



Appendix D

Environmentally Sustainable
Design Report



7 Commercial Drive
Lynbrook VIC 3975
T: 1300 033 343
F: 61 3 5941 9288
E: admin@energylab.com.au
www.energylab.com.au

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Environmentally Sustainable Development

V2

ESD Principles and Initiatives for Sustainable Futures

29 BROWNS ROAD, CLAYTON

October 2015

Introduction

The Australian Government is dedicated to the development of our sustainable future, and thus has set Ecologically Sustainable Development targets for residential / commercial buildings. These targets not only encourage reduced environmental impact during construction, but equally promote sustainable use for the entire life cycle of the development. To facilitate this goal, the commitment of the client is paramount.

The impact of buildings within the environment is very complex. The life cycle of the building from design phase through to use and eventual refurbishment/demolition can produce a variety of impacts. At the initial phase, we must be very mindful of planning for sustainability. Materials, land ecology and waste management are vital to protecting the environment. The design stage must also examine passive design principles and plan for optimum occupant comfort and use. Finally, consideration must be given future refurbishment / demolition to ensure the opportunities for recycling / reuse are maximised.



The design stage is when most of these impacts are determined, therefore is the greatest opportunity to reduce the environmental impact of the project. This is achieved by creating strategies to meet and exceed targets set by the Government (described in this ESD report).

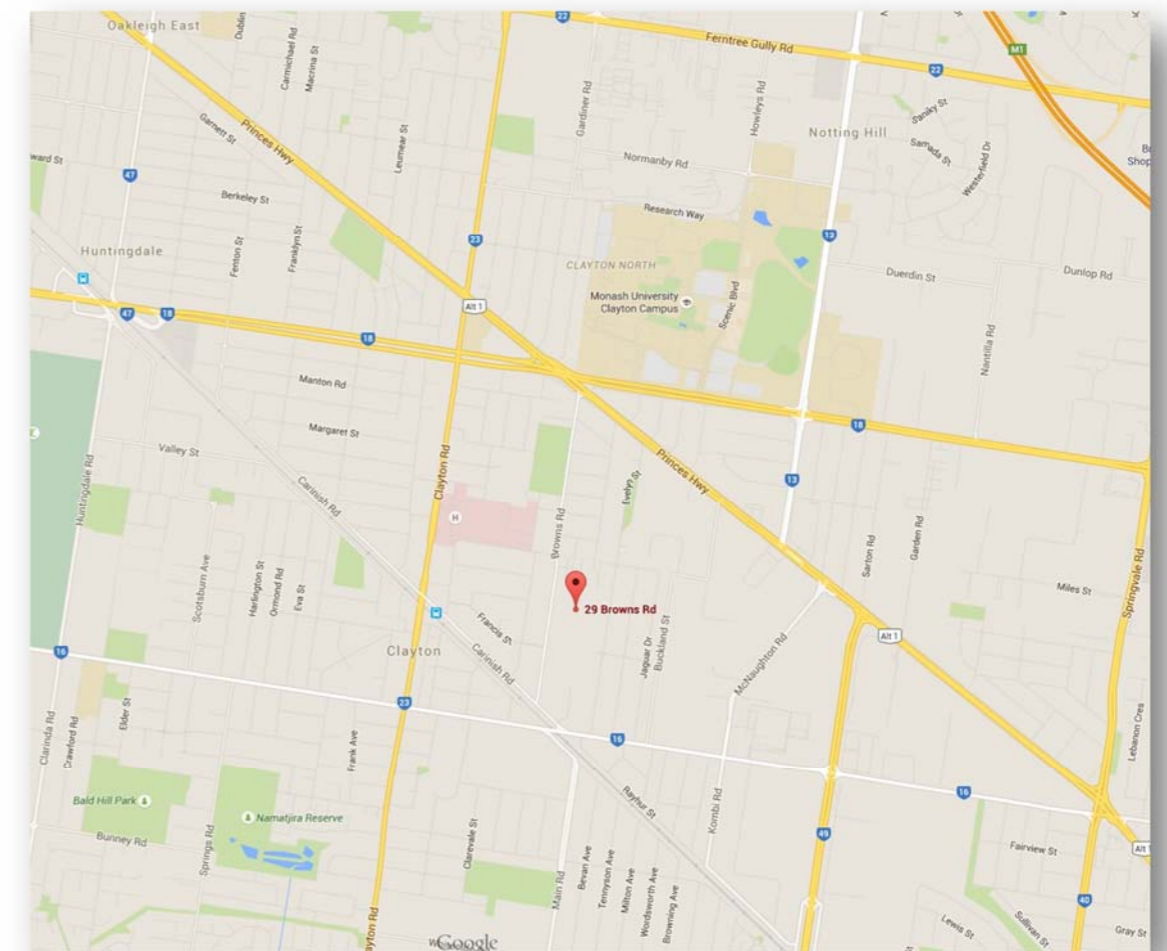
Project Description

The proposed development is designed to be respectful of the environment during both construction and its continued use. The proposal expects to integrate measures that support social, environmental and economic outcomes. This report presents a description of these ESD strategies and initiatives proposed for implementation within the project.

Located within the dynamic City of Monash, the project aims to promote the Council's leading policies on sustainability.

The project consists of the construction of approximately 80 townhouses and 175 apartments. Townhouses will be built on concrete slab with timber flooring all other levels. Wall materials vary from brick to feature lightweight cladding. Apartment buildings will be constructed of concrete slab to all floor and car parking provided in a basement garage.

This report is based on drawings prepared by Mushan Design Studio (dated 09.09/15 – REV P5).



 Indicates location of development

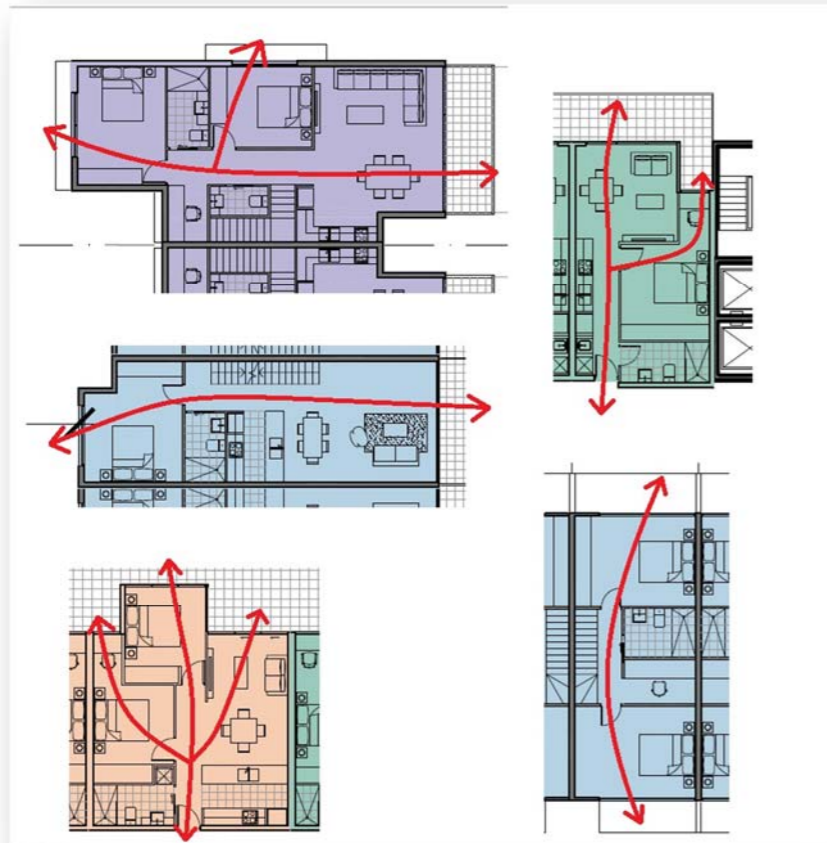
Indoor Environment Quality

Indoor Environment Quality is measured by how the building is perceived by its occupants. This comprises of safety, accessibility, air quality, ventilation, thermal comfort, lighting, noise and visual appeal. It is important to analyse this because people spend around 90% of their time indoors. Ensuring human environments are as pleasant as possible in turn improves comfort.

Direct Application:

Light, ventilation and zoning

- The rectangular shape of each building has 4 useable edges which enhance access to daylight and natural ventilation throughout the townhouse levels, hallways and walkway areas. This supports a fresh air breeze path throughout which contributes to a healthy building. The buildings' shape increases air flow around the perimeter of the building which ultimately has a cooling effect.
- Each townhouse and apartment has been designed to maximise the natural ventilation throughout each dwelling. This has been achieved by providing ample openings to improve air flow throughout each townhouse. Good cross-flow ventilation improves occupant comfort by allowing fresh cool air to flow through the room, reducing the reliance on artificial cooling and circulating methods. It also assists in the removal of indoor pollutants which can be harmful to occupants.



- Each unit features the main living zone directed outward to allow for natural daylight to filter through the daytime occupied rooms.
- All townhouses and apartments feature a terrace or balcony and are shaded from above. This shading protects the glazed doors from high heat gain during summer and thus reduces the cooling

load within the dwelling. The lower angled winter sun flows in helping the internal rooms to keep warm during the cold months.

- Artificial lighting will be installed with low-energy LED globes to living and bedroom areas. The lighting will be adequate for the tasks the occupants need to perform.

Comfort

- Each building is constructed of thermally efficient materials and has achieved a 6.0-star rating overall (refer to FirstRate reports). The townhouses will be very comfortable to live in and will need minimal artificial heating / cooling. The building features extensive thermal mass which will perform as a heat storage method over the cooler months.
- The project features good levels of insulation (at least R2.0 bulk + foil for walls – at least R2.5 bulk insulation for ceilings) therefore will be acoustically and thermally comfortable. Occupants will be able to control their comfort by the use of highly efficient zoned heater/air conditioning systems.

Air quality

- Indoor environment quality has been addressed by committing to using low emission volatile organic compounds (VOC) paints, laminates, adhesives, varnishes, MDF, plywood, particleboard, floor coverings and extends to all other building products being used in the development. The commitments are as follows:
 - Carpets will be selected based on Low VOC labelling (fabric and bonding adhesive). Most VOC emissions dissipate within the first week after installation.
 - Traditional oil-based timber finishes have a high solvent level thus contributing to unpleasant internal air pollution. Timber will be finished with water-based products producing no more than 140 grams of VOC per litre.
 - Internal wall and ceiling paints will be selected with “Low VOC” noted on the product label. Commitment will be made to use products producing no more than 50 grams of VOC per litre.
 - Adhesives will be water-based with “Low VOC” noted on the product label. Commitment will be made to use products producing no more than 80 grams of VOC per litre.
 - Low formaldehyde emissions (LFE) will be addressed by committing to products producing no more than 0.05 parts per million (E0 standard)
 - During construction, doors and windows will be opened to increase ventilation when using products that emit (thus reducing exposure to VOC’s).
 - While the townhouses are being built, the internal temperature and humidity will be kept low (as chemicals release more gas under warmer conditions and higher humidity).

Acoustics

- The site is situated between existing industrial buildings and residential districts. To minimise the impact of industrial noise intrusions, daytime zones are positioned away from these noise sources.
- The project includes high-performance glazing systems to selected orientations designed for acoustic protection and energy performance.
- Acoustic disturbances identified are:
 - Nearby light industry activity (immediate noise source)
 - Urban noise (surrounding light reverberation)
 - Neighbouring residences (immediate noise source)
 - Townhouse / apartment building plant equipment
 - Air conditioning condensers
- Selected external perimeter walls are constructed using heavy duty mass which offer significant protection from noise penetration.

- Party walls will be insulated using 2x R2.0 glasswool acoustic batts with minimum density 14kg/m2 (suitable to provide suitable protection between dwellings and projected sound transmittance).
- Rubber mounts will be applied to all air conditioning condenser units to isolate noise vibrations.
- Greenery and screening will be implemented to private courtyard areas for seclusion and acoustic protection.

Building Community and Safety

The success of a new development can be measured by evaluating safety, accessibility, community and unity between the residents and their built environment. The goal is to ensure each resident can navigate their building safely and are able to engage with other residents to develop a strong community.

Direct Application:

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| Safety |
| <ul style="list-style-type: none"> ■ The development complies with NCC Part 3.9 Safe Movement and Access. |
| <ul style="list-style-type: none"> ■ The development complies with Monash Planning Scheme and offers safe accessibility for all people including those with disabilities. To be included in Building Users Guide. |
| <ul style="list-style-type: none"> ■ The design delivers a comfortable, safe, walkable quality with open courtyards and elevators and stairwells for access to upper apartment levels. |
| <ul style="list-style-type: none"> ■ The main entry doors are a suitable weight for all capabilities. |
| <ul style="list-style-type: none"> ■ The site features separate pedestrian footpaths and road spaces reducing the risks for pedestrians from vehicular traffic within the development. |
| <ul style="list-style-type: none"> ■ Community safety is also boosted by the layout of the townhouses and apartment buildings by ensuring passive surveillance (being rectangular-shaped) thus 'hidden' corners, dark places and obstructions are greatly minimised. |
| Community |
| <ul style="list-style-type: none"> ■ The development features landscaped pedestrian spaces as well as practical courtyards for all townhouses which offer privacy, but also community and will enhance interaction between other residents. |
| <ul style="list-style-type: none"> ■ The development promotes equitable access so all residents can enjoy the building services and engage in community activities. |

Energy Efficiency

Fossil fuels are non-renewable yet provide nearly all the energy needed by Australian residents, businesses and industry. Given that limited resources are available it is imperative that we look towards sustainability for the future. Addressing the efficiency of where we live will greatly improve our position and thus greatly reduce our reliance on these diminishing resources.

Direct Application:

Townhouses and apartments

- It can be demonstrated that the building will meet benchmark rating requirements and will achieve a minimum 6.0-star overall rating with the following energy efficiency initiatives (FirstRate5 energy rating supplement):

Indicative Energy Efficiency Items for all units: (refer to spreadsheet data for specific inclusions)

- Wall insulation to reach R2.0 – R2.5 + foil (no foil to party walls)
- Ceiling insulation to reach R2.5 – R6.0
- Intermediate floor insulation required to selected townhouses
- Suspended slab insulation required to all ground floor apartments
- Windows to be glazed in accordance with spreadsheet data for sample apartments
- Weatherseals to entry doors and windows
- Gaps and cracks to be sealed
- Exhaust fans to be sealed

- The energy rating results are:

| Unit No. | Star Rating | Unit No. | Star Rating |
|-----------------------------|-------------|----------|-------------|
| TH1 | 6.0 | A1 | 5.6 |
| TH2 | 6.0 | A2 | 6.8 |
| TH3 | 6.0 | A3 | 5.0 |
| TH4 | 6.0 | A4 | 6.1 |
| TH5 | 6.0 | A5 | 6.6 |
| TH6 | 6.0 | A6 | 6.6 |
| TH7 | 6.0 | A7 | 6.4 |
| TH8 | 6.2 | A8 | 5.5 |
| TH9 | 6.0 | THM2 | 6.1 |
| TH10 | 6.1 | | |
| Average 6.0 stars estimated | | | |

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| <ul style="list-style-type: none"> ■ Commitment to a heating and air-conditioning system of min. 5-stars (zoned gas ducted heating) – (room/space cooling only to main living/kitchen areas). |
| <ul style="list-style-type: none"> ■ The artificial lighting required is energy efficient LED downlights to living areas and bedrooms. Artificial lighting wattages have been nominated as 5w/m2 which meets current regulatory obligations. |
| <ul style="list-style-type: none"> ■ Each townhouse / apartment space features individually controlled heating/cooling systems, lighting systems and ventilation to allow for flexible control. |
| <ul style="list-style-type: none"> ■ Commitment to a 5-star gas-storage hot water system. |
| <ul style="list-style-type: none"> ■ Common area and carpark lighting will be installed using T5 lamps activated by motion sensors, designed to significantly reduce energy use. Selected areas will be permanently illuminated by approved energy-efficient lighting, however this will be limited. |

Water Sensitive Design

Australia has suffered from a great water shortage in recent years; however being water-wise will greatly improve this position. Implementing the opportunities at design/construction stage will significantly reduce water consumption. The development greatly supports Monash’s water initiative “Integrated water management plan” by the following commitments:

Direct Application:

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| <p><i>Townhouses</i></p> <ul style="list-style-type: none"> ■ Each dwelling will feature its own separate water meter, ensuring each occupant is responsible for their own water usage, and thus water saving performance. |
| <ul style="list-style-type: none"> ■ Shower heads will be installed with a minimum 3-star WELS rating and will feature a flow rate of 4.5lpm to 6.0 lpm plus aeration device. |
| <ul style="list-style-type: none"> ■ Toilets will be installed with a minimum 4-star WELS rating and will feature a dual flush system. |
| <ul style="list-style-type: none"> ■ Basin taps will be installed with a minimum 5-star WELS rating and will feature flow restriction valves. |
| <ul style="list-style-type: none"> ■ Water heating will be achieved through individual 5-star gas-storage systems: <ul style="list-style-type: none"> ○ Minimal hot water piping lengths to minimise energy losses ○ Minimal hot water piping diameter to allow for maximum flow but minimal energy loss ○ Correctly sized water heater ○ Highly insulated piping ○ Heater positioned for easy access for installation and maintenance, resource supply and delivery of hot water to the townhouses. |
| <ul style="list-style-type: none"> ■ Dishwashers, washing machines and other builder-supplied appliances will be installed with minimum 4-star ratings. |

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| <ul style="list-style-type: none"> ■ Residents will be educated (as part of their Building Users Guide) on the monitoring and fixing of leaking taps. The Building Users Guide will include details of a reputable and sustainable plumber to address any issues that may arise during occupancy. Additionally, water meters will be monitored to reveal any evidence of water leakage issues within the development – responsibility of Building Management Company. |
| <p><i>Building and site</i></p> <ul style="list-style-type: none"> ■ Sub-metering will be installed to calculate water efficiency in areas of rainwater harvesting (collection and use) plus gas hot water systems. This allows for monitoring of these systems and subsequently addresses any areas that do not meet the targeted sustainable outcomes. |
| <ul style="list-style-type: none"> ■ Taps will be carefully monitored (daily) by all contractors on site to ensure taps are turned off properly after use. If a leak issue emerges, this will be instantly reported to the site manager and addressed immediately. Contractors will be required to engage in water-saving methods during their appointment and will form part of their signed agreement. |
| <ul style="list-style-type: none"> ■ Refer to “Urban Ecology” for commitments to water efficient landscaping. |
| <ul style="list-style-type: none"> ■ The development aims to be a great sustainable asset to the community particularly with regards to adding value to Water Management. The current site is an existing dwelling which features no water harvesting systems, thus improving the sustainability of the site. |

Stormwater Management clause 22.04 (Water Sensitive Urban Design)

Stormwater typically runs from an allotment, to collection and soon-after into rivers, lakes and the ocean. Making use of this water greatly reduces our impact on the environment, reduces reliance on potable water and protects Monash’s waterways and creeks. Consideration should be given to catchment and storage, filtering the water to trap pollutants, and using this water for toilets and gardens.

Direct Application:

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| <ul style="list-style-type: none"> ■ The project features individual rainwater tanks of 2,500L capacity for all town house units and a single 25,000L capacity tank for each apartment building and will collect rainwater from 100% of the metal-deck roofing area. The rainwater tank storage will total 314,000L minimum and will service the following: <ul style="list-style-type: none"> ○ Every sanitary flushing system within the development ○ Watering gardens in planter boxes / gardens ○ Bin wash out (bin store area) ○ External washdown services ○ Emergency services storage <p>Pre-storage Filtration</p> <ul style="list-style-type: none"> ■ Downpipe / gutter leaf guards will be installed to all collection trains. ■ Rainwater tank will feature an inlet filter in accordance with Australian Standards. ■ The rainwater tank system will initially run through a first-flush filtration process to ensure the water collected is of optimal quality (see below for filtration details). ■ To reduce sediment and particulate build-up within the tank, a triple action filtration system will be installed. Maintenance will be arranged by the building management company to ensure clean water is continually supplied to the toilets plus to minimise flow reductions due to sediment build up. |
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- Rainwater that runs from impervious surfaces to the rainwater tank is directed to the proposed re-use systems, with an On-Site Detention system to control peak flow. (Refer to plans and drainage engineering for location of rainwater harvesting tanks and detention storage).
- Monash’s waterways will be protected by committing to site tidiness. The property will be regularly cleared / cleaned to ensure the footpath, gutter and drains are not contaminated with site rubbish;
 - Include pollutant traps / grates to prevent site waste from travelling to stormwater drains.
 - Divert / protect stormwater from disturbed or exposed areas (to avoid unfiltered water running to the stormwater system); including sweeping up excess sediment on bordering roads and other impervious surfaces.
 - Keep storage bins covered / well enclosed to ensure that rubbish is contained on site and disposed of properly.
 - Revise cleaning systems as the site changes during construction to ensure targets are being maintained.
 - Conduct weekly inspections of the site to ensure all measures are being adhered to.
 - Ensure that when washing equipment on site, the wastewater does not enter the stormwater system. This involves creating a barrier between washing areas and the stormwater drains.
- Prevent contaminants, spills or leaks from entering the stormwater system. This can be achieved by ensuring equipment is readily available to contain the pollutant (such as absorbents, barriers or brooms);
 - Ensure an emergency spill kit is available on site including shovel / brooms, safety gloves, sorbents, absorbent pads and rolls, drain seals and guards.
 - Ensure each contractor is familiar with procedures for emergency spillage.
 - Ensure spill kit is located in a position easily accessible for urgent use.

Building Materials

The materials chosen for a building project has a significant impact on the environment. Preference should always be given to products that have low embodied energy plus low toxicity in manufacture and use. It is also important to consider issues such as the impact of material consumption off-site (e.g. mining).

Direct Application:

- The use of local materials is paramount. The following will be sourced within the Melbourne area to minimise the embodied energy of the products; insulation, tiling, carpets, timber, concrete, plasterboard, cladding, garage doors, windows. Products will be sourced based on the following order of effect:
 1. Made locally (within 30km)
 2. Made within Victoria
 3. Made in Australia using Australian stock
 4. Made in Australia using imported stock
 5. Imported from China/Japan via sea freight
 6. Imported from Europe/USA via sea freight
 7. Imported by all other international air freight
- Recycled materials will be used in areas of insulation, concrete re-enforcing, specialised finishes;
 - Recycled concrete will be used in areas of general fill, pavement aggregate and road base. Minimum recycled commitment is :

- 15% recycled content (for insitu concrete)
 - Glasswool type bulk insulation will be used which is made up largely from recycled glass. Rockwool is also a product which is highly recycled. Insulation will be sourced from suppliers who commit to the following minimums:
 - 70% recycled content
 - Packaged in a compressed state (more product can be shipped in each truck)
- Materials with low toxic emissions will be used (Refer to Quality of Public and Private Realm within this report).
- All materials selected for the project are suitable for their exact purpose, and will meet the installation and usage data as provided by the manufacturer.
- The appliances installed will not use chlorofluorocarbon (based) refrigerants.
- Materials will be selected that have very low embodied energy and water, from raw product to completion and disposal.
- Durable materials are also essential. Products and materials will be chosen that are long-lasting and require minimal maintenance. Commitment will also be given to the ongoing maintenance of materials which will include cleaning and preservation, ensuring continues to meet the intended usage.
- All timber used within the project will be FSC approved (meeting Moreland’s Greenlist specifications) and will be sourced from suppliers who provide plantation timber product.



Transport

Alternative transport options encourage residents to rely on other ways of getting around instead of vehicular. Choosing a site close to public transport promotes this, along with providing space for bicycle storage.

Direct Application:

- Bicycle storage is available within each townhouse’s private garage and in dedicated bicycle storage areas located on the basement level for apartment residents. Residents have convenient, safe access with sufficient room to access their bicycles and are able to exit directly at street level or the basement access ramp.
- The site is located within 10 minutes’ walking distance to Clayton shopping precinct, with access to trains, buses and taxis.

- The M1 Freeway runs a short distance from the site, and thus access to the City is directly available.
- Significant nearby conveniences:
 - Citylink / Freeway access – 10 mins. drive
 - Clayton road shopping precinct including an extensive range of retail shops, services and dining/entertainment options, supermarkets, banking and other daily convenience stores – within 10 mins. walk
 - Chadstone Shopping Centre featuring an extensive range of retail shops, services and dining/entertainment options, as well as bus services and taxi ranks – 10 mins. drive
 - General Practitioner and specialist facilities –10 mins. walk
 - Primary and secondary schooling – various nearby
 - Monash University -15 mins. walk
 - Reserves, sporting fields and stadiums – various nearby
 - Sporting fields and stadiums – various nearby
- Green Travel:
 - Direct access to tram and bus services – Palermo Street tram within 5 mins. Walk
 - Clayton train station – within 5 mins. walk
 - Extensive dedicated bicycle routes, dedicated bicycle lanes and bicycle friendly roads within the City of Monash– all easily accessible from the development

Given the location of the development, it is estimated that occupants will not solely rely on car use for day-to-day activities. Public transport and living amenities are extensive and are within 5-10 minutes' walk.

Waste Management

In the early stages it is imperative to consider the environmental impact of waste on the greater environment. Design needs to be considerate of flexibility for future disassembly. As it is a major environmental issue, we must follow the following rules: avoid, reduce, reuse and recycle. If we do this, we can greatly reduce building-related waste (currently over 40% of landfill).

Direct Application:

- Product calculations (supply) will be precise to avoid over-supply and thus needless waste. Contractors will be consulted regarding how much waste they expect to be generated by the project, and scrutinise how to reduce levels.
- Construction recycled waste and general rubbish will be separated into two bins. Each contractor attending the site will be issued with instructions on sorting waste resourcefully.
- Each townhouse features a wastebin within the kitchen cabinetry, with separated general rubbish / recycling (for occupants). Residents will separate recyclable waste from garbage waste and place into the correct council bins. The area is signed adequately and access is easy.

70% Waste Recycling Strategy – Mass – to be applied to all waste activities encompassing demolition of existing dwellings and during construction phase:

- The Construction Waste Management Plan strategies are as follows:
 - Waste Reduction and Minimisation:
 - Standard sized products will be used to avoid creating waste when materials are cut / adjusted to unusual lengths (this is the responsibility of the designer in collaboration with each contractor involved)
 - Packaging from site materials will be sorted and recycled. Each contractor will be responsible for choosing products with minimal packaging.

- Pre-cut or pre-fabricated products will be given priority (contractor responsibility)
- The design of the units are adaptable, thus when remodelling occurs the impact of waste will be greatly reduced
- Care will be taken when the site is excavated to minimise unnecessary site disturbance, with the aim of reducing organic waste

Waste Organisation:

- Each major contractor will be informed of the waste management principles within this ESD, and it will form part of their contract. Each contractor is responsible for the daily cleaning of their respective work areas and for their own waste sorting.
- Organic waste (vegetation clearance, land clearance, leaf litter and weeds) will be chipped / mulched and either a) salvaged and re-used on-site or b) sent to a compost facility (recommendation: SITA www.sita.com.au)
- Off-cuts from timber will be re-used on site in landscaping. Alternatively, excess timber will be separated and collected from a local salvage company and recycled (recommendation: SITA www.sita.com.au) as a secondary option.
- All waste areas will be clearly identified (re-cycling / general waste) during construction
- Surplus bricks, tiles, plasterboard and concrete will be re-used onsite in areas of landscaping and architectural features, and further waste will be recycled off-site
- No rubbish will be buried on site
- Liquid waste (black & grey water) will be disposed of in accordance with regulations.

- The Operational Waste Management Plan strategies are as follows:
 - Each unit will feature general waste and recycling bins (minimum 10L capacity each) integrated into the kitchen cabinetry.
 - Each tenant is responsible for their own storing and sorting of general waste / recycling. General waste will be placed in the designated garbage chutes whereby it will be collected (by waste contractor) and transferred to the correct bins for disposal. Each level features clearly labelled recycle bins/chutes where tenants will dispose of their recyclable waste.
 - Bins are located centrally on each level with easy, safe access.
 - Each tenant will be provided with a clear guide to recycling as part of the Building User's Guide which will include:
 - What items are accepted
 - What items are excluded
 - Preparation of materials including flattening of cardboard, rinsing bottles and containers
 - Reusable shopping bags
 - No junk mail signage
 - Reduction of store-bought packaged items
- A post-occupancy waste management audit will be performed at 3 months and 12 months with any short-falls addressed within a suitable time period. Priority will be given to environmental performance and occupant welfare.

Urban Ecology

Selecting a site for development can involve many issues. Protecting the urban community can be encouraged by planning to support animals and plants that live in the area. Selecting a site that has been previously used is an advantage, or a site that is located within an urban area. Also implementing a landscaping plan that restores native plants helps us reach our target. Ultimately we aim to impact the environment in a positive way.

Direct Application:

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| <ul style="list-style-type: none"> The project will significantly improve the sustainability and energy efficiency of the site in focus. The current site is a vacant primary school and will be redeveloped to provide for higher density occupancy in the area. The current site features no water harvesting systems which will be improved upon by the introduction of Water Sensitive Urban Design strategies for the new building. |
| <ul style="list-style-type: none"> The development includes great opportunities for residents to be a part of their surrounding environment, particularly the private rear courtyards, balconies and landscaped pedestrian zones. These outdoor areas feature green screening to connect occupants to their surrounding community and the natural environment. |
| <ul style="list-style-type: none"> Vegetation is positioned around the building connecting the occupants to their surrounding green environment. This vegetation is visible from the main living/kitchen area plus bedroom zones. The surrounding shrubs improve air quality and are situated near habitable windows which can greatly benefit from fresh air. |
| <ul style="list-style-type: none"> The design is sensitive to providing a 'green' streetscape consistent with surrounding dwellings and gardens. The proposal will follow Council's instruction regarding protection of street trees including during construction and incorporating existing trees into landscaping design where possible. |
| <ul style="list-style-type: none"> Drought tolerant plants will be planted in garden areas, reducing the amount of water required to maintain the landscaped gardens. Gardens are positioned throughout the site to connect occupants to their green environment. |

Innovations

Each development site has its own strengths and limitations. Understanding how to maximise the sustainability of a project often requires higher levels than basic Australian Standards.

Direct Application:

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| <ul style="list-style-type: none"> Carparking is situated out of view so that they don't become a focus of everyday life. This should promote walking, cycling and the use of public transport. |
| <ul style="list-style-type: none"> The WSUD approach includes rainwater tank and re-use strategies, permeable paving surfaces, and has retained as much permeability as possible (via landscaping). This will contribute to a sustainable development and will support council's stormwater strategies. The STORM rating meets the minimum 100% required. |

- Exceeding STEPS minimum targets by the following:
 - Energy (Score = 37 – minimum score 25)
 - Peak Demand (Score = 73.2 – minimum score 10)
 - Water (Score = 49 – minimum score 25)
 - Building Materials (Score = 17% – minimum score 11%)

| Name | Required Score | Project Score |
|--|-----------------------|--------------------|
| Greenhouse Emissions from Energy Use | 25% | 37% |
| Peak Energy Use | 10% | 73.2% |
| Mains (Drinking) Water Use | 25% | 49% |
| Stormwater Quality Impacts | 100% | 100% |
| Building Material Impacts | 11% | 17% |
| Waste Management - recyclables | 192.00 m ² | |
| Waste Management - rubbish | 64.00 m ² | |
| Waste Management - green waste | 0.25 m ² | |
| Waste Management - TOTAL | 256.25 m ² | |
| Transport: Secure bicycle parks required | 341 | |
| Project sustainability score | | 276.2 / 500 |

Construction and Building Management

The project encourages environmental management during the design and construction phase by:

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| <ul style="list-style-type: none"> Prioritising the use of local materials (as covered in Building Materials). |
| <ul style="list-style-type: none"> Ensuring the stormwater system is protected during construction (refer to Stormwater Management within this report) |
| <ul style="list-style-type: none"> Undertake post-occupancy commissioning and address issues that may not be performing as well as initially reported in particular: <ul style="list-style-type: none"> Rainwater tank collection and quality, leak inspection Performance of heating and cooling systems Operational recycling maximised Occupant well-being analysis |
| <ul style="list-style-type: none"> Compile a Building Users Guide consistent with Green Star's targets and inclusions not limited to the following: <ul style="list-style-type: none"> Targets and strategies for the reduction of energy usage including energy rating building performance, star ratings for appliances and lighting WELS ratings of taps and fittings with additional guidance on water-wise activities Waste reduction and recycling strategies adopted within the development Description of the building services and operational requirements for efficient and safe use of these systems; in particular: |

STEPS v5.0 Report

Revision Timestamp: 2015-10-01 16:29:18

Base Project ID: 30273

Revision: 6ff420c7791ada9bc66375ad45e1aae9

Project Details

Read the [Guide to using STEPS](#) before you begin an assessment

| | |
|-------------------------------|------------------------------------|
| Project name | Proposed Development |
| Assessor | Sharelle Haines - VIC/BDAV/11/2078 |
| Contact email address | admin@energylab.com.au |
| Street number and name | 29 Browns |
| Street type | Road ▼ |
| Suburb | Clayton |
| Postcode | 3168 |
| Municipality | Monash City Council ▼ |
| Permit number | |
| Applicant | Mushan Group |

| | |
|--|----------------------|
| Land size | 19350 m ² |
| Type of residence | Apartment ▼ |
| Number of bedrooms | 578 |
| Total number of apartments (multi-unit developments only) | 256 |

Disclaimer:

The Moreland City Council does not accept any liability for loss or damages incurred as a result of reliance placed upon STEPS. STEPS is provided on the basis that all persons using STEPS undertake responsibility for assessing the relevance and accuracy of its content. Council takes no responsibility for any

- HVAC systems and monitoring
- Electronic systems including intended operation and maintenance
- Lighting systems and efficient use
- Signs of system failures
- Monitoring indoor environment quality
- Information regarding green travel including Carparking provisions, location of bike storage and cycling networks and public transport services
- Emergency situations
 - Fire plans and escape routes
 - Lift evacuation procedures
 - Alarms and testing
 - Accessibility
- Responsibilities of building management company in support of BUG strategies and targets
- Responsibilities of residents in support of BUG strategies and targets

information or services on external websites linked to from this website.

STEPS predicts the environmental impacts of the development based on assumed usage patterns and long term climate. Actual environmental impacts will depend on actual building and appliance use patterns and efficiency as well as future climate. Information about environmental impacts should therefore be taken as indicative only and no guarantee is implied.

The Centre for Design at RMIT University makes no claim as to the accuracy or authenticity of the content of the materials element of STEPS, and does not accept liability to any person for the information or advice provided in it or incorporated into it by reference

Energy

For more information on products available for selection please see the [Energy Appliances website](#).

Enter data and features of the average dwelling in the development.

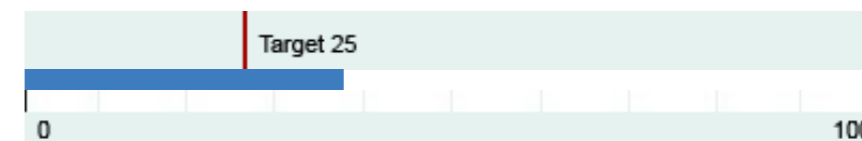
| | | |
|---|--|-----------------------|
| Building Envelope Energy Rating heating score | <input type="text" value="102.8"/> | MJ per m ² |
| Building Envelope Energy Rating cooling score | <input type="text" value="18.0"/> | MJ per m ² |
| Building Envelope Energy Rating conditioned area | <input type="text" value="127"/> | m ² |
| Building Envelope Energy Rating energy star rating | <input type="text" value="6.0"/> | stars |
| Heating system type | <input type="text" value="Gas Heating 5 stars"/> | |
| Heating system options | <input type="text" value="Central Heating"/> | |
| Cooling system type | <input type="text" value="Air-Conditioning, 4 stars"/> | |

| | |
|---|--|
| Cooling system options | <input type="text" value="Room/Space Cooling Only"/> |
| Water heater type | <input type="text" value="Gas storage 5 stars"/> |
| Lighting in living areas | <input type="text" value="LED Downlights / Spotlights"/> |
| Clothes-drying facility | <input type="text" value="No provision for drying space"/> |
| Renewable Electricity Generation | <input type="text" value=""/> |
| Renewable System Size | <input type="text" value=""/> kW (kilowatt peak output) |

Output

Energy

Score **37**



0 equals the estimated average performance of a conventional design

| | | |
|---|-------------|--|
| Required Score | 25 | % |
| Project Score | 37 | % |
| Benchmark Emissions | 8864 | kg CO ₂ / yr / dwelling |
| Target Emissions | 6648 | kg CO ₂ / yr / dwelling |
| Heating Greenhouse Gas Emissions | 432 | kg CO ₂ / yr / dwelling |
| Cooling Greenhouse Gas Emissions | 130 | kg CO ₂ / yr / dwelling |
| Water Heating Greenhouse Gas Emissions | 680 | kg CO ₂ / yr / dwelling |
| Lighting Greenhouse Gas Emissions | 230 | kg CO ₂ / yr / dwelling |
| Clothes Drying | 217 | kg CO ₂ / yr / dwelling |
| Misc incl TV, cooking, refrigerator, computer | 3910 | kg CO ₂ / yr / dwelling |
| Minus Renewable Electricity Generation | -0 | kg CO ₂ / yr / dwelling |
| Total Emissions | 5599 | kg CO₂ / yr / dwelling |

Peak Demand

Output

Peakdemand

Score **73.2**



0 equals the estimated average performance of a conventional design

| | | |
|-------------------------------|-------------|-----------|
| Required Score | 10 | % |
| Project Score | 73.2 | % |
| Benchmark Peak Demand | 3 | kW |
| Target Peak Demand | 2 | kW |
| Calculated Peak Demand | 0.7 | kW |

Water

For more information on products available for selection please see the [WELS website](#).

Fittings (for the average dwelling)

Shower type: 3 (> 4.5 but <= 6.0 plus bonus water saving feature) ▼

Toilet: 4 Star WELS rating ▼

Basin taps: 5 Star WELS rating ▼

Bath type: ▼

Re-use (for the whole building)

Rainfall area: Melbourne (Eastern) ▼

Rainwater collection tank size: 314000 L

Area of roof draining to rainwater tank: 10194 m²

Comments on rainwater tank: For Storm/WSUD Complianc

Alternative water supply other than rainwater tanks used (e.g. greywater, third pipe connection or on-site wastewater treatment and reuse): Yes

Type of alternative water supply:

Are toilets permanently connected to the rainwater tank/alternative water source?: Yes

... and also, number of toilets connected to rainwater tank: 565

Is the irrigation system permanently connected to the rainwater tank/alternative water source?: Yes

Is the washing machine(s) permanently connected to the rainwater tank?: Yes

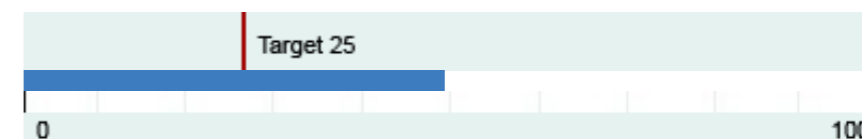
Is the hotwater services(s) permanently connected to the rainwater tank? Yes

Irrigated garden area: 2000 m²

Output

Water

Score 49



0 equals the estimated average performance of a conventional design

| | | |
|--|--------------|---------------------------|
| Required Score | 25 | % |
| Project Score | 49 | % |
| Benchmark Mains Water Consumption | 187 | kL / yr / dwelling |
| Target Mains Water Consumption | 140 | kL / yr / dwelling |
| Shower | 22.3 | kL / yr / dwelling |
| Bath | 0.0 | kL / yr / dwelling |
| Misc hot water | 44.5 | kL / yr / dwelling |
| Toilet flushing | 13.6 | kL / yr / dwelling |
| Basins | 5.6 | kL / yr / dwelling |
| Evaporative cooler | 0.0 | kL / yr / dwelling |
| Irrigation | 2.7 | kL / yr / dwelling |
| Misc other water use | 21.4 | kL / yr / dwelling |
| Total water consumption | 110.1 | kL / yr / dwelling |
| Re-used toilet flushing | 13.3 | kL / yr / dwelling |
| Re-used Irrigation | 0.8 | kL / yr / dwelling |
| Re-used Laundry | 0.0 | kL / yr / dwelling |
| Re-used Hot Water Service | 0.0 | kL / yr / dwelling |
| Re-used Total | 14.1 | kL / yr / dwelling |
| Toilet usage from mains | 0.3 | kL / yr / dwelling |
| Irrigation usage from mains | 1.9 | kL / yr / dwelling |
| Misc other usage from mains | 21.4 | kL / yr / dwelling |
| Total hot water usage from mains | 66.8 | kL / yr / dwelling |
| Total usage from mains | 96 | kL / yr / dwelling |

Stormwater

Read the [Guide to STORM](#) before you begin an assessment
 Please visit the [STORM website](#) to obtain your STORM Score.

Enter STORM Score From Website

Should MUSIC be used instead of STORM?

 Yes

Output

Stormwater

Score **100**



0 is equivalent to the typical urban pollutant loads

| | | |
|--|-----|---|
| Required Score | 100 | % |
| Project Score | 100 | % |
| Best-Practice On-Site Stormwater Treatment | 100 | % |

Materials

Read the [Moreland Greenlist](#) before you begin an assessment

| Building Element | Material | Points |
|--------------------------------------|--------------------------|-------------|
| Ground Floor | | |
| Material 1 | Standard Concrete Slab ▼ | 10.8 |
| Material 2 | ▼ | |
| Material 3 | ▼ | |
| Ground Floor Material average | | 10.8 |

Upper Floors

| | | |
|-----------------------------|--------------------------|------------|
| Material 1 | Standard Concrete Slab ▼ | 3.0 |
| Material 2 | Timber Frame ▼ | 3.2 |
| Material 3 | ▼ | |
| Upper Floors Average | | 3.1 |

Wall Framing

| | | |
|-----------------------------|---------------------------|------------|
| Material 1 | Greenlist Treated Frame ▼ | 8.4 |
| Material 2 | ▼ | |
| Material 3 | ▼ | |
| Wall Framing Average | | 8.4 |

Interior Wall Framing

| | | |
|--------------------------------------|---------------------------|------------|
| Material 1 | Greenlist Treated Frame ▼ | 8.4 |
| Material 2 | ▼ | |
| Material 3 | ▼ | |
| Interior Wall Framing Average | | 8.4 |

Wall Cladding

| | | |
|------------------------------|------------|-------------|
| Material 1 | Brick ▼ | 12.6 |
| Material 2 | FC Sheet ▼ | 11.7 |
| Material 3 | ▼ | |
| Wall Cladding Average | | 12.1 |

Windows

| | | |
|------------------------|-------------|------------|
| Material 1 | Aluminium ▼ | 3.0 |
| Material 2 | ▼ | |
| Material 3 | ▼ | |
| Windows Average | | 3.0 |

Roof Framing

| | | |
|------------|----------------|-----|
| Material 1 | Timber frame ▼ | 3.5 |
| Material 2 | ▼ | |

| | | |
|-----------------------------------|---|-------------|
| Material 3 | <input type="text"/> | |
| Roof Framing Average | | 3.5 |
| Roof Cladding | | |
| Material 1 | <input type="text" value="Steel sheet"/> | 3.5 |
| Material 2 | <input type="text"/> | |
| Material 3 | <input type="text"/> | |
| Roof Cladding Average | | 3.5 |
| Outdoor Structures | | |
| Material 1 | <input type="text" value="Timber - Other"/> | 2.5 |
| Material 2 | <input type="text"/> | |
| Material 3 | <input type="text"/> | |
| Outdoor Structures Average | | 2.5 |
| TOTALS: | | 55.3 |

Output

Materials



0 equals the estimated average performance of a conventional design

| | | |
|-----------------------------------|--------------|---------------|
| Required Score | 11 | % |
| Project Score | 17 | % |
| Benchmark Materials Impact | 47.8 | points |
| Target Materials Impact | 52.65 | points |
| Project Materials Impact | 55.3 | points |

Note:

Points are derived from materials' fate, embodied energy, biodiversity, human health and toxicity. Target is dependant on the specified building elements

Report

Project Details

| | |
|---|--------------------------------|
| Contact | admin@energylab.com.au |
| Project | 29 Browns Road Clayton 3168 |
| Municipality | Monash |
| Permit number | |
| Land size | 19350 m ² |
| Type of residence | Apartment |
| Total number of bedrooms | 578 |
| Total number of apartments (multi-unit developments only) | 256 |

| Name | Required Score | Project Score |
|--|-----------------------|----------------------|
| Greenhouse Emissions from Energy Use | 25% | 37% |
| Peak Energy Use | 10% | 73.2% |
| Mains (Drinking) Water Use | 25% | 49% |
| Stormwater Quality Impacts | 100% | 100% |
| Building Material Impacts | 11% | 17% |
| Waste Management - recyclables | 192.00 m ² | |
| Waste Management - rubbish | 64.00 m ² | |
| Waste Management - green waste | 0.25 m ² | |
| Waste Management - TOTAL | 256.25 m ² | |
| Transport: Secure bicycle parks required | 341 | |
| Project sustainability score | | 276.2 / 500 |

Upon completion of a STEPS assessment, prior to submission for a planning permit: print all pages of the assessment and ensure that the following are notated on the plans for endorsement (where applicable):

Energy

- fixed clothes drying racks; and
- the location of hot water systems (including marking solar panels on roof.)
- specifications used to achieve a 5-star FirstRate rating eg insulation and aluminium improved window framing;
- air-conditioning system and heating system types; and

- specified lighting types.

Water

- the rainwater tank, sized, and showing plumbing from the roof and to the toilets and/or garden.
- specified shower, toilet and basin types.

Stormwater

- the location, size and type of treatment systems;
- permeable paving areas;
- the proposed drainage to the treatment system; and
- section details, planting schedules and maintenance requirements of treatment types.

Materials

- material types.

Transport

- allocated bicycle parking spaces.

Waste

- allocated space for waste management.

Complete :

- an operational waste management plan for the site.

Innovation

Local Government encourages developers to consider inclusion of innovative environmental design solutions that may not be specified in STEPS. Should you wish to include additional environmentally sustainable design features in your proposed development, please notate them appropriately on the plans and include relevant design details in the planning application documentation.



STORM Rating Report

TransactionID: 274538
 Municipality: MONASH
 Rainfall Station: MONASH
 Address: 29 Browns Road

CLAYTON

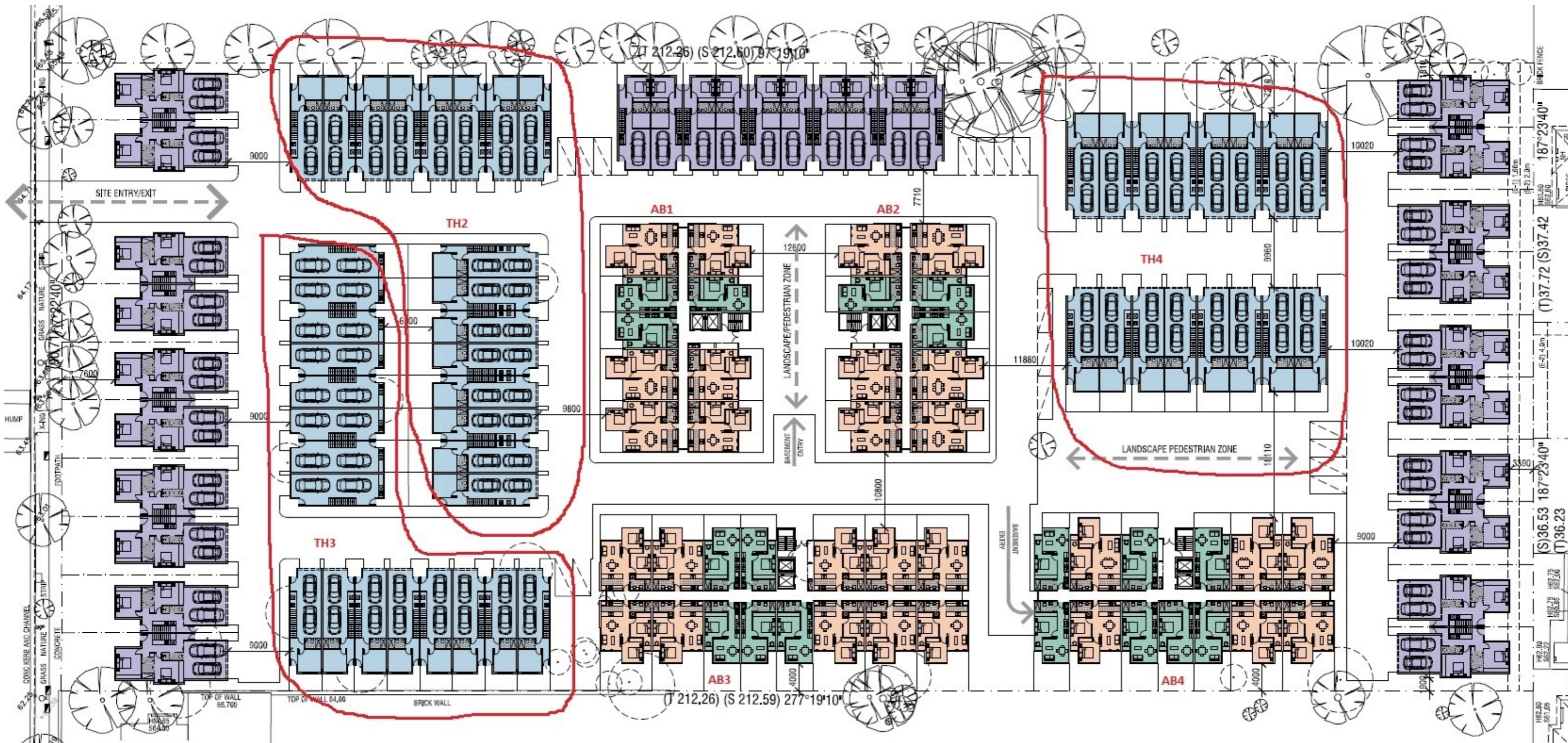
VIC 3168

Assessor: Sharelle Haines - VIC/BDAV/11/2078
 Development Type: Residential - Multiunit
 Allotment Site (m2): 19,930.00
 STORM Rating %: 100

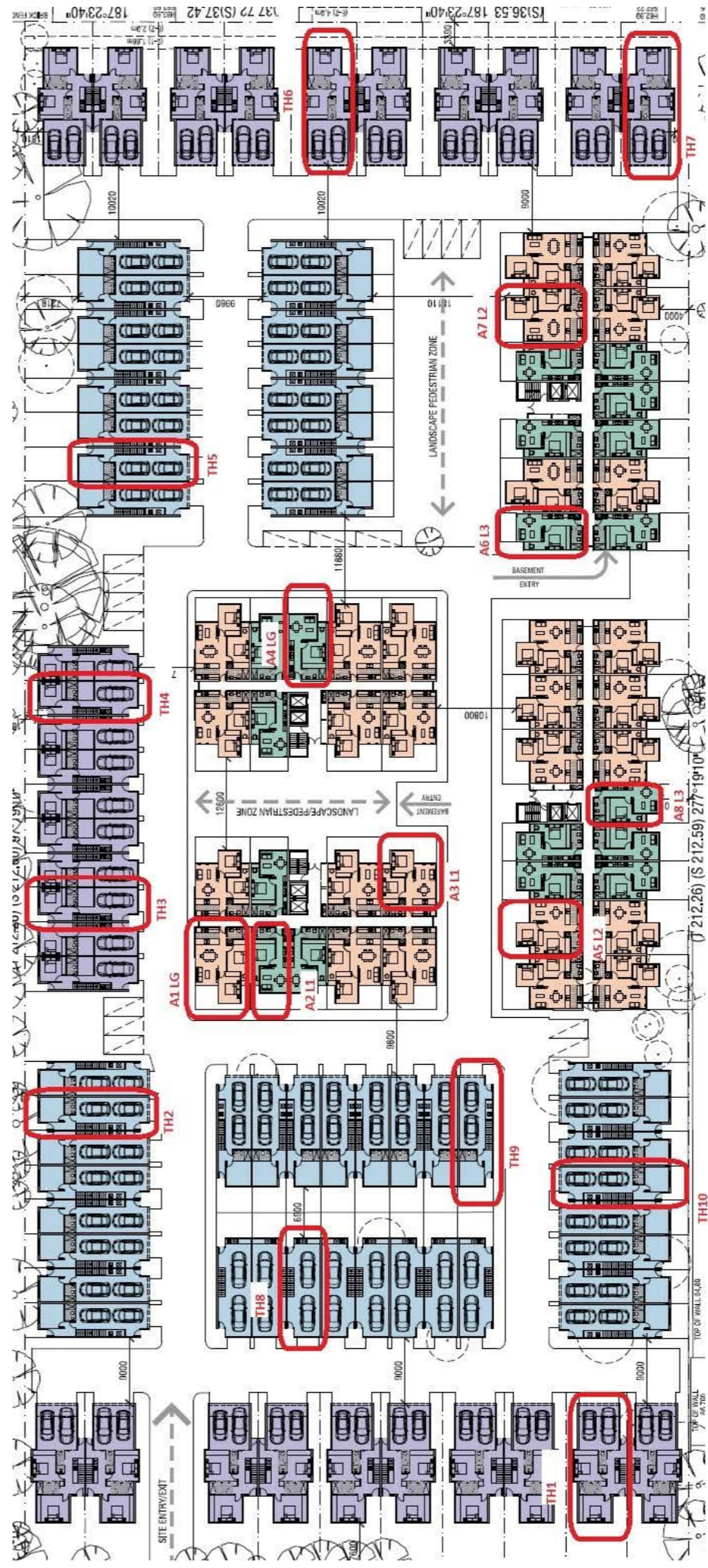
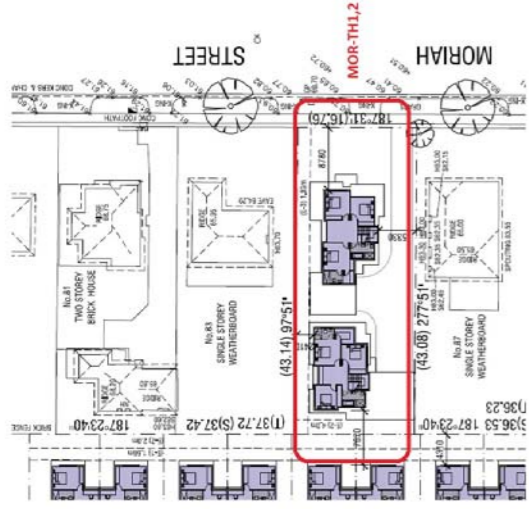
| Description | Impervious Area (m2) | Treatment Type | Treatment Area/Volume (m2 or L) | Occupants / Number Of Bedrooms | Treatment % | Tank Water Supply Reliability (%) |
|------------------------------|----------------------|----------------|---------------------------------|--------------------------------|-------------|-----------------------------------|
| Roofing area TH 4 to tanks | 1,140.00 | Rainwater Tank | 40,000.00 | 60 | 158.90 | 82.00 |
| Roofing area AB 4 to tanks | 1,015.00 | Rainwater Tank | 25,000.00 | 70 | 144.80 | 78.00 |
| Roofing area TH 3 to tanks | 1,082.00 | Rainwater Tank | 40,000.00 | 60 | 161.20 | 82.00 |
| Roofing area AB 3 to tanks | 1,230.00 | Rainwater Tank | 40,000.00 | 100 | 156.60 | 81.00 |
| Hard surface area to storn | 5,250.00 | None | 0.00 | 0 | 0.00 | 0.00 |
| Roofing area TH 2 to tanks | 1,140.00 | Rainwater Tank | 40,000.00 | 60 | 158.90 | 82.00 |
| Roofing area AB 2 to tanks | 785.00 | Rainwater Tank | 25,000.00 | 60 | 155.80 | 81.00 |
| Roofing area TH 1 to tanks | 2,700.00 | Rainwater Tank | 75,000.00 | 100 | 146.40 | 84.60 |
| Roofing area AB 1 to tanks | 785.00 | Rainwater Tank | 25,000.00 | 60 | 155.80 | 81.00 |
| Roofing area MOR1,2 to tanks | 317.00 | Rainwater Tank | 4,000.00 | 8 | 89.50 | 79.70 |

Date Generated: 01-Oct-2015

Program Version: 1.0.0



TH1 = all purple buildings



SAMPLE UNIT RATINGS



7 Commercial Drive
 Lynbrook 3975
 T: 1300 033 343
 E: admin@energylab.com.au
 www.energylab.com.au

SAMPLE UNITS – 29 BROWNS ROAD, CLAYTON

Summary of Results

| Unit No. | Star Rating | Unit No. | Star Rating |
|-----------------------------|-------------|----------|-------------|
| TH1 | 6.0 | A1 | 5.6 |
| TH2 | 6.0 | A2 | 6.8 |
| TH3 | 6.0 | A3 | 5.0 |
| TH4 | 6.0 | A4 | 6.1 |
| TH5 | 6.0 | A5 | 6.6 |
| TH6 | 6.0 | A6 | 6.6 |
| TH7 | 6.0 | A7 | 6.4 |
| TH8 | 6.2 | A8 | 5.5 |
| TH9 | 6.0 | THM2 | 6.1 |
| TH10 | 6.1 | | |
| Average 6.0 stars estimated | | | |

6-Star Energy Report Inclusions

Indicative Energy Efficiency items for all units: (refer to spreadsheet data for specific inclusions)

- Wall insulation to reach R2.0 – R2.5 + foil (no foil to party walls)
- Ceiling insulation to reach R2.5 – R6.0
- Intermediate floor insulation required to selected townhouses
- Suspended slab insulation required to all ground floor apartments
- Windows to be glazed in accordance with spreadsheet data for sample apartments
- Weatherseals to entry doors and windows
- Gaps and cracks to be sealed
- Exhaust fans to be sealed



7 Commercial Drive
 Lynbrook VIC 3975
 T: 1300 033 343
 F: 61 3 5941 9288
 E: admin@energylab.com.au
 www.energylab.com.au

Sample Townhouses / 29 Browns Road, Clayton

| | HEATING | COOLING | STAR RATING | N.C.F.A | Wall ins. | Floor Ins. b/w ground & 1st floors | Ceiling Ins | DG windows | |
|---------|---------|---------|-------------|---------|-----------|------------------------------------|-------------|-----------------|------------------|
| TH1 | 103.6 | 18.4 | 6.0 | 133.2 | 2.5 | 2.5 | 5.0 | all | 2 storey TH semi |
| TH2 | 108.8 | 14.8 | 6.0 | 119.2 | 2.0 | 0.0 | 2.5 | none | 3 storey TH |
| TH3 | 106.4 | 17.3 | 6.0 | 69.7 | 2.5 | 2.5 | 6.0 | all bedrooms | 2 storey TH |
| TH4 | 106.5 | 17.9 | 6.0 | 69.1 | 2.5 | 2.5 | 6.0 | all bedrooms | 2 storey TH |
| TH5 | 109.5 | 14.1 | 6.0 | 119.3 | 2.0 | 0.0 | 2.5 | none | 3 storey TH |
| TH6 | 104.9 | 19.4 | 6.0 | 132.8 | 2.5 | 2.5 | 6.0 | all | 2 storey TH semi |
| TH7 | 104.4 | 19.8 | 6.0 | 132.8 | 2.5 | 2.5 | 6.0 | All DG A&L (3.) | 2 storey TH semi |
| TH8 | 95.8 | 21.1 | 6.2 | 88.6 | 2.0 | 2.5 | 2.5 | none | 3 storey TH |
| TH9 | 103.6 | 20.1 | 6.0 | 119.5 | 2.5 | 2.5 | 6.0 | Bedroom 1 an | 2 storey TH semi |
| TH10 | 111.2 | 13.8 | 6.0 | 119.4 | 2.0 | 2.5 | 2.5 | none | 3 storey TH |
| TH2-M | 101.6 | 18.4 | 6.1 | 149.0 | 2.0 | 0.0 | 2.5 | NONE | 2 storey TH |
| SUM | 1156.3 | 195.1 | 66.3 | 1252.6 | | | | | |
| AVERAGE | 105.1 | 17.7 | 6.0 | 113.9 | | | | | |



7 Commercial Drive
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Sample Apartments / 29 Browns Road, Clayton

| | HEATING | COOLING | STAR RATING | N.C.F.A | Wall ins. | Floor Ins. Over carpark | Ceiling Ins | DG windows | floor no. |
|----------------|--------------|--------------|-------------|--------------|-----------|----------------------------|-------------|----------------------|-----------|
| A1 | 115.0 | 21.5 | 5.6 | 62.2 | 2.0 | 1.2 | 0.0 | none | ground |
| A2 | 80.4 | 16.4 | 6.8 | 40.6 | 2.0 | 0.0 | 0.0 | none | 1st floor |
| A3 | 144.3 | 20.3 | 5.0 | 62.2 | 2.0 | 0.0 | 0.0 | 900mm bedroom window | 1st floor |
| A4 | 108.2 | 13.4 | 6.1 | 40.6 | 2.0 | 1.2 | 0.0 | none | ground |
| A5 | 88.8 | 12.6 | 6.6 | 54.5 | 2.0 | 0.0 | 0.0 | none | 2nd floor |
| A6 | 84.9 | 16.6 | 6.6 | 40.3 | 2.0 | 0.0 | 4.0 | none | 3rd floor |
| A7 | 97.1 | 12.1 | 6.4 | 61.7 | 2.0 | 0.0 | 0.0 | none | 2nd floor |
| A8 | 121.8 | 21.9 | 5.5 | 36.3 | 2.0 | 0.0 | 4.0 | none | 3rd floor |
| SUM | 840.5 | 134.8 | 48.6 | 398.4 | | | | | |
| AVERAGE | 105.1 | 16.9 | 6.1 | 49.8 | | | | | |

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Apartment 1/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 13-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m² |
|---------|--------------|
| Total | 136.5 |
| Heating | 115.0 |
| Cooling | 21.5 |

Areas

| Area | Size (m²) |
|-----------------------------------|-----------|
| Net Conditioned Floor Area (NCFA) | 62.2 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 0.0 |

Zones

| Zone | Area (m²) | Conditioning Type | Conditioned |
|----------------|-----------|-------------------|-------------|
| Bedroom 2 | 12.7 | bedroom | Y |
| Bedroom 1 | 14.4 | bedroom | Y |
| Kitchen/Living | 30.3 | kitchen | Y |
| Bathroom | 4.8 | otherDayCond | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m²) |
|--------------|------------|------------------------|-----------|
| Brick Veneer | 2.0 | 1 | 63.9 |
| Party Wall | 4.0 | 0 | 18.6 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------|------------|-------------|------------------------|
| SuspSlab | 1.2 | encl | 62.2 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|----------------------------|------------|------------------------|
| Slab:Slab - Suspended Slab | 0.0 | 62.2 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 29.52 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| N | 13.9 |
| W | 15.6 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 2 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Bathroom | 249.8 | 1211.3 | 0.0 | 0.0 |
| Kitchen/Living | 107.1 | 3242.1 | 37.0 | 1121.7 |
| Bedroom 2 | 238.2 | 3028.2 | 25.9 | 329.3 |
| Bedroom 1 | 30.2 | 433.8 | 2.0 | 28.3 |

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Apartment 2/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 13-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 96.8 |
| Heating | 80.4 |
| Cooling | 16.4 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 40.6 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 0.0 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Kitchen/Living | 21.2 | kitchen | Y |
| Bedroom | 14.6 | bedroom | Y |
| Bathroom | 4.8 | otherDayCond | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Party Wall | 4.0 | 0 | 39.1 |
| Brick Veneer | 2.0 | 1 | 25.6 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------|------------|-------------|------------------------|
| SuspSlab | 0.0 | encl | 40.6 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|----------------------------|------------|------------------------|
| Slab:Slab - Suspended Slab | 0.0 | 40.6 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 10.32 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| W | 10.3 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 2 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Bathroom | 122.8 | 590.8 | 0.2 | 0.9 |
| Kitchen/Living | 127.2 | 2692.8 | 30.8 | 652.4 |
| Bedroom | 5.5 | 80.2 | 2.2 | 31.8 |

Provisional Diagnostic Information 17-08-2015 14:01:10 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information**FirstRate® Provisional Diagnostic Information****Project Information**

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Deign Studio |
| Rated Address | Sample Apartment 3/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 13-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 164.6 |
| Heating | 144.3 |
| Cooling | 20.3 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 62.2 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 0.0 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Bedroom 2 | 12.7 | bedroom | Y |
| Bedroom 1 | 14.4 | bedroom | Y |
| Kitchen/Living | 30.3 | kitchen | Y |
| Bathroom | 4.8 | otherDayCond | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 2.0 | 1 | 63.9 |
| Party Wall | 4.0 | 0 | 18.6 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------|------------|-------------|------------------------|
| SuspSlab | 0.0 | encl | 62.2 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|----------------------------|------------|------------------------|
| Slab:Slab - Suspended Slab | 0.0 | 62.2 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 27.36 |
| Generic 15: Aluminium improved double-glazed: clear/6 air gap/clear: U = 3.95: SHGC = 0.68 | 3.95 | 0.68 | 2.13 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| S | 13.9 |
| E | 15.6 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 2 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Bathroom | 139.9 | 678.2 | 0.5 | 2.6 |
| Kitchen/Living | 184.4 | 5583.9 | 33.7 | 1020.7 |
| Bedroom 2 | 251.6 | 3198.1 | 23.1 | 293.6 |
| Bedroom 1 | 9.6 | 137.7 | 2.5 | 35.4 |

Provisional Diagnostic Information 17-08-2015 14:10:59 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information**FirstRate® Provisional Diagnostic Information****Project Information**

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Apartment 4/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 13-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 121.5 |
| Heating | 108.2 |
| Cooling | 13.4 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 40.6 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 0.0 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Kitchen/Living | 21.2 | kitchen | Y |
| Bedroom | 14.6 | bedroom | Y |
| Bathroom | 4.8 | otherDayCond | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Party Wall | 4.0 | 0 | 39.1 |
| Brick Veneer | 2.0 | 1 | 25.6 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------|------------|-------------|------------------------|
| SuspSlab | 1.2 | encl | 40.6 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|----------------------------|------------|------------------------|
| Slab:Slab - Suspended Slab | 0.0 | 40.6 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 10.32 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| E | 10.3 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 2 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Bathroom | 259.4 | 1248.6 | 0.0 | 0.0 |
| Kitchen/Living | 148.6 | 3146.1 | 26.2 | 554.9 |
| Bedroom | 13.1 | 191.6 | 0.8 | 12.1 |

Provisional Diagnostic Information 17-08-2015 14:13:21 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information**FirstRate® Provisional Diagnostic Information****Project Information**

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Apartment 5/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 13-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 101.4 |
| Heating | 88.8 |
| Cooling | 12.6 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 54.5 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 0.0 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Bedroom 1 | 12.0 | bedroom | Y |
| Bedroom 2 | 10.6 | bedroom | Y |
| Bathroom | 4.8 | otherDayCond | Y |
| Kitchen/Living | 27.1 | kitchen | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 2.0 | 1 | 42.4 |
| Party Wall | 4.0 | 0 | 33.6 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------|------------|-------------|------------------------|
| SuspSlab | 0.0 | encl | 54.5 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|----------------------------|------------|------------------------|
| Slab:Slab - Suspended Slab | 0.0 | 54.5 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 19.44 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| N | 15.6 |
| E | 3.8 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 2 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Bathroom | 146.9 | 699.5 | 0.5 | 2.3 |
| Kitchen/Living | 68.3 | 1851.4 | 16.0 | 433.0 |
| Bedroom 2 | 214.1 | 2271.0 | 23.2 | 246.5 |
| Bedroom 1 | 18.9 | 227.1 | 2.9 | 34.3 |

Provisional Diagnostic Information 17-08-2015 14:15:14 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information**FirstRate® Provisional Diagnostic Information****Project Information**

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Apartment 6/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 13-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 101.5 |
| Heating | 84.9 |
| Cooling | 16.6 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 40.3 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 0.0 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Bedroom | 14.5 | bedroom | Y |
| Kitchen/Living | 21.0 | kitchen | Y |
| Bathroom | 4.8 | otherDayCond | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 2.0 | 1 | 46.1 |
| Party Wall | 4.0 | 0 | 18.4 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------|------------|-------------|------------------------|
| SuspSlab | 0.0 | encl | 40.3 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Framed:Flat - Flat Framed (Metal Deck) | 4.0 | 40.3 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 10.32 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| N | 10.3 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 2 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Bathroom | 222.5 | 1058.0 | 2.4 | 11.2 |
| Bedroom | 32.8 | 476.4 | 6.2 | 90.5 |
| Kitchen/Living | 111.1 | 2334.4 | 31.2 | 656.0 |

Provisional Diagnostic Information 17-08-2015 14:17:10 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information**FirstRate® Provisional Diagnostic Information****Project Information**

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Apartment 7/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 13-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 109.2 |
| Heating | 97.1 |
| Cooling | 12.1 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 61.7 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 0.0 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Kitchen/Living | 30.1 | kitchen | Y |
| Bathroom | 4.8 | otherDayCond | Y |
| Bedroom 1 | 14.3 | bedroom | Y |
| Bedroom 2 | 12.5 | bedroom | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Party Wall | 4.0 | 0 | 37.2 |
| Brick Veneer | 2.0 | 1 | 45.6 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------|------------|-------------|------------------------|
| SuspSlab | 0.0 | encl | 61.7 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|----------------------------|------------|------------------------|
| Slab:Slab - Suspended Slab | 0.0 | 61.7 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 21.12 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| N | 15.8 |
| W | 5.3 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 2 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Bathroom | 148.7 | 712.6 | 0.6 | 2.8 |
| Kitchen/Living | 76.3 | 2298.9 | 14.2 | 427.5 |
| Bedroom 2 | 238.3 | 2987.9 | 24.6 | 308.5 |
| Bedroom 1 | 16.4 | 234.0 | 2.7 | 39.0 |

Provisional Diagnostic Information 17-08-2015 14:18:58 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information**FirstRate® Provisional Diagnostic Information****Project Information**

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Apartment 8/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 13-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 143.7 |
| Heating | 121.8 |
| Cooling | 21.9 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 36.3 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 0.0 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Kitchen/Living | 21.2 | kitchen | Y |
| Bathroom | 5.1 | otherDayCond | Y |
| Bedroom | 10.0 | bedroom | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Party Wall | 4.0 | 0 | 24.8 |
| Brick Veneer | 2.0 | 1 | 33.7 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------|------------|-------------|------------------------|
| SuspSlab | 0.0 | encl | 36.3 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Framed:Flat - Flat Framed (Metal Deck) | 4.0 | 36.3 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 12.96 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| S | 13.0 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 2 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|----------------|------------------------------|--------------------|------------------------------|--------------------|
| Bathroom | 188.8 | 968.5 | 5.2 | 26.5 |
| Kitchen/Living | 135.3 | 2866.9 | 34.3 | 727.4 |
| Bedroom | 126.5 | 1261.7 | 16.1 | 161.0 |

Provisional Diagnostic Information 17-08-2015 14:23:14 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information**FirstRate® Provisional Diagnostic Information****Project Information**

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 1/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 122.0 |
| Heating | 103.6 |
| Cooling | 18.4 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 133.2 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 34.1 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|------------|------------------------|-------------------|-------------|
| Garage | 34.1 | garage | N |
| Pdr1 | 2.9 | otherDayCond | Y |
| Entry | 15.7 | otherDayCond | Y |
| Bedroom 2 | 14.9 | bedroom | Y |
| Bathroom 1 | 5.4 | otherDayCond | Y |
| Bedroom 1 | 16.0 | bedroom | Y |
| Stairs1 | 2.8 | otherDayCond | Y |
| Bedroom 3 | 14.7 | bedroom | Y |
| Bathroom 2 | 4.5 | otherDayCond | Y |
| Bedroom 4 | 11.5 | bedroom | Y |
| Passage | 10.1 | otherDayCond | Y |
| Pdr2 | 2.3 | otherDayCond | Y |
| Stairs2 | 3.8 | otherDavCond | Y |

| | | | |
|----------------|------|---------|---|
| Kitchen/Living | 30.5 | kitchen | Y |
|----------------|------|---------|---|

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 39.3 |
| Brick Veneer | 2.5 | 1 | 130.5 |
| Party Wall | 4.0 | 0 | 36.5 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 91.9 |
| Timber | 2.5 | encl | 77.4 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 78.2 |
| Framed:Flat - Flat Framed (Metal Deck) | 0.0 | 9.0 |
| Framed:Flat - Flat Framed (Metal Deck) | 5.0 | 82.1 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|---|---------|------|------------------------|
| Generic 15: Aluminium improved double-glazed: clear/6 air gap/clear: U = 3.95: SHGC = 0.68 | 3.95 | 0.68 | 25.95 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| W | 7.2 |
| N | 5.8 |
| E | 13.0 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 5 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|----------------|------------------------------|--------------------|------------------------------|--------------------|
| Kitchen/Living | 73.1 | 2231.8 | 65.1 | 1987.7 |
| Bathroom 2 | 213.1 | 961.7 | 12.4 | 55.9 |
| Passage | 92.5 | 938.5 | 1.9 | 19.3 |
| Bedroom 3 | 48.2 | 706.1 | 22.9 | 335.8 |
| Bedroom 2 | 30.4 | 451.7 | 1.6 | 24.2 |
| Bedroom 1 | 57.8 | 926.5 | 10.6 | 169.9 |
| Pdr2 | 142.6 | 325.9 | 1.2 | 2.7 |
| Entry | 296.0 | 4655.8 | 1.0 | 15.8 |
| Bedroom 4 | 16.2 | 186.5 | 9.0 | 103.4 |
| Pdr1 | 380.4 | 1108.8 | 0.8 | 2.4 |
| Stairs2 | 62.9 | 237.8 | 0.4 | 1.7 |
| Stairs1 | 225.7 | 641.1 | 0.0 | 0.0 |
| Bathroom 1 | 364.1 | 1973.8 | 0.7 | 3.6 |

Provisional Diagnostic Information 17-08-2015 14:01:22 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 2/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 123.5 |
| Heating | 108.8 |
| Cooling | 14.8 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 119.2 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 38.3 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Garage | 38.3 | garage | N |
| Bedroom 1 | 10.9 | bedroom | Y |
| Bathroom 1 | 3.4 | otherDayCond | Y |
| Entry | 8.2 | otherDayCond | Y |
| Kitchen/Living | 37.5 | kitchen | Y |
| Bathroom 2 | 3.7 | otherDayCond | Y |
| Bedroom 2 | 14.9 | bedroom | Y |
| Bedroom 3 | 15.0 | bedroom | Y |
| Bathroom 3 | 4.6 | otherDayCond | Y |
| Landing | 10.3 | otherDayCond | Y |
| Bedroom 4 | 15.0 | bedroom | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|-------------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 47.7 |
| Brick Veneer | 2.0 | 1 | 24.1 |
| Party Wall | 4.0 | 0 | 138.0 |
| Fibro Clad Framed | 2.0 | 0 | 34.4 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 60.8 |
| Timber | 0.0 | encl | 101.0 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 100.4 |
| Framed:Flat - Flat Framed (Metal Deck) | 2.5 | 61.4 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 24.87 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| N | 17.4 |
| S | 7.5 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 4 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|-----------|------------------------------|--------------------|------------------------------|--------------------|
| Entry | 283.6 | 2335.0 | 0.0 | 0.0 |
| Bedroom 1 | 94.9 | 1421.2 | 12.2 | 108.2 |

| | | | | |
|----------------|-------|--------|------|--------|
| Bedroom 4 | 94.9 | 1421.9 | 15.2 | 190.2 |
| Kitchen/Living | 89.9 | 3368.7 | 31.5 | 1179.9 |
| Bathroom 3 | 169.7 | 786.9 | 8.8 | 40.9 |
| Bathroom 2 | 248.7 | 926.9 | 4.4 | 16.3 |
| Bathroom 1 | 305.6 | 1047.3 | 0.1 | 0.2 |
| Landing | 125.8 | 1300.6 | 6.7 | 69.5 |
| Bedroom 3 | 71.8 | 1077.0 | 12.6 | 189.6 |
| Bedroom 2 | 77.3 | 1147.8 | 9.6 | 142.5 |
| Bedroom 1 | 48.8 | 529.6 | 5.0 | 54.4 |

Provisional Diagnostic Information 17-08-2015 14:10:43 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 3/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 123.7 |
| Heating | 106.4 |
| Cooling | 17.3 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 69.7 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 32.7 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Garage | 32.7 | garage | N |
| Bedroom 1 | 11.4 | bedroom | Y |
| Bathroom 1 | 3.5 | otherDayCond | Y |
| Entry | 7.7 | otherDayCond | Y |
| Kitchen/Living | 31.0 | kitchen | Y |
| Bathroom 2 | 3.8 | otherDayCond | Y |
| Bedroom 2 | 14.8 | bedroom | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 42.5 |
| Party Wall | 4.0 | 0 | 80.6 |
| Brick Veneer | 2.5 | 1 | 27.1 |

| | | | |
|-------------------|-----|---|------|
| Fibro Clad Framed | 2.5 | 0 | 10.8 |
|-------------------|-----|---|------|

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 55.4 |
| Timber | 2.5 | encl | 49.6 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 49.0 |
| Framed:Flat - Flat Framed (Metal Deck) | 6.0 | 56.0 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|---|---------|------|------------------------|
| Generic 15: Aluminium improved double-glazed: clear/6 air gap/clear: U = 3.95: SHGC = 0.68 | 3.95 | 0.68 | 5.28 |
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 10.56 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| N | 13.2 |
| S | 2.6 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 3 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|----------------|------------------------------|--------------------|------------------------------|--------------------|
| Entry | 336.7 | 2600.5 | 0.0 | 0.0 |
| Kitchen/Living | 86.7 | 2691.0 | 40.4 | 1252.7 |
| Bathroom 2 | 195.5 | 734.1 | 3.7 | 13.9 |
| Bathroom 1 | 379.8 | 1333.8 | 0.0 | 0.0 |

| | | | | |
|-----------|------|-------|-----|-------|
| Bedroom 2 | 52.8 | 782.3 | 7.4 | 110.3 |
| Bedroom 1 | 41.5 | 473.5 | 2.4 | 27.0 |

Provisional Diagnostic Information 17-08-2015 14:14:59 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 4/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 124.4 |
| Heating | 106.5 |
| Cooling | 17.9 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 69.1 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 32.7 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Garage | 32.7 | garage | N |
| Bedroom 1 | 11.4 | bedroom | Y |
| Bathroom 1 | 3.5 | otherDayCond | Y |
| Entry | 7.7 | otherDayCond | Y |
| Kitchen/Living | 31.0 | kitchen | Y |
| Bathroom 2 | 3.8 | otherDayCond | Y |
| Bedroom 2 | 14.8 | bedroom | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 42.5 |
| Brick Veneer | 2.5 | 1 | 27.1 |
| Party Wall | 4.0 | 0 | 80.6 |

| | | | |
|-------------------|-----|---|------|
| Fibro Clad Framed | 2.5 | 0 | 10.8 |
|-------------------|-----|---|------|

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 55.4 |
| Timber | 2.5 | encl | 49.6 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 49.0 |
| Framed:Flat - Flat Framed (Metal Deck) | 6.0 | 56.0 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|---|---------|------|------------------------|
| Generic 15: Aluminium improved double-glazed: clear/6 air gap/clear: U = 3.95: SHGC = 0.68 | 3.95 | 0.68 | 5.28 |
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 10.56 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| N | 13.2 |
| S | 2.6 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 3 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|----------------|------------------------------|--------------------|------------------------------|--------------------|
| Entry | 337.3 | 2605.2 | 0.0 | 0.0 |
| Kitchen/Living | 85.5 | 2653.9 | 41.5 | 1288.4 |
| Bathroom 2 | 190.4 | 715.1 | 4.0 | 15.1 |
| Bathroom 1 | 379.0 | 1330.9 | 0.0 | 0.0 |

| | | | | |
|-----------|------|-------|-----|-------|
| Bedroom 2 | 52.5 | 777.3 | 7.5 | 111.5 |
| Bedroom 1 | 41.5 | 473.7 | 2.4 | 27.0 |

Provisional Diagnostic Information 17-08-2015 14:17:31 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 5/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 123.6 |
| Heating | 109.5 |
| Cooling | 14.1 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 119.3 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 38.3 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Garage | 38.3 | garage | N |
| Bedroom 1 | 10.9 | bedroom | Y |
| Bathroom 1 | 3.4 | otherDayCond | Y |
| Entry | 8.2 | otherDayCond | Y |
| Kitchen/Living | 37.5 | kitchen | Y |
| Bathroom 2 | 3.7 | otherDayCond | Y |
| Bedroom 2 | 14.9 | bedroom | Y |
| Bedroom 3 | 15.0 | bedroom | Y |
| Bathroom 3 | 4.6 | otherDayCond | Y |
| Landing | 10.3 | otherDayCond | Y |
| Bedroom 4 | 15.0 | bedroom | Y |

Walls

| |
|--|
| |
|--|

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|-------------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 47.7 |
| Brick Veneer | 2.0 | 1 | 24.1 |
| Party Wall | 4.0 | 0 | 138.0 |
| Fibro Clad Framed | 2.0 | 0 | 34.4 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 60.8 |
| Timber | 0.0 | encl | 101.0 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 100.4 |
| Framed:Flat - Flat Framed (Metal Deck) | 2.5 | 61.4 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 24.87 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| N | 17.4 |
| S | 7.5 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 4 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|-----------|------------------------------|--------------------|------------------------------|--------------------|
| Entry | 283.3 | 2333.1 | 0.0 | 0.0 |
| Bedroom 4 | 95.1 | 1423.2 | 13.3 | 108.4 |

| Bedroom 4 | 95.1 | 1423.2 | 13.3 | 108.4 |
|----------------|-------|--------|------|--------|
| Kitchen/Living | 92.4 | 3460.4 | 29.0 | 1085.1 |
| Bathroom 3 | 170.4 | 790.1 | 8.8 | 40.9 |
| Bathroom 2 | 251.6 | 937.7 | 4.4 | 16.5 |
| Bathroom 1 | 306.4 | 1049.9 | 0.1 | 0.2 |
| Landing | 126.2 | 1304.6 | 6.7 | 69.5 |
| Bedroom 3 | 72.1 | 1080.9 | 12.6 | 189.6 |
| Bedroom 2 | 77.6 | 1152.2 | 9.9 | 146.9 |
| Bedroom 1 | 47.4 | 514.2 | 5.5 | 60.0 |

Provisional Diagnostic Information 17-08-2015 14:21:34 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 6/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 124.5 |
| Heating | 104.4 |
| Cooling | 20.1 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 132.8 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 34.1 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|------------|------------------------|-------------------|-------------|
| Garage | 34.1 | garage | N |
| Pdr1 | 2.9 | otherDayCond | Y |
| Entry | 15.7 | otherDayCond | Y |
| Bedroom 2 | 14.9 | bedroom | Y |
| Bathroom 1 | 5.4 | otherDayCond | Y |
| Bedroom 1 | 16.0 | bedroom | Y |
| Stairs1 | 2.8 | otherDayCond | Y |
| Bedroom 3 | 14.7 | bedroom | Y |
| Bathroom 2 | 4.5 | otherDayCond | Y |
| Bedroom 4 | 11.5 | bedroom | Y |
| Passage | 10.1 | otherDayCond | Y |
| Pdr2 | 2.3 | otherDayCond | Y |
| Stairs2 | 3.8 | otherDayCond | Y |

| | | | |
|----------------|------|---------|---|
| Kitchen/Living | 30.5 | kitchen | Y |
|----------------|------|---------|---|

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 39.3 |
| Brick Veneer | 2.5 | 1 | 130.5 |
| Party Wall | 4.0 | 0 | 36.5 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 91.9 |
| Timber | 2.5 | encl | 46.9 |
| Timber | 4.1 | encl | 30.5 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 78.2 |
| Framed:Flat - Flat Framed (Metal Deck) | 0.0 | 9.0 |
| Framed:Flat - Flat Framed (Metal Deck) | 6.0 | 82.1 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|---|---------|------|------------------------|
| Generic 15: Aluminium improved double-glazed: clear/6 air gap/clear: U = 3.95: SHGC = 0.68 | 3.95 | 0.68 | 25.95 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| E | 7.2 |
| N | 5.8 |
| W | 13.0 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 5 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |

| | | |
|-------------|---|---|
| Heater Flue | - | 0 |
|-------------|---|---|

Zone Energy Loads

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Kitchen/Living | 91.5 | 2791.7 | 77.7 | 2371.1 |
| Bathroom 2 | 193.1 | 871.6 | 13.8 | 62.2 |
| Passage | 88.0 | 893.6 | 1.9 | 18.8 |
| Bedroom 3 | 38.6 | 566.5 | 16.8 | 245.8 |
| Bedroom 2 | 29.9 | 443.9 | 2.2 | 32.9 |
| Bedroom 1 | 53.9 | 863.1 | 7.5 | 119.5 |
| Pdr2 | 138.1 | 315.7 | 1.5 | 3.5 |
| Entry | 293.6 | 4617.7 | 0.6 | 9.3 |
| Bedroom 4 | 15.4 | 177.5 | 9.0 | 103.6 |
| Pdr1 | 376.6 | 1097.5 | 0.9 | 2.6 |
| Stairs2 | 65.4 | 247.2 | 0.4 | 1.5 |
| Stairs1 | 226.5 | 643.3 | 0.0 | 0.0 |
| Bathroom 1 | 349.9 | 1897.1 | 0.7 | 3.6 |

Provisional Diagnostic Information 17-08-2015 14:25:51 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 7/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 124.2 |
| Heating | 104.4 |
| Cooling | 19.8 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 132.8 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 34.1 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|------------|------------------------|-------------------|-------------|
| Garage | 34.1 | garage | N |
| Pdr1 | 2.9 | otherDayCond | Y |
| Entry | 15.7 | otherDayCond | Y |
| Bedroom 2 | 14.9 | bedroom | Y |
| Bathroom 1 | 5.4 | otherDayCond | Y |
| Bedroom 1 | 16.0 | bedroom | Y |
| Stairs1 | 2.8 | otherDayCond | Y |
| Bedroom 3 | 14.7 | bedroom | Y |
| Bathroom 2 | 4.5 | otherDayCond | Y |
| Bedroom 4 | 11.5 | bedroom | Y |
| Passage | 10.1 | otherDayCond | Y |
| Pdr2 | 2.3 | otherDayCond | Y |
| Stairs2 | 3.8 | otherDavCond | Y |

| | | | |
|----------------|------|---------|---|
| Kitchen/Living | 30.5 | kitchen | Y |
|----------------|------|---------|---|

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 39.3 |
| Brick Veneer | 2.5 | 1 | 130.5 |
| Party Wall | 4.0 | 0 | 36.5 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 91.9 |
| Timber | 2.5 | encl | 77.4 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 78.2 |
| Framed:Flat - Flat Framed (Metal Deck) | 0.0 | 9.0 |
| Framed:Flat - Flat Framed (Metal Deck) | 6.0 | 82.1 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| A&L: Aluminium Awning Window - Double Glazed: 3mm Clear/12mm Air Gap/3mm Clear | 3.31 | 0.69 | 25.95 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| E | 7.2 |
| S | 5.8 |
| W | 13.0 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 5 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|----------------|------------------------------|--------------------|------------------------------|--------------------|
| Kitchen/Living | 85.0 | 2593.9 | 76.9 | 2347.2 |
| Bathroom 2 | 206.6 | 932.6 | 12.7 | 57.1 |
| Passage | 94.0 | 953.8 | 1.6 | 16.6 |
| Bedroom 3 | 33.4 | 489.4 | 17.3 | 253.4 |
| Bedroom 2 | 39.0 | 579.9 | 1.3 | 18.7 |
| Bedroom 1 | 50.4 | 808.1 | 7.8 | 124.7 |
| Pdr2 | 137.4 | 314.2 | 1.3 | 2.9 |
| Entry | 266.1 | 4185.7 | 0.7 | 10.8 |
| Bedroom 4 | 16.2 | 186.6 | 8.1 | 93.1 |
| Pdr1 | 466.3 | 1359.2 | 0.5 | 1.6 |
| Stairs2 | 64.8 | 245.1 | 0.4 | 1.4 |
| Stairs1 | 223.8 | 635.7 | 0.0 | 0.0 |
| Bathroom 1 | 394.0 | 2136.1 | 0.3 | 1.7 |

Provisional Diagnostic Information 17-08-2015 14:29:49 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 8/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 116.9 |
| Heating | 95.8 |
| Cooling | 21.1 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 88.6 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 57.5 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Garage | 57.5 | garage | N |
| Kitchen/Living | 33.9 | kitchen | Y |
| Bathroom 1 | 3.7 | otherDayCond | Y |
| Bedroom 1 | 11.9 | bedroom | Y |
| Bedroom 3 | 14.1 | bedroom | Y |
| Bathroom 2 | 3.9 | otherDayCond | Y |
| Bedroom 2 | 13.3 | bedroom | Y |
| Landing | 9.3 | otherDayCond | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|-------------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 85.9 |
| Fibro Clad Framed | 2.0 | 0 | 32.1 |

| | | | |
|--------------|-----|---|------|
| Party Wall | 4.0 | 0 | 95.8 |
| Brick Veneer | 2.0 | 1 | 13.9 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 57.5 |
| Timber | 2.5 | encl | 49.5 |
| Timber | 0.0 | encl | 40.5 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 98.8 |
| Framed:Flat - Flat Framed (Metal Deck) | 2.5 | 48.7 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 21.96 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| W | 15.1 |
| E | 6.8 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 3 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|----------------|------------------------------|--------------------|------------------------------|--------------------|
| Kitchen/Living | 111.3 | 3771.7 | 34.5 | 1170.1 |
| Bathroom 2 | 191.4 | 739.8 | 12.4 | 48.0 |
| Bathroom 1 | 177.5 | 665.7 | 10.0 | 37.6 |
| Landing | 122.2 | 1226.0 | 0.0 | 0.0 |

| Landing | 135.5 | 1259.5 | 0.0 | 01.0 |
|-----------|-------|--------|------|-------|
| Bedroom 3 | 96.4 | 1357.5 | 19.9 | 279.8 |
| Bedroom 2 | 89.9 | 1195.5 | 20.0 | 265.5 |
| Bedroom 1 | 54.6 | 647.7 | 19.9 | 236.2 |

Provisional Diagnostic Information 18-08-2015 13:03:39 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|---|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 9/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 123.8 |
| Heating | 103.6 |
| Cooling | 20.2 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 119.5 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 38.7 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Garage | 38.7 | garage | N |
| Entry | 8.4 | otherDayCond | Y |
| Bathroom | 3.5 | otherDayCond | Y |
| Bedroom 1 | 11.0 | bedroom | Y |
| Bedroom 2 | 14.6 | bedroom | Y |
| Bathroom 2 | 3.7 | otherDayCond | Y |
| Kitchen/Living | 37.4 | kitchen | Y |
| Bedroom 3 | 15.0 | bedroom | Y |
| Bathroom 3 | 4.6 | otherDayCond | Y |
| Landing | 11.9 | otherDayCond | Y |
| Bedroom 4 | 13.3 | bedroom | Y |

Walls

| |
|--|
| |
|--|

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|-------------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 47.9 |
| Brick Veneer | 2.5 | 1 | 98.2 |
| Party Wall | 4.0 | 0 | 66.5 |
| Fibro Clad Framed | 2.5 | 0 | 32.0 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 61.5 |
| Timber | 2.5 | encl | 55.6 |
| Timber | 0.0 | encl | 44.8 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 100.6 |
| Framed:Flat - Flat Framed (Metal Deck) | 0.0 | 6.4 |
| Framed:Flat - Flat Framed (Metal Deck) | 6.0 | 55.0 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|---|---------|------|------------------------|
| Generic 15: Aluminium improved double-glazed: clear/6 air gap/clear: U = 3.95: SHGC = 0.68 | 3.95 | 0.68 | 5.28 |
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 18.84 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| W | 9.5 |
| E | 14.6 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 4 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|----------------|------------------------------|--------------------|------------------------------|--------------------|
| Entry | 452.3 | 3805.0 | 0.8 | 6.5 |
| Bedroom 4 | 68.8 | 918.8 | 30.4 | 405.2 |
| Bathroom | 421.5 | 1466.1 | 0.3 | 0.9 |
| Bathroom 2 | 145.3 | 534.1 | 5.7 | 21.0 |
| Kitchen/Living | 79.1 | 2956.3 | 38.6 | 1440.8 |
| Bathroom 3 | 161.9 | 747.0 | 8.2 | 37.9 |
| Landing | 113.9 | 1351.2 | 6.4 | 76.5 |
| Bedroom 3 | 76.6 | 1148.6 | 21.5 | 321.9 |
| Bedroom 2 | 28.7 | 419.0 | 15.2 | 221.7 |
| Bedroom 1 | 49.4 | 542.9 | 15.7 | 172.3 |

Provisional Diagnostic Information 18-08-2015 13:06:28 Ver:5.1.11c Engine Ver:2.13 Accredited Rater:Sharelle Haines
Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|--|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 10/29 Browns Road Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 11-08-15 |
| Reference | |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 121.2 |
| Heating | 107.0 |
| Cooling | 14.2 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 119.4 |
| Unconditioned Room Area | 0.0 |
| Garage Area | 38.2 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|----------------|------------------------|-------------------|-------------|
| Garage | 38.2 | garage | N |
| Bedroom 1 | 10.9 | bedroom | Y |
| Bathroom 1 | 3.4 | otherDayCond | Y |
| Entry | 8.2 | otherDayCond | Y |
| Kitchen/Living | 37.9 | kitchen | Y |
| Bathroom 2 | 3.7 | otherDayCond | Y |
| Bedroom 2 | 14.8 | bedroom | Y |
| Bedroom 3 | 15.0 | bedroom | Y |
| Bathroom 3 | 4.6 | otherDayCond | Y |
| Landing | 11.9 | otherDayCond | Y |
| Bedroom 4 | 13.4 | bedroom | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|-------------------|------------|------------------------|------------------------|
| Brick Veneer | 0.0 | 0 | 47.6 |
| Brick Veneer | 2.0 | 1 | 24.2 |
| Party Wall | 4.0 | 0 | 138.1 |
| Fibro Clad Framed | 2.0 | 0 | 34.4 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 60.8 |
| Timber | 2.5 | encl | 56.4 |
| Timber | 0.0 | encl | 45.0 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Ceil: Ceiling | 0.0 | 101.1 |
| Framed:Flat - Flat Framed (Metal Deck) | 0.0 | 5.4 |
| Framed:Flat - Flat Framed (Metal Deck) | 2.5 | 55.6 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 24.24 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| S | 9.5 |
| N | 14.8 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 4 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|------|------------------------------|--------------------|------------------------------|--------------------|
|------|------------------------------|--------------------|------------------------------|--------------------|

| Zone | Heating (MJ/m2) | Total Heating (MJ) | Cooling (MJ/m2) | Total Cooling (MJ) |
|----------------|-----------------|--------------------|-----------------|--------------------|
| Entry | 365.4 | 3008.6 | 0.0 | 0.0 |
| Bedroom 4 | 74.5 | 1001.4 | 13.4 | 180.4 |
| Kitchen/Living | 70.2 | 2658.2 | 29.4 | 1113.1 |
| Bathroom 2 | 154.6 | 578.3 | 4.5 | 16.8 |
| Bathroom 3 | 181.8 | 842.8 | 8.5 | 39.5 |
| Bathroom 1 | 424.5 | 1454.9 | 0.0 | 0.0 |
| Landing | 115.2 | 1371.1 | 6.6 | 78.8 |
| Bedroom 3 | 91.1 | 1365.1 | 13.3 | 199.7 |
| Bedroom 2 | 45.0 | 666.0 | 10.6 | 156.9 |
| Bedroom 1 | 72.5 | 786.6 | 3.7 | 39.7 |

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Assessor's Accreditation Number:VIC/BDAV/11/2078

Provisional Diagnostic Information

FirstRate® Provisional Diagnostic Information

Project Information

| | |
|------------------|--|
| Mode | New Home |
| Climate | 62 Moorabbin Airport |
| Site Exposure | suburban |
| Client Name | Mushan Design Studio |
| Rated Address | Sample Townhouse 2 / Moriah Street Clayton |
| Accredited Rater | Sharelle Haines |
| Date | 01-10-2015 |
| Reference | MOR-SAMPLE-TH2 |

Energy Usage

| Type | Energy MJ/m ² |
|---------|--------------------------|
| Total | 120.0 |
| Heating | 101.6 |
| Cooling | 18.4 |

Areas

| Area | Size (m ²) |
|-----------------------------------|------------------------|
| Net Conditioned Floor Area (NCFA) | 149.0 |
| Unconditioned Room Area | 16.2 |
| Garage Area | 35.2 |

Zones

| Zone | Area (m ²) | Conditioning Type | Conditioned |
|---------------|------------------------|-------------------|-------------|
| Garage | 35.2 | garage | N |
| bed1 | 12.9 | bedroom | Y |
| kitch-din-liv | 58.3 | kitchen | Y |
| stairwell | 4.9 | otherDayCond | Y |
| entry | 3.6 | otherDayCond | Y |
| laundry | 7.1 | otherDayCond | N |
| hall2 | 3.7 | otherDayCond | Y |
| wc | 2.2 | otherDayCond | N |
| ens | 4.0 | otherNightCond | Y |
| bed2 | 11.9 | bedroom | Y |
| retreat | 17.5 | living | Y |
| master | 18.2 | bedroom | Y |
| bed3 | 12.6 | bedroom | Y |

| | | | |
|------|-----|----------------|---|
| bath | 6.9 | otherDayCond | N |
| ens2 | 4.0 | otherNightCond | Y |

Walls

| Type | Insulation | Num Reflective Airgaps | Area (m ²) |
|--------------|------------|------------------------|------------------------|
| Brick Veneer | 2.0 | 0 | 224.7 |

Floors

| Type | Insulation | Ventilation | Area (m ²) |
|----------------------|------------|-------------|------------------------|
| CSOG: Slab on Ground | 0.0 | encl | 131.7 |
| Timber | 0.0 | encl | 71.2 |

Roofs/Ceilings

| Type | Insulation | Area (m ²) |
|--|------------|------------------------|
| Framed:Flat - Flat Framed (Metal Deck) | 0.0 | 35.2 |
| Ceil: Ceiling | 0.0 | 80.5 |
| Framed:Flat - Flat Framed (Metal Deck) | 2.5 | 16.0 |
| Cont:Attic-Continuous | 2.5 | 71.2 |

Windows

| Type | U-Value | SHGC | Area (m ²) |
|--|---------|------|------------------------|
| Generic 02: Aluminium improved single-glazed: clear glass: U = 6.35: SHGC = 0.77 | 6.35 | 0.77 | 32.91 |

Window Directions

| Direction | Area (m ²) |
|-----------|------------------------|
| S | 8.8 |
| N | 22.3 |
| E | 1.8 |

Air leakage

| Item | Sealed | Unsealed |
|--------------------|--------|----------|
| Generic Vent | - | 0 |
| Unflued Gas Heater | - | 0 |
| Exhaust Fan | 0 | 0 |
| Downlight | 0 | 0 |
| Chimney | 0 | 0 |
| Heater Flue | - | 0 |

Zone Energy Loads

| Zone | Heating (MJ/m ²) | Total Heating (MJ) | Cooling (MJ/m ²) | Total Cooling (MJ) |
|---------------|------------------------------|--------------------|------------------------------|--------------------|
| retreat | 124.5 | 2184.6 | 13.9 | 243.5 |
| entry | 411.5 | 1468.6 | 2.4 | 8.6 |
| ens2 | 140.8 | 563.5 | 27.0 | 107.9 |
| kitch-din-liv | 102.4 | 5965.2 | 34.7 | 2022.7 |
| stairwell | 151.7 | 747.8 | 0.1 | 0.5 |
| ens | 65.1 | 259.8 | 1.6 | 6.5 |
| bed3 | 83.1 | 1046.2 | 11.9 | 150.0 |
| bed1 | 66.5 | 854.3 | 6.2 | 80.1 |
| hall2 | 352.9 | 1302.5 | 0.3 | 1.2 |
| master | 62.5 | 1138.9 | 10.7 | 194.5 |
| bed2 | 82.7 | 982.6 | 15.5 | 184.5 |

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Assessor's Accreditation Number:VIC/BDAV/11/2078

