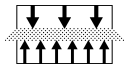
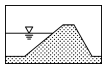
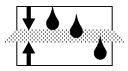
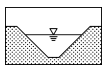
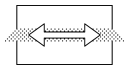
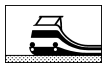
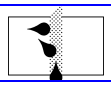
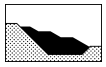
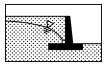
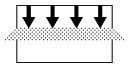
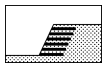
Application field: Geosynthetic application in contaminated soil

Title : Environmental rehabilitation and clean up intervention in Biessefin site

Quantity : 31.000 mq

Location : Friuli Venezia Giulia Region

Time : 2010

FUNCTION		APPLICATION FIELD	
SEPARATION		PONDS	
FILTRATION		CHANELS	
REINFORCEMENT		HIGWAYS	
EROSION CONTROL		RAILWAYS	
DRAINAGE		LANDFILL AND CONTAMINATED SOIL	
WATERPROOFING		DRAINAGE SYSTEM	
PROTECTION		FOUNDATION AND RETAINANED STRUCTURE	

Introduction

Soil contamination is caused by the presence of xenobiotic (human-made) chemicals or other alteration in the natural soil environment. This type of contamination typically arises from the rupture of underground storage tanks, application of pesticides, percolation of contaminated surface water to subsurface strata, oil and fuel dumping, leaching of wastes from landfills or direct discharge of industrial wastes to the soil.

The most common chemicals involved are petroleum hydrocarbons, solvents, pesticides, lead and other heavy metals. This occurrence of this phenomenon is correlated with the degree of industrialization and intensities of chemical usage.

The concern over soil contamination stems primarily from health risks, from direct contact with the contaminated soil, vapors from the contaminants, and from secondary contamination of water supplies within and underlying the soil.

Today geosynthetic materials could represent a valid solution I order to build a safety intervention.

Technical solution adopted

In order to cover properly contaminated soil area (chemical substances), designer decided to install following layers: a HDPE membrane 2 mm thick, a drainage synthetic elements (Isostud Geo P) and a final gravel layer (1 m thick).

Technically a synthetic drainage material is equivalent to a gravel layer, applying Darcy law and checking how many time artificial material is more efficiency than natural.

Taking into account permeability value (k = m/s) of a general gravel material, knowing plane inclination of area where this solution will be applied and overall thickness, designer is able to calcul how much of water (l/sm) natural solution will be able to drain out.

After this checking, designer decided to use artificial material in order to protect and drain water up to membrane.

Installation phases

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Installation of HDPE smooth membrane in direct contact with contaminated soil;

Above geomembrana a studded membrane joined to a nonwoven geotextile is installed, to protect and drain out liquid coming from upper part of closure;

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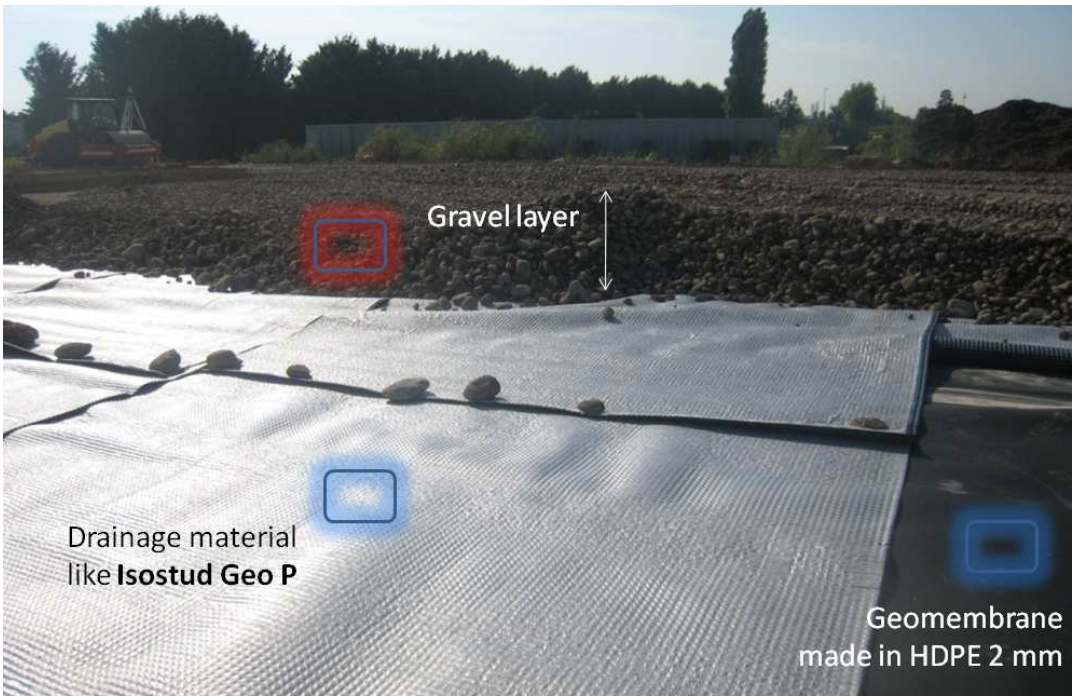
Detail of Isostud Geo P product used above geomembrana in HDPE



Typical section

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