

Big Bends

The entire roof-truss support system for the Dallas Convention Center was fabricated and delivered to the job site by BendTec, Inc., a pipe fabricator located in Duluth, MN that specializes in the fabrication of HSS trusses. BendTec's scope included the sizing of connections, detailing, bending of the arches, fabrication of the truss-work and delivery to the job site.

The four arches were bent from 48" OD API 51X52 pipe using BendTec's induction pipe bending process. Pipe wall thickness varied from 0.625" to 1.5". Since the arches were parabolic, not circular, special measures were taken to guarantee the correct shape. The induction bending process utilized an electric induction coil to heat a narrow band around the pipe to a predetermined, controlled bending temperature. As the pipe was pushed through the machine at a controlled rate, a hinged arm clamped to the pipe caused it to bend. Bendtec utilized specially qualified bending procedures to control essential bending machine parameters and guarantee that required mechanical properties were maintained throughout the bend. After bending, Bendtec installed the gusset plates for the truss hangers and pre-assembled the arch structures in the shop to ensure correct field fit-up. Each arch was shipped to the field in nine segments ranging from 30' to 50' in length.

The arches were anchored to the north and south end trusses, supported by a total of only three columns (one on the south end truss at mid span, and two on the north end truss). The complex intersections at the corners of the end trusses where five to six members intersect were simplified by using 5'-diameter spheres constructed from hemispherical heads welded together by the SAW process. The spheres varied in thickness from 2" to 3".

The south end truss was fabricated from 30" OD by 2"-thick API 51X52 pipe and weighs 186,300 lb. After fabrication, this truss was split into two pieces and truck-shipped from Duluth, MN to Dallas, TX. The lighter north end truss

was fabricated from 30" OD by ½" API 51X52 pipe and was also shipped by truck in two pieces.

The side trusses, which connect to the north and south end trusses, were fabricated from 24" API 51X52 pipe with wall thicknesses ranging from ½" to 1.25". Each truss was furnished in nine shop-fabricated segments, 14'-6" wide by 30' to 58' long.

BendTec detailed the entire project in-house, developing 140 (24" by 36")

drawings. Because the arches were slanted towards the center of the truss assembly, the horizontal cross braces presented special challenges to both detailing and fit-up. By accurately drawing the entire truss assembly on CAD, these connections could be isolated and patterns made for coping the cross braces to intersect the arches.

The project involved furnishing of 1,200 tons of architecturally exposed steel for the two truss assemblies. ★

