

# Mudgee Stage 4 Learning Resource Hub

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Bathurst, NSW, Australia

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# TAFE NSW Western Institute - Australia



- Education and training that changes lives
- 25,000 students across 24 colleges
- Face-to-face delivery is combined with RPL, online/distance learning, workplace delivery/assessment, mobile learning units to expand the range of educational options for individuals and communities
- TAFE Western Connect - “more choices in more places”
- Student Hubs – “wrap around” service provision
- Strategic commitment to leadership in sustainability

# The Mudgee Business Case

- Consolidate Ulan Rd and Court St sites
- Expand educational delivery to meet current and future industry needs
- Build cutting-edge, flexible facilities
- Align Mudgee to Student Hubs and TWC strategies
- Green Star-rated facility
- Reduced environmental footprint and operating costs
- Increased site utilisation and more strategic resource use

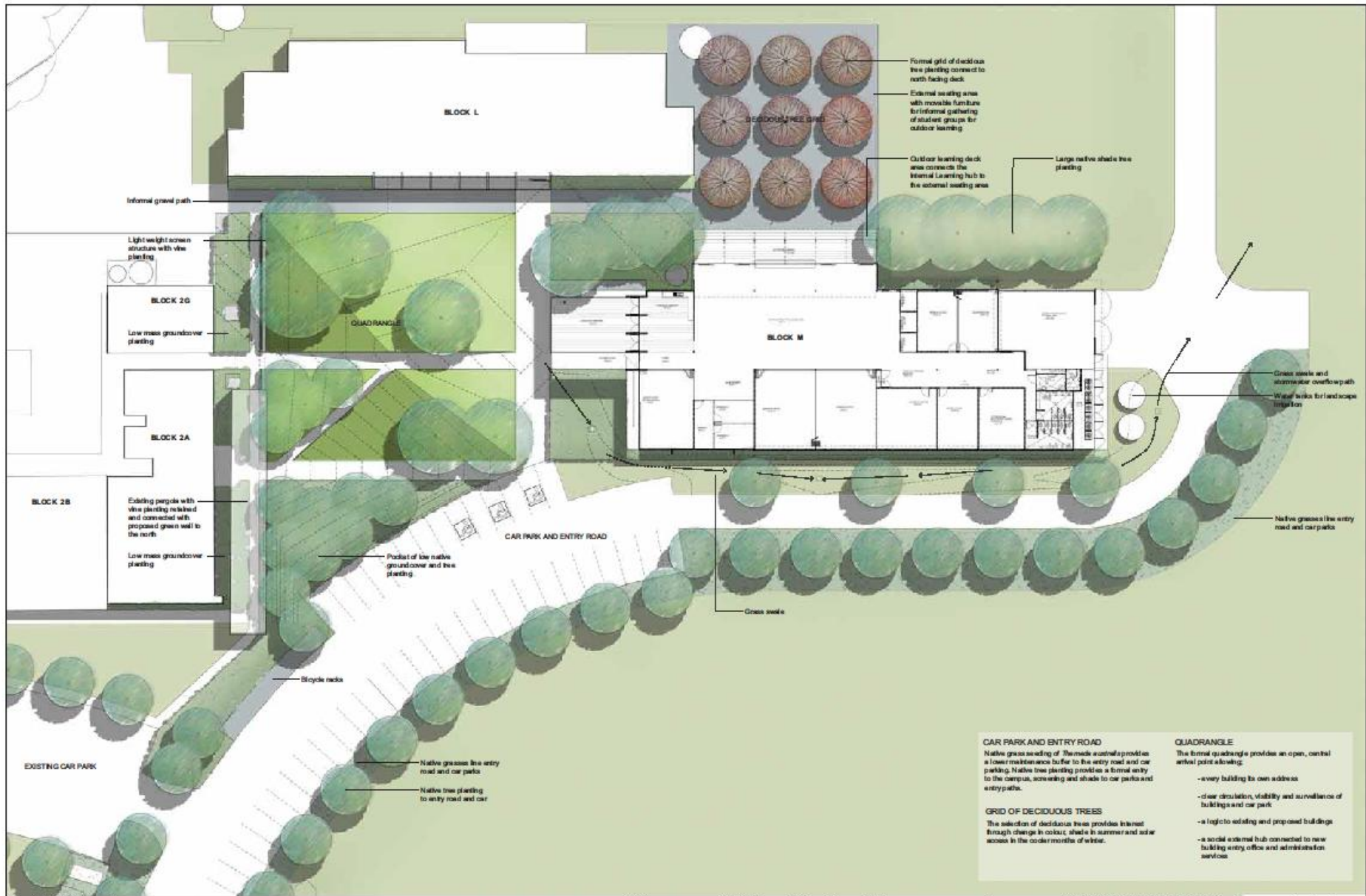
# What is Green Star?

- Green Building Council of Australia is a national NFP supported by government and industry in its mission to develop a sustainable property industry and encourage the adoption of green building practices
- Green Star is the national rating system for design and construction of sustainable buildings and fitouts
- Mudgee Green Star is focused on **design** (2 years) and **as built** (for life)
- Using the Education rating legacy tool
- 5 star = Australian excellence (4 star = best practice, 6 star = world leadership)

# Design Principles

- Lessons learned from previous projects
- Integrate mobile learning unit delivery with building learning spaces
- Space and equipment utilisation as sustainability strategy
- Intelligent building management
- Floor space is fully flexible
- Green building – 5 star GBCA rating
- Respond to issues of cultural and access sensitivity
- Stakeholder involvement
- Resource efficiency – especially energy and water
- In-built capacity for 24/7 operation
- Connect Stage 4 to the rest of the campus
- TAFE Western is the client and controls project governance
- Efficient building envelope *and* fitout including equipment/appliances





	Quadrangle surf		Low groundcover mass planting		Permeable gravel surface
	Grass		Deciduous tree planting		Native tree planting
	Native grass seeding to boundary				

DATE	DESCRIPTION	BY	CHECKED



**MUDGEE COLLEGE OF TAFE**  
**STAGE 4**  
**NEW HUB**

LANDSCAPE PLAN

DATE	BY	DESCRIPTION

**DL02**

A



## Thermal Zoning

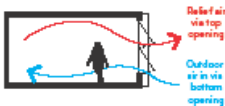
The buildings architectural concept and the ESD-strategy interleaves. As a series of spaces, process the transition between inside and outside so does the concept for the mechanical control of the human environment.

From outside through to an intermediate a buffer-zone one and to the more tightly controlled centre of the building so as to provide the optimal level of human comfort and to ensure/underline the connection and interaction with the surrounding environment.

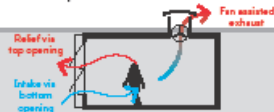
## 01 Natural ventilation

Shall be achieved via:

1) Single sided natural ventilation using high and low level openings



2) Single sided natural ventilation using high level fan assisted exhaust for computer labs.



3) Cross ventilation utilising both high and low level openings on opposing facades



## Mixed-mode ventilation

Mixed mode ventilation is proposed throughout using both natural and mechanical ventilation to condition spaces. Mixed mode ventilation would be employed in the Learning resource Centre, learning spaces and computer labs, to reduce energy consumption associated with full air-conditioning. When outdoor climate conditions are not suitable for natural ventilation, energy efficient local VRD air conditioning with heat recovery will be used.

## 02 Reduced Heat Island Effect

Maximise use of pervious surfaces, and using light colored roofs, paving, and walkways. Provide natural shading of buildings and paved areas with trees and other landscape features in reducing the buildings heat island contribution.

## 03 Opportunity for Renewable Energy

Photovoltaic Panels and cover a significant proportion of the roof area to offset grid power demands. Solar thermal to assist the electric boiler in the generation of hot water.

## 05 Daylight Optimization

Optimize building orientation, massing, shape, design, and interior colors and finishes in order to maximise the use of controlled natural day lighting.

Exclude direct sunlight and reflect diffused daylight to the occupied space below.

## 06 Facade

Automated Horizontal shading applied to the Learning Resource Centre. Shading shall be programmed to optimise solar control in summer and passive warming in winter. Large full height openings for natural ventilation, daylight and views.

## 07 Energy Efficient Appliances

### 08 Facade

- Reduced impervious surfaces
- Rainwater capture, re-use and detention
- Bio-swales and vegetated filter strips
- Vegetation

### 09 Eaves

Eaves to southern facade have been minimised to permit higher levels of natural daylight penetration.

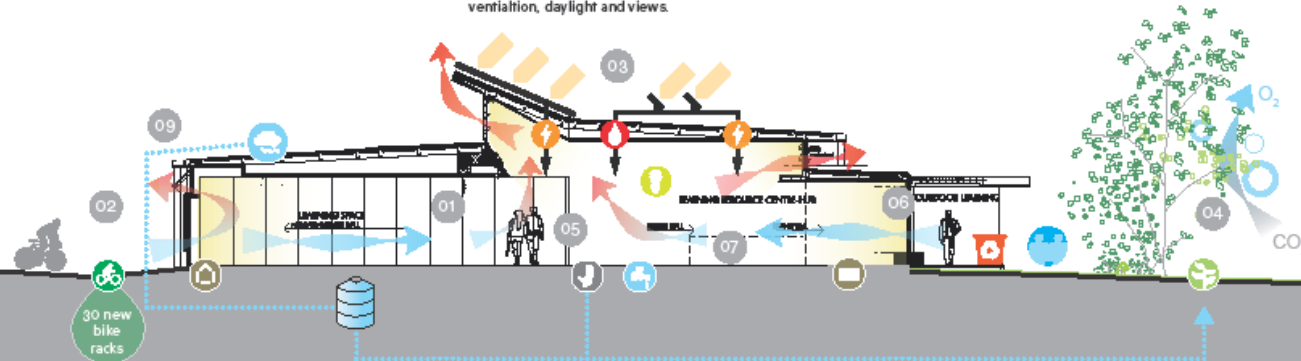
## Water Efficient Fixtures & appliances

Reduction in potable water consumption by using efficient water fixtures and appliances.

## High Performance Building Envelope

Minimises heat gain and heat loss. Measures include:

- High levels of insulation
- Single/double performance glazing
- Reduced infiltration
- External shading



## 04 Bio-filtration

Landscaping provides passive filtration and removal of air contaminants through absorption of CO<sub>2</sub> and release of O<sub>2</sub>.

Incoming outside air for ventilation would be drawn in through landscaping for better indoor air quality and reduce contaminants from traffic exhaust and air based pollutants.

## Central Waste Storage

A dedicated waste storage area for collection is provided in the COLA to the east. Vehicular apron space to the east will be used to separate waste streams and recyclables.

## Bicycle Storage and Facilities

Promote a modal shift towards alternative transport and encourage a healthy lifestyle. Bicycle storage to be secure and well lit. New shower and change room facilities will be provided within the building. The new facilities and existing facilities within block L to serve the whole campus.

## Outdoor Communal Spaces

Outdoor sheltered spaces and roof terraces enable occupants to engage in a broad range of outdoor activities in common areas.

## Energy Efficient Lighting, Controls & Appliances

Installation of energy efficient lighting and appliances as part of the base building works with optimized control. The building design seeks to optimise natural daylight supported by high efficiency artificial lighting.

## Rainwater Storage

Rainwater collection and storage shall be incorporated to reduce the sites potable water consumption. Rainwater shall be used for irrigation, toilet flushing and rain water detention.

## Building Users Guide

A Building User Guide provides clear and simple information about the building's sustainable initiatives, and instructions for building systems which help to reduce resource use (i.e. energy, water etc.) Through instructing occupants on how to use the building in the most efficient manner.

## Landscape

Utilise native plant species with low water requirements and promote local biodiversity. The Central lawn quadrangle will be irrigated using rainwater on a timer (irrigated during the evening)

## Environmentally preferable materials

Preference is given to materials that are non-toxic, contain high-recycled content and/or highly recyclable such as:

- Low VOC finishes for paints, adhesives and sealants, floor products and furniture.
- Low formaldehyde products & furniture
- Sustainable Timber such as INNOWOOD
- Rapidly Renewable Materials
- Concrete with recycled content such as crushed aggregate or flyash to reduce the amount of portland cement.

## Thermal Mass

The floor finish in close proximity to the glazed facade will be of an exposed mass arrangement. The exposed mass will assist in providing passive heating by capturing and re-radiating the sun's energy in winter.



STEENSEN VARMING

Government Architect's Office

MUDGEE TAFE STAGE 4

# Achievements and Lessons Learned

- January 2015 – GBCA confirms Mudgee Stage 4 5 Star Green Star Education design v1 certified rating
- Australian Excellence in sustainable building design
- The first certification of its kind for a TAFE NSW building
- Full integration of educational delivery, service provision and sustainable practice in building design
- It is critical to:
  - Consult building occupants early and often
  - Conduct early design concept testing and modelling
  - Ensure client control of project governance