



BUILDING THE FUTURE NOW

### Selective Demolition of Four Hangers at the Dulles Jet Center Dulles, Virginia 2010

Early this year, the Washington, D.C. area experienced two major snowfalls within a week. The accumulation was a record for the area. Unfortunately, the snowfall was enough to collapse three 167' x 250' hanger structures and seriously deflect the main structure on the fourth hanger at the Dulles Jet Center located at Dulles Airport. The hangers contained over twenty executive jets valued at over \$500 million dollars. The operators of the facility, Landow Aviation LLC, were tasked with determining the best way to salvage the planes from the wreckage.

Landow selected ten bidders. Each bidder made a presentation based on their best method of separating the building from the planes. The intent was to salvage the planes without damaging them any further. There were a number of insurance companies, lawyers, and related engineering firms involved with the process as well. All of the planes had varying amounts of fuel on board. It was established early in the project that the plane components had to be closely protected since they could individually be worth between \$100,000.00 and \$7,000,000.00.

CSE, Inc. of Madison Heights, Virginia was chosen as the successful contractor. CSE had the best overall plan with the least chance of damage to the aircraft. They selected a core team of managers and supervisors with no less than 30 years of experience per manager. CSE's plan consisted of six major parts: 1) stabilize the three, 42,000 square foot structures with a combination of exterior and interior bracing, 2) remove two 125' x 35' doors and two 30,000# counterweights from each hanger, 3) remove all mechanical and structural elements that were suspended from the roof, 4) remove the roof diaphragm as structural demolition progressed, 5) selectively remove the major structural components so that the planes would not be damaged any further, 6) lower and assist with the removal of the planes as soon as they were clear of any obstructions.

CSE incorporated the most efficient crane layout to support their plan. The cranes utilized were a 70t Link Belt 8670, a 60t Terex T560, and a 90t Grove TMS 900E. The heaviest sections to be removed were the 167' long girders that weighed 30,000# each. The biggest challenge was to try to determine how each mangled piece was stressed and how its removal affected the adjacent structure. Many lifts were considered critical. Most girder lifts utilized two cranes. In addition, the length of the crane booms were limited due to the close proximity to the operating runway. Further complications were introduced when forensic engineers determined that selected structural connections and related components would have to be saved for further evaluation.

CSE corroborated with Master Engineers of Lynchburg, Virginia to implement a shoring plan. The shoring was a dynamic process and changed as the building demolition progressed. CSE worked closely with Anglin Aircraft Recovery Services to lower the planes and to help remove them from the hangers as demolition allowed.

The surgical demolition and removal of the planes and structure was completed in 90 days with crew sizes averaging 20-25 per day. Over 2000 tons of steel, siding, roofing, doors, and counterweights were removed from the site. CSE did not have any recordable injuries and every plane was recovered without any additional damage. The primary insurer was pleased enough to award all hourly employees a cash bonus once all planes were removed. The safe and successful completion of this project is a direct reflection of CSE's planning, extensive rigging, ironworking, crane operations, and demolition experience.

