



WILLOW BANK – WATER EROSION & SILT DEPOSITION SOLUTIONS

Dave Weston, the former Secretary of Enmore Golf Club, writes about a small company that offers a unique way to deal with riverbank erosion.

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The small firm of Willowbank, based on the Somerset levels at Stoke St Gregory near Taunton, established their reputation by carrying out river bank restoration and conservation using live willow tree shoots to combat erosion. With the intent of extending their capabilities, enhancing their expertise and working on projects of increasing scale and complexity, the company, in conjunction with their associates Aardvark, held an Open Day on Thursday 27 September at their headquarters. The GCMA were invited to attend, as it was thought possible that the new developments might be of interest to the golf industry.

Mr Mark Clayton, Managing Director of Aardvark E M Ltd, gave a PowerPoint presentation to illustrate the capabilities of his company. Aardvark specialises in the removal of silt deposits from overgrown streams, rivers and lakes. Most slow moving streams deposit silt at points along the watercourse, especially in shallow lakes. There may be a build-up of surface algae that an increase in the speed of the water flow might disperse. On the golf course it may be difficult to be certain that the ball has finished in the hazard, if the ball immediately sinks into the silt layer and there is no observable "splash". This can lead to possible misinterpretations of the "Ball in the Hazard" or "Lost Ball" procedures. For these, or aesthetic reasons, a club may wish to improve the appearance of a water hazard by clearing it out. A site visit by the company followed by core sampling will establish the type and depth of the silt. If the silt is found to be "wet" then the procedure is to pump it out in suspension, into huge porous textile bags. These allow the water to drain away, leaving the silt. If "dry", it is excavated by digger. The major problem is the disposal of the silt - because of its alluvial nature; it is usually very fine but especially rich in nutrient. Most often it is spread on agricultural land to improve fertility. Occasionally, larger amounts may be used in land reclamation. If no local disposal site is available, then the cost of transporting and disposal of the dry silt may have a significant effect on the financial viability of any water enhancement project.

Mr James Hector, Willowbank partner, and his river engineer, Chris Booth, made a presentation offering possible solutions to differing riverbank erosion problems. To deal with the wide range of bank heights, river width and depth, speed of flow and the possible need to build close to a reinforced bank, the company has developed a variety of techniques and considerable expertise

in dealing with specific erosion problems. The technique to be used is determined by the type of watercourse. Protection of the banks of fast flowing rivers will probably require the use of some form of "hard" reinforcements. These might involve the driving-in of steel piling, which may or may not be screened by live willow planting, the installation of random stone behind a steel mesh or the installation of stone gabions. If the bank is particularly high, it may be graded and "stepped back" with angled turf covering the higher faces. For a less severe flow rate, the reinforcement may be "spiling", the use of thin live willow shoots held in place by thicker live willow posts. Alternatively "faggots and coir", may be used. This involves the horizontal stacking of rolls of dead willow lengths (the faggots) on top of each other, topped off with a roll containing live lengths of willow (the coir) both held in position between double rows of posts.

It is difficult to generalise about the cost of a project. The company prefer to make an on-site visit. This enables them to discuss the various solutions they have to offer that would be suitable for the site and the relative costs for each. The choice would then be up to the club. Whatever the problem, the company is confident that it has the necessary expertise to design, cost and build a solution that will be practical and environmentally acceptable.

For a club with a supply of domestic, commercial or agricultural waste-water and a water storage facility, Aardvark can offer the choice of rent or buy of their mobile modular reed-bed unit (MRU) water purification system. Initially the company will sample and analyse the "grey" water to assess the suitability of their reed-bed system for the cleaning up of the water. If appropriate, then one or more of the basic modular units may be recommended. Each unit consists of a large rectangular galvanised tank through which the water is pumped. At the inlet end is a large foam filter to remove the larger suspended solids. The centre matrix consists of interchangeable cartridges of tight fitting light-weight blocks with a lattice of vertical tubular holes, each one containing a reed plant. As the water passes through these reeded channels, the impurities are deposited on the base and the purified water is discharged from the other end of the tank. The tanks are delivered with the reeds in position but empty of water. At the end of the hire period, the cartridges are lifted and the deposited solids removed from the bottom of the tank. The MRU can be used as a single unit or coupled together in parallel or series for larger volume production or the treatment of a more polluted effluent. A typical output from a unit is of the order of 3-4 cu metres (600-900 gallons) per day for relatively unpolluted waste.

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