

The Chicago tunnel and reservoir project: infrastructure to restore city's greatness

by John H. Brown, Jr.

When James Fenimore Cooper's legendary hero Natty Bumppo led his small group of adventurers to the shores of the Great Lakes in *The Pathfinder*, the city of Chicago was no more than a wilderness outpost, visited infrequently by traders and trappers. Chicago's growth over the intervening century and a half—from incorporation as a village in August 1833, to incorporation as a city in March 1837, to prosperity as the nation's second-most-prominent urban center—has depended at each point on innovative engineering solutions

to the unique problems of its siting on the banks of Lake Michigan. Now, the city of Chicago has undertaken the most challenging engineering project in its history, the Tunnel and Reservoir Project, which, when successfully completed, will set a new international standard for urban flood control and sanitation management.

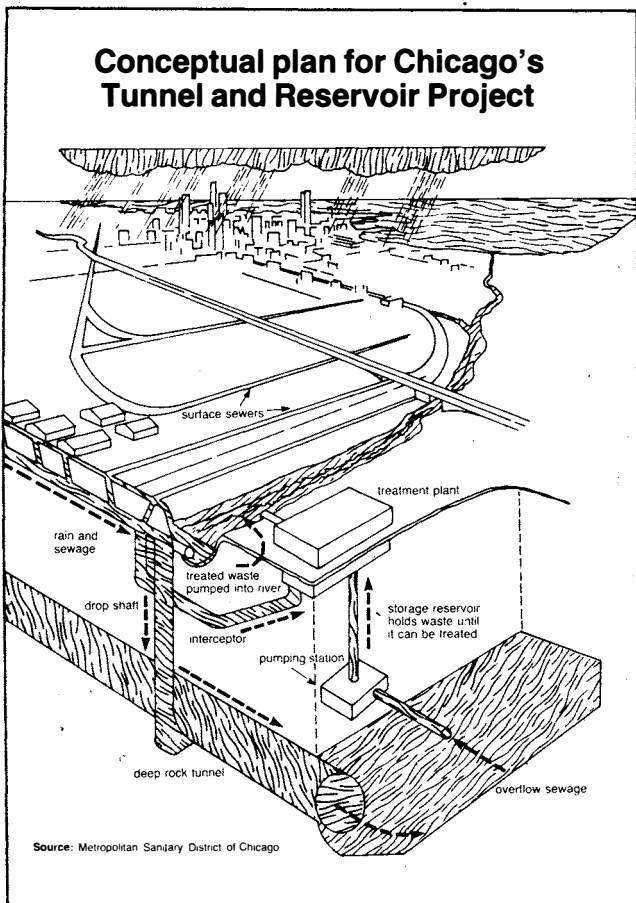
A history of engineering successes

Chicago has a history of innovation in its approach to urban sanitation, particularly since it was struck by a disastrous epidemic in the middle of the 1880s.

In the summer of 1885, a torrential rainstorm flooded the city, causing the sewer system to overflow, and carrying raw sewage far out into Lake Michigan, where it contaminated the city's drinking-water supplies. The resulting epidemic of water-borne diseases resulted in some 90,000 deaths. Such epidemics had occurred on a smaller scale in the past, as Chicago's sewer system, built in 1856 to dump the city's waste into the Chicago River, created a growing potential for drinking-water contamination as the city's population grew. But the shocking death toll of the 1885 epidemic indicated that Chicago's problems with its sanitation and water system had reached life-and-death proportions.

In 1886, a Drainage and Water Supply Commission was created to study the problem of contamination of the city's water supply. The commission's work resulted in the formation of the Chicago Sanitary District in 1889; the District was charged with engineering responsibility for the city's problems of sewage and water pollution.

In 1892, the Chicago Sanitary District began construction on the main channel of the city's Sanitation and Ship Canal. The canal was designed to reverse the flow of the Chicago River by linking it with the Des Plaines River, thus preventing the flow of sewage into Lake Michigan and pollution of drinking-water supplies by the river. After the 32-mile-long canal was completed and put into service, work was begun on a series of interceptor sewers in the densely populated area of the city along the front of Lake Michigan. The interceptor sewers were designed to capture the flow from existing sew-



ers discharging directly into the lake, and to eliminate this source of pollution. With the completion of this project, and the continued growth of Chicago, the city's Sanitary District was replaced by the Greater Metropolitan Sanitary District of Chicago (MSD), whose 20th-century accomplishments the American Society of Civil Engineers have named as one of the seven engineering wonders of the United States.

The MSD's Tunnel and Reservoir Project (TARP), now off the drawing boards and in the implementation stage, was first conceived of in 1972, when a Board of Trustees was convened to investigate the problems being created by heavy rainwater overflow into the city's waterways, highway underpasses, and even the basements of homes and buildings. The board, which consisted of representatives from the State of Illinois, the City of Chicago, Cook County, and the Metropolitan Sanitary District, commissioned an engineering team to draw up plans for the complete overhaul and modernization of Chicago's sewer, water-control, and sewerage-treatment facilities.

How the TARP will work

TARP was designed as a two-phase construction project to upgrade Chicago's surface sewer system to handle current ground-water flows, and to create underground reservoirs in which run-off surface rainwater and river-borne sewage can be bottled up and held for treatment. With completion of the project, there will be no more water damage in the city following rainstorms, and no more pollution of Chicago's water supply. The project will serve a 375-mile area in and around the city of Chicago, which includes approximately 13,500 miles of sewers and 640 overflow outlets which presently discharge sewage and storm water flows into area streams.

The first step in TARP is the widening, deepening, and extension of surface sewerage systems in Chicago and its suburbs, so that this system is capable of handling industrial and domestic waste, even when large amounts of ground-water run-off are added to the system with seasonal snow melt or during a rainstorm.

Next, TARP's engineers are constructing a series of drop shafts, which will draw rain and sewage out of the surface system into underground reservoirs, where it will be stored until it can be pumped back to the surface for processing in one of the modern sewage-treatment facilities being constructed as part of the project.

Four separate tunnel and reservoir systems are being constructed to serve the project area: the Calumet System in the southern part of the area southeast of the center of the city; the Mainstream System in the heart of Chicago and nearest to the shores of Lake Michigan; the Des Plaines System, which is already complete; and the Upper Des Plaines System to the Northwest of the city center. For the four systems, 252 drop shafts will intercept surface sewage channels, and carry waste and rainwater underground, away from the area's rivers and Lake Michigan. The drop shafts will discharge into 131 miles of reservoirs and connecting tunnels, ranging in

diameter from nine to 36 feet.

The largest of these tunnels is the planned 180-foot-deep section of the Upper Des Plaines System. The tunnels will be located in a massive formation of dolomitic limestone, which will provide a minimum of 100 feet of rock cover over the tunnel crowns. The 30-foot-in-diameter boring machines used in construction of the underground system are among the most advanced technologies for hard-rock tunnel boring and modern mining.

Phase I of TARP also includes the completion of four pumping stations, which will remove stored water and sewage from the underground reservoirs, and deliver it to surface treatment plants for discharge into area rivers.

Will TARP be completed?

TARP will cost about \$3.2 billion in constant 1980 dollars, according to Metropolitan Sanitary District Chairman Nicholas Melas. The program has received 75 percent federal funding under the 1972 Clean Water Act, and much of the remaining 25 percent of funding is available from the state of Illinois.

The project has already created more than 2,000 jobs in the Chicago area, many of them for minority workers, and has received recognition as a model of engineering excellence and ingenuity from Japan, Australia, and several African nations, which are particularly interested in the application of high-technology tunnel-boring equipment to their construction and mining efforts at home.

Although Phase I of TARP is nearing completion with the construction of the underground tunnel and reservoir system, the project is threatened by growing political opposition. TARP's opposition from within Illinois is led by anglo-philic Sen. Charles Percy, who is masterminding statewide and Capitol Hill lobbying campaigns against the project. Backing Percy implicitly is Chicago Mayor Jane Byrne, who has ignored TARP throughout her term in office, despite the engineering and scientific evidence that the city's water and sanitation systems, on the verge of breakdown without TARP, pose a death-dealing threat to Chicago's residents. Backing Percy explicitly on its editorial pages and with its news coverage of the TARP project, is the Chicago *Sun-Times*, which has labeled the modernization effort a politicians' "boondoggle."

The conspicuous voice of support for TARP is that of LaRouche Democrat Sheila Jones, who placed TARP's completion high on her list of priorities during her campaign for U.S. Congress last fall. Now a challenger to Byrne for the Democratic Party's nomination for Mayor of Chicago, Jones has scored both the Mayor and the *Sun-Times* for their sabotage of TARP. This is not Jones's first run-in with the Field-family run *Sun-Times*. The Democratic Party leader, who is also chairman of the Illinois Anti-Drug Coalition, is now in court against the *Sun-Times*, charging the paper and its notoriously pro-marijuana reporter Chip Berlet, with unlawful disruption of the coalition's organizing work in the state.

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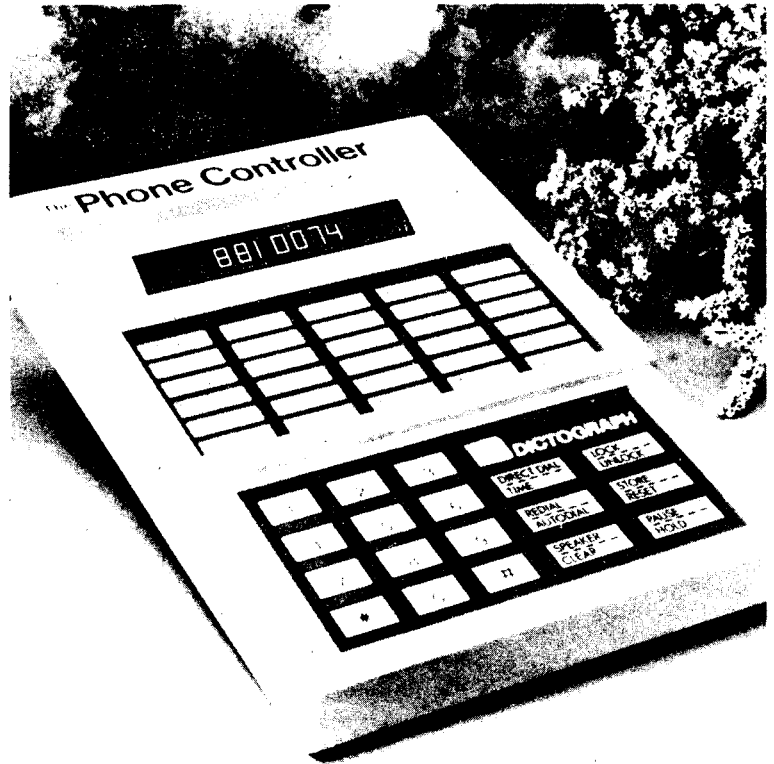
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