



WASTE WATER
Facility Report
#143



New Haven
40 MGD
Pump Station



New Haven Uses Two Unique Serpentix Conveyors In Old East Street Plant

A project converting three primary treatment plants to a 40 million gallons/day (mgd) secondary facility and two pump stations — connected by force mains — at an estimated \$86 million was completed in 1987 in New Haven, Connecticut.

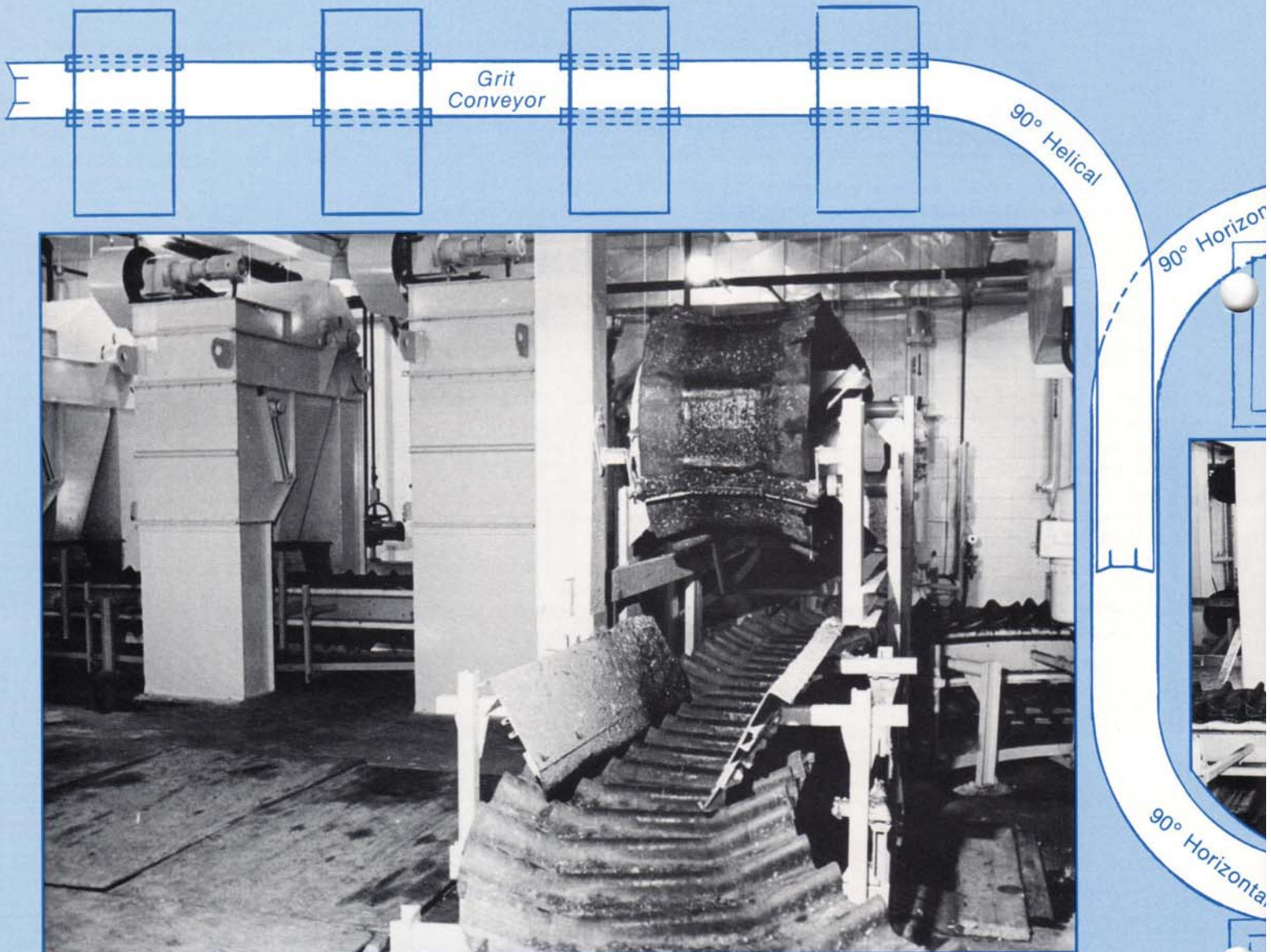
The first facility in the project to be

converted — the former East Street Primary Treatment Plant — went partially on line in early 1985, according to New Haven City Engineer Leonard W. Smith, P.E.

Now a 40 mgd hydraulic capacity pump station, East Street has a headworks utilizing one of the most complex

and unique conveying systems in the nation. It includes two three-dimensional, Continuous Path Conveyors and one flat belt, reversing shuttle conveyor, all supplied by Serpentix Conveyor Corporation.

The horizontal and helical turning and climbing capabilities of the two



GRIT RECEIVED FROM the chambers in the left background by an L-shaped Serpentix is transferred above onto a second Serpentix conveyor. The second unit, just completing a 90-degree turn, has entered the lower right part of the photo after receiving screenings from two screenings stations. It then receives grit col-

lected by the first conveyor as it passes under that unit's discharge end. Making a second 90-degree turn (right background), the conveyor receives screenings from two other stations, completes a third 90-degree turn and a 105-degree helical turn, then exits the building through an opening in the wall.

Continuous Path Conveyors allowed the city to convert the old treatment plant with a minimum of construction changes or physical plant expansion.

The other two facilities include the East Shore Wastewater Treatment Plant and the Boulevard Primary Treatment Plant. Both went on line in their new configurations in 1988. Converting the Boulevard Plant to a pump station commenced in March of that year.

The total project included a force main similar to one installed as part of the East Street plant conversion. After grit and screenings removal, both force mains carry pretreated effluent from the pump stations to the East Shore facility for secondary treatment. Hydraulic capacity of the Boulevard facility was increased to 34 mgd by the conversion.

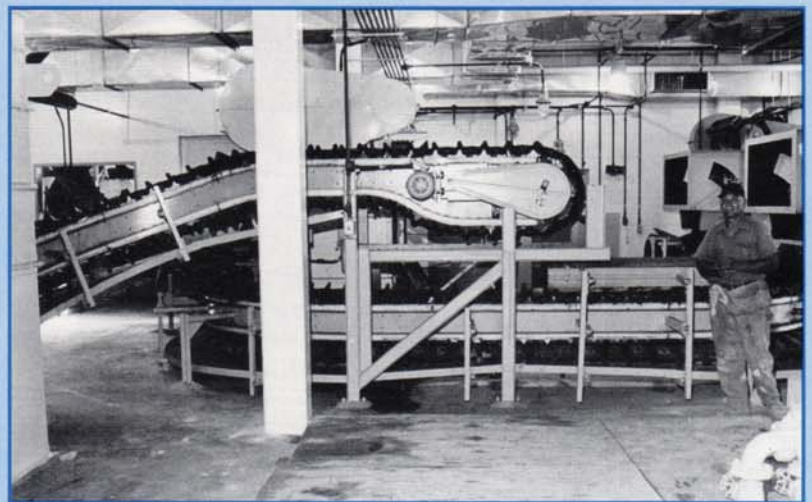
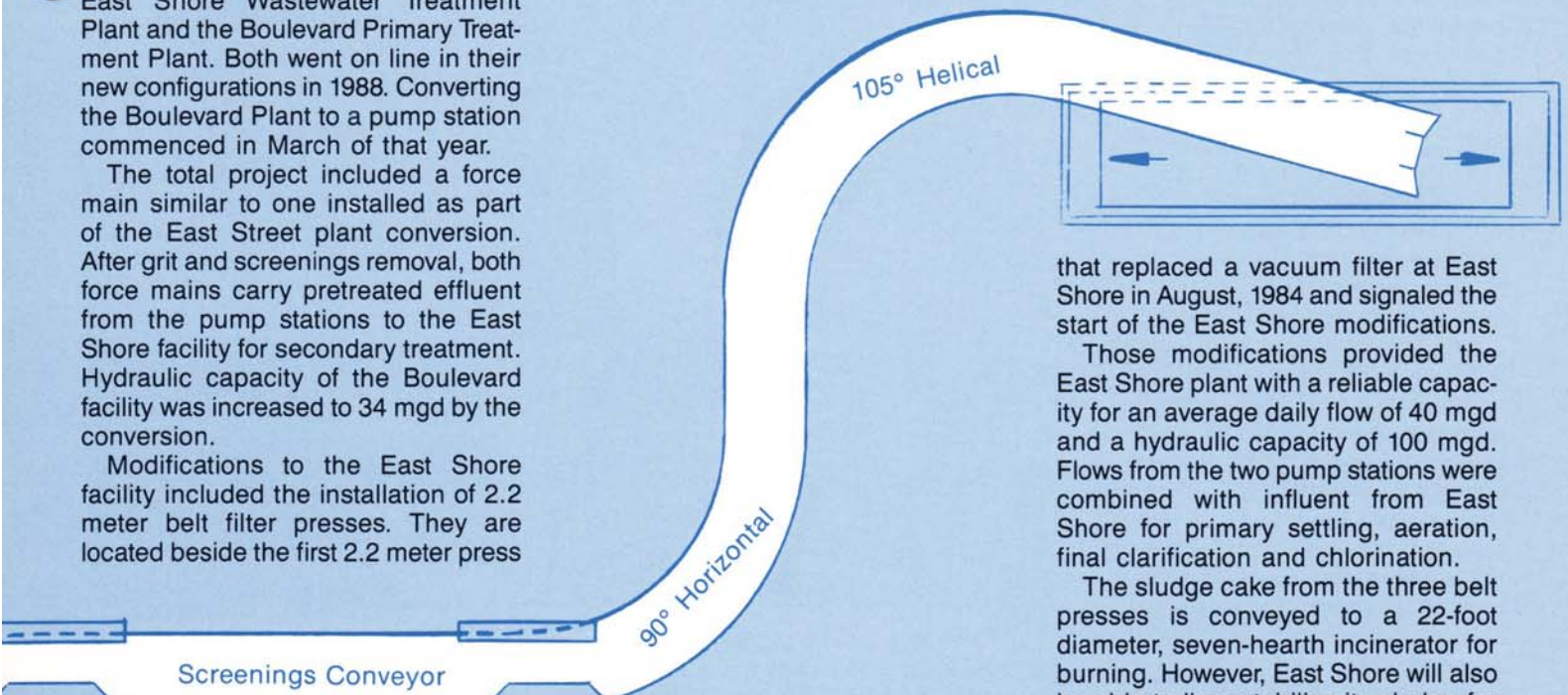
Modifications to the East Shore facility included the installation of 2.2 meter belt filter presses. They are located beside the first 2.2 meter press

that replaced a vacuum filter at East Shore in August, 1984 and signaled the start of the East Shore modifications.

Those modifications provided the East Shore plant with a reliable capacity for an average daily flow of 40 mgd and a hydraulic capacity of 100 mgd. Flows from the two pump stations were combined with influent from East Shore for primary settling, aeration, final clarification and chlorination.

The sludge cake from the three belt presses is conveyed to a 22-foot diameter, seven-hearth incinerator for burning. However, East Shore will also be able to lime stabilize its sludge for disposal in a landfill when necessary, as a backup to the incinerator.

The East Street and Boulevard primary treatment plants were built prior to World War II. Boulevard was built in 1941 and East Street was built in stages commencing in 1929, the last



THE CENTER PHOTOGRAPH shows the conveyor layout from the opposite view from the photo at left. The photo at right shows the first two bar screens (right), the grit conveyor (left foreground), and the screenings conveyor exiting the building through a hole in the wall (extreme left, just above left end of grit conveyor).



being completed in 1968. Effluent from both discharged into New Haven harbor, then into Long Island Sound.

In the 1950s the East Shore Primary Treatment Plant was constructed, and then later expanded. As the area population grew, so did environmental pressures and, by 1972, all cities discharging into the nation's waters were required to provide a minimum of secondary sewage treatment.

In the early 1980s the East Shore Primary Treatment Plant was replaced with a new secondary treatment facility. However, the new plant was operating at approximately 10 mgd, which was less than its design capacity.

An Environmental Assessment Study (EAS) commissioned by the city was completed in the early 1980s by the engineering firm of Metcalf & Eddy, Inc. Its purpose was two-fold: determine the sewage treatment needs of the area (New Haven, East Haven, North Branford, Hamden and Woodbridge); and, recommend the most cost effective method to satisfy those needs.

Among other things, the EAS recommended that East Shore's 40 mgd treatment capability be fully utilized by making it the central treatment plant for the region. In addition, the East Street and Boulevard plants should be con-



AT THE END OF ITS U-SHAPE, the screenings conveyor (lower left photo) makes its third 90-degree turn to the left, followed by the 105-degree helical turn to the right. IN TOP RIGHT PHOTO the conveyor is seen passing through an opening in the wall, completing a 32-degree incline, and discharging from 10 feet above floor level onto a flat belt shuttle conveyor for discharge into dumpsters.



verted to pump stations with appropriately located force mains to convey their flows to the East Shore plant for secondary treatment.

The Maguire Group (formerly C. E. Maguire) designed the East Shore modifications, beginning with the mid-1984 replacement of East Shore's vacuum filters with the first of three belt filter presses.

By 1985, the average flow at East Shore had risen to about 11 mgd. It increased to about 26 mgd in 1985 when the East Street conversion was partially completed, and its flow was diverted to East Shore. It was expected to increase again to about 36 mgd with the Boulevard conversion.

The two Continuous Path Conveyors at the East Street Pump Station included a 55'6" grit conveyor (with a 20-inch convoluted belt) that makes a 90-degree helical turn to achieve a five

foot elevation gain and discharge its grit load onto the second Serpentine conveyor.

The second unit is 89'1" long with a 26-inch convoluted belt. It picks up screenings from four separate stations, makes three 90-degree horizontal turns and a 105-degree helical turn for a 9'6" elevation gain. The conveyor then discharges its combined load of grit and screenings onto an eight-foot, 30-inch wide flat belt shuttle conveyor that feeds two dumpsters. The grit and screenings are then trucked to a landfill.

Capacity of the grit conveyor is 400 cubic feet/day and loading of the screenings and grit conveyor is 1,030 cubic feet/day. Both Continuous Path Conveyors operate at 15 feet per minute. ■

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