



Part C ::

**ECOLOGICALLY SUSTAINABLE
DEVELOPMENT (ESD) REQUIREMENTS**



Ecologically Sustainable Development (ESD) Requirements

Part C – ESD Requirements outlines the importance of, and mandatory requirement to incorporate ecologically sustainable design techniques into developments within Doncaster Hill. The Doncaster Hill Strategy seeks to ensure that ESD is a fundamental component of mainstream development that is no longer be considered as a separate, add-on component.

The incorporation of ESD into mainstream development requires an investment in vision and whole-system thinking, addressing not only what the building will look like, but also what features and qualities the building will incorporate to provide an integrated and functional sustainable end product. Front-loading of the planning and design stages will recover this investment by avoiding downstream costs associated with expensive re-designs and stalled construction and will ultimately deliver a far superior, more marketable development.

Conventional design and construction methods often produce buildings and spaces that can negatively impact on the environment as well as occupant health and productivity. These buildings are expensive to operate and contribute to excessive resource consumption, waste generation and pollution. Well-executed, eco-friendly developments have proven to be both environmentally and financially rewarding, enticing mainstream developers at an increasing rate and allowing them to distinguish themselves from their peers.

The establishment of a cross-functional, integrated development team is essential to achieve ESD through the preparation and implementation of the Sustainability Management Plan.

SUSTAINABILITY MANAGEMENT PLAN (SMP)

The Sustainability Management Plan has been introduced as the vehicle to deliver ESD outcomes in Doncaster Hill. The SMP is a mandatory requirement, to be submitted with an application for new development as part of the planning approvals process (refer to Section B - Doncaster Hill Application Checklist). The Sustainability Management Plan must be prepared in accordance with Clause 22.13, Doncaster Hill Activity Centre Sustainability Management Plan Policy of the Manningham Planning Scheme.

It is policy that the Sustainability Management Plan:

- Identify how the development will achieve the sustainability objectives of the Municipal Strategic Statement, Clause 21.21 Doncaster Hill Activity Centre.
- Identify statutory obligations and documented sustainability performance standards from Government and other authorities.
- Specify key performance indicators, to an agreed level, to measure the achievement of objectives and initiative identified in the Sustainability management Plan.
- Demonstrate:
 - the application of current best practice principles;
 - the use of emerging technology; and
 - a commitment to 'beyond' compliance' throughout the construction period and subsequent operation of the building.
- Identify responsibilities and the schedule for implementation and monitoring.
- Demonstrate that the design elements, technologies and operational practices that compromise the Sustainability Management Plan can be maintained over time.

The SMP must also address the following components:

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|--|---|
| 1. Building Energy Management | 5. Waste Management |
| 2. Water Sensitive Urban Design | 6. Quality of Public and Private Realm |
| 3. Construction Materials | 7. Transport |
| 4. Indoor Environment Quality | 8. Demolition and Construction |

Health, resource and ecological issues are significant factors influencing development in Doncaster Hill and will inherently cross professional boundaries. Consultants engaged by applicants will be expected to demonstrate design excellence through the calibre of materials and information presented to Council. Applicants are encouraged to seek specialised information and skills in the preparation of a Sustainability Management Plan. As indicated in Section B – Application Process Flowchart, information pertaining to sustainable design issues is a requirement of presentation to the Doncaster Hill Sustainable Design Taskforce from the beginning of the permit application process, further emphasising the importance of ESD in Doncaster Hill.

SUSTAINABILITY GUIDELINES (JUNE 2004)

These Guidelines have been developed by Manningham City Council and DesignInc to assist applicants preparing a Sustainability Management Plan (SMP) against the requirements of Clause 21.21 and 22.13 'Doncaster Hill Activity Centre Sustainability Management Plan Policy' in the Manningham Planning Scheme.

Information on each topic is presented as an introduction to the key issues. The applicant team is encouraged to access further resources listed in each section for a fuller understanding of each subject and to meet with Council officers as early as possible to clarify application of the scheme provisions.

A copy of the Sustainability Guidelines is available from Manningham City Council or online at www.doncasterhill.com



1 • Building Energy Management

OBJECTIVE

To achieve new benchmarks in energy conservation and increase use of renewable energy sources.

REQUIREMENTS

The Preparation of a Building Energy Management Plan that addresses but is not limited to the following:

- 1.1** All residential apartments must achieve a minimum 5 Star Energy Rating (in accordance with the First Rate assessment program or equivalent – relevant certificate documentation is to be provided to Council).
- 1.2** Developments must demonstrate new benchmarks for low energy consumption (MJ/m²/year) and greenhouse gas emissions for the alternate use areas of the development (eg. office and commercial/retail areas).
- 1.3** Renewable energy sources must be incorporated into the building design.
- 1.4** To achieve requirements 1.1, 1.2 and 1.3, the following considerations must be addressed in the Energy Management Plan.

ARCHITECTURAL CONSIDERATIONS

Building Envelope

- The building envelope/façade and building footprint are vital considerations in minimising energy consumption in design solutions and should be considered a priority consideration, especially in terms of building orientation, shape and thermal efficiency (including a high level of bulk insulation and thermal/condensation bridging).
- Maximise the use of passive design techniques consistent with occupant comfort levels.
- Use passive (natural) means in preference to mechanical systems to maintain building ventilation, heating & cooling.
- Design to respond to site conditions, including nearby buildings, aspect, gradient and microclimate conditions.
- Use a simple combination of automatic & user-controlled, draft-free natural ventilation, heating and cooling systems that require minimal user supervision.

1 ▪ Building Energy Management (continued)

ARCHITECTURAL CONSIDERATIONS

Shading

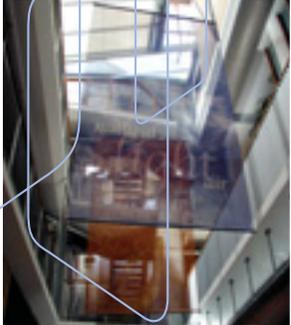
- All windows should be shaded against summer sun penetration, particularly west facing windows, where practicable. Shading options may include vegetation, external louvres, external blinds, structural overhangs, perforated screens, low emittance glazing or spectrally selective glazing.
- Peak cooling loads should be minimised by considering north, northwest, west and southwest facades individually.
- Consideration should be given for the integration of solar shading with solar energy collection technology such as solar heat pumps for domestic hot water and photovoltaic cells generating electricity.

High performance glazing

- Consideration should be given to the use of high performance glazing, thermal breaks and light coloured frames.

Daylight possibilities

- Consideration should be given to envelope planning for maximum daylight admission.
- Living areas should be planned particularly for winter sun and daylight harvesting.
- Rooms utilised for most daytime activity should receive access to natural light.
- Consideration should be given to reducing the need for electric lighting by maximising the use of daylight and elimination of sun/heat in summer, while limiting glare in work areas and ensuring that Heating, Ventilation and Air Conditioning (HVAC) loads do not increase. These considerations could include light shelves, shaded skylights, light shafts and/or atrium with associated daylight sensing control of electric lighting.
- When utilising daylight, existing lighting circuit design and control systems should be arranged to realise the opportunity to minimise the operation of electric lighting. Circuitry should allow for night-time use, minimum daylight availability and maximum daylight availability as a basic requirement.



Natural ventilation possibilities

- Consideration should be given to reducing the need for HVAC by maximising the use of natural ventilation. These considerations should include the following:
 - Night-time purging to cool thermal mass. Thermal mass should be exposed where possible whilst conforming to noise transmission requirements of the Building Code of Australia.
 - Specialised inlet ventilation openings and solar chimney/ ventilation shafts for outlet ventilation.
 - Cross ventilation through floors is strongly encouraged to minimise air conditions use. Air conditioning should be considered, in apartment situations, as an apartment owner installation eg. visually/externally concealed split a/c units on balconies following inherent natural ventilation design solutions.
 - The use of winter gardens, etc. to create increased airflow.
 - Car park ventilation.
 - Landscaping is encouraged to aid in shading and cooling for passive energy efficiency.

Level of exposed internal surfaces

- Light coloured internal finishes should be utilised in order to minimise lighting power densities.

Infiltration

- Consideration should be given to provide good sealing practices for external elements to minimise infiltration/drafts.

Lifts/Stairs

- Consideration should be given to maximise the use of stairs and minimise the use of lifts. The following points should be considered to facilitate this:
 - Place stairs in prominent positions to maximise their visibility and use.
 - Design stairs with pleasant risers and tread sizes to create easy movement.
 - Design stairs to be social spaces where conversations can occur.
 - Design stairs to act, where appropriate, as natural ventilation shafts.

1 • Building Energy Management (continued)

Insulation

- Consideration should be given to exceeding the minimum insulation requirements to minimise heat loss in winter and heat gain in summer. This technique can raise energy star ratings at a minimal cost to developers.

Mechanical – Heating Ventilation Air Conditioning (HVAC) Considerations

- Provisions should be made for an appropriate level of user control for internal environment conditions provided that this does not conflict with energy efficiency objectives.
- Consideration should be given to the HVAC systems selection and design, with respect to the efficiency of the plant and also the reduced capacity required due to the other energy efficient initiatives that will be incorporated into the building.
- Consider the use of geothermal heat pump air conditioning systems, cogeneration systems and mixed mode air conditioning.

Electrical – Electric Lighting Considerations

- Consideration should be given to the layout and zoning for the lighting system.
- Provisions should be made for individual light switching and climate control in rooms (including rooms with occasional and/or outside-hours use).
- Supplement natural light with integrated, high-performance ballasts, lamps and fixtures.
- Incorporate lighting controls, including dimmers and sensors to minimise unnecessary energy consumption.

Renewable Energy Source Considerations

- Consideration should be given to interchange of on-site generation of power with grid supply.
- Use of verified and approved 'green' power from the supply grid should be considered.
- Innovative sources of renewable energy, such as solar thermal technologies and wind turbines, should be considered for careful integration into the design.
- Building integration and careful architectural detailing of renewable energy technologies is important to enhance the appearance of the building and not present an 'add on' detraction from the overall building form.

2 • Water Sensitive Urban Design

OBJECTIVE

To achieve best practice water sensitive urban design that offers an alternative to the traditional approach to water management.

REQUIREMENTS

The Preparation of a Water Sensitive Urban Design Plan that addresses but is not limited to the following:

- 2.1** Selection of water fittings and appliances (shower heads, dishwashers, clothes washers, toilet suites, urinals, tap outlets etc.) must be on the basis of water conservation principles and have a 3A to 5A water conservation rating.
- 2.2** Toilets must be low flush cisterns or other approved water minimisation types.
- 2.3** Garbage disposal units are not permitted.
- 2.4** Provisions must be made for the goal of 100% of rainwater and storm water to be collected, treated and re-used on site e.g. use rainwater and treated water for landscape and building control systems, toilet flushing, use for irrigation in shared recreational areas, swimming pool water, etc.
- 2.5** Maximise opportunities for on-site collection, treatment and re-use of grey water.
- 2.6** Maximise opportunities for on-site collection, treatment and re-use of black water.
- 2.7** Maximise the use of permeable surfaces, reducing continuous impervious surfaces.
- 2.8** Incorporate landscape design that decreases water requirements in gardens and recreational areas eg. maximise use of indigenous and native plants in gardens and open space areas, including xeroscope gardens.
- 2.9** Incorporate podium/roof top gardens to minimise stormwater run-off and provide thermal insulation.
- 2.10** Consideration should be given to integrating storm water treatment into the design of public spaces eg. design of water features to enhance public enjoyment and amenity.

3 : Construction Materials

OBJECTIVE

To minimise the environmental impacts of input and output materials as well as any material used in the external construction and development of buildings and works.

REQUIREMENTS

The preparation of a Construction Materials Plan that demonstrates the developer's commitment to sustainable materials selection, recycling, re-use and disposal. This commitment shall be further supported, at a later stage but prior to the commencement of development, with the submission to Council of a materials schedule, highlighting sustainable material selections.

- 3.1** The Construction Materials Plan must demonstrate:
That the selection of building materials has taken into account source, production process, life-cycle costs, durability and ozone-depleting potential. This includes consideration of the following:
- Is the material made in Victoria or Australia?
 - Is the material necessary for the building?
 - Is the material recycled?
 - Is the material recyclable?
 - Is the material non-hazardous and non-toxic?
 - Does the material emit toxic substances during its lifecycle or when breaking down?
 - Does the material have allergenic traits?
 - Design with panel, pre-cut and engineered construction products via off-site construction methods to minimise waste.
 - Design interior building components for future disassembly, re-use and recycling.
 - Use of durable exterior and interior finishes.
 - No use of timbers from non-sustainable sources e.g. native forest timber.
 - Maximise use of recycled timbers.

- Provision of evidence of source of timber products used e.g. is the timber recycled, from a plantation, from a native plantation or other sources.
- Methods to minimise materials use in the design.
- Use of standard material sizes and components to reduce waste and improve the ease of disassembly.

- 3.2** The Construction Materials Plan must identify:
- All waste materials by type, outlining an on-site sorting and removal process that includes on-site supervision and nominating an appropriate recycling facility for disposal.
 - Minimisation of waste to landfill in relation to on-site materials such as concrete, bricks, timber, furniture, carpets, fixtures, lighting etc.
 - All non-reusable and non-recyclable materials and how they will be disposed of.
 - Possible ways in which waste materials can be recycled on-site.

4 · Indoor Environment 4 · Quality

OBJECTIVE

To achieve healthy internal building environments.

REQUIREMENTS

The preparation of an Indoor Environment Quality Plan that demonstrates the developer's commitment to sustainable, healthy interior materials selection. This commitment shall be further supported, at a later stage but prior to the commencement of development, with the submission to Council of an interior materials schedule, highlighting appropriate material selections, as well as technical building ventilation and noise attenuation details.

The Indoor Environment Quality Plan must address but not be limited to the following:

- 4.1** Establish minimum indoor air quality performance to prevent development of indoor air quality problems in buildings, maintaining the health and well being of occupants.
- 4.2** Windows shall be provided in all occupied spaces for view and natural ventilation.
- 4.3** Windows and doors shall be situated to achieve natural cross ventilation.
- 4.4** Minimise the quantity of indoor air contaminants that are odorous or potentially irritating to provide installer and occupant health and comfort.
- 4.5** Utilise, where possible, flooring surfaces that are easily cleaned and that inhibit dust mite harbouring and breeding.
- 4.6** Demonstrate that selection of materials that contribute to internal atmosphere are judged on their generation of atmospheric pollutants.
- 4.7** Meet or exceed minimum Volatile Organic Compound (VOC) limits for adhesives, sealants, paints, composite wood products, and carpet systems.
- 4.8** Avoid products containing formaldehyde.
- 4.9** Provide for the effective delivery and mixing of fresh air to support the health, safety and comfort of building occupants.
- 4.10** Ensure that all fresh air intakes are located away from loading areas, exhaust fans from underground parking areas, garbage/waste storage areas and restaurants and other contamination points that may transfer odours, particulates and moisture to living/residential spaces.
- 4.11** Extractor fans shall be provided in all wet areas including bathrooms, kitchens and laundries, preferably vented externally rather than into roof spaces – entrainment to adjoining occupancies is to be avoided.
- 4.12** Effective, externally vented range hoods shall be provided over all cook tops – entrainment to adjoining occupancies is to be avoided.
- 4.13** Provide a high level of individual occupant control of thermal, ventilation and lighting systems to support optimum health, productivity and comfort conditions.
- 4.14** Radiant heating which does not collect or circulate dust, and does not produce particles or gaseous combustion by-products is preferred.
- 4.15** Consideration should be given to foil or recycled plastic product insulation to avoid irritant particles.
- 4.16** Provide a connection between indoor spaces and outdoor environments through the introduction of sunlight and views into the occupied areas of the building.
- 4.17** Ensure internal and external noise transmission levels and building acoustics exceed the relevant Australian standards through the use of sound-absorbing materials, high sound transmission loss walls, floors and ceilings and equipment sound isolation.

5 · Waste Management

OBJECTIVE

To achieve a reduction in waste generated by building occupants that is collected, hauled to and disposed of in landfills.

REQUIREMENTS

The Preparation of a Waste Management Plan that addresses but is not limited to the following:

- 5.1** A Waste Management Study providing the following information:
 - Assessment of garbage generation rates for apartments, café, retail and other commercial uses of the building.
 - Estimated breakdown of residential and commercial garbage and recyclables generation for the development.
 - The amount of space required for the storage of recyclables on each floor - as chutes are not suitable for the transfer of recyclables.
 - The amount of space required for the storage of residential garbage and recyclables on the ground/basement floor and how it is collected.
 - How the commercial waste and recyclables are to be stored and collected.
- 5.2** Design details of the built-in waste/recycling system for the building indicating the provision that must be made for the separate disposal of garbage and recyclable streams, for all areas of the building including residential, commercial and retail. Ensure adequate and accessible communal space for the storage and collection of recyclable materials and refuse.
- 5.3** Provide a designated area for convenient wheelie-bin parking within the property with easy access to the kerb-side as appropriate or larger volume shared facility/equipment with adequate access for deposit and pick-up.
- 5.4** Explain and demonstrate the provision of adequate access for waste collection vehicles.
- 5.5** Ensure provision for communal and/or individual household based composting facilities for all kitchen and garden compostables.



6 · Quality of Private and Public Realm

OBJECTIVE

To achieve design excellence in the built, natural and cultural environments.

REQUIREMENTS

The preparation of a Public and Private Realm Plan that addresses but is not limited to the following:

- 6.1** Utilise an integrated approach during the design and construction of any new development to ensure provision for access and mobility so that no user is excluded from any built environment by unnecessary barriers.
 - Development must conform to the Australian Standards for accessibility (including AS1428 Part 2).
 - Development must conform to any Manningham City Council policies relating to provision for access and mobility.
- 6.2** A separate report by an approved independent access auditor to assess any plans and provide advice/recommendations on access and mobility issues is required and will be considered as part of the statutory planning process.
- 6.3** Specify whether varying functions can be accommodated in shared spaces, especially to provide flexibility for future use.
- 6.4** Provide easy access to neighborhood facilities and movement networks.
- 6.5** Ensure open space areas are appropriately designed and located as functional areas:
 - Located for adequate privacy and minimal overshadowing.
 - Appropriately screened/enclosed and sheltered from any wind-tunneling effects.
 - Well proportioned.
 - Surfaced attractively and comfortably.
 - Equipped with appropriate lighting and furniture.
 - Contribute to the building setting.
 - Encourage natural habitat through plant selections and water features.
- 6.6** Provide for direct natural light and solar access to neighbouring properties.
- 6.7** The design proposal must address any wind effects on adjacent properties, existing or proposed (also refer to Part D – Urban Design Requirements – MicroClimate Studies).
- 6.8** Maximise opportunities for construction of rooftop and terrace/podium gardens that can be accessed as private or communal open space.

7 : Transport

OBJECTIVE

Minimise overall environmental impacts due to movement and transportation of people, materials, equipment and systems.

REQUIREMENTS

The preparation of a Transport Plan that addresses but is not limited to the following:

- 7.1** Traffic Assessment explaining and justifying the provision of car parking, access arrangements, impacts on the surrounding road network, provision of bicycle storage facilities, security and provision of visitor parking.
- 7.2** Integrate transport facilities with the surrounding built and natural environment.
 - Driveway pavement materials/design to emphasise safe and shared use (where appropriate) for cars/pedestrians and other users.
 - Effective concealment of car parking facilities.
 - Provision of accessible, safe, secure and well-ventilated car parking facilities.
- 7.3** Provide appropriate amenities for pedestrians and bike riders.
 - Provide 'after trip' facilities for bicycle users, joggers etc. (e.g. such as secure bicycle storage, showers and changing rooms).
 - Access to facilities to be centrally and easily located.
- 7.4** Disabled car parking provisions must be made near entrances and lifts.
- 7.5** Reduce environmental impacts of car parking facilities.
 - Maximise opportunities for permeability, where appropriate.
 - Incorporate sustainable stormwater design elements e.g. collection and recycling of stormwater runoff, where appropriate.
 - Internal circulation of car parks to be bicycle and pedestrian friendly.
 - Internal car parking should be naturally ventilated if possible within relevant codes and incorporate approved screening emissions and noise controls.

- 7.6** Maximise the flexibility of the parking facilities/area to provide car parking that caters for different occupancies of mixed-use buildings with varying schedules, but in keeping with the Statutory Planning requirements for car parking.
- 7.7** Encourage mixed use developments that eliminate the need for many automobile trips, encouraging more low impact transportation modes eg. walking, riding etc.
- 7.8** Minimise transport distances involved in the demolition, recycling, construction, fit-out and operational phases of the development, eg. using local suppliers and services.



8 • Demolition and Construction

OBJECTIVE

To minimise environmental impacts associated with site construction practices.

REQUIREMENTS

The Preparation of a Demolition and Construction Management Plan that addresses but is not limited to the following:

- 8.1** Manage the construction site to minimise pollution of storm water - no sediment-laden run-off is to leave the site.
- 8.2** Materials with the potential to leach or erode contaminants must be kept dry during construction.
- 8.3** Maximise the amount of materials to be re-used on the site.
- 8.4** Identify recyclable materials to be discarded from existing structure(s) (if applicable).
- 8.5** All on-site contractors and sub-contractors must be trained &/or informed of the Construction and Demolition Management Plan to the satisfaction of the responsible authority.
- 8.6** Minimise unreasonable noise levels off-site, with no unreasonable noise levels outside of working hours, including the specification of:
 - Proposed hours of construction of buildings and works.
 - Measures to minimise and control noise from construction works.
 - Measures to minimise impact of construction vehicles arriving and departing from development sites.
 - Details of the operation of cranes on site and their accommodation.
 - Measures to accommodate the private vehicles of workers/tradespersons.
 - Measures to minimise the creation of conditions liable to be a nuisance.
 - Measures to minimise impact upon local amenity of operations such as waste collection, vehicle loading and unloading, management of car parking areas, etc.
- 8.7** Demonstrate best-practice standards for the control of dust.
- 8.8** Avoid use of construction materials with toxic components to facilitate recycling and reduce pollution.
- 8.9** Minimise site disturbance including protection of existing vegetation to be retained and topsoil to be protected, where appropriate.
- 8.10** Ensure that footpaths surrounding the site are kept clear and safe to provide continued access and availability for pedestrians.