Erosion Control, Erosamat Type 3

Allermoor Spillway protection, Somerset

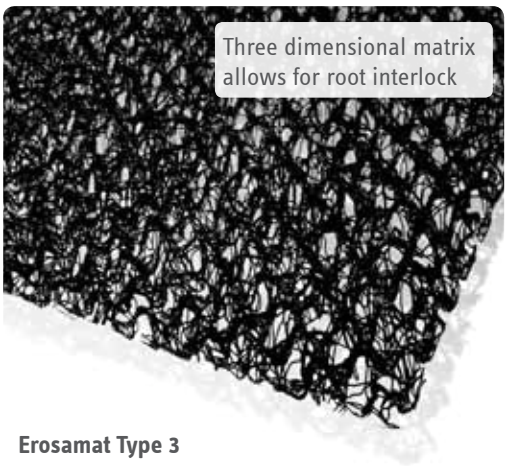
The Somerset Levels is a coastal plain and wetland area of central Somerset running south between the Mendip and Blackdown HIlls, South West England. The Levels are low lying with an elevation around 3 to 4 m above mean sea level and have historically been prone to flooding from both fresh water and occasional salt water inundations.

The Parrett and Sowy Flood Management Improvements were carried out in summer 2013. The work comprised the re-profiling of the River Parrett's bank aimed at improving flow onto the spillway ensuring that during periods of high-flow water is diverted onto the spillway and onwards into the River Sowy.

The consultant's challenge was to design spillway that would withstand high velocity throughout prolonged flows during potential flooding on the Somerset levels whilst maintaining a natural vegetated appearance when not in use. The spillway is critical to the performance of the flood defence system; as a result it was important that the turf reinforcement matting (TRM) provides adequate tensile strength and reinforcement to maintain structural integrity of the spillway. Adequately pinning and correct installation of the TRM system was required to withstand the expected hydraulic loading during flood events.

Key Project Information

Project	Installation of erosion control measures on overflow spillway between Rivers Parrett and Sowy
Location	Somerset, UK
Client	Environment Agency
Products	Erosamat Type 3/20Z500M
Installed	Summer 2013
Benefits	• Permanent erosion control • Withstands high flow velocities • Rapid installation



Erosamat Type 3

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Case Study

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Table 1: Allermoor Spillway, River Parrett and River Sowy, January & February 2014 Flood Monitoring Data, (from Black & Veatch)

Depth on crest (m)	Discharge intensity (m^2/s)	Velocities (m/s)					
		On crest	At edge of track (7m from crest)	At change in gradient (9m from crest)	10m from crest	20m from crest	30m from crest
0.10	0.10	0.99	1.40	1.79	1.88	1.91	1.91
0.20	0.28	1.40	2.09	2.38	2.56	2.88	2.89
0.30	0.51	1.72	2.54	2.83	3.01	3.62	3.68
0.40	0.79	1.98	2.88	3.17	3.36	4.17	4.33

» Flow depth and velocities recorded on Allermoor Spillway during 62 days of flooding in January and February 2014.
» Erosamat installation completed in September 2014. There was only minor grass coverage in January 2014.
» Unvegetated Erosamat system provided the required level of spillway protection for the velocities exceeding 4m/s.

Erosamat was chosen for this application as it is specifically designed to provide both an effective surface erosion control and a vegetative root reinforcement layer. In total over 17,000m2 of Erosamat Type 3/20Z500M erosion control system was installed on the spillway, fixed using 400mm pins spaced at 1m centres (0.5m along the overlaps).

As result of construction delays the system, whilst installed correctly, was not fully vegetated by the end of 2013 leaving areas exposed over the winter months when the Levels are most prone to flood events. Subsequently during January 2014 prolonged heavy rainfall led to extensive flooding across the levels affecting over 6,900 hectares of land.

During this flood event the spillway experienced water flow for 62 days. Without vegetation being established, a key element of the full protection level offered by Erosamat, it was important to understand how, or if, the Erosamat system would withstand the high velocity flows experienced.

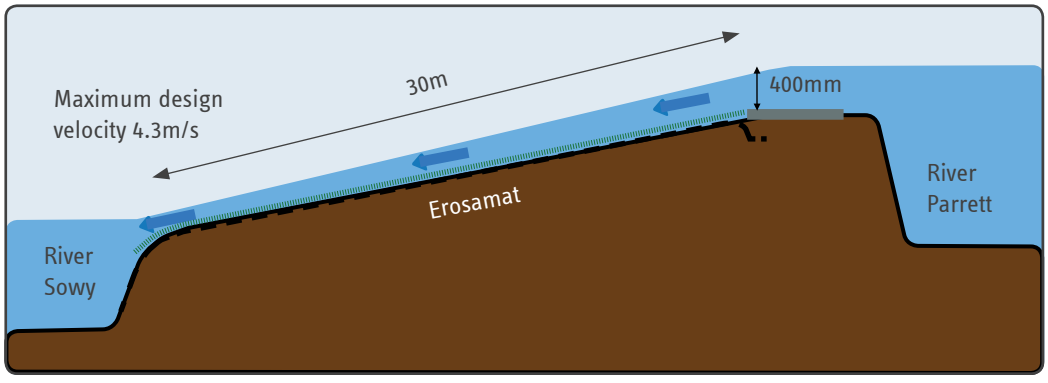
Following the completion of the spillway construction, Black and Veatch, as clients consultant, constantly monitored the performance of the spillway collecting data, including through the flooding events of 2014 (see table 1).

The results collected showed a maximum flow velocity of 4.33 m/s across the spillway, a velocity much better than on the published datasheet, derived from laboratory tests.

Field data from this flooding event demonstrated that un-vegetated Erosamat Type 3/20Z500M erosion protection system provides sufficient spillway protection for the velocities exceeding 4.0 m/s. When fully vegetated, Erosamat Type 3/20Z500M system is capable of hydraulic loading in excess of 6.0m/s.

About ABG

ABG are a market leader in the development of high performance geosynthetics for use in a wide range of civil engineering, environmental and building applications.



Flood monitoring data

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