3.2 Outdoor thermal comfort

Related Credits: LBo-R3: Outdoor Thermal Comfort Strategy

The building orientation in relation to local winds and sunpath as well as the influence of surrounding buildings and other landscape elements should be considered to provide an adequate outdoor space that improves the building's exterior microclimate and achieves adequate pedestrian comfort.

In particular for shading, it is required to check that the shading percentage required by credit LBo-R3 is achieved on the equinox (21st of March) and the summer solstice (June 21st) at 1.00pm over the following elements:

- Exterior Surface Parking with more than 10 spaces, including parking on exposed roof car parks
- Public Open Spaces, including privately owned
- Pedestrian walkways
- Cycle tracks
- Playgrounds

The checks can be done using sun altitude and azimuth data (For Abu Dhabi, the summer solstice alt = 81.4°, azi =-94.6° and for the spring equinox alt = 64.2°, azi = -161.6°) or an appropriate software such as 3D CAD software, e.g. Ecotect, or free 3D tools, such as Sketch up.

Shading can be provided by mature trees or by structures, such as canopies. If structural elements are used, their outer surfaces must have a minimum Solar Reflectance Index (SRI) of 29. The SRI is a measure of the roofs ability to reflect solar heat, and the higher it is, the better the surface is a reflecting heat. High SRI can be achieved with light or reflective materials and/or finishes, e.g. some concretes, light aluminum cladding.

The guidelines in the UPC Urban Street Design manual can be used for designing the outdoor spaces around the building. The manual can be downloaded from

http://www.upc.gov.ae/guidelines/urban-street-design-manual.aspx.

The following example shows different strategies of how the required levels of shading can be achieved using adequate building layouts, natural elements or some additional construction elements.

Example 3.2a