



CANALS AND WATER CHANNELS

The Foreshore "Grout Matt" system represents an ideal solution to the problem of providing suitable linings for canals and water channels. The method is fast, effective and economical and can be applied in a wide range of situations.

The "Grout Matt" has been successfully used to line various projects to date, including irrigation canals, trunk drainage canals, watercourse linings and creek/river diversions.

DESIGN CONSIDERATIONS

There are many factors to be considered when designing canals and these may vary with individual situations depending on the intended use of the canal. The basic and most important of these factors are the alignment, longitudinal gradient and, inter-dependant on these, the shape and dimensions of the cross section.

The use of the "Grout Matt" system as a lining will not impose any extra restrictions beyond those basic design considerations. The installation and performance of the mattress is not inhibited in any way by the shape and size of the channel. The main requirement of the "Grout Matt" system is that all slopes are naturally stable and that any introduced fill is well compacted to 98% optimum.

Therefore, the only design decision to be made in relation to the lining of the channel is as to which style of mattress to use.

The Filter Point (F.P.) mattress is woven together at regular intervals to form Filter Points, which remain free of grout. These Filter Points allow water to permeate through the mattress to relieve hydrostatic pressures, while holding back even the finest soil particles. The inflated F.P. mattress has a dimpled finish and a Manning's 'n' between 0.025 - 0.03 is suggested.

The other style of mattress is the Uniform Cross Section (U.C.S.) mattress. This mattress has no Filter Points, with the two layers of fabric being held together by diagonal restraining ties spaced at regular intervals. Hence, the mattress inflates to a constant thickness forming an impermeable lining, whilst the restraining ties act to reinforce the structure. This mattress has a much smoother finish giving a Manning's 'n' of approximately 0.016. It also allows for traffic from maintenance vehicles without any damage to the integrity of the system as well as preventing the flow of water without the need for an impermeable liner.

The majority of canal/channel/ river linings would be carried out with the 200 mm Filter Point, depending on flow velocities and soil conditions. Although were a more

natural looking side slope is required, our growth matt is utilised. The Collapsible block mattress is also used where large settlement is anticipated.

It is also possible to combine the two styles of mattress using the Filter Point mattress on the sides of the river and the Collapsible Block mattress on the toe. This allows for consideration of frictional aspects as well as maintaining subsoil drainage. The Collapsible Block mattress allows for settlement at the toe in case undermining occurs.

In cases where flow energy needs to be dissipated, the cobbled surface of the mattress will help in a minor way. Where stronger means are required, stilling basins, weirs or other features can be incorporated into the lining because of the versatility of the Grout Matt system.

Any side channels entering the main channel can be easily incorporated into the lining, also feeder pipes or culverts can be encased in a absolutely watertight fashion by the mattress.

SITE PREPARATION

As stated before the channel shape will not affect the use of the "Grout Matt". However, the smoothness of the earthworks is important. As the mattress is of uniform thickness it will follow the contours of the surface it is laid over, therefore, any unevenness or protrusion will detract from the final appearance of the mattress. So in order to achieve a uniform and even finish a smooth well raked earthworks surface is recommended.

The mattress also requires trenching in at the upstream and downstream extremities of the lining to effectively seal the mattress against under scouring. These trenches should generally be 1 metre deep and 0.3 metres wide, and they can be earth backfilled after installation.

