Section 22.

Stormwater Management, Drainage and Groundwater Replenishment Systems

To be read alongside the site layout plan showing the locations of water catchment, drainage, storage and groundwater replenishment systems

The proposed stormwater management and drainage system for Mountain Lodge has been designed so as to reduce excessive runoff and thus avoid overwhelming the existing drainage infrastructure while providing added protection to neighbouring properties during heavy storms. The use of sustainable drainage systems while adopting best management practices are an integral part of the strategy for the control of surface water at Mountain Lodge. This plan provides a basis for replicating the response of a natural catchment and its surfaces by mimicking, to some extent, the behaviour of surface water on the developed site as if it had remained undeveloped.

Principles of the drainage system include controlling surface water quantity (reducing offsite flow rates) while improving surface water quality and positive ecological sustainability through groundwater replenishment, providing added environmental amenity value to the development.

The collection of stormwater runoff from hard paved areas will be divided into three separate systems. 1, The car park area and the top sections of the road will run through one of two groundwater replenishment systems. Any waters over and above that which the (car park) groundwater replenishment system is able to utilise will then run into the existing drain that runs down over the back of the property in a Northwest direction.

2, Water runoff from the garden (we forecast little runoff due to the vegetation) along with water from the lower section of the entrance road will be collected into a drainage system and run into the existing drain on the Southeast side of the property. The system is designed with the option of diverting this water into the groundwater replenishment system situated near the entrance.

3, The rainwater collected from the rooftop of the building will be stored in the swimming pool compensation tank. Rainwater over and above that which can be stored in the compensation tank will be held in the columns around the outside of the building. This will help to provide thermal mass, keeping the building at a steady temperature. This part of the rainwater harvesting system can be used for topping up the swimming pool due to evaporation in the dry season and/or toilet flushing during the rainy season instead of using recycled water. Excess rainwater that cannot be stored in the two previously mentioned systems will then run down a drain on the west side of the property and into the large-capacity underground rainwater harvesting and groundwater replenishment facility.

This underground storage tank is 6ft in diameter and 60 ft deep, giving a storage capacity of around 48,000 litres. This rainwater harvesting and storage reservoir and groundwater replenishment facility is able to slowly release 20% of the upper capacity in a controlled manner, again to avoid overwhelming the existing systems during heavy storms. The bypass/overflow from this system has a stone and sediment trap to avoid any objects, stones or silt from being washed into the underground culvert leading offsite during a heavy storm.

Another benefit of this rainwater harvesting facility is that it will also be used as a supply reservoir for the swimming pool and laundry. After the sediment has cleared, it can be pumped and filtered, thus taking away any dependence upon borehole water for the swimming pool and laundry. We believe this to be a pioneering system, providing a win-win situation and an innovative solution to the control and management of stormwater runoff along with the added benefit of rainwater harvesting. Other water-saving and multi-benefit systems will be installed. These include the borehole water only being used to supply the kitchen, showers, and sinks.

Through creativity and our investment in the development and implementation of exciting, cutting-edge systems for rainwater harvesting, stormwater and wastewater management, and groundwater replenishment, we are aiming for Mountain Lodge, once up and running, to have the lowest environmental impact and be as near carbon-neutral as possible. We must remember that water is not a resource; it's a privilege. We hope that Mountain Lodge will be a pioneering project in Sri Lanka and hopefully help to set a new benchmark in water management and sustainability.

Roy Dixon
Chief designer of the Mountain Lodge project.