

Gap Bluff  
ESD Report  
May 2015

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H I J K L M N  
O P Q R S T U  
V W X Y Z

# Executive Summary

This report identifies the key criteria for delivering the proposed refurbishment and redevelopment function and accommodation project at Gap Bluff with a high quality sustainability outcome. The report identifies key objectives and strategies for the project across the key sustainability areas of:

- Passive design
- Materials use and embodied energy
- Energy use
- Water use
- Waste management and recycling
- Sustainability during construction
- Promotion and education activities

The intent of this report is to firmly establish the desired outcomes in each of the identified strategies so that through the final design resolution process, the design can be optimised, appropriate materials, fixtures and furnishings can be selected and contractors can be procured with the necessary requirements with respect to sustainability.

The key aim in developing the projects sustainability strategy is to maximise the environmental benefits of the existing heritage facilities, minimise reliance on additional mechanical systems, deliver low energy and water conservation strategies as well as create healthy and comfortable rooms. Through construction it is intended that the project ensure minimal disturbance on the environment within and surrounding the site and waste to landfill is minimised through explicit recycling targets.

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# Introduction

This report has been developed to identify and assess the sustainability opportunities for the refurbishment and redevelopment of the Gap Bluff facilities located at South Head on Sydney Harbour. The project involves the refurbishment of a number of exiting cottages and other buildings on the site to provide accommodation and function spaces. Heritage and integration within the natural environment are key considerations for the project.

Key elements of the Gap Bluff project include:

- Gap Bluff Precinct
  - o Officers Mess – Continued use as a function/reception venue
  - o Armoury – Continued use as a function/reception venue
  - o Gap Bluff Cottage – New use as short stay accommodation
- Camp Cove Precinct
  - o Constables Cottage – New use as a café/restaurant.
  - o 33 Cliff St – New use as short stay accommodation
  - o Green Point Cottage – Continued use as short stay accommodation

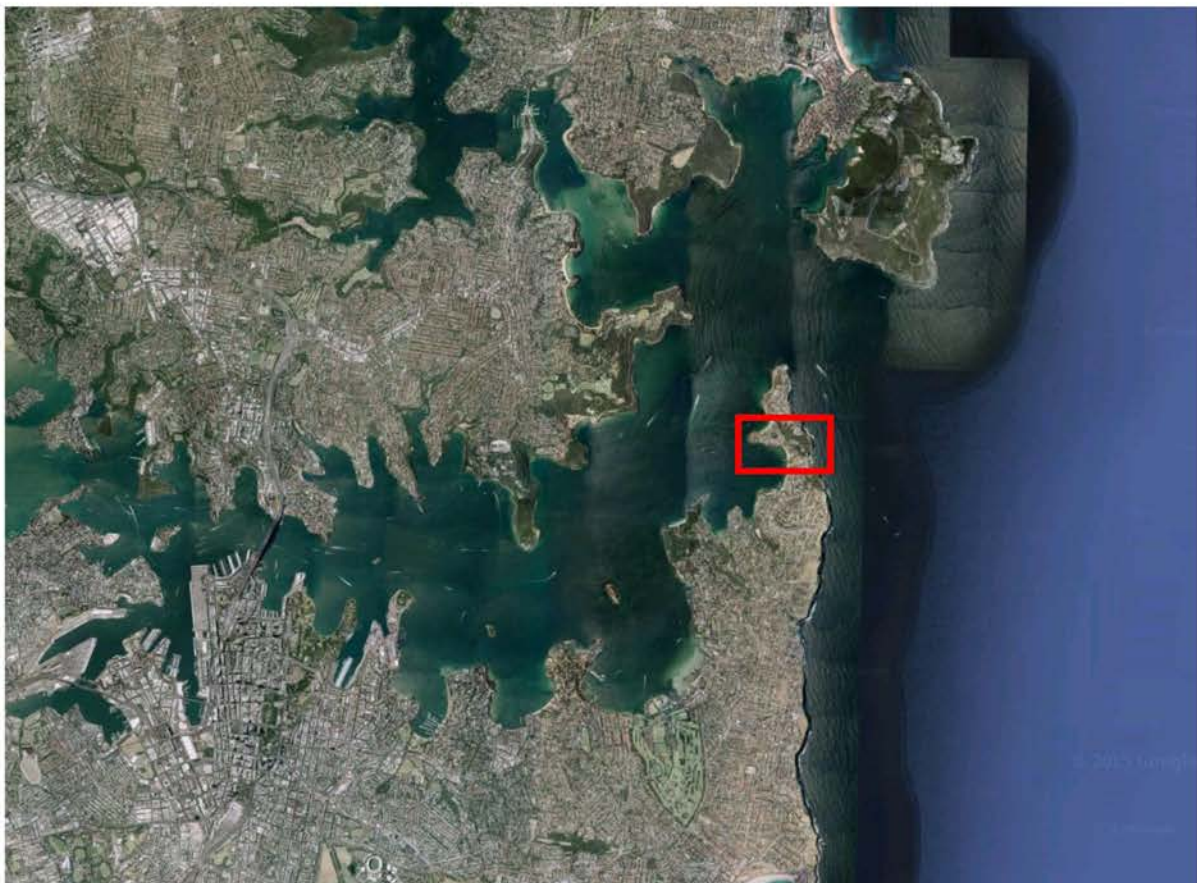


Figure 1 Project Location



Figure 2 - Building Locations

From a sustainability perspective, implementation of strategies shall be focussed on 2 key areas, minimising the impact of the new uses of the site on the existing surrounds and delivering efficiently operating buildings.

It is noted that there is no directly relevant environmental rating scheme that would apply to this style of development with respect to building design. BASIX and NABERS are also not applicable. In developing this report it has been assumed that the provisions of Part J of the NCC have been exempted for the retained heritage elements. It has been assumed that all new elements of the envelope and any new services will meet the DTS provision of Part J of the NCC, subject to direction from the building certifier.

This report considers:

- Passive design including:
  - o Solar access and ventilation
  - o Thermal mass where appropriate
  - o Passive heating and cooling and moisture control
- Materials use and embodied energy
- Energy use
- Water use
- Waste management and recycling
- Sustainability during construction
- Promotion and education activities

For each of the buildings key performance targets and possible strategies have been identified to deliver the targets. Final design analysis and optimisation will be performed on the final tender documentation to ensure the targeted outcomes will be achieved and high performance outcomes are delivered.

# Passive Design

## Objective

The key objective employed in developing the passive design strategy for the site is to minimise reliance on mechanical heating and cooling systems for comfort as well as artificial lighting. In considering the passive design opportunities it is important to consider the possible usage scenarios of the space. For the Gap Bluff development the event mode is an important element in addition to normal operation and set-up/packdown times. During event mode the spaces may be subjected to very high occupancy rates as well as increased electrical demands as a result of AV and other similar equipment.

As the project includes a significant heritage component, many of the building will have been designed originally without the benefits of mechanical comfort systems and will include significant passive design within the existing building. As part of the heritage component of the project the buildings will be reviewed to identify any passive design features originally implemented within the designs with the intent to preserve or reinstate these features where possible.

## Strategies

- For normal operation the goal is to naturally ventilate as many spaces as possible for the majority of the year. The most effective strategy will be to provide cross ventilation. Spaces that are affected by events and/or require acoustic isolation will be designed to be closed and mechanically ventilated. Spaces where guests require comfort in all conditions will be provided with a manually controlled AC system with lockout functions linked to the windows.
- Natural ventilation will be enhanced with effective design of shading and windows to encourage sun penetration in winter and protect the spaces in summer. Where possible this effect will be further enhanced through selection of appropriate floor coverings.
- Where the existing buildings are thermally massive, the potential benefits will be harnessed to provide the most comfortable and efficient outcome possible. This effect will significantly stabilise the internal temperatures making the spaces cooler during the day and warmer at night. Passive design strategies will be used to maximise the benefit of this and, where necessary control strategies will be implemented for mechanical systems to help maintain the stability in temperature during more extreme conditions. Specifically in winter the design will focus on ensuring spaces do not lose heat and become cold for extended periods of time. Appropriate system selection will be critical and may include heating with a radiant component such as hydronic radiators or in slab heating.
- The heritage cottages are a lightweight construction. The cottages used for short stay accommodation shall be designed to provide optimal quick thermal response in line with their anticipated occupancy (i.e primarily overnight). This approach will help avoid the potential energy penalty of maintaining the temperature of the internal thermal mass whilst the space is unoccupied. The Constables cottage will focus on maximising natural ventilation and breeze through the space.
- Daylight penetration will be promoted through the use of clear glazing where possible with blinds to protect from glare and excess radiant heat where necessary.



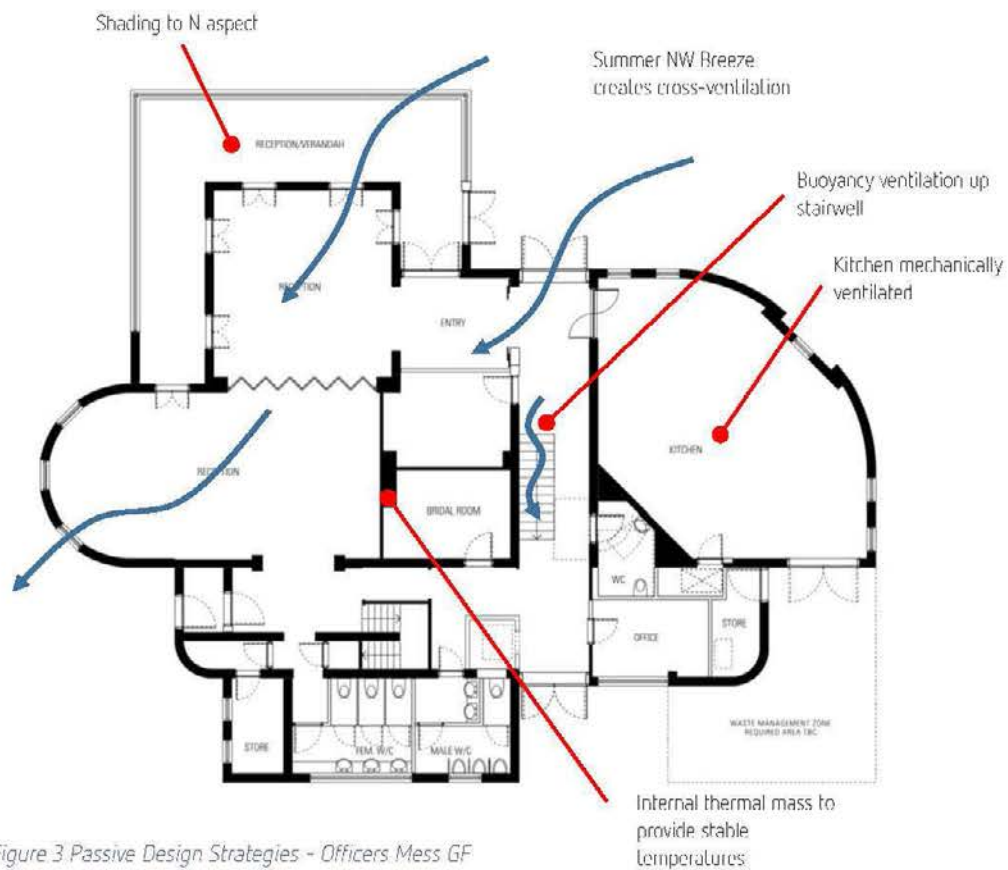


Figure 3 Passive Design Strategies - Officers Mess GF

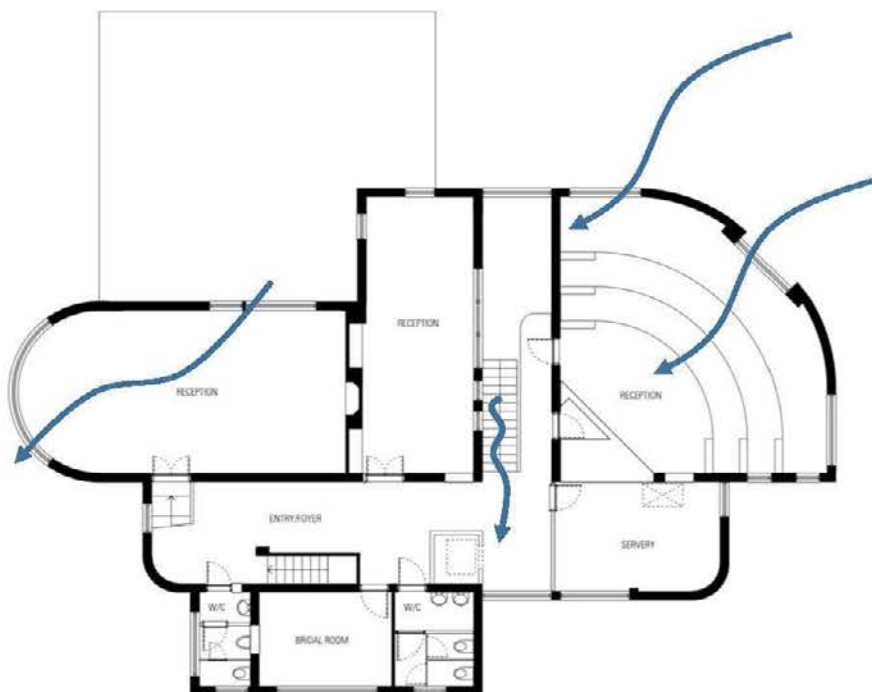


Figure 4 Passive Design Strategies - Officers Mess L1

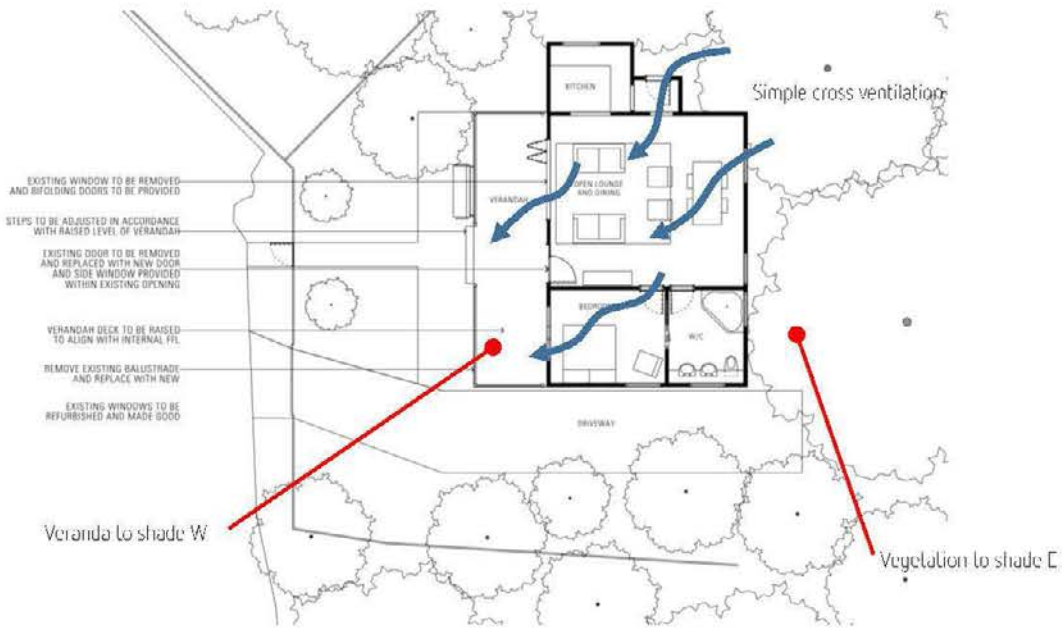


Figure 5 Passive Design Strategies - Gap Bluff

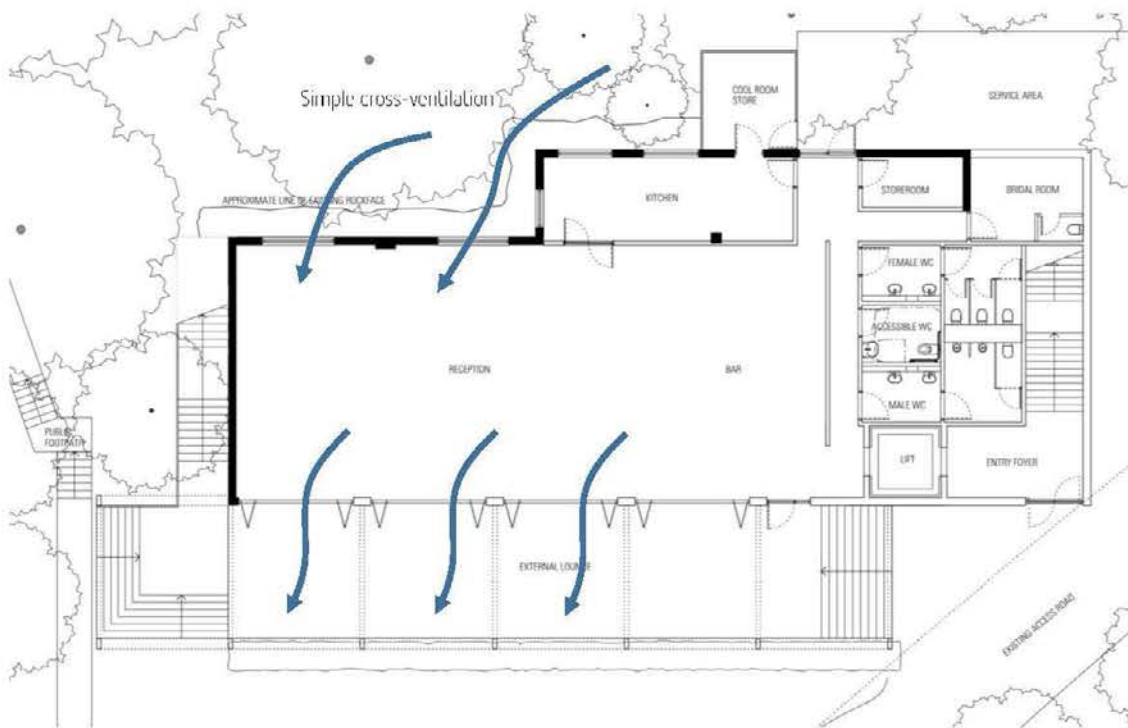


Figure 6 Passive Design Strategies - Armoury GF



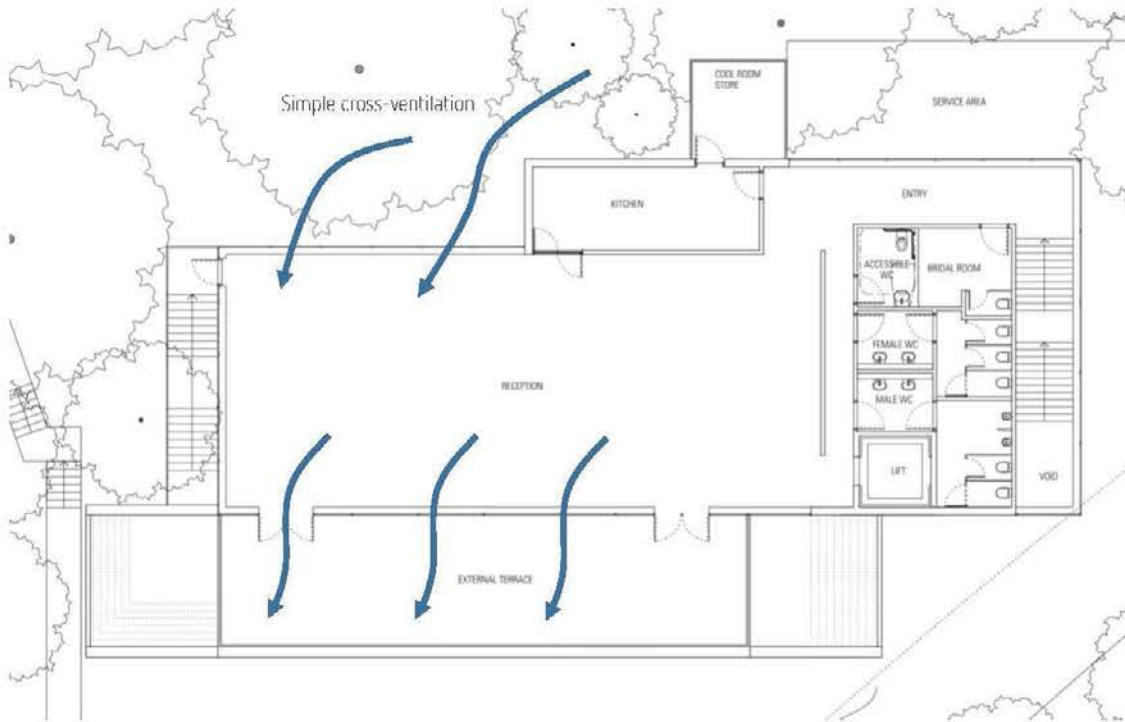


Figure 7 Passive Design Strategies - Armoury L1

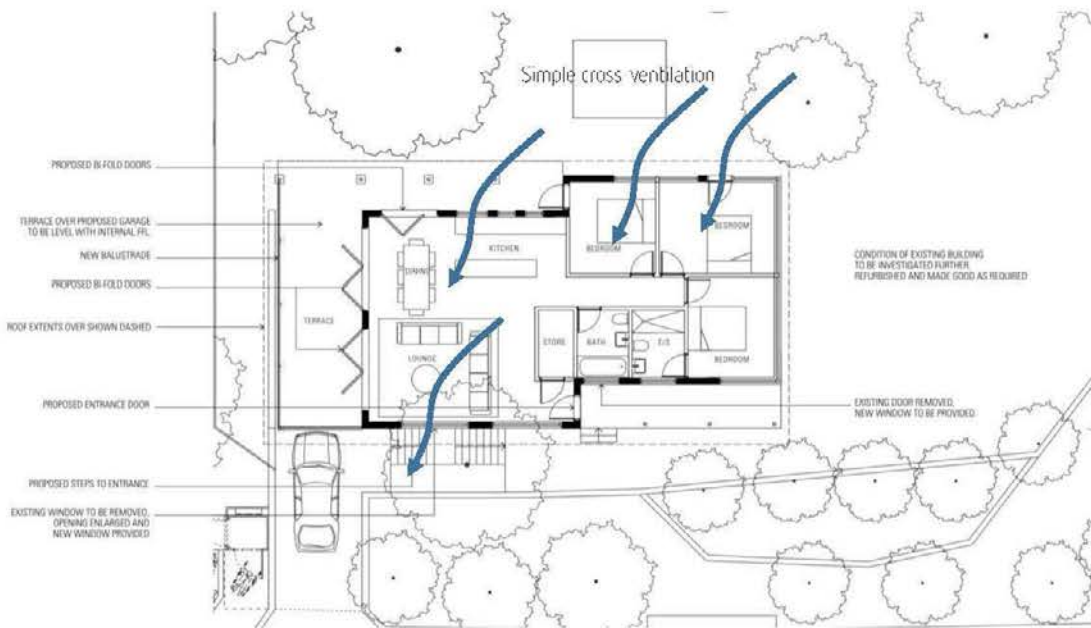


Figure 8 Passive Design Strategies - 33 Cliff St

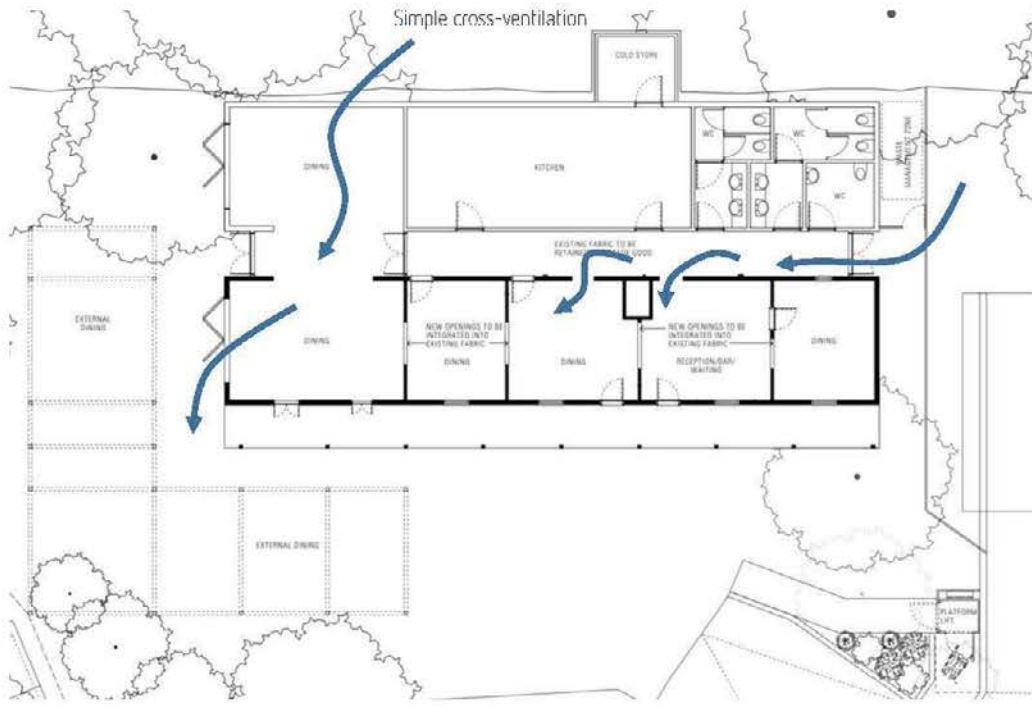


Figure 9 Passive Design Strategies - Constables Cottage

# Materials Use and Embodied Energy

## Objective

The Gap Bluff development represents a significant adaptive reuse project and provides significant preservation of the heritage buildings existing on site. This already delivers a significant environmental benefit for the project. Selection of new materials will be prioritised to help create healthy rooms and event spaces through the selection of low VOC sealants, adhesives and paints, low/zero formaldehyde composite wood products. Low environmental impact products including reused or FSC certified timber and high recycled content materials will also be prioritised. Floor finishes and furnishings will be selected from GECA certified (or similar) product lists where available.

## Strategies

- Reuse of existing heritage buildings
- Low VOC products
- Low/zero formaldehyde composite timbers
- FSC certified timber where a FSC certified product exists
- GECA certified furnishings and floor coverings

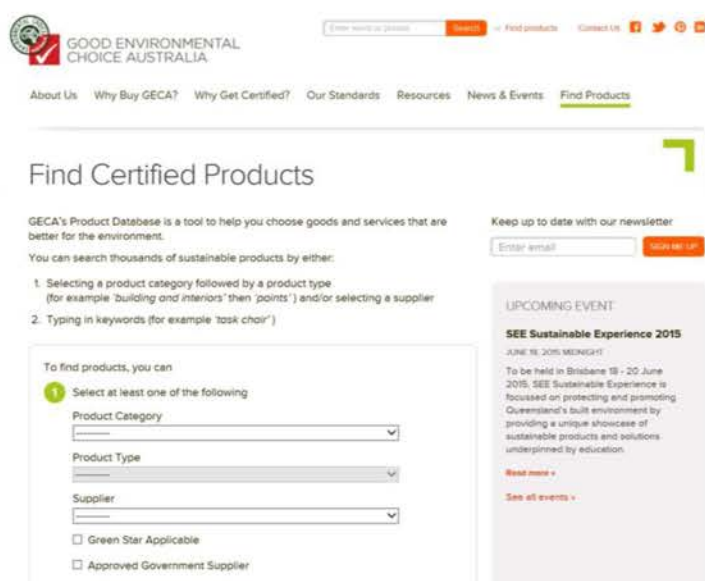


Figure 10 - GECA will be used for Furnishing Selections



Figure 11 - FSC Timber will be selected where available

# Energy Use

## Objective

Energy and the resultant carbon emissions for the project are expected to be the most significant environmental impact of the project. Energy consumption will primarily be attributable to key demands of:

- Permanently installed equipment
- Heating, cooling and ventilation systems
- Lighting
- Rooms

The key objective is to minimise demand in the first instance, select efficient equipment where possible and ensure effective demand management strategies are in place to ensure energy use in unoccupied spaces is eliminated.

## Strategies

- Select star rated equipment where possible within 0.5 stars of best available.
- Select high efficiency HVAC equipment.
- Implement occupancy controls within rooms and other temporarily occupied back of house spaces.
- Use LED lighting in external spaces and in lieu of halogen lights within rooms.
- Energy optimisation and targets will be established during the design finalisation phase of the project to enable ongoing effective management of the facility.

# Water Use

## Objective

The main water uses within the site during operation is expected to be bathrooms and kitchens. These spaces will be fitted with low flow fitting and fixtures generally rated by WELS to be within 0.5 stars of best available. Commercial kitchen equipment will be selected where possible to be star rated to within 0.5 stars of best available. Where suitable star rated commercial equipment isn't available, equipment will be benchmarked against market best practice to help ensure a low water use outcome is delivered. Landscaping will be selected with low water use plants and Water Sensitive Urban Design (WSUD) will be used to both treat any stormwater emissions from site and ensure natural rainfall is sufficient for normal water demands of the plants. As rooftop areas are minimal and very distributed rainwater collection for irrigation is intended to not be required to achieve a low water use outcome.

## Strategies

- Low flow WELS rated fittings and fixtures
- WELS rated appliances and equipment where available
- Best practice commercial kitchen equipment
- Low water demand plants and landscape design
- WSUD design to help deliver water requirements of the landscape and treat stormwater emissions.



Figure 12 - Low flow WELS rated products will be selected

# Waste Management and Recycling

## Objective

Waste management and recycling impacts both the construction and operation phase of the project. During construction a dedicated waste collection point(s) will be allocated with sufficient space to permit on site separation of waste into key waste streams appropriate to the works currently being undertaken. A waste contractor will be procured for construction with a minimum 80% recycling target. Dedicated bin requirements on-site will be established in consultation with the contractor to achieve this outcome in line with the specific works scheduled and projected waste streams. During operation it is intended that the key waste streams of organics, paper, packaging (bottles, glass, cans) and other non-recyclable waste be separated at the point of disposal. Generally rooms will be provided with dedicated paper and packaging bins. Kitchens will have organic collection points. On-site storage facility requirements for waste will be negotiated with the operational waste management provider in line with the agreed collection frequencies.

## Strategies

- Minimum recycling target will be required to be achieved by the waste contractor (80%)
- On site waste collection point during construction with space for dedicated waste separation on-site.
- Operational waste separation at point of disposal for recyclables.
- Implement the Waste Management Plan requirements identified in the Waste Report.
- Organic waste collection in kitchens.



# Sustainability During Construction

## Objective

Protection of the natural environment within and surrounding the site during construction activities is a key consideration for the project. The key impacts that have been identified include erosion and sedimentation impacts during construction, dust emissions into the atmosphere, dirt transfer on vehicle tyres and impacts on local vegetation and fauna. It is intended that the project be delivered using low impact strategies to ensure these potential impacts are proactively managed and mitigated. The project contractor will be required to deliver a comprehensive site Environmental Management Plan prior to the commencement of works that meets the best practice standards within Section 4 of the NSW Environmental Management System guidelines.

## Strategies

On-site waste will be collected in a dedicated screened area to help prevent atmospheric and waterborne emissions.

Site entry and exit points will be provided with suitable cleaning facilities to prevent transport of soils onto and off of the site.

Contaminant audits will be performed on all areas subject to demolition and any contaminants found will be safely contained and removed from site using a dedicated process.

Any through site stormwater flows and on site drains will be protected from sedimentation and contaminants for the duration of construction.

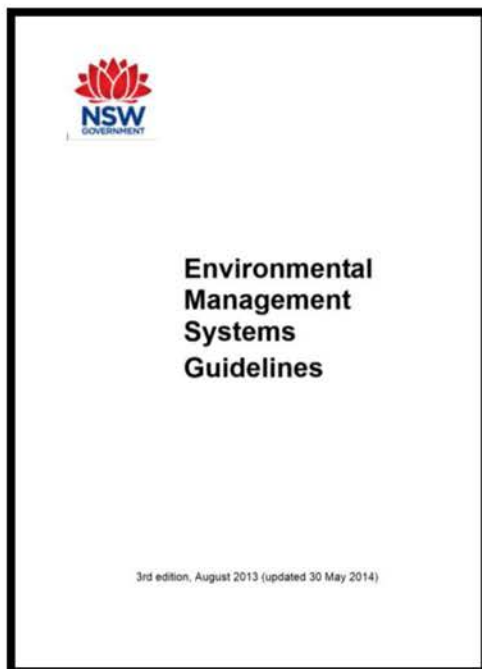


Figure 13 NSW EMS Guidelines

# Promotion and Education Activities

## Objective

The project will showcase and demonstrate the sustainability features of the project to staff, visitors and guests. It is intended that the sustainability features of the project will help create a different experience.

## Strategies

A room manual will help guests understand the sustainability feature within the room and how to best use the feature to achieve the best possible comfort and lowest environmental footprint. Information boards will identify key sustainability elements. A sustainable operations manual will be used to train staff with respect to management and operations of the sustainability features and assist in performance monitoring and communication of design intent. The operations manual will deal with waste, cleaning, monitoring, system control as well and key features to communicate to staff and visitors.