

CHAPTER 4: PREFERRED SHAFT SITE

4.1 PROJECT DESCRIPTION

4.1.1 Introduction

The New York City Department of Environmental Protection (NYCDEP) is proposing to construct a vertical water supply shaft, Shaft 33B, to bring water from City Tunnel No. 3 to the local water distribution system in East Midtown and the Upper East Side in Manhattan. Chapter 2 of the EIS, “Purpose and Need and Project Overview,” describes the purpose and need for Shaft 33B. As discussed in Chapter 2, this new water shaft is needed in the general vicinity of the northeastern portion of the New York City water distribution system’s Middle Intermediate Pressure Zone (MIPZ), which is bounded roughly by Tenth Avenue to the west, the East River to the east, 34th Street to the south, and approximately 54th Street to the north. The shaft would provide water to the MIPZ and to the adjacent water pressure zone, the Northern Intermediate Pressure Zone (NIPZ). NYCDEP has identified a preferred location for Shaft 33B at the northwest corner of E. 59th Street and First Avenue. As described in Chapter 2, this site was identified as the preferred Shaft Site based on a comparative review of the potential advantages and disadvantages of the construction of Shaft 33B at each of the four feasible locations.

Chapter 4 of the EIS addresses the potential environmental impacts associated with the construction and operation of Shaft 33B at the preferred Shaft Site. Section 4.1, “Project Description,” presents an overall description of the preferred Shaft Site (Section 4.1.2), the proposed layout of Shaft 33B at the site (Section 4.1.3), the construction activities that would be undertaken at the preferred Shaft Site to construct Shaft 33B (Section 4.1.4), activation and operation (Section 4.1.5), and the permits and approvals required for construction on this site (Section 4.1.6). The following Sections of this Chapter, Sections 4.2 through 4.17, analyze the potential environmental impacts related to the construction and operation of Shaft 33B at the preferred Shaft Site. The water main connections that would connect Shaft 33B at the preferred Shaft Site to the existing water supply system, and the potential environmental impacts associated with construction and operation of those water main connections, are considered in the following Chapter, Chapter 5, “Water Main Connections.”

4.1.2 Description of the Preferred Shaft Site

The preferred Shaft 33B Site is located adjacent to the Queensboro Bridge approach structure at the northwest corner of E. 59th Street and First Avenue. The two-level Queensboro Bridge (Bridge) carries nine lanes of traffic between Manhattan and Long Island City in Queens. The Bridge’s Manhattan approach stretches from Second Avenue to the East River, between E. 59th and E. 60th Streets. The main vehicular entrance and exit points for the Bridge are on the east side of Second Avenue, where several lanes of traffic enter and exit the Bridge. In addition, a major entrance ramp to the Bridge runs north from E. 58th Street between First and Second Avenues to the upper level of the Bridge, and a major exit ramp extends north from the upper level of the Bridge to E. 62nd Street between First and Second Avenues. An entrance ramp to the

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Bridge's lower level outer roadway is located on the north side of E. 59th Street between First and Second Avenues, and an exit from the lower level is on the south side of E. 60th Street between First and Second Avenues.

Between E. 59th and E. 60th Streets, the vaulted spaces beneath the Bridge are occupied by a range of different uses. Between First and Second Avenues, the New York City Department of Transportation's (NYCDOT) Queensboro Bridge Engineer's Office is located in the enclosed space beneath the Bridge. A portion of this office is used by NYCDOT for sign welding. The New York City Department of Sanitation (DSNY) also uses space under the Bridge west of First Avenue as a lunch room and central meeting place. Between First and York Avenues, uses under the Bridge's vaults include enclosed retail and restaurant spaces close to First Avenue and an unenclosed public recreational area at York Avenue. The areas adjacent to the Bridge between E. 59th and E. 60th Streets are City-owned and identified as part of the Queensboro Bridge on City maps, and generally serve as extensions to the uses beneath the Bridge. Along the north side of the Bridge, adjacent to E. 60th Street, this area also includes the supports for the aerial tramway structure serving the Roosevelt Island Tram.

The preferred Shaft 33B Site is within the area mapped as street adjacent to the Queensboro Bridge on the north side of E. 59th Street. The site is under the jurisdiction of NYCDOT, and most of the site is currently fenced and used by NYCDOT for vehicle parking and access to the adjacent Queensboro Bridge Engineer's Office beneath the Bridge. NYCDOT also uses the site for staging related to the ongoing Queensboro Bridge Rehabilitation Program. Additionally, DSNY uses the site as a meeting place for staff, including those using the lunch room under the Bridge in the NYCDOT offices.

The area alongside the Queensboro Bridge between the NYCDOT fenced area and the entrance ramp to the Bridge from E. 59th Street is predominantly paved, includes nine honey locusts trees, and is 11,900 square feet in size. Together with the 1,100-square-foot triangular traffic island west of the Bridge entrance ramp, where there are three additional honey locust trees, these two spaces are commonly referred to as "14 Honey Locusts Park" or "Gateway Plaza." Although the multi-use area has a New York City Department of Parks and Recreation (NYCDPR) park sign, it is not mapped parkland. The area is under the jurisdiction of NYCDOT and has historically been used as a shared resource, by NYCDOT as a Bridge access area for parking and maintenance and rehabilitation activities, and by the public who generally use it for open space activities. Since the parcel supports several uses, it is referred to as the "multi-use area" in this EIS.

4.1.3 Location of Shaft Components on the Preferred Shaft Site

As described in Chapter 2, Shaft 33B would consist of a shaft, approximately 450 feet deep that would house two 48-inch riser pipes to bring water from City Tunnel No. 3 up to the neighborhood water distribution system. In addition to the riser pipes, the Shaft 33B Site would also contain several other below-grade structures required for distribution of water from City Tunnel No. 3 to the local distribution system. These would include the riser valve chamber and

distribution chamber, each located below ground level around Shaft 33B. Above the shaft, two hatchways would provide access to these underground chambers. In addition, a 10-foot-high air vent, 14 inches in diameter, would be located permanently on the site (above ground) to provide air into the shaft for maintenance workers, and two standard three-foot-high hydrants would provide air relief from the piping during activation. The hydrants could also be used for fire protection.

Several other below-grade chambers would be located in close proximity to the shaft, providing access to valves and equipment that regulates and monitors the flow to the water main connections that would extend from the shaft. These include regulator, valve, and venturi chambers.

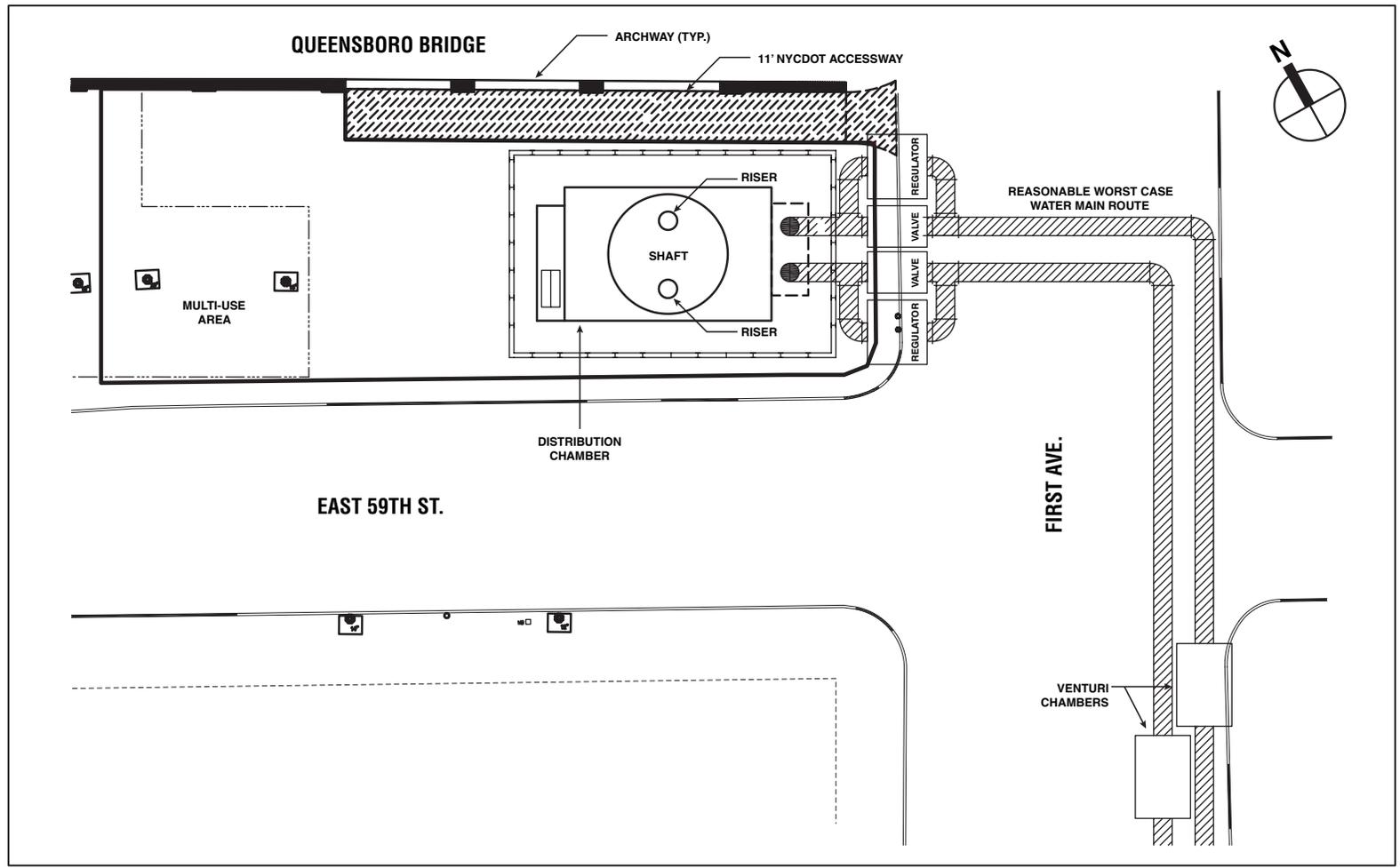
Figure 4.1-1 illustrates the potential location of these project elements at the preferred Shaft Site. As shown in the figure, the 25-foot-wide Shaft 33B would be located in the eastern portion of the site, approximately at the second Bridge archway. Near the surface, the shaft would pass through the underground distribution chamber, approximately 60 by 30 feet in size and 25 feet high, located 3 feet below the surface. The riser valve chamber would be located beneath the distribution chamber.

Two water main connections would extend from the Shaft 33B Site beneath the City streets, connecting the shaft to a trunk main at Third Avenue. Section 5.1 of this EIS describes the potential routes that these water mains might use to reach the Third Avenue main. This EIS analyzes a reasonable-worst case water main route and two additional representative scenarios, which are discussed in detail in Section 5.1, “Project Description” in Chapter 5, “Water Main Connections.” At the preferred Shaft Site, these two 48-inch water main connections would likely extend east from Shaft 33B toward First Avenue. Near the preferred Shaft Site, the water mains would pass through the regulator, valve, and venturi chambers. As illustrated in Figure 4.1-1, depending on the water main route selected, the regulator chambers are likely to be located beneath the sidewalk on the west side of First Avenue adjacent to the preferred Shaft Site, with the water main valve chambers in the same location. From the regulator chambers, the water mains would pass through another set of chambers, the venturi chambers. The location of the venturi chambers also depends on the specific water main connection route selected. For the reasonable worst-case route analyzed in this EIS, the venturi chambers would be located on the east side of First Avenue between E. 58th and E. 59th Streets, at the beginning of that water main route. The underground water main chambers would be accessible for maintenance via manholes in the sidewalk.

4.1.4 Description of Construction at the Preferred Shaft Site

Construction Activity

Chapter 2, “Purpose and Need and Project Overview,” describes the construction activities required to install Shaft 33B and its water main connections. As described there, construction would occur in five stages, including four on the Shaft Site and a fifth for installation of the water main connections.



NOT TO SCALE

Legend:

- Site Boundary
- - - Building Line
- ▬ Cofferdam
- ▬ Curbline
- - - Multi-Use Area
- 🌳 Tree

NOTE: This figure has been updated for the Final EIS



NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
 PROPOSED SHAFT 33B TO CITY WATER TUNNEL NO. 3
 STAGE 2-MANHATTAN LEG
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E. 59TH STREET AND FIRST AVENUE CONCEPTUAL SITE LAYOUT

FIGURE 4.1-1

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During construction, the preferred Shaft Site would be enclosed with a 20-foot-high construction barrier. The site would be occupied by construction trailers, storage containers, and other construction equipment throughout the construction period. Some pieces of equipment would be required throughout the entire construction period, while others would be needed only for a particular stage. Some trucks would arrive at and depart from the preferred Shaft Site each day, bringing deliveries and removing debris from the site. After the initial excavation of soil in Stage 1 and creation of the pilot hole in Stage 2, excavated rock would be removed from the shaft through City Tunnel No. 3 (rather than transporting the material from the preferred Shaft Site by truck). More information on the trucking activity at the preferred Shaft Site is provided in Section 4.9, “Traffic and Parking.”

The shaft excavation, including construction of a cofferdam around the excavation area, would occur in the eastern portion of the preferred Shaft Site. Cranes used during construction would generally be in the center of the site. During Stages 2 and 3, when the most intensive construction work would occur, the construction area would need to be larger than in Stages 1 and 4. The wall would be moved to enclose the larger area (for more information on this, see the discussion below of site configurations). Stages 2 and 3 would also involve most of the concrete pouring required for construction of the shaft and chambers. During these stages, the construction area would include an enclosed, ventilated structure that would house the concrete trucks. This structure would most likely be located in the southwest corner of the preferred Shaft Site during these two stages.

Table 4.1-1 includes a summary of the anticipated construction stages at the preferred Shaft Site including expected duration, activities that would be performed, equipment that would be on site, and the total number of trucks expected at the preferred Shaft Site in each stage of construction and the estimated reasonable worst-case number expected during the peak hour for each stage. Based on engineering estimates, it is expected that no more than three trucks would arrive at and depart from the site in any given hour. For some technical analyses, up to five trucks were assumed in the peak hour to provide a more conservative analysis, as explained in the respective chapters. Additional information on specific work that would be conducted during the four stages at the Shaft Site is provided below.

Stage 1 (4 Months)

Stage 1 would consist of securing the site, removing the pavement in the work area, installing support walls (the “cofferdam”) around the shaft area, and excavating the soils from that area. At the preferred Shaft Site, an estimated 23 feet of soil covers the bedrock. An excavator would be used to remove the soil and place it into dump trucks. As the depth of the excavation increases, a crane with a clamshell attachment may be used in lieu of the excavator. An estimated 3,400 cubic yards of soil would be removed from the site during this stage. The excavation would be completed once bedrock is reached.

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Table 4.1-1
Summary of Shaft Construction Stages at Preferred Shaft Site

Stage	Activity	Schedule*		Trucks**		Construction Equipment***
		Months	Dates	Total	Peak	
1	Cut/demolish sidewalk and asphalt pavement; install excavation support, excavate soil	4	March 1, 2006 – June 30, 2006	224	3	On-site: Backhoe, jackhammers, pile drilling rig, excavator, telescoping crane, compressor, front-end loader Trucks: Dump trucks, flatbed trucks
2A	Drill pilot hole; raise bore the shaft	3	July 3, 2006 – September 29, 2006	14	3	On-site: Derrick crane, raise bore machine, front-end loader Trucks: Dump trucks, flatbed trucks
2B	Distribution chamber excavation (blasting)	2	October 2, 2006 – November 30, 2006	10	1	On-site: Derrick crane, excavator, rock drills, compressor, pneumatic hammer, front-end loader Trucks: Concrete trucks, dump trucks, flatbed trucks
2C	Slashing/lining the shaft (blasting)	6	December 1, 2006 – May 31, 2007	35	3	On-site: Derrick crane, rock drills, compressor, front-end loader Trucks: Concrete trucks, dump trucks, flatbed trucks
3	Riser piping installation, refill with concrete; distribution chamber construction (form and place reinforced concrete); Queensboro Bridge pier installation	12	June 1, 2007 – May 30, 2008	370	3	On-site: Derrick crane, front-end loader, compressor, pumper truck Trucks: Concrete trucks, dump trucks, flatbed trucks
4	Equipment installation; construction of regulator and valve chambers and water main connections at site	17	February 2, 2009 – June 30, 2010	74	3	On-site: Derrick and telescoping cranes, excavator, compactor, backhoe, front-end loader, paver Trucks: Concrete trucks, dump trucks, flatbed trucks
Notes: * The anticipated schedule is estimated based on an <u>estimated</u> construction start of March 1, 2006. ** Total trucks are the total number of trucks over a full stage of construction. Peak trucks are the estimated number of trucks occurring during the peak hour on a given day during that construction stage. ***For more information on construction equipment in each stage, see Chapter 2.						

Stage 2 (11 Months)

Stage 2 would involve excavation of the shaft and distribution chamber at the preferred Shaft Site. During Stage 2A (with a duration of 3 months), the pilot hole would be drilled from the top of the shaft down to City Tunnel No. 3 below and then a 10-foot-wide shaft would be excavated from the tunnel upward using the raise bore machine. Excavated material would be removed from the bottom of the shaft and transported to an off-site location using City Tunnel No. 3.

In Stages 2B and 2C, controlled drilling and blasting would be used to excavate the rock to form the distribution chamber near the top of the shaft (Stage 2B, 2 months) and to enlarge the diameter of the shaft to its full width of approximately 22 to 27.5 feet. Blasting would not occur at the surface, since bedrock at the preferred Shaft Site is more than 20 feet below ground. The rock loosened during blasting of the distribution chamber and shaft would be removed through City Tunnel No. 3. During the eight-month period (Stages 2B and 2C) when blasting would be

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conducted, one to two blasts can be expected on a given day. Blasting would be conducted in coordination with the New York City Fire Department (FDNY). Based on experience with other construction projects that involve blasting, it is expected that blasting would typically occur during the first shift (7:00 a.m. to 3:00 p.m.). In general, blasting would not likely occur until 10:00 a.m. since it can take two to three hours to prepare for the blast. The second blast, if it occurred, would generally occur in the early afternoon, but could be delayed until 6:30 p.m., after peak evening traffic conditions. The New York City Fire Department (FDNY) restricts blasting times to between 7:00 a.m. and 7:00 p.m. or from sunup to sundown. Although not expected to be needed based on blasting at other Shaft Sites, subject to prior approval of FDNY and as necessary, extension of blasting hours may be granted on a case-by-case basis.

The safety measures to be implemented during blasting, including monitoring vibration levels and limiting access to areas close to the blasting zone, are described in Chapter 2. As described later in this Chapter in Section 4.9, “Traffic and Parking,” warning whistles would be used to alert the area that blasting was about to begin. For approximately the first four months of blasting (until a depth of about 100 feet), flag persons would halt vehicular and pedestrian flow at designated locations prior to blasting. Blasting would be conducted only once the area near the preferred Shaft Site is clear of traffic and pedestrians.

Stage 2C would also involve pouring concrete at the preferred Shaft Site to line the shaft walls. During Stage 2 and Stage 3, the preferred Shaft Site would have an enclosed, ventilated structure that would house the concrete trucks operating at the site.

Stage 3 (12 Months)

During Stage 3, riser piping would be installed in the shaft and the distribution chamber’s floor, walls, columns, and roof would be constructed. Both of these activities would involve pouring of concrete at the preferred Shaft Site. Concrete trucks would operate within the enclosed, ventilated structure on the site.

At the preferred Shaft Site, Stage 3 could also involve construction of extensions to the Queensboro Bridge piers close to the shaft. In the vicinity of the preferred Shaft Site, the Bridge’s existing piers extend below the surface to bedrock, approximately 20 feet below grade. To protect Shaft 33B from future excavation activities if expansion to the Bridge is proposed, up to 10 new concrete piers extending from a few feet below the surface down to bedrock may be constructed near the shaft. This would involve excavating the area between the Bridge and the shaft wall and filling that space with new 20-foot-deep concrete piers. Creation of the extensions to the Bridge piers would avoid the need to excavate in close proximity to the shaft in the future, thereby protecting Shaft 33B from potential damage.

A total of 370 trucks would arrive at and depart from the site during the 12-month period to bring concrete and steel to the site and remove waste material. Of these, 220 trucks (during months 2 through 8) would be concrete trucks associated with the riser pipe installation and 110 trucks (during months 9 through 12) would be concrete trucks for the distribution chamber.

Stage 4 (17 Months)

Following Stage 3, the site would be secured and inactive for approximately 8 months while equipment is procured. Once that equipment is available, Stage 4 would consist of installation of distribution pipes, valves, and mechanical and electrical equipment, construction of regulator and valve chambers for the water main connections, and final site clean-up and restoration. Stage 4B would include construction of the regulator and valve chambers required for the water mains, which would extend into First Avenue beyond the boundary of the preferred Shaft Site. The New York City Department of Design and Construction (NYCDDC) would construct the regulator and valve chambers; it is NYCDEP's intent to coordinate this work so it would occur during the final stage of shaft construction to avoid recurring disturbance to the site. Construction of these chambers would take approximately 2 to 3 months. Soil would be excavated and concrete floors would be placed, followed by installation of the 48-inch piping. Concrete walls and roofs would be poured into the chambers and the open excavations would be backfilled.

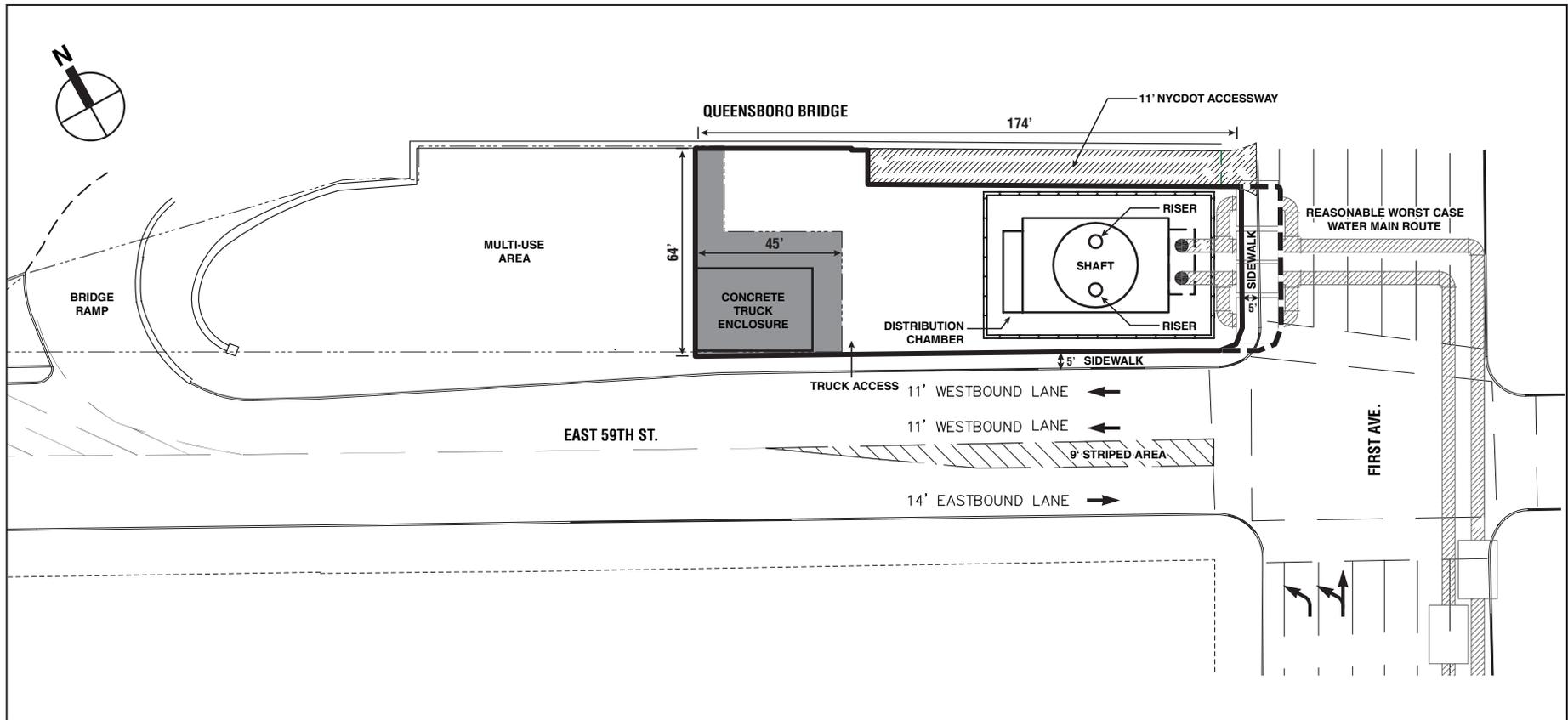
Site Layout

To evaluate the potential environmental impacts related to construction of Shaft 33B at the preferred Shaft Site, two possible site layouts during construction were considered in this EIS—the “base configuration” and the “alternate site configuration.” At this time, NYCDEP anticipates that construction would occur using the base configuration. The alternate site configuration is slightly larger than the base configuration. It was included in this EIS due, in part, to community concerns with respect to the potential disturbances to E. 59th Street due to construction. Its inclusion in the EIS provides an analysis of a reasonable worst-case construction scenario that would occur if construction had to extend into the streetbeds of E. 59th Street and First Avenue to provide a more efficient construction equipment layout. The alternate site configuration could be used by the contractor only with NYCDEP's approval. Both configurations are described below.

Base Configuration

In the base configuration, the preferred Shaft Site would encompass most of the area at the site that is currently fenced and in use by NYCDOT (Figure 4.1-2). An 11-foot-wide accessway would remain alongside the Queensboro Bridge, allowing NYCDOT access from First Avenue to the NYCDOT Queensboro Bridge Engineer's Office beneath the Bridge. In addition, in the base configuration, the preferred Shaft Site would also extend onto a portion of the sidewalk on both E. 59th Street and First Avenue. The sidewalk on the west side of First Avenue would be reduced in width from 13.5 feet to 5 feet, and the sidewalk on the north side of E. 59th Street would be reduced in width from 10 feet to 5 feet. NYCDEP would provide the funding for a traffic enforcement agent (TEA) at the Shaft Site during construction to facilitate vehicular and pedestrian flow. In total, the preferred Shaft Site (NYCDOT site and portions of adjacent sidewalks) would be 7,400 square feet in size.

During Stages 2 (11 months) and 3 (12 months), when the most intensive construction activities would occur, the site would need to be larger than 7,400 square feet. During these two stages, the construction area would also include an 1,800-square-foot portion of the adjacent multi-use area.



NOT TO SCALE

Legend:

- | | | | | | |
|---|---|---|----------------|---|---------------|
|  | Additional Construction Area Only During Stages 2 and 3 |  | Curbline |  | Cofferdam |
|  | Site Boundary |  | Building Line |  | Stage 4B Only |
| | |  | Multi-Use Area | | |

NOTE: This figure has been updated for the Final EIS

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
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BASE CONFIGURATION



FIGURE 4.1-2

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Use of this area would require removal of two honey locust trees. Including the multi-use area and a portion of its adjacent sidewalk on E. 59th Street, the base configuration would have a total area of 9,200 square feet. The barrier around the construction site would be moved so that the portion of the multi-use area in use for construction would be behind the barrier during Stages 2 and 3. The ventilated enclosure for concrete trucks would likely be located in the multi-use area during these construction stages. The multi-use area would be restored in coordination with NYCDOT and the community (as applicable) at the end of Stage 3 and returned to public and NYCDOT use.

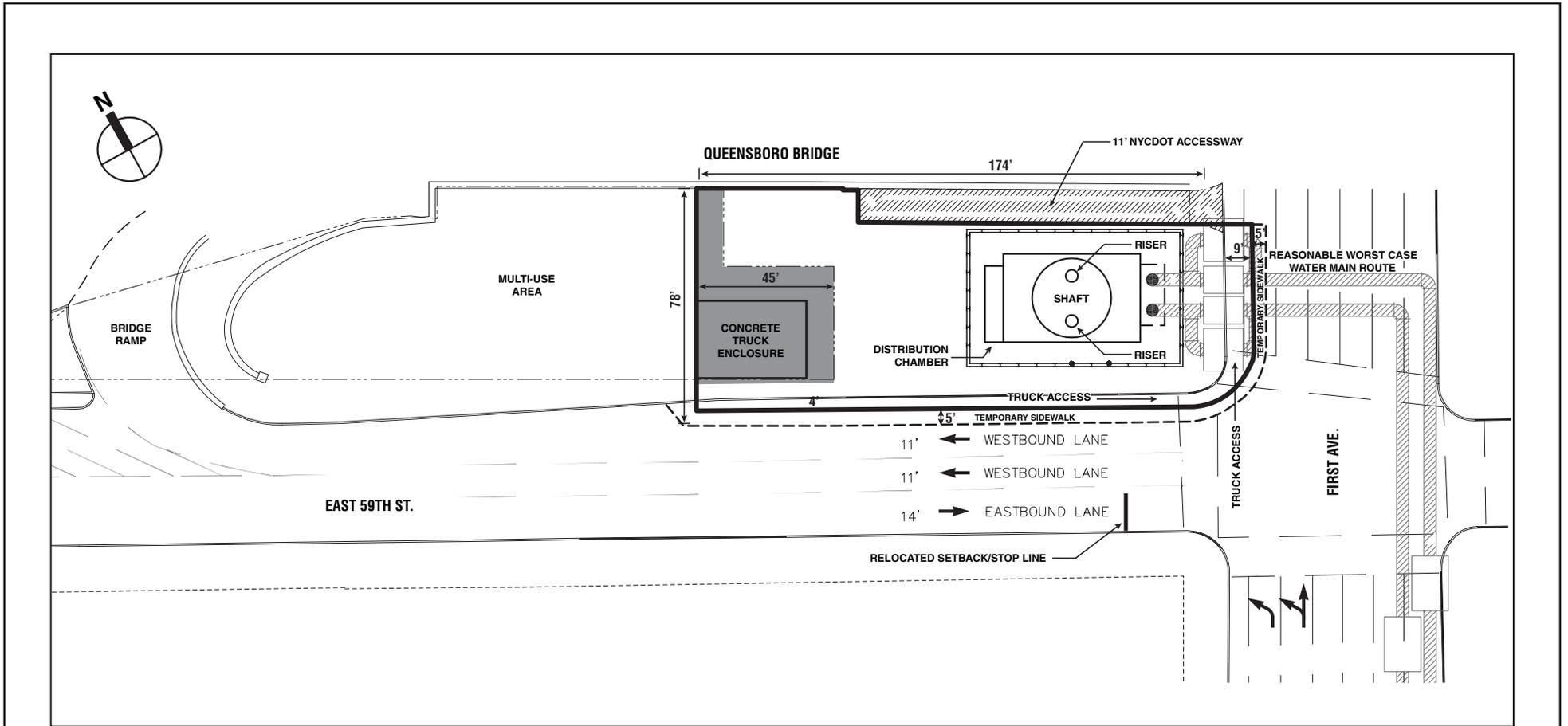
During part of Stage 4B (construction of regulator and valve chambers associated with the water main construction), some construction activities would occur on the western portion of First Avenue, outside the boundaries of the preferred Shaft Site but within the area that would also be affected by construction of the new water main connections. This construction would occur for approximately three months and would require temporary lane closures. An additional 10-foot-high construction barrier would be located on the sidewalk during Stage 4B for the construction of regulator and valve chambers (Figure 4.1-2).

In the base configuration, trucks bringing materials to the preferred Shaft Site and removing debris from the site would pull into the western end of the Shaft Site from E. 59th Street. When exiting, trucks would back out of this driveway (for more information, see Section 4.9, “Traffic and Parking”). The truck entrance point would be secured by a gate that would be integrated into the construction barrier around the site. Concrete trucks would pull into the site to use the concrete-truck enclosure (likely to be in the multi-use area) during Stages 2 and 3. During Stage 4, when the multi-use area would not be available and a smaller number of concrete trucks would arrive at the site, these trucks would be located elsewhere within the site. As explained in Section 4.8, “Infrastructure and Energy,” for either the base or alternate site configuration, concrete trucks would be rinsed and the resulting discharge would be passed through a sediment trap prior to entering the catch basin.

Alternate Site Configuration

In the alternate site configuration, the preferred Shaft Site would encompass the site described above for the base configuration, as well as the full sidewalk along E. 59th Street and First Avenue adjacent to the construction area, a 9-foot-wide portion of First Avenue adjacent to the site, and a 4-foot-wide portion of the E. 59th Street roadway adjacent to the site (Figure 4.1-3). The total site area would be approximately 9,000 square feet. As in the base configuration, an 11-foot-wide accessway would remain alongside the Queensboro Bridge, allowing NYCDOT access from First Avenue to the NYCDOT Queensboro Bridge Engineer’s Office beneath the Bridge.

Like the base configuration, an 1,800-square-foot portion of the multi-use area would also be required during Stages 2 and 3 in the alternate site configuration, to provide enough space for the construction activities required during these two stages. Including the multi-use area and a portion of its adjacent sidewalk on E. 59th Street, the alternate site configuration would have a total area of 10,800 square feet during Stages 2 and 3. As with the base configuration, use of this



NOT TO SCALE

Legend:

- Additional Construction Area Only During Stages 2 and 3
- Curbline
- Building Line
- Site Boundary
- Multi-Use Area
- Cofferdam

NOTE: This figure has been updated for the Final EIS

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
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ALTERNATE SITE CONFIGURATION

FIGURE 4.1-3



area would require removal of two honey locust trees. The barrier around the construction site would be moved so that the portion of the multi-use area in use for construction would be behind the barrier during Stages 2 and 3. The ventilated enclosure for concrete trucks would likely be located in the multi-use area during these construction stages. The multi-use area would be restored in coordination with NYCDOT and the community (as applicable) at the end of Stage 3 and returned to public use.

In the alternate site configuration, trucks bringing materials to the site and removing debris from the site would pull up alongside the preferred Shaft Site, using the areas currently occupied by the sidewalks and roadway on E. 59th Street and by the sidewalk on First Avenue. These areas would be behind the 20-foot high construction barrier. The truck entrance points would be secured by a gate that would be integrated into the construction barrier around the site. Concrete trucks would pull into the site to use the concrete-truck enclosure during Stages 2 and 3. During Stage 4, when a smaller number of concrete trucks would arrive at the site, these trucks would most likely pull into the truck access area on the site's First Avenue side.

Outside of the construction barrier, a portion of the First Avenue roadway and the E. 59th Street roadway would be converted into 5-foot-wide pedestrian passageways for the duration of the construction. In addition, as in the base configuration, NYCDEP would provide the funding for a traffic enforcement agent (TEA) at the Shaft Site during construction to facilitate vehicular and pedestrian flow.

Construction Equipment

Each stage of construction would involve different construction activities, and therefore would use some different kinds of equipment from the other construction stages. For example, the raise bore machine would be used only during Stage 2A. In addition, most equipment would not be used continuously for an entire work shift. Using preliminary engineering information, estimated equipment usage factors were developed for the major pieces of equipment to be used during the construction of Shaft 33B at the preferred Shaft Site. These equipment usage factors are estimates of the percentage of time that each piece of equipment would be used during each construction stage (assuming a 16-hour work day). The equipment usage factors for the preferred Shaft Site are presented in Table 4.1-2. As discussed further in Section 4.11, "Air Quality," NYCDEP would require the contractor for Shaft 33B to use control measures to ensure the construction is conducted in a manner protective of air quality. More specific information regarding equipment to be used at the preferred Shaft Site and their usage factors is presented in the air quality, noise, and vibration analyses in Sections 4.11, 4.12, and 4.13.

Construction Schedule

Based on the conceptual construction schedule presented in Chapter 2, construction activities at the preferred Shaft Site could begin in approximately March 2006 and end in June 2010. A summary of the construction schedule is provided in Table 4.1-1, above. The total construction duration, including the eight-month period between Stages 3 and 4 when the site is inactive,

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Table 4.1-2
Preferred Shaft Site:
Average Equipment Usage Assumptions for Construction

Equipment	Percentage of Time Equipment is Used in Each Construction Stage*							
	Stage 1 (4 mos.)	Stage 2A (3 mos.)	Stage 2B (2 mos.)	Stage 2C (6 mos.)	Stage 3 (12 mos.)	Stage 4A (12 mos.)	Stage 4B (3 mos.)	Stage 4C (2 mos.)
Rock Drill – Two			15 (per)					
Concrete Truck				15	25	5	25	
Paver						5	15	5
Pneumatic hammer			5					
Jackhammer	5						10	
Rock Drill				25				
Backhoe	10						25	
Pile Drilling Rig	25							
Excavator	25		15		5	5		
Front End Loader	30	10	10	5	5	10	10	10
Dump Truck at Idle	25	10	10			10	25	10
Flatbed Truck at Idle	15	5	10	5	20	20	10	10
Derrick Crane		5	5	20	25	10		
Telescoping Crane	20						10	
Pavement Cutter							10	
Compactor						5	10	
Welder	10	5	5	5	20	20	10	
Saw, electric	10	5	5	5	15	20	25	
Compressor (NYC)	5		70	70	5	5	25	
Raise Bore Machine		80						
Concrete Pump				10	25			

Note: Usage factors are based on a 16-hour workday.

would be 52 months. Construction of the water main connections from the new Shaft 33B to the Third Avenue trunk main could overlap with construction of the shaft. Overall using this schedule, construction activities at the preferred Shaft Site are anticipated to be complete in June 2010.

4.1.5 Operation

Activation and operation procedures would be consistent among all potential Shaft Site locations and are described in Chapter 2, “Purpose and Need and Project Overview.”

4.1.6 Permits and Approvals

Construction and operation of Shaft 33B at the preferred Shaft Site may require the following permits, approvals, or reviews by New York State or New York City agencies:

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- FDNY Blasting Permits: FDNY regulates the transport and use of explosives within the City to ensure their safe usage. All blasting at the Shaft Site would be conducted in coordination with FDNY.
- NYCDOT Construction Activity Permits, Sidewalk Construction Permits, and Street Opening Permits: NYCDOT permits would be required for construction-related activities on sidewalks and within streets. These permits typically provide detailed stipulations for traffic and pedestrian control during construction.
- NYCDEP Tunneling Permit: These permits are required for all tunnel construction in the City and set specific limits on blasting and noise levels, construction area layout, muck removal, and other aspects of tunnel construction.
- NYCDEP Sewer Discharge Permit: A permit would be required for discharge into the sewer during the dewatering and Shaft activation process. This permit would specify the quality and quantity of water that can be discharged into a City sewer.
- NYCDEP Air Permit: A permit may be required pursuant to the City's Air Pollution Code for operation of a ventilation system for the concrete truck enclosure.
- Memorandum of Understanding between NYCDEP and NYCDOT: This document would outline the two agencies' agreement regarding NYCDEP's usage of NYCDOT property at the preferred Shaft Site.
- New York City Landmarks Preservation Commission (NYCLPC) Permit and Review: A permit would be required from NYCLPC for work on the piers of the Queensboro Bridge, which is a New York City Landmark. An advisory letter from NYCLPC would also be sought regarding construction activities adjacent to the Bridge. In addition, NYCLPC review regarding methodology and potential impacts of the project on historic resources was sought during the CEQR process.

