

Fishermans Bend Campus Sustainability Framework

Fishermans Bend Campus Masterplan

University of Melbourne

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Accronyms

Accronym	
ABP	Faculty of Architecture, Building and Planning
COM	City of Melbourne
FBCDF	Fishermans Bend Campus Development Framework
FBF	Fishermans Bend Framework
FBCRF	Fishermans Bend Climate Readiness Framework
LCSEF	Fishermans Bend Campus Sustainability Framework
FBTF	Fishermans Bend Task Force
MEI	Melbourne Energy Institute
FABP	Faculty of Architecture, Building and Planning
MSE	Melbourne School of Engineering
MSEFB	Melbourne School of Engineering New Campus Functional Brief
MSESS	Melbourne School of Engineering 2025 Sustainability Strategy
MW	Melbourne Water
SEW	South East Water
UOM	University of Melbourne
UTCI	Universal Thermal Comfort Index

Executive Summary

This Sustainability Management Plan supports the masterplan for the establishment of a campus at Fishermans Bend by the University of Melbourne (UoM). The campus is both important for the University’s growth and development, and a critical ‘first move’ for the development of the Fishermans Bend employment precinct.

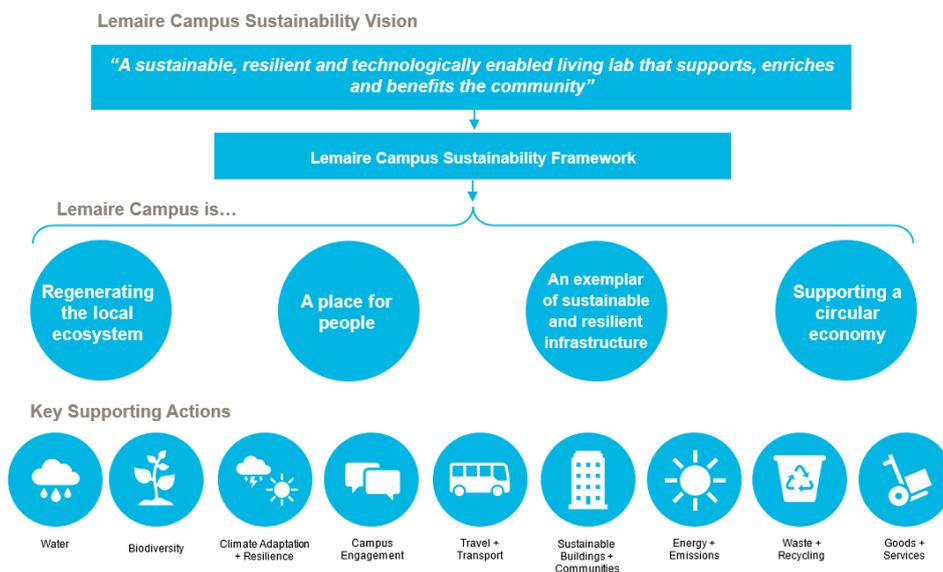
The primary goals for the UoM’s Fishermans Bend Campus Sustainability Framework (LCSF) are to:

- Help the University capture the benefits and opportunities that this urban transformation offers, within this site and across the broader precinct.
- Address key components of the Melbourne City’s Planning Scheme (MPS) in relation to Energy, Water and Waste Efficiency, Water Sensitive Urban Design , and Stormwater Management in Urban Development.

The sustainability framework is informed by an understanding of the critical and practical actions in terms of sustainability, shared services and climate resilience. The sustainability vision for the campus has been developed through a collaborative approach with key stakeholders and considers the local context and global sustainability trends.

“A sustainable, resilient and technologically enabled living lab that supports, enriches and benefits the community”

The Fishermans Bend Campus Sustainability Framework is pillared by four flagship objectives derived from the sustainability touchstones and extensive stakeholder engagement. These are then supported by key sustainability actions related to the current operational categories of University’s Sustainability Plan.



The flagships objectives are world-leading sustainability priorities that the Fishermans Bend Campus will be regarded for through their ambitious and site-specific drivers. The key supporting actions are a collective of University, Faculty and stakeholder sustainability requirements that contribute to the sustainability vision and flagship objectives.

Flagship Objective One // Regenerating the local ecosystem

Regeneration of the ecosystem in the local setting that contributes to the health, wellbeing and resilience of the community, flora, fauna and waterways

Flagship Objective Two // A place for people

Development of the campus to prioritise the health, wellbeing, connectedness and resilience of the campus and neighbourhood community

Flagship Objective Three // Sustainable and resilient infrastructure

Development of infrastructure that supports the Universities sustainability aspirations showcasing world-leading technology and energy-efficient, resilient, low-impact sustainable buildings

Flagship Objective Four // Supporting a circular economy

A campus that uses waste as a resource and encourages the circular flow of materials

1. Introduction

The establishment of a campus at Fishermans Bend by the University of Melbourne (UoM) is both important for the University's growth and development, and also a critical 'first move' for the development of the Fishermans Bend employment precinct.

There are significant challenges facing the area. These challenges include contaminated land, exposure to flooding and climate change impacts, poor connection with the public transport system, and a windy, exposed, coarse urban grain. Despite this, Fishermans Bend represents arguably the most significant opportunity for an Australian city to shape its own future. An opportunity of this scale allows Melbourne to set a framework to engage with the emerging global economy and the Fourth Industrial revolution – to be a living lab.

The University has an opportunity to transform the site into a world-leading innovation precinct and attract the best global talent and investment in research activities to stamp itself as a global leader in innovation, research and technology.

Purpose

The primary goals for the UoM's Fishermans Bend Campus Sustainability Framework (LCSF) are to:

- Help the University capture the benefits and opportunities that this urban transformation offers, within this site and across the broader precinct.
- Address key components of the Melbourne City's Planning Scheme (MPS) in relation to Energy, Water and Waste Efficiency, Water Sensitive Urban Design, and Stormwater Management in Urban Development.

The Sustainability Framework is informed by an understanding of the critical and practical actions in terms of sustainability, shared services and climate resilience.

The framework sets out a vision for sustainability, sets clear actions to guide implementation, and makes specific recommendations in respect to energy, water, waste and air quality so that green and sustainable choices are incorporated into building and site design.

This framework provides clear direction to achieve the overarching sustainability vision for the campus through the setting of ambitious flagship objectives and key supporting actions.

Flagships actions are considered to be world-leading sustainability priorities that the Fishermans Bend Campus will be regarded for through their ambitious and site-specific drivers. The key supporting actions are a collective of University, Faculty and stakeholder sustainability requirements that contribute to the sustainability vision and flagship objectives. These flagship and key supporting actions also flow through to other work streams including utilities, waste, and climate adaptation and resilience, and support the realisation of a living lab.

Sustainability vision

Through stakeholder engagement workshops, collaboration with design team members and ideation exercises, a sustainability vision has been developed to encompass the key drivers of sustainability for the Fishermans Bend Campus development.

“A sustainable, resilient and technologically enabled living lab that supports, enriches and benefits the community”

Sustainability context

Growing Esteem

Planning for the Fishermans Bend Campus is taking place in the context of the UoM's current Growing Esteem. Sustainability is core to the operation of the University, and directly connected to The Melbourne Vision set out in 'Growing Esteem 2015-2020', the University's current Strategic Plan. The Melbourne Vision states that the University will be successful in its aspirations if, by 2020, it is...

“...recognised as a leader in embedding sustainability in all aspects of the University’s operations, teaching and learning, research and engagement”

It is important to acknowledge that stage one of the Fishermans Bend Campus will become active under Strategy 2030, the University’s next strategic plan, as with subsequent stages in the future.

As such, planning needs to acknowledge and respect the current context, but also be ambitious and based on first principles in setting the future direction for sustainability at the University and the Fishermans Bend Campus development.

Sustainability Charter

The UoM Sustainability Charter provides a framework to embed social and environmental sustainability across all facets of the University. The Charter articulates a set of high-level principles and commitments that have been translated into priority actions through the Sustainability Plan. The key principles and commitments set out in the Charter are **research, teaching and learning, engagement, operations and governance**.

The Sustainability Charter is intended to endure beyond the current Growing Esteem and Sustainability Plan and therefore provides a solid foundation on which the Fishermans Bend Campus Framework can be built.

Sustainability Plan

The Sustainability Plan sets out priority actions and targets towards realising the commitments of the Sustainability Charter over a four-year period. The current Sustainability Plan has two targets that endure beyond 2020; achieve carbon neutrality before 2030; and, support the implementation of the Sustainable Development Goals (which inherently have a 2030 timeframe). It also commits to developing campuses as a living laboratory of sustainable communities which is a convergence of the research, teaching and learning and operational aspects outlined in the Charter.

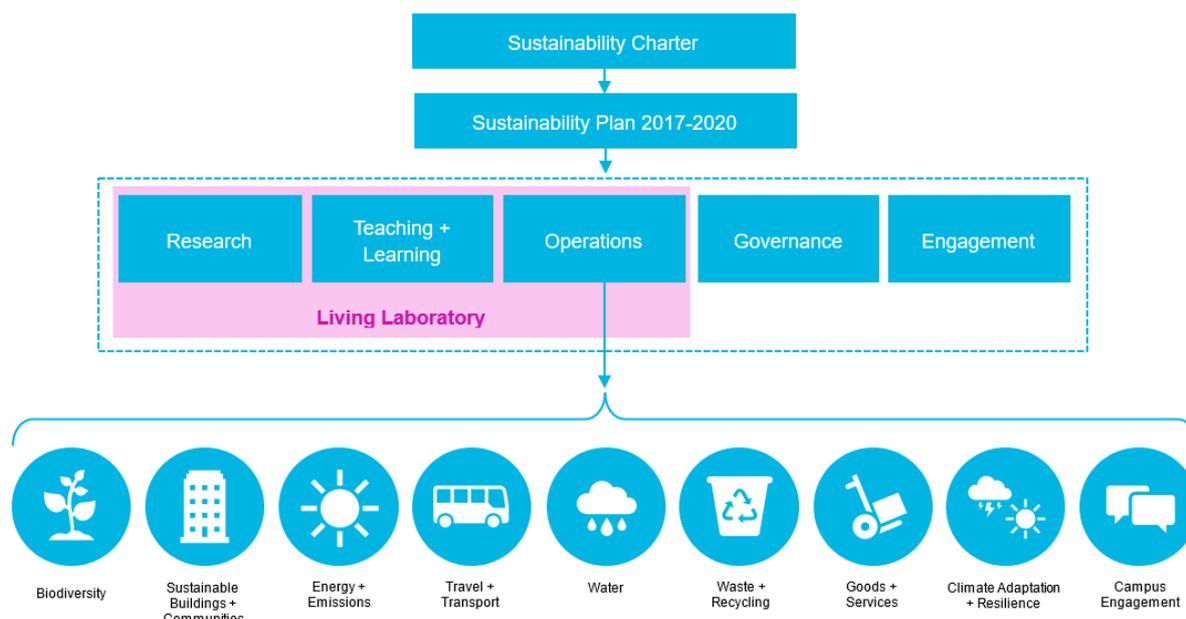


Figure 1: Structure of sustainability at the University, living lab integration and operational categories

The Fishermans Bend Campus Development Framework will support and be enabled by the University’s commitment to explore and create opportunities for a living laboratory. As such the FBSF includes tangible recommendations aligned with project delivery stages to bring this aspect of the new campus to the fore.

Sustainable Development Goals

In September 2016 UoM signed the ‘University commitment to the Sustainable Development Goals’. The commitment calls upon universities to use their unique position in society to drive adoption of the United Nations Sustainable Development Goals (SDGs). A University-wide approach to the SDG’s is currently under discussion. For any future approach, this Framework shows alignment with the SDG’s under each strategy.



Figure 2: SDG's that the Fishermans Bend Campus Sustainability Framework can contribute towards

Faculty Perspectives

Stage 1 of the Campus development is likely to include the Melbourne School of Engineering (MSE) and the Faculty of Architecture, Building and Planning (FABP). These Faculties are well progressed in framing their criteria for the Fishermans Bend Campus. During future stages of the development, other faculties and Schools will also join the new campus. It is therefore necessary to consider future needs and sustainability goals of not only MSE and FABP but also the wider University faculties' potential requirements.

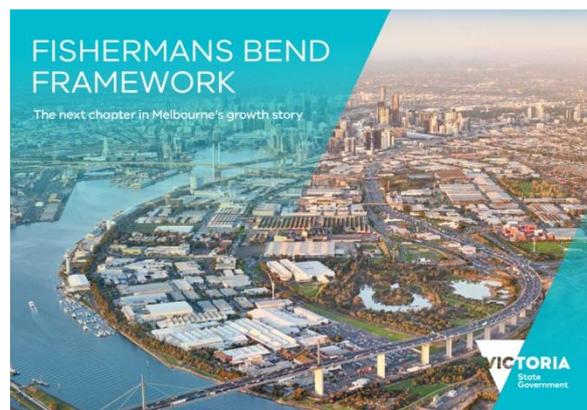
The MSE functional brief aspiration is that the Campus will be a statement of the University's progress in sustainability leadership. The Campus will be a living demonstration of the actions and events occurring within. MSE will recycle water, generate energy and minimise waste, while monitoring and displaying data of the operations to educate occupants. The MSE Sustainability Strategy also developed a triple bottom line approach utilising environmental, social and economic drivers to create a sustainability framework for MSE.



Across a range of disciplines including architecture, construction, landscape architecture, property, urban and cultural heritage, urban design and urban planning, the Faculty of Architecture, Building and Planning (FABP) is a creative and people-oriented built environment faculty. Several collaborative groups, research hubs, centres and institutes are embedded within the faculty including¹; Thrive Research Hub, Connected Cities Lab; and the Melbourne Sustainable Society Institute. It is expected that these areas of activity will translate into sustainability goals for FABP's presence at Fishermans Bend.

Government

The Campus development should also strive to include the sustainability targets as set by the Government's Fishermans Bend Task Force (FBTF) in the Fishermans Bend Framework and Sustainability Strategy. The Framework is the Government's long term strategic plan for the development of Fishermans Bend out to 2050. It provides direction on how the transition of the area will be managed, creating certainty for the community, landowners, developers, businesses and investors.



“A thriving place that is a leading example for environmental sustainability, liveability, connectivity, diversity and innovation” – Sustainability Vision, Fishermans Bend Framework

A Climate Change Mitigation Strategy has been developed by the City of Melbourne (CoM) that aims to reduce the largest source of greenhouse gas emissions in the municipality. While not mandatory, there are opportunities for alignment and collaboration with the CoM and UoM.

¹ University of Melbourne, Melbourne School of Design Research

Approach

The FBSF will translate and apply the UOM and Faculty Sustainability Frameworks to set key sustainability requirements, and foster ambition and innovation by comparing these key requirements against world-leading sustainability approaches.

The diagram below summarises the approach taken in formulating the Fishermans Bend Campus Sustainability Framework, Vision, flagship objectives and key supporting actions.

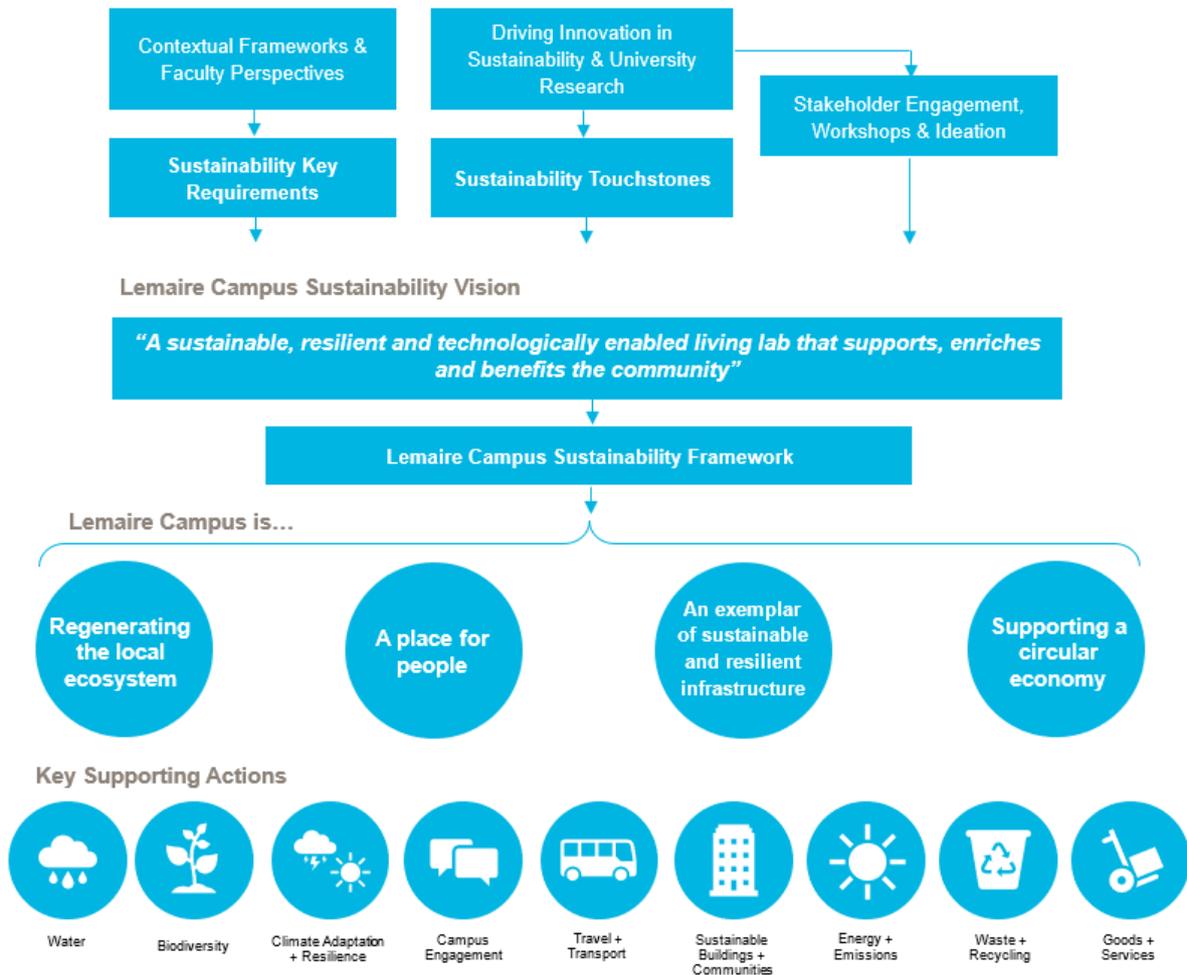


Figure 3: Approach taken in formulating the Fishermans Bend Campus Sustainability Framework

2. Sustainability in planning

City of Melbourne's Planning Scheme sets out the vision and strategic direction for developments within the municipality.

The Campus development will address sustainability aspects of the Melbourne City's Planning Scheme (MPS) that are captured within the following clauses:

- 22.19 Energy, Water and Waste Efficiency
- 22.23 Water Sensitive Urban Design (WSUD)
- 53.18 Stormwater Management in Urban Development

MPS Clause 22.19 Energy, Water and Waste Efficiency

This part of the MPS encourages developments that:

- Minimise greenhouse gas emissions and maximise energy efficiency.
- Minimise mains potable water use and consider the use of alternative water sources, such as rainwater or greywater
- Minimise waste going to landfill, maximise the reuse and recycling of materials, leading to improved waste collection efficiency.

The Campus development will comply with the requirements set out in MPS Clause 22.19 as follows:

- The development will develop and implement a Waste Management Plan in accordance with the City of Melbourne's Guidelines.
- The development will be designed to a benchmark standard of minimum 5-star Green Star Design & As-Built rating or equivalent, with a target of 6-Star rating. Exceptions to this Green Star performance requirement will be assessed by UoM on a case-by-case basis.

In addition to the above, MPS Clause 22.19 is also addressed by the University of Melbourne's Design Standards, which include the following key items for new building or major refurbishment projects:

- Plant and equipment efficiencies based on NCC Part J requirements, relevant Australian MEPS parameters, and criteria nominated within Section 9.3.7 of the Design Standards.
- Energy analysis, including whole building energy modelling during design for applicable projects
- Water analysis / modelling, for example the Green Star Potable Water Calculator
- Efficient water fixtures and fittings, generally within 1 star of best available WELS rating
- Water recycling system, including a third pipe for recycled and rainwater supply to non-potable end uses
- Operational waste management plan
- Construction environmental management plan
- Construction and demolition waste management plan

MPS Clause 22.23 & 53.18 Stormwater Management (Water Sensitive Urban Design)

These parts of the MPS recognize that achieving improved stormwater quality is key in reducing the environmental impact of urban development on waterways and receiving water bodies in the Port Phillip catchment.

The Campus development will comply with the requirements set out in MPS Clause 22.23 as follows:

- The development will prepare and implement a Construction Environmental Management Plan (EMP) which includes measures to prevent litter, erosion, sedimentation, chemical contamination and other pollution entering stormwater systems during the construction phase.
- Water sensitive urban design measures will be implemented for the development, providing means for treating stormwater run-off in a variety of ways so that the run-off flow is reduced and the quality of run-off is improved.
- Stormwater management systems will be designed to ensure that flows downstream of site are restricted to pre-development levels, and will be integrated with the overall development plan including the street and public open space networks and landscape design.
- The development will achieve the best practice water quality performance objectives set out in the Urban Stormwater Best Practice Environmental Management Guidelines, CSIRO 1999. Currently, these water quality performance objectives are:
 - Suspended Solids - 80% retention of typical urban annual load
 - Total Nitrogen - 45% retention of typical urban annual load
 - Total Phosphorus - 45% retention of typical urban annual load
 - Litter - 70% retention of typical urban annual load

MPS Clause 22.27 Fishermans Bend Urban Renewal Policy

This part of the MPS applies to development within Fishermans Bend affected by the Capital City Zone Schedule 4 or Design and Development Overlay Schedule 67, which is technically not applicable to the Campus development.

Regardless of the applicability of Clause 22.27, the Campus development will look at addressing key sustainability aspects within this policy outlined below:

- The development will install a third pipe for recycled and rainwater supply to all non-potable outlets within the development, intended for end uses such as toilet flushing and irrigation.
- The development will provide a connection point from the third pipe to ensure readiness to connect to a future precinct-scale recycled water supply.
- The development will target energy efficiency improvements over the minimum standards in the National Construction Code.
- The development will explore on-site renewable energy options, including opportunities for storage and potential precinct-wide shared renewable energy network.
- The development will seek to maximize site area comprising of building or landscape elements that reduce urban heat island effect, including:
 - Vegetation, green roofs and waterbodies.
 - Roof materials, shade structures, solar panels or hardscaping materials with high solar reflectivity index.
- The development will prepare and implement an Operational Waste Management Plan, and where practicable, explore opportunities to:
 - Optimise waste storage and efficient collection methods.
 - Share storage or collections with adjacent developments.
 - Separate collection for recycling, hard waste, and food and green waste.
- The development will provide easily accessible bicycle parking facilities, including end of trip change rooms, showers and lockers.

3. Sustainability Touchstones

Doing less harm is no longer enough. To achieve the flagship sustainability objectives, we must exceed current standards in sustainable design through innovative thinking and creative application of emerging technologies.

The following concepts are useful touchstones for the sustainability objectives. They prompt the University to view sustainability from different perspectives and highlight gaps and opportunities in the existing frameworks. The following sections provide an overview, with more detail and examples provided in Appendix A.

Regenerative Development

Regenerative development concentrates on our role as members of the community to support high-quality, mutually beneficial relationships between people and place, seeking to reverse the degeneration of ecosystems caused by human activities.

“Regenerative Development is an approach that encourages communities to support and create positive relationships that will benefit society and our environments by allowing the system to evolve and adapt to changing circumstances.” Thrive, Melbourne School of Design²

A thriving eco-system improves the health and wellbeing of the people living and working there.

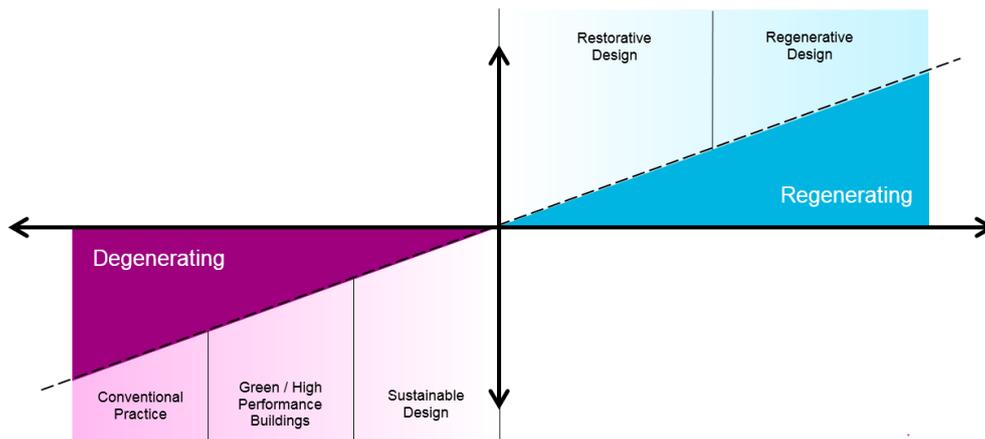


Figure 4: Diagram of the scale of degenerative to regenerative development

In Dominique Hes’ book, “Regenerative Development and Design”, she describes principle 5 as working from potential, not problems. In the context of Fishermans Bend, the potential of the site to be a regenerative development is almost limitless. The starting point of a degraded concrete slab covered site can be improved through thoughtful ecological planning and development.

The University’s current approach lies on the left-hand side of the diagram above, with focus being put on green/high performance buildings and sustainable design. The aspiration to be a carbon neutral campus by 2030 could be seen as the centre point of Figure 4.

Health and Wellbeing

Research confirms the design of our built environments influences our health and wellbeing. With people spending most of their time indoors, buildings designed with natural light, fresh air and connections to nature are crucial in creating better and more enjoyable environments. At broader scale walkable streets, safe places, recognition of culture and identity, and green spaces within a precinct influence community health and wellbeing.

As the first-mover in the redevelopment of the GMH site, the University has an opportunity and a responsibility to catalyse a vibrant, liveable precinct.

² [“Regenerative Development in a nutshell”](#), Thrive Research Hub

Green Star Communities – Liveability

The Green Star Communities tool is categorised into five impact groups. The liveability impact category assesses healthy and active living, community development, sustainable buildings, culture, heritage and identity, walkable access to amenities, access to fresh food and safe places.

“Liveability aims to encourage and recognise developments that deliver safe, accessible and culturally rich communities. The category encourages the development of healthy and active lifestyles, and rewards communities that have a high level of amenity, activity, and inclusiveness³.”

Biophilic Design

Biophilic design refers to the innate connection between humans and nature and the natural processes we can apply to improve the health and wellbeing of the spaces we work, live and study in. **Biophilic design can reduce stress, enhance creativity and clarity of thought, improve our well-being and expedite healing.** As the world population continues to urbanize, these qualities are ever more important. Theorists, research scientists and design practitioners have been working for decades to define aspects of nature that most impact our satisfaction with the built environment.

Happy and healthy people, in a vibrant and liveable community are fundamental to the success of the University.

Ongoing research by the Thrive Research Hub on the impact of plants and biophilia on wellbeing can be drawn upon and used in living lab opportunities throughout the Campus development⁴.

The design of the Shanghai Natural History Museum, shown in Figure 5, is an example of biophilic design principles. The overall shape of the building is inspired by the nautilus shell, with natural elements depicted across the building’s facades including a central wall representing the cellular structure of plants and animals. An intelligent building skin maximises daylight and minimises solar gain.



Figure 5: Biophilic design of the Shanghai Natural History Museum

Resilience

Urban resilience refers to the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kind of chronic stresses and acute shocks they may experience⁵.

We are accustomed to a high level of service from our buildings and critical infrastructure, such as utilities and transport networks, however as our climate changes and our population grows the pressures on urban systems increases resulting in increasing disruption. Our natural assets,

The development of a new campus provides a unique opportunity to pilot different approaches to the provision of infrastructure

³ GBCA Green Star – Communities Liveability Credit

⁴ “How a pot plant or five is good for you”, Pursuit, University of Melbourne, October 2017

⁵ 1 Definition from 100 Resilient Cities – Pioneered by the Rockefeller Foundation (100RC)

Goods + Services					
Climate Adaptation + Resilience					
Campus Engagement					