

Combining procurement models for green and healthy buildings

South Moravian Region (Czech Republic)

Background

The South Moravian Region located in south eastern Czech Republic has over a million inhabitants and is the fourth-largest region in the country (its capital is the city of Brno). The landscape of the region is characterised by highlands as well as the Moravian Karst. The plethora of caves and gorges provide the ideal conditions to treat respiratory diseases.

For more than 35 years, the Children's Sanatorium at Ostrov u Macochy offers [speleotherapy](#) - a climatic treatment method that uses the specific cave climate as a natural resource. It is the only treatment centre in the Czech Republic that uses a karst cave for speleotherapy. The sanatorium was built in the 1980s as a temporary building - the main pavilion is still in use today. However, its operation is not very economical, the environment for clients and staff do not correspond to today's standards and the capacity of 42 beds is insufficient, unable to meet current demand.

The South Moravian Region has applied socially and environmentally responsible approach to its public procurements and emphasises obtaining maximum value for money since 2014. In 2018 - 2019, when the project for the new treatment facility was prepared, it reflected the region's internal directive governing public procurement. In 2020, the regional government adopted a responsible procurement strategy outlining priorities and objectives. An annual evaluation will inform the continuous development of the strategy.

Procurement objectives

The regional government sought to build a new treatment facility for respiratory diseases near the town of Ostrov u Macochy. The current building offers space mainly for accommodation, limited space for rehabilitation and exercise and a small outdoor play area ([virtual tour](#)). In addition to larger and more comfortable spaces for accommodation, rehabilitation (including a sauna or saltwater pool) and facilities for speleotherapy itself, the new sanatorium will also offer space for dining, education (primary school classes) and more outdoor activities - an arboretum in addition to the playgrounds.

The procurement approach was set up to give the market the opportunity to show the best they can offer to make the building as aesthetically pleasing, user friendly, and energy efficient as possible. The process included both a preliminary market consultation, to test the clarity and feasibility of the procedure, as well as a market dialogue event to provide a more detailed description of the planned procurement process and the required content of the tenders.



As such, the procurement procedure combined multiple methods. The tender itself was awarded using a combination of the Competitive Procedure with Negotiation and Architectural Design Contest (as the final stage of the tender). For the first time ever, the South Moravian Region applied the Design and Build approach (DB)¹, and Building Information Modelling (BIM) in the design, implementation, and operational phases.

An expert, independent and pre-announced evaluation committee consisting of the architects, the management of the sanatorium and the political representation of the contracting authority, carried out a comprehensive evaluation of the bids.

Criteria used

Approach:

The contracting authority decided to go with what seemed like the most efficient and transparent approach as in to set a fixed price and select the supplier according to qualitative criteria only. Overall criteria were not weighted but instead ranked according to their importance.

Principles of responsible procurement were taken into account in this case, in particular, as follows:

- involving the operator of the sanatorium in the preparation and conduct of the procurement process,
- the use of pre-market consultations to present the project and its objectives and to consult with potential contractors on the appropriate approach and parameters for the procurement,
- providing tenderers with an opportunity to come up with an innovative and efficient solution to achieve the best possible outcome of the project,
- placing emphasis on legal employment, fair and dignified working conditions, and an adequate level of occupational safety for all persons who will be involved in the performance of the subject of the procurement.

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Subject matter of the contract:

Construction of Children’s Sanatorium with speleotherapy in Ostrov u Macochy with comprehensive use of the Design and Build method. The selected contractor is responsible for the whole project preparation, from the architectural study stage, to the construction itself and in the first three years of operation of the sanatorium, shall also be responsible for energy management in order to achieve the promised energy saving parameters of the building.

Selection criteria:

Tenderers were required to demonstrate that they had, inter alia, experience in the design and construction of buildings using renewable energy, heat recovery, technical heating, ventilation and cooling systems achieving a high degree of indoor comfort and that their implementation team had sufficient previous experience in the relevant areas, e.g. Design and build, [FIDIC](#) (International Federation for Consulting Engineers) or BIM.

¹ Design & Build is a method of construction project delivery that transfers the responsibility for the preparation of the project documentation and thus the overall quality of execution to the construction contractor. The client usually specifies only the purpose, standards, scope and performance criteria in its brief. DB projects are suitable for new buildings as well as for complex reconstruction and modernisation of buildings (office buildings, sports or cultural facilities, schools, hospitals, shopping centres, hotels, industrial halls and buildings). With DB projects, there is a higher certainty that the bid price will be respected and will not be affected by changes in the project documentation made by the contractor during the execution of the work.

Technical specifications:

The technical requirements were defined through:

- operational scheme of the sanatorium - arrangement and continuity of individual operations,
- requirements for the scope and equipment of the building,
- description of the daily regime of the sanatorium - to give an idea of the standard functioning of the sanatorium, activities of clients and staff,
- room book - description of individual rooms, their purpose, connections, equipment requirements,
- standards book - minimum parameters and characteristics when using given products and processes,
- documents for the preparation of the BIM Execution Plan – Employer's Information Requirements (EIR), pre-contract BIM Execution Plan (pre-BEP).

Basic requirements of the Contracting Authority for the building:

- capacity of 78 persons - children and their family members,
- facilities for approx. 35 employees,
- facilities for rehabilitation (including a gymnasium, sauna and indoor swimming pool with salt water),
- three primary school classes,
- catering facilities,
- dining room for 80 people,
- service apartment,
- outdoor playground, garden and 25 parking lots.

Award criteria:

Price was not part of the evaluation/award phase as the contracting authority fixed it in advance. Thus, the quality of the design was evaluated (see also earlier point on 'approach'). Award criteria were inspired by criteria commonly used in architectural competitions (in descending order of importance):

- the overall urbanistic-architectural quality of the design,
- the quality of the energy and technological solutions,
- fulfilment of the operational requirements of the assignment,
- the quality of the tenderer's implementation team (its relevant previous experience),
- value added (options predefined by the contracting authority).

The quality of the energy and technological solutions consisted of:

- quantitative sub-criteria:
 - the average heat transfer coefficient of the building, for which $U_{em} \leq U_{em,rec}^2$ (that is, the recommended coefficient of heat transfer)
 - non-renewable primary energy consumption (NPE) [kWh/year], converted to the total energy reference area (specific NPE in kWh/m².year) for which $NPE < 120$ kWh/m².year (all energy services)

² $U_{em,rec}$ is a recommended value based on the Czech technical standards and their specified boundary conditions (typical values for calculation). As the sanatorium is a specific building, some of the boundary conditions were set differently: Minimum air temperature/relative humidity in the interior of the living rooms (winter) 23 °C / 45%; Maximum air temperature/relative humidity indoors in living rooms (summer) 26 °C / 50%; Minimum ventilation air dose per person in the interior of the living rooms 25 m³/h; Minimum indoor illuminance in living rooms (patient accommodation) 300 lx; Minimum indoor illuminance in living rooms (consulting rooms) 500 lx. The minimum requirement for the average heat transfer coefficient of the building was that the value offered had to be better than the recommendation set by the standards and preferably below the limit of 0.25 W/(m².K).

- qualitative sub-criteria:
 - minimising maintenance and service costs,
 - minimising operating energy costs,
 - the appropriateness of the choice of HVAC systems regarding achieving comfort in the residential areas of the sanatorium,
 - how to integrate HVAC systems and energy sources into the building regarding visual and acoustic comfort,
 - the interconnection of HVAC systems and energy sources, including heat recovery.

Results

The preparation of the tender procedure started in April 2018 and the procurement was launched in April 2019 with a total contract value of 5,700,000 euro (excluding VAT).

Seven suppliers submitted requests. These were assessed by an expert independent evaluation committee, which recommended the exclusion of one supplier due to fundamental flaws in its bid. The remaining four bids were then evaluated according to set criteria. This was also based on the reports of the expert examiners who examined in detail the values offered in the quality of the energy and technological solution criteria. Finally, the evaluation committee formulated recommendations for possible improvements to the best performing bid.

Each supplier also offered additional sustainable and innovative elements as part of their bids, such as creating an arboretum (botanical garden) planting local species of plants as part of the sanatorium complex.

The contract was awarded with the selected contractor in April 2020. Since then, project preparation has been underway, with the construction work starting in June 2021 and expected to be completed by the end of 2022.

Environmental impacts

The winning tender offered a number of sustainable solutions, including reusable (or fully recyclable) components of the main construction and interior design solution enabling simple layout adjustments in future. The building design also envisages rainwater collection and its subsequent use for irrigation, with its surplus being absorbed directly in the sanatorium area.

Furthermore, the successful tenderer committed to achieve an annual consumption of non-renewable primary energy (NPE) valued at 93 kWh/m²/year, and an average heat transfer coefficient through the building envelope (U_{em}) of 0.21 W/(m².K) (with the aim of $U_{em} \leq 0,25$ W/m²K).

Other ideas put forward included composting organic waste and an indoor greenery in the form of aeroponic flowerbeds enabling year-round cultivation of herbs, fruits and vegetables, and serving as an educational and aesthetically impressive element for children.

Calculation of the future environmental savings generated from the new building, compared to the old building, have not been made, as the two buildings are incomparable in size, etc.

Lessons learned

Preliminary market consultations are of great importance, especially when the contracting authority undertakes a new approach to procurement. It is appropriate to present the intentions and goals to potential suppliers, get feedback from the market, or find other information pertinent for preparing the procurement procedure.

It was mentioned that the children's sanatorium project is very demanding in terms of the development of minimum requirements and technical standards, as it includes several parts and different types of operating modes. It might have been more practical for initial testing to choose a project with a simpler type of operation or technical standards.

All entities and persons, who were involved in the preparation and the actual procurement procedure, as well as all those who participated in the procurement procedure, were sent a request for feedback. This was to find out about strengths and weaknesses of using this procurement procedure, the perceived advantages and disadvantages of implementing the public contract in this way. When setting a fixed price, it is essential to think about providing some space to enable suppliers to show extra benefit (added value of their offer). That is, a quality solution in terms of architecture, innovation, materials used or energy consumption, as well as in terms of sustainability generally. The feedback also drew attention to the risk of a fixed price. In this concept of awarding, the estimated value of procurement must be determined exceptionally carefully so that the project is feasible for the scope and quality required. Still, at the same time, the contracting authority must pay attention not to overpay the supplier.

Overall, the feedback received was broad and varied depending on who provided it. Architects pointed out that if there had been a separate architectural design competition to prepare the project documentation, more bids may have been submitted. Contractors appreciated the quality of the documents provided and also noted that the DB concept allowed for more effective communication between the architect and the contractor (or other entities on the contractor's side) already at the stage of project preparation (bidding), as well as subsequently during implementation, including ongoing project optimisation, which can extend into the operational phase. The lack of scoring in some award criteria was also mentioned. But overall the transparent approach to communication - both in the preliminary market consultations and during the tender procedure itself - was positively assessed.

The wide use of the BIM method closer to the implementation was acknowledged, which (although more expensive) lead to a better execution (in terms of the project documentation and the construction itself) and more efficient operation of the building.

This particular procurement procedure has shown that the use of the DB approach can be an interesting and legitimate way for contracting authorities to implement large-scale projects. It can bring higher quality to the field of public procurement and even attract new suppliers. This tender particularly enabled and encouraged the provision of offers of sustainable and innovative solutions.

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For related information, please see European GPP criteria for [Office Building Design and Management](#) and the [Technical Background Report](#).

[Link](#) to the tender documents (in Czech).