



Budapest Pedestrian Tunnel

Hungary



Completion Date
DECEMBER 2019

Engineers
ECO-TEC KFT.

Contractors
**MARKET EPITO ZRT.
AND KESZ EPITO ZRT.**

Products
**ADMIX C-1000 NF,
CONCENTRATE,
PATCH'N PLUG**

Project Type
TUNNELS

Like most federal governments Hungary's central government is housed in several buildings within Budapest. Two primary building complexes are the Parliament building and the Parliamentary Offices building that contains the offices of parliamentarians and their staff. As might be expected there is constant pedestrian traffic between these buildings and the sometimes harsh winter weather as well

as the need to cross a main downtown arterial road make travel between these buildings inconvenient and time consuming. The connection of these building with a climate controlled pedestrian tunnel was deemed a priority.



Parliamentary Offices



Parliament Building in Budapest

High Water Table

The key challenges in building this pedestrian tunnel were the high water table created by the close proximity of the Danube River and addressing the need to prevent interruption of traffic flow on the street between the buildings. The street is both a major thoroughfare for cars as well as a street car line. The tunnel needed to be water tight to create a comfortable pedestrian space and the traffic needed to be maintained throughout the construction phase.



Aerial view of Parliament Building situated on the Danube River with the offices across the street



Street car line running over top of the tunnel

The design team settled on the use of both cast-in-place and precast sections to create the tunnel. Precast was used below the road surface itself to speed construction and thus reduce the time that the full road surface was closed. Both parts of the tunnel had similar dimensions utilizing 20 cm (8 inch) thick walls and ceiling with a 40 cm (16 inch) thick base slab. The base slab was thickened to support the tunnel and overhead loads as well as to provide ballast to keep the tunnel from floating in the high water table environment.

Standalone Waterproofing Solution

The concrete of the tunnel is solely waterproofed with Xypex products. The concrete of the walls, ceiling and slab of both the precast and cast in place are waterproofing with Xypex **Admix C-1000 NF** dosed at approximately 1% of the cementitious content of the mix. The joints of the cast in place section are waterproofed using typical bentonite and steel plane composite waterstops as well as a slurry coat of Xypex **Concentrate**.

The joints in the precast section were waterproofed using both expanding waterstops and a mortar made of a blend of Xypex **Patch'n Plug** and Xypex Concentrate powders. These two combined systems provided redundancy to the waterproofing at these critical joints between the precast sections.



Cast in place walls being formed with typical joint waterstop detail to left



Precast sections and their installation



Precast joint waterproofing systems and their installation

The conclusion of the project is a bright, dry and comfortable pedestrian tunnel between these two buildings that was constructed and waterproofed against ongoing hydrostatic conditions.

The project was completed on time to the satisfaction of all involved, with a minimal of impact on the travelling public and at a cost that was very competitive compared to alternate waterproofing strategies.



Final constructed tunnel