Architecture for tropical climates

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interpretation of the Drip Edge through Balinese edge tiles; Residence on the beach, Chennai.

With the Summer monsoon approaching the Indian sub-continent, the country awaits the refreshing break after a hotter than average season in most major urban areas. The monsoon is an annual phenomenon that covers the months of June through to November in various parts of the country, and can be categorized as the summer monsoon *(Jun- Sept)* and the winter monsoon *(Oct- Nov)*. Architecture in the sub-continent is well adapted for this annual phenomenon. Through the times, architectural detailing in buildings has always taken into account the requirements to drain water and manage storm water run offs in an efficient, aesthetic and sustainable manner.

Interestingly, the very same architectural detailing is well adapted to provide cooler spaces during the harsh summer months. This is what makes tropical architecture in the Indian sub-continent so unique and responsive to the local climatic conditions.

While the architecture of the building is of great importance in effective management of the rains, site planning and landscape forms the next piece of the puzzle in creating a successful design. Traditional treatment of spaces and *catchment zones* are well designed to suit these requirements. In this form of design, we often find that the architectural form is built in with landscape elements. Tropical semi-open spaces are part of traditional architectural styles in the Asian Subcontinent. Semi-open spaces are usually open to sky areas which are landscaped, but are usually covered by habitable spaces on all four sides. These tend to appear in the form of *central courtyards* in buildings, which are filled with lush landscape. Apart from adding tremendous aesthetic value to the surrounding spaces, these *courtyards* keep the space ventilated and cool during the summer, and help act as *catchments and percolation zones* during the rains.

In fact, traditional homes are not considered complete without the addition of a *landscaped courtyard*. The *courtyard* comes alive during the rainy season. The differentiation between the outside and the inside of the built form diminishes, and the gentle sound of the rain covers the entire home. Typically, these courtyards act as great *catchment points for the rain* and can either drain off through the use of a small retention pond or water feature that is part of the *courtyard or directly percolate to the earth through a permeable surface treatment of step stones and gravel.* Several old world courtyards often have a well too, thereby directly charging the earth's water reserves.

tiled roofs and lush gardens; Residence on the beach, Chennai.

planning concepts; Residence on the beach, Chennai.

Traditional roofs in the country are typically sloped and finished with clay tiles on timber rafters. Often these rafters are covered on both sides with an 'under tile' detail as well. This provides an elegant and vernacular solution to the large amount of roof run offs during this season. With easy maintenance, *clay and terracotta tiles* withstand the summer heat, provide a cool roof solution and are fade-resistant due to their natural firing process. While connecting the architecture to the landscape, the main concepts evolve around capturing water from the surfaces of buildings and effectively bringing them down to the ground. This water then along with the water from the surface should be allowed to percolate back into the earth for the cycle to be complete.

A *drip edge* is a metal channel or other overhanging component with an outward projecting lower edge. The *edge detail* is intended to control the direction of dripping water and help protect underlying building components during large quantities of rain. Typically used at the eaves, the *drip edge* is a traditional feature that is part of a tiled roof, channelling water from the rooftops to the natural ground levels.

Rain chains on the other hand, are highly decorative alternatives to a typical rain water downspout. The concept of a *rain chain* is to create a celebration around the mundane idea of transporting water from the roof to the ground, and almost creating a water feature or natural fountain during the monsoon. These have been widely adapted in architecture of the sub-continent and are increasingly used due to their great aesthetic value, coupled with a simple easy installation process. These chains can be effectively coupled with a *drip edge detail* to deliver a very artistic look to the tiled roof structures.

Many urban cities in the country suffer from severe water shortages in the summer months. The monsoons offer an effective way to recharge the natural aquifers in these areas, and surface run off must be treated correctly and allowed to *percolate* back in to the earth. This makes it vital during the rains to not just manage floods, but effectively channel and collect water to recharge natural sources. This can be effectively implemented in a natural and sustainable method.

Drainage of any sized site can be managed well by designing *rain water harvesting pits,* which are pebble beds that lead water deep into the earth for recharge. If the building site has a larger area though, the most effective way to manage storm water is through *landscape swales.* A *landscape swale* is a graded landscape feature that channels water on the surface to a larger collection point, which may also be landscaped. Typically, *the swale* during non-rainy times looks just like a dip in the landscape and can be treated with planting of tall grasses or pebbles.

RE-INTERPRETING THE TROPICAL PARADIGM IN CONTEMPORARY ARCHITECTURAL STYLING

Today's architectural style is slowly moving away from the traditional structures and is tended toward straight lines and minimal design. With this shift in thinking and style, it is important to adapt the mantras of tropical architecture such that the designs respond to the geography and location of new buildings. Contemporary buildings tend to adopt the flat roof structure as opposed to sloping tiled roofs. Draining of such structures when there are large quantities of rain has to be well designed and detailed from a very early stage in the design process for the plan to be successful. Architectural detailing can adapt to provide systems for *rainwater channeling, down-takes and spouts* in a contemporary, yet effective manner.

The contemporary interpretation of a drip edge is achieved by having a *concrete precast element* that serves as a water channel along the edge of a *flat roof slab or exposed balcony* area. This channel can then be detailed with *decorative down spouts* in order to convey the water to the natural ground. Grooves in concrete can be pre-planned and *cast-in situ* to allow for drainage to a particular drain point on the roof. The rain chain detail has evolved from being ornamental to more functional with the usage of simple chains for the conveyance of water. The chains connect the water collection point on the roof, which is created through a series of mild gradients in the case of flat roofs and culminates in a landscape feature on the ground.

No matter the style of architecture, the building needs to respond to its geographical location and climatic conditions in which it exists. This can be successfully done with thoughtful detailing and connecting the building to its site with a strong connection between the architecture and landscape design. ▲

a swale that is filled during the monsoon helps keep the rest of the landscape from flooding; Residential development, Chennai.