



Waterbodies / Courses

Dams and Dikes

Oberaich, Bruck an der Mur (Styria, Austria)

Incomat® Crib as erosion protection for overflow spillway



Incomat® Crib shortly after filling with concrete

Situation

Several flood protection measures were built in the catchment area of the Picheldorfer mountain stream, to protect the Styrian municipality of Oberaich, near Bruck an der Mur (Austria), against the devastating consequences of heavy local rainfalls. The design provides a flood basin with an overflow spillway, which allows large flood discharges to be channeled into the adjacent power plant channel St. Dionysen. The overflow spillway has been incorporated into the existing channel, therefore it had to be designed to withstand heavy hydraulic impacts that could generate deep erosion and dam failure.

Solution

To prevent the mentioned damages, which endanger dam stability, the overflow spillway had to be protected by an erosion resistant cover layer. The construction of the overflow section initially required the deepening and regrading of the dike to the required geometry. Afterwards the geosynthetic concrete mattress **Incomat® Crib** was installed upon the prepared subgrade.



Physical model test at Technical University of Vienna

Incomat® Crib consists of two layers of fabric, linked together by interwoven zones. After filling with concrete, the mattress takes a tubular form with permeable intermediary areas. Physical model tests, which were performed at the Technical University of Vienna in 2010, proved the erosion resistance of overflow spillways covered with **Incomat® Crib** against flow velocities to be higher than 10 [m/s] and specific discharges up to 2.5 [m³/(s*m)].

Three factory-made prefabricated panels, each approximately 550 m², were laid out on the compacted subgrade in Oberaich and linked together by industrial zippers before being filled with liquid fresh concrete. After the concrete had hardened, an additional top layer containing humus was added and vegetated. The removal of this vegetative layer in an overflow event is acceptable, since the concrete mattress beneath guarantees the erosion resistance of the dam.





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Crest of spillway and prepared subgrade



Overflow spillway after completion



Installation of **Incomat**[®]



Filling **Incomat**[®] with concrete

The high permeability of the erosion protection layer has a beneficial effect on plant growth. Due to that, the vegetated surface integrates the whole construction attractively into the landscape, even a short period after completion.

Advantages

The construction of the high resistant, yet permeable concrete revetment did not require extensive excavations or other massive conversion measures at the existing dam. The whole cross-section, consisting of the dam crest and both slopes, was constructed continuously and free of joints. Since **Incomat**[®] Crib acts as a lost shuttering, no additional formworks were necessary, not even in the inclined embankments. The whole 1650 m² of concrete mattress was easily installed and filled within 2 days.

Project: Overflow spillway Picheldorfer Bach

Location: Oberaich, Styria, AUT

Client: Austrian Ministry of Life

Design: Engineering Office Perzplan

Construction: Division of Torrent and Avalanche Control

Construction period: July 2012

Product: **Incomat**[®] Crib 10.200

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