REVIVING THE ABANDONED QUARRIES

NASIK,INDIA

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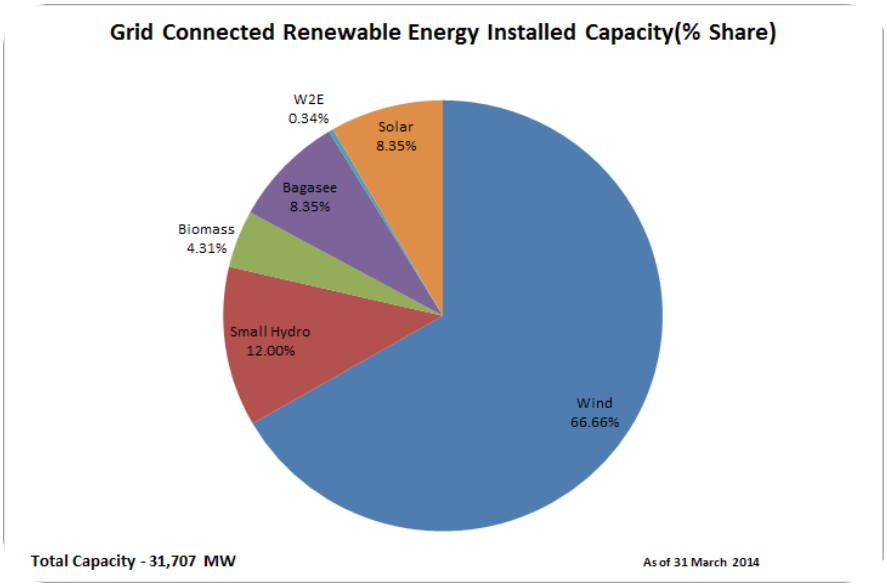
INTRODUCTION -

Within the diverse terrain from Himalaya's peaks to Indian Ocean, resides 1.252 billion people in an area of 3.287 million km^2. With her huge potential to harness renewable energy, India was the first country in the world to set up a ministry of non-conventional energy resources, in early 1980s. India's cumulative grid interactive or grid tied renewable energy capacity (excluding large hydro) has reached about 42.85GW.Years ago the Indian subcontinent did not have air conditioners or electric heaters. Under traditional mud houses and thatch roof lived an entire family consisting of around 20 members sharing resources and tapping energy from their surroundings. Underground water recharge from rainwater through small pits and fans that turn with wind are not alien to us. Since inception, the Indus valley civilization has been known for its well planned community living with its innovative vernacular techniques. 'Change is the only constant' with the evolution of time, new techniques have been developed for comfortable living. But lack of shared spaces and use of non-degradable building materials post a serious threat. If this continues there would be a time when humans would be listed in the red data book and the last surviving humans would not know each other.

The attempt is to create spaces that would enhance people to communicate with each other, share their knowledge and experience, with this they begin to care for the space they live in. The design and features are such that it intervenes with the environment using green methods instilling a sense of responsibility towards the environment. This promotes collective growth and service.

As the world is advancing and no one have time to waste on travel and to enjoy a playful living. The attempt is to create the place to 'LIVE PLAY WORK'.



SITE- **NASIK, INDIA**

Coordinates: 19.56 N 73.43 E

Average Elevation: 700 meters (2,300 ft.)

Area: 25 Acre

Topography: Hilly Terrain

Vegetation: Almost no dense vegetation

Micro Climate:

The city's tropical location and high altitude combine to give it a relatively mild version of a tropical wet and dry climate.

SITE ANALYSIS –

The site is located on a hilly terrain in the outskirts of the city with four abandoned basalt stone quarries and highly contoured topography. The site is in windward direction that allows a better wind flow. Highest point of site have an elevation of 181M above sea level.The annual rainfall is 810mm with major three types of season – Cold humid (mid October-mid March), Moderate (mid March- mid June) and Monsoon (mid June – Mid October).

Temperatures rise slightly in October, but this is followed by the cool season from November to February. The cool season sees warm temperatures of around 28 °C during the day, but cool nights, with lows averaging 10 °C, and extremely dry air.

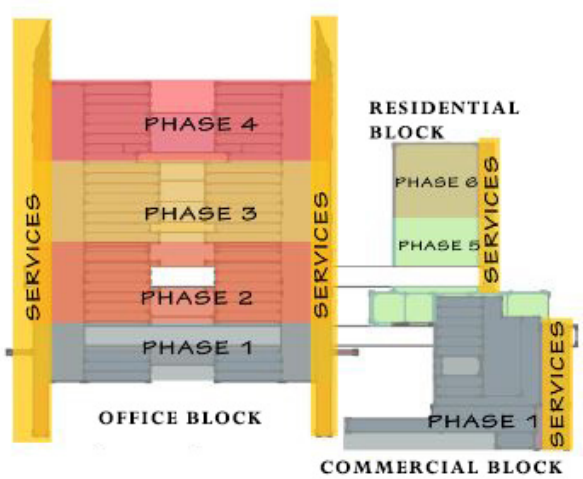
DESIGN STRATEGIES –

LIVE - PLAY - WORK

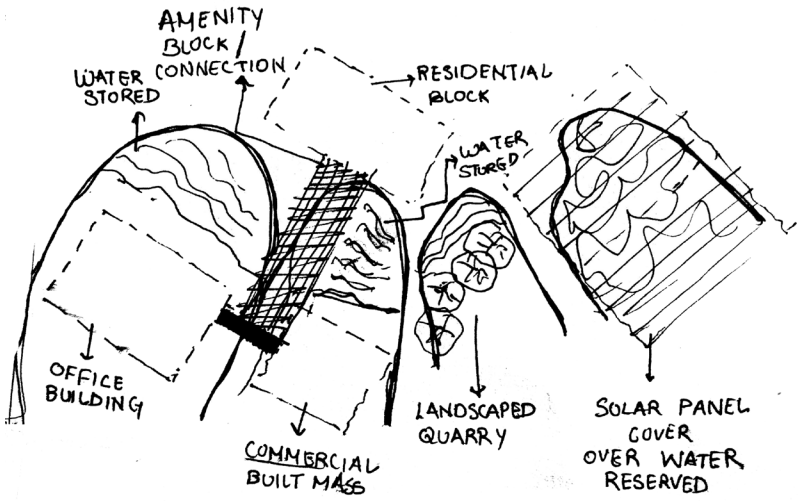
The design and construction embodies an integral approach towards development which encompasses the ecological, climatic, cultural, technological, environment and socioeconomic dimensions.The design approach was to create a place which is self-sustained and comprises of place to work, place to play and a place to live in it.

DESIGN PROGRAM –

The design comprises of majorly three things an IT office building connected with a commercial building and a residential building with many places for recreational activities making the whole mass as hybrid building. The idea is to make a place where one could LIVE, PLAY and WORK at a same place.



ZONING OF THE MASS



BASIC SITE FUNCTION LAYOUT

DESIGN PROCESS –

The design process starts from orienting the built masses into windward direction to provide maximum cross ventilation and then protecting the south façade with shading devices to less down direct solar gain and decrease the HVAC uses. The idea was to build masses inside the quarries and collect rain water at the back of it so the masses shade the reservoir and less evaporative cooling will happen.

1. OFFICE BUILDING-

The building is divided into further two parts which are symmetrical in planning and consist of offices, small restaurants and some common places for people to hangout. The building is covered by a cage like structure i.e. two service blocks and a front skin comprises of shading devices which are pv panels. This less down the energy usage of building by 75%.On either side are two big water collection tanks that collects all water from roof tops and then supplies to offices when needed by gravity system.

2. COMMERCIAL BUILDING-

The building is designed for fulfilling needs of the people staying there that comprises of all the activities needed to live or play. The built mass is strategized such that the services are saving solar heating gain and shading devices on the south facades. The built mass is properly connected by other two built masses at different levels through bridges.

3. RESIDENTIAL BUILDING-

The building is designed taking consideration of population working over there .The flats are 1bhk.2bhk and 3bhk flats. Several social gathering spaces are created at intermediate levels to take care of community living.

4. COMMON AMENITIES AND BRIDGES-

The connections and amenities are the most important part in any of the program. In this design the connection are kept shortest and easiest way to switch from one place to another which in between is interwoven with the amenities and some public parks to relax.

SUSTAINABLE STRATEGIES–

1. COLLECTION OF RAIN WATER-

The site consist of a steep slope and four stone quarries and with enough amount of rainfall to be collected. The site is on a hilly terrain which causes an urban resilience to lay down pipelines and supply water till the site though the water collected on site will fulfil the yearly need of the campus.

2. PHOTOVOLTAIC PANELS-

The use of photovoltaic panels over the water reservoir less down the rate of evaporation and helps to create solar energy .The horizontal shading devices are itself photovoltaic cells that shades the built mass and creates power through solar energy too.

3. WASTE WATER MANAGEMENT SYSTEM-

The water will be used thrice on the site. The water once used will be treated and the grey water will be used for flushing purpose then that water will be further purified and the black water will be used for irrigation by drip irrigation systems. That saves almost 35-40% of water usage annually.

4. SAVING IN HVAC SYSTEM-

The built masses are designed in such a way that it created a cage around the mass that protect it from solar heat gains and less down the usage of HVAC system by 80% annually and also calculated the working hours for an HVAC system every day.

5. NATURAL LIGHTING-

The buildings are designed in such a way that maximum amount of natural light will be there throughout the day majorly for office building where a large amount of energy could be saved by it. The north is totally kept open to gain maximum light and also had a beautiful view of quarry walls.

6. ENERGY SAVING FIXTURES-

The whole idea of doing it is to save as much as energy that could be achieved by few smart decisions such as using water saving fixtures, smart electric layout according to need, thermal sensors for maintaining HVAC system.

7. MATERIALS-

The materials used in building construction as well as interior spaces are all having low embodied energy. The steel taken out from ship breaking has been used as structural steel and at many other places the reused materials are used to construct the whole built mass into sustainable module.

Reused steel

Hollow blocks

Rice husk boards

Gypsum board

Bassalt crush

Pozzolona mortar

Terrazzo tiles

CONCLUSION–

Our work is to Plan and manage of human settlements incorporate climate change impacts and disaster risk management elements, including enforcement of building codes.

Sustainability and resilience are interdependent and can be promoted through a combination of strategies such as integrated urban planning, high density compact planning, mixed land uses; identifying synergies between disaster risk reduction and adaptation; improving urban service quality and promoting green buildings and sustainable transport . There is a need of paradigm shift in traditional urban planning concepts to high density compact planning, which proves to be successful emerging model for development.