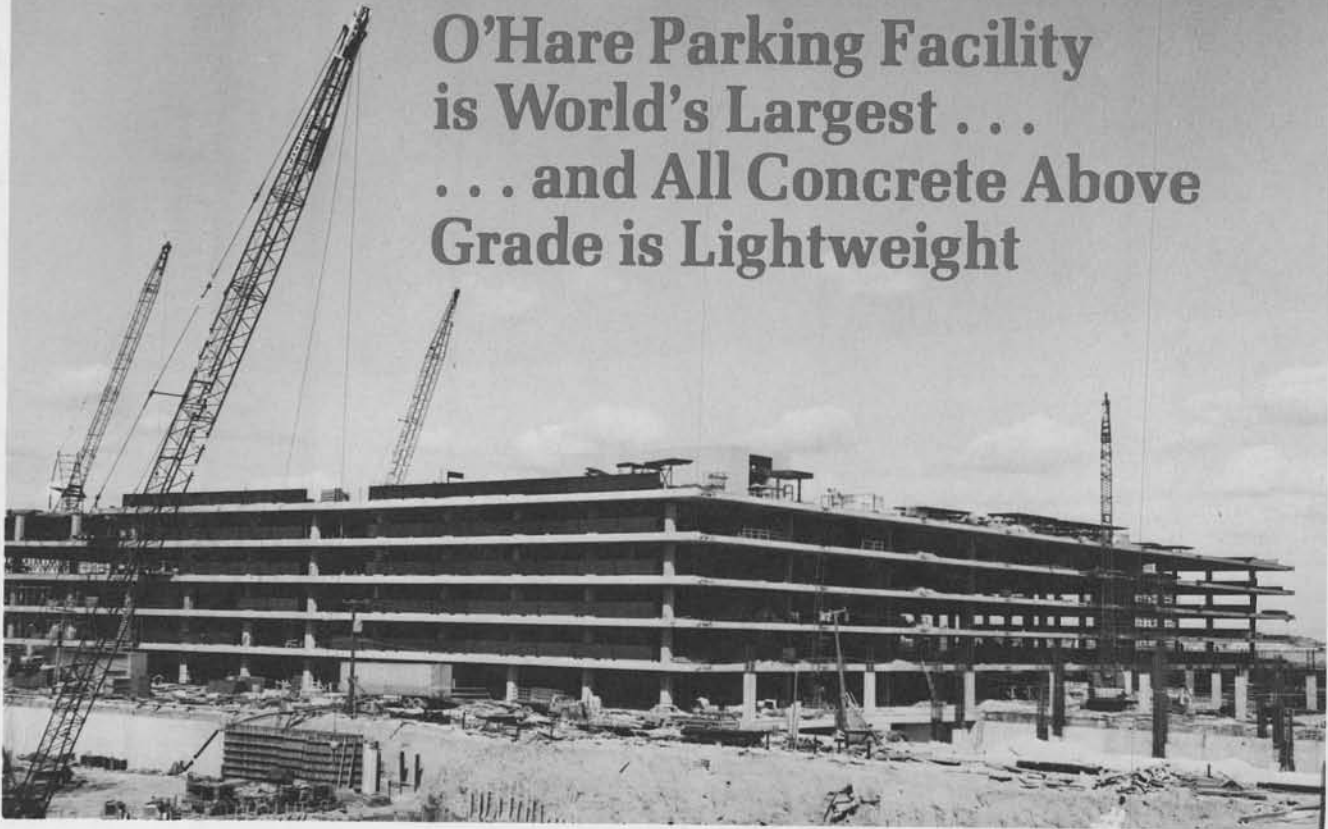


O'Hare Parking Facility is World's Largest and All Concrete Above Grade is Lightweight



Parking structure at Chicago's O'Hare International Airport is all structural lightweight concrete above grade, has 3.4 million sq. ft. of parking area and capacity for 9315 cars.

WITH five supported parking levels and capacity for 9315 cars in its 3.4 million sq. ft. floor area, the parking garage at Chicago's O'Hare International Airport stands as the largest concrete parking structure ever built. Equally significant, structural lightweight concrete was specified for all concrete above grade, a fact which resulted in a sizable reduction in dead load and at the same time increased the proportion of usable revenue space.

The fan-shaped structure is 1432' on its North edge, 1064' on its South edge, and 460' on East and West edges. Grade level and the five supported levels each contain 574,000 sq. ft. of area, and the basement 245,000 sq. ft. In addition, elevated roadways account for 36,400 sq. ft. The structure links to existing parking areas and the collection plaza via two bridge ramps feeding four circular ramps serving all elevated parking levels. Pedestrian traffic is handled by automatic elevators, stairways and tunnels to the terminal building.

The structural lightweight concrete parking decks consist of a two-way beam and slab system, with bay sizes varying from 56'0" x 23'10" to 56'0" x 39'2" because of the building's shape, with its South edge forming an arc between the two main wings of the airport. Beams are 22" deep and are posttensioned in the 56' direction and also on the cantilevers in the short direction. Slabs are 4.25" thick. The structural lightweight concrete has a specified unit weight of 110 pcf and a 23-day compressive strength of 4500 psi. A relatively high early strength was required for the prestressing schedule on this project, and the structural lightweight concrete slabs exhibited a 4-day compres-

sive strength of 3,000 psi. The structural lightweight concrete used for columns in the structure had a 28-day compressive strength of 5000 psi.

In all, approximately 125,000 cu. yds. of structural lightweight concrete were used in the project. An extensive testing program was set up prior to construction on the \$38 million project, which is under the direction of the Chicago Department of Public Works. A primary reason for specifying structural lightweight concrete was that it would permit larger bay spacing and, in addition to reducing foundation and structural requirements, would also provide more revenue space and thus a higher degree of land utilization at the busy airport complex. The reduced dead load also reduced the cost of prestressing through lowered requirements for prestressing steel. Total dead load reduction amounts to 67,500 tons.

Structural lightweight concrete is rapidly becoming the standard for parking structures, particularly where space limitations make high land use desirable. The O'Hare International Airport facility is an outstanding example of effective design and engineering realizing the advantages of this medium.

Owner — City of Chicago
Architects and Engineers — C. F. Murphy Associates, Chicago, Illinois
General Contractor — Consolidated-Brighton Construction Companies, Chicago, Illinois
Ready-Mix Supplier — Rockwell Ready Mix Co., Chicago, Illinois
Materialite aggregate supplied by Material Service Corporation, Chicago, Illinois



Parking decks at a port parking facility consist of two-way beam and slab system, with typical bay size of 34' x 56'. Large bays are made possible through dead load reduction achieved through use of structural lightweight concrete. Result is increased revenue space.

Four circular ramps, two up and two down, serve all parking levels of 9315-car parking structure. South edge of fan-shaped building forms arc between two main wings of terminal building, is connected to terminal via pedestrian tunnels and to collection plaza and existing parking areas by two bridge ramps.

