

Green swales reduce pollution on the A11



Spraying HydraCX onto Type 1 fill

Salix worked with Balfour Beatty and the Highways Agency to create a highly effective large scale SuDS project for 18 km along the side of the A11.

The new soft engineered 'Greenswale Grass Channel' attenuates road run-off water, filters suspended solids, and traps hydro carbons and heavy metals, significantly improving water quality.

Due to the presence of special protection aquifers in this area of the A11, the Highways Agency's environmental statement required a green drainage solution to slow the flow of water and help cleanse hydrocarbons, salt and other road pollutants carried by the water before it reached the soak-aways.

Products Used

- **Tensar HydraCX**
- **Tensar Bionet C125BN**
- **Grass Mix**



Pinning C125BN erosion control blanket over the HydraCX

Robust scour proof erosion control

Tensor HydraCX, a hydraulic erosion control solution, was sprayed onto a Type 1 fill. This was used as it has been tested in extreme environments and ensured rapid vegetation of the drainage channels.

A tough grass selection was added to the straw, cotton, polymer and tackifier mix, these plants could withstand the level of pollution being washed off the road.

A surface erosion control blanket of biodegradable coir – Tensor's Bionet C125BN – was installed over the top of the HydraCX to prevent scour erosion during storm events.

These erosion control blankets are designed to provide immediate erosion protection and vegetation establishment assistance, they then degrade after the root and stem systems of the vegetation are mature enough to be stable and withstand heavy flows of water.



Bionet biodegradable erosion control blankets (top)
HydraCX (bottom)

Reducing pollution naturally

Ensuring the sensitive aquifers near the road did not get inundated with pollutants was an important part of the 50,000m² project.

A mixture of tough grasses in these green swales act as filters that remove heavy metals, hydrocarbons, salts and other pollutants that cause problems in roadside watercourses across the UK.

The new grass will grow up through the coir blanket and as the roots systems establish, the PH neutral coir fibres biodegrade, without releasing any toxic compounds.

The grass slows the runoff and filters the water, absorbing hydrocarbons and around 60 per cent of the suspended matter.

As well as treating the water, it reduces the need for road cleaning and maintenance and is a large scale demonstration that SuDS approaches can be used on such schemes.



Rapid establishment of grasses shortly after installation



Light scattering of topsoil over Bionet C125BN

Proven effectiveness

Salix's work on the A120 and a trial section undertaken in June 2014 on the A11 were key in demonstrating the effectiveness of SuDS on large scale projects. Salix were able to show that not only could the grasses withstand heavy flows in harsh weather they could also cope with the levels of pollution.

The HydraCX has been tested in extreme environments with the HydraCX being tested on 45° slopes and sprayed directly onto rubble with no soil.

HydraCX has been used effectively on landfill sites where pollution control is critical to the business.

In all cases vegetation has been established, pollution stopped and erosion prevented.

Characteristics and removal rates for grass swales (after Yousef et al, 1987)

Swale Length (m)		90-170
Average mass removal rates (m ³ /m ² .hr) [% reductions]	Pb	2.61 [76%]
	Zn	5.76 [77%]
	Cu	0.6 [49%]
	Cd	0.26 [63%]
	P _{total}	13.96 [42%]
	N _{total}	44.8 [41%]



Vegetation establishing