

Deciphering Green Architecture



Moving Towards Sustainable Campus Design

Projects: NIIT University Campus, Neemrana and Indian Institute of Technology, Gandhinagar

Architects: Space Design Consultants, New Delhi

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With the promotions and publicity of green building rating systems, it seems that Green buildings will make a sustainable world but this is far from the truth. Because the issues included in green building rating systems deal with environment sustainability only and that too at a building level, there is no chance that green buildings will result in sustainable development. A framework or guidelines for development of a large campus where response to

environmental issues will be sustainable, does not exist. In addition to designing buildings that are properly oriented, insulated, energy efficient, day-lit, water conserving etc, one needs to think about issues like, what to build? Where to build? How much to build? How to make judicious use of land? What can be done towards food production, social equity and economic sustainability?

The case in point is a NIIT University Campus at Neemrana and IIT, Gandhinagar.

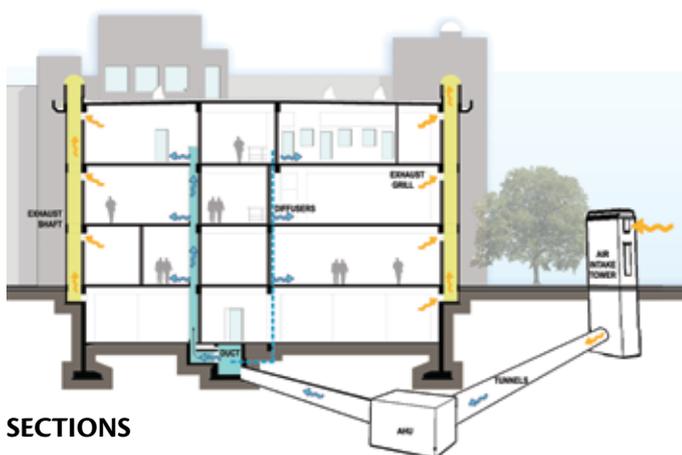


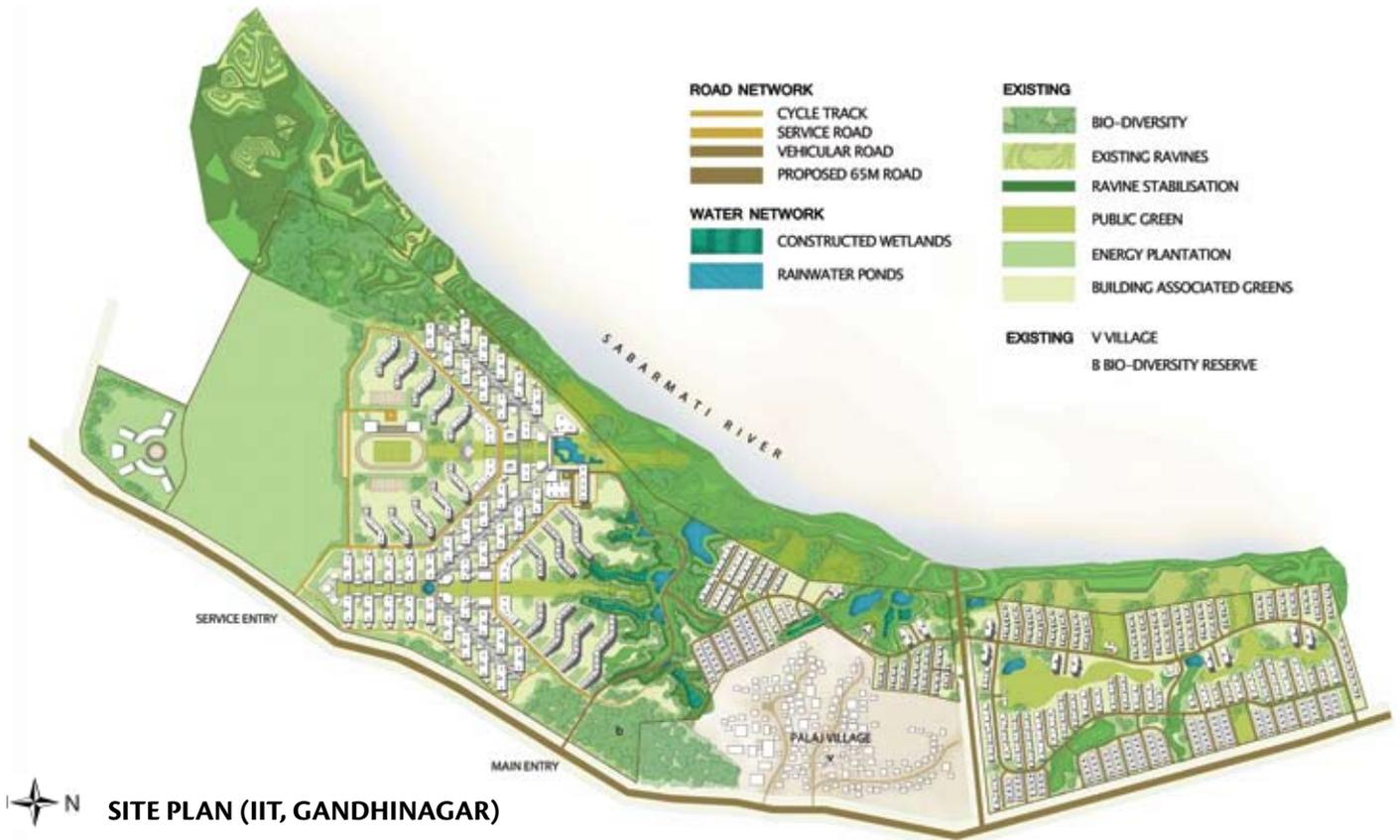
NIIT University Campus, Nemrana

The University has a compact, high-density campus, designed for a resident population of 10,000 (5000 resident students and 2500 day scholars) on 75 acres land. This capacity was based on the available FAR after a sustainable source of water was discovered at the site. This high density development makes possible best utilisation of the land.

The site sits next to a hillock and is deeply eroded with rainwater from the hill. This makes it an ideal site from the environment point of view because it was barren, non-

agricultural land. In the initial design stages it was realized that if students and teachers commute daily to the university, the environmental costs would be high and any number of green buildings would not be able to offset that cost. So, the university is planned as a residential campus for both faculty and students with minimal commuting. Taking the idea further, the campus was designed as a vehicle-free and pedestrian-friendly design. A shaded and rain protected pathway links all the buildings and ensures a pleasant and safe walking experience. Parking near the building is also limited to bicycles.





A university campus grows over a period of time and it is important that the construction phasing plan is aligned with the growth plan of the university. For this reason, each construction phase of NIIT campus has academic, student and staff residential areas and they can all grow independently, starting from one end of the campus, without any gaps in construction. This ensures that the construction area of the site can be cordoned off and the university always looks complete.

Here, it was possible to address some of the key issues of environmental sustainability, beyond the benchmarks established for green buildings. In terms of energy consumption for environmental control (lighting and air conditioning) the academic buildings established a new standard of Energy Performance Index - 33 KWH/SQM/Year, much lower than LEED platinum rated or Griha 5 star rated buildings.



IIT, Gandhinagar

The master plan for IIT Gandhinagar offered possibilities to do much more towards making a sustainable campus. It attempts to go beyond mere environmental sustainability and addresses issues of social and economic sustainability as well. This was possible because of the bigger site (400 acres), the topography of the site and the climate of Gandhinagar being milder than Neemrana. The IIT Gandhinagar site will have 10,000 resident students and it lies next to Sabarmati river. Sitting next to Palaj Village, it is divided into two parts by a 45m wide road. The site has four kinds of areas – agricultural land on the south side, deep ravines (10-12m deep) in the middle directed towards the river and biodiversity reserve forests on the eastern boundary. The land on the north side is undulating with shallower ravines.

The ravines present a unique and interesting experience and the first step towards environmental sustainability was to preserve these natural site features. Preservation did not mean fencing off the ravines and making them out of bounds for people. Instead, these were envisioned as dynamic and active spaces used to create a different experience and also to contribute to the environment. The entrance to the campus is taken through a major ravine allowing the visitor to experience the ravines, the river and finally the view of Gandhi Nagar City across the river. This forms the arrival point and the hub where the central resources of the university are located. A natural water body embellishes the arrival court. Academic buildings and departments radiate southwards from this point.

In line with the old city of Ahmedabad, the university is planned as a high-density compact settlement. This density

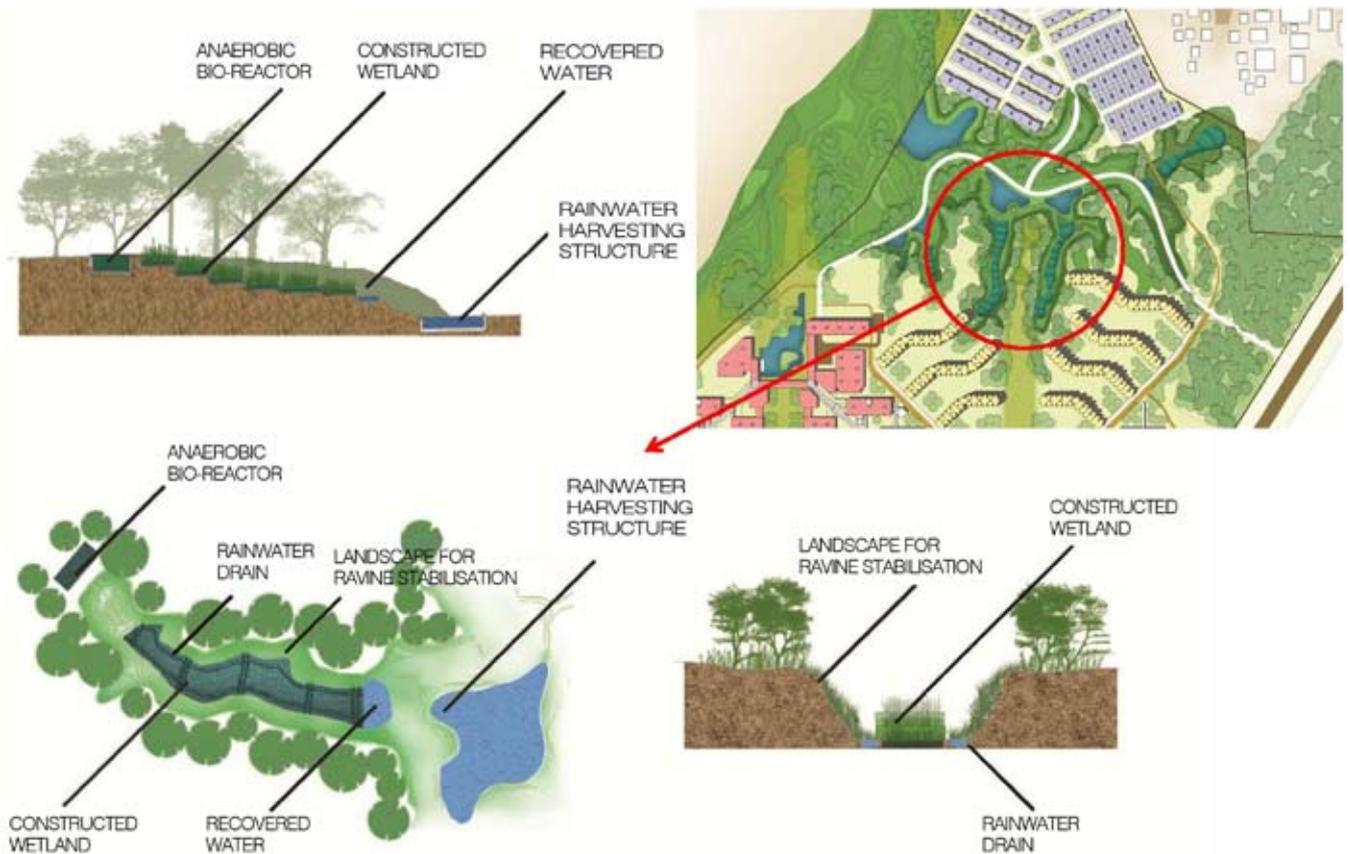
conserves land and after meeting all other requirements, it was possible to allocate about 20 per cent of the site area for fresh food farming or energy plantation. The land on the south side, earlier used for agriculture, is proposed to be made available for farming possibly by the people who gave up their land for establishment of the campus. With application of more sophisticated urban farming methods, this land has the potential for providing the fresh food requirements of the entire university. The interaction between IITGN and the village could be mutually beneficial. Agriculture on university land will create jobs for the local population. The university could assist villagers manage their water supply and dispose of their sewage and in turn create treated water that could be used for agriculture or landscape irrigation. There is an opportunity for strong rural-urban synergy which can lead to social sustainability and equity.

It is proposed to stabilize the smaller ravines and use them as constructed wetlands for tertiary treatment of waste water. Recycled water would be collected at the base. Ravines would also be used for collection of rainwater from open areas of the site. All construction activity would be carried out with harvested rainwater.

The campus will develop in phases and construction activity will go on for a long time. Establishing semi-permanent housing and amenities for construction workers will go a long way towards taking care of the needs of this neglected and exploited section of Indian society.

Towards environmental sustainability and car-free planning, IITGN will be a walk-able campus with an access system heavily biased in favour of pedestrians and cyclists.





WATER UTILISATION SCHEME

This system will be a departure from the common situation in which pedestrians are at a disadvantage because pedestrian paths and cycle tracks are provided alongside a road system primarily designed and optimized for cars. To promote walking and cycling, what is needed is a system primarily designed for pedestrians in which cars are at a disadvantage. The Bus Rapid Transportation system being built in many cities in India also treats cars as the secondary system of transport, buses being the primary system.

The project would be phased in a way that allows construction to proceed outwards from the central hub, in an orderly manner without gaps. Academic buildings and student hostels, planned in close proximity, form a contiguous student activity zone. The northern part of the site is reserved for faculty housing. IIT tradition is to have independent bungalows on large plots of land for senior staff but at IITGN it is proposed to change this extravagant land consuming approach. Generous townhouses for senior staff will conserve land. First phase housing is concentrated on the same plot while future phases

will develop on the second plot towards the north. In the meantime, the available land will be used for agriculture.

It is possible to achieve a smaller ecological footprint by implementing resource conserving practices, but to achieve sustainability, it is necessary to take social, economic and geographical parameters into account. It has to be ensured that while providing for some in the society; a lot of others are not deprived of their rightful share of resources. Individual buildings cannot be expected to solve these issues but larger campuses and developments offers an opportunity of looking beyond buildings and address issues of the larger context.

Fact File

Master Planners: Space Design Consultants and Upal Ghosh Associates

Consultants: MSYK Design (Landscape Design), Krim Engineering Services Pvt Ltd (Public Health Engineering), dBHMS Consultants Pvt Ltd (HVAC)