M0 Northern Danube Bridge
Budapest, Hungary

The Bridge across the Wide Danube Branch

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M0 Highway Ring Crossing Over The Danube
The M0 Northern Danube Bridge

- Flood bridge on the Buda side
- Bridge over the Szentendrei Danube branch
- Flood bridge on the Szentendrei Island
- Main bridge
- Flood bridge on the Pest side

The Cable Stayed Bridge
Three Span Cable Stayed Bridge

- Bridge length 590 m
  - middle span 300 m
  - side spans 145 m
- Pylon height 100 m
- The longest stay cable 163 m

The girder

- Cross section
  - Width 36.83 m
  - Depth 3.63 m
- 2x2 traffic lanes with emergency stop lane
- Steel structure
- Open cross section with edge box girders
- Orthotrop deck
- Surface 21,700 m²
- Steel volume 8,455 tons
Stay Cables

- Two cable planes
  - cables per cable plane 4x11 db
  - total 88 db
- Stay cable
  - max length 163 m
  - min length 56 m
- Total volume of cables 460 t

Geometrical Data of Stay Cables
Pylon geometrical data

- Height 100 m
- Bottom width 51 m
- Pylon leg: variable cross section
  - outside
    5.0 x 4.0 m - 3.5 x 4.0 m
  - wall thickness
    1.0 m - 0.5 m

The construction process of the pylon
Post-tensioned pylon

Post-tensioned outer walls

- stress bar $\phi$ 40
- quality: 1030

Coupler splices

Post-tensioned pylon

Upper anchorage

Lower anchorage
Pylon legs reinforcement

- main reinforcement: \( \phi 28 - \phi 25 \)
- strength class: B500B
- concrete cover: 40 mm

Pylon Stay Cable Anchorage

- Forces on shear keys
  - erection of the deck by cantilever method
  - replacing of cables during maintenance
Bearing on the supporting cantilever of the pylon

- Vertical support: Rga 7000 kN +/- 120 mm
- Horizontal support: MHD 2400 kN +/- 240 mm
- Wind support: LHB 2700 kN +/- 120 mm

Service traffic inside the pylon

- Stairs
- Storey height: 2.88 m
- Number of storeys: 20
- Max member length: 2.50 m
- Max member weight: 36.2 kg
- Fastening: Hilti M12 glued dowel screw
- Corrosion protection: Galvanized
- Total weight: 10 t
Service traffic inside the pylon
Industrial elevators in pylon legs

- Width: 1570 mm
- Depth: 1620 mm
- Lower pit height: 1250 mm
- Head of the elevator shaft: 4650 mm
- Lifting capacity in height: 53.52 m
- In weight: 300 kg / 4 persons

Industrial elevator in pylon head

- Width: 1450 mm
- Depth: 1200 mm
- Lower pit height: 1400 mm
- Head of the elevator shaft: 3560 mm
- Lifting capacity in height: 32.53 m
- In weight: 320 kg / 4 persons
Quantities of materials used for the pylons

- Quantities per pylon
  - concrete C40/50 1700 m³
  - reinforcing steel B500B 370 t
  - prestressing bar 1030 19 t
  - anchorage device 80 t

Glass wall of the pylon head
The bridge on the last lap

The test charging
Thank you for your attention!!