VOLUME XV / NUMBER 3 / THIRD QUARTER 1975

MODERN STEEL CONSTRUCTION

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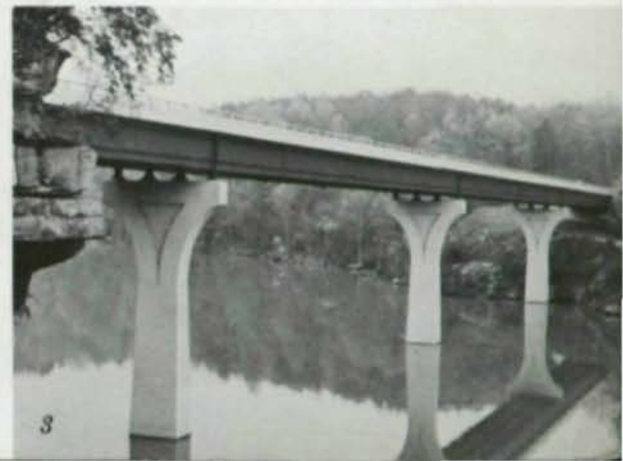

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MODERN STEEL CONSTRUCTION

Published by

American Institute of Steel Construction

1221 Avenue of the Americas
New York, N.Y. 10020

VOLUME XV / NUMBER 3 / THIRD QUARTER 1975

CONTENTS

THE SIXTH ANNUAL T. R. HIGGINS LECTURESHIP AWARD

The T. R. Higgins Lectureship Award Program will select the principal author of the technical paper judged to have made the most significant contribution to engineering literature related to fabricated structural steel within a five year eligibility period ending January 1, 1975. The award winner will receive a $2,000 prize during a ceremony at the 1976 AISC National Engineering Conference in Atlanta, Ga., where he will present his paper.

A jury of six eminent engineers from the fields of education, design, and industry will select the award winner. They are:

Lionel F. Currier *Louisville & Nashville Railroad Co.*

Edwin H. Gaylord *University of Illinois*

Thomas C. Kavanagh *Louis Berger International, Inc.*

N. Jay Law *Debron Corporation, Mississippi Valley Structural Division*

A. C. Van Tassel *Pittsburgh-Des Moines Steel Company*

Cornelius Wandmacher *University of Cincinnati*

1976 FELLOWSHIP AWARDS PROGRAM

Four $3,500 awards will be granted to Master's degree candidates pursuing a course of study related to fabricated structural steel. $3,000 is for the student's use, and $500 is for the department chairman's use in administering the grant.

Students interested should contact their department chairmen or the Committee on Education, AISC, 1221 Avenue of the Americas, New York, N.Y. 10020.

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Russian Residence "Bottoms Out"

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Chicago, Ill.
Associate Structural Engineers
The Office of Irwin G. Cantor, P.C.
New York, N. Y.
Construction Manager:
Tishman Realty and Construction Company
New York, N. Y.
Steel Fabricator:
Grand Iron Works, Inc.
New York, N. Y.

by Irwin G. Cantor

Sixteen synchronized hydraulic jacks (tied into a central console) lifted each floor at the rate of 15 ft per hour.

If the type of building construction introduced to New York City by the new 20-story "Russian Residence" apartment building that recently "went down" in the Bronx catches on, the usual "topping out" ceremony will be replaced by a "bottoming out" celebration!

Each floor of this innovative structure was built at ground level, then jacked into position around two supporting concrete core towers, starting with the top floor and working down.

Nearly $1,000,000 was saved by this revolutionary construction system. The structure was completed in 15 months; using conventional techniques, it is estimated that 20 to 24 months would have been required. Because the floors are supported by the core towers, eliminating all columns, approximately 10 percent more useful floor space is available than in a conventional building.

Located on a rocky six-acre site, the steel-framed building contains 240 apartments on 16 floors. Tenants are Russian officials, including members of the Soviet Mission to the United Nations and their families. In addition, school facilities, gymnasium, auditorium and community spaces occupy the first three floors directly above a 100-car parking garage which is partially underground. Total cost of the structure was $9,000,000.

Construction and Installation

To construct this unusual building it was first necessary to erect the towers that support the floors. These are of slipformed concrete, 260 ft high and 70 ft apart. Each measures 40 ft x 22 ft. Their end walls are 20 in. thick and the side walls are 12 in. thick. Beside supporting the cantilevered floors, the towers serve as elevator cores and contain the building's stairways, as well as some apartment bathrooms and closets.

Both towers were built at the same time at a rate of one floor per day.

The first section of the building to be built and hoisted into place was the roof slab. This was constructed in much the same way as the floors that followed—a double cantilever structural steel frame topped with a metal deck and a 3¼-in. lightweight concrete slab. Each floor measures 173 ft by 63 ft. The roof weighed a total of 300 tons, while the floors weighed 430 tons each.

After each floor was completed at the ground level, the exterior curtain wall was added to its perimeter. Then the floor was loaded with dry wall for partitions, heating and air conditioning units, electrical and plumbing supplies, glass for the windows, and any other materials required for finishing the apartments for that floor.

Floors were constructed in five-day cycles. The first day the prefabricated structural steel floor assembly was put together. The next day composite steel floor decking was welded to the steel floor frame. This was followed the third day by placing the 3¼-in. concrete slab. Finishing materials were loaded on the floor the fourth day, and ascent began on the fifth.

As soon as the floor reached a level of about 30 ft above ground the cycle could begin again. A sequence was established in which the finishing trades were working on the floor that had been lifted into position while the next floor was ascending and yet another floor was being fabricated on the ground.

As work progressed, the five-day cycle was shortened and, in fact, the last two floors were accomplished on a two-and-a-half day cycle.

To raise the floors into position, two 2½-in.-square "climbing rods" were positioned at the corners of each tower. Sixteen synchronized hydraulic jacks (tied into a central console) lifted each floor at a rate of approximately 15 ft per hour through temporary steel yokes place in each floor.

The floors in turn were finally connected to the concrete towers by steel pins. The pins were in the form of pullbars which had been previously inserted in the tower walls during slipforming. There were eight pins per floor, one at each corner of each core. They are each 3⅛-in. by 9½-in. and made of 50 ksi steel.

Resting on the pins are the building's main girders, each 172 ft long and

Mr. Cantor is president of The Office of Irwin G. Cantor, P.C., Consulting Engineers, Associate Structural Engineer on this project.

made of A36 steel. The two members support the entire floor. Each floor is completely independent of another and all forces, vertical and horizontal, are transferred to the tower core at each level. Atlas Steel Erectors contributed significantly to the technical innovations required to accomplish this complex installation.

Unusual Construction

This unusual style of building is based on a patented system developed by International Environmental Dynamics, a New York City based company, which devised the method as a means of building high-rise structures to withstand the forces of earthquakes. It has already been used on several office buildings in California and a 220-room motel in Huntington, West Virginia.

Because the construction was totally new to New York City, our office was initially retained to work with Dr. Fazlur Khan of Skidmore, Owings & Merrill to obtain approval from the New York City Buildings Department. While not actually required, since the building is owned by a foreign country, the submission was made partly as a community gesture and also as a contingency in case the building should ever be sold.

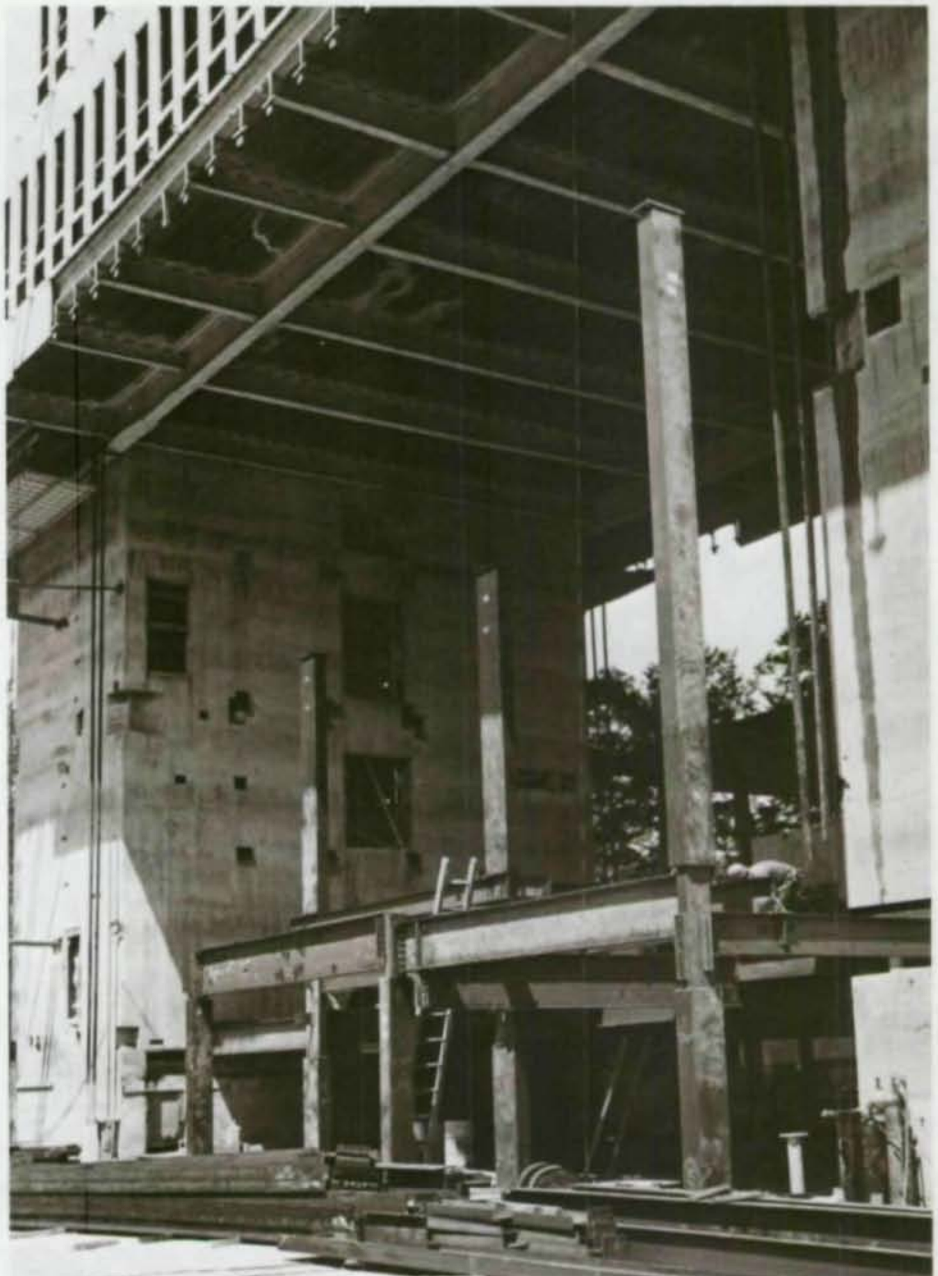
Once the Buildings Department approval was obtained, as associate structural engineer for the project the writer's office was responsible for the development of structural working drawings, engineering specifications, shop drawing review, and field inspections. Through this entire period we worked closely with Charles A. DeBenedittis, Senior Vice President of Tishman Realty and Construction Company, Constuction Manager for the project.

The many advantages afforded by the system made it readily acceptable. There was no heavy welding of moment connections, no loss of time transporting workers vertically, no work stoppage from weather interference and—best of all—no necessity for the complex safety precautions generally required for the construction of high-rise framework. The strength of the system actually surpasses that of conventional construction.

Another advantage of the system is the high level of quality control it makes possible. Because nearly all of the building operations are carried out at one spot at ground level, supervision and inspection are greatly simplified.

Steel was the logical material of choice here because of the long—28 ft—cantilevered spans of the design. Its light weight was instrumental in making the plan work. Steel also allowed a much faster construction cycle than would have been possible with concrete, which would have required additional time for curing.

Because no vertical structural framing is required, this type of construction can save as much as 10 to 15 percent of the cost of a conventionally framed structure of the same size.



Most building operations were carried out at ground level, simplifying supervision and inspection.

the A-B-E Airport

It's hard to imagine a modern, bustling airport terminal as being designed on a warm and human scale, but that's only one of the more pleasing aspects of the new passenger terminal at the Allentown-Bethlehem-Easton (A-B-E) Airport.

Nestled in the Lehigh Valley of eastern Pennsylvania in the foothills of the Pocono Mountains, the fast-growing airport lies within a 300-mile radius of five of the largest metropolitan areas of the nation, with New York 90 miles to the east and Philadelphia 60 miles to the south.

From its beginning in 1929 through its use as a training facility for pilots during World War II, the A-B-E Airport —now served by three major and three commuter airlines—has experienced a steady increase in both passenger and aircraft traffic, due largely to the various major industries located in the valley region.

A few years ago, the Lehigh-Northampton Airport Authority—owner of the airport—authorized a study of the airport's future needs. As a result of that study, construction on a new passenger complex was begun in the early spring of 1973.

The overall complex also includes a food service wing and a satellite departure terminal that is linked to the main terminal via a 300-ft tunnel that runs beneath the aircraft apron.

Passenger Terminal

The 172 ft x 300 ft, three-level main building utilizes natural terrain to maintain its snug, low profile—only 30 ft from the aircraft apron to the top of the terminal—and its design allows for future expansion.

Eleven large exposed rigid steel frames, each spanning a distance of 172 ft and spaced on 30-ft centers, make up the framework of the building. Each frame has two inclined legs and one horizontal member.

The legs of the main framing members rest on 1½-in. thick neoprene bearing pads. Steel tie beams, which act as tension members to counteract the outward thrust of the frame legs, also function as major floor girders extending through the entire width of the building. Horizontal X-bracing has been installed in three of the ten bays of the terminal to provide longitudinal stiffness.

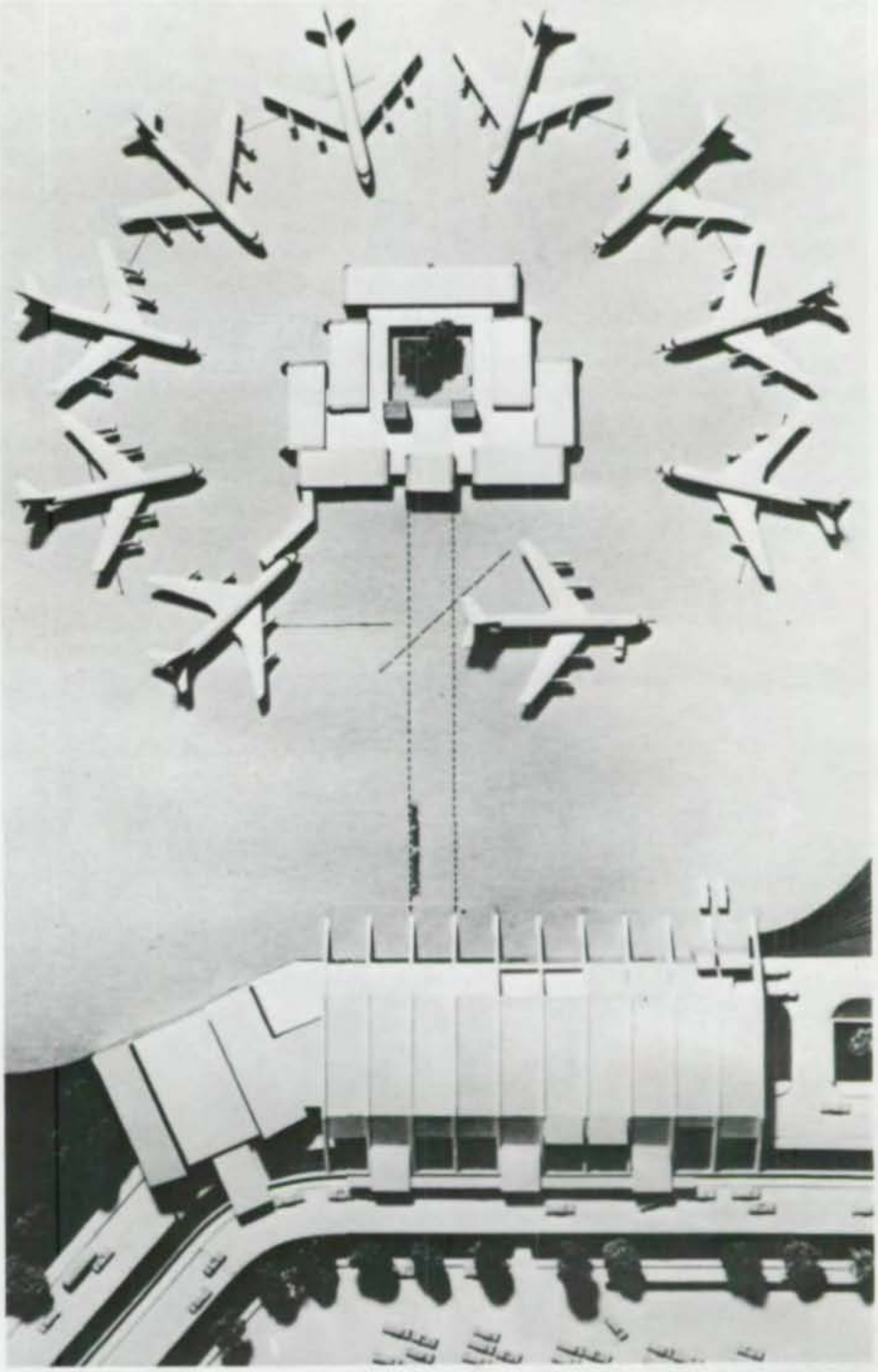
Both the rigid frames and the tie beams were fabricated from high strength A572 Grade 50 steel. Built up from steel plates, the frames vary in depth from 40 to 66 in. and average 41 tons in weight. The tie beams are fabricated from W36 rolled sections.

The terminal's spacious main ticketing floor—about the size of a football field—is largely free of columns, since all roof loads are carried by the exposed exterior steel frames.

The second floor, or mezzanine, of the terminal provides office space for the airport authority, as well as 6,000 sq ft of rental area. Movement between floors is accomplished by elevators and escalators and special attention has been given to providing unhindered access to all parts of the building by handicapped persons.

The pleasing architecture of the building results from the sloping sides of the giant frames, and sloping roof panels which visually reduce its scale, relating it to other traditional low profile structures of the Lehigh Valley.

By supporting the upper roadway into the terminal on an earthen landscaped berm and placing trees and shrubs in strategic areas, the environment is softened naturally.



The terminal and satellite departure building will be connected via a 300-ft underground passageway, as indicated by broken lines.

Architect:
Wallace & Watson Associates
Bethlehem, Pa.

Structural Engineer:
G. Edwin Pidcock Co.
Allentown, Pa.

General Contractor:
Avella Construction Co.
Endicott, N. Y.

Steel Fabricator:
Cumberland Bridge Company
Camp Hill, Pa.

The entire complex is served by access roads forming a loop around a 1,000-car parking lot.

Three Pedestrian Bridges

The three-level main building is served directly by an upper roadway for flight-bound passengers and a lower roadway for deplaning passengers. Entrance to the upper level is made over three canopied pedestrian bridges; two serving the ticket concourse, containing 15 counter positions. The third bridge serves the main waiting area which is adjacent to restroom and concession areas, a small nondenominational chapel and the food service wing.

Exiting from the ground, or deplaning level, is made under protection of the first level overhang, and a second tunnel provides access to the parking lot area.

Food Service Wing

The food service wing has a ground floor with a receiving dock and employee facilities, and a first floor with a cocktail lounge seating 40; a restaurant seating 120; a coffee shop seating 60; and a central kitchen. Adjacent to the restaurant is a private dining area for approximately 35 people.

The wing, in addition, has been structurally designed to accommodate future expansion of up to seven floors.

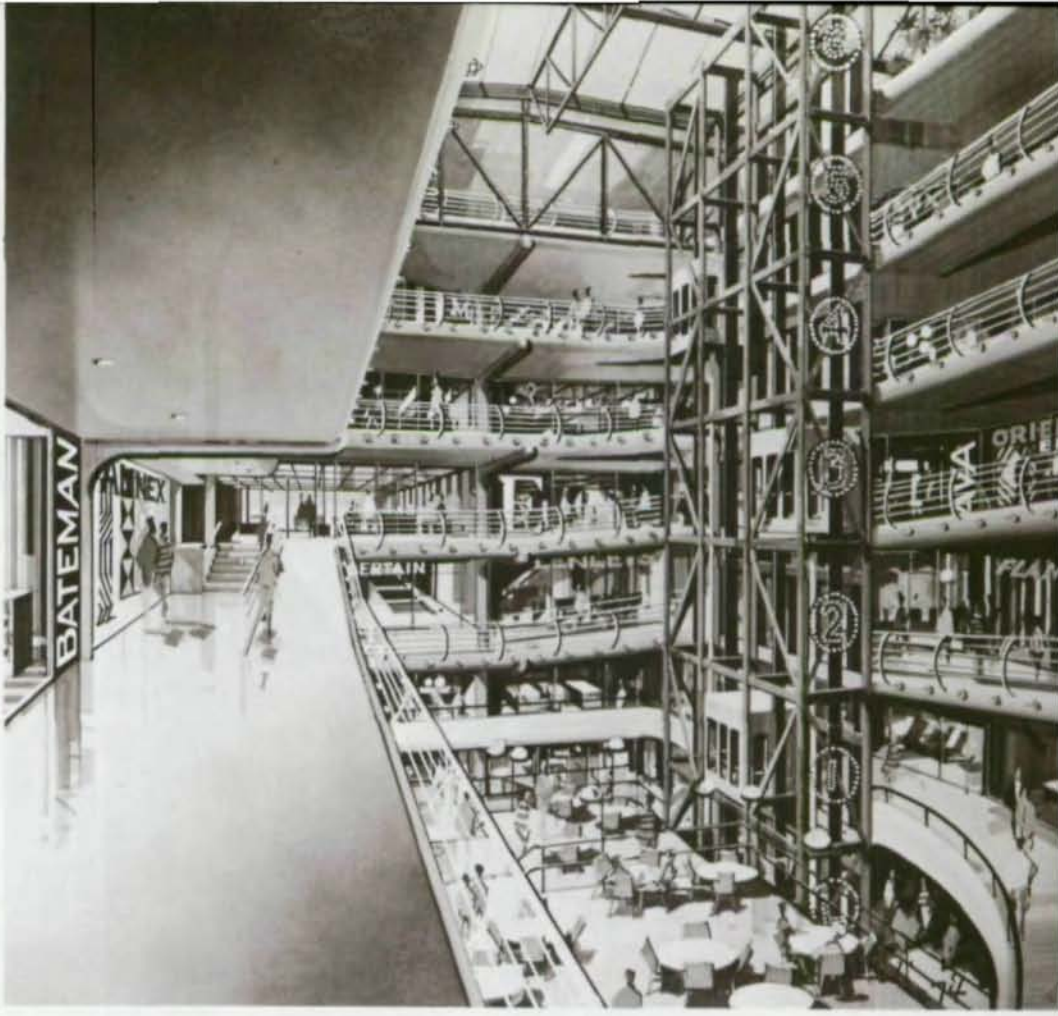
Steel-Framed Satellite Terminal

The steel-framed departure terminal contains four large passenger lounges, plus restrooms and a snack bar. The building, virtually an island from the rest of the complex, can serve as many as 10 aircraft gate positions. Here, too, plans allow for the future addition of four more passenger lounges, thereby doubling the gate capacity of the departure terminal now under construction. Similarly, the site has been prepared to permit the addition of a second main terminal, passenger tunnel, and departure terminal.

Jumbo jets as well as wide-bodied aircraft can be accommodated on the apron encircling the departure building.

The ribbing of the new passenger terminal is provided by 11 exposed rigid steel frames, fabricated from high strength A572 Gr. 50 steel.

Steel Framing for Vertical Shopping Mall



by Jules M. Davis

The difficulty of purchasing enough small parcels of land and lack of inter-urban real estate has led developers to the suburbs, where acreage is available for horizontal shopping malls. Recently, a Chicago developer hit upon the idea of staying in town by going vertical. Due for completion later this year, the Century shopping mall will be housed in what once was a 4,000-seat movie palace, built in the 1920's.

Major Structural Modifications

The Century shopping mall is designed for shopper comfort. The old theater has been completely gutted and the center will feature seven basic tiers which dramatically become 22 indoor shopping levels through a series of connecting winding ramps. An unusual open view elevator bank was built using 8-in. round pipe columns for supports. An attached parking structure will provide direct access to the 110,000 sq ft of gross leasable store areas. The Century's interior will resemble a street scene with the glass roof design incorporated to create a natural, open, bright environment.

The project involved major structural modifications to the existing theater. Studies were made in both steel and concrete and it was determined by the developer that only steel framing could meet the difficult construction conditions and the tight construction schedule. All 750-plus tons of A36 steel were erected by a conventional ground-mounted crane which was driven into the building through a hole knocked into the rear masonry wall. The boom was horizontal when the crane entered the building and then raised into the vertical position as it neared the center-clear space of the theater. Erection of all steel took place in this central core. This presented many uncertain conditions, especially when new steel construction was required to be connected to existing steel framing (for example, validity of the old structure and keeping the design within the framework of the AISC Specification).

All the existing steel trusses supporting the roof required extensive modifications and upgrading. Some of the diagonals and chords had to be replaced or removed to meet architectural requirements even as shop fabrication and erection progressed.

The exposed steel trusses at the roof add an interesting flavor to the project. In the words of the architect, "A dynamic decor of primarily glass, lucite and chrome will be designed using reflected materials to pick up highs and curved-textured shapes to create spatial relationships. Designed to lead the eye throughout the Century, the natural skylight will pick up shadow patterns from trusses providing an illusion of space moving through space."

Mr. Davis is president of Alert Steel Products Co., Inc., Chicago, Ill., faricator-erector on this project.

Architect:
Jerome Brown & Associates, Ltd.
Chicago, Ill.

Structural Engineers:
Alan Gold and Associates
Chicago, Ill.
Edmund Charcut and Associates
Chicago, Ill.

General Contractor:
E & S Realtors
Chicago, Ill.

Steel Fabricator:
Alert Steel Products Co., Inc.
Chicago, Ill.

AISC ERECTION TOLERANCES FOR COLUMNS

Erection tolerances for columns are contained in both the AISC Specification and the AISC Code of Standard Practice. The applicable provisions are:

AISC Specification
Sect. 1.23.8.1

"Compression members shall not deviate from straightness by more than 1/1000 of the axial length between points which are to be laterally supported."

AISC Code of Standard Practice
Sect. 7 (h) 2a

"Individual column shipping pieces shall be considered plumb if the slope of the working line does not exceed 1:500 provided that: The member working points of column shipping pieces adjacent to elevator shafts are displaced no more than 1 inch from the established column line in the first 20 stories; above this level, the displacement may be increased 1/32 inch for each additional story up to a maximum of 2 inches.

"The member working points of exterior column shipping pieces are displaced from the established column line no more than 1 inch toward nor 2 inches away from the building line in the first 20 stories; above the 20th story, the displacement may be increased 1/16 inch for each additional story, but may not exceed a total displacement of 2 inches toward nor 3 inches away from the building line.

"The member working points of exterior column shipping pieces at any splice level for multi-tier buildings and at the tops of columns for single tier buildings shall fall within a horizontal envelope parallel to the building line not exceeding 1½ inches wide for buildings up to 300 feet in length. The width of the envelope may be increased by ½ inch for each additional 100 feet in length, but shall not exceed 3 inches.

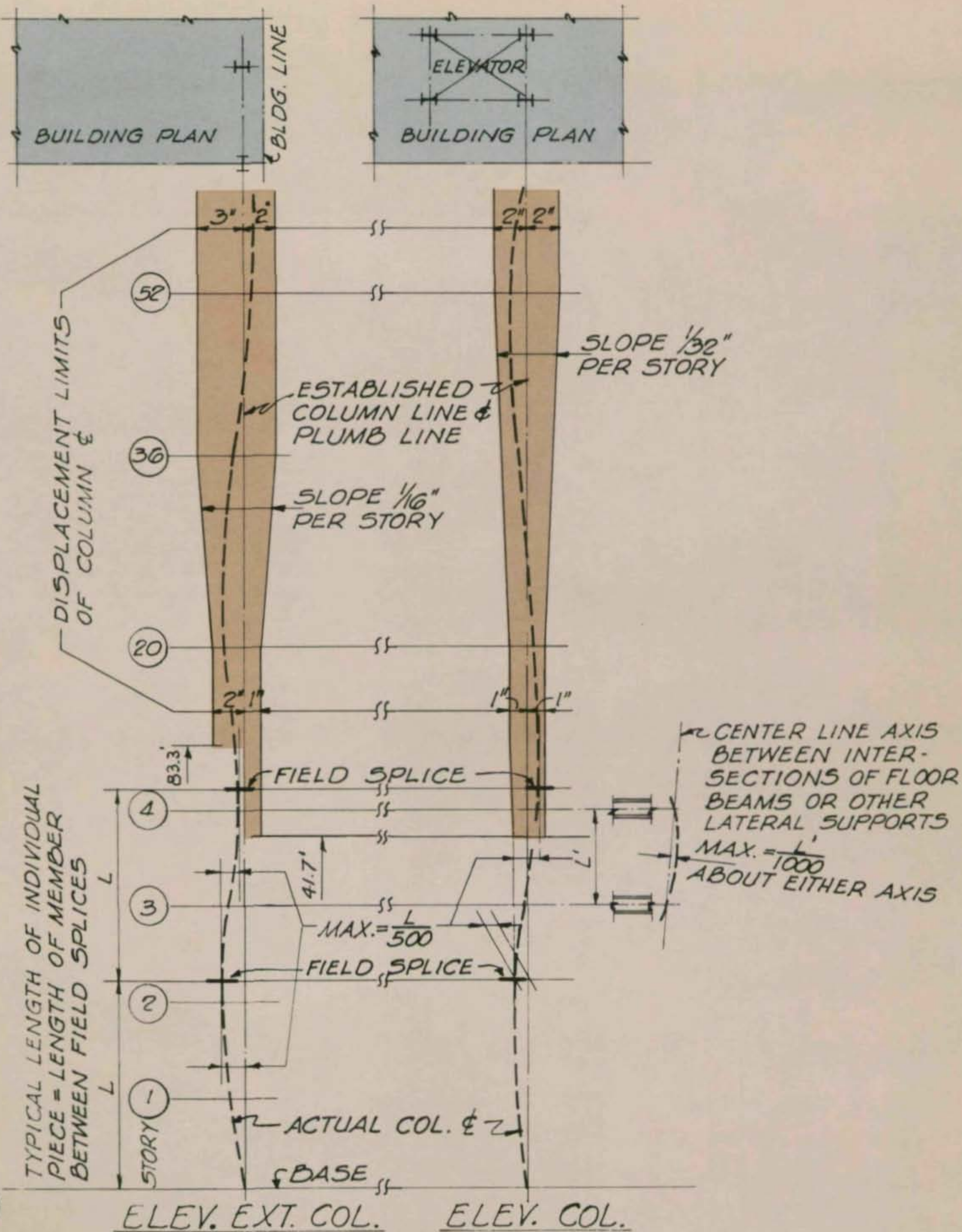
"The displacement of the center line of exterior columns parallel to the plane of the wall, from the established column lines shall be no more than 2 inches in any direction at any point in the first 20 stories plus 1/16 inch per floor above 20 stories, to a maximum of 3 inches."

Figure 1 shows the column erection tolerances. The envelope defined by the tinted area represents the maximum permissible variation of the column center line. The broken line represents the error limitation of 1:500 described in the Code.

The reasons for allowing a smaller displacement toward the outside of the building (the building line) area are:

1. Encroachment on the adjoining property or over the property line would be more serious than having a column displaced toward the center of the building.
2. Experience by major multi-story building fabricators in New York, who formed the Subcommittee which established these criteria in 1959, indicates a tendency towards a shortening of beams in upper stories. The cumulative effect of many column-web half-thicknesses being detailed on the "thick side" according to the AISC Manual, as well as the effect of beam lengths being detailed 1/16-in. short, makes exterior columns tend to be displaced away from the "building line."

It should be especially noted that the established column line is not necessarily the precise plan location, since Sect. 7(h)2a of the Code deals only with plumbness tolerance and does not include inaccuracies in foundation and anchor bolt locations, which are beyond the control of the fabricator and erector.


BUILDING PLAN
BLDG. LINE
ELEVATOR
BUILDING PLAN
3"
2"
2"
2"
52
36
20
4
3
2
1
DISPLACEMENT LIMITS OF COLUMN ¢
SLOPE 1/32" PER STORY
ESTABLISHED COLUMN LINE ¢ PLUMB LINE
SLOPE 1/16" PER STORY
2"
1"
1"
1"
83.3'
FIELD SPLICE
CENTER LINE AXIS BETWEEN INTERSECTIONS OF FLOOR BEAMS OR OTHER LATERAL SUPPORTS
MAX. = L'/1000 ABOUT EITHER AXIS
L'
41.7'
MAX. = L/500
FIELD SPLICE
TYPICAL LENGTH OF INDIVIDUAL PIECE = LENGTH OF MEMBER BETWEEN FIELD SPLICES
L
L
STORY
ACTUAL COL. ¢
¢ BASE
ELEV. EXT. COL.
ELEV. COL.

1975 PRIZE BRIDGES

▲ **PRIZE BRIDGE 1975 — LONG SPAN**

Daniel Webster Hoan Memorial Bridge
Milwaukee, Wisc.

Designer: Howard Needles Tammen & Bergendoff
Owners: Dept. of Transportation, State of Wisconsin
Expressway and Transportation Commission, Milwaukee County
General Contractors:
Superstructure: Pittsburgh-Des Moines Steel Company
Substructure: Druml/Hufschmidt (A Joint Venture of Druml Company, Inc. and Hufschmidt Engineering Company)
Steel Fabricator: Pittsburgh-Des Moines Steel Company
Steel Erector: John F. Beasley Construction Co.

◀ **PRIZE BRIDGE 1975 — MEDIUM SPAN, HIGH CLEARANCE**

Kentucky Highway 312 Over Laurel River Lake Bridge
Whitley and Laurel Counties, Ky.

Designer: U.S. Corps of Engineers, Nashville District
Owner: Dept. of Transportation, Commonwealth of Kentucky
General Contractor: Bush Contracting Company
Steel Fabricator: Tucker Steel, Division of U.S. Industries, Inc.
Steel Erector: Lexington Bridge and Erection Company

▶ **PRIZE BRIDGE 1975 — MEDIUM SPAN, LOW CLEARANCE**

South Fork Flathead River Bridge
85 Mi. SE of Kalispell, Mont.

Designer: Morrison-Maierle, Inc.
Owner: U.S. Forest Service, Region 1
General Contractor: R. Redding Construction Company, Inc.
Steel Fabricator: McNally Mountain States Steel Co.
Steel Erector: R. Redding Construction Company, Inc.

PRIZE BRIDGE 1975 — SHORT SPAN

Laceyville Bridge

Laceyville, Pa.

Designer: Gannett Fleming Corddry and Carpenter, Inc.
Owner: Department of Transportation, Commonwealth of Pennsylania
General Contractor: Higgins Erectors & Haulers Inc.
Steel Fabricator: Williamsport Fabricators Inc.
Steel Erector: Higgins Erectors & Haulers Inc.

PRIZE BRIDGE 1975 — HIGHWAY GRADE SEPARATION

South Weber Interchange

Davis County, Utah

Designer: Utah Department of Highways
Owner: Utah State Road Commission
General Contractor: Peter Kiewit Sons' Co.
Steel Fabricator: McNally Mountain States Steel Co.
Steel Erector: American Crane, Inc.

PRIZE BRIDGE 1975 — MOVABLE SPAN

Burlington Northern Inc. No. 117.35

Beardstown, Ill.

Designer: Howard Needles Tammen & Bergendoff
Owner: Burlington Northern Inc.
General Contractor: American Bridge Division, United States Steel
Steel Fabricator/Erector: American Bridge Division, United States Steel

PRIZE BRIDGE 1975 — SPECIAL PURPOSE

Pedestrian Bridge Over U.S. 27 at Pine Knot

McCreary County, Ky.

Designer: Kentucky Bureau of Highways, Division of Bridges
Owner: Dept. of Transportation, Commonwealth of Kentucky
General Contractor: McGregor & Neal Construction Company
Steel Fabricator: Wise Iron Works
Steel Erector: McGregor & Neal Construction Company

◀

AWARD OF MERIT 1975 — LONG SPAN

I-24 Over Ohio River

Between Paducah, Ky. and Metropolis, Ill.

Designer: Hazelet & Erdal
Owners: Dept. of Transportation, Commonwealth of Kentucky
Dept. of Transportation, State of Illinois
General Contractors:
Superstructure: Nashville Bridge Company
Substructure: Traylor Bros., Inc.
Steel Fabricator/Steel Erector: Nashville Bridge Company

▶

AWARD OF MERIT 1975 — MEDIUM SPAN, HIGH CLEARANCE

Sutton Creek Bridge

Near Eureka, Mont.

Designer: U.S. Army Corps of Engineers, Omaha District
Responsible Agency: U.S. Army Corps of Engineers, Seattle District
Owner: Montana Highway Department
General Contractors: Peter Kiewit Sons' Co.
Hensel Phelps Construction Company
Steel Fabricator: Fought & Company, Incorporated
Steel Erector: Don L. Cooney, Inc., Tacoma, Washington

◀

AWARD OF MERIT 1975 — MEDIUM SPAN, HIGH CLEARANCE

PR 52 Ravine Bridges (Nos. 2042 & 2043)

Pedro Avila-Cercadillo, Cayey, Puerto Rico

Designer: Tippetts-Abbett-McCarthy-Stratton
Owner: Commonwealth of Puerto Rico, Highway Authority
General Contractor: Constructora de Autopistas, Inc.
Steel Fabricator/Steel Erector: Sucesores de Abarca Incorporated

AWARD OF MERIT 1975 — MEDIUM SPAN, LOW CLEARANCE

Kern River Bridge
Kern County, California
Designer: CALTRANS—Division of Structures, State of California
Owner: State of California
General Contractor: Griffith Company
Steel Fabricator/Steel Erector: Kaiser Steel Corporation

AWARD OF MERIT 1975 — SHORT SPAN

Seaboard Coast Line R.R. Bridge Over Chattahoochee River
Near LaGrange, Ga.
Designer: Prybylowski and Gravino, Inc.
Architectural Consultant: U.S. Army Corps of Engineers, Savannah District
Owner: SCL/L & N Railroad, The Family Lines System
General Contractors: W. H. Carder, Inc.
Midwest Construction Co.
Steel Fabricator: Gamble's Inc., A Trinity Industries Company
Steel Erector: Foster & Creighton Company

AWARD OF MERIT 1975 — SHORT SPAN

Kansas Avenue Bridge
St. Louis, Mo.
Designer-Owner: Missouri Pacific Railroad Company
General Contractor: St. Louis Bridge Company
Steel Fabricator: Stupp Bros. Bridge and Iron Company
Steel Erector: St. Louis Bridge Company

AWARD OF MERIT 1975 — HIGHWAY GRADE SEPARATION

Ramp E-2 Structure/I-10 To I-12 Connection
Baton Rouge, La.
Designer: Modjeski and Masters
Owner: Dept. of Highways, State of Louisiana
General Contractor: Boh Brothers Construction Co., Inc.
Steel Fabricator: Orleans Materials & Equipment Co., Inc.
Steel Erector: Sun Erection Company, Inc.

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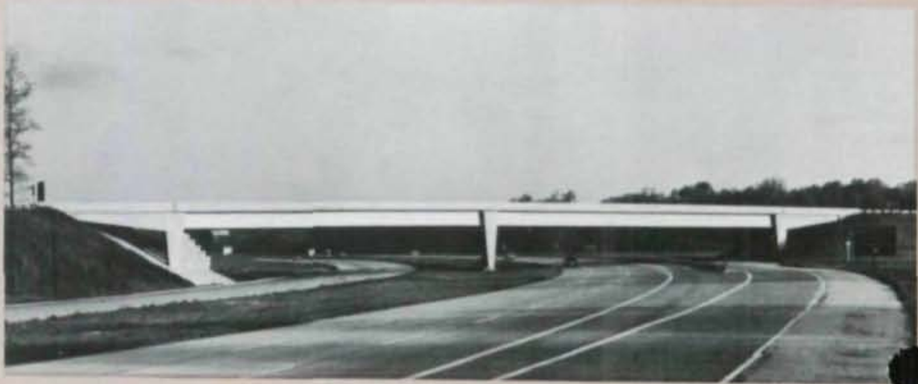

AWARD OF MERIT 1975 — HIGHWAY GRADE SEPARATION
Sandy Point Park Road Overpass at U.S. 50
Anne Arundel County, Md.
Designer: Whitman, Requardt and Associates
Architectural Consultant: Greiner Engineering Sciences, Inc.
Owner: Maryland State Highway Administration
Architectural Consultant: Greiner Engineering Sciences, Inc.
General Contractor: Williams Construction Company, Inc.
Steel Fabricator/Steel Erector: High Steel Structures, Inc.

AWARD OF MERIT 1975 — SPECIAL PURPOSE
City Avenue Pedestrian Bridge
Philadelphia, Pa.
Designer-Owner: Department of Transportation, Commonwealth of Pennsylvania
General Contractor: Miller & Brown Construction Company, Inc.
Steel Fabricator: Cumberland Bridge Co.
Steel Erector: Cornell & Company, Inc.

AWARD OF MERIT 1975 — SPECIAL PURPOSE
Madeira Beach Pedestrian Overpass
Madeira Beach, Fla.
Designer-Owner: Florida Department of Transportation
General Contractor: Scott Industries, Inc.
Steel Fabricator: Bristol Steel & Iron Works, Inc.
Steel Erector: Scott Industries, Inc.