

# Structural Drainage

Sprayed Concrete, Deckdrain,  
Mukkola - Kerala NH-47 Highway, India



## Project Description

The National Highways Authority of India (NHAI) awarded the NH-47 bypass stretch from Mukkola Junction to the Kerala/Tamil Nadu Border (NH-47) to L&T Construction, the construction arm of engineering major Larsen & Toubro.

The much anticipated 16.5 km project develops the road into a four-lane highway, at a total cost approaching £100 million. The project is undertaken in an Engineering, Procurement and Construction (EPC) mode under the third phase of the National Highways Development Project.

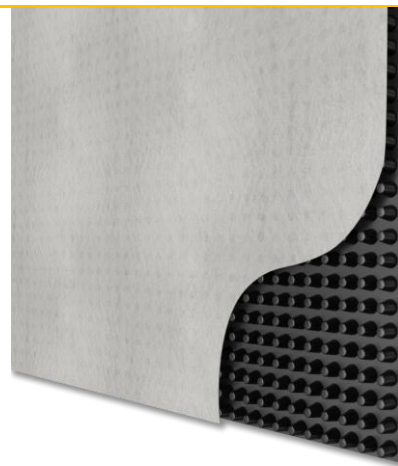
## The Challenge

The highway passes through built up areas and to minimise land take, where the highway is in cutting, a steep sided cut face was proposed. The proposed cross section of the road includes a 4m wide central median, paved shoulders of 1.5m in non-build-up locations and 2m in built-up locations, earthen shoulders of 2m, and reinforced cement concrete (RCC) drains of 1 m on either side of the developed stretch. This will result in a Right of Way (RoW) of 45 m.

The cut faces were of a stiff but erodible soil and were cut to a steep profile in the short term. Reinforced shotcrete cladding was proposed to seal and stabilise the open face of the wall. However, the ground investigation report revealed a high mean water table through the cut areas that would inevitably induce hydrostatic forces behind the shotcrete resulting in bursting out of the surface. This effect is increased by the seasonal monsoon rains which rapidly raise the water table still further.

## Project Information

Client	National Highway Authority of India
Contractor	Larsen & Toubro
Consultant	Yong Ma Engineering
Products	Deckdrain 1200S/NW8
Quantity	50,000m <sup>2</sup>
Benefits	<ul style="list-style-type: none"><li>• Lightweight and easily handled for rapid installation</li><li>• High flow providing hydrostatic relief</li><li>• Excellent shotcrete lock - Material and cost savings in shotcrete rebound</li></ul>



ABG Deckdrain

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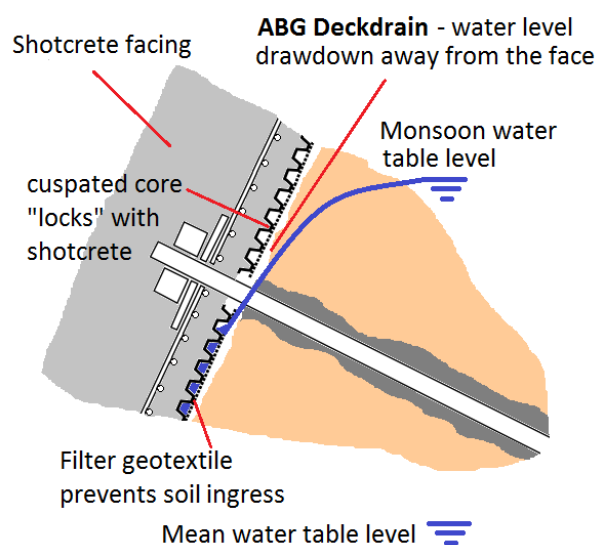
## The Solution

**ABG's Deckdrain** easily installed drainage geocomposite was used. The single cusped impermeable core with integrated filter geotextile placed against the cut slopes acts as a filter/separator transmitting the water safely down to concrete drainage channels below. The geotextile prevents fine particles from blocking the drainage core which freely drains water away removing the hydrostatic pressure forming behind the back of the shotcrete.

The impermeable cusped core protects the shotcrete from water with the added benefit of a surface locking effect on the shotcrete when it is sprayed onto the back of the **Deckdrain**. Trials showed this locking effect reduces shotcrete rebound by 10-20% giving additional cost savings as less shotcrete is lost to surface during spraying.

## The ABG Service

ABG assisted with drawings details and cost comparisons, supplying relevant documentation to assist with gaining approvals.



**Deckdrain draws water away from the front face  
reducing hydrostatic pressure on the surface**



**Cross sectional view taken during construction**



**Shotcrete application to the back of Deckdrain**

Contact ABG today to discuss your project specific requirements and discover how ABG past experience and innovative products can help on your project.