



## BOSTON SOUTH STATION, PHASE I

Boston, Massachusetts, USA

**Project Scope:** Engineering Professional Services for Physical Security

**Size:** 49-story office tower, 100,000 square-foot bus terminal expansion and rail terminal renovations

**Project Start:** 2016

**Project Completion:** Ongoing

**Client Reference:**

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**Project:** The Boston South Station Phase I will be an iconic, new, mixed-use (commercial and residential), high-rise tower located at the South Station in downtown Boston. This first of a three-phase private development includes a new 49-story office tower, 100,000 square-foot bus terminal expansion and rail terminal renovations that will help connect the 30,000 daily customers who use the existing rail service to existing bus and subway systems. The tower will be constructed atop of the existing railway station. The structural system consists of a central reinforced concrete core with overhung floors extending predominantly in the north and south directions. Major challenges include preservation of the existing (historic) station structure, transfer of the main tower onto mega-columns below the lower mechanical level (just above the station), hung floors (supported by hangers, mega-diagonals and transfer trusses). Also, the potential loss of some of the floors on one side of the building (threat side) might result in a severe structural imbalance, potentially leading to the collapse of the building.

**Assignment:** Provided blast hardening recommendations to the structural engineering consultant and co-ordinated with the owners and the other consultant teams on the project (architectural, mechanical, electrical, etc). Possible threats may occur outside the building, at the security checkpoint or in the parking lot due to a vehicle-borne improvised explosive device (VBIED), or inside the office tower due to a person-borne improvised explosive device (PBIED).

**Responsibilities:** Developed and co-ordinated the protective design process for the tower and adjacent parking structure through non-linear, dynamic analyses for far-field blast loading. Analyses for close-in and near-contact detonations, as well as those for explosions in confined spaces, involving complex computational fluid dynamics (CFD) numerical simulations, were conducted. Participated in team co-ordination meetings and presented blast hardening solutions and recommendations to the consulting team, owners and stakeholders.

