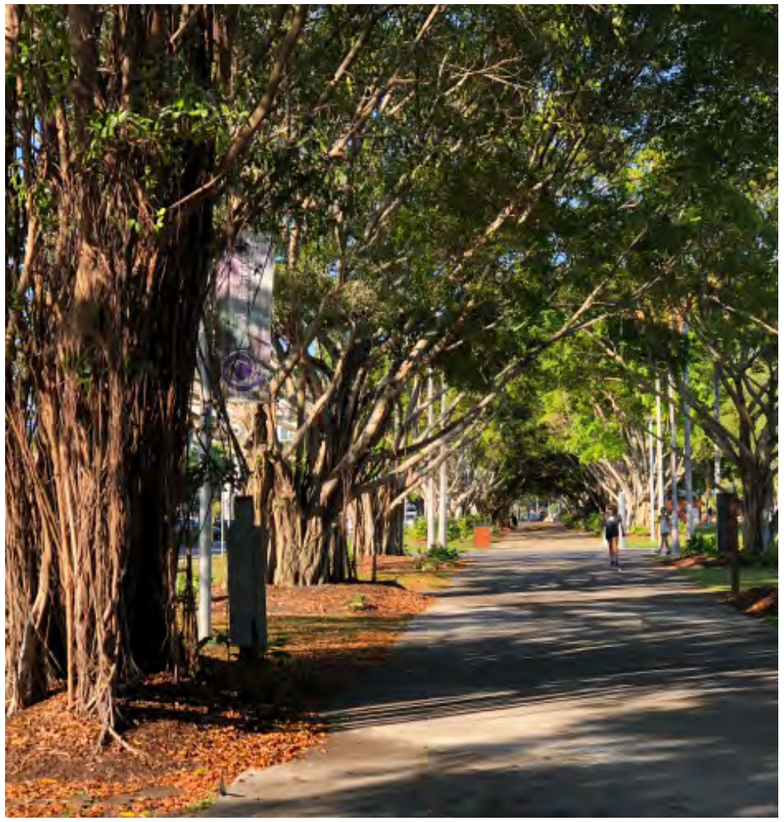
Image above: Diagram illustrating potential relationship of The JCU Square within The Master Plan.

Image above: Harvard Yard

6.1 LANDSCAPE INTERVENTIONS

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

06
PLANT SIGNATURE TREES



PRIORITY 1

_Large signature trees (e.g. Fig trees on Cairns Esplanade) to create identity and to mark the campus entrance.
_Trees to be planted within a 10mx10m zone.
_If infrastructure is located in designated tree zone, infrastructure to be moved as signature trees have precedence.
_Root control methods to be integrated. Refer to page 126 for more detail.

Image above: Large figs along Cairns Esplanade

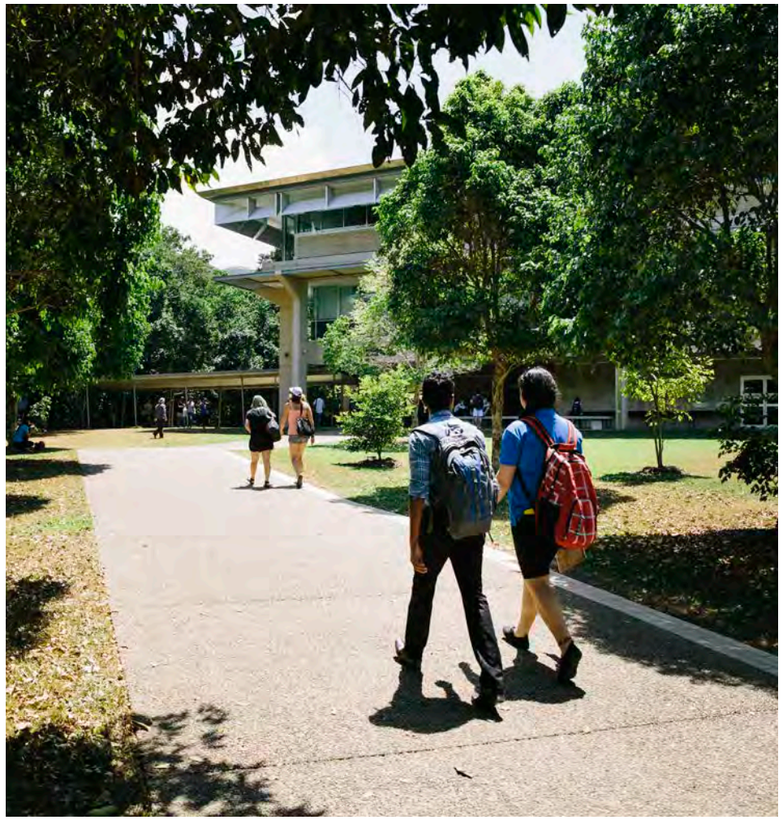
07
LANDSCAPED "WALK OF DISCOVERY"

PRIORITY 2

_"Walk of Discovery" to extend the existing covered walkway from the Panguna Street bus stop.
_Arbour structure with landscape to provide additional shade to a highly utilised covered walkway.
_Potential to integrate campus wayfinding, sound and art.
_Adequate lighting and accessibility for all campus users.
_Key link from existing sports oval to newly proposed Fitness & Wellness Centre (Initiative 42), Multi-purpose Sports Hall (Initiative 36) and Sports Piazza (Initiative 35).

Image above: Shaded arbour walkway, Martin Munroe Parklands, Cairns

08
CREATE SHADE OVER LIBRARY GREEN



PRIORITY 3

_Create a large shaded area on the Library green.
_Power outlets to be provided for study purposes or to provide flexibility to host various events.
_Allow for air movement to pass through the space to encourage a comfortable outdoor space within the tropics.

Image above: Students walk up to the library at JCU Cairns.

6.1 LANDSCAPE INTERVENTIONS

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

09
ENHANCE & EXTEND THE ARBORETUM TRAIL

PRIORITY 2

Enhancements could include:
_Additional seating along path.
_Improve accessibility for all campus users.
_Additional educational elements along trail.
_Potential for art integration and sound along trail.

Images above:

10
CREATE HUBS ON GROUND FLOOR

PRIORITY 2

_Hub spaces are key for campus planning in the 21st Century.
_Hub spaces encourage collaborative informal learning and socialising between peers.
_Hub spaces break out into covered outdoor areas shaded by built form above and landscape and provide visual transparency through the A-precinct buildings

Image above: JCU Townsville Building 300-303 outdoor hub space

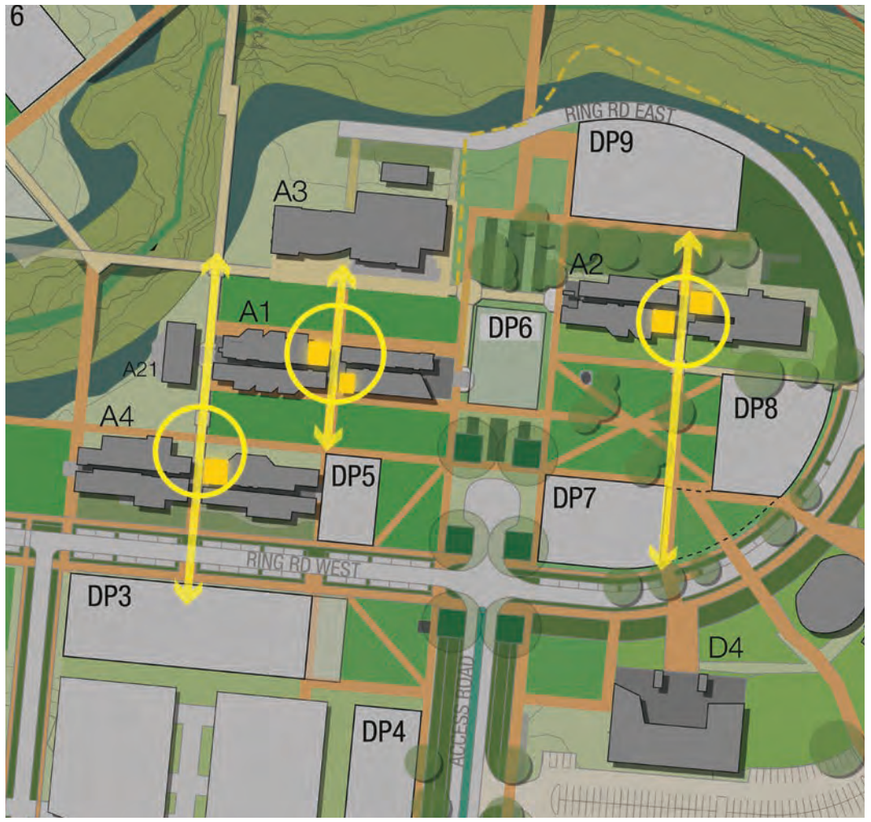
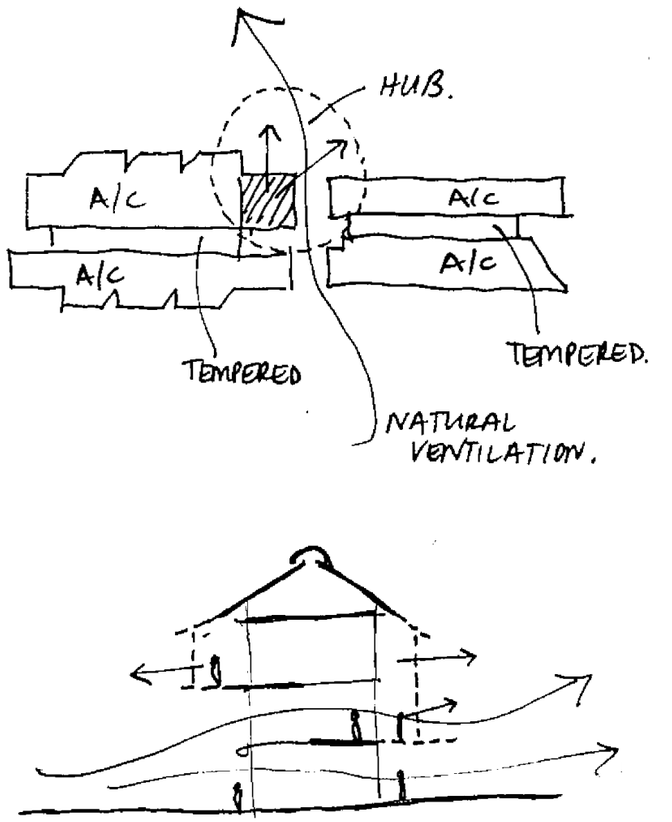


Image above:
Placement of ground floor hub spaces at intersections of existing internal circulation routes (Refer to page 54 for full Cairns Campus Master Plan 2019)

Top-right image:
Sketch example of hub space at ground level of A1
Break open the ground floor of A-Precinct buildings to encourage engagement and natural ventilation.
The mechanically ventilated spaces temper the internal circulation route between.
Removing the existing dark glass to allow better visual connections through campus and encourage air movement.



Bottom-right image:
Sketch example of building section with outdoor terraces to engage with the environment.
Create covered terraces at level 1 and 2 to provide opportunities to engage with the JCU Cairns Campus unique setting.
Large overhangs provide shade and allow for comfortable circulation around the building edge

6.2 A-PRECINCT MODIFICATIONS

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

11
CREATE NEW VISUAL & PHYSICAL LINKS

PRIORITY 1

_New links to support the campus pedestrian network and improve campus wayfinding.
_Open up interiors of existing A-precinct buildings to create gathering spaces and collaborative hub areas for students and staff to interact.
_Outdoor terraces can be placed above the new mid-building entrances to create shade below and provide important connections to the environment.
_Activate walkways and bridge links between buildings.

Image above: Top: KIRK visualisation for Anting New Town School showing open links through buildings; Bottom: CIP2, UQ (KIRK)

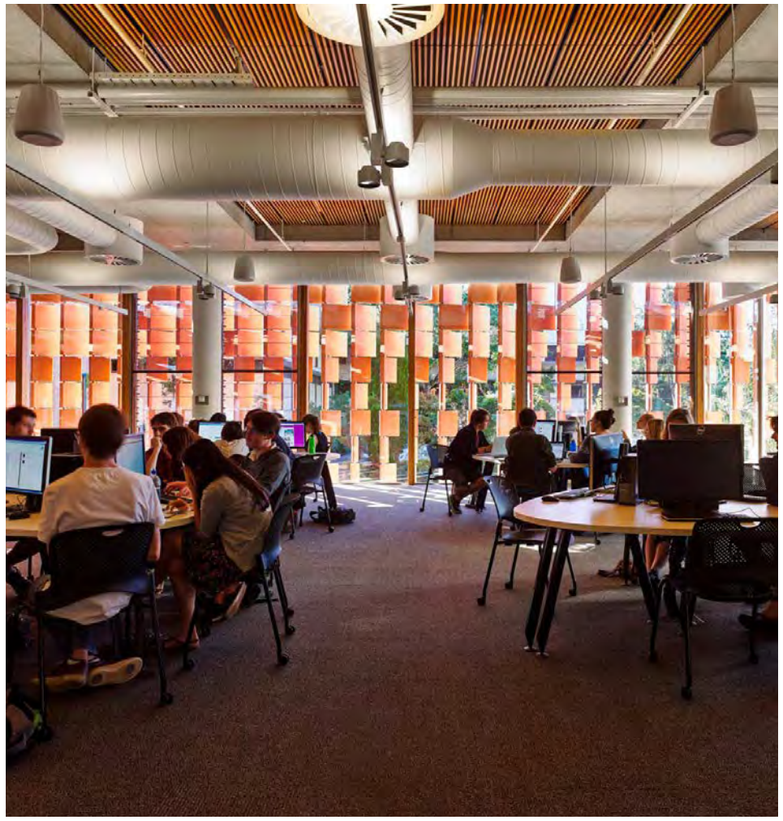
12
CREATE COVERED TERRACES ON LEVEL 1 & 2

PRIORITY 3

_Covered terraces to provide outdoor learning opportunities and enhance engagement with the natural setting.
_Break open the A-precinct buildings at level 1 and level 2 to allow for greater engagement with the unique rainforest setting of the campus.
_Provide opportunities for natural ventilation for the comfortable months of Cairns (refer to Climate analysis).
_Create dynamic layers within the existing building fabric.

Image above: Top: CIP2 Rooftop terrace, QUT (KIRK); Bottom: Botanica Khao Yai, Thailand

13
UPGRADE LEARNING SPACES



PRIORITY 1

_Upgrades to align learning spaces with new pedagogies
_Improve classroom spaces to facilitate collaborative learning & new learning technologies
_Improve natural light and ventilation within teaching spaces
_Create flexible learning spaces to support a variety of class sizes and styles

Image above: Collaborative learning spaces at the Advanced Engineering Building, UQ (KIRK)

6.3 CAMPUS CONNECTIVITY UPGRADES

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

14
UPGRADE CAMPUS ENTRANCE OFF MCGREGOR ROAD

PRIORITY 1

_Redefine the entrance and enhance wayfinding through large shade tree avenues along the access road to create tropical identity and provide shade for the road and pedestrians.
_Large shade trees to provide shade to pathways and over the roadway to reduce the urban heat island effect and improve comfort levels along primary circulation routes.
_Continue designated bicycle lane into the campus.
_Work with Cairns Regional Council to appropriately develop McGregor Road.

Image above: Structured landscape - Tree lined plaza with seating

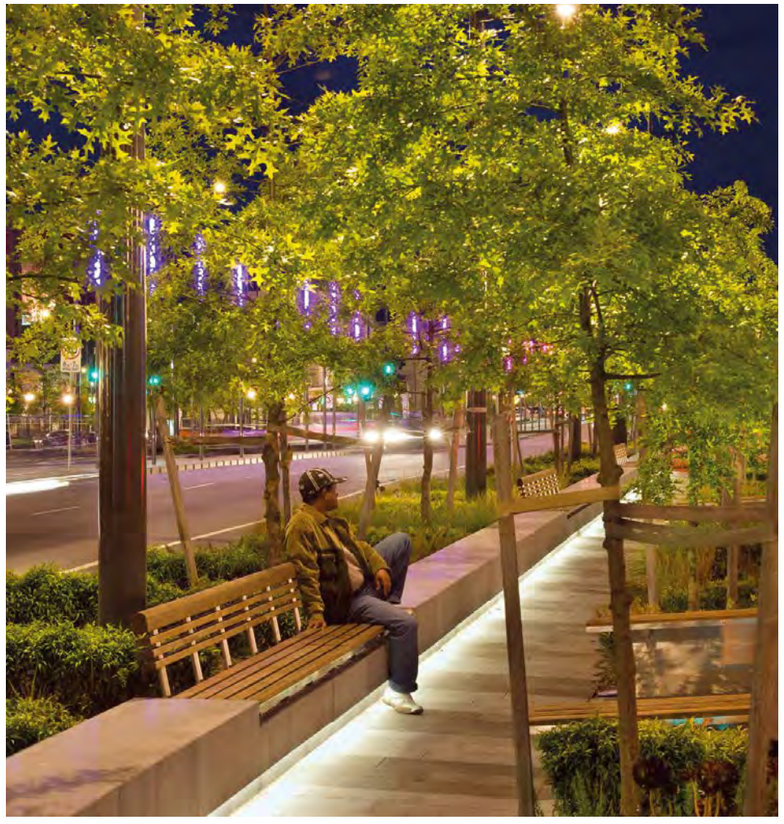
15
EXEMPLAR DEMONSTRATION OF WSUD

PRIORITY 4

_Water Sensitive Urban Design (WSUD) to be incorporated throughout the campus (such as bosques and bio-swales).
_Potential project integration with JCU Tropical Urban Design Lab (TUDLab).
_Potential engagement with the community as an educational resource about WSUD and green infrastructure.
_Bosque water features to line the key axis and provide evaporative cooling potential if shaded.

Image above: Sasaki Landscape Design (rainwater detention bosque and raingarden)

16
COMPREHENSIVE CAMPUS LIGHTING SOLUTION



PRIORITY 1

_Integrate CPTED measures to enhance campus safety.
_Potential to integrate energy generation and sustainable energy usage.
_Potential to integrate art light installations.
_Potential for Signature Trees to be lit at night. (Refer Initiative 6)

Image above: Dandenong Lonsdale Street, John Gollings

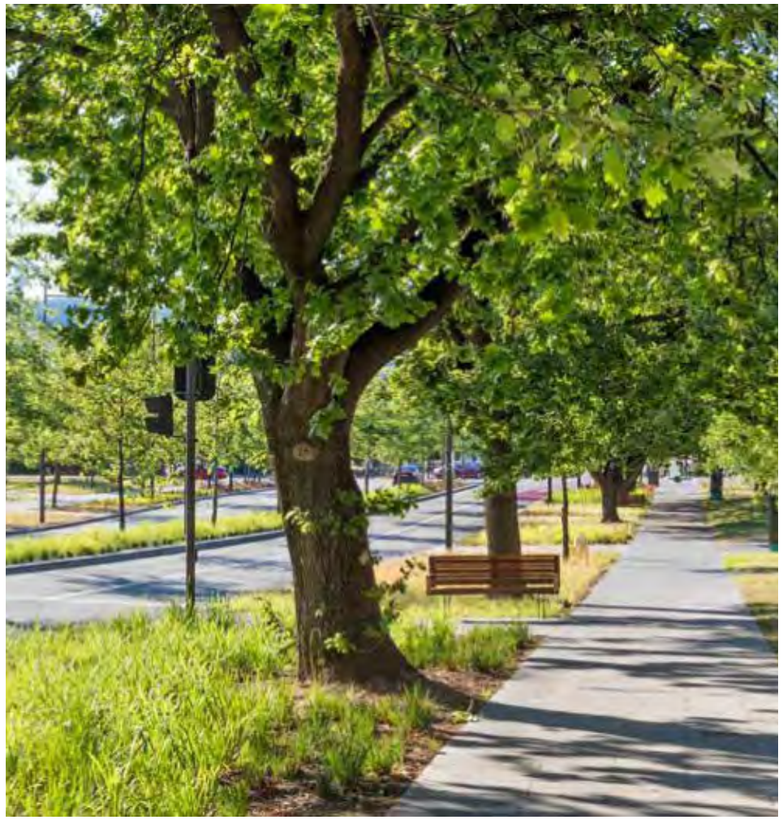
17
RING ROAD REDEVELOPMENT

PRIORITY 1

_Redevelopment to include widening for future traffic and mobility needs.
_Integration of green infrastructure in the form of a bio-swale for stormwater treatment.
_Parallel parking to be integrated on either side of the ring road. Priority parking should be located close to building entrances.
_Landscape zones along the ring road to provide shade and reduce the urban heat island effect.
_Ring road should become a lively circulation route for all campus users.
_Refer to Campus Urban Design Guidelines for suggested road sections.
_Potential to incorporate electric charging points. (To be aligned with Initiative 45).

Image above: Bourke Street, Sydney

18
UPGRADE WAYFINDING STRATEGY



PRIORITY 1

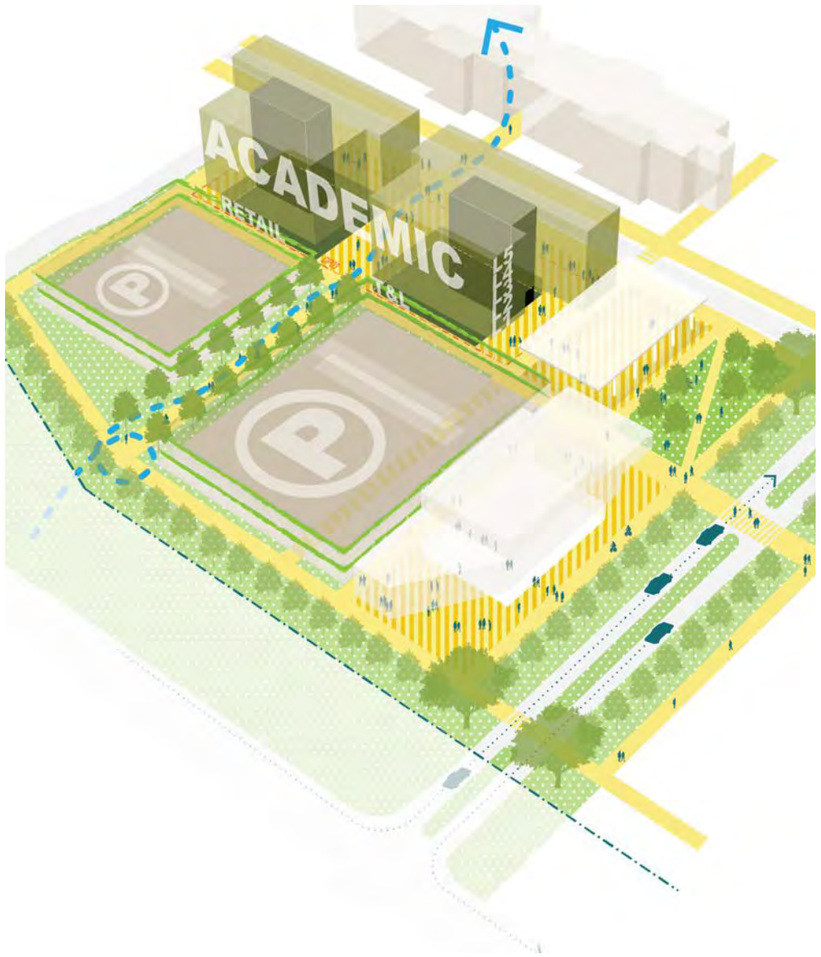
_Workshop to rename campus road network and review building and precinct naming conventions for increased legibility and address.
_Potential for significant artwork pieces to be incorporated at the campus gateway entry statements.
_Campus wayfinding systems to be upgraded to show recently completed buildings - potential to be digital and to be incorporated with the indigenous heritage of the campus and surrounds.
_Campus wayfinding to consider naming conventions for Precincts, Buildings, Roads and bridges. The Master Plan has suggested alternative Precinct names, refer to Section 7 - Precincts.

Image above: Constitution Avenue Street Trees, John Gollings

6.3 CAMPUS CONNECTIVITY UPGRADES

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

19
CREATE STACKED CAR PARKING (DP19, 20, 21 & 22)



PRIORITY 5

_Stacked car park structures separated by a minimum of 15m to allow air flow from predominant winds with floor to floor heights of a minimum 3.8m for future re-purposing.
_Edges of car park to be heavily landscaped to improve visual amenity to surrounding developments.
_Consider integration with adjacent developments (DP3 and DP4). Floor levels should align for future repurposing and connectivity.
_Potential to provide electric charging stations.

Image above: Landscaped carpark for public housing in Singapore. Architect: SCDA Architects

Image above: Diagram of car park on DP21 & DP22

20
EXPLORE CITY TO SMITHFIELD CONNECTIVITY

PRIORITY 1

_Potential to improve connectivity between JCU Cairns City campus and Smithfield campus.
_Provide alternate transportation methods to reduce reliance on automobiles between the two campuses (i.e. cycleways, eco-shuttle).
_Reduce budget pressures on students with or without vehicles that rely on Taxi's/ Uber to commute to the CBD.
_Feasibility study to be completed before implementation.

Image above: JCU Cairns City Campus. Architects: MMP in association with Phillip Smith Conwell Photographer: Andrew Rankin

21
ENABLE POWER & WATER FOR STREET MARKETS

PRIORITY 3

_Allow for community or University street markets to be held to boost campus identity and life.
_Power and water to be available for a variety of community and University events.

Image above: Tanks Art Centre Markets, Cairns Botanic Gardens

22
COVERED WALKWAY ENHANCEMENTS

PRIORITY 1

_Improvements of existing covered walkway acoustics.
_Potential for integration of speakers along walkways. Location of speakers to be considerate of informal learning areas and surrounding building uses.
_Additional seating along covered walkways to be considered.
_Air movement to be considered in placement of additional seating.
_Wi-fi enabled seating areas.
_Potential for bluetooth speaker connectivity to be explored.

Image above: Sverre Fehn Nordic Pavilion

23
JCU OVERPASS

PRIORITY 2

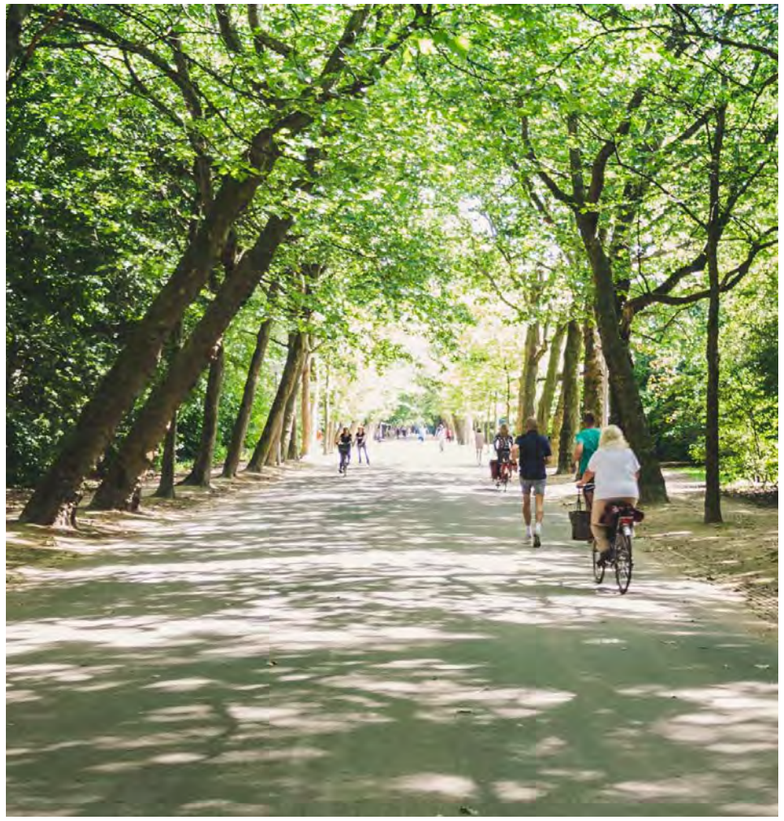
_Overpass to assist in mitigation of Smithfield Bypass.
_Signage opportunity for JCU Cairns Campus.
_Shade, weather protection and air movement to be considered in design.
_For use by pedestrians and cyclists.
_Potential for landscape to be a strong element within the overpass design.
_Design and placement to be explored with local authorities.

Image above: Vancouver Land Bridge, Vancouver, Washington

6.3 CAMPUS CONNECTIVITY UPGRADES

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

24
RING ROAD COMPLETION



PRIORITY 5

_Completion of Ring Road through to Panguna Street extension should only occur once Panguna Street Extension to Reed Road Roundabout has been completed.
_Refer to Appendix F Infrastructure report.

Image above: Tree lined road example.

25
CREATE NEW BRIDGE LINKS

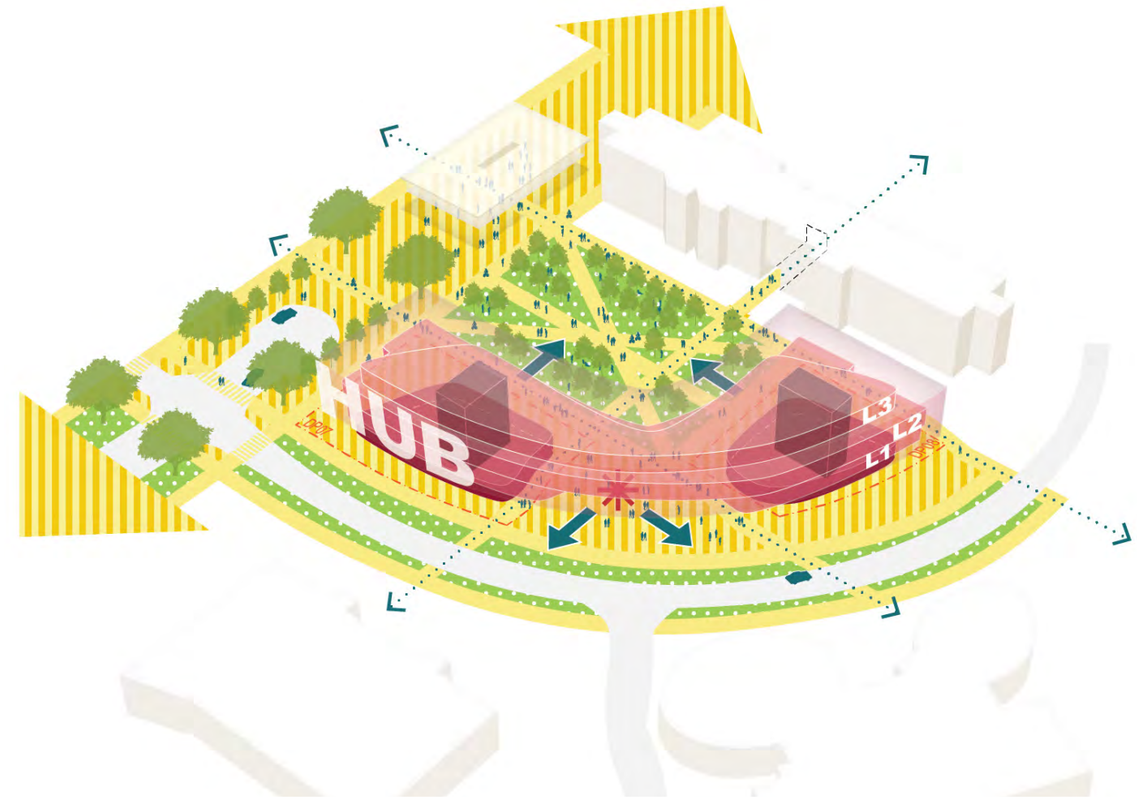
PRIORITY 5

_Proposed bridges as located within the Master Plan.
_Integration of seating areas and gathering spaces for informal learning.
_Weather protected and shaded.
_Consider air movement and thermal comfort.
_Ensure adequate lighting and accessibility for all University and community users.
_Potential consideration include sound integration, local art installation, campus wayfinding integration.

Image above: Footbridge Crossing L'Areuse, Geninasca Delefortrie Architectes, Switzerland.

Image above: Windhover Contemplative Centre, Aidlin Darling Design.

26
SIGNATURE LEARNING COMMONS & STUDENT HUB



PRIORITY 2

_Signature building to support the campus heart and The JCU Square (Initiative 5).
_Provides a large shaded courtyard between The JCU Square and The Cairns Institute to encourage campus connectivity.
_Multi-focussed student hub to encourage campus heart activation and density.
_To be integrated with the Knowledge and Community Centre (Initiative 50).
_Refer to Campus Urban Design Guidelines.

Image above: Master Plan proposal for integrated hub in revitalised campus heart

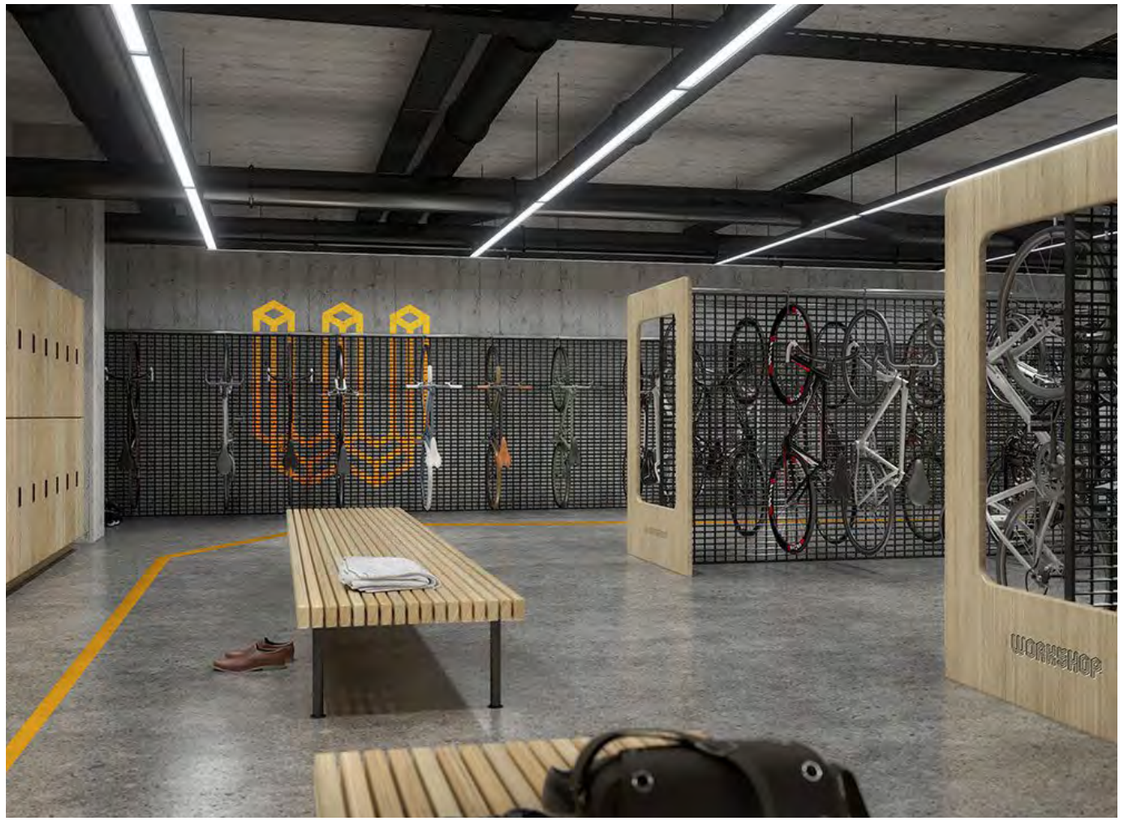
Images above: NTU Learning Hub, KIRK

Image above: Top: Sasaki, Tecnológico de Monterrey New Main Library
Bottom: NTU Learning Hub, KIRK

6.4 CAMPUS AMENITY

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

27
END OF TRIP (EOT) FACILITIES



PRIORITY 1

_Safe bicycle storage.
_Showers and toilets for staff, students and weekend campus users.
_Potential to integrate with the Cairns Mountain Bike Club through shared facilities such as a bike workshop and/or cafe.

Image above: EOT Facilities at Workshop Pyrmont, Sydney

Image above: Smithfield World Class Mountain Bike Trails

28
CHILDCARE FACILITY ON CAMPUS

PRIORITY 2

_Potential employment for students.
_Provides important amenity for staff if required.
_Provides engagement with the community.
_Potential to be linked with the landscape stacked carpark (CP2).

Image above: Children at government childcare facility. Source: aifs.gov.au

29
THE EXCHANGE - SHADE HOUSE (DP6)

PRIORITY 1

_Versatile tropical shade house for all campus users.
_Easily transformed between formal and informal modes.
_Potential to host events, seminars, lectures, presentations, exhibitions etc.
_Key wayfinding and identity development.
_Densely landscaped and naturally ventilated space with future potential to be air-conditioned and enclosed.
_Large roof form to provide shade to the ground plane.
_Refer to Campus Urban Design Guidelines.

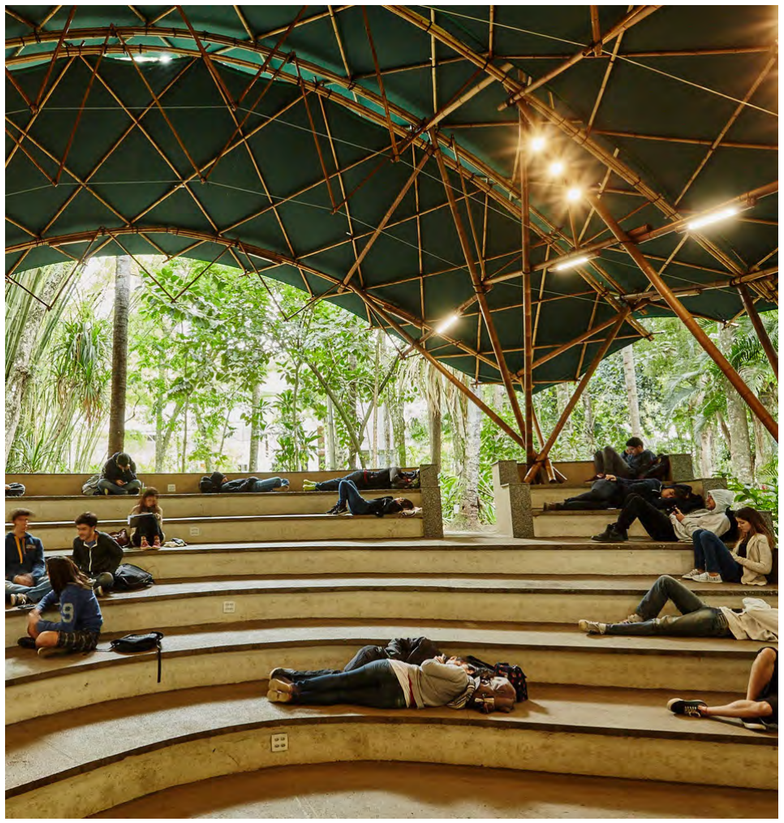
Image above: Illustration of potential for JCU Cairns Exchange Shade House

Image above: (top) Potential illustration of JCU Cairns Exchange - Shade House, (bottom) Sasaki, Tecnológico de Monterrey La Carrera Pavilion

6.4 CAMPUS AMENITY

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

30
AMPHITHEATRE UPGRADE



PRIORITY 3

_Provide weather protection for the existing amphitheatre.
_Upgrade seating & lighting.
_Integrate design with TUDLab for sustainable design potential in the tropics.

Image above: Bamboo shade structure over amphitheatre seating, Brazil
Architect: Babutec Design

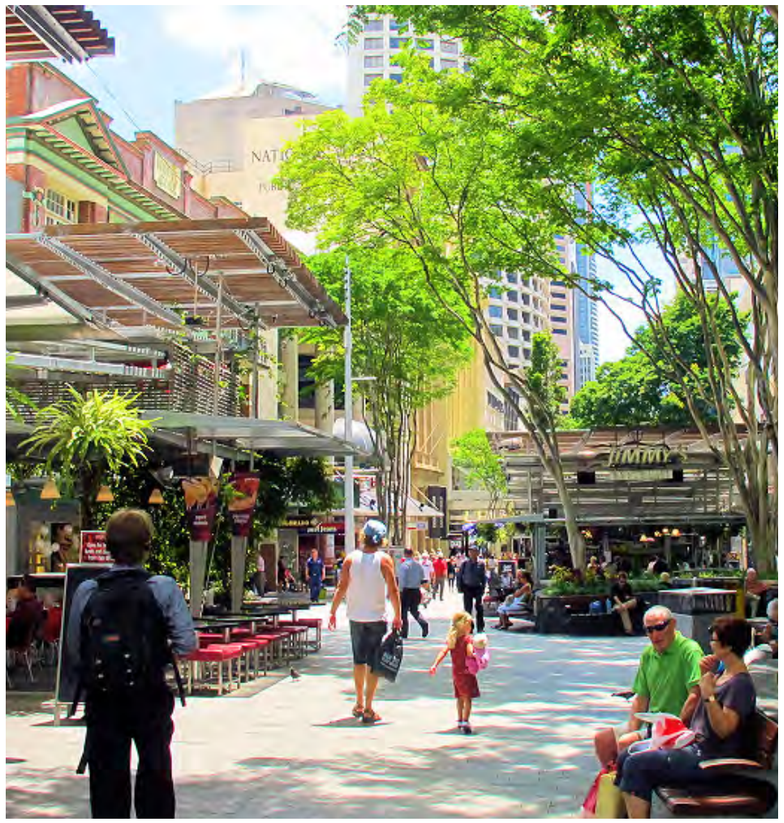
31
THE UNIVERSITY BAR

PRIORITY 2

_Key social hub of the campus.
_Opportunity for the bar to provide students employment opportunities on campus.
_Potential to restore the Boathouse Bar and provide knowledge about the history of the structure.
_Reconsider the University Bar's long term location on campus.

Image above: JCU Cairns Boathouse bar. Photo taken 2014.
Source: The Boathouse JCU Facebook page

32
CAMPUS VILLAGE



PRIORITY 4

_Creation of an urban campus village to provide essentials for staff and students.
_Market sounding to be completed by JCU to engage with potential retailers.
_Provide amenities closer to campus users.
_Potential to increase activity on campus.
_Refer to Campus Urban Design Guidelines.

Image above: Queen Street Mall, Brisbane

33
STUDENT ACCOMMODATION

PRIORITY 5

_The University has an aspiration to grow to 900 beds on campus.
_Student accommodation to include catering services on campus.
_Student accommodation to be located in accordance with the Master Plan.
(REFER PAGE 60)

Image above: Students within John Grey Hall Residences at JCU Cairns Campus

Image above: The Master Plan (DP1, DP2 & DP18 suggested for student accommodation)

6.5 SPORTS & RECREATION

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

34
UPGRADES TO EXISTING SPORTS OVAL & FACILITIES

PRIORITY 2

_Potential signage opportunity for JCU as a Smithfield Bypass mitigation.
_To include shaded tiered seating.
_Small amenities & gym to be incorporated under the tiered seating.
_Landscaped seating to the South.
_Development of amenities and gym to coincide with development of Secondary School on campus (refer to Initiative 49).

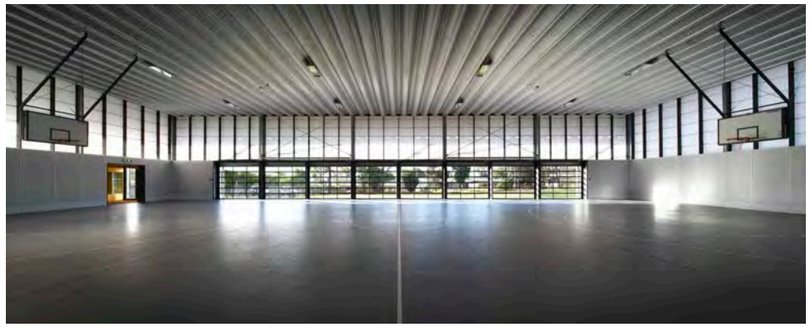
35
CREATE A SPORTS PIAZZA

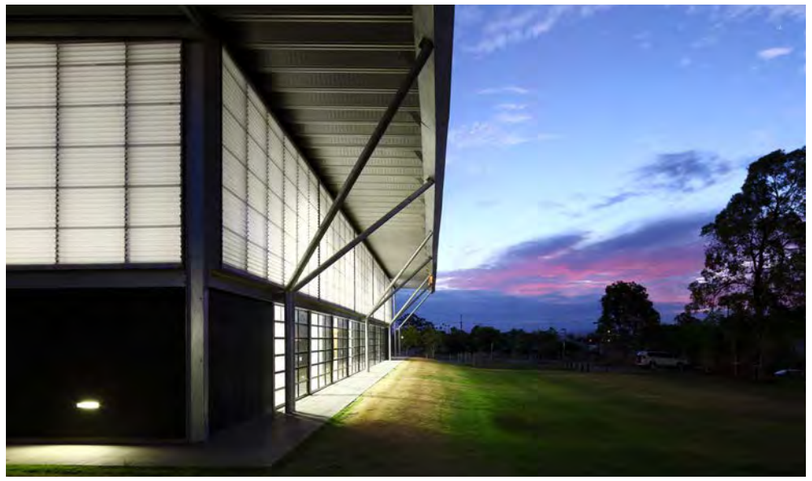
PRIORITY 3

_Sports Piazza to be shaded and to provide seating opportunities for campus users.
_Forecourt landscape should be incorporated as proposed within the Open Space and Landscape Framework.
_Integration between Sports Piazza and Walk of Discovery (Initiative 7) is suggested.
_Located within walking distance of the campus heart.
_Consider shade provisions to span between Fitness and Wellness Centre (Initiative 42) and Multi-purpose Hall (Initiative 36)

Image above: Example of covered tiered seating: Redfern Park & Oval. Architects: BVN in collaboration with Spackman Mossop & Michaels

36
CREATE A SPORTS MULTI-PURPOSE HALL





PRIORITY 3

_Indoor sports and multi-purpose centre for a range of sports (e.g. netball, basketball, indoor soccer, badminton, martial arts, dance, table tennis, etc.)
_Storage facility for sporting equipment.
_Sporting facilities should consider targeting international sporting standards.
_Facility to consider opening hours suitable for staff and students (e.g. night time activation).

Images above: AIICS Multi Purpose Hall, KIRK

37
ACTIVATE THE UNIVERSITY GREEN

PRIORITY 2

_Key active space on the prominent campus corner.
_Programmed activities, lighting, landscape and shade (e.g. ultimate frisbee, training field, etc.)

Image above: Students playing ultimate frisbee

38
SPORTS & RECRECATION SHADE STRUCTURE

PRIORITY 3

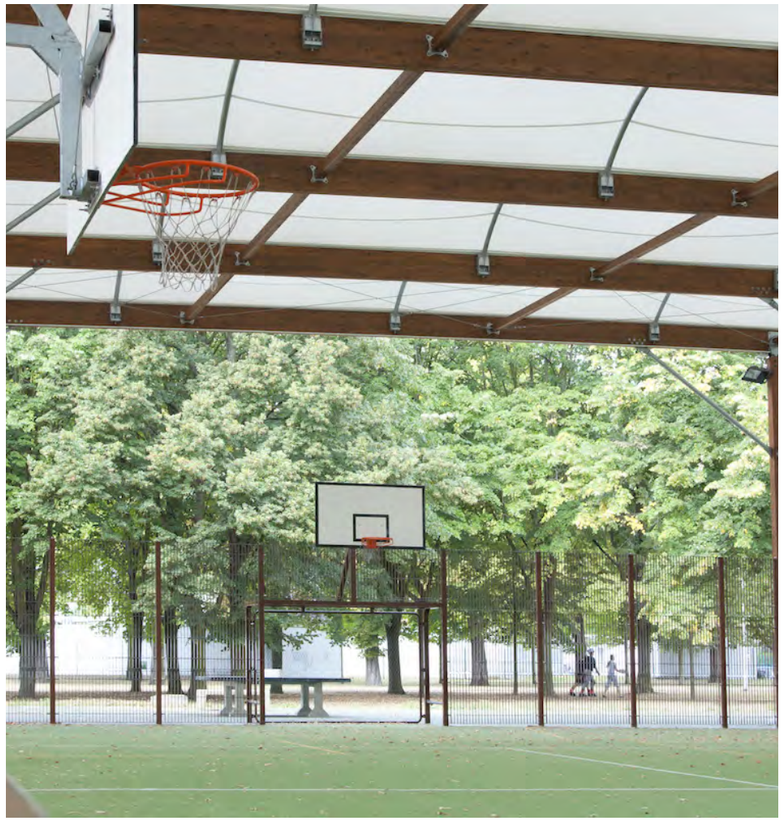
_Multi-purpose covered outdoor space with fixed shade structure for recreational/ sports activities (e.g. volleyball courts, badminton etc.)
_Integrated lighting for night activation.

Images above: Example of shade structure with integrated lighting. Project: Portimao Shading Structure; Architect: Coletivo Cais

6.5 SPORTS & RECREATION

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

39
BASKETBALL HALF-COURT



PRIORITY 1

_Consider shade provisions.
_Not bookable.

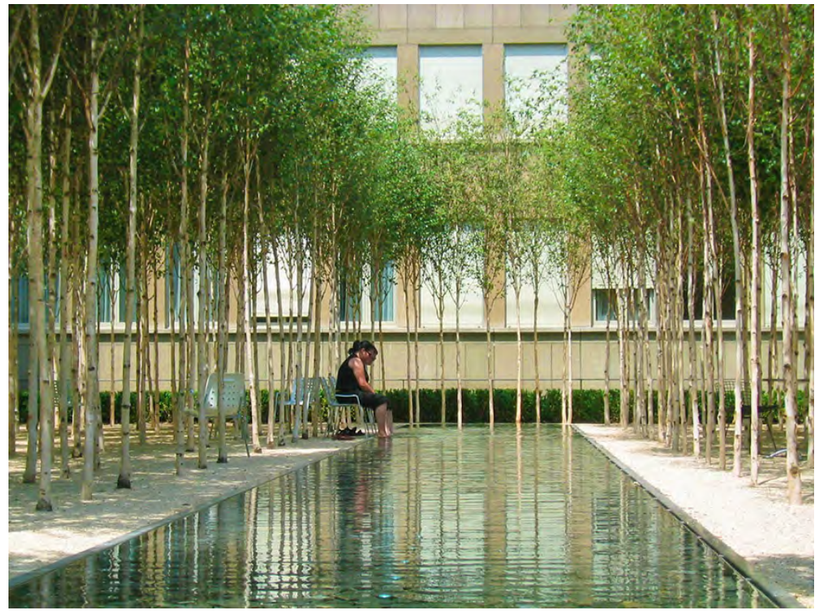
Image above: Covered Basketball Court Example

40
ENGAGEMENT ZONE WATER FEATURE

PRIORITY 2

_Water sensitive design strategies to be implemented.
_Provide shade (tree canopies or arbour structures) over water feature to promote evaporative cooling.
_Potential to collaborate with local artists for urban art commissions.
_Potential for contemplative zone to be incorporated.

Image above: Bosque Fountain, The Battery, NYC



6.5 SPORTS & RECREATION

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

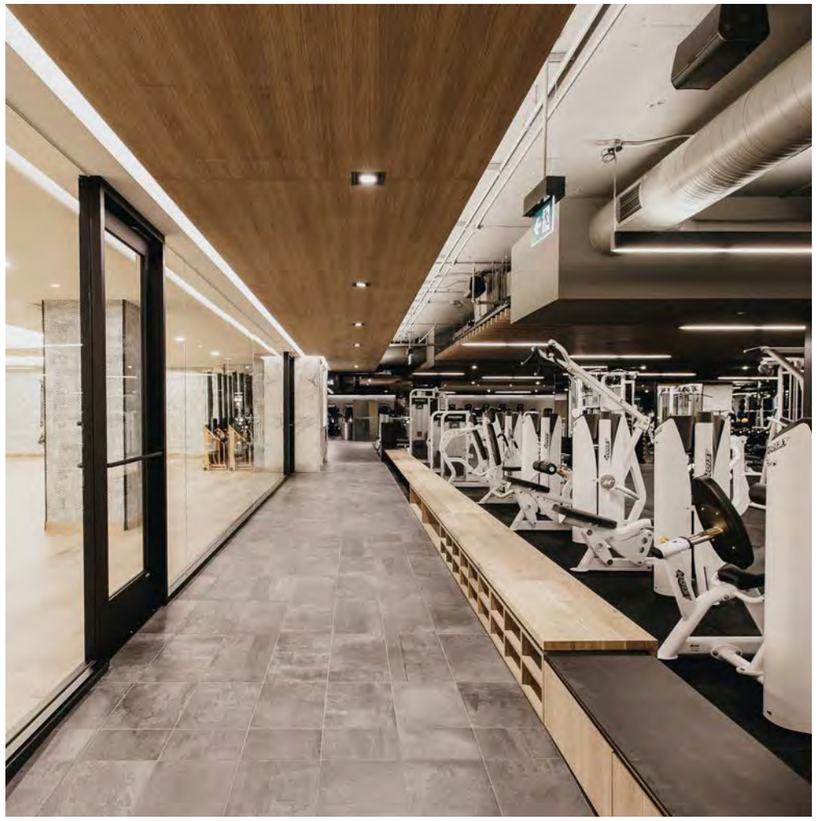
41
ACTIVE PLAY ZONES

PRIORITY 2

_Located throughout the campus.
_Encourage well-being for students and staff.
_Potential facilities include a rock-climbing wall, outdoor table tennis, exercise stations, etc.
_Shade provisions to be considered.

Image above: Recreational rock climbing

42
FITNESS & WELLNESS CENTRE



PRIORITY 4

_Fitness and Wellness Centre to consider indoor/outdoor connection.
Functional Considerations could include:
_Gym & Fitness room for group classes (pilates, yoga etc.).
_EOT facilities.
_Training pool, aqua-aerobics, hydrotherapy, swim teaching etc.
_Community engagement potential.
_Opening hours appropriate for staff and students.

Image above: Multifunctional Centre Doelum, NOAHH + Studio Nuy Van Noort, The Netherlands.

6.6 SUSTAINABILITY

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

43
ENERGY GENERATION

PRIORITY 4

_Potential for energy generation over car parks or on vacant campus land.
_Potential to explore alternative energy generation systems suitable for the Cairns Campus context.
_Energy generation to be developed in accordance with the University Plan and the Campus Wide Sustainability Plan.

Image above: Solar panels as shade structures over on-grade car park

44
BUILDING ENERGY EFFICIENCY AUDIT

PRIORITY 1

_Actionable outcomes of the campus building energy efficiency audit to be prioritised.

Image above: Internal corridor within Building A1

45
CAMPUS WIDE SUSTAINABILITY PLAN

PRIORITY 1

_Energy efficient public realm lighting - solar powered or sensor lighting.
_Public realm lighting to ensure CPTED measures are met to provide safe circulation environments during the evenings or early mornings.
_Sustainability plan to set achievable goals in order to meet the University Plan target of UN Sustainable Development Goals.
_Potential for campus to provide electric charging stations.

Image above: Gyeongui Line Forest Park, South Korea

46
CAMPUS ART CURATION

PRIORITY 4

_Campus art curation to integrate with campus landscape, circulation network and built form.
_Potential to engage with community and local artists.

Image above: Metallic artwork 'Reflection', Artist: Braham Stevens. Location: JCU Cairns Campus outside A2.

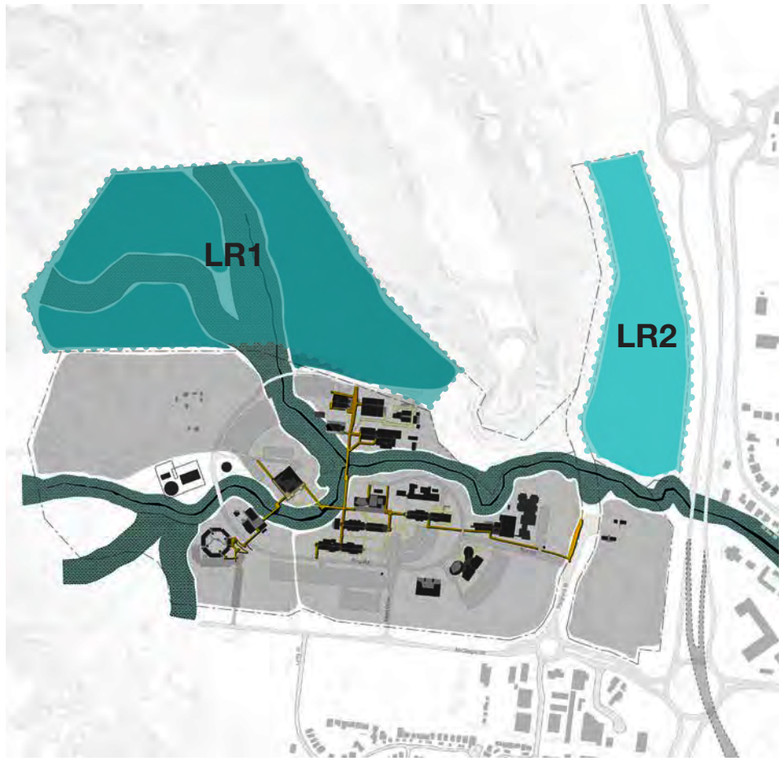
47
RESEARCH ON DISPLAY

PRIORITY 3

_Potential to explore a facility to provide enhanced community engagement with JCU research.
_Functional considerations could include enhanced EduQuarium facilities, display of the Joseph Banks collection, etc.
_Explore location and investigate viability.
_Potential for a large facility to facilitate interdisciplinary learning and connect JCU high-quality research with the campus core.

Image above: Clown fish at JCU EduQuarium

48
LAND RESERVES FOR FUTURE UTILISATION



PRIORITY 5

LR1 Land Reserve 1 (Lot 13)
LR2 Land Reserve 2 (Lot 13)

_LR2 identified as surplus to the current needs of James Cook University.
_Disconnection of LR1 and LR2 suggests a subdivision of Lot 13.
_Development in LR2 super-lots along Captain Cook Highway - viable only when Panguna Street is extended to Reed Road roundabout.
_Any residential solutions development to be aligned with University mission.
_Residential solutions development to be distinctly tropical and exemplar sustainable developments.
_Provide educational opportunities for students.
_Provide allied industry engagement with JCU Cairns.

Image above: Diagram of JCU Cairns land reserves

6.7 COMMUNITY FOCUS

OPEN SPACE & LANDSCAPE FRAMEWORK
ACCESS & CIRCULATION FRAMEWORK
BUILDING & LAND USE FRAMEWORK
PLACE-MAKING FRAMEWORK

49
SECONDARY SCHOOL ON CAMPUS

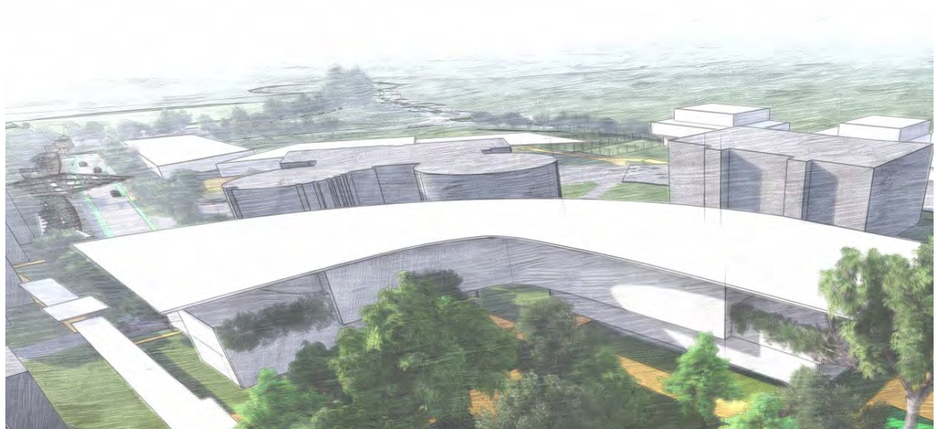
PRIORITY 2

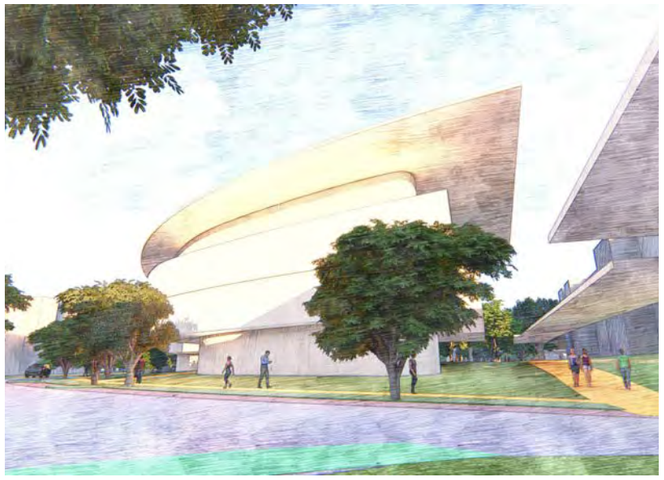
_Separate siting & feasibility study to be completed.
_Requirement for sporting facilities and large gathering space.
_Secondary school to be aligned with JCU curriculum.
_Provides opportunities for educational excellence teaching at JCU.
_Provides employment opportunities for students.

Refer to Appendix I for conceptual siting studies of a secondary school on campus.

Image above: International School, Park City Proposal (KIRK)

50
INTEGRATED KNOWLEDGE & COMMUNITY CENTRE





PRIORITY 4

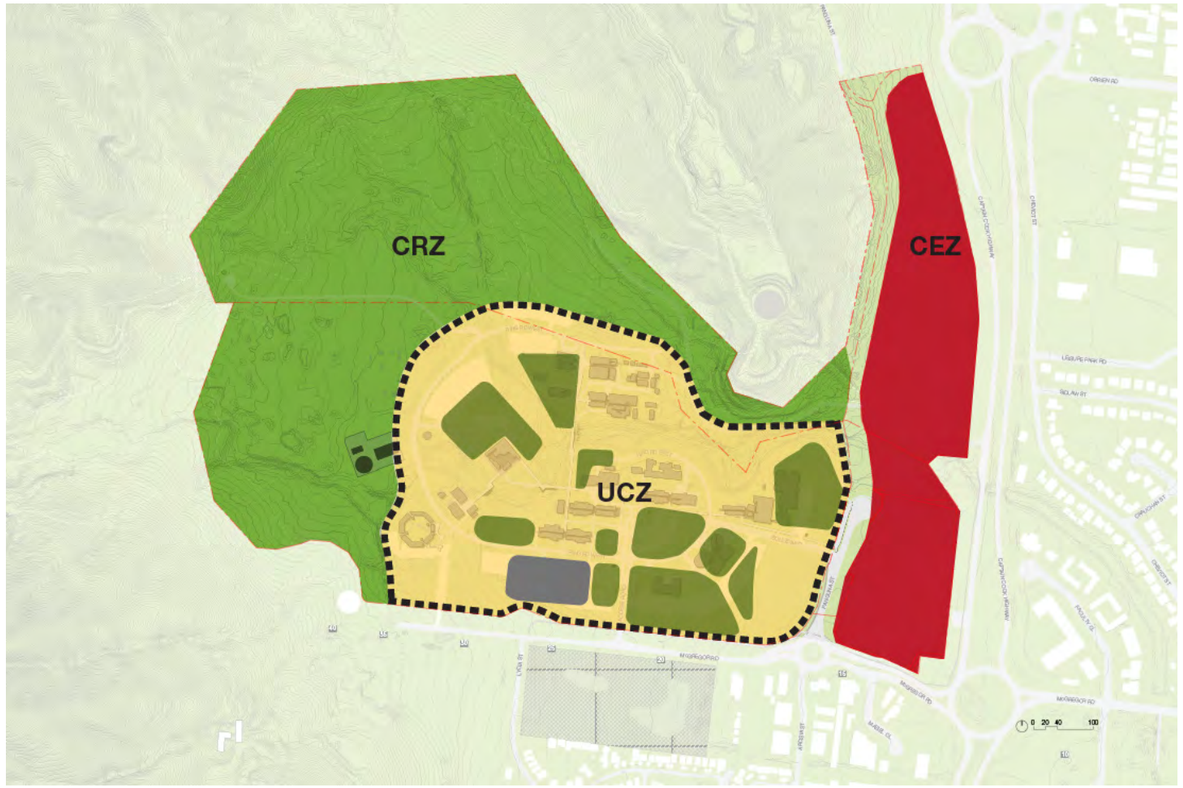
_Opportunity to engage with the community.
_Pass down traditional knowledge to the indigenous community.
_Potential to host University and Community events.
_To be integrated with the proposed learning commons - The Hub (Initiative 26).
_Refer to Campus Urban Design Guidelines.

Image above: Illustration of potential DP7 & DP8 - Learning commons (The Hub) with Integrated Knowledge & Community Centre

FIGURE 7: MASTER PLAN PROPOSED ALTERNATIVE PRECINCTS

07

PRECINCTS



CONSERVATION & RESEARCH ZONE
UNIVERSITY CENTRE ZONE
COMMUNITY ENTERPRISE ZONE
PRIMARY DEVELOPMENT ZONES
CAR PARK CONSOLIDATION

FIGURE 7.1.1: 2010 MASTER PLAN - DEVELOPMENT ZONES**

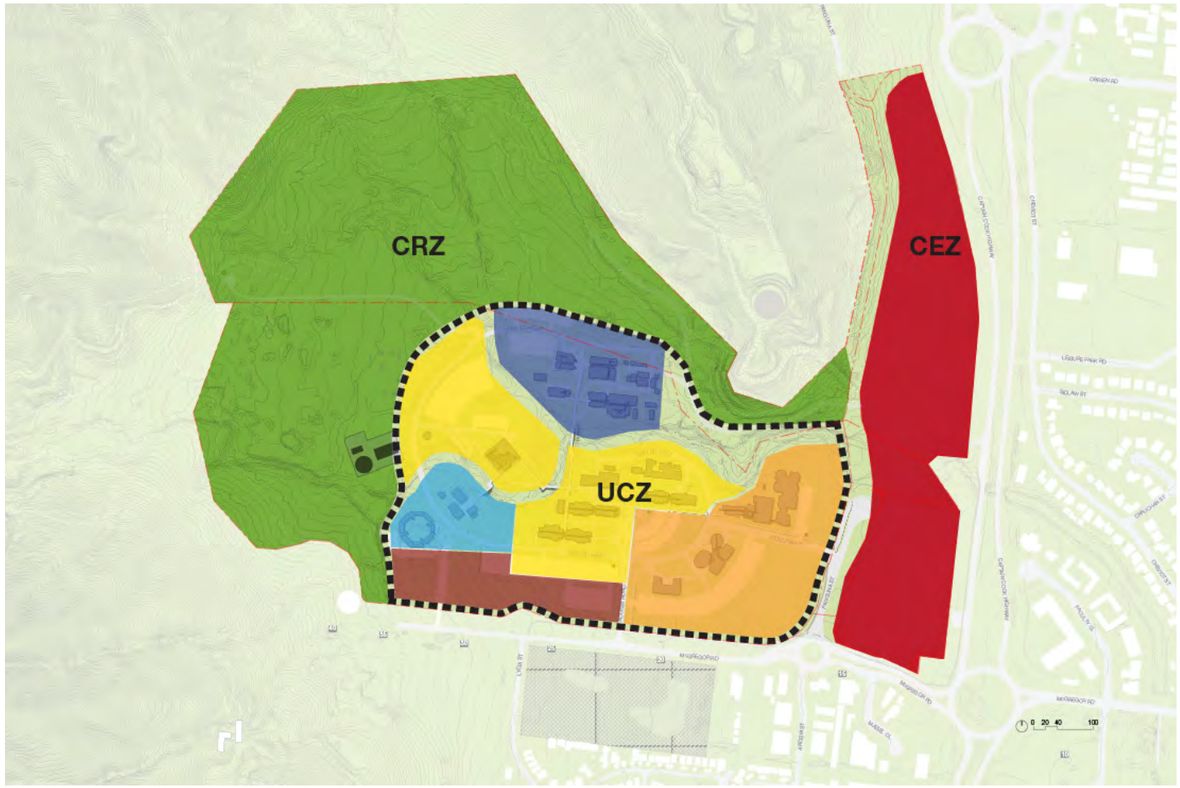
The 2010 JCU Cairns Campus Master Plan focussed on a small development footprint based on greater environmental awareness of the site's setting.

The zones have the following primary uses:
UCZ: Academic Core of teaching and research buildings; commercial facilities such as childcare, small retail and financial institutions; student accommodation; a public space of high amenity and sense of place at the campus heart; and University services

CEZ: partnerships, collaborations and public and private investment for education, hospital, research and development
CRZ: conservation in the forested area at the base of the range; modest scale agricultural or forestry; research plots.

The JCU Cairns Campus Master Plan 2019 advances and clarifies the 2010 Master Plan development zones through a development lot configuration plan whilst maintaining the car park consolidation.

**2010 MASTER PLAN ZONES REDRAWN FROM COX AND FLANAGAN CONSULTING GROUP



CONSERVATION & RESEARCH ZONE (CRZ)
UNIVERSITY CENTRE ZONE (UCZ)
COMMUNITY ENTERPRISE ZONE (CEZ)
MEDICAL & SCIENCE CENTRE
UNIVERSITY HEART
CAR PARK CONSOLIDATION
CULTURAL CENTRE
CONSOLIDATED CENTRE

FIGURE 7.1.2: MINISTERIAL DESIGNATION - AREAS OF CHARACTER*

UCZ: Total 130,000m^2 for Educational and Research core functions (based on population forecast and 13.4m^2 per EFTSL).

CEZ: Maximum building height of 5 storeys, more intense development at greater heights to occur along the Captain Cook Highway and adjacent to DTMR's Public Transit Link. Subject to no adverse impact on the environment, social fabric of JCU.

CRZ: Maximum building height of 3 storeys with no to very low impact on the environment. Development to retain and is complementary to the natural values of JCU Cairns Campus and implementing ecological sustainability.

**2010 MASTER PLAN AREAS OF CHARACTER REDRAWN FROM COX AND FLANAGAN CONSULTING GROUP

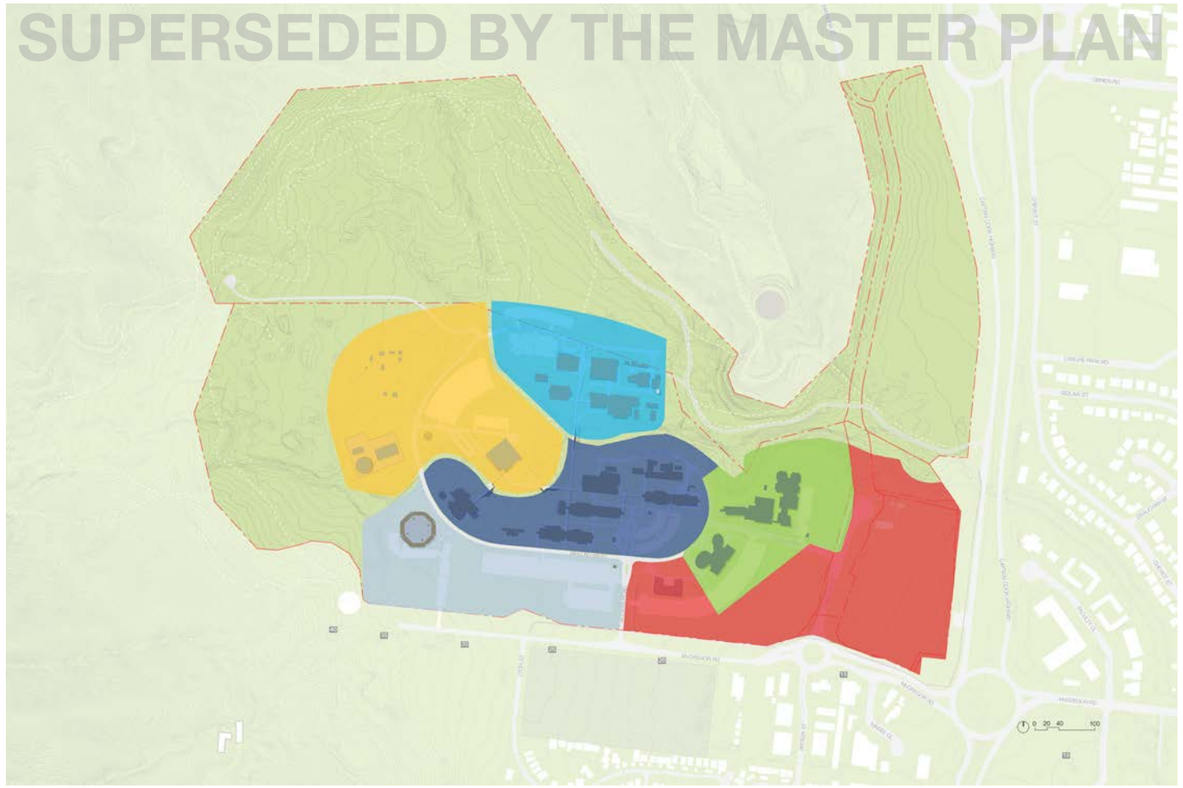


FIGURE 7.1.3: PRECINCT AREAS (JCU)

Existing Campus Precinct information from JCU maps.

7.1 PRECINCTS

The JCU Cairns Campus is currently broken into six precincts: A, B, C, D, E & F. The Master Plan proposes an alternative precinct naming convention to assist wayfinding and campus legibility. A final solution should be determined throughout the undertaking of The Master Plan Initiative 18 - A campus wide wayfinding strategy update and should extend to building, road and walkway names.

The proposed Master Plan zones provide another layer to the 2012 Ministerial Designation as seen in Figure 7.1.2.

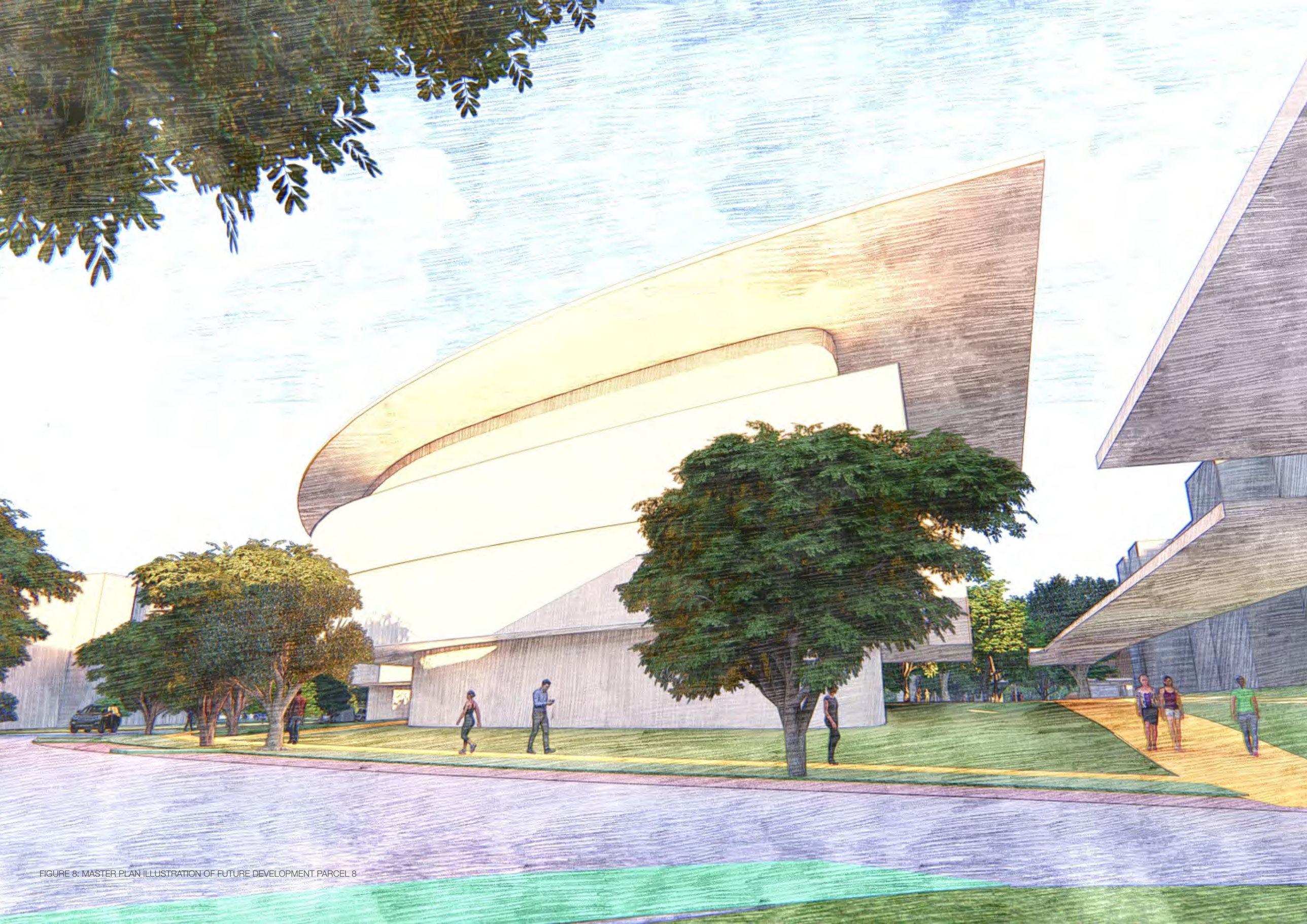


FIGURE 8: MASTER PLAN ILLUSTRATION OF FUTURE DEVELOPMENT PARCEL 8

08 CAMPUS URBAN DESIGN GUIDELINES

To allow JCU to implement the Cairns Campus Master Plan 2019 effectively, guidelines have been outlined to ensure a holistic approach across the campus, and to ensure Master Plan principles and University Plan goals are being met.

The following campus urban design guidelines for the JCU Cairns Campus in Smithfield provide overarching design direction campus-wide urban, building and landscape elements that should assist in achieving a cohesive and sustainable campus environment to support the mission of the University. The guidelines should be read in conjunction with JCU design guidelines.

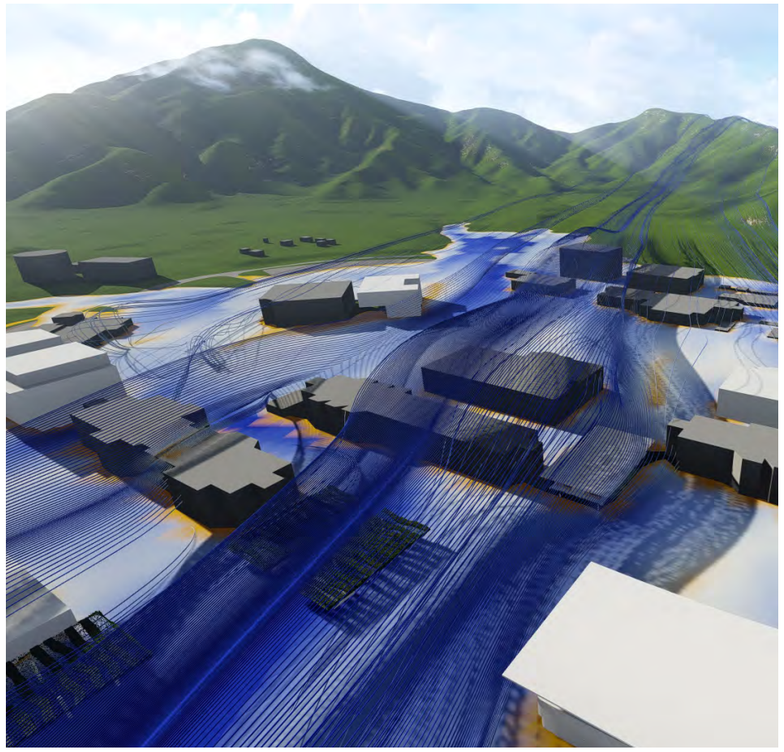


FIGURE 8.1: COMPUTATIONAL FLUID DYNAMICS MODEL OF AIR MOVEMENT ACROSS THE CAIRNS CAMPUS (REFER CONTEXT: CLIMATE FOR MORE INFORMATION)

8.1 CAMPUS URBAN DESIGN GUIDELINES

The campus urban design guidelines establish principles governing building orientation and treatment to ensure that the overall campus setting is cohesive, climate-responsive and supports the activities of all campus users. The campus urban design guidelines should be read in conjunction with JCU Design Guidelines and should address the following elements:

1.0 Building Placement

1.1 New buildings should respond to the alignment of adjacent buildings;
1.2 New buildings should adhere to the delineation of outdoor spaces and landscape zones as described in the Master Plan;
1.3 New buildings should be placed to achieve maximum use of their sites;
1.4 New buildings should engage and improve the quality of the outdoor realm;
1.5 Buildings should not block major pedestrian or visual corridors;
1.6 Buildings should not encroach on campus outdoor spaces; and
1.7 Building placement should respond to the existing comfort zones on campus and optimise daylight access and shade.

2.0 Tropical Building Design

2.1 New developments should emphasise the importance of shade on the building form and must integrate deep shade and deep planting around the edges of buildings;
2.2 New developments should integrate indoor/outdoor areas over multiple levels;
2.3 New developments should provide microclimate analysis to demonstrate development parcel air movement and surrounding campus air movement corridors are enhanced; and
2.4 New developments should enhance and improve the thermal comfort of the surrounding external environment.

3.0 Building Setbacks

3.1 Street edges, buildings and pedestrian pathways should be continuous and help define the edges of the campus and outdoor spaces;
3.2 Buildings should be situated in a manner that balances security and collegiality of the campus, while maintaining an open and welcoming atmosphere; and
3.3 Development Parcels are inclusive of building setbacks.

4.0 Building Orientation

4.1 Building orientation should consider the predominate south-south-easterly breezes to create opportunities for natural ventilation and air movement throughout the development parcel and the surrounding campus; and
4.2 Facades should be designed to minimise excessive solar heat gain through shading devices or high-quality materials.

5.0 Building Form and Massing

5.1 Uninterrupted facade lengths should not exceed 38 to 46 metres to ensure a pedestrian scale;
5.2 Plan widths should be in the range of 18 to 27 metres wide to allow for daylighting and natural ventilation opportunities;
5.3 Building heights should generally be 3 to 5 levels to create a consistent massing and to maximise utilisation of campus land, and should relate to the development parcel nominated height **(REFER DEVELOPMENT CONTROLS)**;
5.4 Building form should optimise air movement to improve thermal comfort;
5.5 Landmark features should be located at important public places to create a sense of arrival and to provide visual markers for the campus; and
5.6 Typically the most public functions of a building, such as the building entrance, should be highlighted in the composition, but their proportions should be appropriate to the building's use and scale.
5.7 Large roof overhangs are desirable to provide shade to the ground plane and built form.

6.0 Ground Level Treatment

6.1 The ground floors of buildings should contain the most active and public uses;
6.2 Transparent materials should provide visual access to these areas; and
6.3 When facing a public plaza or central open space, the ground floor should be located at the plaza level to emphasise the physical and visual connection between the interior and exterior of the building

7.0 Building Entrances

7.1 Building entrances should align with outdoor paths and reflect the unique or memorable qualities of the building uses;
7.2 All entrances and pathways should facilitate accessibility;
7.3 Entrances should create fluid connections between interior rooms and exterior spaces;
7.4 Entrances should provide physical and visual access to buildings through transparent materials and clarified circulation;
7.5 Entrances should be defined by building massing, roof, and facade articulation; and
7.6 Entrances should contain canopies and overhangs for climate protection and shade.

8.0 Mechanical Equipment Screening

8.1 Mechanical and service equipment should be properly screened, and mechanical stacks should be grouped together to minimise audible and visual impediments;
8.2 Building equipment should be integrated in the roof structure; and
8.3 When flat roofs are employed, mechanical equipment should not be visible from ground level or from adjacent buildings.

9.0 Sustainable Design

9.1 New developments should achieve the University's LEED targets.

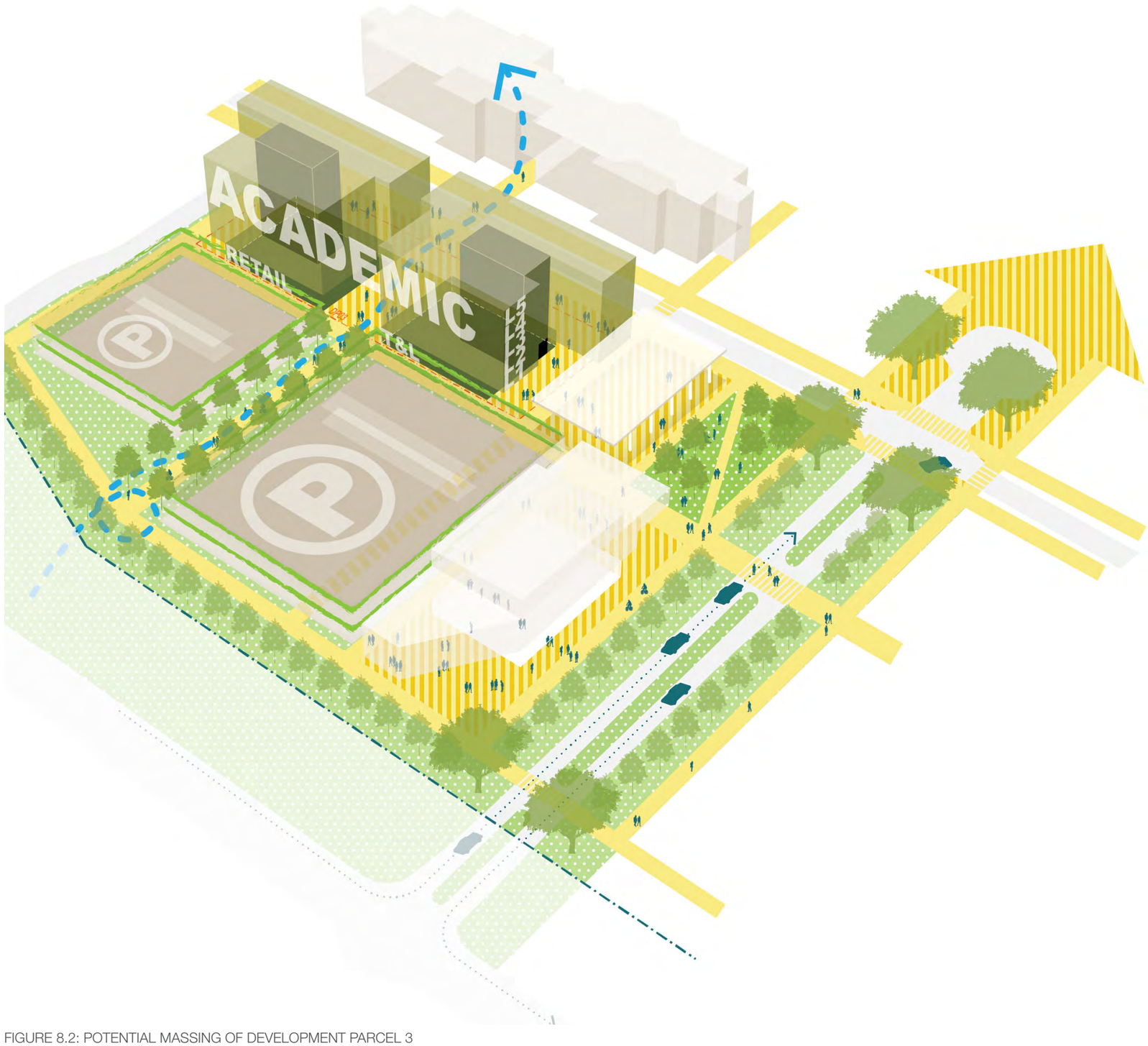


FIGURE 8.2: POTENTIAL MASSING OF DEVELOPMENT PARCEL 3

8.2 EXAMPLE DEVELOPMENT PARCEL - DP3

Development Principles:
_40% built form at ground plane
_60% built form at level 1
_80% built form at level 2
_80% built form at level 3
_80% built form at level 4
_Built form to shade the ground plane
_80% built form site cover excludes roof overhangs and screening elements.

Potential Purpose:
_Gathering
_Ceremonial
_Civic space
_Activation of the ground plane
_Connection to The Cairns Institute and JCU Ideas Lab
_Key arrival buildings

FIGURE 8.2.1: LANDSCAPED AND SHADED CONNECTIONS BETWEEN BUILDINGS

FIGURE 8.2.2: UNIVERSITY OF BRASILIA - LANDSCAPED AND SHADED ACTIVE BUILDING EDGES

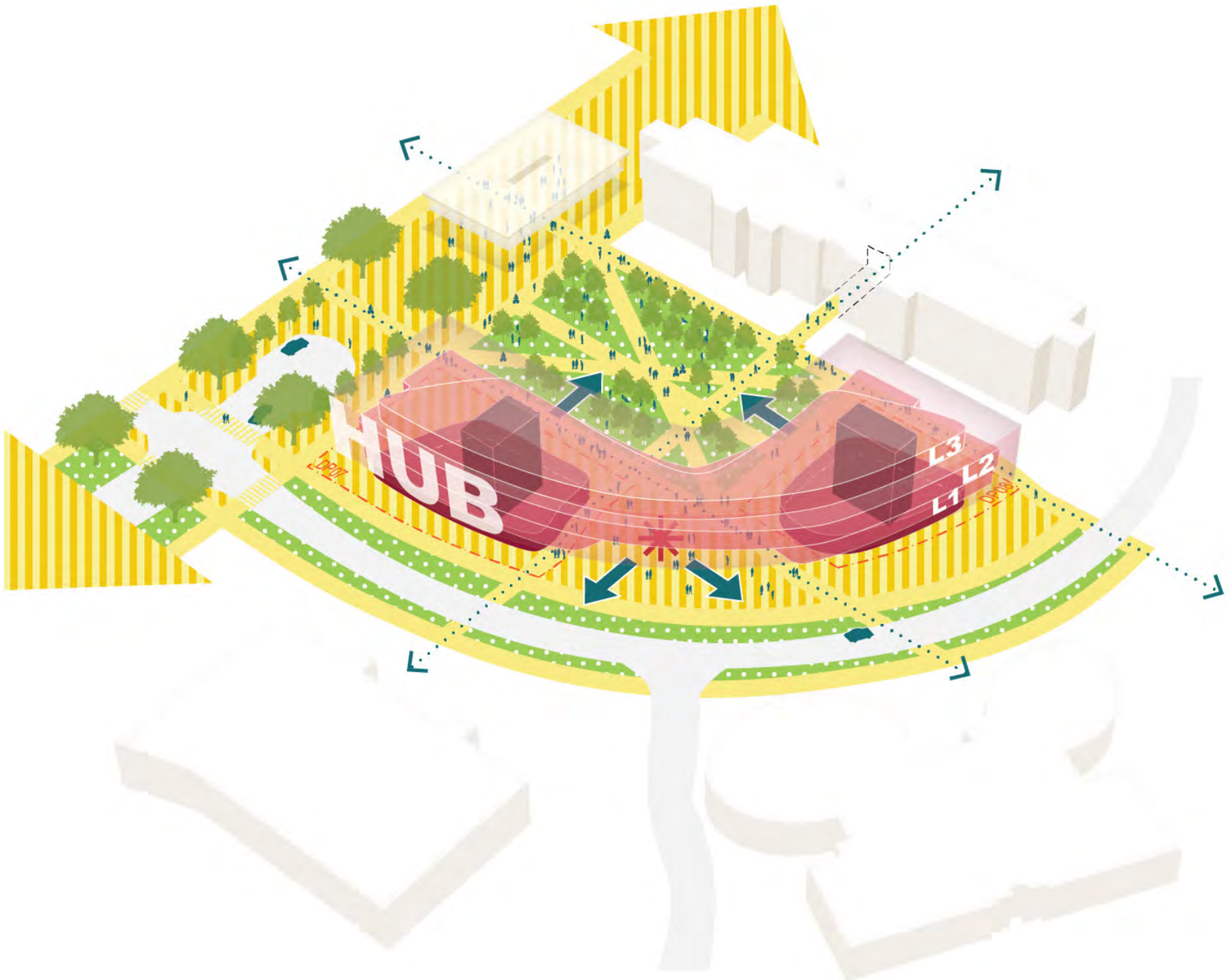


FIGURE 8.3: POTENTIAL MASSING OF DEVELOPMENT PARCEL 06 & 07

8.3 EXAMPLE DEVELOPMENT PARCEL - DP7 & DP

Development Parcel 6 & 7 are landmark sites and it is suggested that one signature building occupy both parcels.

Development Principles:
_Potential to combine as one building provided the ground plane is left open at LZ5
_Maximum 40% built form at ground plane
_Building form to shade the ground plane
_Respectfully developed as a high-impact and landmark building
_Built form must address the key civic space 'The Square' through permeability and visual transparency

Potential Purpose:
_Gathering
_Ceremonial
_Civic space
_Activation of the ground plane
_Connection to The Cairns Institute and JCU Ideas Lab
_Key arrival buildings

FIGURE 8.3.1: PEDESTRIAN LANDSCAPED PATHWAY WITH ACTIVATED EDGES

FIGURE 8.3.2: UNIVERSITY OF BRASILIA - BUILDING OVERHANGS CREATE SHADED EDGES. LANDSCAPING PROVIDES SHADED SEATING PLACES ON THE LAWN

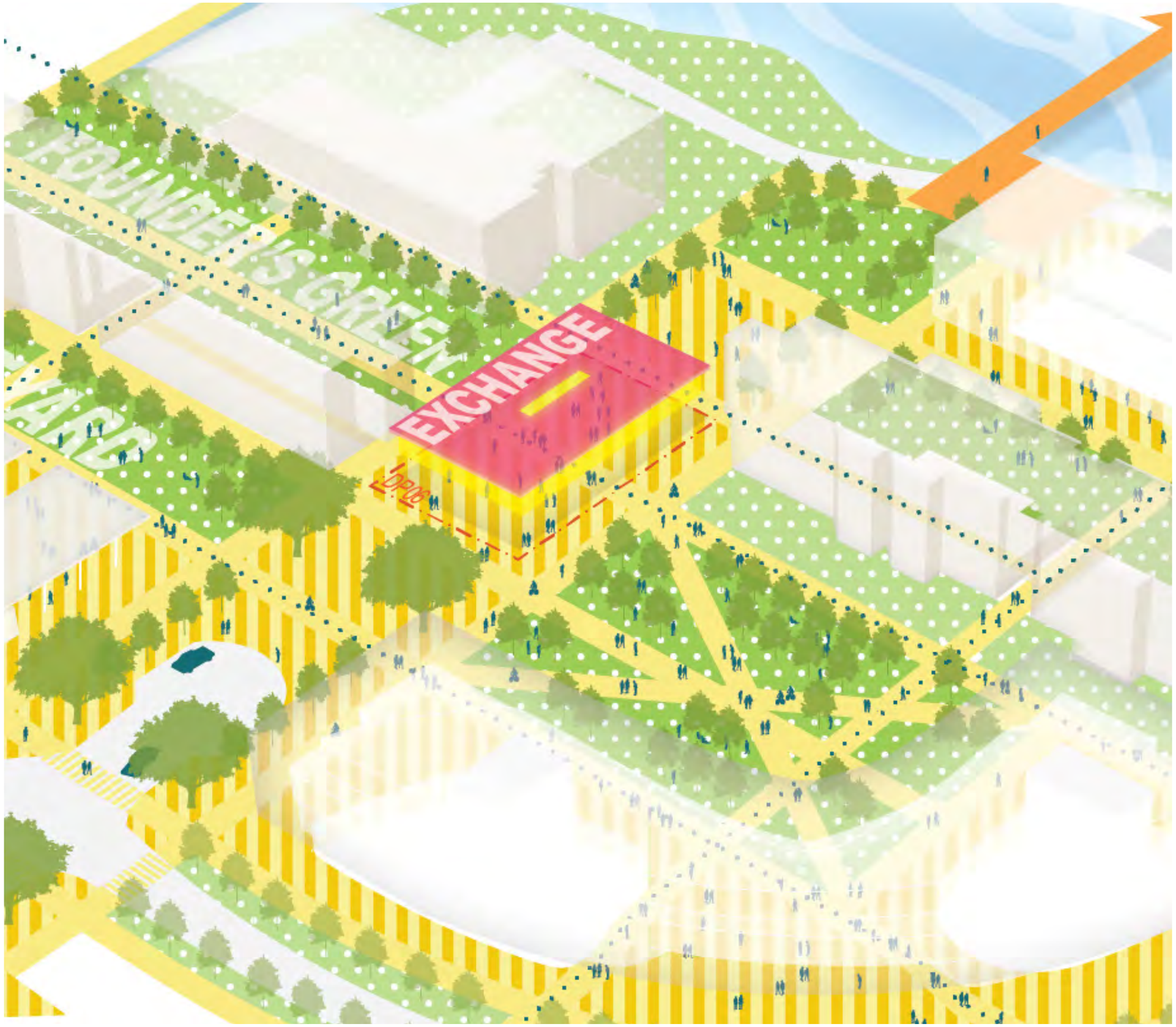


FIGURE 8.4: POTENTIAL MASSING OF DEVELOPMENT PARCEL 6

8.4 EXAMPLE DEVELOPMENT PARCEL - DP6

DP6 presents an opportunity for the campus to provide a signature place for students, staff, researchers and the broader community to engage with one another, to collaborate, and to share ideas; a focal point and meeting place for assemblies, social events, and the exchange of ideas.

Development Principles:
_Built form to shade the ground plane
_Large-scale double height landscaped gathering space for students and staff
_Significant wayfinding structure at cross-roads of campus
_Highly flexible, open and transparent
_Minimal structure
_Approachable from all sides

Potential Purpose:
_Gathering
_Ceremonial
_Civic space
_Activation of the ground plane
_Connection to The Cairns Institute and JCU Ideas Lab prior to development of DP7 & DP8.
_Key arrival building
_Multi-purpose space to host a variety of functions: exams, functions/events, lectures, informal learning hubs, meeting spaces etc.

FIGURE 8.4.1: UNIVERSITY OF BRASILIA - LANDSCAPED SHADE HOUSE

FIGURE 8.4.2: INSTITUTO TECNOLÓGICO DE MONTERREY - STUDENT EXCHANGE BUILDING (SASAKI)

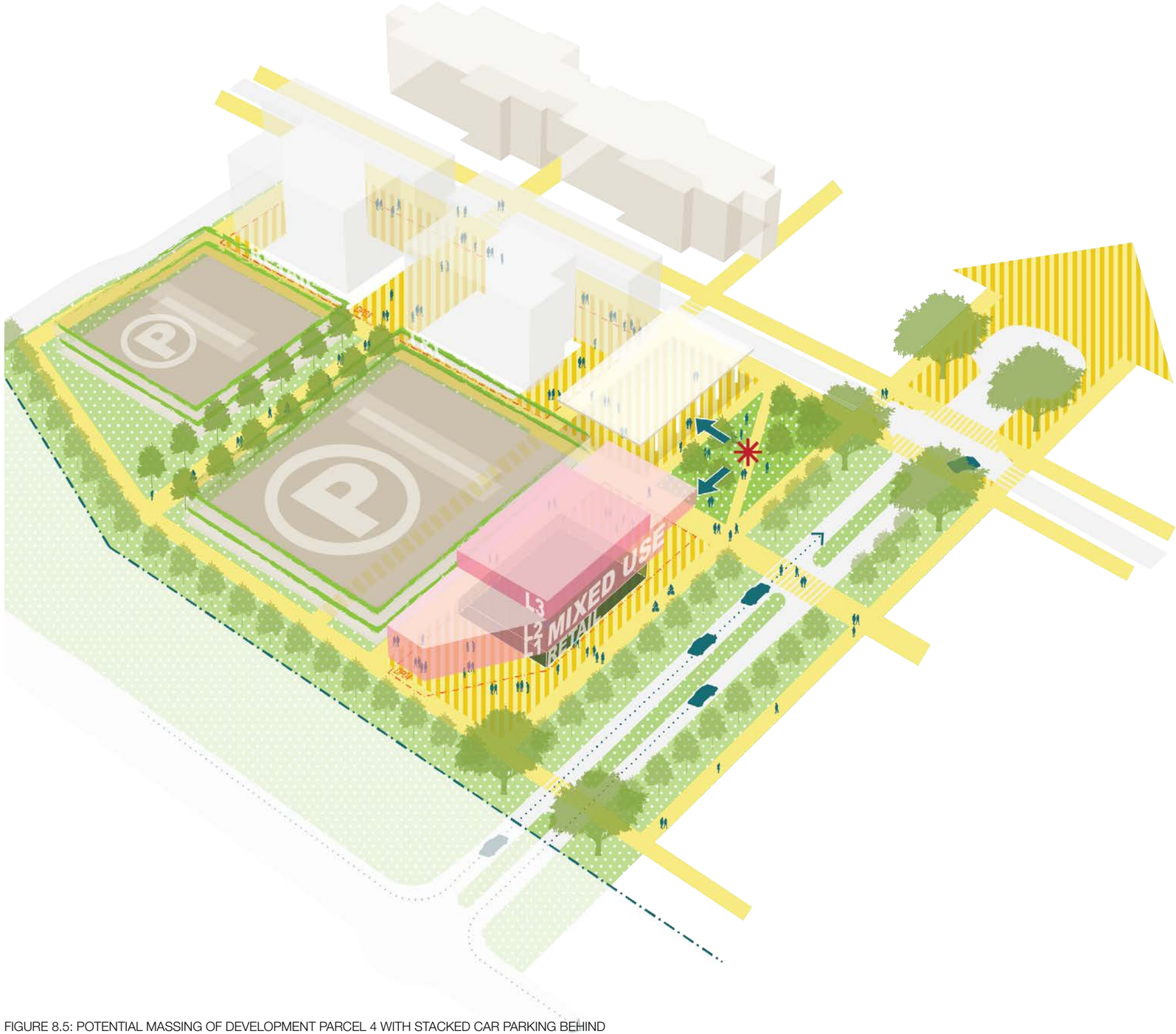


FIGURE 8.5: POTENTIAL MASSING OF DEVELOPMENT PARCEL 4 WITH STACKED CAR PARKING BEHIND

8.5 EXAMPLE DEVELOPMENT PARCEL - DP4

Development Parcel 4 is a gateway building to the campus on a primary site. The architectural expression of the development parcel should reflect the strong, landscape focus of the campus. It should encourage engagement with place through transparent facades and subtle, comfortable transitions between indoor and outdoor spaces.

The ground plane should be 40% built form whilst the levels above should provide shade for the ground plane.

DP4 sits adjacent to the proposed multi-storey landscaped car park, built for future re-purposing, and should therefore be considerate of the car park floor levels to allow for future connection potential.

The development parcel could allow for retail opportunities to create a University village vibrancy, and provide amenities for students, staff and all campus users, including weekend activation.

FIGURE 8.5.1: MULTI-STOREY LANDSCAPED CAR PARK EXAMPLE IN SINGAPORE

FIGURE 8.5.2: PEREZ ART MUSEUM MIAMI, LARGE BUILT FORM OVERHANGS SHADE THE PERIMETER OF THE BUILDING

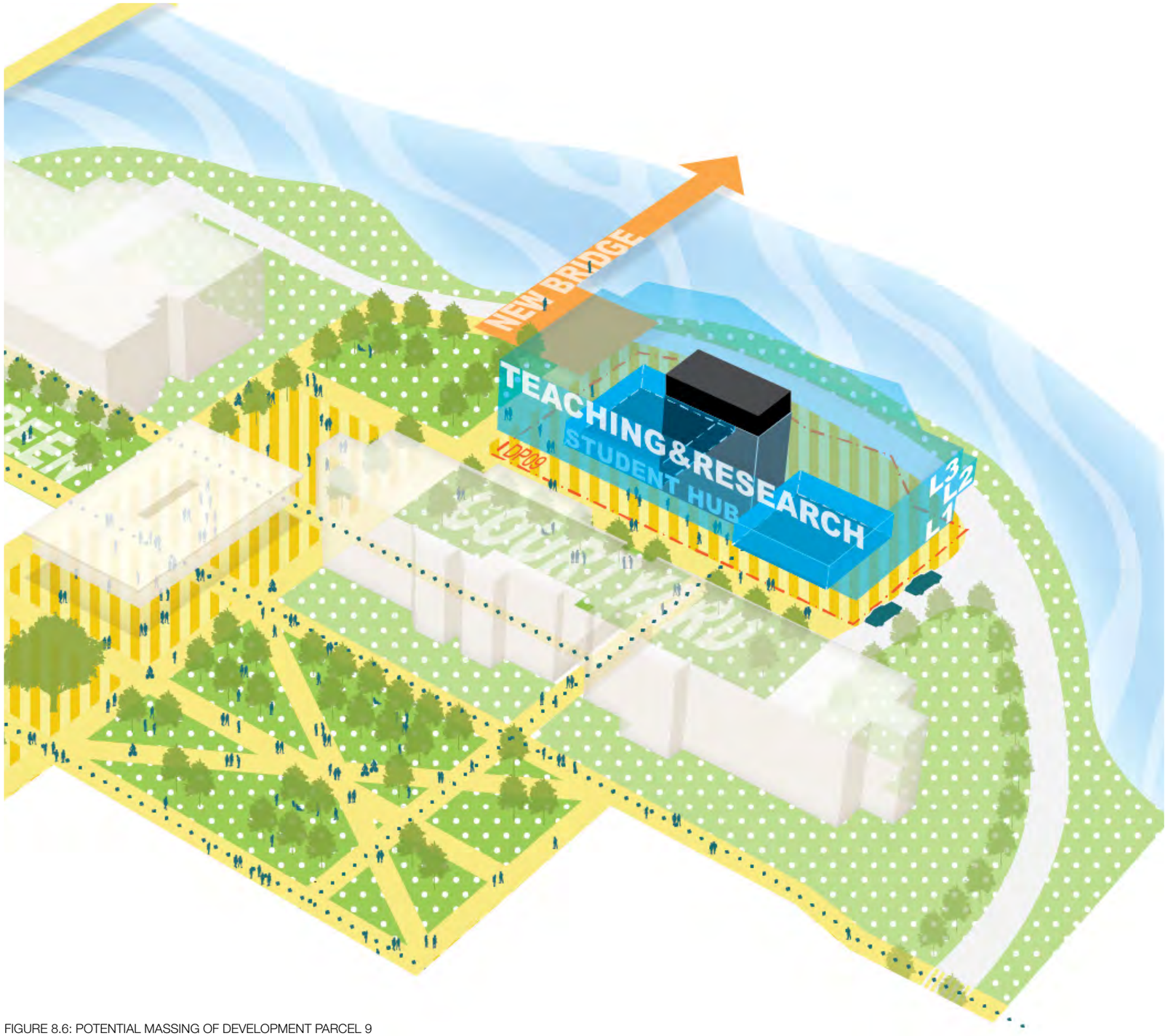


FIGURE 8.6: POTENTIAL MASSING OF DEVELOPMENT PARCEL 9

8.6 EXAMPLE DEVELOPMENT PARCEL - DP9

Development Principles:
_Building form to shade the ground plane
_Large-scale significant building to allow for interdisciplinary learning across academic and research
_Supports community engagement with safe display zones for community visitors
_Sensitively designed to connect and engage with the riparian zone of Atika creek

Potential Purpose:
_Academic/Research
_Retail
_Community focussed

FIGURE 8.6.1: TRANSPARENT BUILDING EDGES TO ENGAGE WITH THE RIPARIAN ZONE

FIGURE 8.6.2: WATER FEATURE POTENTIAL AT THE EDGE OF ATIKA CREEK

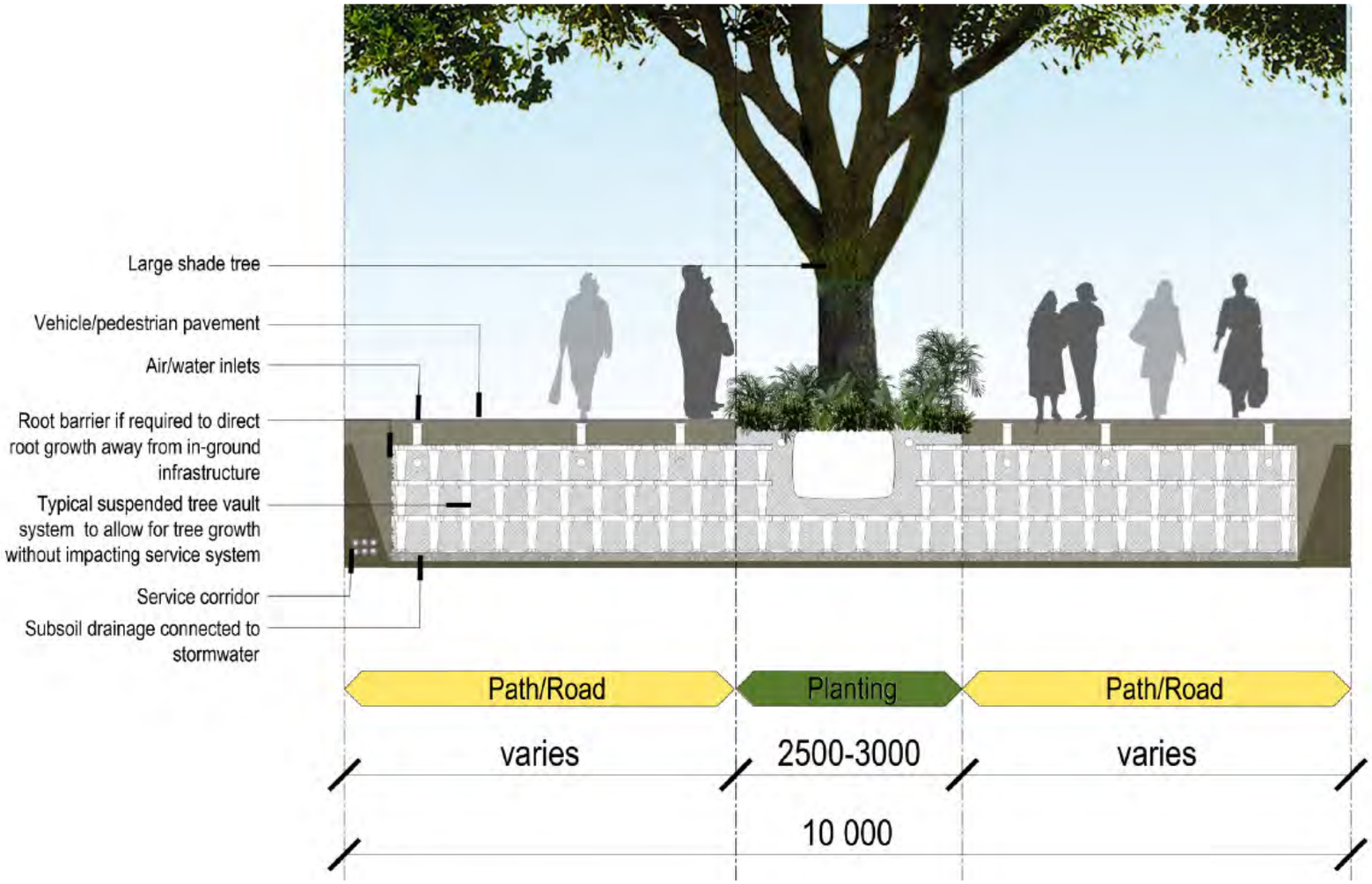


FIGURE 8.7: TYPICAL SECTION FOR LARGE TREE ZONE INTENT WHERE SERVICING CORRIDORS ARE NEAR-BY

8.7 LANDSCAPE & SERVICES

A significant tropical landscape with large shade trees is a vital element to grow the identity of the JCU Cairns campus in Smithfield. It should be prioritised over servicing corridors for the benefit of student life, campus comfort and identity.

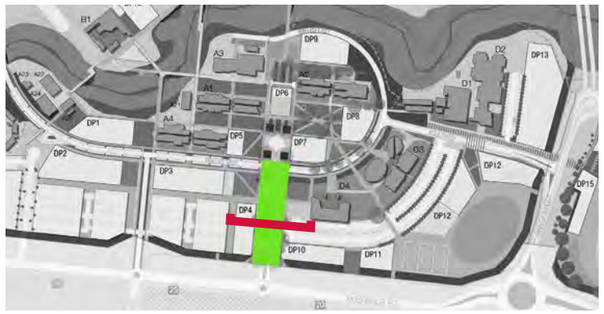
In order to facilitate the growth of substantial shade trees within the campus whilst reducing impact to services, a tree vault system can be implemented. The growing cells assist with direction of roots and providing ideal growth conditions for the trees without root compaction by pedestrian and road pavements.

8.8 INTEGRATED STORMWATER MANAGEMENT

As a working landscape, campus open spaces and landscapes also function as part of a larger integrated stormwater management system with water sensitive urban design (WSUD) strategies. The goal is to retain and detain stormwater runoff where it occurs to prevent negative impacts on neighbouring land.

The overall stormwater strategy is designed to manage typical rainfall events and accommodate significant storm events. The Cairns Campus has the potential to clean run-off before the water enters into the creek and out to the Great Barrier Reef.

The integrated stormwater management strategy for the JCU Cairns Campus includes the following measures:
_Integrated water sensitive urban design principles (water features)
_Green parking
_Integrated Bioswales



KEY PLAN FOR PRIMARY ACCESS ROAD SECTION

8.9 MAIN ENTRY ROAD SECTION

_Pedestrian footpath
_Dedicated cycle lanes to roadway
_Central planted swale
_Large feature trees
_Intermediate large trees zones for Figs or similar

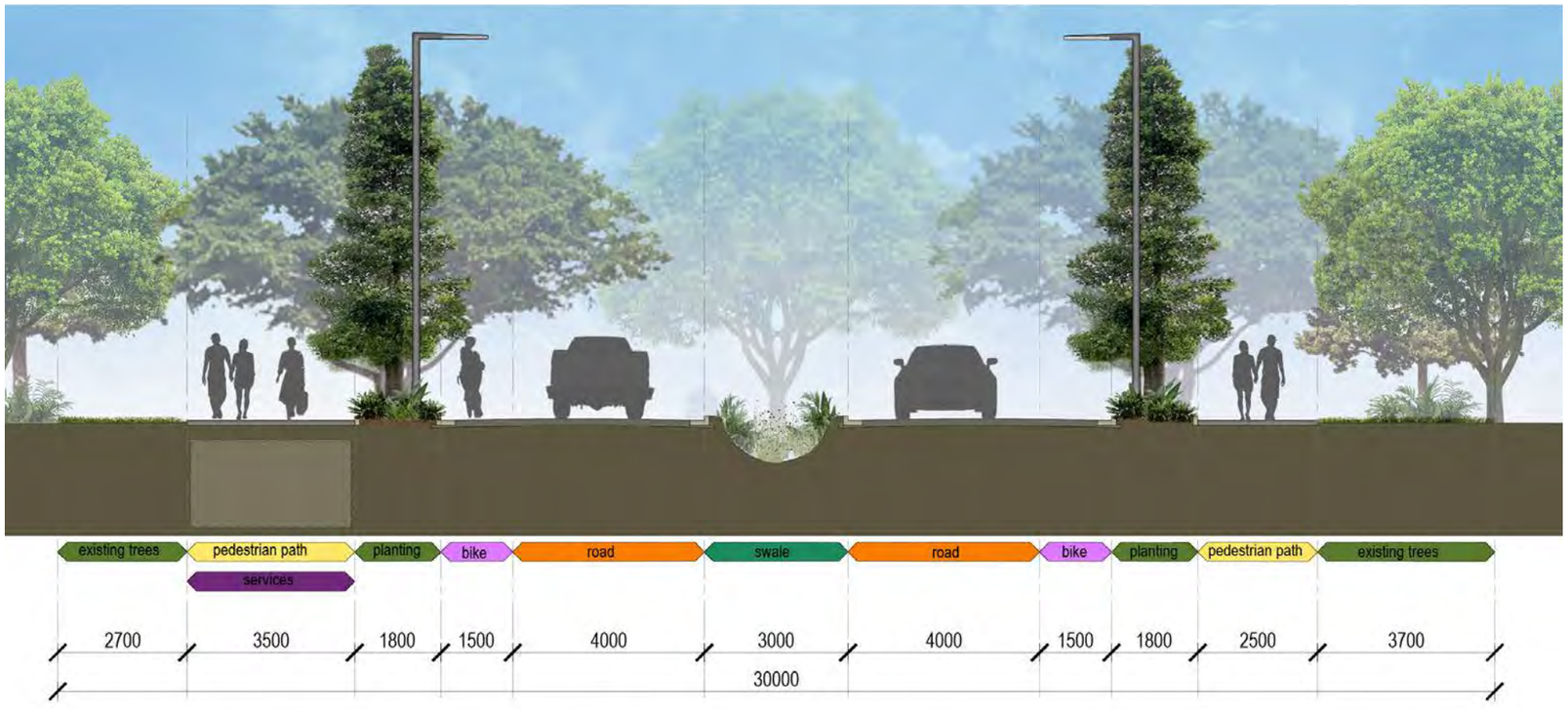


FIGURE 8.9 - PRIMARY ACCESS ROAD SECTION 1:125

FIGURE 8.9.1: SEATING POSSIBILITIES ALONG THE PRIMARY ACCESS ROAD

FIGURE 8.9.2: SIGNIFICANT LANDSCAPING OPPORTUNITIES FOR THE PRIMARY ACCESS ROAD (PHOTO LOCATION: CAIRNS ESPLANADE)

KEY PLAN FOR PRIMARY ACCESS ROAD SECTION PEDESTRIAN CROSSING

8.10 MAIN ENTRY PEDESTRIAN CROSSING

_Designated crossing points
_Highlighted with overhead arbour structures
_Arbours to provide shading where tree planting is not possible

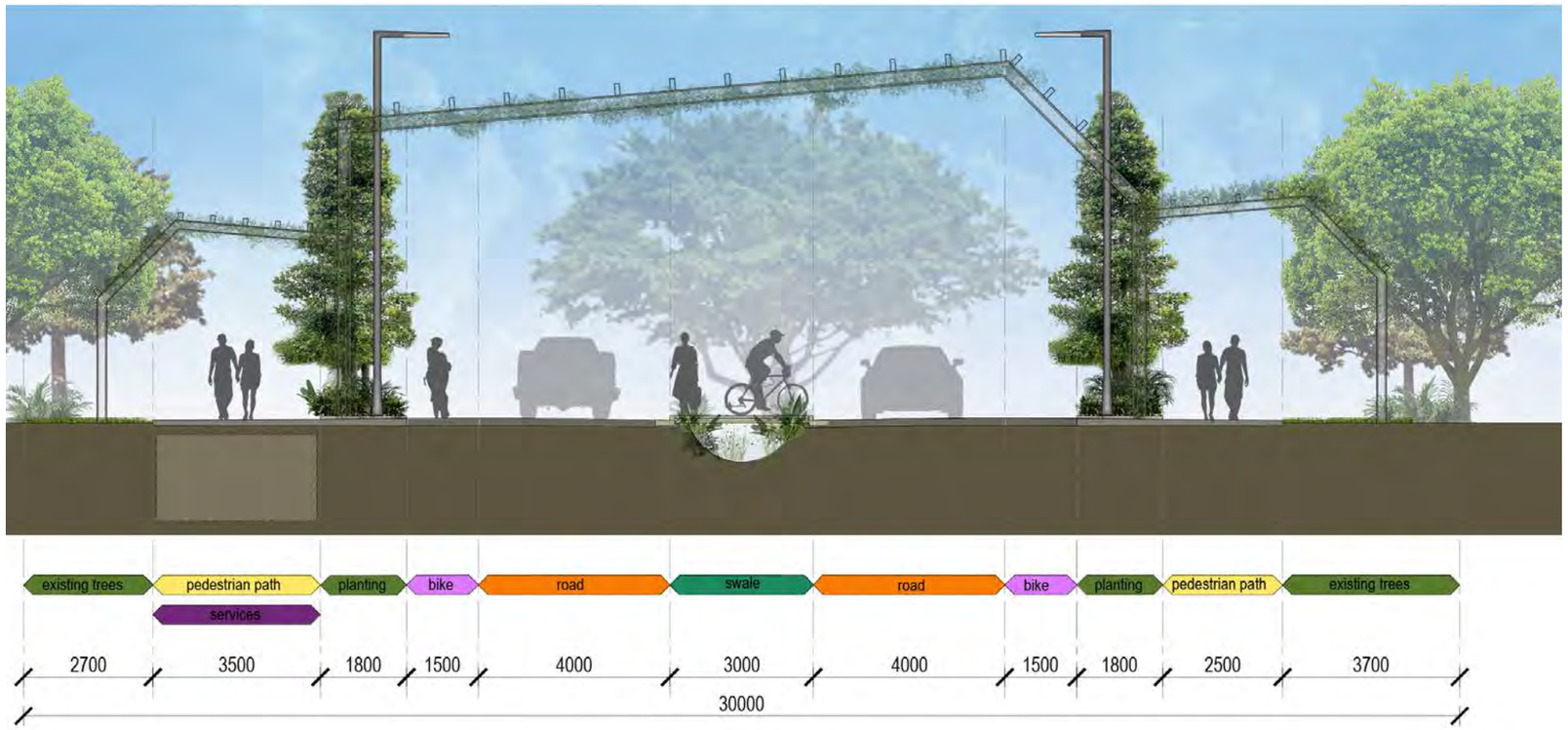
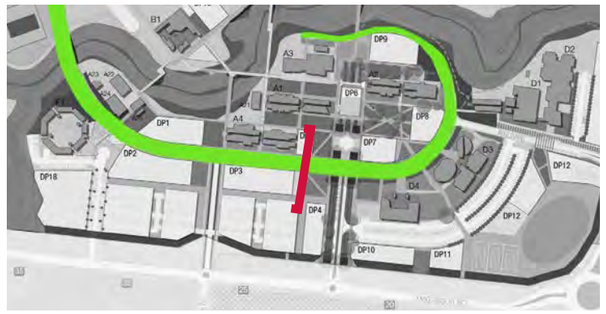


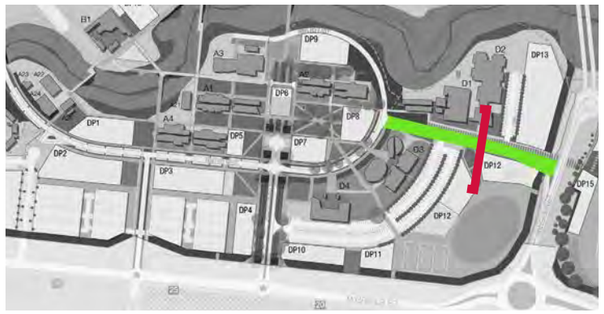
FIGURE 8.10: PRIMARY ACCESS ROAD - PEDESTRIAN CROSSING 1:125

FIGURE 8.10.1: POTENTIAL FOR SEATING ALONG PRIMARY ACCESS ROAD

FIGURE 8.10.2: POTENTIAL FOR TREE LINED RING ROAD WITH PARALLEL STREET PARKING



KEY PLAN FOR RING ROAD SECTION



KEY PLAN FOR BOULEVARD SECTION

8.11 RING ROAD SECTION & PEDESTRIAN/CYCLIST GATEWAY

_Roadside swale to ring road incorporated with pedestrian pathway to maintain suitable cross section width
_Larger shade trees to define building forecourts or important intersections to ring road
_Boulevard to incorporate planted arbours where tree planting not suitable

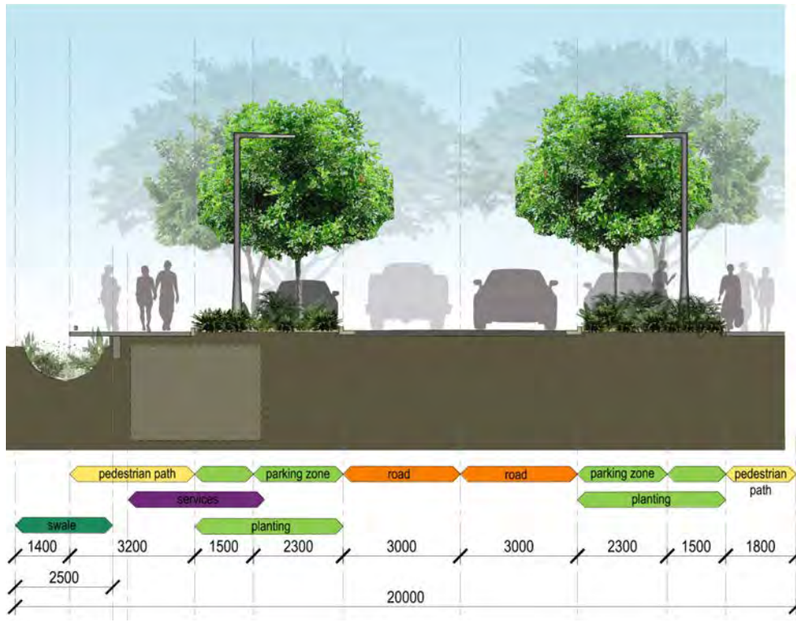


FIGURE 8.11: RING ROAD SECTION

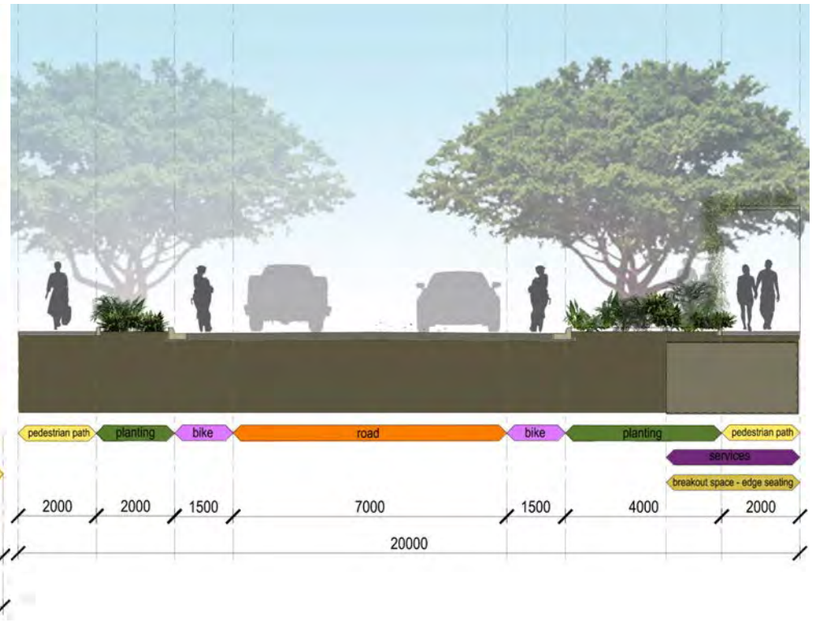
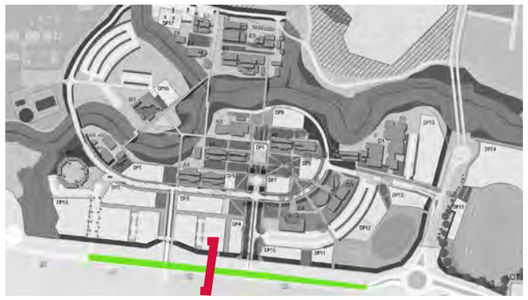


FIGURE 8.11.1: BOULEVARD SECTION

FIGURE 8.11.2: MARTIN MUNRO PARKLANDS, CAIRNS - POTENTIAL FOR PEDESTRIAN ACCESS FROM BUS STOP

FIGURE 8.11.3: POTENTIAL FOR TREE LINED RING ROAD WITH PARALLEL STREET PARKING



KEY PLAN FOR MCGREGOR ROAD SECTION

8.12 McGREGOR ROAD SECTION

The Master Plan suggests engagement between JCU and the Cairns Regional Council and the Department of Transport and Main Roads to provide the best outcome for both parties. JCU would be benefited from a Cairns Regional Council landscaping strategy along McGregor Rd to allow for a shaded, tropical experience as campus users approach the gateway.

There is potential for car parking along McGregor Road. The Master Plan proposes treatment to McGregor Road be explored further between JCU and CRC.

_Shaded footpath to campus boundary
_Shared pedestrian and cycleway
_Well lit pathways for safety

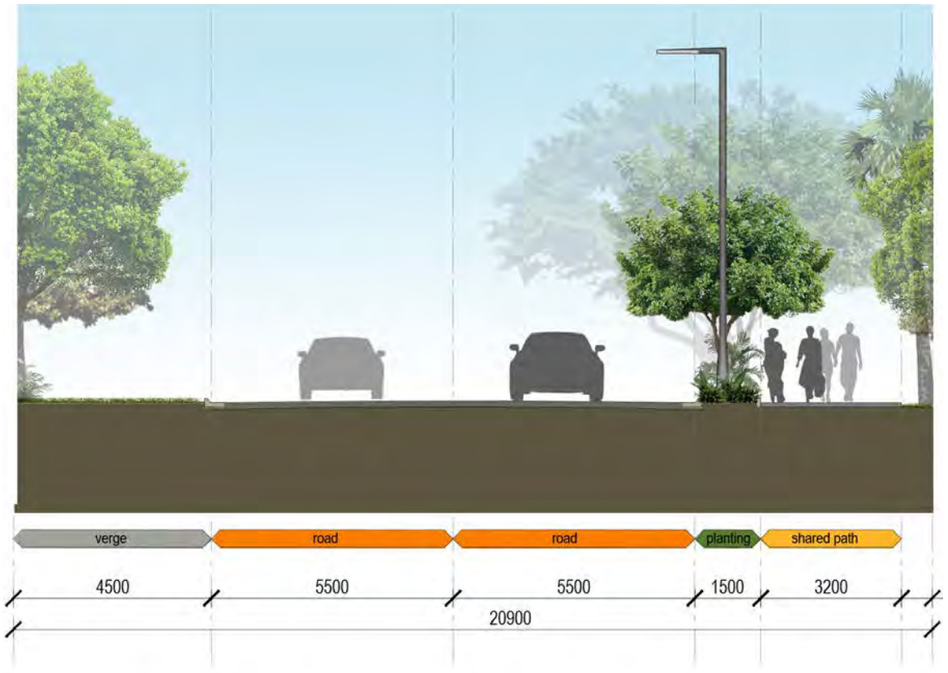


FIGURE 8.12: MCGREGOR ROAD PROPOSED ROAD SECTION

FIGURE 8.12.1: PEDESTRIAN CIRCULATION SEPARATED FROM THE STREET WITH PARALLEL PARKING, LANDSCAPING AND BIOSWALES

FIGURE 8.12.2: SHADED FOOTPATH SEPARATED FROM VEHICLE CIRCULATION

FIGURE 8.12.3: COLLINS AVENUE, CAIRNS BOTANIC GARDENS - LANDSCAPE SHADES THE ROAD AND CREATES STRONG IDENTITY

8.13 PROJECT REVIEW CRITERIA

Design review should be triggered by any project that affects or modifies a building's appearance, interior or exterior public spaces, or the University's skyline.

Such projects could include site and landscape development, new construction, building repairs, and renovations.

Major landscape projects with construction costs greater than $50,000 and building projects that have footprint or facade implications should be reviewed.

An abbreviated administrative process could be used for smaller projects, although it should be acknowledged that such projects can create opportunities to initiate a transformation in the design character of the campus and should always be evaluated for that potential.

8.14 MASTER PLAN UPDATES

The JCU Cairns Campus Master Plan 2019 requires updating every five years to ensure the document is relevant to the campus conditions and growth patterns. For more information on document control refer to the JCU Governance procedures.

8.15 DEVELOPMENT GUIDELINES

Building guidelines are intended to assist architects, planners, and campus designers in the design of future facilities and renovations. The recommendations should align with the University's sustainability objectives and desire for high-performance buildings. They are intended to minimise energy use and associated greenhouse gas emissions and to optimise daylighting opportunities, while achieving a sense of place on campus.

James Cook University Design Standards should address:
_Facades and fenestrations
_Roof form and color
_Materials and color
_Connector bridges
_Building service and mechanical equipment

8.16 LANDSCAPE GUIDELINES

Landscape and open space guidelines are intended to assist landscape architects, planners, and campus designers in the design of new outdoor spaces or the improvement of existing ones. The guidelines provide fundamental organising ideas and concepts for the campus landscape. While the guidelines offer sufficient detail for the design of the campus open spaces, they establish a design direction rather than prescribing definitive design solutions.

The guidelines promote a 'working landscape' and seek to achieve a comprehensive campus landscape design that is sustainable and environmentally responsible, economical and practical to maintain.

1. Landscape should respond to climate and natural conditions of the site
2. Landscape should establish an integrated environment that fosters a 'living and learning environment',
3. Landscape should enrich the campus experience.
4. Landscape should align with the University's objectives for sustainability and its desire for highly sustainable landscapes, which include careful management of water resources and use of native species to minimise maintenance and irrigation requirements.

The goal of the design guidance is to create landscapes with clear, identifiable characteristics that make them distinctive parts of an overall landscape fabric. In addition to the landscape design guidelines, a landscape master plan that defines a comprehensive strategy for the replacement and renewal of trees and plantings should be undertaken.

The landscape design guidelines should include the following areas:
_Landscape zone types and guidelines
_Plantings
_Paving
_Furnishings
_Lighting
_Wayfinding and signage
_Exterior art
_Maintenance
_Storm drainage integration

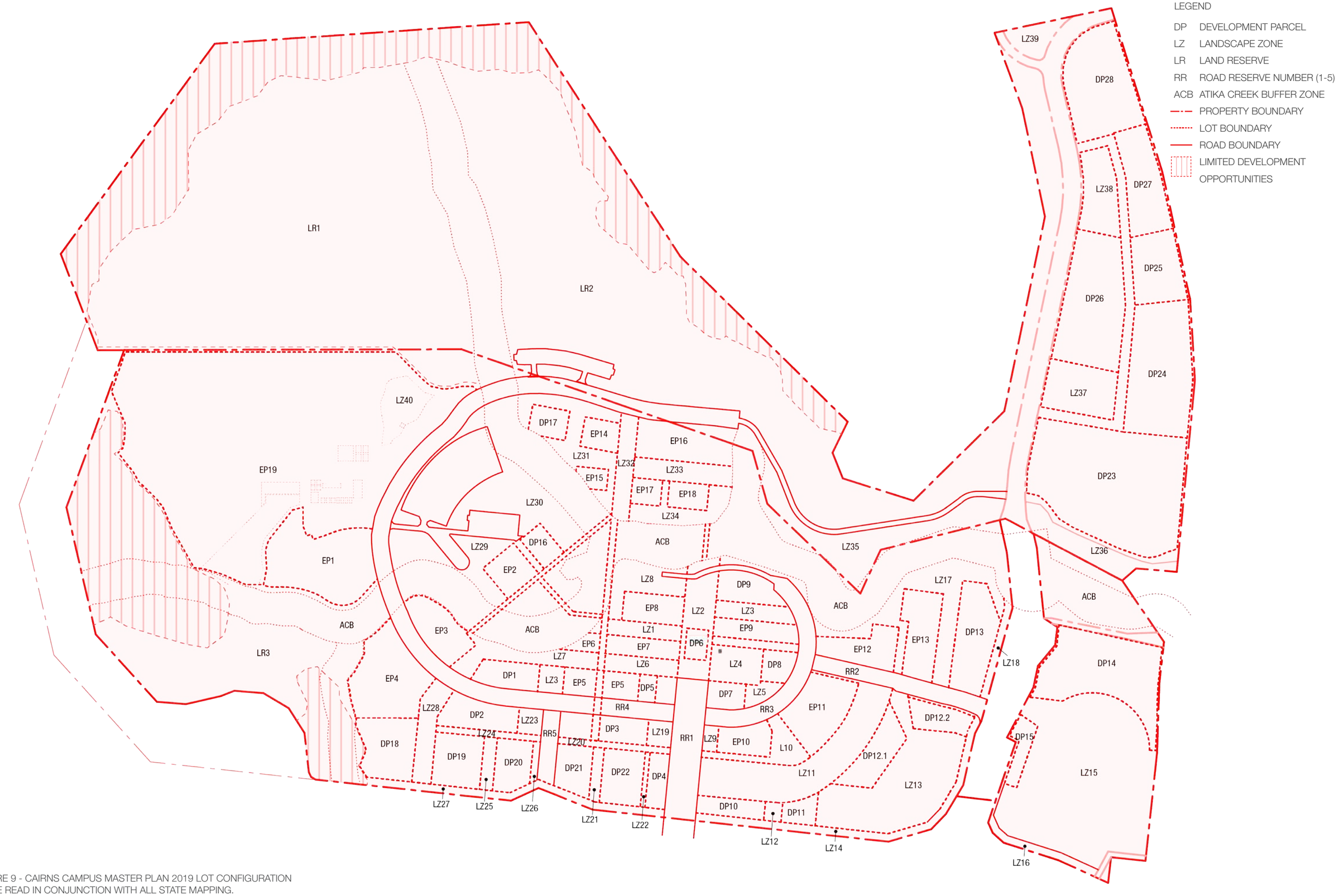


FIGURE 9 - CAIRNS CAMPUS MASTER PLAN 2019 LOT CONFIGURATION
TO BE READ IN CONJUNCTION WITH ALL STATE MAPPING.
NATURAL BOUNDARY AND BUFFER TO ATIKA CREEK SUBJECT TO CHANGE.

09 DEVELOPMENT CONTROLS

To allow JCU to implement the Cairns Campus Master Plan 2019 effectively, development controls have been outlined to ensure a holistic approach across the campus, and to ensure Master Plan principles and University Plan goals are being met.

WELL-BEING

INNOVATE

DEVELOPMENT PARCEL CHARACTER

The Master Plan suggests that each development parcel is linked with a specific character that relates to its siting and place on campus. These character references promote any new buildings to engage with place and reinforce the unique, natural setting of the campus.

INSPIRE

RETREAT ON RIPARIAN

ACTIVE PLAY

ZONING CHARACTER	LOT	PARCEL AREA (m²)	SUGGESTED HEIGHT (FLOOR LEVELS)*	STREET ADDRESS	SUGGESTED OPTIMAL GFA (m²)	KEY CONSIDERATIONS
	DP1	2180	6	Ring Rd West	8,500	DP1 & DP2 generate a cluster of student life around the existing student accommodation, generating street activation and vibrancy.
	DP2	3270	6	Ring Rd West	9,500	
	DP3	3000	4	Ring Rd West	7,100	DP3 is a key linking building located on a primary pedestrian network axis. Permeability is critical for the success of the site.
	DP4	1540	4	Access Road	3,200	DP4 has the potential to create a university village entrance to the campus, spilling onto LZ19.
	DP5	630	3	Ring Rd West	300	DP5 extends EP5 towards the ceremonial drop-off. Built form in this zone should be permeable.
	DP6	875	2	Campus Cross-roads	400	DP6 is an open, landscaped pavilion structure conceived to enhance gathering outdoor spaces and engage with the unique tropical setting.
	DP7	1350	4	Ring Rd East	3,700	DP7 & DP8 are landmark sites and should support one high-value building that considers the significance of its connection to the campus and community.
	DP8	1460	4	Ring Rd East	3,100	
	DP9	2060	4	Ring Rd East	6,500	DP9 should engage sensitively with the Riparian zone and support multi-disciplinary functions for research and academic purposes.
	DP10	1650	4	McGregor Rd	4,500	DP10 & DP11 are community focussed sites. DP10 should celebrate the pedestrian entrance to the campus.
	DP11	1100	4	McGregor Rd	3,500	
	DP12.1 DP12.2	3250 2050	4 4	Boulevard	3,900	DP12.1 & DP12.2 should support sporting activities to engage with the University Green.
	DP13	5390	6	Boulevard	4,900	DP13 is a landmark site that should celebrate the arrival to the campus.
	DP14	11,090	6	Panguna St	6,400	DP14 is a landmark site that should address the campus identity due to its high visibility from Capt. Cook Highway & adjacency to the community.
	DP15	1370	4	Panguna St	1,500	DP15 is a support site to the University sports oval.
	DP16	1350	4	Ring Rd West	3,900	DP16 should celebrate the surrounding riparian zone.

** IF FUTURE BUILT FORM PROPOSALS DO NOT ACHIEVE SUGGESTED DEVELOPMENT PARCEL HEIGHTS AND SUGGESTED OPTIMAL GFA, AN ANALYTICAL PROCESS OF THE DEVELOPMENT WITHIN THE CAMPUS WILL BE REQUIRED.*

TABLE 9.1: DEVELOPMENT PARCEL SCHEDULE

9.1 DEVELOPMENT LOT CONFIGURATION

The campus includes a variety of land and building uses whose organisation and function create a sense of collegiality, enhance the academic atmosphere, and promote rich learning environments.

The development lot configuration provides direction and guidance for building placement, site organisation, and placemaking decisions, and expresses the overall character of the campus.

Development parcels have built-in setbacks to adjacent lots, therefore no additional setback guidelines have been assigned.

9.1.1 DEVELOPMENT PARCELS

The structure of identified development parcels is founded on the existing organisational grid of the Cairns campus. Locating development parcels within the existing campus grid, reinforces the pedestrian movement patterns through the campus and enhances wayfinding, improving accessibility for all campus users.

Future built form within each development parcel should respond to the primary address and engage with the proposed campus pedestrian network.

As a general campus rule, all built form on development parcels should occupy a maximum of 40% of the ground floor plane to encourage air movement and promote visual transparency through the campus.

Future built form orientation should consider optimising air movement and natural ventilation opportunities. Vertical circulation should be clearly visible from the primary address to improve campus wayfinding.

Identified development parcels may be interchangeable. The Master Plan indicates an organisation strategy that is consistent with current campus trends and represents an ideal arrangement for future development.

9.1.2 LANDSCAPE ZONES & LAND RESERVES

Landscape zones provide certainty for JCU to further establish a significant tropical landscape environment on campus by designating areas for planting and open space.

The landscape zones also provide separation between development parcels to promote air movement, critical in the tropics. Key landscape zones are themed, such as the courtyard spaces between A precinct buildings. The open space and landscape framework provides further detail on these spaces. (Refer page 75)

Land Reserves are noted for future use, however, it is a principle of the Master Plan that all new development is focussed within the academic core. Land reserves may be used for mixed use (such as residential) in future.

9.1.3 EXISTING DEVELOPMENT PARCELS

Existing development parcels have been identified for future use when existing built form is repurposed, renovated or demolished.

- Well-being
- Innovate
- Inspire
- Retreat on Riparian
- Active Play

FIGURE 9.1.1: DIAGRAMMATIC ILLUSTRATION OF AIR FLOW MOVEMENTS

9.1.4 DEVELOPMENT PARCEL THERMAL CONSIDERATIONS

Development parcels and landscape zones have been strategically placed and separated to allow for air movement to penetrate the campus, mitigating against areas of inadequate air movement for thermal comfort.

As shown in existing conditions computational fluid dynamics modelling, the predominate breezes come from the southerly to south-south-easterly direction. The existing campus building layout create 'wind shadows' where the air movement is less than adequate for thermal comfort.

Development parcel principles should incorporate strategies to optimise the air movement through the sites, including ensuring that no more than 40 per cent of the ground plane is built form.

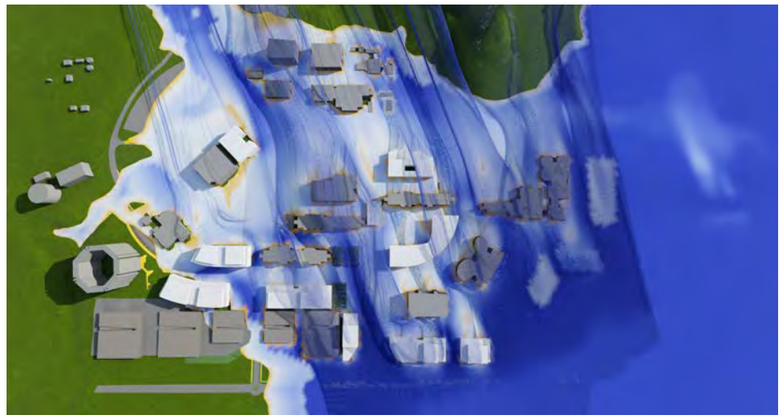
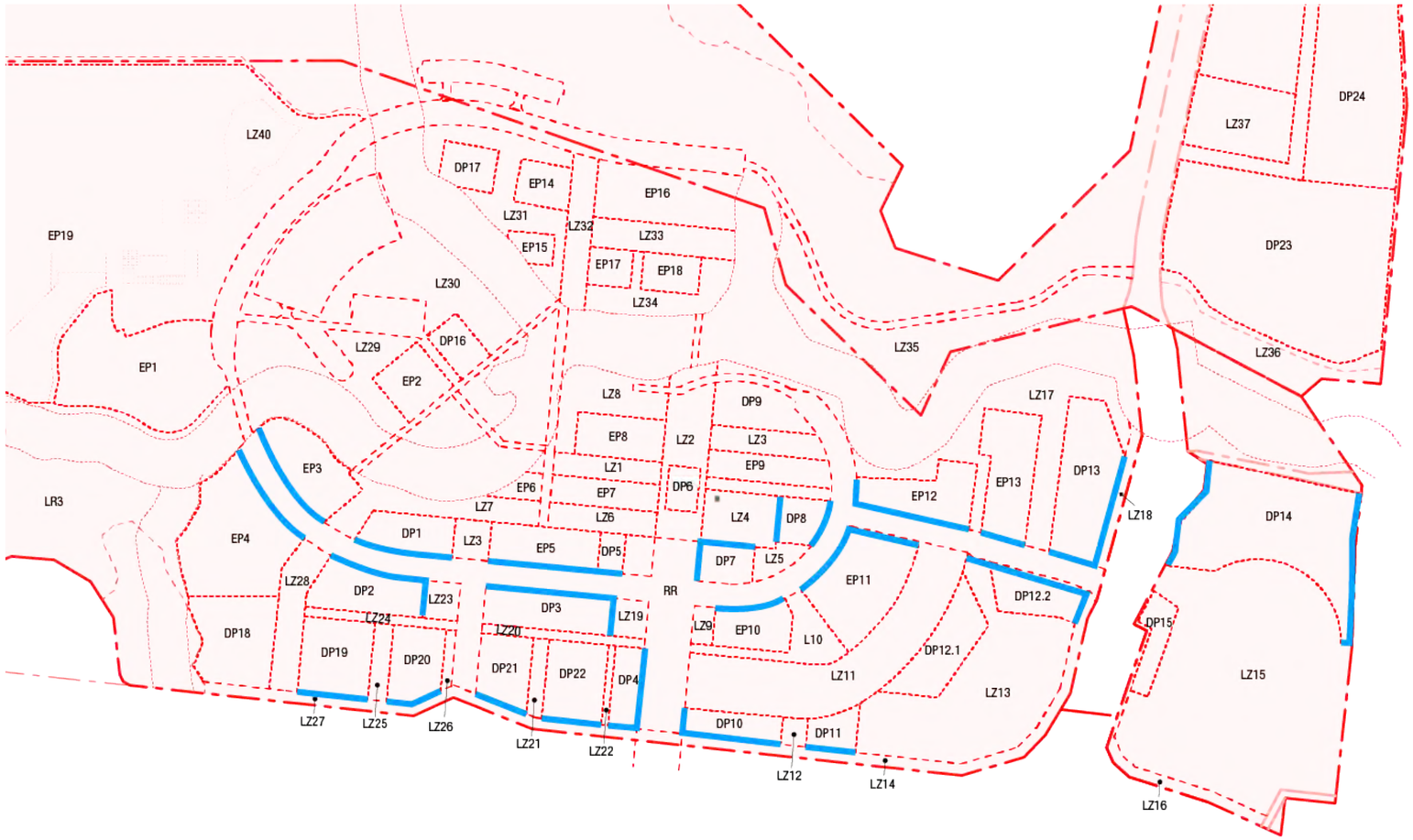


FIGURE 9.1.2: CFD (WIND) OVERLAY WITH PROPOSED DEVELOPMENT PARCELS



PRIMARY ADDRESS

FIGURE 9.1.3: PRIMARY ADDRESS OF DEVELOPMENT PARCELS

9.1.5 DEVELOPMENT PARCELS PRIMARY ADDRESS

Each development parcel has a primary address to the existing road network to improve campus wayfinding and legibility.

Primary addresses are identified to ensure development parcels are designed in a holistic approach and to avoid blank, unengaging building facades. The Master Plan promotes an open, permeable building character throughout the campus to allow for maximum engagement with the surrounding environment and community.

kirk
Level 1, 11 Logan Road
Woolloongabba QLD 4102 Australia

T + 61 7 3434 8000

WWW.KIRK.STUDIO

JAMES COOK UNIVERSITY
AUSTRALIA