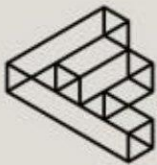


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FRATER

15 -17 Marriott Parade, Glen Waverley

30/01/2020

Sustainability Management Plan

Sustainability Management Plan (SMP)

Proposed Residential Development

Table of Contents

| | |
|---|----|
| Initiatives to be Marked on Drawings..... | 3 |
| Introduction | 4 |
| Site Description..... | 5 |
| Proposed Development | 5 |
| Energy Efficiency..... | 6 |
| Water Efficiency & Stormwater Management..... | 7 |
| Indoor Environment Quality | 8 |
| Construction, Building & Waste management..... | 9 |
| Transport..... | 10 |
| Building Materials..... | 11 |
| Urban Ecology | 12 |
| Implementation & Monitoring..... | 12 |
| Appendix A – WSUD Report / STORM Assessment | 13 |
| Appendix B – VOC & Formaldehyde Emission Limits | 17 |
| Appendix C – BESS Assessment | 19 |

DOCUMENT VERSION

Version 0: Draft issued on 20/01/2020 for Client review

Version 1: Draft issued on 21/01/2020 for Client review – updated WSUD

Version 2: Final issued on 30/01/2020 for Client review – no changes



INITIATIVES TO BE MARKED ON DRAWINGS

Water & Stormwater Management

- Mark-up showing roof catchment area to be diverted to the Rainwater tank for the development – If required, the use of charged pipe system will be explicitly acknowledged on the drawings and charged pipes will not be running underneath the building footprint
- Filtering system to be installed for the tanks due to catchment from trafficable areas
- Location and size of each Rainwater tank proposed (See Appendix A)
- Note showing connection to the all toilets for townhouses, as well as irrigation systems as required
- Note showing connection to the all toilets for apartment on **ground floor, first floor and second floor**, as well as irrigation systems as required
- Note showing use of native or drought tolerant species wherever possible. If irrigation required, include drip irrigation and mulch
- Note showing WELS rating for water fittings/fixtures (refer to report) – Fixtures (e.g. dishwasher) provided as part of base building work have to be chosen within one WELS star of best available at the time of purchase

Energy Efficiency

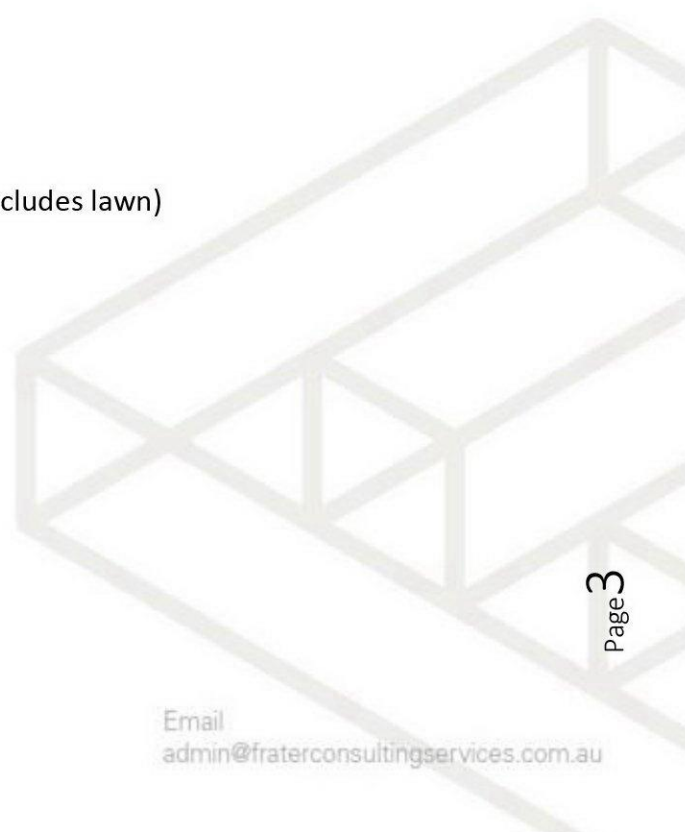
- Note showing commitment to 4W/m² lighting density in the dwellings
- Retractable external clothes drying line for townhouses
- Lighting sensors for external lighting (motion detectors, timers etc.)
- CO sensors for car park ventilation

Transport

- 22 bike spaces in the car park for residents
- One bike space for visitors

Urban Ecology

- Show extent of vegetated areas around the site (includes lawn)





INTRODUCTION

Frater Consulting Services have been engaged to undertake a Sustainability Management Plan for the proposed residential development located at 15 -17 Marriott Parade, Glen Waverley. This has been prepared to address Monash City Council's Planning Policy Clause 22.13 Environmentally Sustainable Development.

Within Clause 22.13, Monash City Council has identified the following key categories to be addressed:

- Energy Performance;
- Water Resources;
- Stormwater Management;
- Indoor Environment Quality;
- Building Materials;
- Construction, Building & Waste Management;
- Transport; and
- Urban Ecology.

The site has been assessed using the BESS tool. BESS was developed by association of councils led by Moreland City Council. This tool assesses the energy and water efficiency, thermal comfort and overall environmental sustainability performance of new buildings or alterations. It was created to demonstrate how new development can meet sustainability requirements as part of a planning permit application for the participating council.

Each target area within the BESS tool generally receives a score of between 1% and 100%. A minimum score of 50% is required for the energy, water, stormwater and IEQ areas. An overall score of 50% represents 'Best Practice' while a score over 70% represent 'Excellence'. The result of the BESS assessment is included as Appendix C.

The Stormwater Treatment Objective – Relative Measure (STORM) calculator which addresses stormwater quality considerations has been used for the development to ensure that stormwater management best practice requirements have been achieved. The result of the STORM assessment is included as Appendix A.





SITE DESCRIPTION

The proposed site is located at 15 -17 Marriott Parade, Glen Waverley. The 2,186m² site is currently occupied by single storey house which is proposed to be demolished prior to the construction of the development. It is located in an established residential zone approximately 19km south-east of the Melbourne CBD.

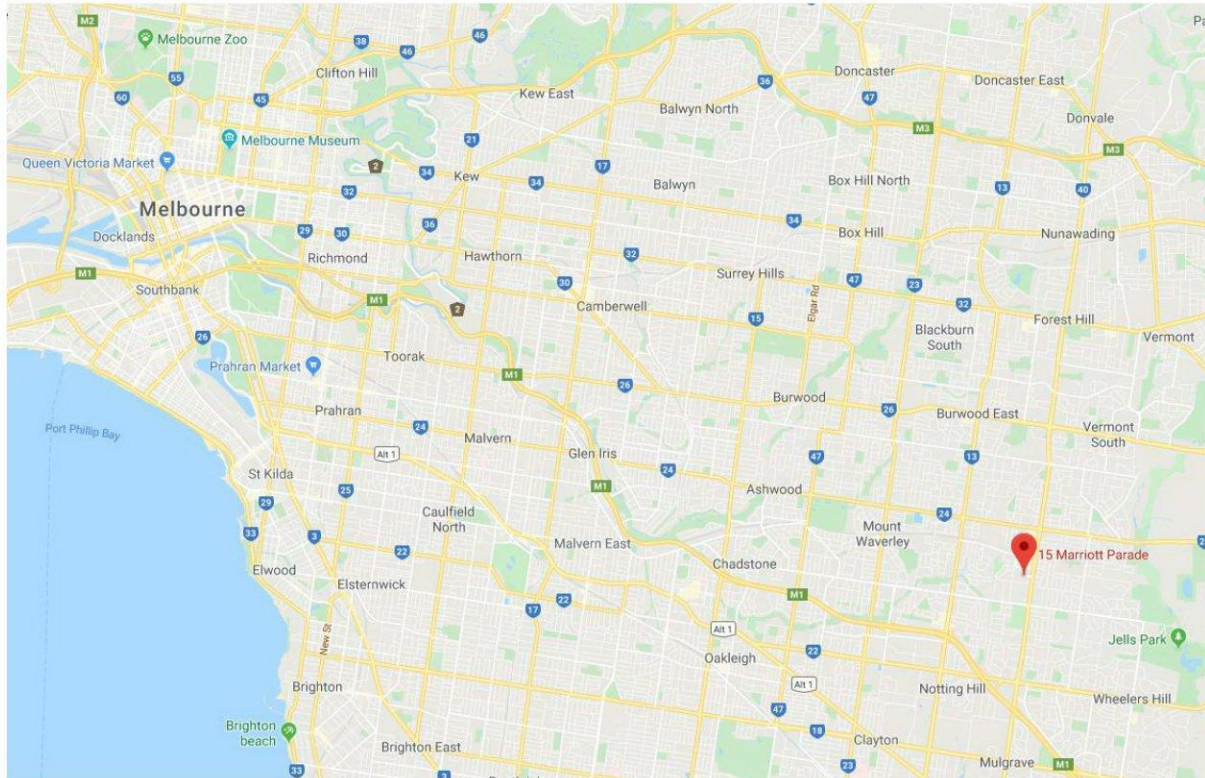
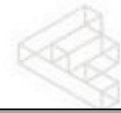


Figure 1: Location of the proposed development in Glen Waverley with relation to Melbourne CBD (Source: Google Maps)

PROPOSED DEVELOPMENT

The proposal consists of development of the site into a residential development with five townhouses (5 x 4-bedroom) and 11 apartments (11 x 4-bedroom). The basement level will include garages for townhouses and a car park comprising 22 car spaces, a central waste storage area, bicycle spaces and storage cages. The area of the site is approximately 2,186m².





ENERGY EFFICIENCY

Energy and its key elements should be integrated into the design of the proposed development. These elements contribute to reducing greenhouse gas emissions by utilising energy efficient appliances, energy conservation measures and renewable energy.

FirstRate5 Energy Rating

Energy ratings will be completed at the building approval stage. A commitment is made that all dwellings will meet the energy efficiency requirements of minimum 6.0-Star average energy rating with no individual apartment scoring less than 5.0-Stars (10% improvement above BCA requirements). This will be achieved using appropriate insulation level in all external walls (minimum R2.0), roof (minimum R4.0) and floors as well as the use of thermally efficient glazing windows throughout habitable rooms.

Heating and Cooling Systems

To reduce the energy consumption, heating and cooling in the dwellings will be provided by energy efficient air conditioners (minimum of 4 star or chosen within one star of the best available product in the range at the time of purchase or COP \geq 3.5).

Hot Water Heating

Hot water will be provided with a gas instantaneous system chosen within one star of the best available at the time of purchase (6 Star minimum).

Lighting

Lighting power consumption will be reduced by 20% as compared to NCC 2016 standards by the use of LED throughout the development. Lighting levels will not exceed 4 W/m² for all dwellings.

Common areas and external areas will have a motion sensor, time clock or daylight sensors installed which will only activate lighting when triggered.

Car Park Ventilation

Car park ventilation will be designed to best practice energy efficiency with the exhaust fans installed with CO sensors which will only operate when required.

Energy Efficient Appliances

All appliances provided in the development as part of the base building work (e.g. dishwasher) will be chosen within one energy efficiency star of the best available.

Variable Speed Drives

Variable speed drives will be installed on all major pumps and fans to reduce energy consumption.

Gas Cooking

All cooktops in the development will be gas fired. Gas cooktops generate less greenhouse gas emissions as compared to electric cooktops. Use of gas cooktops decreases peak electricity demand.



WATER EFFICIENCY & STORMWATER MANAGEMENT

Water saving-use and reuse and its key elements should be integrated into the design of the proposed development. These principles contribute to reducing the water demand in addition to promoting water reuse. Stormwater management and its key elements should be integrated into the design of the proposed development. These principles contribute to ensuring natural systems are protected and enhanced whilst promoting on-site retention and aims to reduce runoff or peak flows.

Water Efficient Fittings

The development will include efficient fittings and fixtures to reduce the volume of mains water used in the development. The following WELS star ratings will be specified;

- Toilets – 4 Star;
- Taps (bathroom and kitchen) – 5 Star; and
- Showerhead if provided – 3 Star with aeration device (6.0-7.5L/min).

Rainwater Collection & Use

Rainwater runoff from the roof/terrace area of townhouses will be collected and stored in 2,000L rainwater tanks¹ for each townhouse.

Rainwater runoff from the roof/terrace area of apartments will be collected and stored in rainwater tanks with a total effective capacity of 12,000L.

Collection will occur from trafficable areas, therefore an appropriate filtering system will be required to be installed (first flush, cartridge filter, UV) and maintained.

In the case of a charged pipe system, the charged pipes will not be running underneath the building footprint (slab) and the stakeholders (builder/developer/architect) will be required to explicitly acknowledge this solution and have the capacity to install it.

Rainwater collected will be used for toilet flushing in all townhouses, toilet flushing in apartments on **ground floor, first floor and second floor**, as well as for irrigation (as required). These initiatives will reduce significantly the stormwater impacts of the development and help achieve compliance with the STORM calculator (See Appendix A).

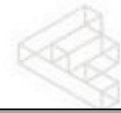
Water Efficient Appliances

All appliances provided in the development as part of the base building work (e.g. dishwasher) will be chosen within one WELS star of the best available.

Landscape Irrigation

Native or drought-tolerant plants will be preferred for the landscaped areas on site. If irrigation is required, the proposed landscaping will be provided with drip irrigation and mulch to help minimise water requirements.

¹ Please note that any stormwater detention volume requirement for the site will be in addition to the proposed rainwater retention and that the proposed tank will not be directly topped up by mains water.



INDOOR ENVIRONMENT QUALITY

Indoor Environment Quality and its key elements should be integrated into the design of the proposed development. These elements play a significant role in the health, wellbeing and satisfaction of the development occupants. Facilitating a good (IEQ) design provides a naturally comfortable indoor environment and less dependence on building services such as, artificial lighting, mechanical ventilation and heating and cooling device.

Volatile Organic Compounds

All paints, adhesives and sealants and flooring will have low VOC content. Alternatively products will be selected with no VOCs. Paints such as eColour, or equivalent should be considered. Please refer to Appendix B for VOC limits.

Formaldehyde Minimisation

All engineered wood products will have 'low' formaldehyde emissions, certified as E0 or better. Alternatively products will be specified with no Formaldehyde. Products such as ecological panel – 100% post-consumer recycled wood (or similar) will be considered for use within the development. Please refer to Appendix B for formaldehyde limits.

Daylight Levels

Daylight penetration will be enhanced with the use of light internal colours to improve daylight reflection. All living/kitchen areas have limited room depth (<9m from windows) allowing for good daylight access. All bedrooms will have access to a window (outside or light court) so no bedroom will rely on borrowed daylight. Installation of mirrored wardrobe doors could improve even further the daylight spread within the bedrooms.

Task Lighting

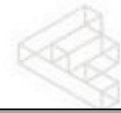
A higher illuminance level (300Lux) will be provided for all task areas (e.g. kitchen bench, bathroom basin) to ensure appropriate light is provided to do any tasks in these areas.

Ventilation

All kitchens will have a separate dedicated exhaust fan (range-hood) which will be directly exhausted out of the building.

All townhouses will have access to effective cross flow ventilation. It will provide fresh air to the occupants and reduce the need for mechanical cooling. Window locks and door catches will be included to encourage and improve natural ventilation in the dwellings.

External windows in the apartments will generally include an operable component. This will help introduce fresh air to the residents and, when weather conditions are suitable, reduce the need for mechanical cooling. Most apartments (more than 70%) will have access to effective cross-flow ventilation with the implementation of windows in opposing or adjacent walls. Window locks and door catches will be included to encourage and improve natural ventilation in the dwellings.



CONSTRUCTION, BUILDING & WASTE MANAGEMENT

Building Management and its key elements should be integrated into the design of the proposed development. These principles contribute to ensuring efficient and effective on-going building performance. Waste management and its key elements should be integrated into the design of the proposed development. These principles contribute to ensuring minimal waste is transported to landfill by means of disposal, recycling and on-site waste storage and/or collection methods.

Metering / Monitoring / Tuning

Each major common energy (air-conditioning, lighting, water heating) and water use (rainwater reuse, hot and cold water) within the proposed development will be separately metered and monitored.

Each apartment and townhouse will be separately metered for potable water and energy. Effective metering ensures that residents/tenants are responsible for their consumption and they can reduce their water consumption.

Construction Waste Management

A waste management plan will be introduced to all on-site staff at a site orientation session to ensure that the waste generated on site is minimised and disposed of correctly. A minimum 80% of all construction waste generated on site will be reused or recycled.

Construction Environmental Management

The builder will identify environmental risks related to construction and include management strategies such as maintaining effective erosion and sediment control measures during construction and operation and ensure that appropriate staging of earthworks (e.g. avoid bare earthworks in high risk areas of the site during dominant rainfall period).

Operational Waste

The development will be provided with bin storage areas in garages for townhouses and a central waste storage room in the basement for apartments. Waste storage room will have facilities both for general waste and recycling as well as hard rubbish. Recycle bins will be provided next to general waste bins in kitchens. Please refer to the Waste Management Plan for further details.



Figure 2: Examples of kitchen receptacles for general waste and recycling.



TRANSPORT

The Marriott Parade site has been assessed using the “Walk Score” tool. This tool using Google maps takes into account the number of facilities within close proximity of the site and provides a score between 1 and 100, with 1 being heavily car dependent with all facilities far from the site and 100 representing a location that is easily accessible to several facilities by foot. The Marriott Parade development achieves a score of 92 out of 100, which is classified as “Walker’s Paradise”. Walk score of 90+ indicates that the occupants can complete all daily errands without the need for a car.

15 Marriott Parade

Glen Waverley, Melbourne, 3150

Commute to **downtown melbourne**

60+ min 60+ min 60+ min [View Routes](#)

Favorite

Map

Nearby Apartments

Walk Score
92

Walker’s Paradise

Daily errands do not require a car.

Transit Score
59

Good Transit

Many nearby public transportation options.

[About your score](#)

[Add scores to your site](#)

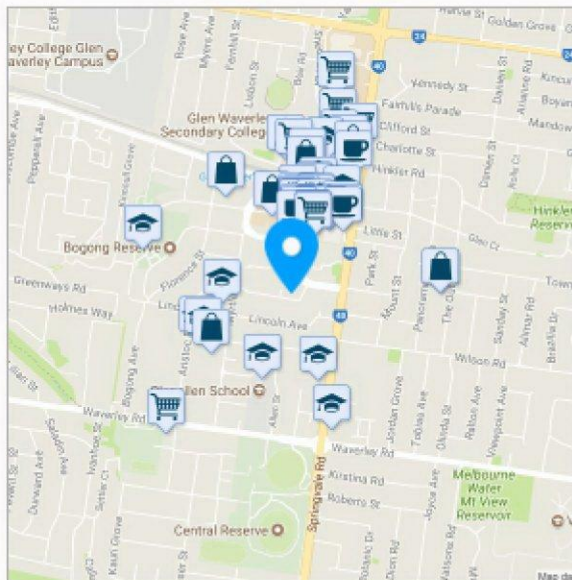
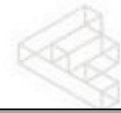


Figure 3: Walkscore for 15 -17 Marriott Parade, Glen Waverley.

Bicycle Parking

Residents will be able to securely park their bicycle in the dedicated bicycle storage areas provided in the basement car park. This will be protected from weather and theft. A total of 22 bicycle spaces are provided for residents for townhouses and apartment residents.

One visitor bicycle space will be provided near the main entry to Marriott Parade.



BUILDING MATERIALS

Materials selection should be integrated into the design of the proposed development. The criteria for appropriate materials used are based on economic and environmental cost.

Timber

All timber used in the development will be Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC) certified, or recycled / reused.

Flooring

The use of timber flooring will be preferred for all living areas and bedrooms. All flooring will be selected from products/materials certified under any of the following:

- Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS) v1.2;
- Ecospecifier GreenTag GreenRate V3.2; and/or
- Good Environmental Choice (GECA).

Alternatively, flooring must be durable, include some eco-preferred content, be modular and/or come from a manufacturer with a product stewardship program and ISO 14001 certification.

Joinery

All joinery will be manufactured from materials/products certified under any of the following:

- Ecospecifier GreenTag GreenRate V3.1;
- Good Environmental Choice (GECA); and/or
- The Institute for Market Transformation to Sustainability (MTS) Sustainable Materials Rating Technology standard Version 4.0 – SmaRT 4.0.

The use of Ecological Panel (or equivalent) will be investigated, which is created from 100% post-consumer recycled products.

Non-toxic and Durable External Materials

All external materials used to construct the building will be long lasting and will be non-toxic.

Steel

Wherever possible, steel for the development will be sourced from a Responsible Steel Maker². Reinforcing steel for the project will be manufactured using energy reducing processes commonly used by large manufacturers such as Bluescope or OneSteel.

² A Responsible Steel Maker must have facilities with a currently valid and certified ISO 14001 Environmental Management System (EMS) in place, and be a member of the World Steel Association's (WSA) Climate Action Program (CAP).



URBAN ECOLOGY

In highly urbanised environments, such as metropolitan Melbourne, it is important to recognise the importance of maintaining and increasing the health of our urban ecosystems to improve living conditions not only for the fauna but also ourselves. We can improve our urban ecosystem through the incorporation of vegetation through landscaping for both new and existing developments.

Re-use of Land

The development is a redevelopment of an existing established site, therefore increased density in an established urban area will reduce urban sprawl.

Landscaping

The development will include garden beds (planter boxes) on each level. These will be planted with a mixture of native and exotic species to enhance the ecological value of the site.

Insulant ODP

All thermal insulation used in the development will not contain any ozone-depleting substances and will not use any in its manufacturing.

IMPLEMENTATION & MONITORING

The proposed Marriott Parade development will meet the best practice requirement of the City of Monash through the different initiatives describe in this SMP such as thermally efficient building envelope, efficient air conditioning and hot water system and sustainable materials. An appropriate implementation and monitoring of the initiatives outlined within this SMP will be required.

Implementation of the ESD initiatives outlined in this report requires the following processes:

- Full integration with architectural plans and specifications
- Full integration with building services design drawings and specifications
- Endorsement of the ESD Report with town planning drawings
- ESD initiatives to be included in plans and specifications for building approval

APPENDIX A – WSUD REPORT / STORM ASSESSMENT

New development must comply with the best practice performance targets for suspended solids, total phosphorous and total nitrogen, as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999. Currently, these water quality performance targets require:

- Suspended Solids - 80% retention of typical urban annual load.
- Total Nitrogen - 45% retention of typical urban annual load.
- Total Phosphorus - 45% retention of typical urban annual load.
- Litter - 70% reduction of typical urban annual load.

The STORM tool, an industry accepted tool, was used to assess the development and ensure that the best practice targets described above are met. A minimum compliance score of 100% is required to achieve for the development.

Site Delineation

For the purpose of the assessment, the development has been delineated into the following surface types:

- Site area of 2,186m²;
- The roof/terrace area TH 1 of 150.8m² which will be diverted into rainwater tank(s);
- The roof area of TH 2 of 90.0m² which will be diverted into rainwater tank(s);
- The roof area of TH 3 of 90.0m² which will be diverted into rainwater tank(s);
- The roof area of TH 4 of 85.1m² which will be diverted into rainwater tank(s);
- The roof area of TH 5 of 93.7m² which will be diverted into rainwater tank(s);
- The roof/terrace area of apartment of 768.1m² which will be diverted into rainwater tank(s);
- Permeable area of 624.4m² comprised of landscaped area, permeable paving and other pervious surfaces not located above the basement;
- Remainder of impervious areas of 283.9m² comprised of unconnected roof and terraces, driveway/pathway above basement and other impervious areas.



Figure 4: Roof catchment area to rainwater tank (blue), permeable area (green) and untreated impervious areas (white/clear) for the development.

Stormwater initiatives

Rainwater Tank

(Rainwater tank for toilet flushing)

Rainwater runoff from the roof/terrace area of townhouses will be collected and stored in 2,000L rainwater tanks for each townhouse.

Rainwater runoff from the roof/terrace area of apartments will be collected and stored in rainwater tanks with a total effective capacity of 12,000L.

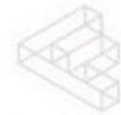
The rainwater collected will be used for toilet flushing in all townhouses and apartments on ground floor, first floor and section floor, as well as for irrigation (if required).

Collection will occur from trafficable areas, therefore an appropriate filtering system will be required to be installed (first flush, cartridge filter, UV) and maintained.

In the case of a charged pipe system, the charged pipes will not be running underneath the slab and the stakeholders (builder/developer/architect) will be required to explicitly acknowledge this solution and have the capacity to install it.

The remainder of impervious areas will directly be released at the legal point of discharge on site.

Permeable areas are excluded from the STORM assessment.



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Stormwater Results

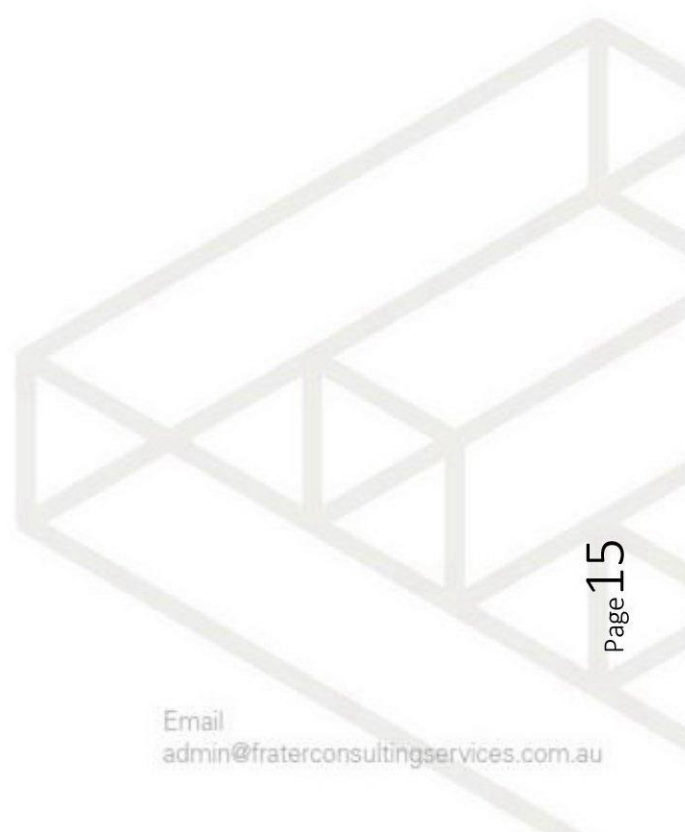
The initiatives and areas described above have been applied to the STORM calculator and the proposed development has achieved a score of 101%.

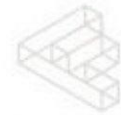


STORM Rating Report

TransactionID: 898110
 Municipality: MONASH
 Rainfall Station: MONASH
 Address: 15 -17 Marriott Parade
 Glen Waverley
 VIC 3150
 Assessor: Frater Consulting Services
 Development Type: Residential - Multiunit
 Allotment Site (m2): 2,186.00
 STORM Rating %: 101

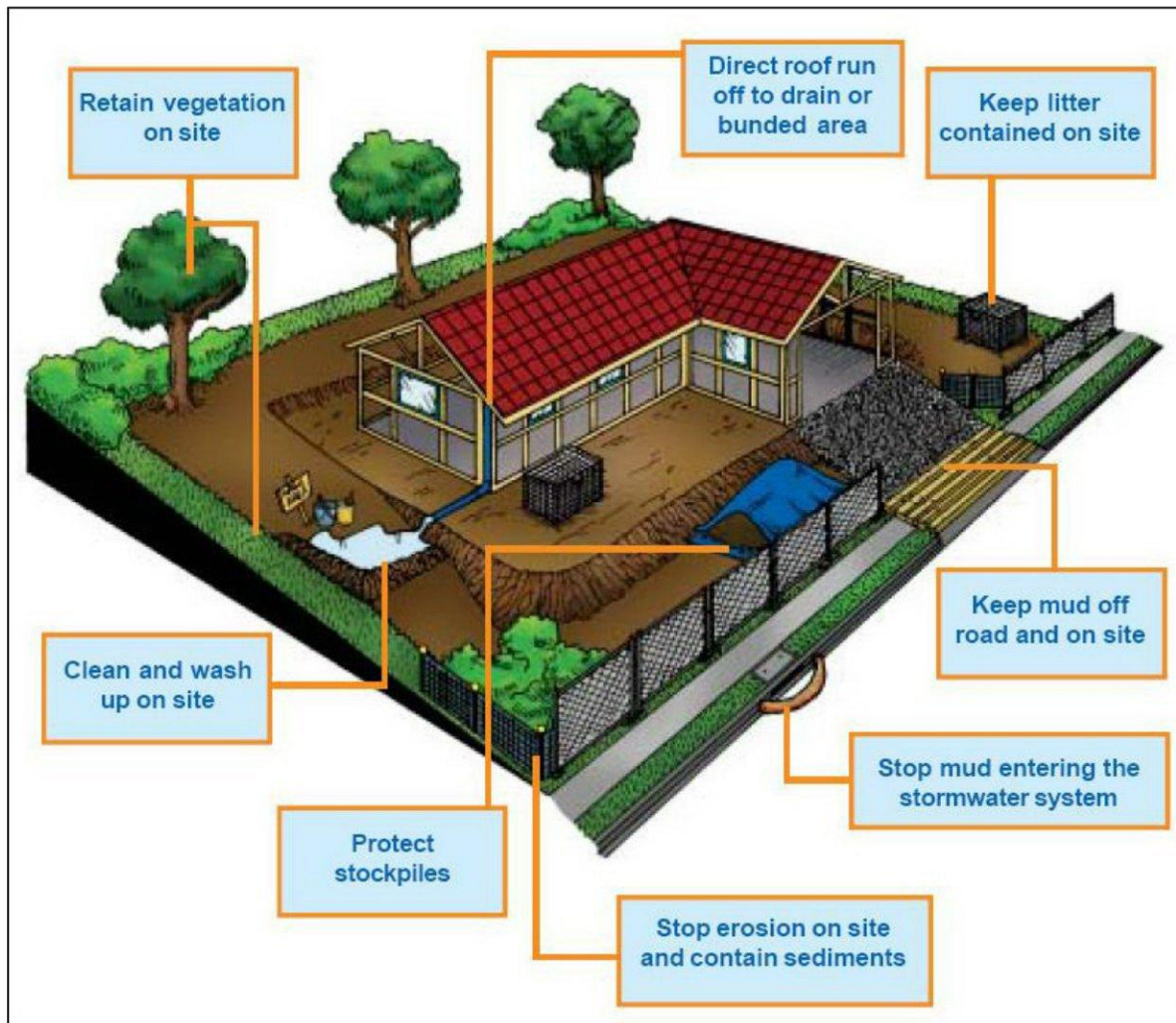
| Description | Impervious Area (m2) | Treatment Type | Treatment Area/Volume (m2 or L) | Occupants / Number Of Bedrooms | Treatment % | Tank Water Supply Reliability (%) |
|-------------------------|----------------------|----------------|---------------------------------|--------------------------------|-------------|-----------------------------------|
| TH 1 Roof to RWT | 150.80 | Rainwater Tank | 2,000.00 | 4 | 94.20 | 77.10 |
| TH 2 Roof to RWT | 90.00 | Rainwater Tank | 2,000.00 | 4 | 135.80 | 77.00 |
| TH 3 Roof to RWT | 90.00 | Rainwater Tank | 2,000.00 | 4 | 135.80 | 77.00 |
| TH 4 Roof to RWT | 85.10 | Rainwater Tank | 2,000.00 | 4 | 143.40 | 78.00 |
| TH 5 Roof to RWT | 93.70 | Rainwater Tank | 2,000.00 | 4 | 131.90 | 76.70 |
| Apartment Roof to RWT | 768.10 | Rainwater Tank | 12,000.00 | 35 | 122.20 | 68.00 |
| Remainder of impervious | 283.90 | None | 0.00 | 0 | 0.00 | 0.00 |





Stormwater Management at Construction Site

To manage stormwater management in the construction stage, measures will be put in place to minimise the likelihood of contaminating stormwater. This will mean ensuring buffer strips are in place, sediment traps are installed, and the site will be kept clean from any loose rubbish. The builder will follow the process outlined in "Keeping Our Stormwater Clean – A Builder's Guide" by Melbourne Water.



Copies of "Keeping Our Stormwater Clean – A Builder's Guide" booklet can be obtained from Melbourne Water by ringing on 131 722 or can be downloaded from the following website.

http://www.melbournewater.com.au/content/library/rivers_and_creeks/keeping_our_stormwater_clean-a_builders_guide.pdf



APPENDIX B – VOC & FORMALDEHYDE EMISSION LIMITS

The following table are an extract of the Green Star Design and as built submission guidelines:

Table 13.1.1: Maximum TVOC Limits for Paints, Adhesives and Sealants

| Product Category | Max TVOC content in grams per litre (g/L) of ready to use product. |
|--|--|
| General purpose adhesives and sealants | 50 |
| Interior wall and ceiling paint, all sheen levels | 16 |
| Trim, varnishes and wood stains | 75 |
| Primers, sealers and prep coats | 65 |
| One and two pack performance coatings for floors | 140 |
| Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives | 250 |
| Structural glazing adhesive, wood flooring and laminate adhesives and sealants | 100 |

The product complies with the Total VOC (TVOC) limits specified in the Table below.

Carpet Test Standards and TVOC Emissions Limits

| Test protocol | Limit |
|---|--------------------------------|
| ASTM D5116 - Total VOC limit | 0.5mg/m ² per hour |
| ASTM D5116 - 4-PC (4-Phenylcyclohexene) | 0.05mg/m ² per hour |
| ISO 16000 / EN 13419 - TVOC at three days | 0.5 mg/m ² per hour |
| ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours | 0.5mg/m ² per hour |



Table 13.2: Formaldehyde Emission Limit Values for Engineered Wood Products

| Test Protocol | Emission Limit/ Unit of Measurement |
|---|--|
| AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood | ≤1mg/ L |
| AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16 | ≤1.5 mg/L |
| AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16 | ≤1mg/ L |
| AS/NZS 4357.4 - Laminated Veneer Lumber (LVL) | ≤1mg/ L |
| Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL | ≤1mg/ L |
| JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460 | ≤1mg/ L |
| JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460 | ≤1mg/ L |
| JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates) | ≤0.1 mg/m ² hr* |
| ASTM D5116 (applicable to high pressure laminates and compact laminates) | ≤0.1 mg/m ² hr |
| ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates | ≤0.1 mg/m ² hr (at 3 days) |
| ASTM D6007 | ≤0.12mg/m ³ ** |
| ASTM E1333 | ≤0.12mg/m ³ ** |
| EN 717-1 (also known as DIN EN 717-1) | ≤0.12mg/m ³ |
| EN 717-2 (also known as DIN EN 717-2) | ≤3.5mg/m ² hr |

*mg/m²hr may also be represented as mg/m²/hr.

APPENDIX C – BESS ASSESSMENT

