3.0 Sustainability

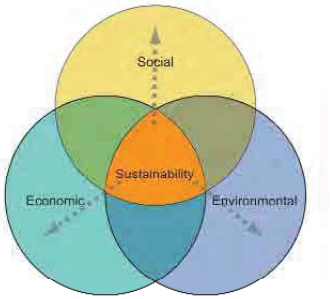
The development must be sustainable and able to withstand effects of climate change

Definition of sustainable development

The most frequently quoted definition comes from the report 'Our Common Future' (The Brundtland Report), 1987:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

This means meeting environmental and social objectives as well as economic goals in the development in order to help ensure the future sustainability of our planet. On this basis, a sustainable building must address the 'triple bottom line', namely environmental impacts, social concerns and economic performance.



Planning and design of new development can contribute to social and economic sustainability. The design for the Esplanade Quarter will provide a robust and well researched assessment of the most appropriate density, scale and mix of uses for the site that will support the aims and objectives of the States of Jersey and its partners, in creating a balanced and sustainable development that integrates with and complements the existing town of St Helier.

The main measurable contribution to environmental sustainability is made by:

- Protecting the physical environment;
- Conserving natural resources;
- Enhancing ecology; and
- Increasing biodiversity.

Site layout and design on the Esplanade Quarter will contribute to sustainable development by:

- Setting appropriate targets and standards. Design proposals will set out high standards in energy efficiency and sustainable construction. All dwellings should achieve Code for Sustainable Homes level 3 and commercial/employment space should achieve BREEAM 'excellent' rating. Other uses will target standards of an equivalent nature;
- Reducing carbon dioxide (CO_2) emissions from the development through sustainable transport planning, energy efficient building design, and the integration of renewable energy systems;
- Reducing the water use of buildings through water efficient design and the integration of systems for water conservation;
- Considering daylighting, solar gain and passive design; when deciding the layout, orientation and design of buildings;
- Orientating and designing buildings and their roofs to facilitate the immediate or later installation of solar renewable technologies;
- Reducing the quantity of water run-off to the main surface water drain through the use of sustainable drainage systems;
- Reducing the amount of waste arising during use (and also in construction) increasing the proportion that is reused or recycled and decreasing the quantity going to landfill. Considering the inclusion of modern methods of construction and approaches to construction utilising prefabrication;
- Reducing the demand for and impact of materials by considering the impacts of design on the scope for selecting materials from sustainable sources, reclaimed sources or recycled content, that can be locally sourced; and
- Protecting and enhancing site ecology and biodiversity.

CO_2 emissions

It is now accepted that rapid climate change is a result of human activity. Unchecked it will cause serious and damaging changes to the global environment and human society. Emissions of greenhouse gases are the biggest cause, and carbon dioxide (CO_2) is the main greenhouse gas.

In the UK the government has suggested a "long term ambition should be zero carbon development", i.e. zero net annual CO_2 emissions from building energy use on new sites. The States of Jersey has a commitment to follow suit and the design at the Esplanade Quarter should work towards the goal of "carbon neutrality", and work towards it.

Development at the Esplanade Quarter should contribute to limiting CO_2 emissions. This should be achieved through:

- Planning for sustainable transport;
- Designing energy efficient buildings; and
- Integrating renewable energy generation on site.

Sustainable transport

Transport is covered in more detail in section 6.0. Measures to be taken fall into a number of categories, all aimed at encouraging low carbon and environmentally friendly modes of transport: public transport; walking; cycling; and car sharing.
Measures that favour these modes of travel include:

- Priority in the design of the transport network;
- Safe, direct, routes for pedestrians and cyclists along desire lines and to key destinations, including schools, public transport stops, and local centres;
- Site layout to minimise average walking distance to key destinations.

Energy efficiency

Design will observe the energy hierarchy:

- Reduce demand – e.g. through less leakage with controlled ventilation, good daylighting, good insulation, and passive solar design;
- Meet remaining demand efficiently – e.g. with efficient heating (using fuel with the lowest net carbon emissions), lighting, ventilation and appliances;
- Generate energy on site from renewable sources; and
- Supply energy generated from low carbon sources.

Homes will be designed to provide good levels of daylight in kitchens, living and dining rooms, and studies. Low energy lighting with dedicated fittings should be fitted as standard in dwellings and for external lighting across the site.
Good practice criteria for daylighting and lighting can be found in the Code for Sustainable Homes.

Renewables and low carbon technology

There is now strong encouragement for the integration of low carbon and renewable energy generation in new developments. The following renewable energy technologies are likely to be technically feasible and should be studied and applied where appropriate:

- Ground source heat pumps possibly utilising the thermal mass of the sea;
- Biomass heating if suitable supply of fuel is available on the Island;
- Solar water heating;
- Photovoltaic (PV) panels; and
- Small/micro-wind turbines or links to larger offshore turbines.

Gas fired CHP for electricity generation is low carbon when the heat is also used for space and/or hot water heating or absorption cooling. It is likely to be feasible where density is high and there is a consistent heat (residential) or cooling demand (commercial). Guidance on renewables and low carbon energy sources can be found in “Low or Zero Carbon Energy Sources: Strategic Guide”, DCLG.

Site layout and climatic analysis

The redevelopment of the Esplanade Quarter should address microclimate and environmental concerns.

Noise levels

The main road, La Route de la Liberation, will run beneath the site. The design and detailing must acknowledge both air and structure borne noise sources in the development proposals. Noise from plant will be considered in the planning application.

National planning policy on noise and its impact on new development is set out in Planning Policy Guidance Note 24 (PPG24). PPG 24 defines various Noise Exposure Categories (NEC’s) for development sites, with reference to external (free field) daytime (7:00-23:00 hours) and night time (23:00-07:00 hours) noise levels. Where ambient noise levels are particularly high (NEC’s C and D) PPG 24 advises that planning permission for new residential developments should normally be refused. Possible mitigation measures to be considered are:

- Diverting traffic from the roads (informed by the Movement and Transport Analysis);
- Setting buildings back from the main roads;
- If necessary, noise barriers including the use of walls, fences and landscaping;
- Accoustic glazing and ventilation (although this may prevent natural ventilation); and
- Location and orientation of habitable rooms to avoid noise intrusion and anti vibration features to isolate structure borne noise.

Attention must be paid to residential properties within ten metres of La Route de la Liberation tunnel entrance at the west end of the site.
Once site-specific details are finalised a detailed noise assessment will be carried out.

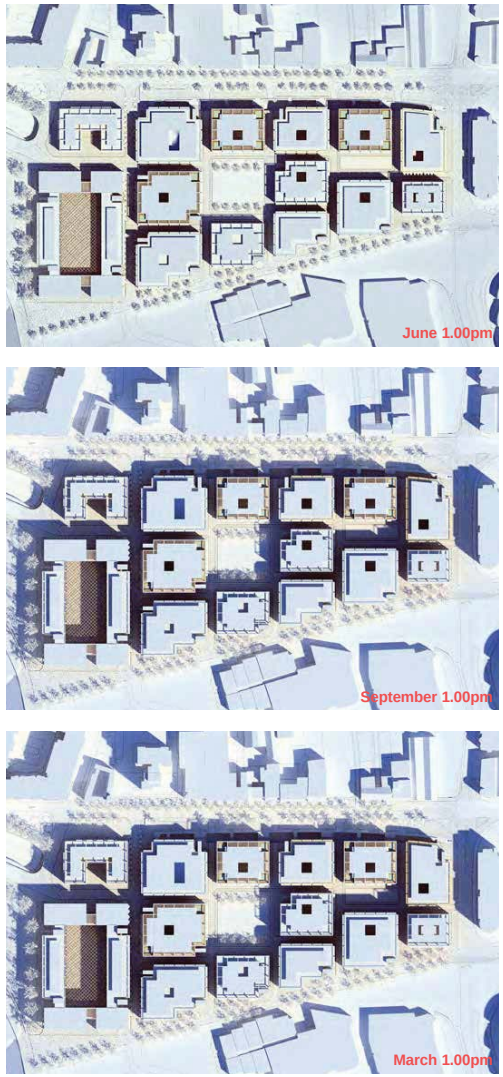
Air quality

As with noise, La Route de la Liberation beneath the site will have air quality issues. The underground car parking will require ventilation to ensure that the air quality is at least of sufficient standard to meet regulation requirements.

Mitigation measures to be considered here are:

- Reduce the traffic from within the site - priority pedestrian streets;
- Ensure that car park exhaust air is ejected where it can be dissipated given the prevailing environmental and microclimate conditions;
- Provide a ten metre buffer zone between residential accommodation and the tunnel entrance;
- Do not locate residential accommodation below the first and possibly second floor for the narrower roads subject to an air pollution study and modelling. It is anticipated there will not be residential accommodation at ground floor level. Microclimate information should be used to ensure that buildings provide protection from the worst weather while utilizing sea breeze to dissipate traffic fumes.

An air quality survey will be undertaken to identify any areas of particular concern.



Site sun path studies

Sunlight

In Jersey sunlight is welcomed both in the workplace and the home and is valued in open spaces to encourage plant growth. Sunlight availability is limited by cloud cover.

Sunlight throughout the winter months is especially valued. However, due to its low angle it is difficult to obtain in high density urban locations.

In summer months spaces exposed to the sun may need shading to prevent thermal discomfort of occupants of buildings. The orientation and layout of both residential and workplace accommodation needs to be considered to achieve the best balance.

For overshadowing purposes it is necessary to consider the path of the sun throughout the year. Solar radiation and solar gain will also need to be considered with regard to the facades of buildings.

Daylight

Daylight will be an important aspect in the development of the building facades with measures such as largely glazed facades, light shelves and internal atria being considered.

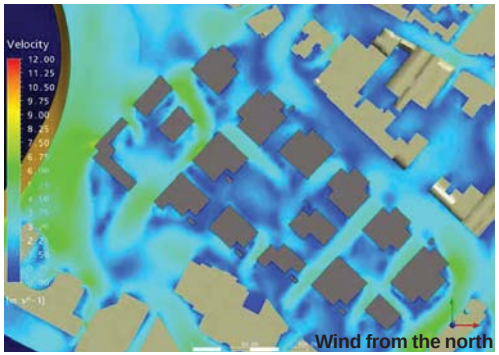
Wind environment

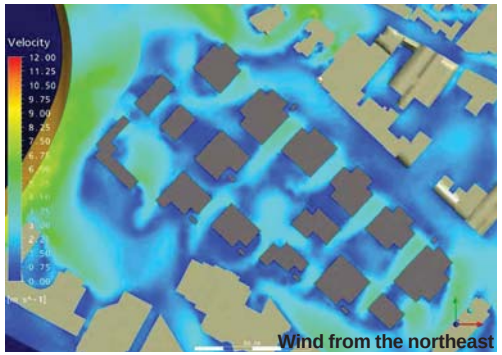
Overview of pedestrian comfort:

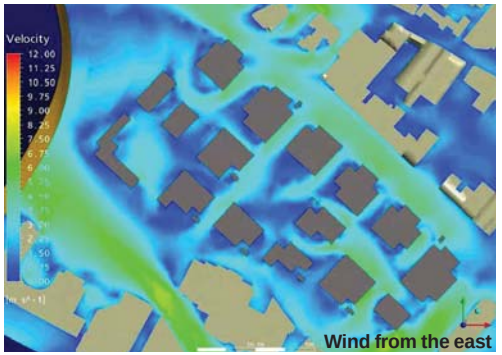
The pedestrian wind environment is governed by the interaction of the prevailing wind systems with the local topography. Wind flows can affect the comfort and safety of pedestrians. Comfort is influenced both by mechanical and thermal effects of the wind. Thermal effects arise due to the cooling of the wind. Therefore, in the summer months, wind may enhance the environment rather than cause discomfort as long as nuisance effects are not too significant. In winter months, wind will generally cause discomfort due to increased heat loss.

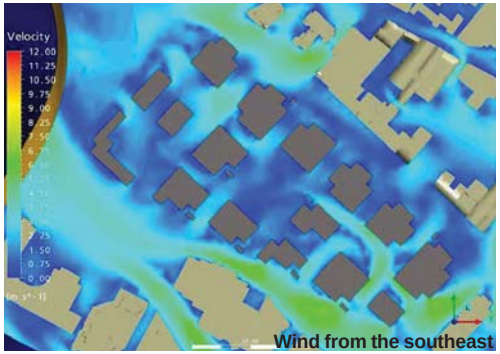
The microclimate of the development aims to provide protection from the worst weather. This will mean protection from the sea, while utilizing sea breeze, particularly prevalent in the summer, to provide natural cooling and help disperse traffic fumes.

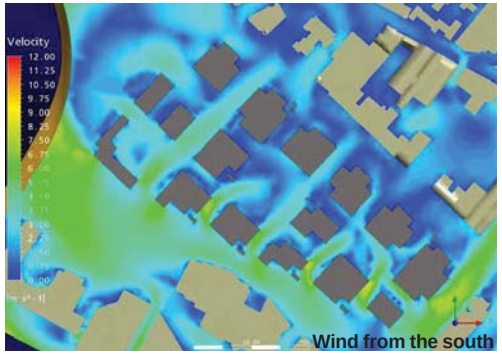
The wind studies (opposite) indicate that pedestrian comfort should be generally achieved within the quarter for all wind directions.

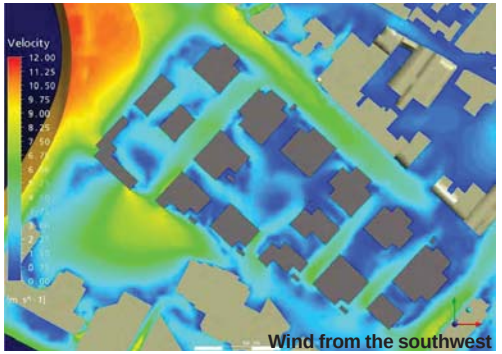


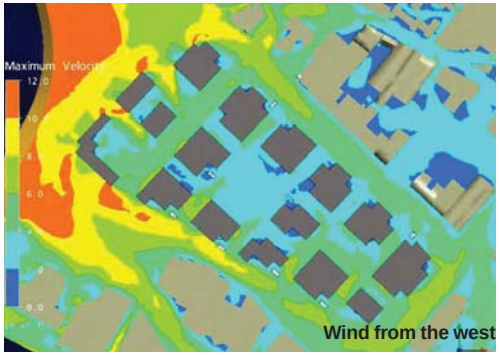


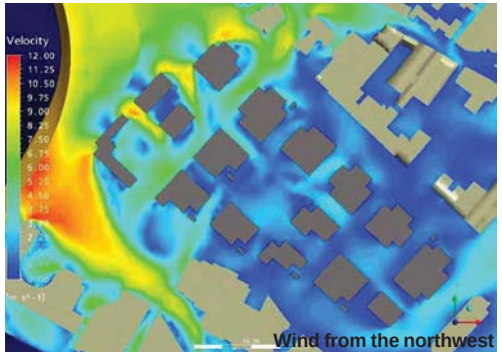


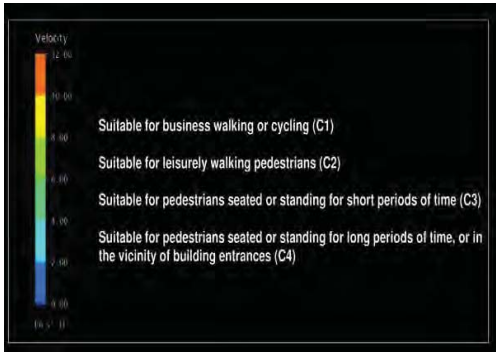












* These studies were carried out before the revised scheme for the winter garden, Le Jardin d'Hiver, was developed. New studies will be carried out the final proposals.
This work will be finally tested on a physical model.

Water efficiency

Design should observe the following order of priorities for reducing mains water use:

- Reduce demand – e.g. through use of water efficient fittings and with drought-resistant landscape planting; and
- Collect rainwater for non-potable uses.

Buildings should incorporate cost effective water efficiency measures to reduce mains water demand, including:

- Dual, low flush WCs;
- Aerating/spray taps for wash hand basins;
- Low flow showers;
- Urinal flushing controls in commercial buildings; and
- Rainwater collection systems, with an appropriate management structure to ensure maintenance.

Criteria for water efficient fittings and benchmarks for overall water use (in m3/person/year) are included in the Code for Sustainable Homes.

Sustainable drainage systems (SDS)

Traditional engineered drainage systems focus on attenuation, i.e. slowing down the rate at which rainwater flows from a site into the surface water drainage system. SDSs are designed to attenuate but also to reduce run-off by providing opportunities for water to soak into the ground and to evaporate.
In addition to the site-wide drainage system, SDS techniques could include the use of soakaways. Rainwater collection will also contribute to attenuation and run-off reduction.

Waste management

Design should take account of the waste hierarchy:

- Reduce;
- Reuse;
- Recycle; and
- Dispose.

Each building and local area should be designed to facilitate recycling by incorporating the containers and space for the collection and storage of recyclable materials. The design should assume the instigation of future local authority collection schemes.
Good practice criteria for collection and storage of recyclables can be found in the Code for Sustainable Homes.

Materials

Design should aim to provide scope for the selection of materials with low lifetime environmental impacts. In general, such materials may be those that meet some or all of the following criteria:

- Come from a sustainable source – e.g. labelling schemes are in place for sustainable timber;
- Are reclaimed or have a high recycled content – e.g. plasterboard and concrete blocks have varying recycled content depending on the type and manufacturer; and
- Can be locally sourced – e.g. local stone and other locally manufactured building materials should be preferred.

Designers should make use of available guidance on selecting sustainable materials. Good practice criteria on materials for internal and external walls, floors, roofs etc. can be found in the Code for Sustainable Homes based on the BRE Green Guides to Specification. The Code also includes criteria for sustainable timber.
The Waste and Resources Action Programme (WRAP) provides guidance on selecting materials with increased recycled content.

Ecology

The Code for Sustainable Homes includes criteria for protecting and enhancing site ecology and biodiversity. The aim for each phase of development should be to achieve the maximum score for ecology (allowing for the fact that this is a brownfield site on reclaimed land). The development of the landscaping proposals, particularly for Les Jardins de la Mer, will aim to enhance the existing wildlife and biodiverse habitats found locally.

Environmental standards

Good practice opportunities to address environmental issues – energy & related CO2 emissions, water, waste, materials, biodiversity – should be taken wherever they are cost-effective. As a minimum, development at the Esplanade Quarter must meet the following benchmark building performance standards:

- Overall environmental performance – dwellings: Code for Sustainable Homes ‘Level 3’;
- Overall environmental performance – non-domestic buildings: BREEAM (Building Research Establishment Environmental Assessment Method) rating of “Excellent”.