

VTB Arena Park

Moscow, Russia

Owner
VTB Bank

Client / Architect
Manica Architecture

Estimated Construction Cost
\$1.5 billion

Total Area
655,000 m²

Seating Capacity
Stadium – 33,000
Arena – 12,000



Thornton Tomasetti provided structural engineering, through schematic design, and building skin design services for the initial design of a reconstruction of the existing Dynamo Stadium into a world-class sports venue. The design included a 655,000-square-meter sports center composed of a new 33,000-seat football stadium, a 12,000-seat basketball / hockey arena, restaurants, a training facility and parking. Two levels of retail space would have been constructed within portions of the preserved historic façade of the old stadium.

Maintaining the aesthetic goals of the new structure and the historic exterior entryway of the old stadium would have required several types of structural materials and system configurations. Cast-in-place concrete would have been utilized in the parking and retail levels for foundations, floor slabs and columns up to the event floor. Above the event floor, structural steel framing would have been used to frame the seating bowls, concourses and super trusses at building overhangs.

The enclosed roof over the arena, the stadium roof with an oculus, and the building façade would have been contained within one structural system, each with vastly different support conditions and spans. The roof framing would have consisted of diagrid trusses built of round hollow structural steel members supporting the building skin elements.

Polycarbonate, a rigid, cellular material, had been selected for the building skin based on the owner's aesthetic preferences. Thornton Tomasetti performed an in-depth analysis of the material—balancing properties such as maximum unsupported spans for façade and roof applications, maximum fabrication width and appearance—to determine efficiency of various panel sizes, shapes and connection angles. A rationalized panelization scheme was developed for the 25,000 panels that would have achieved the design's curvature.