

Retention pond drainage Golf course, Oaks Prague

Nebrenice, Czech Republic

The new PGA National Golf Course will be part of the prestigious Oaks residential complex in Nebřenice, southeast of Prague. A large retention pond has been built to enable watering of the course on regular base. Enkadrain Wide provides a simple and economical solution for drainage of groundwater around the pond.



Project owner
**Arendon Development
Company a.s.**

Product
**Enkadrain 5004F/5-2s/
M300PP**

Functions
**Drainage
Filtration
Separation
Protection**

Contractor
PSJ, a.s.

Volume
8,000 m²

Challenge

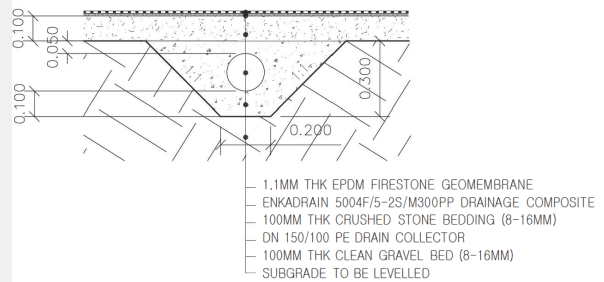
The Oaks residential complex and its golf course are situated in a rich natural landscape including forests and several ponds. A complex irrigation system will keep the golf course regularly watered. The main retention pond, designed to hold 44,000 m³ of water, is part of this system. Even though preliminary geotechnical survey did not confirm presence of ground water in this particular locality, designers were cautious and made provision for a dedicated pump station collecting ground- and rainwater to be pumped to the pond when required.

The initially proposed technical solution included a drainage composite consisting of regularly spaced perforated pipes between nonwoven needlepunched geotextiles that were to be connected to DN 150 main drain collectors. This solution needed reconsidering when excavation works confirmed that the rock base and intended 100 mm thick bedding layer made of angular aggregate 4-22 mm placed below drainage composite, would generate higher puncture forces than assumed in design criteria. This fact together with higher cost of original solution called for a reasonable alternative.



Cut and removal of rock base to accommodate the main retention pond as a part of golf course irrigation system

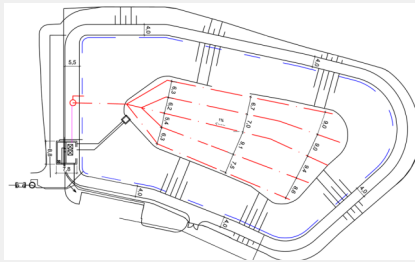
TYPICAL CROSS SECTION DETAIL OF MAIN DRAIN COLLECTOR UNDER POND



Typical cross section detail of the bottom of the retention pond, showing a layer of Enkadrain above main drain collector



Installation works: Enkadrain is laid underneath EPDM geomembrane



Layout of the retention pond with five drain collectors transporting water from Enkadrain to the dedicated pump station



Cutting and overlapping does not require any sophisticated tools.

Solution

For an alternative solution the designers focused on three goals which lead to choosing the composite drainage product Enkadrain Wide. The goals were:

- Provide higher CBR puncture strength (>5,5kN) and dynamic perforation resistance and thus secure effective protection for EPDM membrane
- Use a stable yet economical product with high flow and long term drainage performance for groundwater
- Simplify details and installation and cut down the installation time

Benefits of the solution

Enkadrain Wide guaranteed fast and simple installation as the composite was delivered to site in 5 m wide rolls that are particularly suited to large scale projects. It also provided optimal balance between price and overall performance.

Result

With the new solution including Enkadrain, all goals were met. Technically it achieved the strict design criteria. Practically Enkadrain proved to be a simple product to work with, not requiring any extra connectors, accessories or sophisticated tools while being installed. And economically the solution provided savings in time and money for both contractor and investor.

Products used



Enkadrain[®] Wide

High flow capacity drainage composite combining a low compression core with two layers of needlepunched PP nonwoven geotextile