



HEALTH AND COMFORT RATING : A CASE STUDY OF AN EXISTING HOTEL BUILDING

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ABSTRACT

The hotel industry is one of the most energy intensive subsectors of tourism industry. In response to these impacts, there is growing consensus among organizations committed to environmental performance targets that appropriate strategies and actions are needed to make building activities more sustainable. It should meet a number of certain objectives: resource and energy efficiency; Carbon dioxide and Green House Gases(GHG) emissions reduction; pollution prevention; mitigation of noise; improved indoor air quality; harmonization with the environment In the current life scenario, health and comfort plays an important role in the overall green building analysis. The negligence towards health and comfort has resulted mainly in depletion of the indoor environmental quality.

Keywords: *health and comfort rating, indoor environmental quality, indoor air quality*

INTRODUCTION

Health and comfort is an important aspect to be considered in rating of a hotel building. An unintended consequence of indoor smoking is the relocation of building entrances, where non smokers may be exposed to second hand smoke, and smoke from outdoor areas may drift through entrances, exposing people inside. Tobacco smoke has been linked to numerous health effects in non smokers and there is no safe level of secondhand smoke (SHS) exposure. [1] Control of indoor environment has developed over the centuries from simply providing heating for living and working spaces to the use of mechanical cooling system for more comfortable year round indoor environment by mid nineteenth century. However , growing concern about the quality of indoor air and the development of more elaborate central air conditioning systems have given more emphasis to ventilation systems and the control of indoor air quality in relation to airborne contaminants. [2]The understanding of ventilation requirements in commercial buildings has been significantly revised in the last 10-15 years. A link between health, productivity and increased fresh air use has been established by some research and this understanding underpins the ventilation philosophy adopted for the building. Minimization of indoor pollutants, adequate filtration and high levels of ventilation should, however, ensure satisfactory air quality during occupied hours.[3]The building industry is a vital element of any economy but has a significant impact on the environment. By virtue of its size, construction is one of the largest users of energy, material resources, and water, and it is a formidable polluter. In response to these impacts, there is growing consensus among organizations committed to environmental performance targets that appropriate strategies and actions are needed to make building activities more sustainable. The idea of sustainability involves enhancing the quality of life,

thus allowing people to live in a healthy environment, with improved social, economic and environmental conditions . A sustainable project is designed, built, renovated, operated or reused in an ecological and resource efficient manner . It should meet a number of certain objectives: resource and energy efficiency; CO₂ and GHG emissions reduction; pollution prevention; mitigation of noise; improved indoor air quality; harmonization with the environment. An ideal project should be inexpensive to build, last forever with modest maintenance, but return completely to the earth when abandoned. [4]The hotel industry is one of the most energy-intensive subsectors of the tourism industry, with about 50% of the overall energy consumption due to space conditioning. The thermal comfort standards applied in defining the required levels of thermal comfort in hotels have a substantial effect on the overall energy use in this sector. Among commercial buildings, lodging facilities are unique with regard to operational schemes, the type of services offered, as well as the resulting patterns of natural resource consumption. Comfortable indoor environments, safety and reliability are some of the amenities valued by guests. State-of-the-art technical infrastructure is typically utilised in hotels to provide high levels of comfort, including thermal comfort. The indoor temperature levels set to be maintained greatly influence the quantity of energy consumed in a building. The temperatures recommended by relevant standards are typically a function of the season of the year and relative humidity, and are usually fixed within a limited range In reality, temperatures perceived as comfortable vary greatly depending on the activity performed, clothing worn, time of the day, a person's physical and emotional state, and other factors, not least the climate a person is typically accustomed to. Using general, narrowly fixed comfort temperature ranges for indoor applications thus appears rather questionable, especially against the increasing need of energy-efficiency and conservation.[5]

II.METHODOLOGY

To understand Indian Green Building Council (IGBC) ratings-- Indian green building council provide "IGBC green existing buildings rating manual. Use of rating system for health and comfort norm has been used. To find out the actual rating for health and comfort norm is the aim of this project and give some suggestions in order to make it a more good practice.

III.STUDY AREA

Hotel Rasika Renaissance is a 3 Star Facility Hotel with a new concept in hospitality. It is located in the heart of the city of Kolhapur just three minutes away from the central bus stand and five minutes from railway station. Even being located in the heart of the city it has a peaceful surrounding which makes it an ideal place for both business and leisure traveler. All the guests' rooms are well designed to make the guests feel more comfortable with all modern amenities like business centre, laundry & direct dialing from rooms. All these facilities are combined together with personalized service to make your stay memorable.

IV.RESULTS AND DISCUSSIONS

HEALTH AND COMFORT

Following are the requirements for a hotel building to apply this rating :

4.1 MANDATORY REQUIREMENTS

4.1.1 Tobacco smoke control

Minimise exposure of non smokers to the adverse health impacts arising due to passive smoking in the building. Demonstrate that smoking is prohibited in the building and is in accordance with government regulations. Signages are displayed all around in the hotel .Smoke detectors are provided in all areas except from bar area.

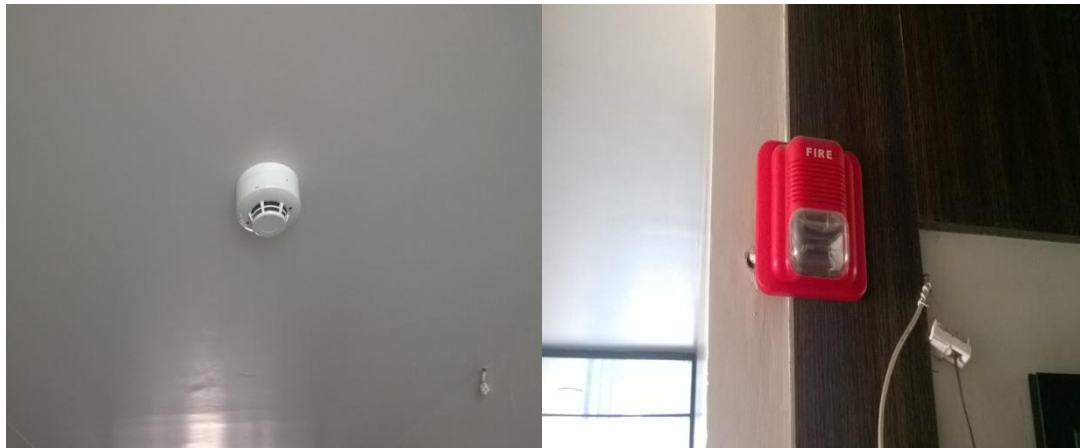


Figure 1 Signages and smoke detector

4.1.2 Fresh air ventilation

Provide adequate outdoor air ventilation so as to avoid pollutants affecting indoor air quality. Demonstrate that the ratio of openable area to the carpet area is atleast 4% in each regularly occupied zone. Also demonstrate that fresh air ventilation in all regularly occupied areas meet the minimum ventilation rates. majority of rooms fulfil the requirement, except passage and conference room which can be improved by increasing size of opening or by providing fans.

TABLE 1- Shows ratio of carpet area to openable area

Rooms	Numbers	Carpet Area	Openable Area	Ratio
Typical floor rooms	40	16.86	3.55	4.75
Passage	4	21.54	8.18	2.63
Conference	1	27.5	9.15	3
Bar	1	113.05	23.66	4.77
Kitchen	1	74.92	14.2	5.27

4.2 HEALTH CREDITS

4.2.1 Carbon dioxide monitoring and control

Continuously monitor and control carbon dioxide level in the building to provide occupant comfort and well being. For each regularly occupied area in the project, demonstrate that ratio of openable area to carpet area is 6%. Since the CO2 sensors are not installed in the building this points cannot be achieved.

TABLE 2- Shows requirement for carbon dioxide monitoring

Requirement	Credits	Achieved	Points awarded
1) Demonstrate that the project has installed CO2 sensors and a control system to maintain a differential CO2 level of 530ppm in all regularly occupied areas.	1	Nil	0
2) For each regularly occupied area of naturally ventilated spaces, demonstrate that the ratio of openable area to carpet area is atleast 6%	1	Nil	0

4.2.2 Isolation of polluting equipment & systems

To minimize the exposure of building occupants and maintenance team to hazardous indoor pollutants which adversely affect indoor air quality and occupant health. Partitions are provided for areas like housekeeping areas etc.

TABLE 3 – Shows requirement for isolation of polluting equipments

Requirement	Credits	Achieved	Points awarded
For areas such as janitor rooms, housekeeping areas and printer rooms demonstrate that the project has isolated these areas with regularly occupied areas by providing partitions.	2	ACHIEVED	2

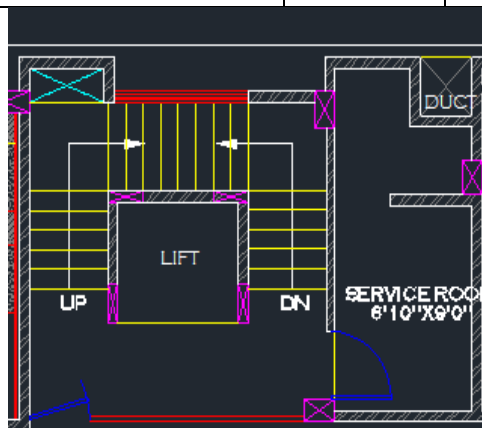


Figure 2 service room provided with partition

4.2.3 Eco-friendly Housekeeping Chemicals

To encourage the use of eco-friendly housekeeping chemicals so as to reduce adverse health impacts for building occupants. Eco friendly housekeeping chemicals have not been used in the hotel to reduce the health impacts. But if proper chemicals like Bsica, fin marca, welsonlcdetc were used then the points could have been achieved.



TABLE 4- shows requirements and points achieved

Requirement	Credits	Achieved	Points awarded
Demonstrate that the project is using housekeeping chemicals that meet green seal standard (GS-37) or other Indian equivalent standards, for all building applications.	2	nil	0

4.2.4 Thermal Comfort Indoor Temperature & RH

To provide comfortable thermal indoor environment to promote productivity and well being of occupants. The building must maintain a minimum temperature in order to achieve this points for the thermal comfort indoor temperature. If the method of providing thermal comfort like blanket insulations, loose fills, insulating boards , light weight materials and reflective sheet materials could have been then the points could have been achieved.

TABLE 5 – shows requirement of thermal comfort

Requirement	Credits	Achieved	Points awarded
Demonstrate that the building was maintained at the requisite temperature and relative humidity conditions for 90% of the time. The comfort condition to be maintained is 26+/-2 degree C and RH in the range of 30 to 70%	2	nil	0

4.2.5 Facilities that the building is user friendly for differently abled people

Ensure that the building is user friendly for different abled people. Facilities like non slippery ramps, lifts and uniformity in floors has been provided in order to achieve this points.

TABLE 6- shows requirement for facilities to differently abled people

Requirement	Credits	Achieved	Points awarded
Demonstrate that the facility has following provisions for differently abled people: <ul style="list-style-type: none"> • Non-slippery ramps for easy access to the main entrance of the building. • Uniformity in floor level for hindrance free movement in common areas such as wash room canteen etc. • Preferred car park spaces having an easy access to the main entrance or closer to lift lobby. 	4	ACHIEVED	4



Figure 3 Lift for differently abled people



Figure 4 Non slippery ramp

4.2.6 Occupant well being facilities

To provide facilities so as to enhance physical, emotional & spiritual wellbeing of building occupants. The building is occupied with gym which can cater 10% of the building occupants. Well being facilities such as gym, aerobics, indoor games provision are of really great importance as they provide a great for occupants to relax and also to enjoy the leisure facilities provided by the hotel.

TABLE 7 – shows requirements of well being provisions

Requirement	Credits	Achieved	Points awarded
Demonstrate that the project has atleast 2 occupant wellbeing facilities(SUCH AS GYMNASIUM, AEROBICS, YOGA AND GAMES) to cater atleast 10% of building occupants, through the day.	2	ACHIEVED	2



Fig. 5 Gym Facility



Fig. 6 Aerobics Cum Gym

V.CONCLUSION

Health and comfort plays an important role in making a building sustainable or green. proper ventilation, controlling of CO₂ gases, providing facilities for differently abled persons are really required in todays scenario. The case study taken helped in understanding and implementing the health and comfort ratings to an existing building and to actually find out the performance of the building.

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