

Prominent green features of new RSETI IGBC Platinum Rated Net-Zero Energy Building at Jodhpur

(a) Use of site excavated material for construction

Jodhpur has rocky strata and thus stone masonry is very popular. The building is located in a rocky area and the site-excavated material has been used for construction and partly resourced from alternate local sources.



Fig 1: Rocky strata & use of excavated material

(b) Superior design for abundant use of daylight

The building is well-designed and good natural daylight is available in more than 80 % functional area of the building. The central part of the building is open to sky and lined with open verandah allowing sufficient light visibility. Glass with overhangs used on the outer periphery of the building.



Fig 2: Central part of building & daylight availability

(c) Energy efficient and eco-friendly phyto-remediation STP plant

The 20KLD phyto-remediation plant has very less energy consumption and natural slope of the terrain has been used to transfer wastewater to the natural plant based twin treatment tank units.



Fig 3: Recently commissioned STP plant

(d) Captive installation of 35kWp SPV plant

A 35 kWp SPV plant has been installed on the roof of first floor and is catering to the captive load. This is being connected to the grid for net-metering. The unit comprises of 120 modules and a central inverter has been used.



Fig 4: Captive SPV plant 35kWp

(e) Zero discharge institution. 100% water reuse.

- The treated water from STP is used for flushing through a separate water line and the treated water is used for plants and foliage. To economise on water consumption, drip irrigation has been used in the building landscaping area.
- Rain water harvesting

The building uses the natural gradient for water recharge zone, where surface runoff water is guided towards the recharge pit in addition to the roof top water harvesting.



Fig 5: Drip irrigation and natural gradient

(f) Climate specific landscaping

The plants and foliage are drought tolerant variety suited to the local climate and after re plantation have picked up a good growth.



Fig 6: Climate specific plantation

(g) Use of only LED based lighting (entire premises)

Only LED based lighting has been used in the entire building premises. The two Fascia boards mounted on the building top are also LED based.

(h) Use of standalone SPV Street light for outer premises lighting

The SPV standalone lights with integral built in battery, SPV module and auto on/off feature has been used on poles for the outer premises lighting. (Fig 7)

(i) No Nocturnal light pollution

Green buildings minimise the nocturnal light pollution and at RSETI Jodhpur all the peripheral SPV street lights are facing downwards to minimise nocturnal light pollution.



Fig 7: Solar photovoltaic street down-lighter

(j) Cool Roof tiles used on entire roof

The cool roof tiles with very high solar reflective index (SRI) value has been used on the entire roof of the institute building to minimise solar heat gain through roof.



Fig 8: Cool roof tiles on entire roof

(k) Use of super energy efficient Brush less DC ceiling fans

The entire building has 68 fans and all these are super energy efficient brushless DC (BLDC) fans. These fan consume very less energy compared even to star rated fans.



Fig 9: Super-efficient BLDC fans

(l) Use of Star rated appliances

5-star inverter air conditioners have been installed in the building and other equipment such as Transformer, refrigerator, geyser etc. are star rated. For the pumping of water, high energy efficient units have been deployed.

(m) Excellent natural ventilation

The building has an open to sky central area with lawn and foliage. This provides excellent natural ventilation of the entire premises. In the reception room, which is separated out from the central open area, a traditional natural ventilator (*Jaali*) has been provided on the entrance side.



Fig 10: Natural ventilation provisions

(n) Minimising window to wall ratio on sun exposed side

Jodhpur is located in hot and climatic zone. While maintaining the functionality, the window to wall ratio provision has been considered for minimising heat gains.



Fig 11: East facade of building

(o) Shading cum ventilation provision

The glazing on the south side has shading provision with cement grill (Jalli), The glass window has an open top portion behind the cement grill for natural ventilation.



Fig. 12: Shading cum ventilation on the South side of the building

(p) Use of innovative products

(i) Solar cooker built on the roof for cooking purposes.



Fig 13: Built in solar cooker on roof

(ii) Built in solar still – This can generate distilled water for captive use(batteries)



Fig 14: Distilled water solar still

(iii) Eco Air fan at reception has a large sweep area and low energy consumption. The fan is mounted at the reception of the building is sufficient for the large area.



Fig15: Eco Air fan at building reception

(iv) Use of light pipe: Light pipe is used in the medical room and provides excellent illumination



Fig 17: Light pipe used in medical room

(v) Use of local sheesham wood for the furniture



Fig17: Use of local sheesham wood in furniture

(vi) Provision of battery charging point and use of battery driven three wheelers.