Sustainable Hotel
Siting, Design and Construction

The industry guide to good practice

Conservation International

International Tourism Partnership

3 CREATING THE DESIGN BRIEF

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CREATING THE DESIGN BRIEF

The design brief should be developed by the architect working in partnership with the client, the supply team, key stakeholders and any external specialists who may be called upon to advise upon the sustainability of the project. The design brief should develop and expand the project brief, providing greater detail but remaining sufficiently open-ended to allow for alternative solutions to be incorporated.

During the design phase, the client and the supply team can greatly influence the sustainability of a development. The key areas of focus should include the identification of preferred materials and identification of quantifiable benchmarks for issues such as energy and water efficiency and accessibility. All will have a significant influence on the final design and future performance of the building.

Al Maha Desert Resort in Dubai, United Arab Emirates, has assisted with the repopulation of its surrounding desert ecosystem with native animals and flora including two endangered species of oryx, an Arabian gazelle. The resort's design is based on a traditional Bedouin camp, with rooms made of canvas and stone.

Picture © Emirates, courtesy Al Maha Desert Resort

Successful buildings must achieve the following objectives:

- Functionality—how the space is to be managed for optimum use by its occupants.
- Build quality—the engineering performance of the building, which includes its structural stability as well as the integration and robustness of the systems, finishes and fittings.
- Impact—the ability of the building to create a sense of place, and to have a positive effect on the local community and environment. This also encompasses the wider effect its design may have within the design and construction community.[25]

[25] Design Quality Indicators, Construction Industry Council, www.dqi.org.uk

3.1 Key criteria

In addition to the above goals, there are several key criteria that need to be met both in the outline and detailed design briefs if the building aspires to be 'sustainable':

3.1.1 Protection and enhancement of the site

Every effort should be made to **limit the impact** of the development on local ecosystems and to **preserve and protect** biodiversity wherever possible. This should be addressed during the Environmental Impact Assessment *(see* ***Section 2.3****)*. Physical aspects of the development—such as the provision of water and energy resources, as well as effluent treatment emissions and their affect on the air quality, light, soil and surface and ground water quality—need to be considered in relation to the surrounding flora and wildlife. This is particularly important if any endangered or threatened species are present or the project is in or close to an area of high biodiversity. Plans should be drawn up to mitigate and offset any environmental impact caused by the development in consultation with key stakeholder groups (including conservation non-governmental organisations) and the opportunity taken to enhance local degraded areas.

3.1.2 Socio-economic effects

Consideration must be given to how the development can **positively** rather than negatively affect the neighbourhood, its inhabitants and the local economy and how to mitigate any potential negative impacts. This involves addressing issues such as additional traffic pollution, possible displacement of local residents, cultural or archaeological implications, ease of access and use for those with physical impairments, provision of recreation and sports facilities, tourism opportunities, sanitation and public health and consulting with members of the local community for their perspective on how they will be affected.

3.1.3 Aesthetics and building efficiency

It is important that the hotel building is **in harmony with the environment**, both in terms of being aesthetically pleasing and resource efficient. How it sits on the site, its orientation and layout, the use made of existing buildings and infrastructure, consideration of other purposes for the building and the materials from which it is made will all have a bearing on its aesthetic appeal. The project team needs to design for optimum operational performance and durability as well as factoring in what may happen at the end of its life. Could the materials and components be disassembled and reused or recycled rather than discarded? The quantity of materials used should be kept to a minimum and waste avoided as far as possible. The choice of materials should be guided by what is local and appropriate to the site, whether they are renewable or sustainably produced and taking into account any environmental impacts.

3.1.4 Quality of indoor and outdoor environment

Provision of a **high quality internal and external environment** will affect the way the hotel is perceived locally, the productivity of its staff and the general satisfaction of guests and visitors, all of which is important for business. Consideration needs to be given to the amount of daylight or shading that should be provided, opportunities to use natural ventilation, views from the building and making the development a pleasant place to be and use.

Indoor air quality can be improved dramatically through the use of **non toxic and non-VOC-emitting[26] materials**. Thermal comfort will be enhanced by the extent to which the building's occupants can control temperature, light and windows. The building itself and the equipment it contains should be well-insulated to cut down on noise. Health, life safety and environment issues such as air emissions, water quality, waste water control, prevention of Legionnaires' disease, fire extinguishing systems and avoidance of hazardous substances and waste all need to be factored in.

3.1.5 Energy efficiency

The aim should be to **reduce the development's environmental impact both globally and locally** by minimising the building's contribution to global warming, and its depletion of non-renewable energy sources and atmospheric ozone levels.[27] The aim should be to build using natural systems rather than replacing or working against them. This involves making good use of daylight (depending on the climate) and using natural ventilation, passive solar gain and passive cooling techniques. Consider whether energy can be supplied wholly or partially by renewable energy technologies such as photovoltaic solar panels, solar hot water collectors or wind generated electricity. Specify minimum efficiency levels for equipment, systems, fixtures and appliances and ensure that variable demands for air, water, lighting, energy and refrigerant can be met through the use of building automation systems. Provision should be made for energy (and water) consumption to be sub-metered by major department to enable monitoring to take place once the building is operational. It will also be important to plan in sufficient time for commissioning to ensure optimum equipment and systems performance.

3.1.6 Water efficiency

Assess by what means the hotel's requirement for water will be met, and whether the location will be able to support the additional demand without detriment to the **supply to the surrounding community**. Reduce the strain on local resources by establishing maximum demand and consumption levels. Consider water recovery techniques such as rain water harvesting, grey water recycling and xeriscaping (low water-use landscaping). Specify low water-use technologies and equipment.

3.1.7 Construction and development impact

If possible use a **design and construction team** with experience of 'green' development and suppliers with a proven environmental track record. It may be necessary to implement a training and awareness programme to ensure that all parties are at the same stage of the learning curve and aware of the sustainability goals.

Make it clear that in **preparing the site** for construction it should not be completely cleared or all vegetation removed, rather, existing vegetation should be catalogued and viewed as a potential asset for the development of the site. It may need to be screened with boarding, perhaps depicting an artist's impression of the hotel building, which creates an opportunity to explain the sustainability objectives to the community. Temporary infrastructure needs and impacts such as waste and waste water handling, storage, facilities and machinery, noise, transportation and the impact on local traffic will need to be assessed. Consider how storm water will be contained, erosion and sedimentation prevented and topsoil retained for landscaping the site.

It will also be necessary to **communicate with the local community** at each stage regarding what is happening, when they might expect high noise levels from activities such as pile driving or vehicles delivering building materials to the site.

[26] Volatile Organic Compounds, found in some paints and varnishes.

[27] Ozone depleting substances include refrigerants such as HCFCs, the use of which is increasingly restricted around the world under the terms of the Montreal Protocol. More information is available from the UNEP Division of Technology, Industry and Economics (DTIE) OzonAction Programme, **www.unep.org/dtie/Branches/OzonAction/tabid/29688/Default.aspx**

3.1.8 Performance monitoring

It is important to **design and build in systems** that will facilitate operational aspects such as control of energy and water consumption, waste separation, recycling and composting and the storage and disposal of hazardous substances. Systems should be easy to operate and maintain and should also incorporate devices to enable performance monitoring so that targets can be set.

3.1.9 Ensuring high sustainability standards

Various methods can be used to help ensure high standards of sustainability and to keep the project on track. The most widely adopted are outlined below.

a **Life Cycle Assessment (LCA)** is the systematic identification and quantification of inputs and outputs of the project over its entire life cycle, from 'cradle to grave'. It is particularly useful in assessing the environmental performance of materials introduced into the building and can be integrated into the procurement process and in supply chain management.

b **Whole life costing** (also referred to in *Section 1.2*) is arguably the best way to quantify 'the financial value of a structure over its whole life, balancing capital with revenue costs to achieve an optimum solution.'[28] It involves the systematic consideration of all relevant cash flows associated with the acquisition and ownership of an asset and can be applied to an entire built structure or to any individual component. In a typical office building, for every unit spent on design, five are spent on construction, 20–50 units on operating costs over its lifetime and 200–500 units on the occupants' salaries. If the building is designed and constructed to halve the operating costs, the savings would be 10–25 units. If the design makes the occupants just 5% more productive, the savings would be a further 10–25 units. To achieve these savings requires more input at the design and construction stages, but there is a clear business case for the developer to justify spending up to five times more on both design and construction, without increasing the life cost of the building.

c **Design Quality Indicators (DQI)** developed by the Construction Industry Council in the UK. DQI is an online tool for use by stakeholders such as the client, members of the design team, users of the building, contractors and facilities managers who are guided through the process by a trained DQI facilitator. It can be used at any stage in the development of a building project and can be used repeatedly at successive stages such as briefing, mid-design, ready-for-occupation and post occupancy. The questionnaire automatically adjusts the questions displayed so they are relevant to the particular phase of the project that is being assessed.

More information

Achieving Excellence in Construction Procurement Guide 07 Whole Life Costing
UK Office of Government Commerce, 2003
www.ogc.gov.uk/sdtoolkit/reference/achieving/ae7.pdf

American Society of Landscape Architects
www.asla.org

BRE WLC Comparator
A tool to calculate the whole life costs of building components.
Building Research Establishment
www.bre.co.uk/page.jsp?id=48

Design Quality Indicators
Construction Industry Council
www.dqi.org.uk

Green Building Advisor
A software program designed to help architects and other building professionals design occupant-friendly and environmentally-friendly buildings.
www.greenbuildingadvisor.com

Sustainable and Secure Buildings Act 2004
Amends the existing Building Act to enable building regulations in the UK to address sustainability for the first time.
www.legislation.gov.uk/ukpga/2004/22/contents

[28] 'Achieving Excellence in Construction, Successful Delivery Toolkit', UK Office of Government Commerce, **www.ogc.gov.uk/sdtoolkit/reference/achieving/index**