



**Project Name:**  
Fall Arrest Roof Anchor Installation

**Project Location:**  
1120 North Lake Shore Drive  
Chicago, Illinois

**Client:**  
1120 Lake Shore Drive Building  
Corporation

**Approximate Construction Cost:**  
\$240,000

**Year Completed:**  
2018

**Nature of Services:**  
Evaluation, Design, Bidding Assistance,  
Construction Phase Services

The 1120 North Lake Shore Drive Building is a 20-story masonry residential building completed over 90 years ago in 1925. The building features patinaed standing seam copper gable roofs, setback terraces, and a narrow low slope roof supported by original structural steel, hollow clay tile, and a topping slab. The low slope roof is parallel to Elm Street, and a gabled attic on the east elevation is parallel to Lake Shore Drive; forming the building's L-shaped footprint.

The 1120 Lake Shore Drive Building Corporation retained BTC in 2017 to evaluate the feasibility of installing fall arrest roof anchors for purposes of window washing and facade access. Unfortunately, original structural drawings were unavailable, and the gabled east attic roof did not allow for a typical roof anchor installation. As such, BTC performed an investigation and subsequent structural analysis to evaluate the existing structure to carry fall-arrest loads. BTC identified locations for a contractor to make exploratory openings and to cut a sample of steel for material testing. BTC also performed ground penetrating radar (GPR) scanning on the surface of the east attic floor slab to locate existing structural steel members in a non-destructive manner.

BTC's evaluation indicated that the existing low slope roof structure would be insufficient in supporting OSHA-prescribed loads for personal fall arrest equipment. As such, our design incorporated additional field-welded structural steel channels along the low slope roof to support the installation of 18 roof tieback anchors.

To address the unique layout of the east attic, BTC proposed installing 6 tieback anchors and structural steel stanchions with operable insulated enclosures within the attic space (lower right photo). The stanchions penetrate the copper gable roof of the attic, providing secure facade access along the building's east and west elevations.

