

### Roof Garden Drainage

Products: Deckdrain

#### Project Background

Dotted along Kenya's coastline are some magnificent homes with views of the Indian Ocean. While beach and clifftop properties are highly sought after prime real estate, growing and maintaining a lush garden in a coastal climate can be a challenge if not managed properly. At the end of Green Wood Drive, Nyali, a series of private villas would be built, not only with a lush tropical garden in mind, but having each roof topped with a coastal green roof.

#### The Solution

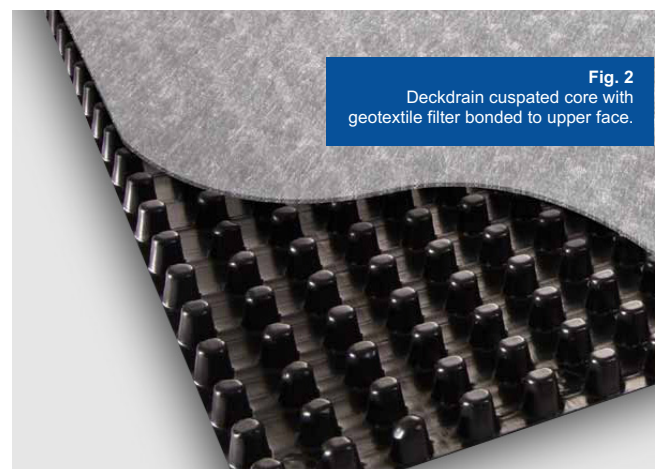
A 2-in-1 drainage product, Deckdrain, was laid directly onto the protective screed on the waterproofing of the flat concrete roof slabs. The structured drainage product consists of a cusped core with a nonwoven geotextile bonded to the upper face. Deckdrain's high-strength drainage core allows constant drainage in addition to providing added protection to the



The equatorial coast is known to have consistent and relatively predictable monsoon rains and wind. The pattern of these winds from the Indian Ocean have been categorized as the *Kaskazi* (north-easterly) from December to mid-March and the *Kusi* (southerly) from April to mid-September. Whilst the winds dry out moisture very quickly from vegetation, the winds by the ocean are moist and salty. Drainage on the roof gardens to cope with the monsoon conditions was critical, though important to find a balance so as not to drain off too quickly during the dry months of the year.

**Geotextiles East Africa** was brought onto the project at an early stage by the architect, to assist with the design of the green roofs. A series of modern villas perched on the edge of a cliff above a small bay at the Tudor Creek estuary, in an exclusive area looking out towards the Indian Ocean. Ships sailing into Mombasa's famous harbour would have a direct view of the green roofs and the idea was to have the villas blend in with the natural surroundings. When designing green roofs, native beach vegetation is desired as local plants will always be the most resilient to the climatic conditions along the coast.

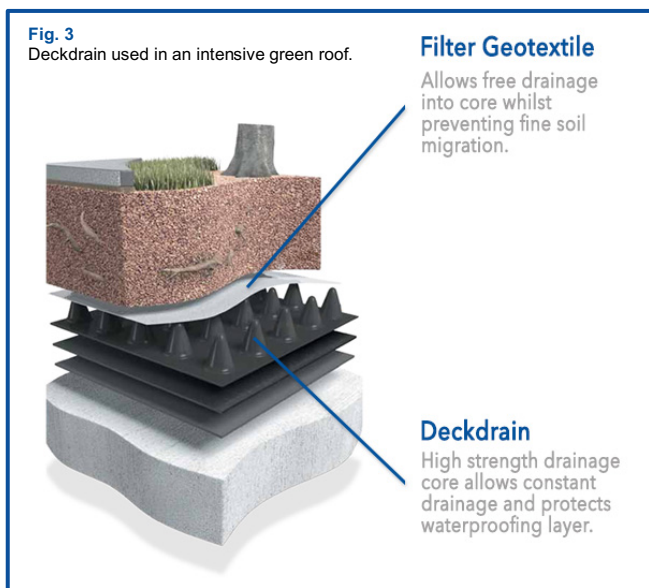
waterproofing layer. The filter geotextile allows free drainage into the core whilst preventing fine soil migration into the drainage path.





In conventional roof gardens, bulky & heavy graded stone filter layers have been replaced with a HDPE cusped sheet with a nonwoven geotextile bonded to one side. The nonwoven geotextile provides soil separation and filtration while the HDPE core provides a structural drainage system and added protection to the waterproofing membrane.

soil depth there is a greater range of planting available and the roof can be treated very much like a garden landscaped with trees, lawns, flower beds and paved areas. The context of this project and its proximity to the ocean with an almost constant wind demanded for a suitable ground cover to be selected. The



The filter geotextile in Deckdrain is manufactured from up to 95% recycled material making it an environmentally sound choice. Deckdrain comes in rolls of 1.1m x 50m (55sqm/roll) and is easily rolled out and installed. It is flexible which allows it to be bent up against parapet walls, upstand beams, other protrusions and planter boxes.

The green roofs in this project are known as intensive green roofs, often referred to as roof gardens. They can be designed to be as complex or simplistic as desired. In this case, they were kept beautifully simple, celebrating its surrounding coastal environment.

Intensive green roofs consist of a deep layer of engineered growing media, typically 150-1500mm deep. As a result of this



obvious choice was the native beach vegetation which required little maintenance and could withstand the coastal weather conditions.

## The Results

Approximately 85% of the roof surfaces are covered with coastal vegetation, blending the villas into the surroundings and providing lower energy demands for cooling, sound insulation, filtered rainwater for irrigation, created new habitat and contributes to the spectacular backdrop including extra advantages.

The resulting flat, green-topped roofs withstand the corrosive ocean air and the tropical monsoon elements, blending the exterior with the environment. The design of the modern villas with simple architectural box-shapes and minimalist material palette celebrate its coastal context blurring the boundary between indoor and outdoor living.





### Benefits of Green Roofs:

- Reduce Stormwater Runoff
- Lower Roof Temperature
- Lower Energy Bills for Cooling
- Reduce Heat Island Effect
- Reduce Carbon Footprint
- Improve Air Quality
- Increase Life Span
- Provides Sound Insulation
- Aesthetics & Creates Habitat

### Benefits of Deckdrain:

- 2-in-1 Filter and Structured Drainage Layer
- Replaces Traditional Stone Filter Layer
- Reduces Structural Load
- Reduce Material & Maintenance Costs
- Added Protection to Waterproofing Membrane
- Increases Longevity of Roof Installation
- Geotextile Filter Extracts Pollutants
- Quick & Easy Installation
- Eco-Friendly Solution



**Fig. 6**  
A few months later vegetation could be seen thriving.

**Client:** Private.

**Main Contractor:** Masscon

**Consultant:** Geotextiles East Africa Ltd.

#### Products used:

- Deckdrain 1200S/NW8
- Deckdrain 600S/NW8

**Date of completion:** December 2015.



**Fig. 5**  
Planting native vegetation in soil placed over the Deckdrain layer.

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