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**An Ecologically Sustainable Hotel Design**

Eighty seven percent of today’s global travelers are searching for eco-friendly hotels’ as cited by a (2018) Booking.com survey. Sixty seven percent indicated they are willing to pay 5% more for it. By creating an eco-friendly plan, it opens new opportunities for long term energy saving costs, increased social media engagement, and increase in the number of guests. Based on an Accor survey 70% of travelers and 75% of business venues prefer sustainability credentials (Business Green, 2011). To acquire the certifications, a good resource can be found at the Sustainable Hospitality Alliance (2024) website. It has a wealth of information on design standards. Another certification source is from the LEED (Leadership in Energy and Environmental Design, 2024) for green building standards. Recycled Track Systems (RTS) defines what a LEED certification is. The links can be found in the reference section toward the end of the document.

To be ecologically sustainable within the confines of a hotel, newly built or renovated, requires the human impact to be reduced to the lowest achievable level. There should be no waste introduced into the surrounding environment, be it trash, polluted water, hazardous chemicals of any kind, lighting that might attract and kill birds. Developing sustainability is an on-going process, but it starts with being environmentally and energy efficient.

**An Environmentally and Energy Efficient Hotel**

A new hotel could be built as a 5-story pyramid like structure. The external structure would be built with steel and environmentally produced concrete. To learn more about sustainable concrete visit (Earth Friendly Concrete, 2024). The link is available in the resources section at the end. Windows, set back from the overhanging balconies can have hurricane shutters that can be closed to provide shelter during storms. This is to provide as much protection as reasonably achievable from the extreme effects of climate change that might be encountered over the life of the facility (The Intergovernmental Panel on Climate Change (2023). All the rooms in this portion of the structure can have extensive balconies, to the extent they might be classified as terraces. Rooftop and terraces will provide significant panoramic views of the land, mountains, seas they may overlook.

Adjacent to the hotel an earth-sheltered structure could be set into the side of an adjacent hill with the lay of the original land enveloping the building. The building can house the primary maintenance, HVAC, and laundry facilities. The large ground source and/or air-to-air heat pumps will be in a secluded portion of the hill in which this structure is located. Delivery vehicles and such will also come and go from this portion of the facility easily.

The internal structure of the hotel can use manmade structural wooden beams so the interior will be made from regenerable wood to the maximum extent required for structural and aesthetic purposes. This use of wood will blend well with the wood used in the hotel guest rooms.

For new and renovated hotels, the following design changes will be incorporated as time and resources allow or as local conditions require.

Rooftop and balconies/ terraces will be home to an abundance of plants, bushes, trees, to provide substantial shade from the winds and sun, as needed. It will also shade the structure to protect it from heating up in the summertime. Plantings can include grape vines, fruit trees, herbs, vegetables, etc., so the kitchen staff will have fresh produce to pick from, to work their magic within their kitchens, then serve to grateful guests.

Modern art mimicking solar and wind energy collectors can be scattered around the facility, transmitting the energy they collect to a rack of well vented underground storage batteries, re-using lithium-ion car batteries. Solar Umbrellas can also be used to shade the hotel in the summer, reducing heat loads within. These batteries will be used to supplement/ replace power from the grid, as available.

Lighting will be primarily LED with a significant portion in hallways and other common areas linked to a computer. Lighting in the rooms will be simply on, adjustable brighter/ darker, off. Lighting in common areas will be adjustable with respect to color, intensity, flashing for alerts and alarms, low power to conserve in times of power loss, etc. Additional energy efficiency can be found in the use of smart thermostats and appliances to reduce load when not in use.

As a result of being aware of increasingly restrictive water issues, cities like Mexico City, Bogota Columbia, Singapore, San Antonio, Texas and many more around the country and the world, are implementing a variety of different approaches to saving and re-using all water. Simple actions include not changing out sheets and towels each day in each guest rooms. This will require encouraging guests to keep track of their towels, which will in turn likely require a bit of education to staff and guests. Using water reclamation equipment would allow the re-use of gray water from showers, washing machines, and dish washers. Initially, the water can be used to irrigate plants, cleaning and general maintenance. Subsequently, additional equipment can be installed to upgrade water to potable grade, to further minimize the impact on systems already straining to meet local population needs.

Since most hotels are typically renovated every 3 to 5 years. Keeping ecological issues in mind helps the designer when selecting recycled materials and or ones which can be recycled at the end of use. Recycled materials are ones which are free from chemical dyes, and Volatile Organic Chemicals (VOCs) found in paints and cleaning products or using sustainably harvested wood. Many retailers offer wood products and faux leather goods. In addition, avoiding very trendy design plans may also reduce the need to renovate as often.

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