

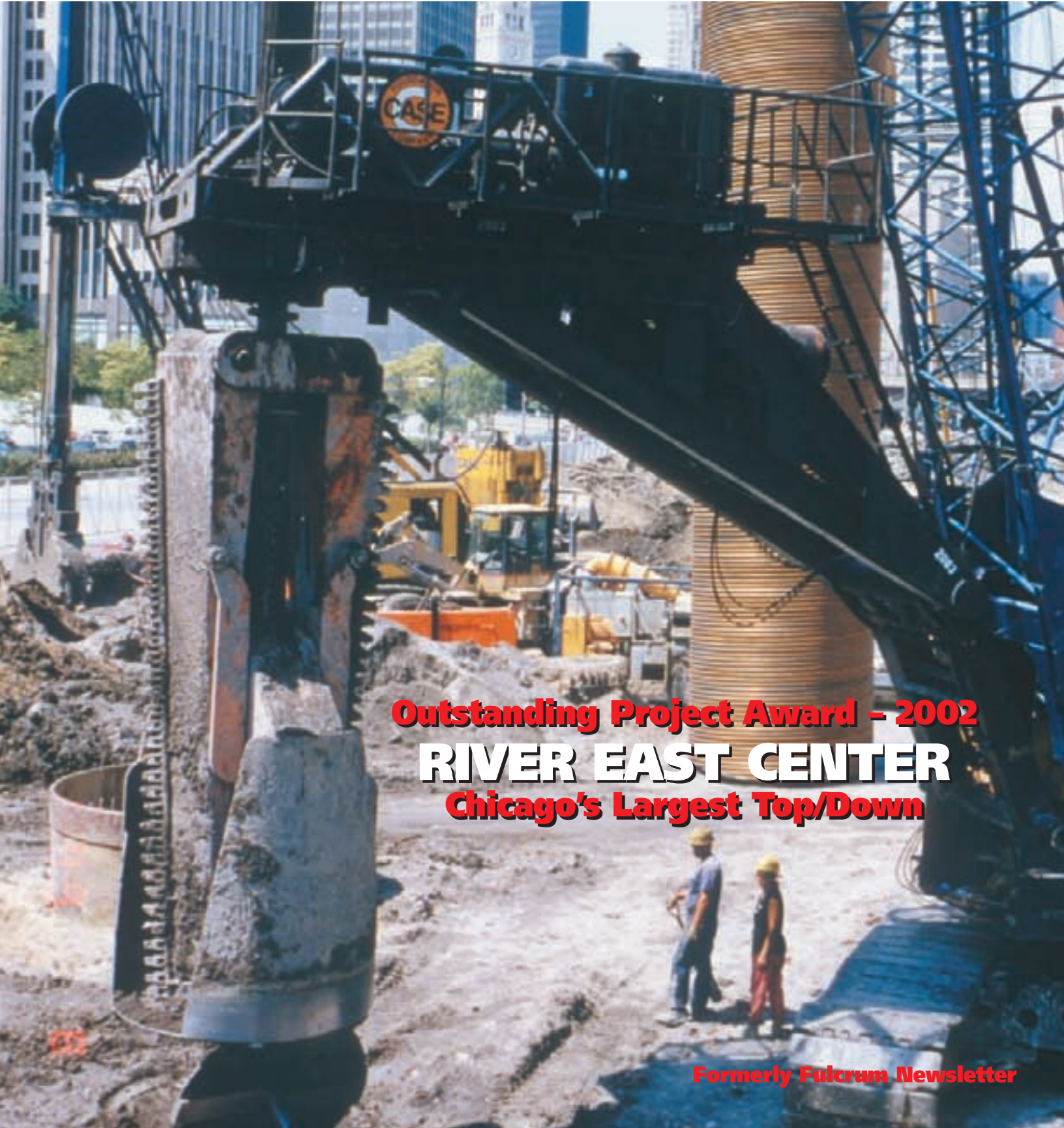
DEEP



FOUNDATIONS

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Outstanding Project Award - 2002

RIVER EAST CENTER

Chicago's Largest Top/Down

Formerly Fulcrum Newsletter

2002 Outstanding Project Award

River East Center Chicago's Largest Top/Down



DFI's Outstanding Project Award for 2002 is to be presented to **Case Foundation Company** for an impressive application of foundation construction techniques in a huge top/down construction project in Chicago, Illinois.

In the Streeterville neighborhood of downtown Chicago, bounded by Lake Michigan and the Chicago River, MCL Companies is completing the 2 million square foot River East Center mixed use project. A 58-story Residential Tower on the east end of the block-long site contains 620 condominiums. On the opposite end, Embassy Suites has opened a 450-suite hotel. In between these 2 structures, residents and guests will find a 21-screen AMC theatre, restaurants, and shops in a 3-story podium.

For a project of this size, Chicago zoning ordinances mandate that developers create parking spaces within the property for a significant proportion of the building's projected population. Underground parking is the best solution, but conventional shoring and basement construction in Chicago's soft clays are expensive and time-consuming.

Case Foundation Company teamed with Construction Manager AMEC and the Design Consultants to devise a top/down construction program for foundations and the 4-level, 1,150-space underground parking garage for River East. The 30" thick Case-designed slurry wall forms the basement walls, extending 65 ft. deep. Belled caissons (drilled shafts) 98 ft. deep support the entire structure. STS Consultants established a design end-bearing pressure of 50 ksf, one of the highest used in Chicago, based on their extensive pressuremeter testing experience in Chicago hardpan. Column loads near the core of the 58-story concrete-framed residential tower required 9'-6" diameter shafts with 22'-6" diameter bells.

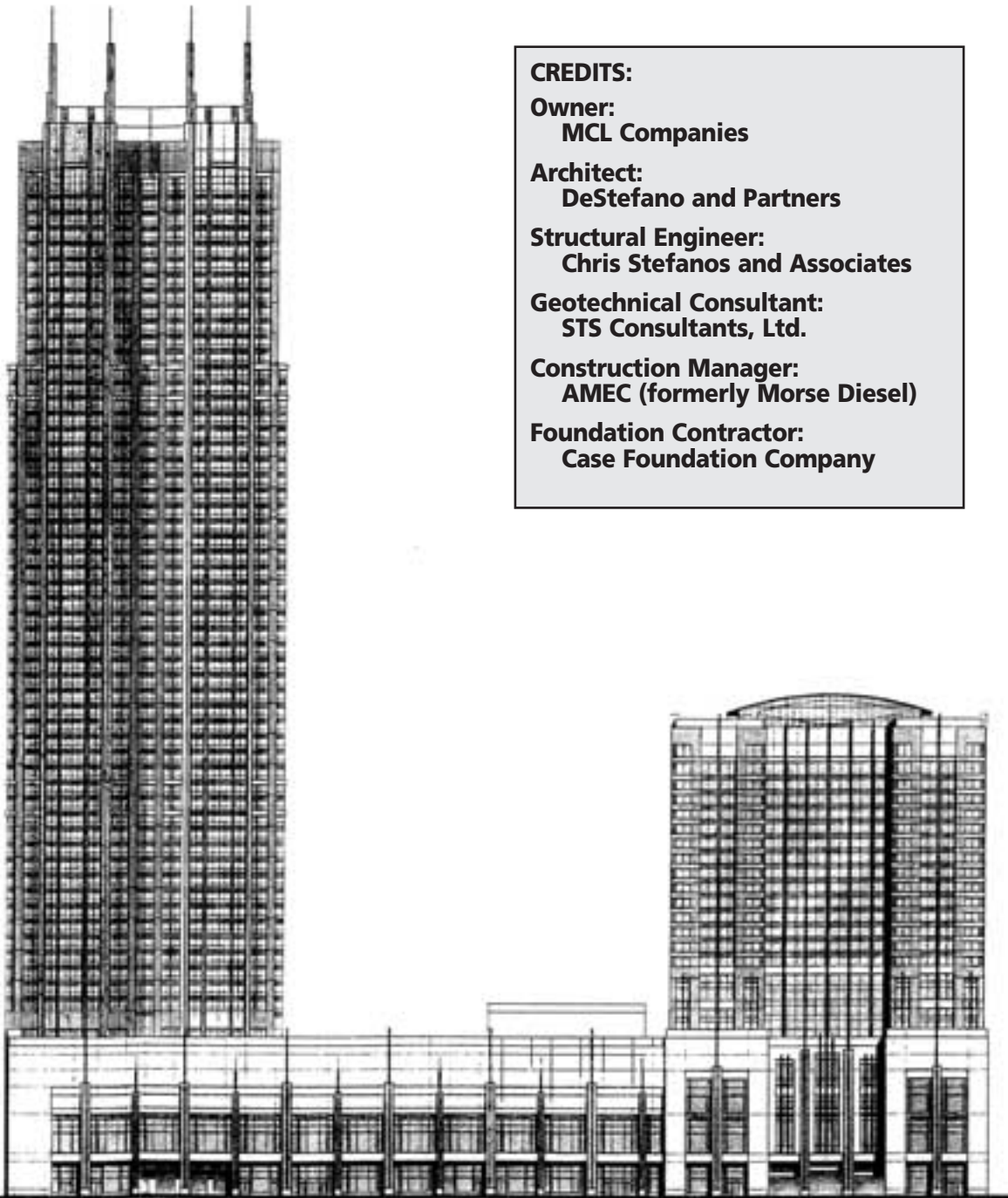
Because the core with its massive shear walls could not be built top/down, it was isolated by a Case-designed 90-foot circular sheetpile cofferdam, and constructed from the bottom up. The caissons were installed from street level; the upper 50 ft. of each interior caisson was formed with double-wall CMP with a smooth inner liner. Once the slurry wall and drilled shafts were in place, the site was excavated to the first parking level at -15 ft. and the floor and framing elements were formed and poured on grade, followed by the ground level slab on shored forms. From this point, top/down construction began. Using "long reach" excavators, the soil from beneath parking levels 1, 2, and 3 were successively excavated from grade level through slot-

Cover Photo: Last stages of excavating 22'-6" diameter bell under the Tower of East River Center. Doublewall 9'-6" x 50' liner stands ready behind drill rig. Slurry wall clamshell rig in background (left).

shaped openings in each floor slab. Small loaders and dozers moved the dirt from the cut face to the slot openings. At each level, the CMP lining was stripped from the caisson/column shafts, and doweled connections were drilled and grouted into the shafts and slurry walls to connect the floor beams and slab to those vertical elements. Each floor was poured monolithically with its framing members. The forms were then “undermined” and dropped down to the next structural level. When excavation reached basement level 4 at -45 ft., the Tower and Hotel Superstructures had been topped out high above. In total,

275,000 cy of soil were, “mined” from beneath River East for the underground parking structure.

While not an “architectural finish”, the exposed slurry wall and caisson shaft surfaces required very little cosmetic work beyond cleaning, and are in full view today - one of very few Case projects where the finished product is readily visible! This is the third, and by far the largest, Case top/down project in Chicago. The method saved, in addition to the tiebacks or rakers that were not needed, 6 months from the construction schedule compared to a conventional “bottom up” sequence.



CREDITS:

Owner:

MCL Companies

Architect:

DeStefano and Partners

Structural Engineer:

Chris Stefanos and Associates

Geotechnical Consultant:

STS Consultants, Ltd.

Construction Manager:

AMEC (formerly Morse Diesel)

Foundation Contractor:

Case Foundation Company

NORTH ELEVATION



**Mass excavation to parking level 1 at -15'.
Slurry walls in place.**



**Caisson Installation.
Completed 9'-6" Φ tower caisson in foreground.**



**Installation of reinforcing steel for
9'-6" Φ tower caisson.**



**Drilled Shafts become below-grade columns once
the double-walled CMP liners are removed.**



Lower level 1 framing and floor slab construction. Note drilled-in connections at caisson/beam intersections. Slurry wall in background designed to cantilever until Level 1 construction is complete.



Sheet pile cofferdam braced by compression rings enabled tower core and shear walls to be constructed early.