

# 5.0 Design building systems

The lighting, shading and ventilation strategies established early in the design process will reduce the requirements for building systems. Careful detailing of systems to provide cool, comfortable and efficient performing indoor spaces can further reduce the buildings environmental impact.

## Approach

For credit LBi-R1, the building must comply with ventilation requirements set out in ASHRAE Standard 62.1-2007, or local code, whichever is more stringent.

## Energy

The design of the building HVAC and lighting systems is driven by the requirements outlined in ASHRAE Standard 90.1- 2007. Compliance with RE-R1 is achieved by a 12% improvement in Proposed Design Energy Performance when compared with the Baseline Design Energy Performance. This improvement is demonstrated through dynamic simulation modelling to simulate energy performance as outlined by the Performance Rating Methodology in Appendix G of ASHRAE 90.1-2007.

Credit RE-R2 requires energy submetering, whereby installed meters are to be clearly labeled and provided in easily accessible locations. They must measure, as a minimum, 90% of the estimated annual energy consumptions of each fuel type (electricity, gas, etc) for all energy end use categories, in both Landlord and Tenant areas. Metering is also required for all onsite energy generating systems and large plant items.

## Water

Efficient water fixtures and metering are covered by credits PW-R1 and PW-R2. Estidama requires specific flows rates for water fixtures, fittings, and appliances. As with energy meters, water meters must be easily accessible and clearly labeled, to sub-meter the building's external water use. These must have a pulsed output and be capable of remote monitoring.

## Materials and Waste

SM-R3 requires waste generated in the building to be stored on each building floor before being taken to a central waste storage for the whole building from where it will be collected to the appropriate treatment or disposal facility. Credit IDP-R1 requires decisions regarding the design of MEP and waste to be agreed on in integrated development workshops.

Credit RE-R3 specifies that only refrigerants and fire suppression systems with an ozone depletion potential (ODP) of zero can be used for any purpose onsite.

### useful resources

- ASHRAE Handbook of Fundamentals 2009.
- ASHRAE Standard 62.1-2007 Ventilation for Acceptable Indoor Air Quality/ASHRAE/IESNA 90.1 – 2007: Energy Standard for Buildings Except Low- Rise Residential Buildings.
- UNIFORM PLUMBING CODE of Abu Dhabi Emirate 2009, Environment Agency Abu Dhabi.

### Related Credits

- LBi-R1: Healthy Ventilation Delivery
- LBi-R3: Legionella Prevention
- PW-R1: Minimum Interior Water Use Reduction
- PW-R2: Water Monitoring
- RE-R1: Minimum Energy Performance
- RE-R2: Energy Monitoring & Reporting
- RE-R3: Ozone Impacts of Refrigerants & Fire Suppression Systems
- SM-R3: Basic operational waste management strategy

