



41-59 Stephenson Street, South Kingsville Development Plan ESD Report

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1 Introduction

Precinct 16 will place a high emphasis on a design strategy that reduces environmental impact while providing a healthy living environment with a mixture of apartment and townhouse dwellings. Drawing on best practice Environmentally Sustainable Design (ESD) masterplanning principles, the development proposal includes a broad spectrum of sustainability initiatives.

This report demonstrates the significant regard that the development plan pays to ESD by detailing the principles proposed for inclusion in the scheme. A copy of the Development Plan (received 11/2/2020) is provided in Appendix A for reference. A final detailed ESD response for Precinct 16 will be confirmed with the Planning Permit application, which will guide the development design process.

The development's environmental performance will be benchmarked against the Built Environment Sustainability Scorecard (BESS), or Green Star Design and As Built v1.2, or another comparable tool to demonstrate Council's sustainability objectives have been achieved.

The development is committed to achieving best practice in relation to sustainable design and the development plan allowances provide a sound basis for moving forward.



2 Site Masterplanning Opportunities

This section advises the thinking that has been developed to date in relation to:

- site selection
- site planning and layout
- design of the public domain
- project management and delivery

The Precinct 16 Development Plan will be designed considering ESD factors, including consideration of a wide range of initiatives and adoption of specific principles as detailed below.

2.1 Site Selection

The site selected offers a significant reclamation opportunity. Development of this site will assist with minimising urban sprawl through avoidance of building on an equivalent green-field site. Specifically:

- The project is re-using land that has been previously developed.
- The project has selected a site that has undergone remediation for contamination caused by its previous industrial use and will follow best practice recommendations to address the current site conditions.
- The land in its current state has minimal ecological value and this presents significant opportunity for improvement.
- A preliminary site context analysis highlights the following issues:
 - Site contamination may challenge the opportunities for incorporating Water Sensitive Urban Design (WSUD) initiatives.
 - The rail lines and Spotswood Maintenance Facility to the east service freight and interstate trains and pose noise and vibration issues.
 - The east to north-east solar access of the apartment building is challenged as appropriate treatment must be applied to effectively mitigate the impact associated with adjacent noise sources.

The site planning and layout strive for a balance which best achieves sustainable urbanism and adopting best practice urban design principles:

- Higher density living is located at the north-east corner of the site. This massing helps protect and shelter the townhouses from the adjacent noise sources.
- Layout of the apartments and placement of the car parks is designed in a way to address the unique acoustic nature of the site, while prioritising good natural light to all living spaces and bedrooms.
- The new roadways provide separation between the higher density building and the townhouses, which will assist with minimising overshadowing.

2.2 Liveability

The site has good access to existing facilities in the locality, including:

- Various amenities (food retail, medical, pharmacy, laundry etc.) are located within the Vernon Street shopping strip
- Newport town centre with train station and library
- Spotswood town centre with train station
- Future neighbourhood activity centre on McLister Street
- 2 No. childcare facilities and a pre-school
- 4 No. primary schools
- 3 No. secondary schools
- Various recreational parklands including Newport Lakes and Ducrow Reserve



The Landscape/Urban Design supports social interaction and physical activity by providing:

- Access to nearby public open space. Improved pedestrian and cyclist links to adjacent precincts and local shops e.g. Vernon Street shopping strip.

In order to create a safe place, the design incorporates:

- Visibility of public areas from at least one street.
- Appropriate lighting.

In order to promote dignified access for all persons, the design incorporates:

- Design for universal access to dwelling entrances where practicable.
- Design for adaptable dwellings where practicable.
- Design for an accessible public domain.

2.3 Economic Prosperity

Residents will have access to local and diverse employment opportunities as the site is near to CBD (approx. 10km) and Williamston (4km).

Residents will have access to a range of education and skills development opportunities through good proximity to the following higher education facilities:

- Victoria University (<7km away).
- Trade Institute of Victoria (<3km away).

Affordable housing has been provided.

2.4 Transport Planning

Integrated transport planning has addressed the following:

- The site has good proximity to mass transport:
 - Spotswood Station is within 1.2km walk
 - Bus services run along nearby Aloha and Stephenson Streets (<250m), as well as Montgomery Crescent and Stephenson Street (<500m) via the existing pedestrian railway crossing to Hick Street.
- The developer aims to work with transport providers to re-route buses along Blackshaws Road for improved site amenity.
- Provision of visitor bicycle racks in convenient locations.
- Provision of on-site parking space for car share scheme e.g. GoGet / Flexicar (subject to provider agreement).

2.5 Landscape Design

The landscape design will aim to incorporate a wide range of ESD and Water Sensitive Urban Design (WSUD) elements, with the following preliminary initiatives identified for inclusion where practicable:

- Emphasis is placed on the use of indigenous and native plant species with selected exotic species to be used for special seasonal qualities or ESD values (such as allowing sunlight penetration in winter).
- Other plants will be attractive hardy species, which are suited to the relatively harsh local growing environment.
- Any automatic irrigation system will use an efficient, in-line drip emitter system, which will utilise rainfall and moisture sensors to control and adjust the use of water.



- The larger portion of the site will rely on natural rainfall regimes, and will survive without supplementary irrigation, once established.
- All garden beds will be fully mulched, to help to retain soil moisture.
- Opportunity would be explored to harvest roof stormwater for irrigation of open space landscape.
- The bicycle trail will link-up to the main pedestrian entry nodes, and bicycle hoops will be provided at key locations.
- Opportunity would be explored to use recycled material e.g. recycled timber or composite timber for decking / street furniture, bollards etc.

2.6 Environmental

The development will target the following environmental initiatives:

- Offset urban heat island effect through using increased vegetation and light-coloured surfaces.
- Design of external lighting to avoid light spill/pollution.
- Responsible sourcing of materials – including concrete, steel, timber, asphalt & PVC.
- Design to facilitate reduction and enable recycling of operational waste e.g. recycling bins in public areas.
- Best practice stormwater management (management in relation to detention and discharge water quality).
- Substantial electricity generation through a significant commercial grade PV system located on apartment building roof.

2.7 Project Management and Delivery

The project has appointed an ESD professional early in the development process to guide the design, and will consider:

- Environmental Management Plans to be developed by the contractor(s) for all stages of the works.
- Contractor should achieve an 80% waste diversion (recycling) rate for all construction and demolition waste (measured by mass)
- Developing a Residents' Guide and/or providing interpretation signage to raise awareness of sustainability issues and initiatives.



3 Built Form Opportunities

The built form of Precinct 16 will be described in further detail in the planning permit documentation. The following principles are to be considered for inclusion where practicable. The initiatives listed will be used as a starting point to guide the design and tested for suitability as the design is developed.

This ESD process will culminate with the rating of each dwelling using an appropriate assessment tool (BESS, Green Star, or similar) during the next phase of the design.

3.1 Management

Throughout the project, the following initiatives will be considered to ensure the project achieves its design objectives:

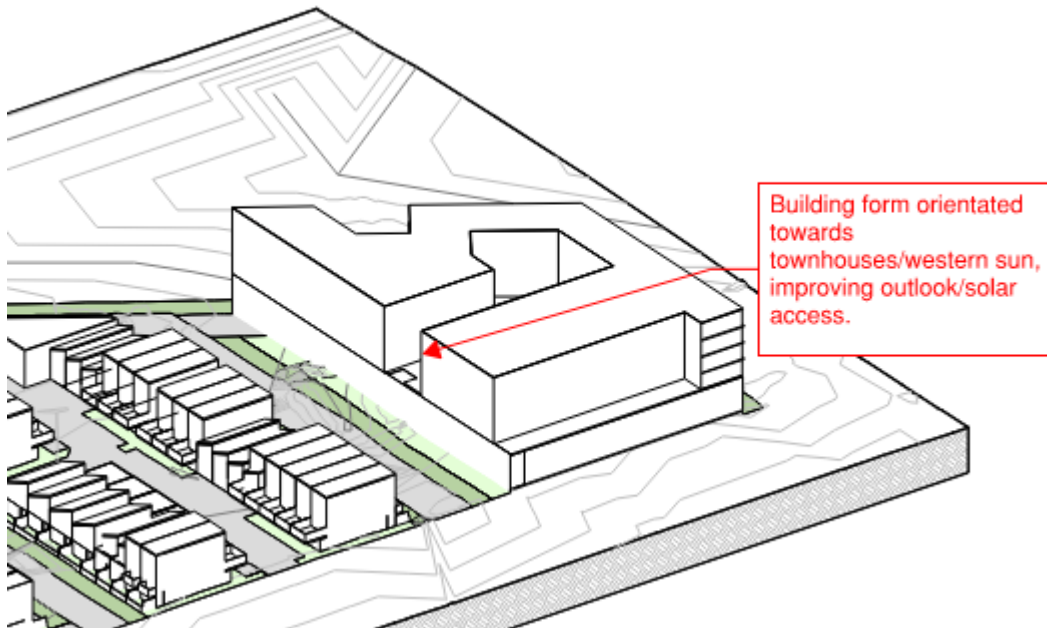
- Engagement of a suitably qualified ESD professional to champion the project's sustainability targets.
- Commitment to building services design review, commissioning and tuning processes to ensure systems operate as intended by the design.
- Incorporation of suitable metering and monitoring systems to enable all residents understand their own consumption data and make informed decisions.
- Commitment to good environmental practices during construction, including implementation of a site-specific environmental management plan in accordance with ISO 14001, and reduction of construction landfill waste.

3.2 Indoor Environment Quality

The following initiatives will be considered to improve the overall indoor environment quality:

- Aim to achieve high indoor air quality through natural ventilation and specification of low emission materials, including low VOC (volatile organic compound) paints/sealants/adhesives, low formaldehyde timber products, etc.
- Provide natural ventilation, or where not feasible due to acoustic issues associated with the adjacent train lines, aim to provide optimum mechanical ventilation rates as necessary for the same outcome.
- Thermal comfort levels will be optimised wherever possible through measures such as air conditioning, exposed thermal mass, high efficiency glazing and external shading.
- The project will seek to provide an abundance of natural daylight in all living areas through the provision of large high-performance windows with high visible light transmission. For any singled-sided south- / south-west-facing apartments, this will maximise indirect natural light into all the bedrooms and open plan spaces. It is worth noting that daylight modelling is typically undertaken under a Uniform Sky and is intended to represent a heavily overcast sky and disregards building orientation.
- The placement of the townhouses and the apartment building should be such that the overshadowing impact is minimised given the site constraints.
- The project will aim to achieve internal noise levels at an appropriate level for occupant comfort through measures such as:
 - Careful specification of mechanical equipment.
 - Integrated design of the building façade, glazing and ventilation systems to minimise break-in of external noise (e.g. freight trains on adjacent rail lines).
- The apartment building has been orientated towards the west and the townhouses to improve access to afternoon sun and general interconnectedness between the two dwelling types.





3.3 Energy

Passive building design measures will assist with compliance and improvement upon the NCC energy efficiency requirements. Passive measures will also minimise peak energy demand by reducing summertime cooling loads. Energy Ratings will be undertaken using FirstRate5 software for all dwellings and Deemed-to-Satisfy Section J analysis for common areas and non-residential components.

Initiatives to be targeted include:

- Well-designed solar shading which allows for passive solar heat gain in winter and provides protection in summer.
- Glazing to be sized to provide a good balance between daylighting, external views, energy, comfort and ventilation requirements.
- Natural ventilation to comply with the BCA requirements.
- Exposed thermal mass.
- Appropriate site-specific response to building orientation.

Energy conscious design to further reduce the Carbon Emissions footprint of the development will be adopted wherever possible, including:

- Low lighting power density through selection of efficient lamps / fitting types
- Access to daylight to reduce demand for electric lighting.
- Provision of star-rated (low-energy) appliances.
- Provision of clothes lines for passive drying of clothes.
- Digital smart meter displays.
- Dwelling master shut-down switches.

In addition, the following energy efficiency initiatives (specific to each dwelling type) will be considered where practicable:

Apartment	Townhouse
<p>The minimum NatHERS energy star rating for the building envelope is to be 5.5 stars minimum (per dwelling) and 6.5 stars minimum (per building). This represents a 0.5 star increase on BCA mandated performance.</p> <p>All apartments modelled in the preliminary analysis demonstrate an annual cooling energy demand of less than 22 MJ/m².</p> <p>Central solar hot water system with gas boost and individual dwelling authority sub-metering.</p> <p>Natural ventilation of carparks, or efficient mechanical ventilation using CO₂ monitoring and control.</p> <p>Automated switching of lighting in common and external areas.</p> <p>A substantial commercial grade solar PV system is proposed for the roof area of the apartment building, with extent as shown in the architecture drawings.</p>	<p>The minimum NatHERS energy star rating of the building envelope is to be 6.5 stars. This represents a 0.5 star increase on BCA mandated performance.</p> <p>Gas instantaneous hot water system high efficiency equipment with solar preheat (in some dwellings).</p> <p>Gas ducted heating for each dwelling using high efficiency equipment.</p> <p>Room cooling using high efficiency air-conditioning equipment.</p> <p>Townhouses will be provided a rooftop PV system.</p>

3.4 Transport

The following initiatives (specific to each dwelling type) are proposed:

Apartment	Townhouse
<p>Provide an area for storage of residents' bicycles.</p> <p>Provide visitor bicycle parking close to building entrances.</p> <p>Provide one (1) shared electrical charging spot. This may be as part of a share car scheme.</p> <p>Spatial and electrical allowances to be made to allow future installation of electric charging facilities to carparks generally.</p>	<p>Provide a secure bicycle parking space for each dwelling.</p> <p>Spatial and electrical allowances will be made for future installation of electric charging facilities in the garage.</p>

3.5 Water

The project aims to select maximum WELS rated water efficient fittings throughout, reducing water demand and flow to sewer.

Star-rated (low-water) appliances will be provided.

In addition, the following water saving initiatives (specific to each dwelling type) will be considered where practicable:

Apartments	Townhouses
<p>All rainwater diverted to central rainwater collection with re-use for irrigation, common areas and other private uses (depending on water balance / volume available).</p> <p>Fire system test water recycling (if required).</p>	<p>Individual dwelling rainwater collection tanks reticulated for various uses e.g. irrigation, toilet flushing and / or clothes washing.</p>

3.6 Materials

The project will consider the following in relation to specification of materials:

- Material Durability – external/internal materials will be chosen where practicable for their natural durability to minimise the possibility of vandal damage and to reduce the need for on-going maintenance.
- Health Impact – attention will be given to minimise use of PVC and other materials (e.g. PCB's and mineral fibre) in the development. These and other toxic chemicals can have harmful effects on building occupants and should be avoided where practicable in order to improve occupant health and wellbeing.
- Where practicable, timber is to be sourced from sustainably managed plantations.
- The development aims to avoid use of materials and products that contribute to ozone depletion and/or global warming, including certain refrigerants and insulation.
- The impact of embodied energy/carbon of materials will be considered. For concrete, the following will be achieved as far as practicable:
 - 30% SCM replacement
 - Maximise use of recycled water
 - 40% of coarse aggregates to be manufactured/recycled

3.7 Land Use & Ecology

For private open spaces and shared external areas, the project aims to:

- Include Victorian native planting to encourage wildlife diversity.
- Include drought tolerant planting.

3.8 Emissions

The following initiatives are considered to reduce general emissions.

- Design and selection of external lighting systems to eliminate all direct light spill to neighbouring properties and towards the night sky.
- All space cooling systems to utilise air-based heat rejection to avoid the risk of Legionella.
- Select refrigerants with low environmental impact, including refrigerants that have low Global Warming Potential (GWP) and zero Ozone Depletion Potential (ODP) - no CFC or HCFC refrigerants to be used.

3.9 Stormwater

The following initiatives are to be considered as a means of managing stormwater flow from site and enabling pollution reduction:

- Permeable surfaces (subject to future geotechnical investigations to determine ground permeability).
- Rainwater collection from roofs to be stored and re-used to offset potable water usage.
- Consider other innovative and integrated WSUD strategies that create cooling environments and provide amenity benefits.



Note that the above stormwater management response focuses upon ESD considerations. As the design progresses, the proposed ESD stormwater / WSUD requirements must be further assessed with respect to compliance with the SoEA.

3.10 Waste Management

The following initiatives are considered as a means to improve waste management:

- Recycling of household waste will be encouraged through provision of adequate areas for storage of waste and recycling.
- The project will aim to provide space for waste separation at source within the kitchen joinery.

In addition, the following initiatives (specific to each dwelling type) will be considered where practicable:

Apartments	Townhouses
<p>Provide dedicated areas within building basements for co-mingled recycling and waste to landfill.</p> <p>To ensure a high component of recyclables with minimal contamination, provide signage at the recycling areas as well as on the inside of a kitchen cupboard door in each apartment.</p>	<p>Provide adequate space within private garage areas for co-mingled recycling, waste to landfill and green waste.</p>

3.11 Innovation

Several innovative ESD initiatives are currently being investigated for consideration (including the details of the substantial PV system) and will be detailed further as the design progresses.



4 Conclusion

The development's environmental performance will be benchmarked against BESS, or Green Star, or another equivalent tool to demonstrate the high level of commitment to sustainable design outcomes. Final methodology will be confirmed in the next phase of the project.

Overall the development is committed to achieving best practice in relation to sustainable design and the development plan allowances are providing a sound basis for moving forward.



Appendix A –Development Plan

