

3.12 INFRASTRUCTURE

Introduction

This chapter presents the demands and potential impacts of the proposed East 125th Street Development on the city's infrastructure. For CEQR purposes, the city's "infrastructure" comprises the physical systems supporting its population, including water supply, wastewater treatment and storm water management systems. The proposed action would result in new development that could place additional demands on other aspects of New York City's infrastructure, such as its energy distribution systems and roadways. Per the *CEQR Technical Manual*, developments with greater than one million gallons per day (mgd) of water consumption may require a detailed assessment of effects on water pressure and supply.

3.12.1 Existing Conditions

Water Supply

Most of New York City obtains potable water from three surface water supply systems, operated by the New York City Department of Environmental Protection (NYCDEP), that form a network of reservoirs, aqueducts, and tunnels extending as far as 125 miles north of New York City. The watersheds of the three systems cover nearly 2,000 square miles, with 19 reservoirs and three controlled lakes that have a combined storage capacity of 550 billion gallons. Most of New York City's water supply flows to the city through aqueducts, and reaches consumers by gravity alone; only four percent of the city's water must be pumped to its final destination. New York City residents and other water users consume approximately 1.2 billion gallons of water per day through this supply system.

The proposed development is located in the Croton Service Area that receives its water from the Croton Watershed in Putnam and Westchester Counties, via the Jerome Park Reservoir in the Bronx. From that point, water is distributed to the Bronx and Manhattan through the New Croton Aqueduct.

The East 125th Street Development project site is served by 12-inch water lines on East 125th Street, East 126th Street, East 127th Street, Second Avenue, and Third Avenue, as well as a 20-inch line along East 125th Street. Water is delivered to the project site through eight-inch laterals from the grid system. Water pressure throughout the city is controlled by pressure regulators. According to NYCDEP, there are no known pressure problems (high or low) in the area of the project site.¹

To calculate existing water demand from the project site, water consumption rates from *CEQR Technical Manual* Table 3L-2 have been applied to existing uses, with four residences

¹ Estesén, Terrell, NYCDEP, June 12, 2007.

assumed to be present for the purposes of a conservative analysis of infrastructure. As described in Chapter 3.1, all dwelling units on the project site appear to be vacant. For all uses on the three parcels comprising the East 125th Street Development project site, current water demand of the project site is estimated at 5,703 gallons per day (gpd), exclusive of air conditioning demand, as indicated in Table 3.12-1 below. With all built areas assumed to be air conditioned, total water consumption approximately doubles to 12,447 gpd.

Table 3.12-1: Existing Water Usage/Wastewater Generation of Project Site

Use	Rate (gpd)	Floor Area (square feet)	Dwelling Units	Persons/Employees	Water/Wastewater Generation (gpd)	Air Conditioning (gpd)
Residential @ 2.57 residents per DU	112 gpd/person		4*	11	1,232	
Vacant Land	0	51,115		0	0	0
Commercial	25 gpd/person	21,328		63	1,575	
A/C	0.10 gpd/sf					2,123
Parking Facilities	0	132,054		0	0	0
Industrial	0.17 gpd/sf	2,498			425	
A/C	0.17 gpd/sf					425
Mixed Commercial/Residential	0.17 gpd/sf	2,813			478	
A/C	0.17 gpd/sf					478
Transportation/Utility	0.17 gpd/sf	8,341			1,418	
A/C	0.17 gpd/sf					1,418
Other	25 gpd/person	22,982		23	575	
A/C	0.10 gpd/sf					2,300
		241,131	4	SUBTOTALS	5,703	6,744
TOTAL WATER CONSUMPTION					.012 mgd	
Demand based on rates indicated in <i>CEQR Technical Manual, Table 3L-2</i> . M/I autobody/muffler shop uses consumption rate for retail/public use since manufacturing is not listed.						
* DCP's MapPluto database identifies four existing dwelling units on the project site on the upper floors of 225 East 125 th Street. Field visits conducted between April and July 2007 by STV, Inc. indicate that these units are not occupied. However, the infrastructure analysis considers the potential demand from four occupied units in this building for the purposes of a providing a conservative analysis.						

Sanitary Sewage and Stormwater

New York City's sewer system consists of a grid of sewers beneath the streets that send wastewater flows to 14 different water pollution control plants (WPCPs) for treatment prior to discharging to a surface water body. Combined, the WPCPs treat approximately 1.7 billion gallons of sewage per day. Approximately 85 percent of the City's sewer system collects both wastewater and stormwater runoff. During wet weather, large volumes of

rainfall runoff enter the combined system through storm drains and catch basins in streets and mix with sanitary sewage, then flow through regulators (relief valves) before being sent to the WPCPs through interceptor sewers. During such wet-weather events, excessive volumes of stormwater runoff (10 to 50 times the dry-weather flow) can enter the combined sewer system and, if transported to the WPCP, could exceed the treatment design capacity. For limited periods, WPCPs are designed for only twice the average dry-weather flow. In order to avoid flooding of the WPCPs, the regulators act to divert excess flow from reaching the WPCP. A diversion chamber in the regulator is set to allow two times the average design dry-weather flow into the interceptor sewer to be carried to the WPCP. When the combined sewer flow exceeds two times the design dry-weather flow capacity of the regulator, it overflows a weir in the diversion chamber and this overflow is discharged to a receiving water body as “combined sewer overflow” (CSO).²

Sanitary sewers can be one-to-two feet in diameter on side streets, and three or four feet in diameter under larger roadways. They connect to trunk sewers, which are generally five-to-seven feet in diameter. Combined sewers discharge to regulators. The interceptors carry wastewater to the WPCPs for treatment.

The project site is served by the Wards Island WPCP, which has a design capacity of 275 million gallons per day (mgd) of wastewater and a permitted limit for dry-weather flow of 250 mgd. Wards Island WPCP serves a population of approximately one million residents.³ The Wards Island drainage area covers approximately 12,000 acres in the western section of the Bronx and the upper east side of Manhattan and consists of sanitary, storm, and combined sewer systems. During dry weather, the combined sewers function as sanitary sewers, bringing sewage flows to the Wards Island WPCP. The average annual dry-weather flow recorded during 2000 and 2001 was 184 mgd. The average daily flow during 2006 was 218 mgd⁴.

According to the CEQR Technical Manual wastewater is considered to include sanitary sewage, wastewater generated by industries, and stormwater. Water used for air conditioning generates a negligible amount of wastewater since it is recirculated or evaporates in the cooling and heating process. The wastewater collection system at the project site consists of 15-inch lines along East 127th Street and East 126th Street, and a four-foot by two-foot eight-inch combined sewer along East 125th Street. The total current estimated wastewater sewage is 0.006 mgd.

Vacant lots on the project site exceed 50 percent of the total and do not significantly contribute to sewage flow to the sewer system or the WPCP. Stormwater at the project site would infiltrate the soil or be captured in a combined sewer and be discharged to the receiving water body as CSO for larger precipitation cases.

² CEQR Technical Manual, Chapter 3L, Section 121.1

³ Estesen, Terrell, NYCDEP, June 12, 2007.

⁴ Ibid.

3.12.2 Future Conditions Without the Proposed Action

In the year ~~2012~~2016, under conditions without the proposed action, infrastructure demands of the project site would likely remain essentially the same as those under existing conditions; demands on infrastructure would be expected to remain the same. Without implementation of the proposed action, the East 125th Street Development project site would likely continue to be characterized by underutilized and vacant sites, generating relatively low demand for water and sewer service.

Projected developments within one half-mile of the project site that are independent of the proposed action and that are expected to be completed by the year ~~2012~~2016 are identified in Chapter 3.1. These developments would place additional demand on water and wastewater services. Planned and projected developments would include approximately 1.5 million square feet of commercial, institutional, and industrial/manufacturing use, and over ~~1,800~~2,530 dwelling units. For areas within one half-mile of the project site in the Future Without the Proposed Action condition, demand on water supply would be expected to increase by approximately ~~1.25~~1.45 mgd. The portion of this amount that would contribute to sewage flows is not expected to cause any significant impact on the Wards Island WPCP, with its design capacity of 275 mgd.

3.12.3 Future Conditions With the Proposed Action

The proposed East 125th Street Development is a mixed-use development containing new residential, retail, offices, public facility, and hotel uses. The residential component includes up to 1,000 dwelling units housing up to approximately 2,570 new residents. Following is a discussion on additional demands on infrastructure from the Proposed Action.

Water Supply

According to the *CEQR Technical Manual*, due to the size of the city's water supply system, water consumption from any given action is not likely to be significant relative to the city's overall demand. Actions that could affect water pressure or supply are generally those that use more than 1 mgd; a development of that magnitude would require a detailed assessment of effects on water pressure and supply. As shown in Table 3.13-2 on the following page, the Proposed Action would increase demand by approximately 550,000 gallons per day above Future Conditions without the Proposed Action, including usage by residents, employees, visitors, and air conditioning systems. This increase does not exceed the impact threshold of 1 mgd and, therefore, would not create any adverse impacts to water pressure or supply. No detailed assessment of the development's effects on water supply or pressure is required. However, DEP's water supply distribution division would be contacted during the engineering/design phase of the project to coordinate requirements for the project, with which the project sponsor would need to comply.

Sanitary Sewage and Stormwater

Sewage generation from the proposed East 125th Street Development is estimated to be approximately equivalent to water consumption, or 432,840 gpd during peak demand (does not include water used for air conditioning). This represents an increase of less than 0.2 percent of the average flow (2006) to the Wards Island WPCP and would not be expected to adversely impact the plant's treatment design capacity of 275 mgd.

The proposed action would increase the built density of the project site with vacant lots and underutilized parcels replaced with new commercial, residential, retail, and other uses. As a result, the Project Site may experience an increase in impermeable surfaces, and stormwater runoff may likewise increase. The project includes rooftop gardens where buildings are conducive to green space on the roof. This would help to reduce stormwater runoff, although rooftop gardens have not been factored into the estimate of increase in stormwater runoff from the site presented below in order to provide a conservative analysis.

As outlined in the *CEQR Technical Manual* (§323), by applying the *Rational Method* for calculating stormwater runoff, the estimated increase in stormwater runoff from the East 125th Street Development would be approximately five cubic feet per second (cfs) during a 10-year storm event, from 20 cfs in the existing conditions to 25 cfs with proposed action. This calculation assumes a reduction of permeable surfaces from approximately 1 ½ acres to no permeable surfaces and a rainfall intensity of five inches per hour. This assumption was made to ensure that the most conservative situation was analyzed since site plans are only conceptual at this time. After the site plan and designs are advanced, additional information about the amount of impermeable and permeable surfaces (see above discussion about green roofs and the creation of open space as part of the project) will be available. This information will allow a more accurate analysis of storm water runoff due to the project and would indicate if further analysis is warranted. Although an increase in storm water runoff is anticipated, the change would be small and the proposed project would not result in significant impacts as a result of storm events.

The additional increment of development that would be possible as a result of the proposed rezoning of the separate United Moravian Church parcel that is to be rezoned only would not be expected to result in significant adverse impacts on infrastructure. No development is proposed on that off-site parcel at this time.

Table 3.13-2: Water Consumption and Sewage Generation with East 125th Street Development

Use	Rate* (gpd)	Floor Area (sf)	DUs	Persons	Water/Waste water Usage (gpd)	Air Conditioning (gpd)
Residential	112 gpd/person		1,000	2,570	287,840	
Office	25 gpd/ person	300,000	N/A	1,200	30,000	
Air Conditioning	0.10 gpd/sf		N/A			30,000
Retail	0.17 gpd/sf	470,000	N/A		79,900	
Air Conditioning	0.17 gpd/sf		N/A			79,900
Institutional	0.17 gpd/sf	30,000	N/A		5,100	
Air Conditioning	0.17 gpd/sf		N/A			5,100
Hotel	150 gpd/rm/ occupant	100,000	N/A	100 rooms (assume double occupancy)	30,000	
Air Conditioning	0.10 gpd/sf					
Public Open Space	0	12,500	N/A	0	0	0
SUBTOTALS					432,840	115,000
TOTAL WATER CONSUMPTION					0.55 mgd	
<p>*Demand based on rates indicated in <i>CEQR Technical Manual, Table 3L-2</i>. For land uses not specifically listed, an assumption of 0.17 gpd was used. The rates listed in the manual are for new uses incorporating low-flow fixtures, as required by law.</p>						