

Use of Bituminous Geomembrane (BGM) to Waterproof Large Canals

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Abstract. Bituminous geomembranes (BGM) collaborate in the global challenge of improving water resources management by waterproofing hydraulic works. BGMs are multi-layered composite geomembranes with each of the components providing a technical benefit on large canals projects. These technical advantages include: A very low Manning coefficient for efficient water flow, extreme puncture resistance, which allows rapid deployment on rougher subgrades and permits many types of cover directly on top, excellent resistance to wind uplift due to their high surface mass, meaning installation can be done in strong winds up to 40 km/h. BGMs also have a very low coefficient of thermal expansion and do not wrinkle with changes in temperature like other polymeric membranes do. This is particularly useful in high heat projects when geomembrane is left exposed, providing a more secure project in the long run with less risk of wrinkle-induced cracks and failures.

To illustrate this, this presentation will describe the composite structure of bituminous geomembranes and will explain its main advantages in the hydraulic field. All these will be presented with the description of test results in different types of large width canals: Canals for irrigation: in France, for the waterproofing of the Canal de Provence; in India, where the Maharashtra state decided to replace original concrete for a geomembrane lining system in Pench Canal. Navigable canals: in France where VNF (French Waterways) chose the BGM for waterproofing the repairs of its canals. A work near Montargis will be presented as well as waterways in England (Lancaster Canal) and Canada (Chambly Canal). Finally, hydroelectric power canals will be also described: at the Sankt Dyonisen power plant in the Alps in Austria and the Cumpeo power plant in the Maule region in Chile.

Keywords: *Bituminous geomembrane, watertightness, puncture resistance, canal, potable water, exposed liner*



Fig. 1. BGM installed in Canal de Provence (France)