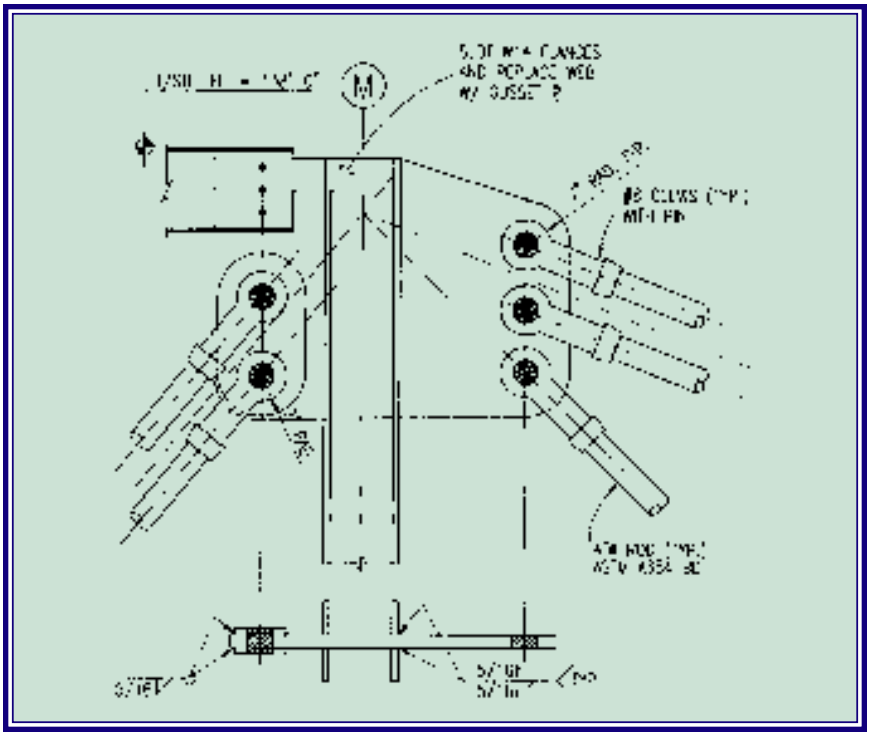
Stadium Addition Mirrors Team's Success

The growing popularity—and success—of Northwestern University's football team led the school to add a new pressbox facility

The new pressbox facility, inside (above) and out (top).
Photos by George Lambros Photography

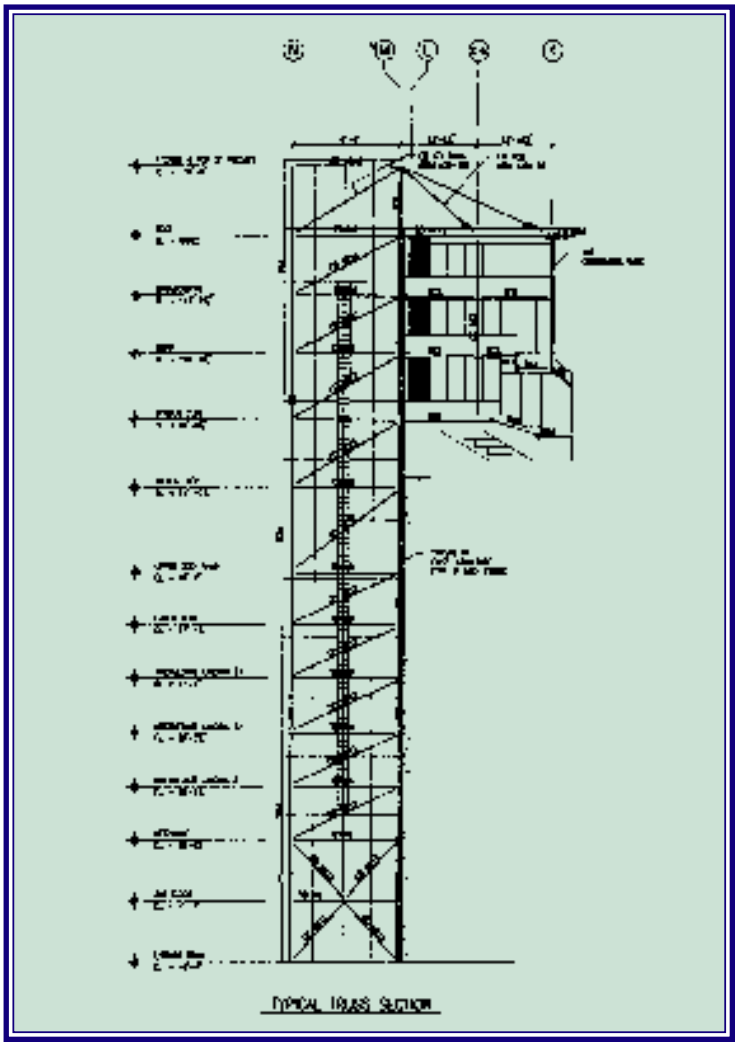
The Northwestern University Wildcats soared above the odds in 1996, when they earned only their second trip to the Rose Bowl in the University's long and storied history. Once league-wide doormats, Northwestern has emerged as a competitive team in the nation's toughest conference. While an appearance in the Rose Bowl exceeded everyone's expectations, the athletic department had shown faith in the team a year earlier when they launched a $25 million upgrade of the existing football facilities. The upgrade was sorely needed to help raise the standard of their stadium to that of other Big 10 universities.

The Ryan Field Pressbox was one of the most publicly visible parts of the upgrade. In addition to the pressbox, however, the project included a new locker room facility, a lowered natural grass playing field and rehabilitation of the existing stadium structure. Athletic officials felt



the former pressbox was outdated and undersized; it didn't adequately accommodate the local and national newspaper, television and radio personnel, as well as the athletic department's major supporters.

The pressbox, which today climbs above the stadiums walls and is readily visible from the surrounding blocks, was designed with three main levels: Broadcast, Media and the VIP Stadium Club. There were several challenges to the construction of the pressbox. A height restriction in Evanston, IL—the University's home—limited the building to 1,255' at the main roof level, making floor-to-floor heights tight and the depths of steel support beams shallow. Kevin Wilson, S.E., with Tylk, Gustafson & Associates, struc-



Project:
Ryan Field Pressbox
Evanston, IL

Owner:
Northwestern University

Structural Engineer:
Tylk, Gustafson & Asociates
Chicago

Architect:
Griskelis& Smith Architects
Chicago

AISC Member
Fabricator & Detailer:
Zalk Joseph Fabricators
Stoughton, WI

General Contractor:
Turner Construction
Chicago

tural engineers for the project, said that with the top of the stadium at +/- 82', only 43' were available to squeeze in the four levels.

In order to meet these challenges, some modifications to the design had to be made. Six independent vertical steel trusses were designed to extend above the concrete stadium to support the three floor levels, which cantilevered up to 30', and hung over the existing upper deck level of seating. The trusses vary in depth from 10'-6" to 18'-8" to follow the oval contour of the existing stadium and are spaced laterally between the stadium's existing concrete arches. The trusses are made up of wide flange column-chords and double channel/tube web members. Exposed above the main level are 4" diagonal steel rods that carry two rows of double channel and tube verticals that extend down through the structure. These continuous tension hangers support the broadcast, media and stadium club levels. A 10' high, 1-1/8" thick butt-glazed laminated glass wall on the Stadium Club level provides 180' of unobstructed football field and campus view.

At the ground level, the width of the new structure was limited because of an existing right-of-way on the adjacent street to the west. The steel trusses adjacent to the centerline of the pressbox are only 10'-6" deep. Floor beams were designed compositely with the 5¼" lightweight concrete slab-on metal deck to minimize the depth of the steel. The architectural design also sought to minimize visual obstructions, so the size and location of the columns were restricted. W30 girders supporting the stadium club extend out 30' over the Wildcat Den to create a column-free space.

Because of the structure's slenderness, Wilson said that the design of the six vertical trusses was based on lateral stiffness rather than steel strength. "During high winds, we did not want the swaying of the steel frame to become noticeably perceptible," Wilson added. "We limited our lateral drift criteria for different loading combinations to between H/400 to H/500." Once strength criteria requirements were met, member sizes were adjusted upward to meet the stiffness criteria.

Due to the large cantilever floor lengths, the design dead loads and Building Code prescribed live loads, the "columns" at the west side of the structure are in tension. A vertical camber to the west was intentionally designed and fabricated so that when the dead load was fully applied, the erected steel structure would be plumb. Horizontal expansion joints are present at each level where the new pressbox structure abuts the existing stadium.