



▲ *The National Technical Library in the course of construction*

Construction of the National Technical Library began in autumn 2006. The Library is situated on the college campus in the Dejvice district of Prague and includes the collections of the State Technical Library as well as part of the Czech Technical University libraries and the central library of the faculty of chemistry and technology. The National Technical Library's project scope, construction time constraints, prestige and social importance created challenges for all the parties involved.

The construction investor was the State Technical Library and Sekyra Group a.s. and the contractor was a consortium of Metrostav a.s. and OHL ŽS a.s.. The works including the subterranean support structure were designed by Helika a.s. and the support structure's overground section was designed by PPP, s.r.o.. The post-tensioning system was supplied by VSL Systems (CZ), s.r.o..

The typical 15m by 15m spacing of the supports and the high imposed loads led to the design of a two-way floor system. For the project's overground storeys, the 300mm flat slab is supported by columns topped by 6m-diameter rounded shallow cones. The building has a square footprint with smoothly-rounded sides and corners. It measures nearly 75m by 75m. Post-tensioning of the support structure uses the proven SO 6-4

bonded slab PT system in flat ducting, with passive H 6-4 anchorages. The PT tendons provide strong reinforcement of the slab, while in the column strips there are typically 11 tendons at 400mm spacing. In specific cases, this spacing is reduced to half in one direction. The plate strips are reinforced with PT tendons with a typical axis spacing of 1,500mm. A total of approximately 300t of prestressing steel, 63km of steel ducts and 2,200 active and passive

Scope of works performed

- Design support during the application of the VSL prestressing system
- Tendon Placing
- Tensioning and grouting the tendons



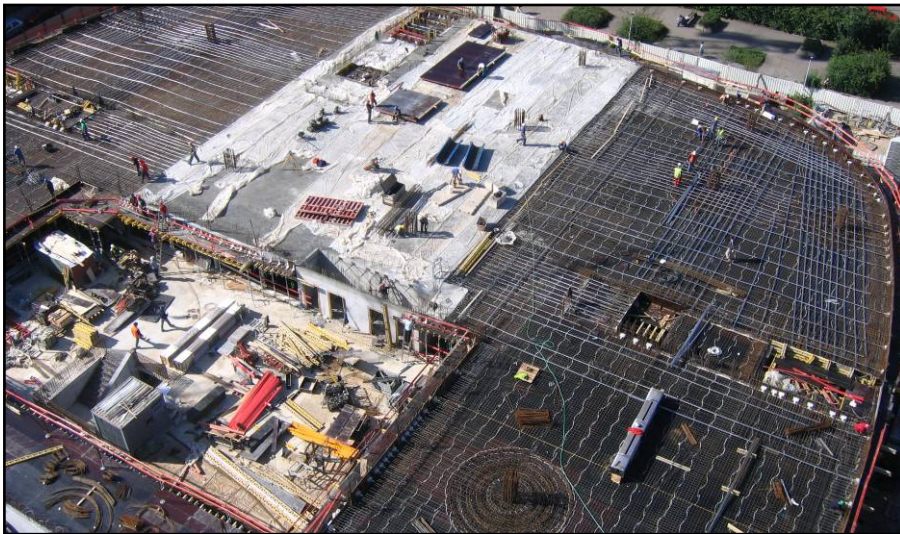
▲ *Concreting of sections at various stages of construction*

anchorages had to be installed in the six levels of the structure at a rate of one floor a month. This meant that the average floor required installation of more than 50t of strands, 10km of ducts and 360 active and passive anchorages. The PT tendons had to be assembled in the formwork with a minimum use of prefabrication because of their length and the changing layers. The first step involved the installation of an active anchorage at the front of the formwork



▲ PT tendons in the column area

▼ View of the work showing concreting at various stages



▼ Active and passive anchorages prior to concreting



and assembly on the prepared supports of ducting for the required tendon length. Subsequently, the prestressing strands were pushed from the passive anchorage. Once the grouting and venting connections had been fitted at the tendon tops and anchorage area, the

▼ Anchoring pockets after grouting of the tendons



OWNER

The State Technical Library,
Sekyra Group a.s.

ENGINEER

Helika, a.s.
PPP, s.r.o.

CONSTRUCTION

Consortium of Metrostav a.s. and OHL
ŽS a.s.

SUPPORT STRUCTURE

CONTRACTOR

Metrostav a.s., division 6

VSL ENTITY

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upper reinforcement layer could be placed. The laying of the PT tendons for an individual floor took just a fortnight, with five days for the subsequent tendon stressing and three days for their grouting. Tens of buildings that use post-tensioning for their support structures have already been built in the Czech Republic. The construction of the National Technical Library is undoubtedly among the most important of them, as it surpasses parameters of other projects completed so far in its use of post-tensioning technology. The Czech National Library was officially opened in September 2009.



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