New Berrima Brickworks Facility

416-524 Berrima Road, Moss Vale NSW

Ecological Sustainable Development Report

Prepared for: The Austral Brick Co Pty Ltd

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Date: 3 March 2020

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Revision

Revision	Date	Comment	Prepared By	Approved By
1	28/02/2020	For Review	JAL	ALK
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Contents

1. Executive Summary

This Ecological Sustainable Development Report has been prepared on behalf of Austral Brick for the proposed new brick factory to be located at 416-524 Berrima Road, Moss Vale NSW (Lot 1, DP 785111). In response to the Secretary's Environmental Assessment Requirements (SEARs), the report provides an overview of the proposed Ecologically Sustainable Development (ESD) principles and sustainability initiatives to be included within the project forming part of the Environmental Impact Statement (EIS).

The report forms a direct design response to the ESD component of the Secretary's Environmental Assessment Requirements (SEARs) SSD-10422, and NSW Environmental Planning and Assessment Regulation 2000, as required by the NSW Environmental Planning and Assessment Act 1979 No 203.

This report includes:

- An overview of the sustainability drivers for the project
- Detail regarding specific ESD initiatives through all phases of the project; and
- Identifies initiatives that minimise the consumption of resources, water (including water sensitive urban design) and energy.

Information contained within this report has been prepared in direct response to the:

- Secretary's Environmental Assessment Requirements;
- NSW Environmental Planning and Assessment Act 1979;
- NSW Environmental Planning and Assessment Regulation 2000; and
- Wingecarrebee Development Control Plan 2010 (as amended);

In coordination with the above, the project will implement a number of sustainable design principles and includes initiatives designed to mitigate the environmental impact of the following:

- Greenhouse Gas, including:
    - A quantitative assessment of the potential Scope 1 and 2 greenhouse gas emissions of the development, and a qualitative assessment of the potential impacts of these emissions on the environment; and
    - A detailed description of the measures that would be implemented on site to ensure that the development is energy efficient.
- Water Efficiency – including reduced potable water demand and improved storm water quality.
- Materiality – considering the whole of life impact of materials and considering their retention and selection to minimise harm to the environment, including efficiency and construction.

The following sections detail the development's specific sustainable design response in more detail.

2. Introduction

The proposed development consists of the construction of a new purpose-built brick manufacturing plant located on the site 416-524 Berrima Road, Moss Vale NSW (Lot 1, DP 785111). The property is located in the Moss Vale Enterprise Zone and owned by Austral Brick.

The project includes the following detailed elements:

- New factory building with amenities of approximately 25,600m2;
- Raw materials shed (approx. 4,800m2) including drive over bins and raw materials bunkers;
- Laboratory of 50m2;
- Yard storage of 32,000m2;
- Export Yard and Container Area of 6,000m2;
- Operational office facility (for up to 10 staff); and
- On-site car park.

2.1 Site Location

The proposed development site is located at 416 Berrima Road, Moss Vale NSW (Lot 1 DP785111) and located within the Moss Vale Enterprise Zone. Access to the plant will be from an existing entrance from Berrima Road, the raw materials deliveries are proposed to use the quarry road, which is part of the Mandurama property.

Figure 1: Proposed development site. Source: SBA Architects

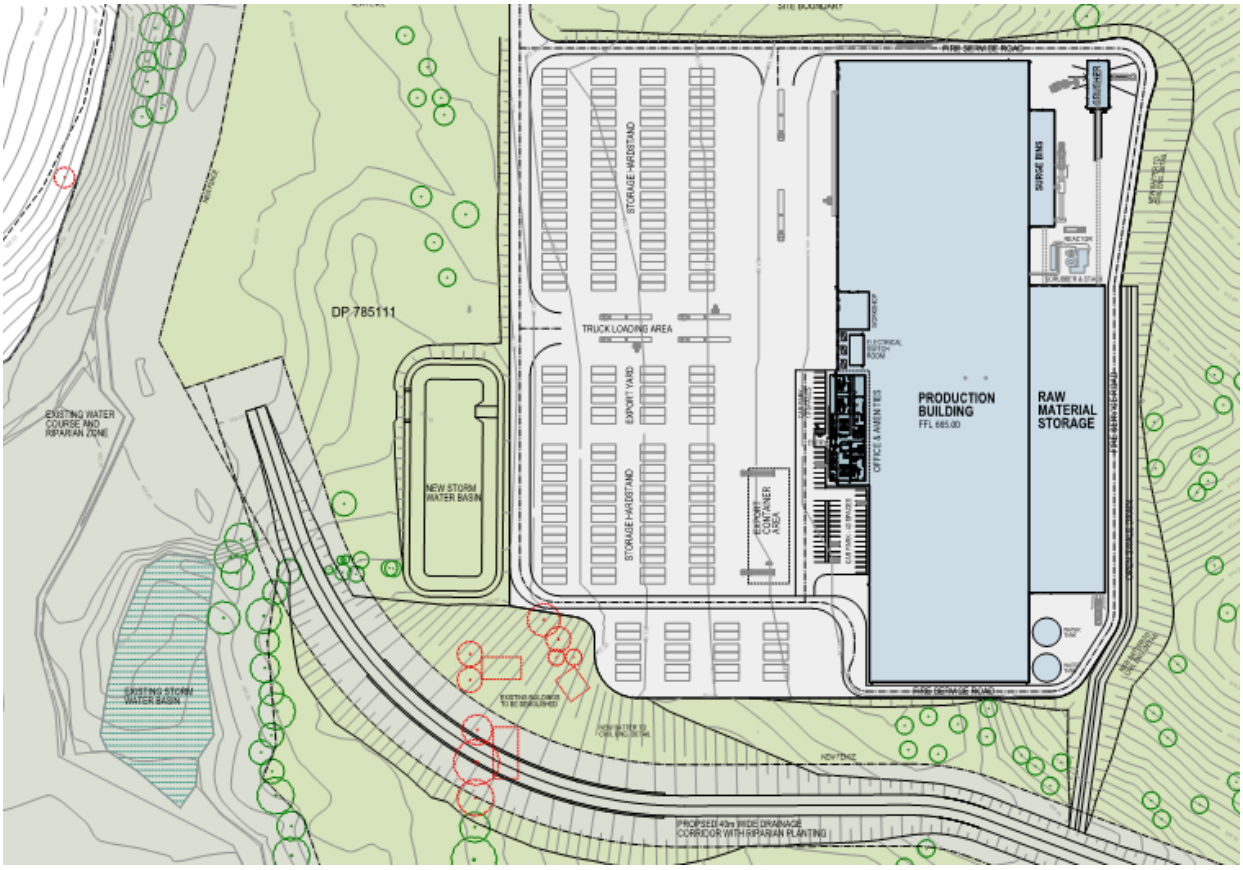


Figure 2: Proposed Plant Location. Source: SBA Architects

It is proposed to locate the new masonry plant at the north-western corner of the site. The proposed location maintains appropriate separation from other parts of the site by a large riparian and flood zone that traverses the middle of the property. Access to the site for operational purposes will be via the existing Quarry Road located at the top of the image above.

2.2 Sustainable Design Framework

ESD excellence is demonstrated, being benchmarked from a number of sources.

These include best practice design initiatives from:

- Secretary's Environmental Assessment Requirements;
- Section 4.12(8) NSW Environmental Planning and Assessment Act 1979;
- Section 2 of the NSW Environmental Planning and Assessment Regulation 2000; and
- Wingecarrebee Development Control Plan 2010 (as amended).

This report addresses the ESD and efficiency aspects in response to the Key Issue within the SEARS regarding *Greenhouse Gas*, which states:

- **Greenhouse Gas** – including:
    - A quantitative assessment of the potential Scope 1 and 2 greenhouse gas emissions of the development, and a qualitative assessment of the potential impacts of these emissions on the environment; and
    - a detailed description of the measures that would be implemented on site to ensure that the development is energy efficient.

Further to the above, the report also addresses the Wingecarrebee DCP (2010, as amended), Section 3.0 – Ecological Sustainable Development – Section 3.2 Development on land within the Urban Ecological Setting, including objectives and Controls.

In response, this report utilises best practice sustainable design principals and borrows elements from external sustainability assessment tools deemed to be in-line with accepted industry best practice standards.

2.3 Environmental Planning and Assessment Regulation 2000

The SEARs response outlines requirements for this development that must be addressed as part of the Environmental Impact Statement. These are:

Detail how **ESD principles** (as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2000) will be incorporated in the design and ongoing operation phases of the development.

Schedule 2 7(4) of the Environmental Planning and Assessment Regulation 2000 states:

"The principles of ecologically sustainable development are as follows:

a) the precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:
  i. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and
  ii. an assessment of the risk-weighted consequences of various options,

b) inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,

c) conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,

d) improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:
  i. polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
  ii. (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
  iii. (iii) environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems."

2.4 Wingecarrebee Development Control Plan (DCP) 2010

Wingecarrebee Shire Council has a specific DCP developed in 2010 (as amended) with aim of addressing ESD & sustainability more broadly within the precinct. The ESD requirements identified within the DCP include:

Objectives:

The objectives for the development of land classified as being part of an urban ecological setting are:

- to that ensure that there is no net loss of riparian condition, remnant vegetation, biodiversity values, wetland values, wildlife habitat or stormwater quality; and
- to ensure the protection of vegetation, threatened species or ecological communities, hydrological aspects, watercourses or significant natural feature, and any other aspect of environmental quality.

Controls:

Council may consent to the carrying out of development on land classified as being part of the urban ecological setting, only if it is satisfied that the development is consistent with these objectives and that adequate provision has been made for:

- the appropriate management of the impacts of the development and ongoing land management of natural ecosystems and ecological processes occurring on the land, and on any other land,
- practicable incorporation of the principles of ecologically sustainable development into the development;
- the preparation and implementation of a programme for the rehabilitation of land that has suffered environmental degradation.

2.5 NCC Section J – Energy Efficiency

Further to ESD frameworks identified above, applicable elements of the development will also be subject to compliance with the minimum energy efficiency provisions as identified within the National Construction Code (NCC) – Section J – Energy Efficiency provisions.

The following sub-sections are applicable:

- Part J1 – Building Fabric (*as applicable*)
- Part J2 - No longer used
- Part J3 – Building Sealing (*as applicable*)
- Part J4 – No longer used
- Part J5 – Air-Conditioning & Ventilation Systems (*as applicable*)
- Part J6 – Artificial Lighting & Power
- Part J7 – Hot Water Supply; and
- Part J8 – Access for Maintenance & Facilities for Monitoring

3. Energy Analysis

3.1 Office Design

The office has been quantitatively analysed for a number of different design elements and configurations to ensure energy efficiency. These elements include:

- Shading across glazing
- Zoned mechanical systems (center/perimeter)
- Wider temperature control band
- Increased mechanical equipment performance
- Increased lighting efficiency
- Combining the above elements.

The models below are representative of a component of the western façade only and are not to scale.

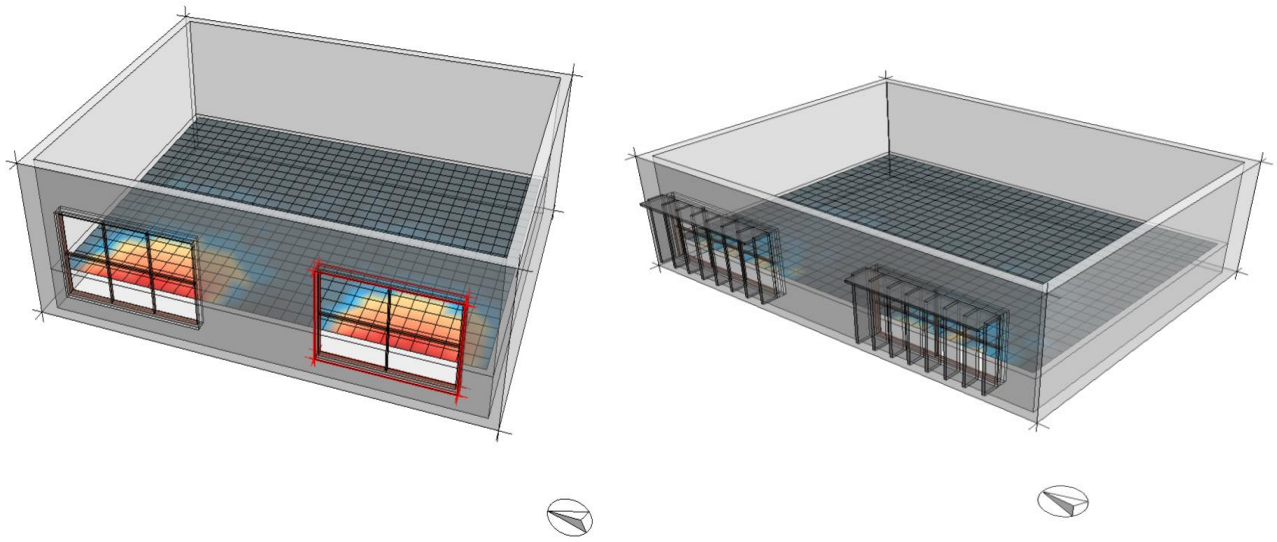


Figure 1 Simplified model of the office – with and without window protection. (warehouse not shown)

Figure 3 Shading solution for the Office Western Façade

3.1.1 Description of inputs

The office has a base line model that begins with the following baseline assumptions. These have been chosen to describe a typical office construction that meets typical requirements:

	Insulation	Glazing Performance	Window Height	Heating COP	Cooling COP	Internal Loads	Density
Base Case	BCA Deemed to Satisfy requirements	U-Value = 4.0 SHGC = 0.5	2.7m	3 (standard air conditioning cooling)	3 (standard air conditioning cooling)	10W/m2 equipment 6W/m2 lighting	1person/ 15m2

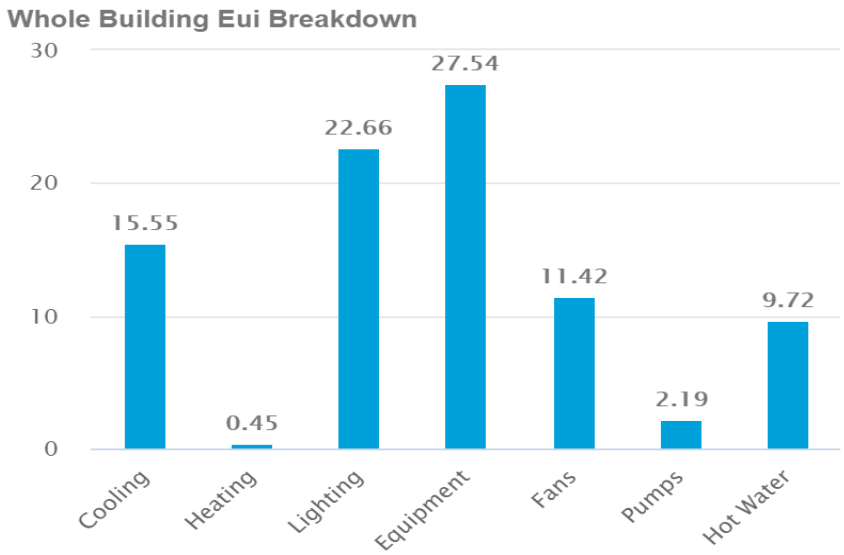
A number of models have been developed to investigate the effects of changing a number of the design elements. The office to the largest warehouse has been modelled as it is believed this will be the most representative.

Case	Description
Baseline	Business as usual, in line with the BCA and standard operational procedures
Improved Mechanical Systems	Modelling a mechanical system that exceeds typical performances. This would include replacing the boiler and air conditioning system with an efficient DX reverse cycle cooling method (i.e. VRV).
Zoned Mechanical Systems	Splitting the floorplate into a perimeter/centre zone typically improves the performance as façade loads are captured in a smaller area. This is not always the case in small floor plates.
Shading across Glazing.	Improving the cooling performance through the introduction of glazing shades.
Temperature Control Band	Increasing the temperature control band from 21-24degC to 19-26degC.
Increased Lighting Efficiency	Reducing the glazing below the BCA maximum, from 6W/m2 to 4W/m2. 4W/m2 is representative of a very low energy office.
Combined elements	Combining the above initiatives

3.1.2 Results

Through the analysis, the following savings have been estimated as possible for the office:

Case	Annual Energy Consumption (kWh/m2)	% of baseline
Baseline Concept	127.3	100%
Improved Mechanical Systems	97.7	77%
Zoned Mechanical Systems	122.4	96%
Glazing Shades	119.8	94%
Wider Temperature Band	124.4	97%
Reduced Lighting	122.6	96%
Combined version	81.0	63%

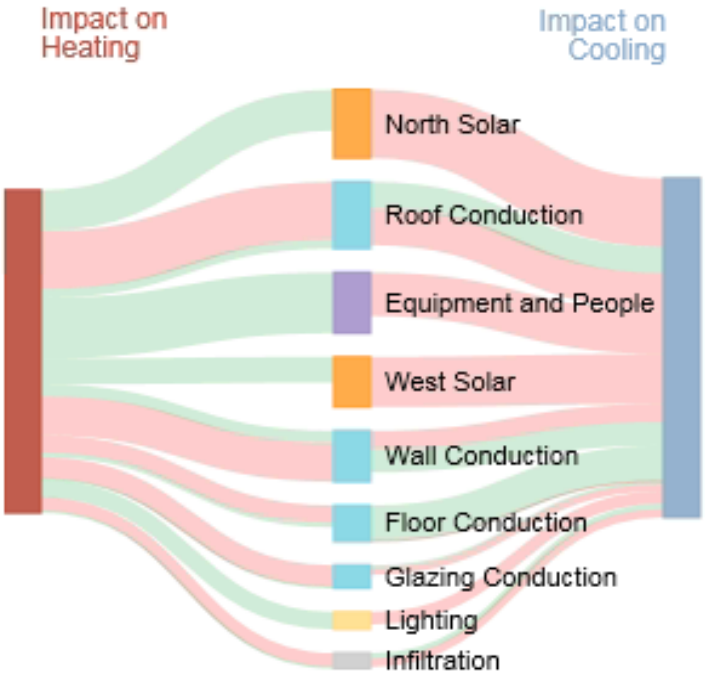


Combining all the above elements reduces the energy consumption of the building from the base case by 44%. Controlling for appliances which are required for functional reasons, the savings are 56% of the baseline case.

3.1.3 Analysis

It can be seen that by making a number of improvements, the building's energy load is drastically reduced.

The below infographic demonstrates the influence on heating and cooling loads for the base line case. It demonstrates that the primary loads are attributable to internal loads (equipment, people and lighting), followed secondly by conduction then solar loads.



The reduction of lighting power can be complemented with motion detectors, daylight sensors and time clocks. This will further reduce the direct energy consumption of the site. For functional reasons, loads from equipment and people are not controlled.

3.2 Warehouse Design

The warehouses contribute to the vast majority of the total building area and as such are responsible for the significant component of energy consumption within the site. A number of initiatives have been proposed to reduce the greenhouse gas emissions and environmental damage associated with the warehouse component on the development. These include:

- Natural ventilation of the warehouses.
- Roof ventilators are proposed to provide effective air changes to the space. This reduces the buildup of heat in the space and encourages air circulation. This also helps control humidity in the space, reducing concerns of mould in the space.
- Encouraging natural lighting where possible, through the use of translucent roof materials, targeting 10% across the warehouse roofing components.
- Rainwater harvesting and reuse
- Lighting controls including zoned switching, motion sensors and/or time clocks.

By providing an unconditioned space with natural ventilation, the key energy sources are lighting and plug loads. Plug loads are required for the function of the space and cannot be reduced. Lighting load can be reduced by 30% or even

further by the introduction of zoned switching, time clocks and/or motion sensors. As such, this provides an energy efficient solution to the warehouse component of the development.

3.3 Energy Consumption Estimation

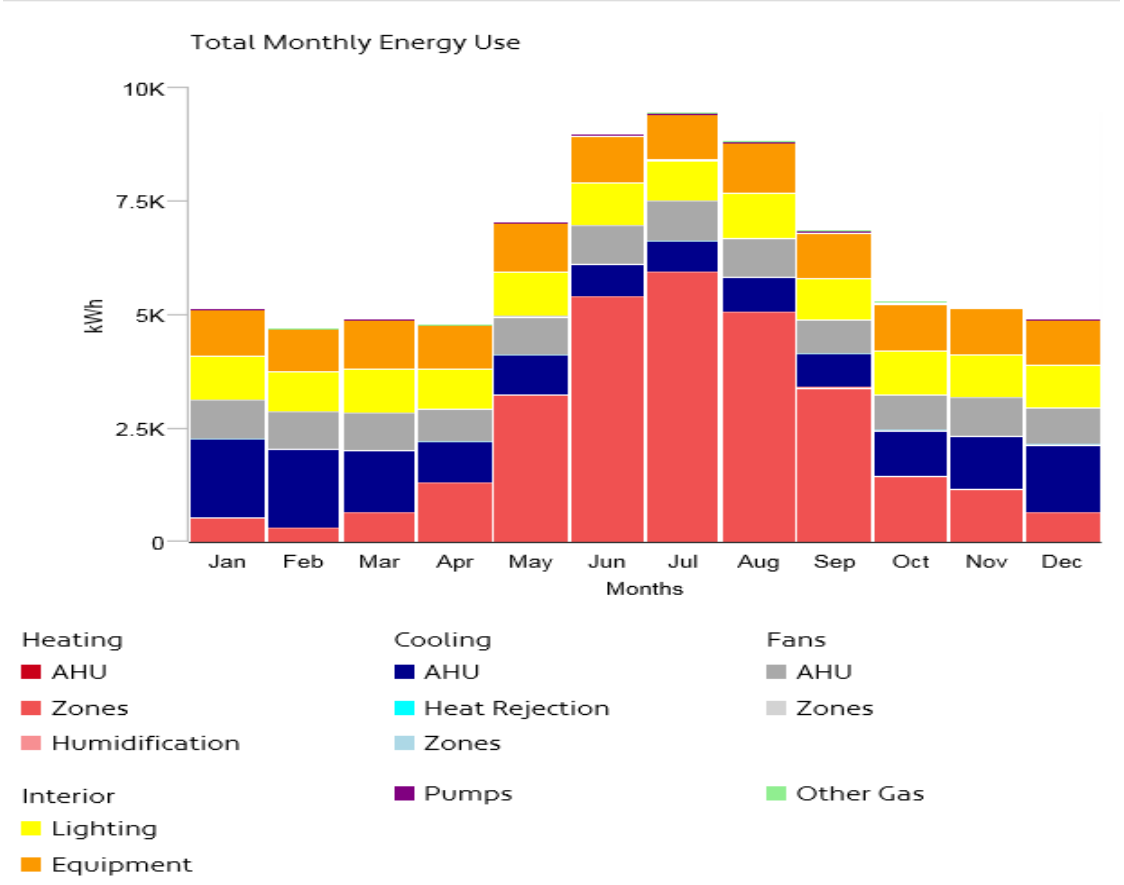
The following table is a simplistic estimation of the energy consumption of the site for the base case scenario and for the offices and warehouses.

	Baseline (kWh/m2/year)	Combined Case (kWh/m2/year)
Office	127.3	81.0
Warehouse	34	24
Energy Saving		**32%**

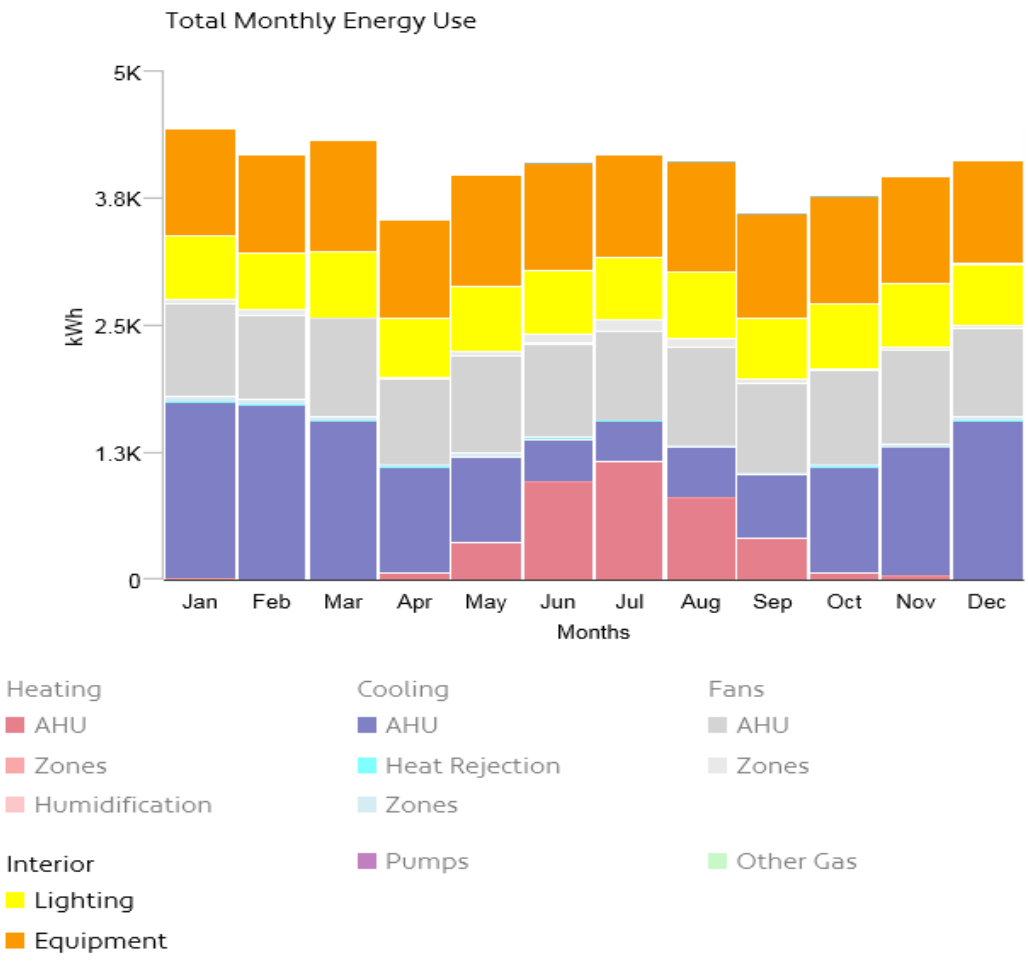
Note the above numbers are indicative and are based on the information presented herein only. These should not be used for sizing loads and are intended for comparative studies and architectural decisions only.

The below shows the monthly breakup of energy consumption for the office Baseline and Proposed cases:

Baseline Consumption:



Proposed Case:



4. SEARS Design Response

The following section documents the project's dedicated response to the Principles of ESD as defined within Clause 7(4) – Schedule 2 of the Environmental Protection and Assessment Regulation 2000).

4.1.1 Precautionary Principle

The precautionary principles aim to address the threats of serious or irreversible environmental damage as a result of the proposed development. Key project risks are identified, along with the identification of appropriate mitigation measures to ensure irreversible environmental damage does not occur as a result of the development.

The SEARs response identifies a number of key environmental issues for the project beyond the ESD requirements which includes:

- Air-quality;
- Noise & vibration;
- Soil & water;
- Waste management; and
- Biodiversity.

For a direct response to the above, the department should refer to specific third-party reports prepared to respond to each of the nominated items. In order to compliment the above, the development will further implement the following as part of the proposed development.

Design Framework:

Environmental Policy – ISO14001: Design of the facility including functional layout, location of specific equipment, built form and associated operational activities will be given careful consideration as to comply with the organisations on-going Health, Safety & Environment Management System, specifically the organisations Environmental Policy, including:

- **Energy efficiency & greenhouse gas emissions reduction** – plant design aims to identify and include initiatives that improve energy efficiency & reduce greenhouse gas emissions which in turn reduce the long-term risk of the impacts of climate change. Examples include location and proximity of key manufacturing processes resulting in less energy demand via reduced travel distances, smaller pumping requirements and improved natural daylight.
- **Identify & implement water management initiatives –** for on-site reuse, including opportunities for rainwater harvest & re-use reducing the project's reliance on mains potable water supply. On-site harvesting to only occur from identified 'clean' areas such as plant roof & nominated hard-stand areas only.
- **Implementation of waste management initiatives** – ensuring proper handling & disposal of the plants waste streams ensuring the larger ecological footprint of the plant is minimised; and
- **Consideration of environmental issues** – such as the conservation of virgin materials, resources and new product development.

Operational Framework:

A site-specific Safety, Health & Environment Management System inclusive of standard operating procedures has been identified by Austral Masonry and will be implemented during the operation of the new manufacturing plant. The following procedure are aligned to ensure the plant operations do not cause serious of irreversible environmental damage as follows:

- **Energy efficiency** - regular energy audits (in accordance with AS/NZS 3598.2:2014) with a view to improve operational energy efficiency & process reducing the long-term environmental risks associated with climate change.

- **Water efficiency –** regular measurement & control of water usage levels in accordance with SHE-MSP-Env-10.336. The target for all Austral sites is to reduce mains potable water demand & replace with recycled sources as much as possible.
- **Waste Management** - dedicated standard operating procedures across all Austral sites include appropriate facilities for effective waste separation & reduced waste for landfill, including:
    - General waste;
    - Co-mingled recycling;
    - Contaminated materials; and
    - Paper
- **Materials Management** - the following approach to reducing virgin material usage & reduced ecological impact as identified within SHE-MSP-Env-07.334.

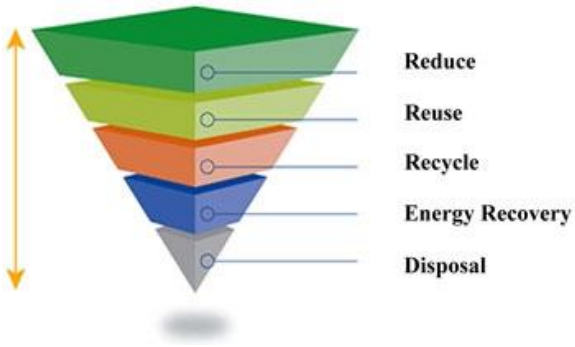


Figure 3: Waste/Materials Hierarchy – SHE-MSP- Environmental. Source: Austral Masonry.

The proposed development is to include a well-documented approach to ensuring the threats of serious or irreversible environmental damage occurs as a result of development. The Department should refer to additional third-party reports to further support the information included within this report.

4.1.2 Inter-generational equity

The proposed development will contribute to the conserves inter-generational equity through minimising the consumption of resources whilst providing an upgraded built environment that will ensure the health and well-being of occupants into the future.

The organisations dedicated Safety, Health & Environment Management System (SHE-MSP) aims to ensure both the design & operational process of the proposed plant reduce the overall environmental impact, reduce resources use and ensure the immediate ecological value of the site is preserved for future generations.

The following sections of the Austral Masonry SHE-MSP are directly aligned with preserving inter-generational equity:

- **SHE-MSP Env – 06.331 – Environmental Aspects** – aimed at ensuring environmental impacts of the organization are identified, managed & reported upon.
- **SHE-MSP Env – 07.333 – Energy Efficiency –** aimed at ensuring energy demand & associated greenhouse gas emissions are reduced, managed & reported upon.
- **SHE-MSP Env – 07.334 – Waste Management –** aimed at reducing waste to landfill & increased rates of recycling.
- **SHE-MSP Env – 07.335 – Water Management –** aimed at reducing overall water demand & increased rates of recycling, management & reporting.

- **SHE-MSP Env – 07.342 – Prevention & Control of Pollution –** to ensure potentially harmful & hazardous materials are managed, treated & monitored with a view to ensuring no major environmental impacts are identified as a result of plant operations; and
- **SHE-MSP Env – 10.336 – Water, Energy, Waste Resources Monitoring –** ensuring appropriate records, data and monitoring programs are kept with a view to report & improve operational impacts in all categories.

Further to the operational procedures identified above, a list of targeted ESD initiatives is provided below with the view to protect & ensure inter-generational equity.

- High WELS rated water fittings ensuring lower building water demand;
- On-site rainwater harvesting & reuse;
- LED lights, which have longer lives, consume less energy and produce a higher quality light than their counterparts, reducing overall energy demand;
- Energy & water metering for effective monitoring & demand reduction;
- Low-VOC paints, sealants, adhesives, carpets (where applicable), which do not emit dangerous volatile components, risking the health of users;
- Steel sourced from manufacturers who are members of the Australian Steel Institute Sustainability Charter for sustainable and energy reducing steel manufacture;
- Best practice PVC plastics in formwork, piping, cables and conduits. These materials have a reputation for damaging the environment in their production, both upstream and downstream of the manufacturing process;
- Operational waste procedures including defined streams for effective material recycling;
- A target of 80% of construction and demolition waste will be diverted from landfill; and
- On-site stormwater management in accordance with EPA/WSUD best practice guidelines.

4.1.3 Conservation of biological diversity and ecological integrity

For a more detailed response to the specifics of the project response to the conservation of biological diversity & ecological integrity, the Department should refer to specific third-party report prepared by relevant consultants in support of this development application.

Further to the above, the following examples are envisaged to contribute to the conservation of biological diversity & ecological integrity.

- On-site rainwater harvesting & reuse will reduce the site discharge levels and maintain the overall health & ecological integrity of receiving water bodies;
- Dedicated site boundary does not encroach on the existing watercourse & riparian zone, limiting the local impact to this zone; and
- Targets for waste reduction in both project construction & operation will reduce biological & ecological impacts in general via reduced waste to landfill.

4.1.4 Improved valuation, pricing and incentive mechanisms

The proposed masonry plant development will include the integration of a number of initiatives which aim to internalise pollution and other undesirable environmental outcomes ensure that full consideration of the impacts of development are considered. In accordance with the project design brief, a number of items have been considered – including:

- Contractors will be requested to provide and abide by an Environmental Management Plan and Environmental Management System that is in accordance with NSW Environmental Management Systems Guidelines. This places a value on environmentally responsible building practices and places a form of "polluter pays" onto the contractors to ensure they are held responsible for the environmental management of the building site as they complete their work;
- The cost to recycle the construction and demolition waste will be borne by the project team. The project team will be required to target 80% recycling of construction waste. The increased cost of recycling construction materials will also incentivise the purchase of less materials, thereby reducing over-ordering and material wastage; and
- The costs of producing the following pollution: sewage, landfill waste, and CO2 emissions are partially borne by the project team and accounted for in the project's sustainability initiatives. The project has voluntarily elected to:
    - improve their water consumption efficiency, thereby paying to reduce production of sewage;
    - reduce their energy consumption, which means the project has paid for the design and implementation of solutions which will reduce CO2 emissions; and
    - recycle waste streams in the construction and operation of the project, which will cost more than standard practice where all material waste is directed to landfill.

5. Wingecarrebee DCP Design Response

The following section details a provisional list of ESD initiatives for inclusion within the design & development of the project in direct response to the Wingecarrebee Shire Council DCP 2010 (as amended).

Control (b) of the DCP states that the development should include practicable incorporation of the principles of ecologically sustainable development into the development. In response to this, the development will seek to include the following ESD initiatives in response to the DCP Control.

5.1.1 Design Initiatives

Energy Efficiency:

A variety of energy efficiency measures are applicable to the proposed development. These energy efficiency measures may form part of the final design and operation of the space. The final strategy will always be a combination of sustainability, operational feasibility, architectural intent and site-specific appropriateness.

The energy efficiency strategy follows the hierarchy pyramid below. Best practice energy conservation dictates that in the first instance demand is reduced. This has a much greater benefit to the overall long-term sustainability of the site compared to efficiency measures or renewables/offsets. As such, the focus will be on the elements that provide the greatest return on investment.

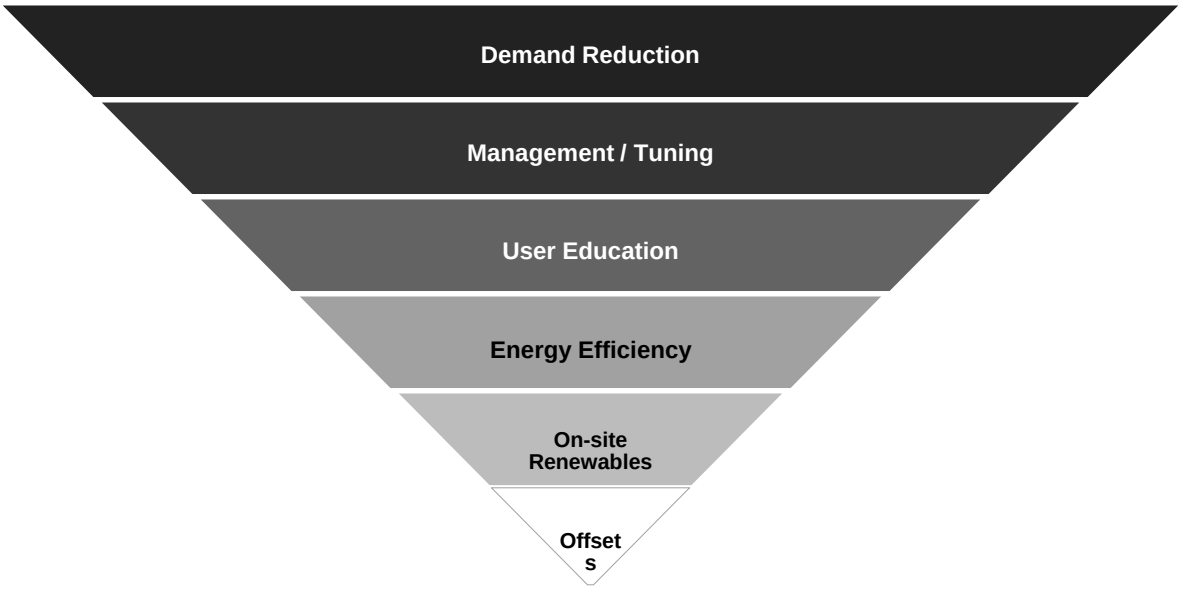


Figure 4: Energy efficiency strategy hierarchy.

- Façade design for optimised passive thermal performance. Processing plant will be naturally ventilated with the inclusion of large access openings & skylights to provide natural daylighting reducing energy demand.
- Administration building will be designed to comply with minimum energy efficiency provisions as identified in national construction code – Section J – energy efficiency provisions.
- Efficient lighting e.g. LEDs. This will reduce the electrical load on the grid for the same electrical output. Further, LED globes have a longer life, reducing replacement periods which demands less maintenance, as well as reducing landfill of precious materials – applicable to both administration building/ processing plant.
- Lighting controls including timing and occupancy sensors to reduce the demand on the lighting systems.
- Sub-metering will allow for effective energy management & optimisation of building performance.

- Factory BMS building control will monitor & provide automated building operation & maximise energy efficiency.
- External lighting to timeclock controlled for optimised energy efficiency.
- Energy and water efficient appliances – lowering energy demand
- Localised hot water systems for lower GHG emissions impact & on demand response.

Water Efficiency:
A variety of water efficiency measures are applicable to the proposed development. The following water efficiency initiatives are intended to influence the final design and operation of the spaces contributing to the project's overall commitment to reduce potable water demand.

Water efficiency measures, which reduce water consumption & included within the project are:

Water efficient fixtures and fittings – includes taps, wash basins, WCs, Urinals, showers and supplementary water uses.

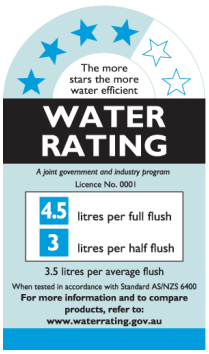


Figure 2. Example of a WELS water efficiency rating label.

In accordance with industry best practice standards, the following performance schedule identified within Green Building Council of Australia's – Green Star scheme will ensure potable water demand is effectively reduced:

Nominated WELS Fixtures –	
Fixture / Equipment Type	**WELS Rating (minimum)**
Taps	5 Star
Toilet	4 Star
Showers	3 Star (<= 7.5 L/min)

- On-site rainwater harvest – offset for masonry manufacturing; and
- Landscape irrigation supply shall be also connected to existing on-site rainwater storage infrastructure reducing the demand from potable water supplies.

Design Materials:

Improved indoor environment quality is a significant benefit of sustainable design. The design will include a significant commitment to improve indoor environment quality via the following initiatives (applicable to the administration building only):

- Material selections, which focus on reducing volatile organic compounds (VOC) levels and minimise formaldehyde impacts. Paints, sealants, adhesives, carpets, floor and material finishes will all comply with best practice VOC criteria as identified within Green Star – industry best practice standard;
- Engineered wood products will limit formaldehyde levels via architectural specification in accordance with industry best practice standards; and
- Consideration of additional material specifications which select & prefer materials and products which include reused content, environmental product declarations, third party sustainability certifications or product stewardship programs.

5.1.2 Operational Initiatives

Energy Efficiency:

- Undertake regular operational energy audits to track performance, progress & inform future operational improvements in energy efficiency;
- External energy audits - AS/NZS 3598.2:2014 (as required);
- Maintenance periods to implemented to ensure equipment operational efficiency is maintained;
- Comprehensive analysis for new equipment procurement to ensure overall plant operational efficiency is maintained; and
- Regular reporting and disclosure around energy & GHG emission performance to drive future refinements and improved performance.

Water Efficiency:

- Separation of surface water for reuse & effective treatment prior to discharge reduces both potable water demand and improves stormwater quality leaving site;
- Effective maintenance programs ensuring leak detection is timely identified
- Sub-soil landscape irrigation systems; and
- Regular reporting and disclosure around energy & GHG emission performance to drive future refinements and improved performance.

Construction Materials:

Construction materials are a highly carbon intensive component of any development. They often involve very energy intensive production processes, large amounts of raw materials including water and energy, and long transport distances to reach the location of the development.

The following will be adopted by the project to reduce waste from construction materials.

- A high recycling target of 80% diversion from landfill for the construction and demolition waste.
- Steel sourced from producers who are members of the Australian Steel Institute Sustainability Charter for responsible steel manufacture & energy reducing manufacturing techniques.
- PVC materials will be procured from suppliers which comply with industry best practice guidelines for PVC manufacture which aims to reduce the environmental impact of PVC material production.

Operational Waste:

A dedicated waste management plan shall be prepared in accordance with SHE-MSP Env – 07.334 – Waste Management with specific response to the waste streams identified above & ensure the following is achieved:

- General waste to landfill is reduced;
- Co-mingled recycling activities are maximised - cardboard, plastics, glass;
- Contaminated materials; and
- Paper

6. NCC Section J – Energy Efficiency Design Response

NCC Section J – energy efficiency provisions will apply to the design & construction of the development with the intent to ensure the build form and associated building services demonstrate a minimum level of energy efficiency performance.

Typically applying to the administration building, the following design response provisions are likely to applied in order to ensure minimum compliance with NCC Section J:

Climate Zone 5 – Wingecarrebee		
Building Element	Total Construction Thermal Performance Requirement	Comment
Roof & Ceiling Construction	Rt3.7	Architect to provide detail for project Tender Issue
External Wall	Rt2.8	Architect to provide detail for project Tender Issue
Internal Wall	Rt1.8	Architect to provide detail for project Tender Issue
Exposed Suspended Floor	Rt2.0	Architect to provide detail for project Tender Issue
External Glazing	To be confirmed	Design assessment to be undertaken during detailed project design phase. Design response will be project specific and appropriate to the extent of glazing included with the applicable conditioned zone.
Building Sealing	Refer Architectural Specification and/or notes on Drawings	Architect to provide detail for project Tender Issue
Services	Refer Building Services Specification and Certification for compliance details.	Relevant services design consultants to confirm during detailed design project phase.

7. Summary

Ecologically Sustainable Design is a driving consideration in the development of the proposed Austral Brick plant located at 416-524 Berrima Road, Moss Vale NSW. As described within the report above, the project will incorporate a number of ESD initiatives in both design & operation aimed at ensuring the principles of sustainable development are both demonstrated & achieved.

The responses provided within this report have largely been informed by Austral Brick internal standard operating procedures which are strongly aligned with the principles of sustainable development. The inclusion of items such as:

- Safety, Health & Environment Management System – ISO14001 accredited;
- Energy efficiency management system;
- Water efficiency management system;
- Waste management system; and
- Additional commitments to Ecological Sustainable Development initiatives

All of the above examples are designed to reduce energy demand & associated greenhouse gas emissions, reduce potable water consumption and material resources of the plant in both design & operation. All of the initiatives proposed within this report have been selected with consideration to the Secretary's Environmental Assessment Requirements by NSW Department of Planning and Environment.

The development's commitment to reducing the overall environmental impact is evident of the holistic approach taken to long-term sustainability. Documented initiatives cover a range of categories including:

- Energy & greenhouse gas emissions
- Potable water reduction
- Minimising waste to landfill; and
- Improve material selection & preservation

We trust this report provides sufficient overview of the project commitment to environmentally sustainable design and the sustainability vision for the proposed Austral Brick development project.

Design with
community in mind

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