



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION

CITY WATER TUNNEL No. 3

City Tunnel No. 3 is the largest capital construction project in New York City's history, and is one of the world's engineering marvels. Construction began in 1970 and is expected to be completed in 2020 at a total cost of \$5.5 to \$6 billion. The tunnel is being built in four Stages and, when completed, will total more than 60 miles in length (see map on other side).

- **Stage 1** went into service in August 1998 and cost approximately \$1 billion. This 13-mile segment runs from Hillview Reservoir in Yonkers, through the Bronx, down Manhattan across Central Park, and into Astoria, Queens.
- **Stage 2** consists of two sections. The \$750 million Brooklyn/Queens section has two distinct legs. The Brooklyn leg runs 5.5 miles from Red Hook, Brooklyn to Maspeth, Queens. It will also connect with the Richmond Tunnel, which delivers drinking water to Staten Island. From Maspeth, the Queens leg runs 5 miles through Woodside and Astoria. The Brooklyn and Queens legs connected on January 31, 1997, and concrete lining of both legs was completed in May 2001. It is anticipated that the Brooklyn/Queens section will be activated by 2009.

The 8.5-mile Manhattan portion of Stage 2 of City Tunnel No. 3 consists of two sections and is located at an average depth of 540 feet below street level. Current construction of the different sections of the Manhattan leg originates from the same location on the far West Side. The first 3.5 mile segment runs south to lower Manhattan. Following this, the second 2.5 mile segment runs north to Central Park, and the final crosstown portion advances eastward before turning north. The Manhattan section of the Tunnel will cost approximately \$1 Billion and is expected to begin delivering water by 2012.

- **Stage 3**, the Kensico-City Tunnel, a 16-mile long section, extending from the Kensico Reservoir to the Valve Chamber in the Bronx is currently in the final planning stage. Under current operating conditions water can be delivered from Hillview Reservoir, through the Bronx, to City Tunnel No. 3. When completed, the Kensico-City Tunnel will be able to deliver water directly from Kensico Reservoir to City Tunnel No. 3. When Stage 3 is completed, City Tunnel No. 3 will operate at greater pressure as a result of the Kensico Reservoir's higher elevation.
- **Stage 4** will allow water to flow through the Tunnel to the eastern parts of the Bronx and Queens. This final stage, if required, will be 14 miles long and will run from the Valve Chamber in the Bronx under the East River into Queens.

Stage 1 was constructed using the "Drill and Blast" method. Stage 2 is being constructed using Tunnel Boring Machines (TBM). The TBM is lowered into the tunnel in sections and assembled at the bottom. By application of enormous pressure, the TBM chips off the bedrock through the continuous rotation of a series of steel cutters, allowing excavation to proceed at two to three times the rate previously attained in tunnel construction. It is anticipated that all future construction of Tunnel No. 3 will utilize the TBM technology.

At its deepest, City Tunnel No. 3 is 800 feet below ground. At its shallowest, it averages 400 feet below ground. Finished diameters of Tunnel No. 3 will range from 10 feet to 24 feet. The operation of City Tunnel No. 3 will allow inspection and repair of City Tunnels No. 1 and 2 for the first time since they were put in service into 1917 and 1936, respectively.

City Tunnel No. 3 would not exist without the creativity and dedication of New York City engineers, some of whom have spent their entire careers working on this project. This remarkable engineering achievement is also a monument to the 24 people who have lost their lives in accidents during its construction, and to all those whose commitment and hard work brings a flow of safe, delicious water into our homes and workplaces with the simple turn of the tap.



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