The surface covering represents an effective element in encapsulating tips and contaminated sites, and as yet there is no established standard for its construction. As a general rule, however, the covering always exhibits the following elements: grass cover, top substrate (with surface drainage), sealing system, gas drainage and levelling layer.

A technically perfect design for a surface covering requires the detailed formulation of the tasks to be performed by each individual element, taking into consideration the peculiar characteristics of the case in question, and the listing of all the expected stresses. A design can then be prepared and - as is usual for structural designs - examined in the course of dimensioning to determine whether the design meets the established objectives, and whether the materials selected are suitable for the expected stresses. The dimensioning should be organised so that it can be subsequently checked.

Problems often arise when adopting the procedure described because the stresses are difficult to determine, and because there is still insufficient information on the material properties. Dimensioning formulations are indicated for 3 frequently recurring problem cases, namely the dimensioning of surface drainage between the sealing system and the top substrate, and the mechanical stressing of PE-HD seals by shearing force and biaxial tension.

1. TASK AND APPLICATION OF SURFACE COVERINGS

To avoid undesirable removal of contaminants from deposited waste materials, they are frequently encapsulated. An essential element in this encapsulation is the surface covering, because the following objectives are generally sought in using it:

- The water penetration of the tip body, i.e. by seeping precipitation water, must be prevented to avoid the risk that contaminants may be washed into the ground water and into the area surrounding the tip.
- The uncontrolled emission of gas into the atmosphere, which occurs even when the tip gas is trapped by means of wells, must be prevented wherever possible, particularly when the escaping tip gas contains additives hazardous to health.
- In the case of a hill site, where a closed backwater level has already established itself, the seeping water escaping from the site embankments must be trapped in the surface covering, and supplied to a processing plant, having been rendered harmless to the environment.
Finally the surface covering must allow the application of a grass cover to enable the refuse site to be merged back into the surrounding landscape.

Surface coverings with the above-mentioned objective are now being constructed essentially as part of the programme to clean up contaminated sites, and recultivate special waste tips. However, it is already being shown that such surface coverings are also being used increasingly on other sites, e.g. domestic refuse sites, a trend which will be even more noticeable after the introduction of the General Administrative Provisions for Waste Removal (TA/Waste).

2. BASIC STRUCTURE OF A SITE COVERING

At present there is no established standard for the construction of a site covering (1). However, a covering having the objectives defined above will always exhibit the following main elements, cf. Fig. 1:

- Grass cover,
- Top substrate,
- Sealing system,
- Gas drainage and levelling layer.

The grassing of a surface covering serves two purposes, that of maintaining the quality of the landscape and a technical purpose. The determining landscape maintenance aspect involves the optical merging of a refuse site or contaminated site back into its surrounding landscape. The essential technical objectives are the protection of the covering from erosion, and maximisation of the evapotranspiration rate, i.e. the proportion of rainwater which is re-emitted into the atmosphere from the covered surface and its vegetation by evaporation.