

World Trade Center Memorial and Redevelopment Plan

Environmental Assessment for the Proposed Amendment to the
Approved Plan and General Project Plan

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WORLD TRADE CENTER (WTC) MEMORIAL AND REDEVELOPMENT PLAN
ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED AMENDMENT TO THE
APPROVED PLAN AND GENERAL PROJECT PLAN

Project Location: The Project Site is substantially the entire Southern Site added to the WTC Site in 2004; within the Project Site, the Development Site is the area bounded by Washington Street, Albany Street, Greenwich Street and Liberty Park in Lower Manhattan.

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This EA is available for review on the LMDC website at www.renewnyc.com and on the Empire State Development website at www.esd.ny.gov/WTCsite

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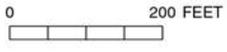
A. INTRODUCTION

In April 2004, the Lower Manhattan Development Corporation (LMDC), a subsidiary of the New York State Urban Development Corporation doing business as Empire State Development (ESD), a political subdivision and public benefit corporation of the State of New York, acting as lead agency and responsible entity pursuant to 42 USC § 5304(g) and 24 CFR Part 58 for compliance with the National Environmental Policy Act (NEPA), and 6 NYCRR Part 617 for compliance with the New York State Environmental Quality Review Act (SEQRA) prepared in cooperation with the United States Department of Housing and Urban Development (HUD) and the Port Authority of New York and New Jersey (Port Authority), a *Final Generic Environmental Impact Statement (2004 FGEIS)* for the World Trade Center (WTC) Memorial and Redevelopment Plan. In June 2004, LMDC adopted its Record of Decision and Lead Agency Findings Statement (ROD) for that Plan and affirmed the General Project Plan (GPP) for LMDC's WTC Memorial and Cultural Program.

Implementation of the WTC Memorial and Redevelopment Plan began with a formal groundbreaking on July 4, 2004, for the new 1 World Trade Center (Tower 1) on the WTC campus, which was expanded in 2004 pursuant to the World Trade Center Act to include the Southern Site south of Liberty Street (the WTC Site). Since that time, a number of adjustments, refinements, and amendments have been made to the Plan and the GPP, as described below. The current Plan and GPP with such adjustments, refinements, and amendments are referred to in this Environmental Assessment (EA) as the Approved Plan and the GPP, respectively.

By 2019, many elements of the WTC Approved Plan were complete. Specifically, the National September 11 Memorial and Museum; Towers 1, 3, and 4; the Oculus; the Port Authority's Vehicle Security Center (VSC); and Liberty Park were complete. The site for Tower 2 was occupied by mechanical equipment housed in a series of industrial buildings, which also provided access to the Oculus from the north. Also, by 2019, construction began on the Ronald O. Perelman Performing Arts Center at the World Trade Center (PACWTC) east of Tower 1, and the St. Nicholas Church on the east end of Liberty Park (see **Figure 1-1**). Of the principal components of the Approved Plan, only the construction planned for Site 5 (the Development Site) on the Southern Site (Project Site) portion of the WTC Site remained undeveloped. The previously approved plan for the Development Site provided for a 57-story, approximately 1.314-million-square-foot (sf) office building.

On June 26, 2019, LMDC and the Port Authority issued a Request for Proposals (RFP) for the Proposed Project on the Development Site. The Development Site is located south of Liberty Park and north of Albany Street between Greenwich and Washington Streets. Respondents were invited to propose either commercial development consistent with the Approved Plan or mixed-use development that might include residential development and consequently require modification to the GPP.



- WTC Site
- Project Site
- Development Site (Site 5)
- Proposed Project



In September 2019 proposals were received from five entities. In February of 2021, the Boards of LMDC and the Port Authority voted to conditionally designate a joint venture comprising Brookfield Properties, Dabar Development, OMNI New York, and Silverstein Properties (collectively, the “Developer”) as the development team, subject to the completion of environmental and all other reviews and public approvals required by law, amendment to the GPP to permit residential development and the negotiation and execution of the necessary project agreements, and approval by the LMDC and ESD Boards of the Proposed Amendment to the Approved Plan and GPP and the project transaction documents.

This EA considers the potential environmental impacts of the Proposed Amendment to the Approved Plan and GPP, which would permit either the currently approved office tower with a retail base or a mixed-use tower with residential, office, retail, fitness and social center, and community facility uses (the “Proposed Project”). LMDC, its parent corporation ESD, and the Port Authority are the Project Sponsors for the Proposed Project. If the Proposed Amendment is approved, and a mixed-use development were to proceed, it is contemplated that LMDC would transfer the Development Site to ESD and that ESD would enter into a long-term ground lease of that property to a developer to carry out the Proposed Project. LMDC continues to serve as the lead agency under both NEPA and SEQRA for this EA.

B. PREVIOUS REFINEMENTS TO THE APPROVED PLAN

Preliminary design and engineering led to certain adjustments and refinements in the 2004 Approved Plan, which were analyzed by LMDC in an EA in April 2005 (2005 EA). The 2005 EA found no new significant adverse environmental impacts resulting from these adjustments and refinements to the 2004 Approved Plan. With respect to the Development Site and the larger Project Site as a component of the WTC Site, these adjustments and refinements included (1) shifting 300,000 sf of office space from the Development Site to the buildings on the WTC Site so that the Development Site would contain 1.2 to 1.5 million sf (a reduction from the previous Plan, which assumed 1.5 to 1.8 million sf); (2) relocation of the WTC Site underground vehicular network entrance ramp from the north side of Liberty Street to the south side and making Liberty Street two-way; (3) leaving the block of Cedar Street between Washington and Greenwich Streets closed; and (4) expanding the size of Liberty Park by 11,400 sf and raising it to 20 to 30 feet above grade to accommodate the VSC. The 2005 EA concluded that the environmental impacts of the Approved Plan with such refinements would not differ significantly from those set forth in the 2004 *FGEIS* and ROD. The refinements were approved by LMDC in May 2005 after adopting a Finding of No Significant Impact (FONSI) under NEPA and a determination of non-significance under SEQRA and are reflected in the GPP as currently in effect.

Ongoing work on the design and engineering of Tower 1, particularly in response to security concerns expressed by the New York City Police Department (NYPD), led to revisions to the design of Tower 1’s lower floors. A Technical Memorandum was prepared to consider the potential environmental impacts resulting from these changes. Finalized in September 2005, the Technical Memorandum concluded that there would be no significant adverse impacts from the design changes and, accordingly, that there was no need to supplement or amend the 2004 *FGEIS* or the ROD.

As planning and implementation advanced, LMDC worked in cooperation with HUD, the Port Authority, and the City of New York to continue to refine the Approved Plan. Because the Approved Plan was generic, preliminary design and engineering led to certain adjustments and

refinements based on coordination with oversight agencies as well as design and other considerations. In September 2006, LMDC adopted an *Environmental Assessment for Proposed Further Refinements to the Approved Plan* (2006 EA) to document and assess the potential environmental impacts of these changes in the planning, engineering, design, and construction of the WTC Site since the 2005 EA and Technical Memorandum. The 2006 EA addressed modifications to the Memorial design and the programming of cultural facilities; a reduction in the proposed use of river water cooling in the office tower; elimination of an oil-water separator in the street; and revisions to the construction staging and phasing. LMDC issued a FONSI and determination of non-significance in October 2006 for these refinements to the Approved Plan.

In 2007, a Technical Memorandum was prepared to consider the potential environmental impacts resulting from proposed amendments to the GPP that LMDC had released in late 2006 and from an alternative pathway to meet LMDC's Sustainable Design Guidelines (SDGs) for the office towers in the Approved Plan. The 2007 proposed amendments were made to update the GPP to include (1) the proposed refinements addressed in the 2006 EA; (2) a formal delineation of the WTC Site boundaries to include areas south of Liberty Street (the Project Site, including the Development Site, Liberty Park, and the VSC) and north of Vesey Street (Northern Site); (3) modifications to the programming of office, retail, and cultural uses on the project site; (4) modifications and refinements to proposed and potential new streets; and (5) modifications for the implementation of the Sustainable Design Guidelines. The Technical Memorandum concluded that there would be no significant adverse environmental impacts from such design changes and, accordingly, that there was no need to supplement the 2004 *FGEIS* or take other further action pursuant to NEPA or SEQRA to carry out such amendments. The LMDC Board formally adopted these GPP Amendments on February 14, 2007.

In 2013, NYPD, in collaboration with other New York City agencies, the Port Authority, and other WTC stakeholders, completed its own separate environmental impact statement (NYPD FEIS) under SEQRA for NYPD's WTC Campus Security Plan. The Security Plan modified certain vehicular access and traffic flow patterns considered in the 2004 *FGEIS*. In proximity to the Development Site, in particular, the NYPD Security Zone limits vehicular access on Greenwich Street between Vesey and Cedar Streets and on Liberty Street between Church Street and Route 9A/West Street. Greenwich Street has remained open from the Cedar Street intersection south, and Albany Street on the south side of the Development Site and Washington Street on its west side are both open.

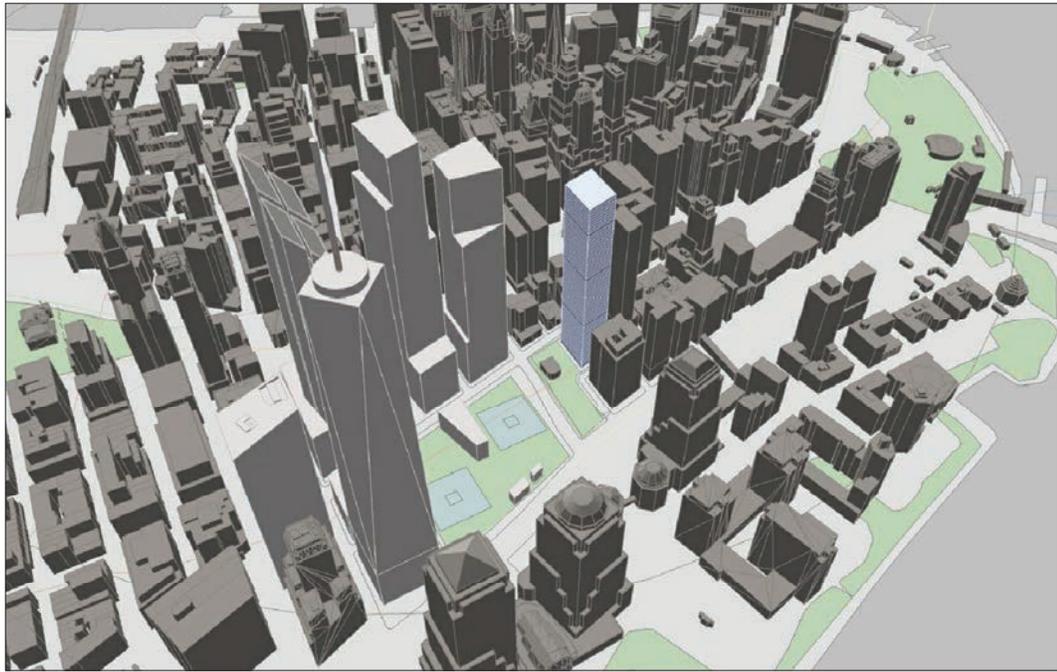
C. APPROVED DEVELOPMENT SITE PLAN

The 2004 *FGEIS* analyzed an approximately 57 story building with 1.5 to 1.8 million sf of office space, including retail at its base, on the Development Site. As adjusted in 2005, the tower was assumed to contain 1.2 to 1.5 million sf of office use, including a retail base. In the 2007 amendment to the GPP and the NYPD FEIS, the Development Site was assumed to be developed with 1.3 million sf of office use.

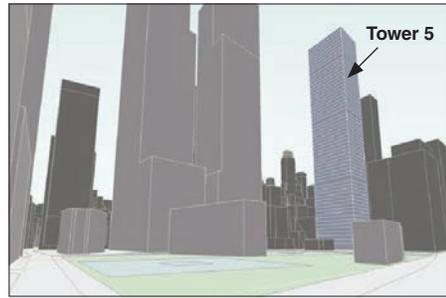
An illustration of the Approved Plan for Tower 5 shows an approximately 1.314 million sf building on **Figure 1-2**. It was expected to be approximately 57 stories (approximately 839 feet tall), and to incorporate the SDGs developed by LMDC as part of the Approved Plan.

D. THE PROPOSED AMENDMENT

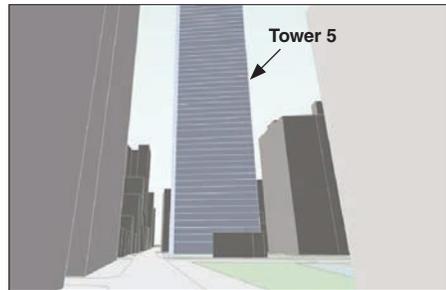
Since the Plan's approval in 2004, changes in the market for office and residential space in the neighborhood have left both the Tower 2 site and the Development Site undeveloped. At the same



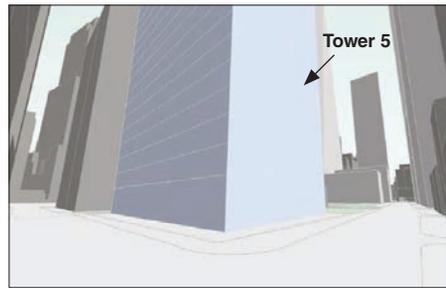
AERIAL VIEW



FULTON & WEST STREET



FULTON & GREENWICH STREET



GREENWICH & ALBANY STREET

SOURCE: P K
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NOTE: FOR ILLUSTRATIVE PURPOSES ONLY

Approved Plan -
Illustrative Aerial and Street Views
Figure 1-2

WTC Site 5

time, new construction and renovation of former office buildings has introduced new residential uses in the WTC area. Recognizing these changing circumstances, LMDC, ESD, and the Port Authority issued the RFP for the Development Site to explore the feasibility of developing a mix of uses, including residential and community facility with reduced commercial or retail use on this portion of the WTC Site.

The Proposed Amendment would permit greater flexibility in the future uses on the Development Site by allowing residential and community facility uses in addition to commercial and retail uses. Parking is not contemplated on the Development Site. Although the final program for the Development Site has not yet been defined, two potential programs shown in **Table 1-1** were created to represent the reasonable worst-case for a conservative analysis of the Proposed Project.

**Table 1-1
Potential Programs for Analysis***

	Maximum Residential (1,270 Units)	Reduced Residential (1,193 Units)
Residential	1,386,898 gross square feet (gsf)	1,126,563 gsf
Commercial	180,000 gsf	374,361 gsf
Fitness and Social Center	36,000 gsf	80,645 gsf
Community Facility	13,000 gsf	21,329 gsf
Retail	12,000 gsf	25,000 gsf
Total	1,627,898 gsf**	1,627,898 gsf**
Notes: * These figures represent gross square footages of the uses indicated to ensure conservative analysis. ** An additional 50,000 gsf of residential mechanical space is permitted for an all-electric building under either program.		

Construction of the Proposed Project under the Proposed Amendment is expected to commence in 2023 and be complete in 2028.

E. PURPOSE AND NEED

As noted above, the original planning for the Development Site and subsequent updates to the Approved Plan and GPP assumed that an office building with retail at its base would be constructed. However, in view of the WTC Plan’s allocation of office and hotel uses to the future Tower 2, and the growing demand for residential space in the area surrounding the WTC campus, LMDC and the Port Authority proposed to allow greater flexibility of uses on the Development Site by allowing residential and community facility uses in combination with retail use and significantly reduced office use.

The new potential uses—residential and community facility—would support Lower Manhattan’s revitalization and the transition from a predominantly office district to a mixed-use neighborhood. Residential use would be in keeping with the new residential development in the area and the many residential conversions that have occurred in nearby outmoded office buildings and would also reduce the total planned office space on the WTC Site. Today, the area to the east, south, and west of the Development Site contains a mix of residential and hotel uses in converted and new buildings with additional ongoing construction. The Development Site is located within the Special Lower Manhattan District, which was created to enhance the vitality of Lower Manhattan and includes not only the oldest central business district in New York City, but also a growing residential community. The district regulations allow for the conversion of older commercial buildings to residential use, with the goal of encouraging a dynamic mix of uses in the area. In

addition, the Downtown Alliance strives to promote Lower Manhattan as a world-class destination to live, work, and play by creating a vibrant, multi-use neighborhood where businesses can prosper and the residential community can flourish. Relating to the Proposed Amendment and the area to the east, south, and west of the Project Site, the Downtown Alliance has developed its Greenwich South Plan to encourage a diverse mix of uses in this area, create a neighborhood within a business district, encourage active uses in building bases, and add cultural destinations to attract repeat visitors. The Proposed Project, a mixed-use tower on the Development Site, would better fulfill LMDC's goal of creating a strong and vibrant 21st century business district in the study area by integrating the mix of residential, commercial office, retail, community facility, and other uses to create a more dynamic district. Overall, the proposed residential uses would be consistent with residential uses to the east, south, and west of the Project Site, and would also be in keeping with a recent trend of increased residential development in the Lower Manhattan area as it becomes a mixed-use neighborhood. In addition, the requirement that a portion of the residential units be permanently affordable is in keeping with federal, state, and City policies promoting the development of affordable housing.

F. FRAMEWORK FOR ANALYSIS

In assessing impacts, an environmental assessment considers a proposed action's potential for significant adverse impacts on the environment. Because most proposed actions become operational in future years, the environmental setting is not the current environment, but the future environment at the time of the action's completion or implementation. In this case, the expected completion date of the Proposed Project on the Development Site under the Proposed Amendment would be the year 2028, with construction expected to start in 2023. Therefore, the technical analyses that follow first assess current conditions and then forecast these conditions to 2028, the analysis year for this action. This EA provides a description of existing conditions for the year 2021 and assessments of future conditions under the Approved Plan and under the Proposed Amendment. To forecast the Approved Plan condition in 2028, information on known land use proposals and, as appropriate, changes in anticipated overall growth are incorporated. Absent the Proposed Amendment, it is anticipated that the Development Site would be developed, as contemplated by the Approved Plan, with a 1.3 million-sf office tower with ground-floor retail use. The differences between the Approved Plan and Proposed Amendment conditions are assessed to determine whether they would result in any new significant adverse environmental impacts not already disclosed for the Approved Plan. Consistent with LMDC and ESD practices, for the analyses in this EA undertaken pursuant to SEQRA, the 2020 *New York City Environmental Quality Review (CEQR) Technical Manual* generally serves as a guide with respect to environmental analysis methodologies and impact criteria for evaluating the effects of the Proposed Amendment.

As there is no final program for the Proposed Project, two illustrative programs (see **Table 1-1**) are being considered to assess the potential impacts of the Proposed Amendment. The Maximum Residential building would have up to 1,270 dwelling units and less of other uses, while the Reduced Residential building would have up to 1,193 dwelling units and more of other uses. The Maximum Residential building would also have up to 180,000 gross square feet (gsf) of commercial office space, up to 36,000 gsf of fitness and social center space, up to 13,000 gsf community facility space and up to 12,000 gsf of retail space. The Reduced Residential building would have up to 374,361 gsf of office space, up to 80,645 gsf of fitness and social center space, up to 21,329 gsf for community facility uses, and up to 25,000 gsf of retail use. If the building

under either program is all-electric, the residential area and the overall building would be allowed to be 50,000 gsf larger to accommodate additional mechanical equipment.

The proposed arrangement of uses for either program would be as follows: the ground floor (anticipated to be 24 feet high) would contain lobbies for all the different uses and retail space as well as a service area. The second floor is anticipated to be split between office space and a community facility. Floors 3 through 7 would contain offices. It is anticipated that the eighth floor would be a mechanical level, and that the ninth and tenth floors would provide fitness and social center. The upper floors would contain residential units with four outdoor spaces.

As a primarily residential tower, the bulk form of the Proposed Project would be more slender than the commercial tower of the Approved Plan because the residential building would maximize access to windows, while the commercial building would maximize the square footage of the office floor plates. While building materials are not known at this time, it is likely that the façades and façade materials would differ from those of the office tower. The completed office towers on the WTC Site now have glass curtain walls, while most residential buildings have a combination of windows and masonry or other solid elements on their façades.

The Proposed Amendment would include an override of local zoning provisions for the mixed-use building, which would be included in the Design Guidelines administered by ESD (“ESD Design Guidelines”).¹ These Design Guidelines would regulate bulk, massing, and exterior design; the gross square footage of development; ground floor uses and transparency; landscaping; and parking and loading. The ESD Design Guidelines would provide flexibility in redevelopment of the Development Site and support Lower Manhattan’s transition from a predominantly office district to a mixed-use neighborhood. Except for the overrides discussed in detail in Chapter 2 “Land Use, Zoning and Public Policy,” the mixed-use tower would be subject to and conform with the New York City Zoning Resolution as administered by the City’s Department of Buildings. ESD would administer and determine compliance with the ESD Design Guidelines. This EA analyzes the potential environmental impacts of both the Maximum Residential and Reduced Residential programs in comparison to the environmental impacts of the Approved Plan. In order to assure a conservative analysis, in each of the impact areas discussed below, this EA compares the potential impacts of whichever of the two programs has the greater potential impacts with the expected impacts under the Approved Plan.

MAXIMUM RESIDENTIAL PROGRAM

The Maximum Residential Program would include up to 1,270 dwelling units in up to 1,386,898 gsf, up to 180,000 gsf of commercial office use, up to 12,000 gsf of retail use, up to 36,000 gsf of fitness and social center uses, and up to 13,000 gsf for community facility uses. The total development would be up to 1,627,898 gsf. If the building is all-electric, the residential area and the overall building would be allowed to be 50,000 gsf larger to accommodate additional mechanical equipment. This would increase the total building area to 1,677,898 gsf.

The Maximum Residential Program would include an affordable housing component in which a minimum of 25 percent of the residential units would be permanently affordable, as required in the RFP. The provision of affordable housing would be governed by a Regulatory Agreement

¹ The ESD Design Guidelines would provide for provisions of the WTC commercial design guidelines governing retail and signage to apply to the Proposed Project.

issued by the New York State Division of Housing and Community Renewal (HCR). For purposes of analysis, this EA assesses a program in which 25 percent of the units would be affordable.

At approximately 77 stories, the overall building height would be up to 940 feet. As shown on the site plan and the ground floor plan (see **Figures 1-3 and 1-4**), the base would occupy the entire site with a driveway created on the north side of the site for covered vehicular drop-offs. The residential units would have an entrance on the driveway and on Albany Street connected by a through-block lobby. The office entrance would also be on the driveway closer to Greenwich Street. The retail entrances would be on Greenwich Street and Albany Street and the service entrance and loading dock would be on Washington Street. It is anticipated that the community facility space would be on the third level with access from Albany Street via a dedicated elevator.

The proposed project would also have direct public access to and from Liberty Park on the second level (see **Figure 1-5**). Above the mix of uses in the base, the residential tower would rise in a series of setbacks up to a maximum height of 940 feet (see **Figures 1-6 and 1-7**).

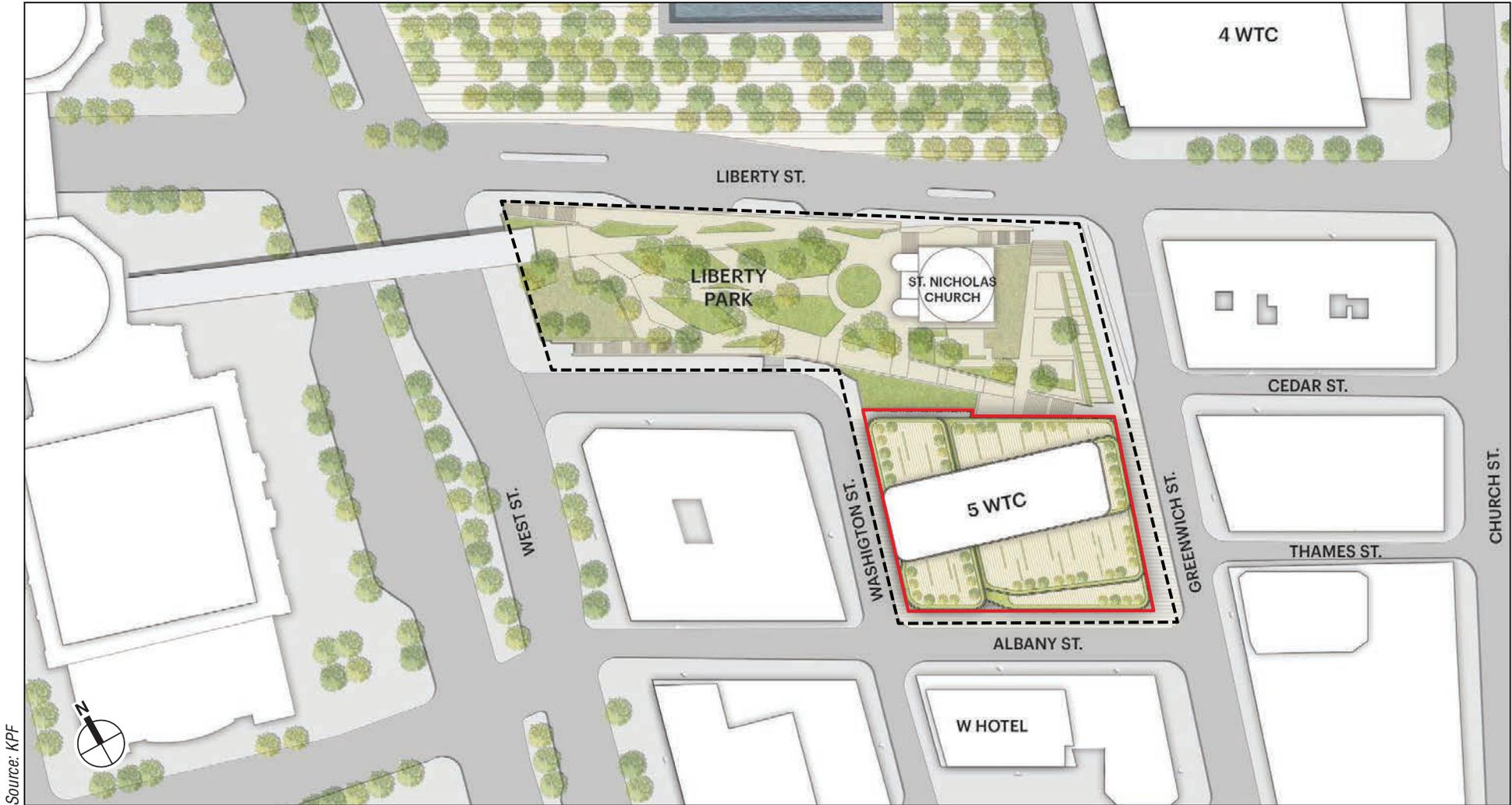
REDUCED RESIDENTIAL PROGRAM

The Reduced Residential Program includes fewer residential units, 1,193 dwelling units in 1,126,563 gsf, but more of the other uses in the building: commercial office space at 374,361 gsf; fitness and social center at 80,645 gsf; community facility at 21,329 gsf; and retail at 25,000 gsf. The overall development total would be the same as the Maximum Residential Program. The site plan, the ground-floor plan, access to Liberty Park, and the requirement for affordable housing would be the same as described for the Maximum Residential Program. If the building is all-electric, the residential area and the overall building would be allowed to be 50,000 gsf larger to accommodate additional mechanical equipment.

G. PROPOSED ACTIONS

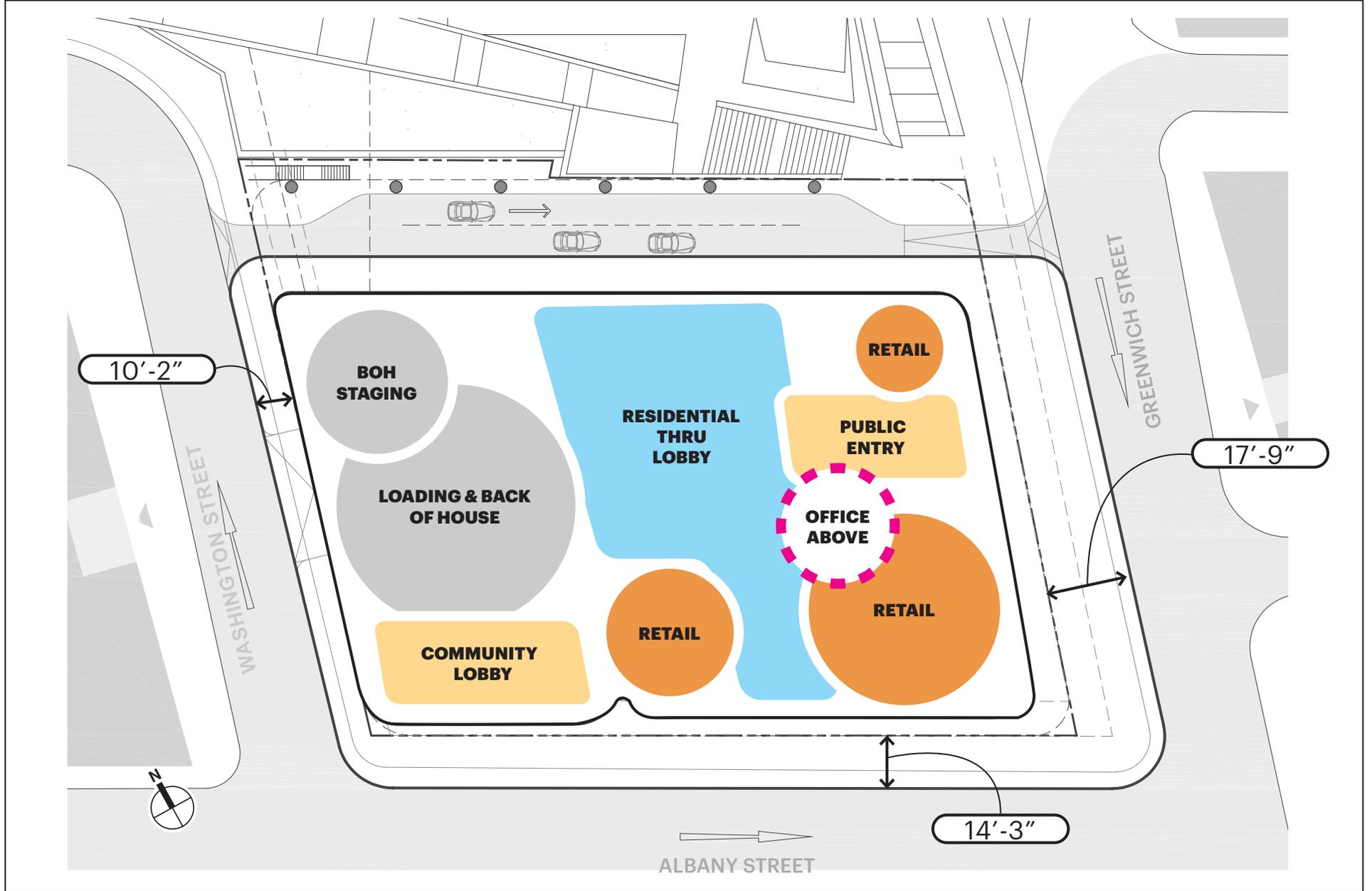
The Proposed Actions—Amendment of the GPP to permit residential and other development on the Development Site, the transfer of the Development Site from LMDC to ESD and the long-term lease of the Development Site to the Developer for development in accordance with the Amended GPP and related actions implementing agreements—require compliance with the following environmental review and regulatory requirements:

- NEPA, along with applicable environmental reviews pursuant to 24 CFR § 58.5;
- SEQRA;
- National Historic Preservation Act, State Historic Preservation Act, and the WTC Memorial and Redevelopment Plan Programmatic Agreement, dated April 22, 2004;
- Any actions required by HUD relating to federal funds used in the original acquisition and improvement of the Development Site;
- New York State Coastal Management Policies;
- New York State Urban Development Corporation Act;
- New York State Public Authorities Law;
- New York State Finance Law;
- Any required Approvals of HCR, the New York State Housing Finance Agency or HUD in connection with the affordable housing portion of the proposed residential development; and
- Approvals of the LMDC, ESD, and the Port Authority in connection with the above.

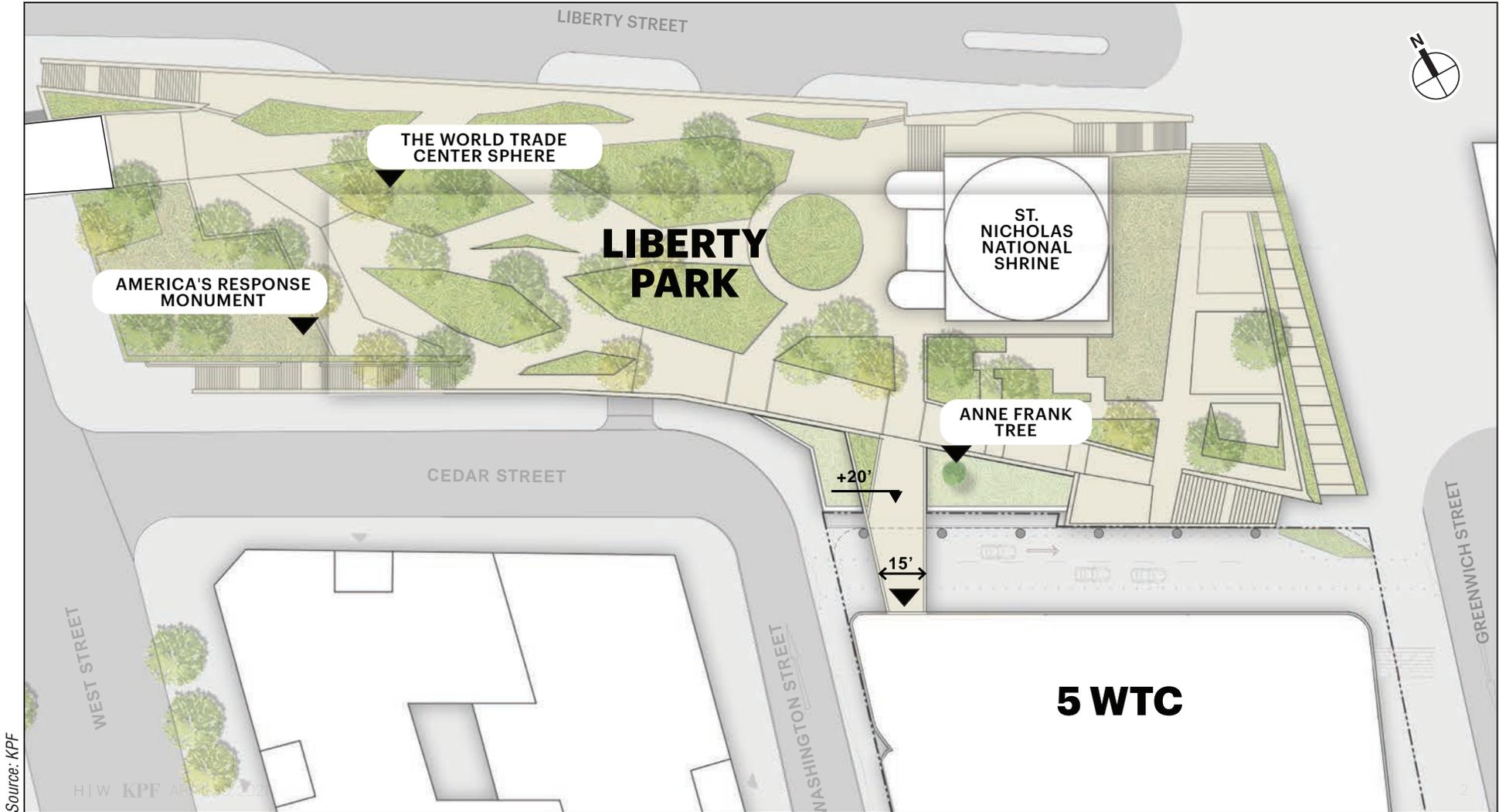


Source: KPF

-  Project Site
-  Development Site (Site 5)



Source: KPF



Source: KPF

HIW KPF APRIL 2021





Source: KPF

Proposed Project View from the corner of
Liberty and Greenwich Streets
Figure 1-7

In addition, the developers would be required to engage in extensive community outreach efforts including presentations to the WTC Site 5 Community Advisory Committee (CAC), Manhattan Community Board 1, and meetings with local elected officials and applicable stakeholders. The Developers' community outreach efforts would continue during the public review process for the Proposed Project and throughout the construction and development periods. The Developer would also be responsible for all construction approvals and permitting subject to the New York City building code as administered by the New York City Department of Buildings, and would be responsible for any additional construction oversight and other restrictions in recognition of the Development Site's status as part of the WTC Site as specified in the proposed Development Site lease.

H. SUMMARY OF FINDINGS

As discussed in detail in the following chapters of this EA, the Proposed Amendment and the Proposed Project it supports have been evaluated for its potential effects on land use, zoning, and public policy, urban design and visual resources, historic resources, open space, shadows, community facilities, socioeconomic conditions, neighborhood character, hazardous materials, water and sewer infrastructure and solid waste services, transportation, air quality, greenhouse gas emissions, noise, coastal zone consistency, natural resources, environmental justice, public health, and construction. Based on this analysis, the Proposed Amendment is not expected to have, either independently or cumulatively with all prior adjustments, refinements, or amendments to the Approved Plan and GPP, any significant adverse environmental impacts not previously disclosed in the 2004 *FGEIS*. *

A. INTRODUCTION

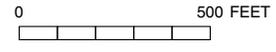
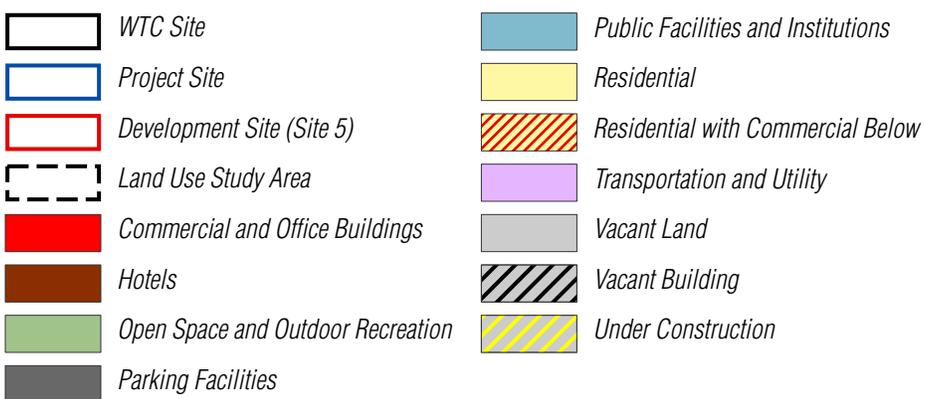
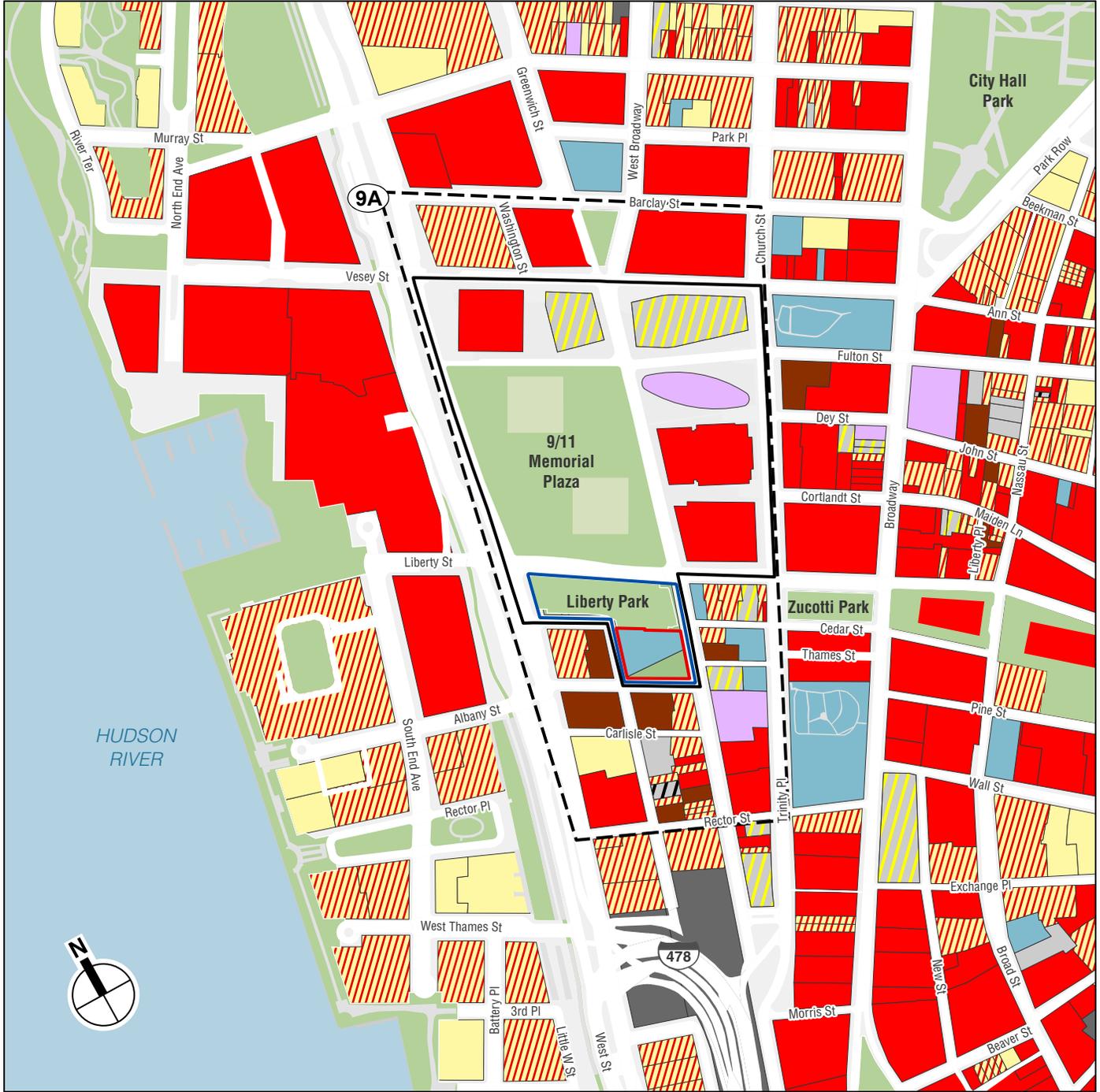
This chapter considers the Proposed Amendment’s potential impacts on land use, zoning, and public policy, within a study area surrounding the Development Site (see **Figure 2-1**). The analysis described in this chapter characterizes existing conditions, evaluates changes in land use and zoning that are expected to occur independently of the Proposed Amendment by the 2028 analysis year, and identifies and addresses any potential impacts to land use, zoning, and public policy associated with the Proposed Amendment, which would permit greater flexibility in future uses by allowing residential and community uses in addition to commercial and retail uses. The assessment presented below concludes that the Proposed Amendment and the Proposed Project which it would allow, would not result in any significant adverse impacts to land use, zoning, and public policy on the Project Site, the Development Site, or in the primary and secondary study areas.

B. METHODOLOGY

The Project Site is located in the Financial District in Lower Manhattan. The land use study area has been adjusted to reflect the geographical context of the area by extending the boundary north to include the entire the WTC Site and areas beyond and further adjusting it to conform to full blocks, as shown in **Figure 2-1**. Therefore, the study area is generally bounded by Barclay Street to the north, Church Street/Trinity Place to the east, Rector Street to the south, and Route 9A/West Street to the west.

The analysis begins by considering existing conditions in the study area in terms of land use, zoning, and public policy. The analysis then projects land use, zoning, and public policy in the future without the Proposed Amendment in the 2028 analysis year by identifying developments and potential policy changes expected to occur within that time frame.

Probable impacts of the Proposed Amendment are then identified by comparing conditions under the Proposed Amendment against projected conditions under the Approved Plan. To examine the full range of impacts, two illustrative programs are considered for the Proposed Project as described in Chapter 1, “Project Description” and below. The analysis considers both Programs in assessing the potential for the Proposed Amendment to result in significant adverse impacts to land use, zoning, and public policy.



C. EXISTING CONDITIONS

LAND USE

DEVELOPMENT SITE/PROJECT SITE

The Development Site (approximately 33,000 square feet [sf]) is bounded by Albany Street to the south, Greenwich Street to the east, Washington Street to the west, and the former bed of Cedar Street to the north (see **Figure 2-1**). The larger Project Site was formerly the Southern Site added to the WTC Site in 2004. At that time, the Project Site included the block occupied by the former Deutsche Bank building that was damaged by the terrorist attacks on September 11, 2001, and the small block to the west containing a church and a paved parking lot. The northern portion of the Project Site (including the former bed of Cedar Street between Greenwich and Washington Streets) was excavated for the construction of the now complete Vehicle Security Center (VSC). Liberty Park is located on top of the VSC, and the new St. Nicholas Greek Orthodox Church is currently under construction at its eastern end.

The damaged Deutsche Bank building, formerly located on the Project Site including the Development Site, was decontaminated and deconstructed in 2011. When the National September 11 Memorial and Museum opened, a platform on the south end of the Development Site served as the queuing area for the Memorial's visitors before they proceeded through security and entered the plaza; this portion of the site is now a temporary public plaza area. To the north, the Development Site is currently occupied by construction trailers containing the Port Authority Police Department World Trade Center Command Center.

STUDY AREA

As noted above, the study area is located in the Financial District of Lower Manhattan in Community District 1 and comprises the WTC Site, including the Project Site, as well as certain blocks to the north, south, and east. To the east, south, and west of the Project Site are a variety of old, new, small, and large buildings that are occupied by a mix of uses.

Liberty Street between Greenwich and West Streets is only accessible to vehicles entering and leaving the VSC. To the north of Liberty Street, the Memorial Plaza opened to visitors on September 12, 2011, followed by the opening of the Memorial Museum on May 21, 2014. The Memorial Plaza encompasses an approximately 6.6-acre area with two cascading pools marking the one-acre footprints of the former Twin Towers. The pavement is relieved with plantings and oak trees. The outer walls of the pools are inscribed with the names of the 2,983 individuals who died as a result of the September 11th attacks and the February 1993 WTC bombing.

Northeast of the Project Site, between Greenwich and Church Streets to the north of Liberty Street are, from south to north, the completed Towers 4 and 3, the Oculus transportation hub and underground shopping complex, and the site of the future Tower 2. Tower 4, completed in 2013, is 978 feet tall and contains approximately 1.8 million sf of office and retail space. Tower 3, completed in 2018, is 1,079 feet tall and contains approximately 2.0 million sf of office and retail space. The Oculus, the 160-foot-tall aboveground entrance to the WTC Transportation Hub, was completed in 2016 and provides access to Port Authority Trans-Hudson (PATH) trains to New Jersey and the New York City Transit (NYCT) Subway as well as the underground Westfield World Trade Center retail mall. Fulton Street (closed to public vehicle traffic) to the north of the Oculus separates it from the site of the future Tower 2. Tower 2 has been constructed to grade

level, but construction otherwise remains paused with only entrances to the Oculus mechanical equipment in industrial structures and a seasonal Beer Garden at grade. West of the Tower 2 site and the north of the Memorial Plaza are the under-construction PACWTC and the completed Tower 1. The PACWTC, located on the former location of a temporary entrance to the PATH train platforms, is anticipated to be completed in 2023, will be 138 feet tall, and will contain approximately 90,000 sf of performance space. Tower 1 was completed in 2014 and rises to 1,776 feet. It contains approximately 3.5 million sf of office and retail space as well as a public observatory. The two buildings are separated by a plaza area.

The portion of the study area to the east, south, and west of the Project Site has long been an underutilized area of Lower Manhattan, cut off from Tribeca to the north by the WTC superblock that closed Washington and Greenwich Streets. Today it contains a mix of residential and hotel uses in converted and new buildings with additional ongoing construction. This portion of the study area is part of a larger emerging neighborhood called Greenwich South, an area the Downtown Alliance has identified as having the potential to contain a denser and more diverse mix of uses (commercial, residential, retail, and tourism).

The block bounded by Trinity Place and Liberty, Cedar, and Greenwich Streets east of the Project Site contains three smaller residential-use buildings with ground-floor retail, one small retail building, and an under-construction hotel at 112 Liberty Street. The west end of the block is occupied by the New York City Fire Department (FDNY) Ten House—Engine Company 10 and Ladder Company 10. The block to the south, directly east of the Development Site, includes an older building containing residential uses with ground-floor retail at its northwest corner, a Courtyard Marriott hotel at the southwest corner, and the High School of Economics and Finance facing Trinity Place (serving approximately 650 students) on its eastern side. The block to the southeast of the Project Site includes an under-construction residential tower at 125 Greenwich Street, east of which is the High School for Leadership and Public Service at 88 Trinity Place (serving approximately 815 students). South of these are the American Stock Exchange Annex, the recently completed Trinity Commons mixed-use tower, and 101 Greenwich Street, an older recently renovated office tower.

The block directly south of the Project Site between Greenwich and Washington Streets is occupied by the W New York Residences and Hotel tower and 120 Greenwich Street, a former commercial building converted to residential use. Farther south of 120 Greenwich Street is a block with a mix of smaller older buildings and newer larger buildings containing residential with commercial below, commercial, hotel, and vacant uses. Southwest of the Project Site across Washington and Cedar Streets is the Club Quarters Hotel. The building west of this hotel, 90 West Street, was severely damaged on September 11, 2001, but its exterior has been extensively restored and its interior converted to residential use. South of 90 West Street, the Marriott Hotel occupies the entire block. South of the Marriott, to the southwest of the Project Site, Post Towers, a former office building that was converted to residential use, occupies half of a city block at 71 West Street; another older office building is located at 40 Rector Street.

In the northern portion of the study area, to the north of Vesey Street between Church Street and Route 9A/West Street are, from east to west, 90 Church Street, the Silverstein Family Park, Tower 7, and New York Telephone Company (Barclay-Vesey) Building. Ninety Church Street and the New York Telephone Company Building are both older office buildings that were damaged on September 11, 2001, but have since reopened. Ninety Church Street contains a U.S. Post Office with offices above, and the New York Telephone Company Building contains reduced Verizon operations as well as residential units with some retail uses in its base. Tower 7, completed in

WTC Site 5

2006, is 743 feet tall and contains approximately 1.7 million sf of office space. The Silverstein Family Park is a 0.5-acre triangular paved plaza with landscape beds and a circular fountain. The plaza was built on a portion of the pre-September 11, 2001 WTC 7 site located between West Broadway and an extended Greenwich Street.

Besides hotels, commercial uses in the study area generally include ground-floor retail and office buildings. The ground-floor retail uses include restaurants and neighborhood services that cater to the office workers and residents in the area. The New York Stock Exchange and the former Chase Manhattan Bank headquarters are located in a portion of the Financial District east of the study area and Battery Park City is located to the west. To the north of the study area is the neighborhood of TriBeCa and to the south is Greenwich South. Farther to the south, the west, and the east are the waterfronts of New York Harbor, the Hudson River, and the East River, all of which now have ample open spaces. In particular the East River Esplanade was partially sponsored by LMDC as recipient of HUD Community Development Block Grant program funds as part of the recovery after September 11, 2001.

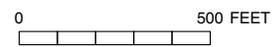
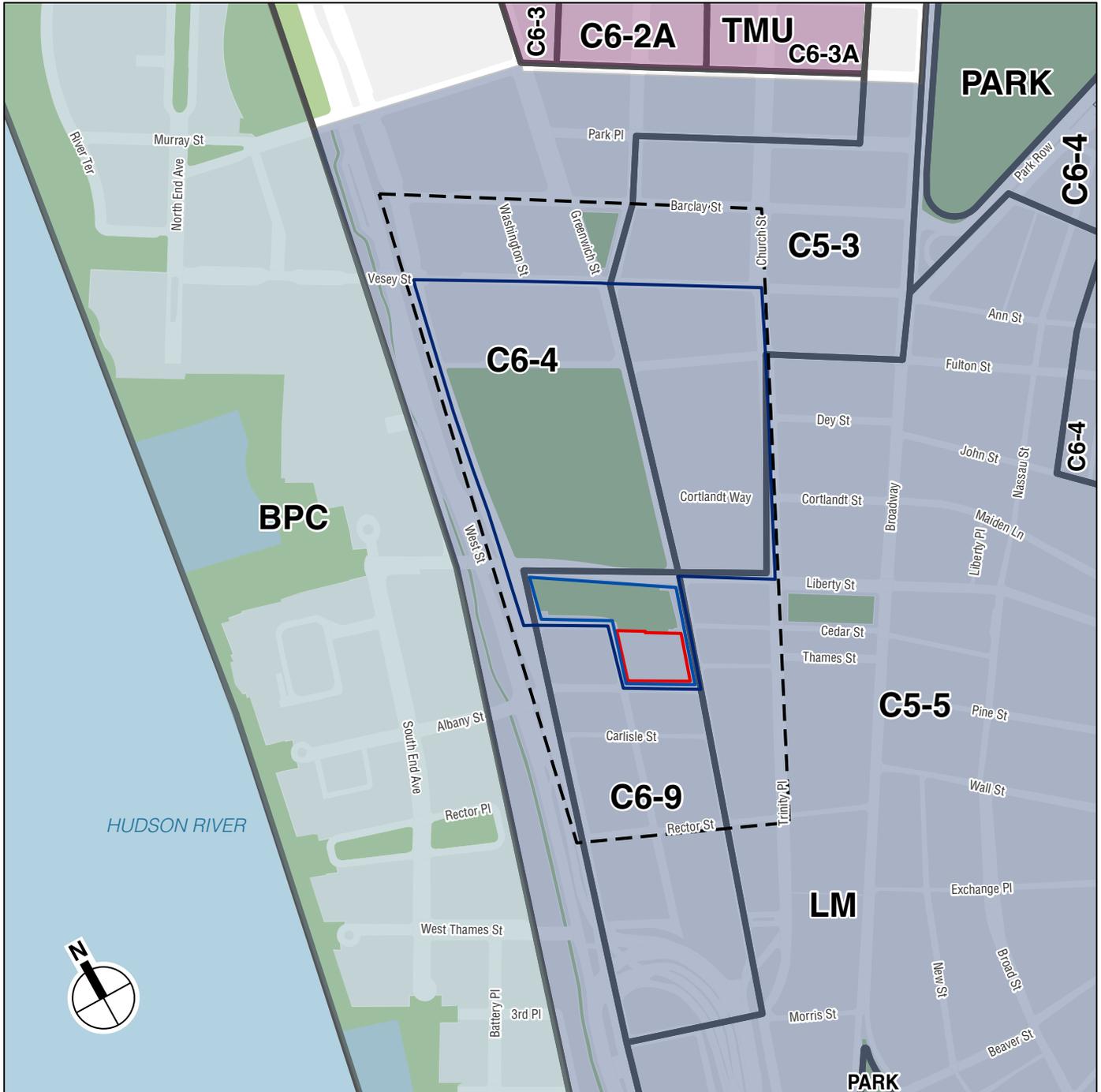
ZONING

PROJECT SITE

The Project Site is located in a C6-9 zoning district that covers the blocks between Greenwich and West Streets from Liberty Street in the north to Morris Street in the south, and the Special Lower Manhattan District. The Special Lower Manhattan District covers the area east of Route 9A/West Street and south of Murray Street, City Hall Park and the approaches to the Brooklyn Bridge, which includes the Project Site and the entire study area (see **Figure 2-2**). However, the Development Site is being developed pursuant to the New York State Urban Development Corporation Act (the “UDC Act”) and the WTC Memorial and Cultural Program General Project Plan (GPP), which includes overrides of the otherwise applicable zoning requirements, and the ESD Design Guidelines to be administered by ESD.

STUDY AREA

The WTC Site to the north of the Project Site is split between a C5-3 district in the east and a C6-4 district in the west, and is subject to the WTC Act exemption from local law as well as the WTC Memorial and Cultural Program GPP which includes overrides of certain otherwise applicable zoning requirements. The C5-3 district extends from Liberty and Fulton Streets in the south to Park Place and Chambers Street between Broadway and Greenwich Street in the north. The C6-4 district extends from Liberty Street in the south to Murray and Hubert Streets in the north (a portion also follows the path of Route 9A/West Street south to the tip of Manhattan). These C5-3 and C6-9 districts also cover the northernmost portion of the study area north of Vesey Street. The C6-9 district in which the Project Site is located covers the southwestern portion of the study area, while the southeastern portion lies in a C5-5 district. The C5-5 district covers much of the Financial District south of Fulton Street broadly between Water and Greenwich Streets. The zoning districts in the study area are summarized in **Table 2-1**.



- WTC Site
- Project Site
- Development Site (Site 5)
- Land Use Study Area
- Zoning District Boundary
- BPC Special Battery Park City District
- LM Special Lower Manhattan District
- TMU Special Tribeca Mixed Use District
- Parks

**Table 2-1
Zoning Districts in the Land Use Study Areas**

Zone	Allowable Floor Area Ratio (FAR) ¹	Use
C5-5	15.0 Commercial ² ; 10.0 Residential ² ; 15.0 Community Facility ²	Central commercial district with continuous retail frontage intended for offices and retail establishments that serve the entire metropolitan region.
C6-4	10.0 Commercial ² ; 10.0 Residential ^{2,3} ; 10.0 Community Facility	High-bulk commercial district for uses requiring a central location, typically mapped within the city's major business districts
C6-9	15.0 Commercial ² ; 10.0 Residential ³ ; 15.0 Community Facility	High-bulk commercial district for uses requiring a central location, typically mapped within the city's major business districts
C5-3	15.0 Commercial ² ; 10.0 Residential ² ; 15.0 Community Facility ²	Central commercial district with continuous retail frontage intended for offices and retail establishments that serve the entire metropolitan region.
Notes: 1. FAR is a measure of density establishing the amount of development allowed in proportion to the base lot area. For example, a lot of 10,000 sf with a FAR of 1 has an allowable building area of 10,000 sf. The same lot with an FAR of 10 has an allowable building area of 100,000 sf. 2. Can be increased with 20% public plaza bonus. 3. Can be increased with Inclusionary Housing bonus. Sources: New York City Zoning Resolution		

The Special Lower Manhattan District was created to enhance the vitality of Lower Manhattan, which included not only the oldest central business district in New York City, but also a growing residential community. The district regulations allow for the conversion of older commercial buildings to residential use, with the goal of encouraging a dynamic mix of uses in the area while protecting the distinctive skyline and old street patterns. Buildings are controlled by height and setback regulations and there are requirements for retail continuity, pedestrian circulation space, and subway station improvements.

PUBLIC POLICY

LOWER MANHATTAN DEVELOPMENT CORPORATION

In the aftermath of September 11, 2001, Governor Pataki and Mayor Giuliani formed LMDC to help plan and coordinate the rebuilding and revitalization of Lower Manhattan, defined as the area south of Houston Street, including the Development Site and the entire WTC Site. LMDC is charged with assisting Lower Manhattan in the recovery from the attacks on the WTC and ensuring that it becomes a strong and vibrant 21st century community. Since its inception, LMDC has worked in cooperation with public- and private-sector partners to coordinate long-term planning for the WTC Site and surrounding communities, while pursuing short-term initiatives that have improved the quality of life in Lower Manhattan during the revitalization effort. The plan for Lower Manhattan calls for the public and private sectors to partner in support of Lower Manhattan's growth and revitalization beyond the borders of the WTC Site, and to strike the appropriate balance between the commercial uses planned for the WTC Site and the need to develop Lower Manhattan as a viable, full-service New York community.

DOWNTOWN-LOWER MANHATTAN BUSINESS IMPROVEMENT DISTRICT

The Downtown Alliance manages the Downtown-Lower Manhattan Business Improvement District (BID), the largest BID in the City extending from City Hall to the Battery Tunnel (or Hugh L. Carey Tunnel) from the East River to West Street. The mission of the Downtown Alliance is to

provide service, advocacy, research, and information to advance Lower Manhattan as a global model of a 21st century central business district (CBD) for businesses, residents, and visitors. The Downtown Alliance strives to promote Lower Manhattan as a world-class destination to live, work, and play by creating a vibrant, multi-use neighborhood where businesses can prosper and the residential community can flourish. Relating to the Proposed Amendment and the area to the east, south, and west of the Project Site, the Downtown Alliance has developed its Greenwich South Plan to encourage a diverse mix of uses in this area, create a neighborhood within a business district, encourage active uses in building bases, and add cultural destinations to attract repeat visitors.

NEW YORK LIBERTY BOND PROGRAM

To support the rebuilding and revitalization of New York City in the wake of the attacks of September 11, 2001, the New York Liberty Bond Program was introduced as a cooperative program between New York Liberty Development Corporation, New York City Industrial Development Agency (IDA), New York State Housing Finance Agency (HFA), and New York City Housing Development Corporation (HDC). These agencies offered tax-exempt financing for the construction and renovation of commercial and residential properties to rebuild Lower Manhattan after the September 11 attacks. The goal of the program was to create a 24/7 mixed-use and diversified community in Lower Manhattan by repairing and replacing damaged and destroyed commercial space; creating additional multifamily residential and neighborhood retail development; providing modern office space for displaced and decentralized businesses; attracting new residents and employers to New York City; and encouraging environmentally responsible design and construction. A number of residential and commercial developments in the area were funded through the program, including restoration and renovation of 90 West Street and 90 Washington Street. The program ended in 2011.

HOUSING NEW YORK

On May 5, 2014, the de Blasio administration released *Housing New York*, a plan intended to build and preserve 200,000 affordable homes over the coming decade to support New Yorkers with a range of incomes. To achieve this goal, the plan aimed to double New York City Department of Housing Preservation and Development (HPD)'s capital budget, target vacant and underused land for new development, protect tenants in rent-regulated apartments, streamline rules and processes to unlock new development opportunities, contain costs, and accelerate affordable housing construction. In 2017, the de Blasio administration released *Housing New York 2.0*, an updated and expanded plan that increased the city's goal to 300,000 affordable homes by 2026 and introduced new initiatives to achieve this goal. The plan details the key policies and programs for implementation, including developing affordable housing on underused public and private sites, facilitating homeownership, preventing displacement, creating more homes for seniors, protecting Mitchell-Lama moderate- and middle-income buildings, and utilizing innovative design techniques, such as modular building and micro-units. In calendar year 2019, the City financed 25,889 affordable DUs. This includes 15,692 preserved affordable DUs and 10,197 new affordable DUs—a record for new construction. This brings the total number of affordable DUs financed under *Housing New York* to 147,933. In 2019, New York City financed a record-breaking 3,030 affordable DUs for people experiencing homelessness and 1,482 affordable DUs of supportive housing. Nearly 85 percent of all homes financed through Mayor de Blasio's housing plan are affordable to low-income New Yorkers; more than 40 percent of these homes will serve families earning less than 50 percent of Area Median Income (AMI).

ONENYC

In April 2007, the Mayor’s Office of Long Term Planning and Sustainability released PlaNYC: A Greener, Greater New York (PlaNYC). Since that time, updates to PlaNYC have been issued that build upon the goals set forth in 2007 and provide new objectives and strategies. In 2015, One New York: The Plan for a Strong and Just City (OneNYC) was released by the Mayor’s Office of Sustainability and the Mayor’s Office of Recovery and Resiliency. OneNYC builds upon the sustainability goals established by PlaNYC and focuses on growth, equity, sustainability, and resiliency.

WATERFRONT REVITALIZATION PROGRAM

The Project Site is located in the Coastal Zone designated by New York State and City (see **Figure 2-3**) and is therefore subject to the Coastal Zone management policies of both the City and the State. The New York City Waterfront Revitalization Program (WRP) is the City’s primary coastal zone management tool. The WRP is made up of 10 major policies focusing on the goals of improving public access to the waterfront; reducing damage from flooding and other water-related disasters; protecting water quality, sensitive habitats like wetlands and the aquatic ecosystem; reusing abandoned waterfront structures; and promoting development with appropriate land uses. An assessment of the Proposed Amendment’s consistency with the WRP is provided in Chapter 16, “Coastal Zone Consistency.”

EXECUTIVE ORDER 11988

As the Project Site is located within a floodplain, the project is subject to Code of Federal Regulations Title 24 §55 Floodplain Management, which implements Executive Order (EO) 11988. This executive order and federal regulations resulting from it are intended to: (1) assert leadership in reducing flood losses and losses to environmental values served by floodplains; (2) avoid actions located in or adversely affecting floodplains unless there is no practicable alternative; (3) take action to mitigate losses if avoidance is not practicable; and (4) establishes a process for flood hazard evaluation based on the 100-year base flood standard of the National Flood Insurance Program (NFIP) as well as directing federal agencies to issue implementing procedures, provides a consultation mechanism for developing the implementing procedures, and provides oversight mechanisms. An assessment of the Proposed Amendment’s consistency with EO 11988 is provided in Chapter 16, “Coastal Zone Consistency.”

D. THE FUTURE WITHOUT THE PROPOSED AMENDMENT

PROJECT SITE

In the future without the Proposed Amendment, the Approved Plan for the Development Site is an office tower. As contemplated in the 2004 *FGEIS*, it would be an approximately 57-story office tower with ground-floor retail uses. While the Approved Plan resulted in a change in land use on the Development Site as compared with the existing Port Authority Police Department WTC Command Center and public plaza uses, the new office and retail use would be consistent with past uses and the redevelopment of the larger WTC Site. On the remainder of the Project Site, the VSC and Liberty Park, would each remain in its current condition, while it is expected that St. Nicholas Greek Orthodox Church would be completed at the eastern end of Liberty Park.



0 500 FEET

-  WTC Site
-  Project Site
-  Development Site (Site 5)
-  Coastal Zone



STUDY AREA

In the larger WTC Site, the PACWTC would be completed by the 2028 analysis year. For the purposes of environmental review, it is also conservatively assumed that Tower 2 would be completed as contemplated in the 2004 *FGEIS*. Future development in the study area is expected to follow trends similar to the primary study area. As shown in **Table 2-2**, there are two additional projects in the remainder of the study area anticipated to be completed by the analysis year, 125 Greenwich Street (also known as 22 Thames Street) and 112 Liberty Street. Cumulatively, 273 DUs, 2,200,000 gsf of office uses, 67,027 gsf of retail uses, 104,700 gsf of community facility uses, and 1,030 hotel rooms are anticipated to be developed within the land use study area by the 2028 analysis year. Within the larger socioeconomic and open space study areas assessed in Chapter 8, “Socioeconomic Conditions” and Chapter 5, “Open Space,” 2,067 DUs (including 63 affordable DUs), 2,251,317 gsf of office uses, 271,698 gsf of retail uses, 271,788 gsf of community facility uses, and 2,228 hotel rooms are anticipated to be developed by the 2028 analysis year.

ZONING AND PUBLIC POLICY

The development of an office tower with ground-floor retail on the Development Site in the future without the Proposed Amendment would be consistent with pre-existing zoning and neighboring commercial uses and would add to the amount of modern office space in the Lower Manhattan business district. However, it would not advance the policy goals of making Lower Manhattan a viable, full-service community with an appropriate balance between commercial and residential development, nor would it advance the goals of *Housing New York* to build or preserve affordable housing.

The goals of the public policies relating to the Project Site would be partially met in the future without the Proposed Amendment and would be consistent with the goals of the Downtown-Lower Manhattan BID. An assessment of the consistency with EO 11988 and the WRP under the future without the Proposed Amendment is provided in Chapter 16, “Coastal Zone Consistency.”

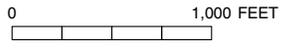
There are no notable changes to zoning or public policy anticipated on the Development Site, Project Site, or elsewhere in the primary or secondary study areas under the future without the Proposed Amendment.

**Table 2-2
Development Projects Planned for the Study Area**

Map No. ¹	Project Name	Address / Location	Program	Status / Build Year
Land Use Study Area				
1	Tower 2	Northeast corner of Fulton and Greenwich Streets	2.2 million sf of office; 57,000 sf of retail; 600,000 sf of hotel (800 rooms)	Assumed complete by 2028
2	Performing Arts Center at the World Trade Center (PACWTC)	Northwest corner of Fulton and Greenwich Streets	90,000 sf of performing arts	2023
3	125 Greenwich Street/ 22 Thames Street	Southeast corner of Thames and Greenwich Streets	273 DUs; ~10,000 sf of retail	Construction stalled; assumed complete by 2028
4	St. Nicholas Greek Orthodox Church	Southwest corner of Liberty and Greenwich Streets	~1,200 sf of community facilities	2021
5	112 Liberty Street	South side of Liberty Street between Greenwich and Church Streets	230 Hotel Rooms	Assumed to be complete by 2028
Socioeconomic/Open Space Study Areas (Census Tracts 7, 9, 13, 15.01, 15.02, 21, 317.03, 317.04, 319)²				
6	One Wall Street	Eastern side of Broadway at Rector Street	566 DUs; 122,000 sf of retail	2021
7	50 Trinity Place	Southwest corner of Trinity Place and Rector Street	180 Hotel Rooms; ~4,000 sf of retail	2021
8	185 Broadway	West side of Broadway between Dey Street and Cortlandt Street	209 Market Rate DUs and 63 Affordable DUs; ~15,000 sf of retail; ~27,000 sf of office	2021
9	8 Maiden Lane	South side of Cortlandt Street between Broadway and Liberty Pl	198 Hotel Rooms	Assumed to be complete by 2028
10	42 Trinity Place	West side of Trinity Place between Rector and Edgar Street	90 DUs; ~5,000 sf of retail; ~80,000 sf of community facilities	2021
11	86 Warren Street	North side of Warren Street between Greenwich Street and West Broadway	~12,000 sf of residential, ~50,000 sf of hotel (70 Hotel Rooms)	Assumed to be complete by 2028
12	11 Stone Street	North side of Stone Street between Whitehall Street and Broad Street	130 Hotel Rooms	2021
13	7 Hanover Square	Southern corner of Pearl Street and Hanover Square	~717,000 sf of office	Assumed to be complete by 2028
14	120 Water Street	Northern corner of Water Street and Wall Street	128 Hotel Rooms	2021
15	82 Wall Street	North side of Wall Street between Pearl Street and Water Street	181 Hotel Rooms	2021
16	59 Warren Street	South side of Warren Street between West Broadway and Church Street	23 DUs; ~15,000 sf of retail	Assumed to be complete by 2028
17	161 Maiden Lane	Bounded by South Street, Front Street, Fletcher Street, Maiden Lane	98 DUs	2021
18	212 Pearl Street	South side of Pearl Street between Fletcher Street and John Street	48 Hotel Rooms	2026
19	7 Platt Street	North side of Platt Street between Gold Street and Pearl Street	250 DUs; 172 Hotel Rooms	Assumed to be complete by 2028
20	130 William Street	East side of William Street between Fulton Street and John Street	242 DUs; ~18,000 sf of retail	2021
21	83 Nassau Street	West side of Nassau Street between Fulton Street and John Street	229 DUs; ~24,000 sf of retail; ~24,000 sf of office	2022
22	21 Park Place	Bounded by Park Place, Murray Street, Broadway and Church Street	11 Hotel Rooms	Assumed to be complete by 2028
23	265-267 Broadway	West side of Broadway between Chambers Street and Warren Street	37 DUs; 80 Hotel Rooms	Assumed to be complete by 2028
24	South Street Seaport Museum Expansion	Southern corner of Front Street and Fulton Street	~87,000 sf of community facilities	2026
25	45 Park Place	North side of Park Place between West Broadway and Church Street	50 DUs; ~1,200 sf of retail	Assumed to be complete by 2028
Notes:				
¹ See Figure 2-4.				
² This table includes anticipated No Action development projects outside of the Land Use study area, that are within the study areas established for other technical areas, such as Socioeconomics and Open Space.				
Sources: New York City Department of Buildings; http://www.renewnyc.com ; newyorkyimby.com ; field visits, May 2021.				



- WTC Site
- Project Site
- Development Site (Site 5)
- Land Use Study Area
- 1 No Build



E. THE FUTURE WITH THE PROPOSED AMENDMENT

LAND USE

PROJECT SITE

In the future with the Proposed Amendment, the Development Site would be redeveloped with a mixed-use building containing residential (including affordable residential), commercial office, retail, fitness and social center, and community facility uses. The remainder of the Project Site, including the VSC and Liberty Park, would remain in its current condition, except for the completion of St. Nicholas Greek Orthodox Church at the eastern end of Liberty Park. Both the Maximum Residential Program and the Reduced Residential Program for the Development Site are considered in this analysis. At approximately 77 stories, the overall building height would be up to 940 feet tall under either program.

Both the Maximum Residential Program and the Reduced Residential Program would include an affordable housing component in which a minimum of 25 percent of the DUs would be permanently affordable, as required by the RFP.

Maximum Residential Program

The Maximum Residential Program would include up to 1,270 DUs in 1,386,898 gsf, 180,000 gsf of commercial office use, 12,000 gsf of retail use, and 36,000 gsf of fitness and social center uses, as well as 13,000 gsf for community facility uses. The total development would be 1,627,898 gsf. If the building is all-electric, the residential area and overall building would be allowed to be 50,000 gsf larger to accommodate additional mechanical equipment. This would increase the total building area to 1,677,898 gsf.

Reduced Residential Program

The Reduced Residential Program would include fewer residential units, up to 1,193 DUs in 1,126,563 gsf, but more commercial office space at 374,361 gsf and more retail at 25,000 gsf than the Maximum Residential Program. The gross square footage of the fitness and social center would be larger at 80,645 gsf. The community facility space would be larger at 21,329 gsf. However, the overall development total would be the same as the Maximum Residential Program. As with the Maximum Residential Program, if the building under the Reduced Residential Program is all-electric, the residential area and the overall building would be allowed to be 50,000 gsf larger to accommodate additional mechanical equipment. This would increase the total building area to 1,677,898 gsf.

STUDY AREA

In the future with the Proposed Amendment, residential uses on the Development Site would be different from completed and planned uses on the remainder of the WTC Site, and the office area on the overall WTC Site would be reduced by between approximately 925,000 gsf and 1.1 million gsf. However, in addition to the millions of square feet of office space that have already been completed on the WTC Site, an additional approximately 2.3 million sf of office space is anticipated to be developed in Tower 2. When compared to the future without the Proposed Amendment, a mixed-use tower on the Development Site would better fulfill LMDC's goal of creating a strong and vibrant 21st century business district in the study area, by integrating the mix of residential, commercial office, retail, community facility, and other uses to create a more

dynamic district. The proposed residential uses would be consistent with residential uses to the east, south, and west of the Project Site, and would also be in keeping with a recent trend of increased residential development in the Lower Manhattan area as it becomes a mixed-use neighborhood.

The building in the future with the Proposed Amendment would be consistent with the height and bulk of neighboring buildings, which include large commercial, residential, and hotel towers. Overall, the Proposed Amendment would not result in any significant adverse impacts to land use on the Development site, the Project Site, or in the study area.

ZONING

The Proposed Amendment would allow the development of a mixed-use tower with residential, health and fitness, and community facility uses, in addition to the commercial office and retail uses currently authorized on the Development Site. For the mixed-use building, the Proposed Amendment would override certain local zoning provisions, including the Special Lower Manhattan District regulations. Specifically, the zoning provisions that would be overridden are: (1) the requirement for a special permit for a physical culture establishment; (2) the definition of “zoning lot,” to allow for creation of a zoning lot consisting of the Project Site; (3) the maximum floor area ratio (FAR) of 15.0, to allow an FAR of 15.0 for the building without regard to floor area attributable to improvements on the other portions of the Project Site (such as St. Nicholas Church); (4) the residential base FAR, to increase the residential FAR from 10.0 to 12.0; (5) regulations governing height, setback and lot coverage controls, maximum horizontal dimensions for tall buildings, curb cuts, pedestrian circulation space, lobby space permitted on Greenwich Street, and the location of retail space; and (6) other zoning limitations, including provisions of the Special Lower Manhattan District regulations, as necessary to construct the project in conformity with the final ESD Design Guidelines.

The ESD Design Guidelines would regulate bulk, massing, and exterior design; the gross square footage of development; ground floor uses and transparency; landscaping; parking and loading; and signage. The ESD Design Guidelines would provide flexibility in redevelopment of the Development Site and support Lower Manhattan’s transition from a predominantly office district to a mixed-use neighborhood. Except for the above overrides, the mixed-use tower would be subject to and conform with the New York City Zoning Resolution as administered by the City’s Department of Buildings. ESD would administer and determine compliance with the ESD Design Guidelines.

The Proposed Project would be consistent with the height and bulk of neighboring buildings, which include large commercial, residential, and hotel towers. The use of the ESD Design Guidelines to regulate bulk, massing, and exterior design; the gross square footage of development; ground floor uses and transparency; landscaping; parking and loading; and signage is intended to support Lower Manhattan’s transition from a predominantly office district to a mixed-use neighborhood, while providing flexibility in the redevelopment of the Development Site. Except for the above overrides, the mixed-use tower would be subject to an conform with the New York City Zoning Resolution as administered by the City’s Department of Buildings. Overall, the Proposed Amendment would not result in any significant adverse impacts to zoning on the Development site, the Project Site, or in the study area.

PUBLIC POLICY

The Proposed Amendment would not include any changes to public policy on the Project Site or in the study area and would be consistent with the public policies that currently govern the site and the surrounding area. The Maximum Residential and Reduced Residential Programs for the Development Site would both be compatible with the goals of the Downtown-Lower Manhattan BID and with its Greenwich South Plan. A mixed-use tower on the Development Site containing residential, commercial office, retail, community facility, and other uses would better fulfill the public policy goals of balancing the development of Lower Manhattan as a commercial center with the benefits of a mixed-use neighborhood. The Proposed Amendment would support the goals of *Housing New York* with a minimum of 25 percent of the proposed DUs being affordable whereas there would be no new affordable DUs in the future without the Proposed Amendment. The introduction of a new mix of uses, including affordable DUs, to the Lower Manhattan area would support OneNYC's focus on growth and equity. The design of the Proposed Project would support OneNYC's focus on sustainability and resiliency, as described in Chapter 14, "Climate Change." The Proposed Amendment is also consistent with the goals and objectives of EO 11988 and the WRP, as described in Chapter 16, "Coastal Zone Consistency." Overall, the Proposed Amendment would not result in any significant adverse impacts to public policy.

As described above, the Proposed Amendment would not result in any significant adverse impacts to land use, zoning, or public policy on the Development Site, the Project Site, or in the study area.

*

A. INTRODUCTION

This chapter considers the potential of the Proposed Amendment, allowing residential and community facility use on WTC Site 5 (the Development Site), to affect the urban design character and visual resources of the study area. Urban design characteristics include components that may affect a pedestrian's experience of public space. These components include streets, buildings, visual resources, open spaces, natural resources, and wind. An urban design assessment must consider whether and how a project may change the experience of a pedestrian in a project area. The analysis provided below addresses urban design characteristics and visual resources for existing conditions and the future without and with the Proposed Amendment (i.e., the Approved Plan and Proposed Project conditions). As described below, this assessment concludes that the Proposed Project would not result in any significant adverse impacts to urban design and visual resources from the pedestrian's perspective.

B. METHODOLOGY

This assessment of urban design and visual resources considers the potential for a pedestrian to observe, from the street level, a physical alteration beyond that allowed by existing zoning. As the proposed development would potentially result in a building on the project site different than the Approved Plan, an assessment of potential impacts to urban design and visual resources is provided in this chapter.

When compared with the previously approved approximately 57-story office tower with ground-floor retail, the Proposed Project would allow for greater flexibility in the future development of the project site by allowing a different mix of uses to include residential and community facility uses in addition to commercial office and retail uses and an increase in allowed height from 900 feet to 940 feet.

As described in Chapter 1, "Project Description," two programs were created to assess the potential impacts of the Proposed Project. Both the Maximum Residential and the Reduced Residential buildings would rise to approximately 77 stories and be up to approximately 940 feet in height. As the urban design characteristics for the two programs are similar, this chapter analyses both programs.

The study area for urban design is the area where the project may influence land use patterns and the built environment. Therefore, the primary study area has been delineated as the area generally bounded by West Street/Route 9A to the west, Rector Street to the south, Trinity Place/Church Street to the east, and Barclay Street to the north (see **Figures 3-1 and 3-2**).



-  Study Area
-  WTC Site
-  Project Site
-  Development Site (Site 5)

0 400 FEET



WTC SITE 5

Aerial
Figure 3-2

C. EXISTING CONDITIONS

URBAN DESIGN

PROJECT SITE

The northern portion of the Development Site is currently occupied by the Port Authority Police Department (PAPD) Command Center in stacked construction trailers visible over the surrounding fence. The southern portion of the site is now a temporary public plaza area (see views 1 and 2 of **Figure 3-3**).

PRIMARY STUDY AREA

The topography of the study area slopes down to the south and west. The grid is somewhat irregular; West Street/Route 9A, Washington Street, and Greenwich Street travel parallel to each other at a slight northwest–southeast direction, while Church Street/Trinity Place is laid out in a more north–south direction. As a result, the blocks in the study area have irregular trapezoidal shapes. In general, the blocks south of Liberty Street in the study area are different sizes due to the presence of narrower, east–west streets, such as Albany, Thames, Cedar, and Carlisle Streets, that extend only one or two blocks between West Street/Route 9A and Trinity Place. Washington Street terminates at the superblocks that contain Liberty Park and the National September 11 Memorial and Museum.

West Street/Route 9A and Church Street/Trinity Place carry the greatest levels of vehicular traffic, as other streets in the primary study area are small, including the one-way single-lane Thames and Cedar Streets. Fulton Street, in the northern portion of the study area, is closed to public vehicle traffic. Parked cars line wider streets in the study area, except near construction sites. Street furniture includes fire hydrants, mailboxes, newsstands, lampposts, and vendor carts.

World Trade Center Sites

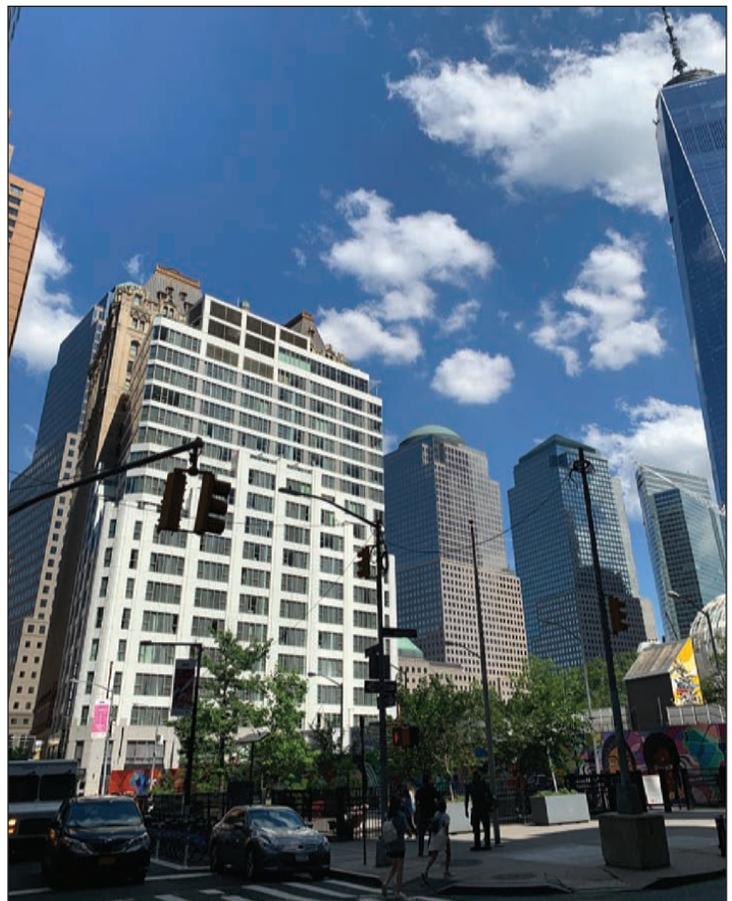
Located immediately north of project site is the Vehicle Security Center (VSC) with Liberty Park on its roof. Liberty Park is a one-acre public park overlooking the National September 11 Memorial and Museum to the north. The VSC's north wall, facing Liberty Street, is green and covered with plants. It includes two vehicular bays to the VSC. The park connects to the South Bridge of the former World Financial Center (now Brookfield Place), an enclosed pedestrian walkway that crosses West Street/Route 9A to connect into Brookfield Place. Immediately north of Site 5, St. Nicholas Greek Orthodox Church is under construction in Liberty Park overlooking Liberty Street at the corner of Greenwich Street.

The National September 11 Memorial is an approximately 6.6-acre site bounded by West Street/Route 9A to the west, Fulton Street to the north, Greenwich Street to the east, and Liberty Street to the south. The site has two cascading pools marking the one-acre footprints of the former Twin Towers. Mature trees are planted throughout the Memorial, and stone bollards are positioned at the perimeter of the site along the streets (see view 7 of **Figure 3-6**). In the midst of the Memorial, the National September 11 Museum is a modern steel and glass pavilion located near Greenwich Street. North of Memorial Plaza and across Fulton Street, Tower 1 is a symbolic 1,776-foot-tall office and building clad in mirror glass. To its east, the PACWTC is under construction. Upon completion, it will be 138 feet tall and will contain approximately 90,000 square feet (sf) of performance space.

Northeast of the project site, and across Greenwich Street from Memorial Plaza, 3 WTC and 4 WTC occupy a superblock north of Liberty Street and south of Fulton Street. At the southern end of the block, Tower 4 is a 74-story (979-foot-tall) office building with a mirror glass curtain wall.



View of the Project Site from Albany Street 1



View of the Project Site from the corner of Albany and Greenwich Streets 2

Urban Design and Visual Resources
Existing Conditions

Figure 3-3



View north on West Street/Route 9A, a wider corridor
in the study area 3



View east on Albany Street 4

View southeast on West Street/Route 9A showing Liberty Park and the residential tower under construction at 22 Thames Street

5



National September 11 Memorial 6

Urban Design and Visual Resources
Existing Conditions
Figure 3-5



View northwest at Liberty and Greenwich Streets, showing the National September 11 Memorial and Tower 1 7



View southeast across the National September 11 Memorial, including Towers 3 and 4 8

The office building contains a retail base as well as a major entrance to the Oculus retail space and the Port Authority Trans-Hudson (PATH) station. Tower 3 is a 1,083-foot-tall office and retail building, also clad in a mirror glass curtain wall. Cortlandt Way is a pedestrian-only passage that crosses east–west across the superblock between Towers 3 and 4. Occupying the northern portion of the block, the Oculus itself is 160 feet tall and serves as the aboveground entrance to the WTC Transportation Hub. The Oculus is a distinctive curving ribbed structure (see view 9 of **Figure 3-7**). Northeast of Memorial Plaza; the site for Tower 2 occupies the block north of Fulton Street but contains only industrial structures housing mechanical equipment for the complex as well as another entrance to the Oculus and the PATH Station. The structures are surrounded by walls that have been decorated with murals.

At the northern edge of the study area is the 52-story (743-foot-tall) steel-and-glass Tower 7 building. The east side of the modern tower overlooks Silverstein Family Park, a triangular-shaped plaza with a central fountain surrounded by stone benches. The perimeter of the Belgian block-paved park has bench seating on walkways through rectangular planters of trees and shrubs. To the east of the park is the 15-story, masonry-clad former Federal Office Building. With an address of 90 Church Street, this imposing building occupies the entire block between West Broadway, Park Place, Church Street, and Barclay Street. West of Tower 7 is another masonry-clad building, the 32-story Barclay-Vesey Building, at 140 West Street. A New York City Landmark (NYCL), the building form is composed of a tower on a base with setback transitions above the tenth floor.

South, East, and West of the Project Site

The southern portion of the study area is characterized by a mix of modern towers and older, low- to mid-rise commercial, residential, and institutional buildings ranging from 2 to 27 stories with setbacks. Buildings generally occupy their entire lot and are built to the lot line, creating continuous streetwalls along the north–south streets. Older, low- to mid-rise former office buildings generally have setbacks at the upper floors. Many of these buildings have been converted into residential use with ground-floor retail. These conversions reflect the area’s ongoing trend—shifting from an office/commercial work zone with a small residential population to a more densely populated residential neighborhood with local retail uses.

The blocks immediately south and east of the project site are developed with modern residential towers. The 56-story (approximately 630-foot-tall) steel-and-glass W New York Residences and Hotel at 123 Washington Street is located immediately south of the project site, across Albany Street. The glass tower is set back on a five-story base that meets the sidewalk on Washington and Albany Streets, but provides a small plaza on Carlisle Street. A 70-story (approximately 1,360-foot-tall) residential tower at 22 Thames Street (also known as 125 Greenwich Street) awaits completion of its construction immediately east of the project site, at the southeast corner of Greenwich and Thames Streets. The glass-clad building is also composed of a tower set back above an approximately five-story base.

The east side of West Street/Route 9A south of Cedar Street contains a mix of building ages and heights. The buildings form a consistent streetwall along the sidewalk at street level in this portion of the study area. Early-20th century, masonry-clad buildings, such as 90 and 71 West Street and 40 Rector Street, range from 18 to 24 stories in height (see view 10 of **Figure 3-7**) and are clad in stone and brick. The buildings are occupied as residential and institutional uses. The modern, 38-story (approximately 375-foot-tall) brick-and-glass Marriott Hotel located at 80 West Street is composed of a glass and masonry tower with no setbacks (see view 11 of **Figure 3-8**). Further south, outside the study area, 50 West Street is a 64-story (approximately 780-foot-tall) residential tower with curved glass windows.



View west on Fulton Street, showing the WTC Transit Hub and Tower 1 9



View south on Washington Street, from Albany Street, showing a mix of building ages and sizes 10



View south on West Street/Route 9A showing older mid-rise buildings and the modern hotel at 80 West Street 11



View south on Trinity Place, including the American Stock Exchange 12

In the southeast portion of the study area, along Greenwich Street and Trinity Place, early-20th century buildings in the Wall Street Historic District range from 6 to 27 stories in height and also form a consistent streetwall (see view 12 of **Figure 3-8**). These primarily stone and brick buildings have decorative features on their street façades, such as terra cotta ornament. Two modern, brick-and-stone-clad, mid-rise institutional buildings are located to the north at 90 and 100 Trinity Place (see view 13 of **Figure 3-9**). To the north, a small cluster of two- to five-story, brick commercial and residential buildings, some adorned with cornices, occupy the eastern portion of the block bounded by Trinity Place and Thames, Liberty, and Greenwich Streets (see view 14 of **Figure 3-10**). To the west of these buildings are late-19th and early-20th century mid-rise brick-and-stone-clad commercial and residential buildings (see Chapter 4, “Historic and Cultural Resources”).

The portions of Washington and Greenwich Streets in the study area contain a mix of low- to high-rise buildings ranging in height from 3½ to 56 stories. In general, the low-rise, predominantly commercial and residential buildings along these streets date to the 19th century and range in height from four to six stories (see view 15 of **Figure 3-10**). The mid-rise commercial and residential buildings generally date to the 20th century and range in height from 7 to 13 stories (see view 16 of **Figure 3-11**). The high-rise buildings consist mainly of hotels and residences, such as the W New York Residences and Hotel at 123 Washington Street, the 50-story (approximately 488-foot-tall) Holiday Inn located at 99 Washington Street, and the 70-story tower awaiting completion of construction at 22 Thames Street/125 Greenwich Street.

Gwathmey Plaza, a public open space located behind 123 Washington Street, consists of a paved area with benches for seating (see view 17 of **Figure 3-11**). Across Carlisle Street to the south of this plaza, an approximately 11,000-sf site is uniquely undeveloped and verdant.

VISUAL RESOURCES AND VIEW CORRIDORS

PROJECT SITE

A visual resource is defined as the connection from the public realm to significant natural or built features, including views of the waterfront, public parks, landmark structures or districts, otherwise distinct buildings or groups of buildings, or natural resources.

The project site is occupied by parking and a temporary public plaza, which do not constitute visual resources.

STUDY AREA

Visual resources in the study area include known architectural resources that consist of architecturally significant buildings, such as the early 20th century skyscraper at 90 West Street and the Art Deco-style primary façade of the American Stock Exchange on Trinity Place (see Chapter 4, “Historic and Cultural Resources”).

The National September 11 Memorial and Museum, the WTC Transit Hub, Liberty Park, and Towers 1, 3, 4, and 7 are significant visual resources in the primary study area. Within the study area, Towers 1, 3, 4, and 7 are visible in northern views on Greenwich Street and Washington Street. However, the buildings are not visible from more than a block or two away, due to the narrow width of the one-way street. Tower 1 dominates northern views on the wide West Street/Route 9A, from throughout the study area.

Distant north views from the study area are along Trinity Place, and include tall buildings in Tribeca, such as the modern glass residential tower at 56 Leonard Place, with a distinctive silhouette of cantilevered floors. Washington Street and Trinity Place do not have long south views, as the streets



Mid-rise institutional buildings on Trinity Place 13



Low-rise buildings on Trinity Place 14

Urban Design and Visual Resources
Existing Conditions

Figure 3-9



View along Cedar Street, showing a mix of building sizes in the study area **15**



View north on Washington Street from Rector Street, towards the Project Site **16**



Gwathmey Plaza, a public plaza adjoining the south side of 123 Washington Street 17

converge and terminate south of the study area. Views south from the portion of West Street/Route 9A in the study area include expansive views of the low- to high-rise buildings that characterize Lower Manhattan, such as Battery Park City, as well as views of the Rector Street Bridge and distant views of Battery Park. Views east from Trinity Place include the historically significant Trinity Church and burial ground located outside of the primary study area (see view 23 of **Figure 3-14**). Views east from Trinity Place also include Zuccotti Park, a stepped plaza shaded by trees and featuring tables, benches, and a sculpture. Views west in the study area are typically obstructed by the structures in Battery Park City along the west side of West Street/Route 9A, where various streets terminate, including Fulton, Cedar, Carlisle, and Rector Streets.

D. THE FUTURE WITHOUT THE PROPOSED AMENDMENT

PROJECT SITE

In the future without the Proposed Amendment, it is assumed that the approximately 57-story office tower with ground-floor retail contemplated for the Development Site in the 2004 *FGEIS* will be constructed (see Chapter 1, “Project Description”). It would have large floor plates typical of modern office buildings in the City.

STUDY AREA

As discussed in Chapter 2, “Land Use, Zoning, and Public Policy,” within the remainder of the WTC Site, St. Nicholas Greek Orthodox Church and the PAC would be completed by the 2028 analysis year. For the purposes of environmental review, it is also conservatively assumed that Tower 2 would be completed as contemplated in the 2004 *FGEIS*.

There are two additional planned developments in the study area that are expected to be completed by the 2028 analysis year: 22 Thames Street (also known as 125 Greenwich Street) and 112 Liberty Street. The unfinished building at 22 Thames Street is a 70-story (approximately 1,360-foot-tall) tower expected to contain residential use. The vacant site on the south side of Liberty Street between Church and Greenwich Streets (112 Liberty Street) is expected to see construction of a 230-room hotel.

E. THE FUTURE WITH THE PROPOSED AMENDMENT

URBAN DESIGN

PROJECT SITE

In the future with the Proposed Amendment, the Development Site would be redeveloped with a mixed-use building containing residential, health and fitness, and community facility uses, in addition to the currently-authorized commercial office and retail uses (the Proposed Project). Having the same height and bulk configuration, both the Maximum Residential Program and the Reduced Residential Program are considered in this analysis. The overall building height would be up to 940 feet tall under either program. Preliminary designs show the building with an articulated façade and panels of masonry-like materials. An elevated pedestrian bridge across the driveway would connect the proposed building and Liberty Park, further enhancing the pedestrian experience. See **Figures 3-12 to 3-14** for renderings of the proposed project.

To accommodate residential use above the podium, the residential floor plates would be smaller than the commercial office floors, to be more in line with the needs for residential planning. The increased need for mechanical space that comes with more energy efficiency would be the factor increasing the height of the building. However, the additional height of the building is not expected



Source: KPF

Illustrative rendering of the view northwest on Greenwich Street 18

Illustrative Renderings of the Future with the Proposed Amendment



Source: KPF

Illustrative rendering of the view south on Greenwich Street, showing Liberty Park 19

Illustrative Renderings of the Future with
the Proposed Amendment

Figure 3-13



Illustrative rendering of the view south from the National September 11 Memorial 20

Illustrative Renderings of the Future with the Proposed Amendment

to be out of scale with the buildings on the WTC Site or with the newer buildings to the east and south of the project site. In addition, as the study area contains a mix of older, low-rise, masonry-clad buildings and newer, high-rise buildings with glass façades, it is anticipated that the materials for the Proposed Project would be compatible with the existing materials found in the study area.

For the mixed-use building, the Proposed Amendment would include an override of local zoning provisions, including the Special Lower Manhattan District regulations, as follows: to allow for physical culture establishments without a special permit; for the definition of “zoning lot” to allow for creation of a zoning lot comprising the Project Site; to allow a maximum floor area ratio (“FAR”) of 15.0 for the building without regard to any additional floor area attributable to other improvements on the Project Site; to increase the residential base FAR from 10.0 to 12.0; for height, setback and lot coverage controls and maximum horizontal dimensions for tall buildings; for curb cuts; for pedestrian circulation space, lobby space permitted on Greenwich Street, location of retail space, and other provisions of the Special Lower Manhattan District regulations not consistent with the ESD Design Guidelines; and other zoning limitations necessary to construct the mixed-use building in conformity with the ESD Design Guidelines.

The ESD Design Guidelines would regulate bulk, massing, and exterior design; the gross square footage of development; ground floor uses and transparency; landscaping; parking and loading; and signage. The ESD Design Guidelines would provide flexibility in redevelopment of the Development Site and support Lower Manhattan’s transition from a predominantly office district to a mixed-use neighborhood. Except for the above overrides, the mixed-use tower would be subject to and conform with the New York City Zoning Resolution as administered by the City’s Department of Buildings. ESD would administer and determine compliance with the ESD Design Guidelines.

PRIMARY STUDY AREA

The Proposed Project would be built on an existing block and would not alter street orientation or street patterns in the primary study area. The building is anticipated to fully occupy the site, similar to other buildings in the study area, and its height would be comparable to the height of newer development in the primary study area. Though taller than the 56-story (approximately 631-foot-tall) W Residences and Hotel and the nearly complete 52-story (approximately 488-foot-tall) Holiday Inn Hotel, the Proposed Project would be shorter than the 70-story (approximately 1,360-foot-tall) residential tower in construction at 22 Thames Street, and comparable in height to the other WTC towers, including the 979-foot-tall Tower 4 located closest in proximity to the project site, and the 1,083-foot-tall Tower 3.

The massing of the building also would be consistent with other development in the primary study area in that it would consist of a tower set on an approximately 190-foot-tall base built to the lot line. Similar to other buildings in the study area, Proposed Project is anticipated to fully occupy the site. The Proposed Project would contribute to the existing streetwall along Greenwich, Albany, and Washington Streets. Overall, although zoning overrides would be utilized to achieve the Proposed Project, the height and massing of the mixed-use tower would be consistent with the urban design character of existing buildings and buildings currently under construction in the study area. As described above, the use of ESD’s Design Guidelines to regulate bulk, massing, and exterior design; the gross square footage of development; ground floor uses and transparency; landscaping; parking and loading; bicycle parking); and signage is intended to support Lower Manhattan’s transition from a predominantly office district to a mixed-use neighborhood, while providing flexibility in the redevelopment of the Development Site.

The residential use proposed for the building would be consistent with uses in the study area, including other residential towers; would contribute to the mixed-use community; and would continue the current trend in this area of shifting to a more densely populated residential neighborhood with local retail uses. The Proposed Project would have retail, office, and community uses on the lower floors, including approximately five floors of offices and a portion of a floor dedicated to community facility use. The ground floor would include pedestrian entrances on three or four sides of the building, providing an active streetfront that would enliven the pedestrian experience. This ground floor would have entrances from the street level along Greenwich Street and Washington Street. A residential through lobby would have entrances along Albany Street and on the proposed driveway.

Overall, the Proposed Project would be compatible with the urban design character of the study area and would not adversely affect the pedestrian experience.

VISUAL RESOURCES AND VIEW CORRIDORS

PROJECT SITE

As there are no visual resources on the Development Site, the Proposed Project would have no adverse impacts on such resources. Therefore, there would be no adverse impacts on views to visual resources from the project site.

STUDY AREA

Just as in the Approved Plan, the Proposed Project would be visible in views south from the National September 11 Memorial and Museum. Views from the memorial include modern glass Towers 1, 3, 4, and 7. The proposed Tower 5 would be similar in design and height to the existing buildings that are visible within the study area.

Similar to the approximately 57-story office tower in the Approved Plan, the Proposed Project would block some pedestrian views of Tower 1 looking north from Albany Street between Washington and Greenwich Streets. However, views of Tower 1 are available from many other locations in the primary study area. In addition, views of the older historic buildings to the south would remain, as would views of Trinity Church and its burial ground.

The Proposed Project would not obstruct views north along Greenwich Street of Tower 7, or views south from West Street/Route 9A of Lower Manhattan, Battery Park City, and Battery Park. As with the approved office tower, the residential building constructed under the Proposed Amendment would likely block some pedestrian views of Liberty Park from portions of Greenwich Street north of Albany Street. However, views of this visual resource would be available from many other locations within the primary study area. Therefore, the Proposed Project would not create any new impacts as compared to the Approved Plan or adversely impact the pedestrian's view of visual resources or view corridors in the primary study area.

F. CONCLUSIONS

This assessment concludes that the Proposed Amendment would not result in any significant adverse impacts to urban design and visual resources, or the pedestrian's experience of these characteristics on the project site or in the primary or secondary study areas as compared to the Approved Plan. Therefore, no further analysis is warranted. *

A. INTRODUCTION

This chapter considers the potential of the Proposed Amendment of the General Project Plan (GPP) for WTC Site 5, 130 Greenwich Street, (Block 54, Lot 1) to affect historic and archaeological resources in the areas of potential effects (APEs) for those resources.

This analysis has been prepared in accordance with the National Environmental Policy Act (NEPA), the New York State Environmental Quality Review Act (SEQRA), and the New York State Historic Preservation Act of 1980 (SHPA). These laws and regulations require that federal and state agencies, respectively, consider the impacts of their actions on historic properties. This analysis has also been prepared in accordance with Section 106 of the National Historic Preservation Act of 1966 (NHPA). Section 106, as implemented by federal regulations appearing at 36 CFR Part 800, mandates that federal agencies take into account the effect of their actions on any properties listed on or determined eligible for listing on the National Register of Historic Places (NR) and afford the federal Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings.

The Approved Plan was reviewed in accordance with Section 106, as detailed in the 2004 *FGEIS*, which identified the potential for certain impacts and specified mitigation for unavoidable impacts on historic resources, which are set forth in Section 3.2.3 of the ROD issued in June 2004. In addition, as set forth in Section 1.5 of the ROD, in satisfaction of its obligations pursuant to Section 106 and the State Historic Preservation Act, LMDC executed and entered into the WTC Memorial and Redevelopment Plan Programmatic Agreement, dated April 22, 2004, with the ACHP and the New York State Historic Preservation Officer (Programmatic Agreement, annexed as Exhibit E to the ROD). The Programmatic Agreement incorporates by reference the mitigation for any historic resources impacts set forth in the ROD, and sets forth the process for unanticipated or adverse effects and previously unidentified historic resources.

The analysis presented in this section characterizes existing conditions, evaluates changes to historic and cultural resources that are expected to occur independent of the proposed actions in the future without the Proposed Amendment, and identifies and addresses any potential impacts to historic and cultural resources associated with the Proposed Project.

B. METHODOLOGY**ARCHAEOLOGICAL RESOURCES**

The archaeological resources area of potential effects (APE) generally includes those areas that would be disturbed by subsurface excavation. Archaeological resources include material culture and other physical remnants of past human activities on a site. Precontact archaeological resources are those that date to the time before the region was colonized by European settlers, and which are associated with Native American populations that used or occupied a site. Archaeological resources can also include remains from activities that occurred during the historic period, which began with the European colonization of New York City in the 17th century. On sites where

development (including the construction and demolition of buildings, landfilling, and other landscape modifications) occurred at some point during the past, archaeological resources may have been disturbed or destroyed by grading, excavation, infrastructure installation, and tidal action/erosion. However, some resources do survive in urban environments despite extensive development. Archaeological sites can be protected when covered with pavement. In both scenarios, archaeological deposits can be sealed beneath the ground surface, protected from further disturbance and archaeological investigations can be designed to further investigate those deposits.

The APE for archaeological resources is the Development Site itself. As set forth in the 2004 *FGEIS*, the Development Site was not considered archaeologically sensitive due to its previous excavation for construction of the Deutsche Bank Building. Since completion of the 2004 *FGEIS*, the Development Site was excavated as part of the decontamination and deconstruction of the Deutsche Bank structure and for construction of the adjacent Port Authority Vehicular Security Center (VSC) to the north.

Section 3.2.3 of the ROD identified the portions of the WTC Site potentially sensitive for historic period archaeological resources and provided for mitigation consisting of a Phase 1B investigation in those areas, in the form of archaeological monitoring during construction.

In the event that there are any unanticipated discoveries of previously unidentified historic period archaeological resources on the Development Site during any excavation for the Proposed Project, they would be subject to the process set forth in the Programmatic Agreement.

Therefore, no additional study of archaeological resources is warranted and this chapter will focus only on historic architectural resources.

ARCHITECTURAL RESOURCES

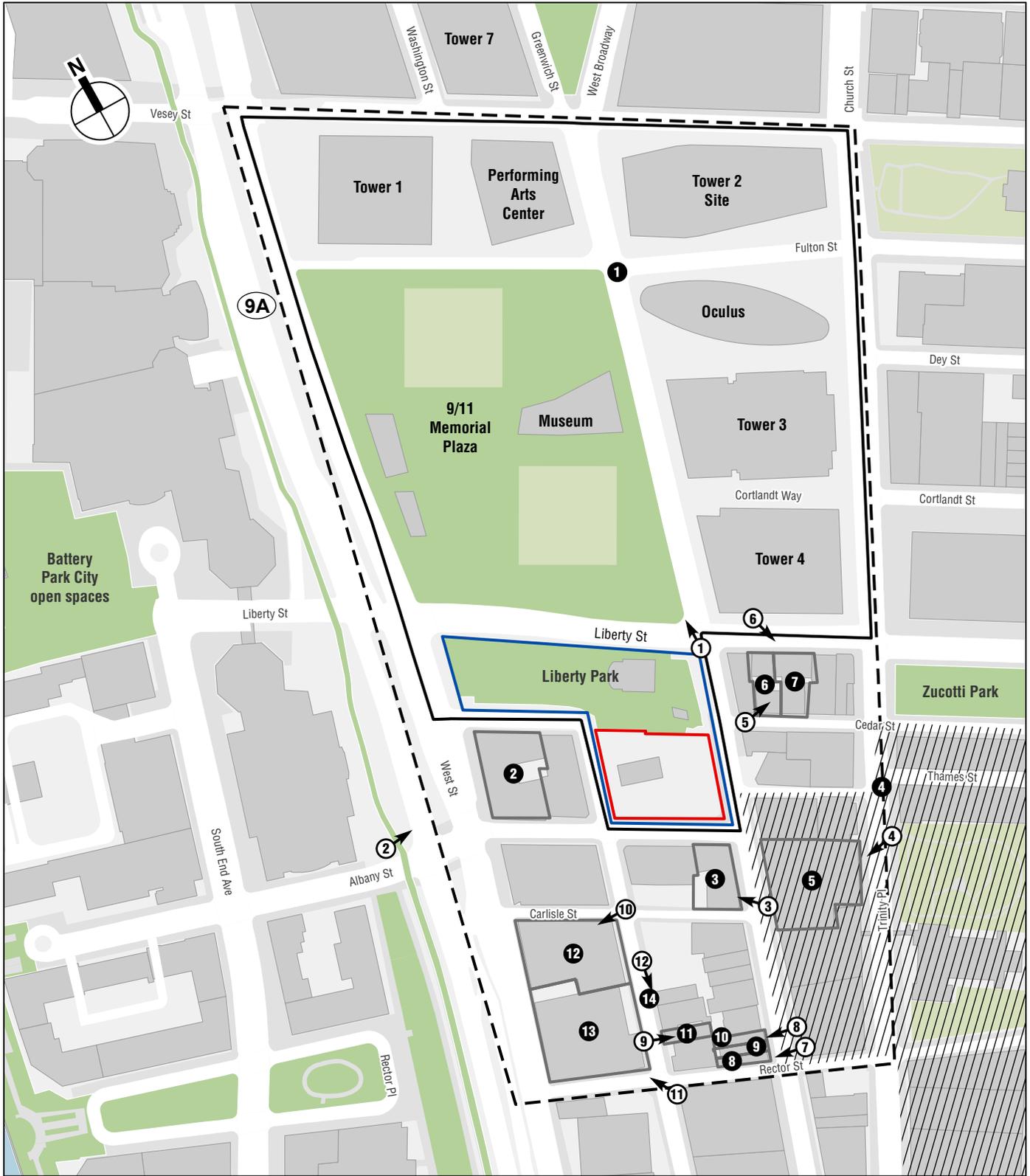
AREA OF POTENTIAL EFFECTS

To account for visual and contextual effects, as well as potential construction-related impacts, the APE for historic architectural resources is defined as the area between Church Street/Trinity Place, Rector Street, West Street/Route 9A, and Vesey Street (see **Figure 4-1**).

Impacts on architectural resources can include both direct physical impacts and indirect impacts. Direct impacts include demolition or significant alteration of an architectural resource, damage from vibration (i.e., from construction blasting or pile driving), and additional damage from adjacent construction that could occur from falling objects, subsidence, collapse, or damage from construction machinery. Adjacent construction is defined as any construction activity that would occur within 90 feet of an architectural resource, as defined in the New York City Department of Buildings (DOB) *Technical Policy and Procedure Notice (TPPN) #10/88*.¹

Indirect impacts on architectural resources are contextual or visual impacts that could result from project construction or operation. Indirect impacts could result from blocking significant public views of a resource; isolating a resource from its setting or relationship to the streetscape; altering the setting of a resource; introducing incompatible visual, audible, or atmospheric elements to a resource's setting; or introducing shadows over a historic landscape or an architectural resource

¹ *TPPN #10/88* was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. *TPPN #10/88* outlines procedures for the avoidance of damage to historic structures that are listed on the S/NR or NYCLs resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.



-  WTC Site
-  Development Site (Site 5)
-  Project Site
-  Photograph View Direction and Reference Number
-  Area of Potential Effect
-  Known Historic Resource (see Table 4-1)
-  Wall Street Historic District (S/NR-listed)

with sun-sensitive features that contribute to that resource's significance (e.g., a church with stained-glass windows).

IDENTIFICATION OF ARCHITECTURAL RESOURCES

Once the APE for architectural resources was determined, an inventory of officially recognized architectural resources in the APE was compiled. Officially recognized historic resources ("known resources") include designated New York City Landmarks (NYCL); properties calendared for consideration as landmarks by LPC; properties listed on the State and National Registers of Historic Places (S/NR) or contained within a S/NR-listed district or formally determined eligible for S/NR listing; properties recommended by the New York State Board for listing on the S/NR; National Historic Landmarks; and properties not identified by one of the programs listed above, but which meet their eligibility requirements.

Criteria for inclusion on the National Register are listed in the Code of Federal Regulations, Title 36, Part 63. Districts, sites, buildings, structures, and objects are eligible for the National Register if they possess integrity of location, design, setting, materials, workmanship, feeling and association, and:

- A. Are associated with events that have made a significant contribution to the broad patterns of history; or
- B. Are associated with the lives of significant persons in our past; or
- C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- D. That have yielded or may be likely to yield, information important in history or prehistory.

Properties that are less than 50 years of age are ordinarily not eligible, unless they have achieved exceptional significance. Determinations of eligibility are made by the State Historic Preservation Office (SHPO).

LPC designates historically significant properties or areas in New York City as NYCLs and/or New York City Historic Districts (NYCHDs), following the criteria provided in the Local Laws of the City of New York, New York City Charter, Administrative Code, Title 25, Chapter 3. Buildings, properties, or objects are eligible for landmark status when they are at least 30 years old. Landmarks have a special character or special historical or aesthetic interest or value as part of the development, heritage, or cultural characteristics of the city, state, or nation. There are four types of landmarks: individual landmarks, interior landmarks, scenic landmarks, and historic districts.

As part of the 2004 *FGEIS*, a survey was conducted to identify any previously undesignated properties that appeared to meet S/NR or NYCL eligibility criteria ("potential architectural resources") in the APE.

With the architectural resources in the APE having been identified, the Proposed Amendment was assessed for both direct physical impacts and indirect contextual impacts on architectural resources.

C. EXISTING CONDITIONS

DEVELOPMENT SITE/PROJECT SITE

The Development Site is the block bounded by Albany Street to the south, Greenwich Street to the east, Washington Street to the west, and the former bed of Cedar Street to the north (see **Figure 4-1**). The damaged Deutsche Bank building, which was formerly located on the Development Site, was decontaminated and demolished in 2011. When the National September 11 Memorial and

WTC Site 5

Museum opened, a platform on the south end of the Development Site served as the queuing area for the Memorial’s visitors before they proceeded through security and entered the plaza; this portion of the site is now a temporary public plaza area. The remainder of the Development Site is currently occupied by construction trailers containing the Port Authority Police Department WTC Command Center.

The larger Project Site was formerly the Southern Site, added to the WTC Site in 2003–2004. The portion of the Project Site not included within the Development Site described above is occupied by the VSC and Liberty Park (located on top of the VSC). The new St. Nicholas Greek Orthodox Church is currently under construction at the eastern end of the Project Site, northeast of the Development Site.

There are no historic architectural resources on the project site.

AREA OF POTENTIAL EFFECT

The APE contains a variety of historic architectural resources.² These resources are listed in **Table 4-1**, mapped on **Figure 4-1**, and described below.

Table 4-1
Known Resources in the Areas of Potential Effect

Ref. No.	Name	Address	NHL	S/NR	S/NR-eligible	NYCL	NYCL-eligible
1	World Trade Center Site	Bounded by West Street/Route 9A, and Vesey, Church and Liberty Streets			X		
2	90 West Street	90 West Street		X		X	
3	Hazen Building	120 Greenwich Street			X		
4	Wall Street Historic District	South of Thames Street and east of Greenwich Street in the APE		X			
5	American Stock Exchange	86 Trinity Place	X	X		X	
6	Beard Building	125 Cedar Street			X		X ^x
7	114-118 Liberty Street	114-118 Liberty Street			X		
8	94 Greenwich Street	94 Greenwich Street			X	X	
9	94 ½ Greenwich Street	94 ½ Greenwich Street			X		
10	96 Greenwich Street	96 Greenwich Street			X		
11	Former St. George's Syrian Roman Catholic Church	103 Washington Street			X	X	
12	New York Evening Post Building	75 West Street		X			X ^x
13	40 Rector Street Building (Barrett Building)	40 Rector Street			X		
14	Lamppost 80	Adjacent to 107-109 Washington Street				X	

Notes: Resources are mapped on Figure 4-1.
 NHL: National Historic Landmark.
 SR: New York State Register of Historic Places.
 NR: National Register of Historic Places.
 S/NR-eligible: Site has been found eligible for listing on the New York State and National Registers of Historic Places.
 NYCL: New York City Landmark.
 X = NYCL-eligible: In July 2021, LPC determined that the sites appear eligible for NYCL designation

² LPC’s 1997 designation report for Historic Street Lampposts also identified Lamppost 79, located at the northeast corner of Albany Street and Route 9A. However, during a field inspection on June 23, 2021, the lamppost could not be located. Therefore, Lamppost 79 is not included in the list of historic architectural resources identified in **Table 4-1**.

WTC SITE (S/NR-ELIGIBLE)

The WTC Site was determined eligible for S/NR listing due to the September 11, 2001 terrorist attacks and the significance of that event and its aftermath to American history. On September 11, 2001, terrorists hijacked two commercial jetliners and used them to strike each of the Twin Towers. Within hours, the Twin Towers collapsed onto the WTC and surrounding areas, causing massive death and devastation in Lower Manhattan. In the aftermath of the terrorist attacks, the Twin Towers became a symbol of antiterrorist resolve, and the collective determination of the City, the state, and the nation called for rebuilding to restore the iconic center of the financial district and to honor those who died there on September 11, 2001. The attack was a catalyst for major changes in local and national security programs, including the establishment of the Department of Homeland Security.

As described in Chapter 2 “Land Use, Zoning, and Public Policy,” in the past 10 years the WTC Site has been largely redeveloped with the Memorial and Museum and Towers 1, 3, and 4 complete; the PACWTC under construction; and the tower on Site 2 awaiting construction (see view 1 of **Figure 4-2**).

90 WEST STREET (S/NR-LISTED, NYCL)

Located west of the Development Site, 90 West Street was designed by Cass Gilbert and built in 1905–1907 (see view 2 of **Figure 4-2**). It is among the most important early 20th century skyscrapers in New York City, and the aesthetic precursor to Gilbert’s Woolworth Building. The 24-story former office building is also the earliest example of the use of Gothic detail on a skyscraper with a distinctly vertical massing in New York City. Above its two-story granite base, the building is clad in white terracotta with marble and polychromed terracotta trim. The façade is articulated with recessed window bays and clustered columns that form piers. These piers, along with colonettes between the windows, rise uninterrupted for most of the building’s height. The building’s upper five stories are ornately detailed, and the windows on the 22nd floor are recessed below a blind arcade with engaged columns. A mansard roof with dormers topped with pinnacles crowns the building.

HAZEN BUILDING (S/NR-ELIGIBLE)

Located south of the Development Site across Albany Street, the Hazen Building, designed in 1905 by Jardine, Kent & Jardine, is a 13-story former office building converted to residential use (see view 3 of **Figure 4-3**). The Renaissance Revival-style brick structure has a three-story rusticated base that contains arched window bays on the third floor with pronounced voussoirs and a cartouche in each keystone. A stone cornice with egg and dart molding runs above the base. The main entrance fronting Albany Street is crowned with a large broken pediment and an ornate cartouche above the door. The Greenwich Street corners are rounded, with protruding horizontal bands of brick that create the appearance of quoining and emphasize the curved design. Brick quoining also marks the northwest and southwest corners. The smaller windows above the base have stone sills and jack arches with double keystones. The 11th and 12th floors are embellished with brick pilasters and ornate, arched bay windows with pronounced voussoirs and volute keystones. A denticulated stringcourse is located below the 11th floor, and a modillioned cornice crowns the building.

WALL STREET HISTORIC DISTRICT (S/NR-LISTED) AND THE AMERICAN STOCK EXCHANGE (NHL, S/NR-LISTED, NYCL)

The Wall Street Historic District contains the country’s most important collection of skyscrapers, as well as a variety of building types and styles dating primarily to the period between 1835 and



The WTC Site, view northwest from Greenwich and Liberty Streets 1



View of the west façade of 90 West Street 2

1932. The portion of the district located within the APE contains two buildings dating from the early 20th century: The American Stock Exchange (an individually designated resource) and 2-8 Rector Street.

The American Stock Exchange consists of two components: a seven-story Renaissance Revival-style office and exchange building at 111-123 Greenwich Street built for the New York Curb Market and opened in 1921, and a 14-story Art Deco addition (1930–1931) designed by Starrett and Van Vleck at 78-86 Trinity Place (see view 4 of **Figure 4-3**). Clad in brick, the Greenwich Street façade consists of largely blank and unornamented wall surface. The most notable features are five large, arched windows in the center of the façade and a stone plaque reading “New York Curb Market” set in the wall above these windows. The Art Deco limestone façade on Trinity Place has five double-height windows with decorative keystone lintels above the base and the words “American Stock Exchange” in letters above the windows.

The Beaux Arts commercial office building at 2-8 Rector Street was formerly known as the Electric Bond and Share Company Building. It was designed by Clinton & Russell (1905–1907) with a terracotta-clad façade that rises 23 stories before stepping back in a series of setbacks. Large round-arched openings located at the ground floor enclose an arcade.

The building in the district that would have been closest to the Development Site, at the southeast corner of Greenwich and Thames Streets, was demolished in 2013 for new construction.

BEARD BUILDING (S/NR-ELIGIBLE, NYCL-ELIGIBLE)

Located northeast of the Development Site at 120 Liberty Street/125 Cedar Street, the 13-story Beard Building was designed by Oswald Wirz as an office building but was converted to residential use prior to 2001. Constructed in 1895–1897, it is a brick-and-stone Romanesque Revival-style building (see view 5 of **Figure 4-4**). It has a three-story stone base on the north façade; the second and third floors are composed of pilasters and deeply recessed window bays. The ground-floor façade has been stripped and altered to house a retail space. Above the base, brick piers frame corner window bays and create a large central bay broken up by thin, closely spaced brick mullions. Round-arched windows with decorative lintels are located on the 11th floor, while deeply recessed single- and double-pedimented windows are located on the 12th floor. A modillion cornice crowns the building.

114-118 LIBERTY STREET (S/NR-ELIGIBLE)

This 11-story Renaissance Revival-style building was constructed in 1900–1901 and designed by John T. Williams. Due to the irregular lot shape, the through-block loft building is three bays wide on Liberty Street and two bays wide on Cedar Street. The three-story rusticated base is clad in stone, while the floors above are clad in brown brick (see view 6 of **Figure 4-4**). The ground floor has a framed entrance on the northeast corner of the building, and a decorative frieze is located above the arched show windows with keystones on the second floor. Cartouches and an entablature mark the third floor. The upper floors are articulated with brick pilasters that create the three bays, each of which has three single-pane windows. An entablature crowns the ninth floor, and two-story pilasters with swag and volute capitals delineate the bays on the 10th and 11th floors. A modillion cornice is located above the round-arched windows with keystones on the 11th floor. The building was converted to residential use prior to 2001.

94 GREENWICH STREET (S/NR-ELIGIBLE, NYCL)

The Flemish-bond, four-story brick building located at 94 Greenwich Street was built ca. 1800 (see view 7 of **Figure 4-5**). The building is three bays wide and the line of the original roof slope



View of the east façade of the Hazen Building located at 120 Greenwich Street 3



View of the east façade of the American Stock Exchange located at 86 Trinity Place 4



View of the south façade of the Beard Building located at 125 Cedar Street 5



View of the north façade of 114-118 Liberty Street 6



The east facades of 94 Greenwich Street and 94 1/2 Greenwich Street 7



The east façade of 96 Greenwich Street 8

is visible on the north façade. The ground floor has been stripped of ornament and altered with replacement windows, but the stone sills and jack arches on the second and third floors are intact.

94½–96 GREENWICH STREET (S/NR-ELIGIBLE)

No. 94½ Greenwich Street is a four-story brick building built ca. 1800 that has been significantly altered, including the addition of gray panel cladding on the front façade and replacement of the windows (see view 7 of **Figure 4-5**). No. 96 Greenwich Street, also built ca. 1800, is a 40-story building that has been expanded with an additional 3½-stories. The brick is laid in a Flemish-bond pattern to just above the third floor, and then transitions to a seven-course American bond pattern with the addition of the fourth floor. The original stone sills and lintels are intact, but the fourth-floor windows have been replaced with a modern band of windows (see view 8 of **Figure 4-5**).³

FORMER ST. GEORGE'S SYRIAN ROMAN CATHOLIC CHURCH (S/NR-ELIGIBLE, NYCL)

The former St. George's Syrian Roman Catholic Church located at 103 Washington Street was originally built as a tenement in 1871. It was converted into a church in 1920 to serve a Middle Eastern Christian community that lived in Lower Manhattan at that time and was given a new, Gothic terracotta façade. Confined to a narrow lot, the church expresses its Gothic character through applied façade details, rather than through a typical church form of nave, tower, and side aisles. The Gothic details include pointed-arch side entrances; a central, arched entrance with a tympanum and flanking colonnettes; Tudor-arched windows, piers and pinnacles; and Gothic tracery (see view 9 of **Figure 4-6**).

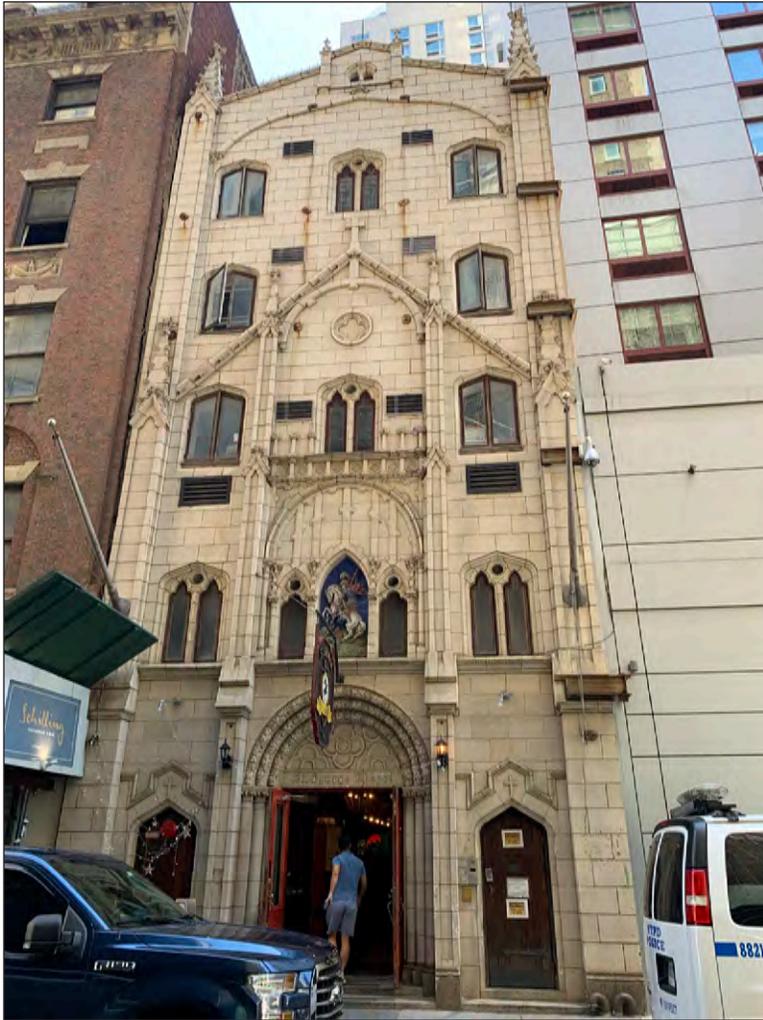
NEW YORK EVENING POST BUILDING (S/NR, NYCL-ELIGIBLE)

The New York Evening Post Building occupies the blockfront on Carlisle Street, between West and Washington Streets (see view 10 of **Figure 4-6**). Horace Trumbauer designed the 18-story Art Deco building in 1925. It has a two-story stone base with recessed window bays and an entablature with stylized balustrades. The upper floors are clad in brick and rise in a series of setbacks that form a central tower. Projecting brick piers with stone caps emphasize the verticality of the massing. Colorful panels of geometric tiles ornament the upper stories. Stone detailing is also used on the upper setbacks.

40 RECTOR STREET BUILDING (S/NR-ELIGIBLE)

The 19-story, Renaissance Revival-style, 40 Rector Street Building (originally the Barrett Building) was designed in 1920–1921 by Warren & Wetmore. The building has no setbacks and has an eight-story wing at the southeast corner. Sometime after 1951, an addition was constructed on this parcel adjacent to the north of the eight-story wing, but the addition does not replicate the original façade treatment which featured a rusticated stone base with upper floors clad in brick (see view 11 of **Figure 4-7**). Tall-arched and rectangular windows puncture the base on all three street façades, and a stone balustrade runs above the base. Metal spandrel panels and stone quoins adorn the shaft of the building. The top two floors are designed as a loggia with stone pilasters. A stone entablature and projecting metal cornice crowns the building.

³ Given the significant alterations to these buildings since the 2004 FGEIS, they may no longer be eligible for listing on the S/NR due to a lack of historic architectural integrity.



Former St. George's Syrian Roman Catholic Church 9



The north and east façades of the New York Evening Post Building, on Washington and Carlisle Streets 10



View of the south façade of the 40 Rector Street 11
(Barrett Building)



View of Lamppost 80 located adjacent to 107 and 109 Washington Street 12

LAMPOST 80 (NYCL)

Lamppost 80, located adjacent to 107 and 109 Washington Street between Rector and Carlisle Streets, is an example of the ornamental lampposts that were erected in Lower Manhattan in the early 20th century. Beginning around 1900, ornamental arc lampposts were designed, and the earliest of this form was the bishop's crook. Several variations of this style were produced, but the earliest incorporated a garland on the fluted shaft and a short ladder rest, and was made from a single iron casting up to the crook section. Lamppost 80 is an example of a later bishop's-crook-style lamppost as it lacks the garland and ladder rest, with sections of iron pipe and attached iron castings forming the upper portion of the lamppost (see view 12 of **Figure 4-7**).

D. THE FUTURE WITHOUT THE PROPOSED AMENDMENT

DEVELOPMENT SITE/PROJECT SITE

In the future without the Proposed Amendment, the approved development for the Development Site is an office tower. As contemplated in the 2004 *FGEIS*, it will be an approximately 57-story office tower with ground-floor retail uses.

On the remainder of the Project Site, the VSC and Liberty Park would each remain in their current condition, while it is expected that St. Nicholas Greek Orthodox Church would be completed at the eastern end of Liberty Park.

AREA OF POTENTIAL EFFECT

As discussed in Chapter 2, "Land Use, Zoning, and Public Policy," several development projects are expected to be completed within the APE by the 2028 analysis year. Within the remainder of the WTC Site, the PACWTC would be completed by the 2028 analysis year. For the purposes of environmental review, it is also conservatively assumed that Tower 2 would be completed as contemplated in the 2004 *FGEIS*. There are two additional projects in the remainder of the APE anticipated to be completed by the 2028 analysis year: 125 Greenwich Street (also known as 22 Thames Street) and 112 Liberty Street. At the southeast corner of Thames and Greenwich Streets, 125 Greenwich Street will contain approximately 273 dwelling units and 10,000 square feet of retail space. Located at the south side of Liberty Street between Greenwich and Church Streets, 112 Liberty Street will be a 230-room hotel.

The new developments would be located among the older, smaller-scale buildings south and east of the Development Site. The planned developments are generally taller than the older buildings in the APE, but are consistent with the scale of recent development on the WTC Site, such as the 104-story, 1,776-foot-tall (with the broadcast tower) Tower 1; the approximately 80-story, 1,155-foot-tall Tower 3; and the approximately 88-story 1,349-foot-tall Tower 2.

The new developments may result in construction-related direct impacts to architectural resources within the APE. The proposed hotel at 112 Liberty Street will be located in close proximity (i.e., within 50 feet) from the S/NR-eligible 114-118 Liberty Street and the S/NR-eligible and NYCL-eligible Beard Building at 120 Liberty Street/125 Cedar Street. Neither resource is protected by *TPPN #10/88*, as they are not NYCLs, part of a NYCHD, or S/NR-listed. Construction at 125 Greenwich Street is adjacent to the American Stock Exchange (NHL, S/NR-listed, NYCL) and within the S/NR-listed Wall Street Historic District. As an NYCL and S/NR-listed resource, the American Stock Exchange is protected from construction damage by *TPPN #10/88*. With the protective measures of a Construction Protection Plan (CPP) in place, no significant adverse construction-related impacts would occur to this resource.

The 71-story (approximately 841-foot-tall) residential tower under construction at 125 Greenwich Street (22 Thames Street) is in the Wall Street Historic District. The new building will modify the character of this corner of the Wall Street Historic District.

Construction-period impacts to nearby historic resources were analyzed in the 2004 *FGEIS* and are subject to the measures set forth in the ROD and Programmatic Agreement, which contemplate a CPP for historic resources located within 90 feet of construction activities, to be developed in consultation with SHPO prior to the commencement of construction.

There are two historic architectural resources in the APE located within 90 feet of the Development Site—the Hazen Building and the American Stock Exchange. Both were identified in the 2004 *FGEIS*. Under the Approved Plan, in conformance with the Programmatic Agreement, a CPP will be implemented to avoid inadvertent construction-related impacts on the Hazen Building and the American Stock Exchange. The CPP will contain measures to avoid construction-related impacts, including ground-borne vibration and accidental damage from heavy machinery, as appropriate. The CPP will be developed in consultation with SHPO and implemented by a professional engineer prior to excavation and construction activities, and will be based on the requirements laid out in *TPPN #10/88* concerning procedures for avoidance of damage to historic structures from adjacent construction.⁴

E. THE FUTURE WITH THE PROPOSED AMENDMENT

In the future with the Proposed Amendment, the Development Site would be redeveloped with a mixed-use building containing residential, commercial office, retail, fitness and social center, and community facility uses. Having the same height and bulk configuration, both the Maximum Residential Program and the Reduced Residential Program are considered in this analysis. The overall building height would be up to 940 feet tall under either program.

DEVELOPMENT SITE/PROJECT SITE

As there are no historic architectural resources on the Development Site or the remainder of the Project Site, the Proposed Project would have no adverse effects on such resources.

AREA OF POTENTIAL EFFECT

On August 3, 2021, the Project Sponsor submitted information regarding the Development Site, the Proposed Project, and architectural resources within the APE to SHPO. In a letter dated August 31, 2021, SHPO determined the Proposed Project to be acceptable, and concurred with the proposal to develop Construction Protection Plans for the Hazen Building at 120 Greenwich Street and the American Stock Exchange at 86 Trinity Place (see **Appendix A**).

As set forth above, construction-period impacts to nearby historic architectural resources were analyzed in the 2004 *FGEIS* and are subject to the measures set forth in the ROD and Programmatic Agreement, which contemplate a CPP for historic resources located within 90 feet of construction activities, to be developed in consultation with SHPO prior to the commencement of construction.

⁴ *TPPN #10/88* was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. *TPPN #10/88* outlines procedures for the avoidance of damage to historic structures that are listed on the S/NR or NYCLs resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

There are two historic architectural resources in the APE located within 90 feet of the Development Site—the Hazen Building and the American Stock Exchange. In conformance with the 2004 WTC Memorial and Redevelopment Plan Programmatic Agreement among ACHP, SHPO, and LMDC, and to avoid any potential adverse direct effects to these historic architectural resources, a CPP would be implemented to avoid inadvertent construction-related impacts on these resources. The CPP would contain measures to avoid construction-related impacts, including ground-borne vibration and accidental damage from heavy machinery, as appropriate. The CPP would be developed in consultation with SHPO and implemented by a professional engineer prior to excavation and construction activities, and would be based on the requirements laid out in *TPPN #10/88* concerning procedures for avoidance of damage to historic structures from adjacent construction.⁵

The Proposed Project would not result in adverse contextual or visual effects on historic architectural resources in the APE. The additional height of the Proposed Project would not result in a building that is substantially taller than the building approved in the 2004 *FGEIS*. The APE already consists of a mix of historic and modern structures that range in height from two to 104 stories (approximately 30 to 1,776 feet in height). The size and architectural styles of these buildings vary greatly, reflecting the architectural styles of the eras in which they were designed and constructed. The urban fabric of the APE is characterized by this juxtaposition of low- to mid-rise historic masonry-clad structures with high-rise, contemporary steel-and-glass structures, and the Proposed Project would continue this trend. Therefore, it is anticipated that the materials for the Proposed Project would be compatible with the existing materials found in the APE.

The proposed uses would not introduce incompatible visual, audible, or atmospheric elements to any historic architectural resource's setting in the APE. The Proposed Project would be of a height, size, and use compatible with existing structures in the APE, particularly the new high-rise hotel and residential towers planned in the future without the Proposed Amendment. In addition, the Proposed Project would not obstruct any significant public views of historic architectural resources in the APE.

Overall, with the preparation and implementation of a CPP to avoid construction-related effects on the Hazen Building and the American Stock Exchange, the Proposed Amendment would not result in any significant adverse direct or indirect effects to historic architectural resources in the APE. *

⁵ *TPPN #10/88* was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. *TPPN #10/88* outlines procedures for the avoidance of damage to historic structures that are listed on the S/NR or NYCLs resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

A. INTRODUCTION

This chapter assesses the potential impacts of the Proposed Project on open space resources in the study area. Open space is defined as publicly accessible, publicly or privately owned land that is available for leisure, play, or sport, or serves to protect and enhance the natural environment. An open space assessment may be necessary if a project imposes direct effects on the study area, such as removing or altering a publicly accessible public space as a result of development. Indirect effects may also warrant analysis, such as when an increase in population overwhelms the existing capacity of open spaces in the area. Other direct effects on open spaces to be considered are the potential increases in noise, air pollutant emissions, odor, or shadows generated by the proposed action.

As outlined in Chapter 1, “Project Description,” the “Approved Plan” for the Development Site is a 57-story, approximately 1.314 million-square-foot (sf) office building. The Approved Plan would be the No Action Condition. The Proposed Amendment would provide greater flexibility for the Development Site by allowing residential and community facility use in addition to the currently approved office and retail use. Since the program for the Proposed Project on the Development Site is not final, two programs have been created for analysis purposes, one with the maximum residential uses (Maximum Residential Program), and the other with reduced residential use (Reduced Residential Program). The total floor area for either would be 1,627,898 gross square feet (gsf) (or 1,677,898 gsf for an all-electric building). The Maximum Residential Program would include up to 1,270 dwelling units (DUs) and 1,386,898 gross square feet (gsf) of residential space (or 1,436,898 gsf for an all-electric building), up to 180,000 gsf of commercial office use, up to 12,000 gsf of retail use, up to 36,000 gsf of fitness and social center uses, and up to 13,000 gsf for community facility uses. The Reduced Residential Program would introduce 1,126,563 gsf of residential use (or 1,176,563 gsf for an all-electric building) with 1,193 DUs. The commercial office space would be increased to 374,361 gsf, and the fitness and social center and community facility space would also be increased to about 80,645 gsf and 21,329 gsf, respectively. The retail space would more than double, with a proposed 25,000 gsf. The differences between the Approved Plan and Proposed Project conditions are assessed in this chapter to determine whether they would result in any significant adverse open space impacts.

In order to ensure a conservative analysis, the development program with the greatest potential for impact on open space resources for residential and nonresidential analyses was evaluated. The analysis identifies and assesses potential impacts to open space resources in the study area, while also accounting for the substantial open space resources just outside the designated ½-mile radius. In particular, this area of Lower Manhattan has access to significant open space resources that extend beyond the study area, including Hudson River Park, Washington Market Park, Governors Island, East River Esplanade and Pier 17, among others. These publicly accessible open spaces are taken into consideration when evaluating the potential impacts of the Proposed Project on open space resources. In addition, the Proposed Project could potentially have effects related to air quality, noise, and shadows that may affect the use of nearby open spaces. Therefore, an

assessment of the Proposed Project's direct and indirect effects on open space resources was conducted to determine whether the Proposed Project would result in significant adverse open space impacts.

B. METHODOLOGY

DIRECT EFFECTS

A project would directly affect open space resources if it causes the loss of publicly accessible open space, changes the use of an open space so that it no longer serves the same user population, limits public access to an open space, or results in increased noise or air pollutant emissions, odor, or shadows that would temporarily or permanently affect the usefulness of publicly accessible open space. This chapter uses information from Chapter 6, "Shadows," Chapter 13, "Air Quality," and Chapter 15, "Noise," to help determine whether the Proposed Project would have the potential to directly affect any open spaces near the Project Area and also considers the ready availability of areawide active open space resources within or immediately adjacent to the study area.

INDIRECT EFFECTS

Indirect open space effects may occur when a project would add enough of a population, either residents or workers, to noticeably diminish the ability of an area's open space to serve the future population.

Typically, an assessment of indirect effects is conducted when a project would introduce 200 or more residents or 500 or more workers to an area; however, the thresholds for assessment are slightly different for areas of the City that have been identified as either underserved or well-served by open space. Since the Development Site is in an area identified as neither well-served nor underserved, the threshold of 200 residents and 500 workers was applied in this analysis.

Under the Maximum Residential Program, the Proposed Project would introduce an incremental increase of 1,270 DUs, or an estimated 2,426 residents, as compared to the Approved Plan. Therefore, an assessment of the potential effects of the Proposed Project's residential population on open space resources has been conducted. With respect to the worker, or non-residential population, the Proposed Project would result in an incremental decrease in the worker population as compared to the Approved Plan, which would introduce a 1.3-million-sf office building to the Development Site. Therefore, a detailed analysis of the effects of the Proposed Project's nonresidential population on open space resources is not warranted. An assessment of the potential effects of the Proposed Project's residential population on open space resources, including both passive recreation and active recreation resources, is provided below.

The following sections describe the methodology for the analysis of indirect effects on open space, including establishing the study area, identifying open space user populations, creating an inventory of open space resources, and assessing the adequacy of open space resources.

STUDY AREA

Establishing a study area is the first step in the open space assessment. The study area is based on the distance that users are likely to walk for an open space resource. Residents are assumed to walk approximately 20 minutes, or up to ½-mile, to an active or passive open space. The adequacy of open space resources was assessed for a study area extending ½-mile from the project area, which was adjusted to include all census tracts with at least 50 percent of their area within the ½-

mile boundary. This adjustment to the study area allows analysis of both the open space resources in the study area, as well as population data.

Figure 5-1 illustrates the open space study area and the census tracts in the study area. The ½-mile perimeter included the following 2020 U.S. Census Tracts: 7, 9, 13, 15.02, 21, 317.03, 317.04, and 319 in Manhattan. These census tracts are mapped over portions of Manhattan Community District 1.

OPEN SPACE USER POPULATIONS

Existing Conditions

The existing residential population in the study area was calculated using 2015–2019 American Community Survey (ACS) data for each census tract.

No Action Condition

As outlined in Chapter 2, “Land Use, Zoning, and Public Policy,” there are several developments anticipated to be completed in the residential study area by the analysis year of 2028, in the future without the Proposed Amendment (No Action condition with the Approved Plan). The residential population anticipated to be introduced to the study area by these projects was estimated by applying an average household size of 1.91 persons per household (the 2015–2019 ACS average household size for Manhattan Community Districts 1 and 2) to the number of projected dwelling units expected in the anticipated projects.

With Action Condition

The future population to be introduced into the study area as a result of the Proposed Project was also estimated by applying an average household size of 1.91 persons per household, as described above, to the number of dwelling units included in the Proposed Project and adding the estimated population to the residential population in the No Action condition, as well as to the developments outlined in Chapter 2, “Land Use, Zoning, and Public Policy.” The With Action condition evaluates the incremental increase in residential population (open space users) anticipated with the Proposed Project to the residential population estimated with the Approved Plan.

INVENTORY OF OPEN SPACE RESOURCES

Publicly accessible open space as open space that is publicly or privately owned and is accessible to the public on a regular basis, either constantly or for designated daily periods of time. Open spaces that are only available for limited users or are not available to the public on a regular or constant basis are not considered public open space but are considered in a qualitative assessment of open space impacts.

Information on open space amenities and utilization was developed based on previous environmental reviews conducted in the area, where available, online resources, and field visits in May 2021. Online resources include the New York City Department of Parks and Recreation (NYC Parks), and the Hugh L. Carey Battery Park City Authority (BPCA), the latter of which develops and maintains many public open spaces in Battery Park City. Active and passive uses and amenities were noted at each open space, as were condition and utilization when feasible. Active facilities are categorized by intended use for vigorous activities such as jogging, field sports, and children’s active play. These facilities may include courts, trails, ball fields, and playground equipment. Passive facilities are those that encourage leisurely use, such as sitting or



- WTC Site
- Project Site
- Development Site (Site 5)
- Open Space Study Area
- 13 Census Tract

0 1,000 FEET

strolling. These facilities may be characterized by picnic areas, walking paths, gardens, and benches. In some instances, public facilities, such as lawns and public plazas, can function as both active and passive open space resources.

This analysis also considered any open spaces that would be created or displaced in the No Action and With Action conditions by the end of the analysis year of 2028.

ADEQUACY OF OPEN SPACE RESOURCES

The adequacy of open space in the study area was quantitatively and qualitatively assessed for existing conditions, the No Action condition, and the With Action condition. The quantitative assessment is based on ratios of usable open space acreage to the study area populations (the “open space ratios”). These ratios were then compared with the City’s open space guidelines for residential populations. For residential populations, the Citywide Community District median open space ratio is 1.5 acres per 1,000 residents, which is used as a guideline. In addition to this ratio, the City has set an open space ratio planning goal of 2.5 acres per 1,000 residents, which includes 0.50 acres of passive space and 2.0 acres of active space per 1,000 residents. It should be noted that the City’s open space planning goals are often not feasible for many areas of the city, and they are not considered an impact threshold. Rather, they are used as benchmarks to represent how well an area is served by its open space resources and provide guidelines to determine if a project may have a significant adverse impact on open space conditions in the study area.

If an assessment shows that a study area’s open space ratio falls below the City guidelines, and a proposed action would result in a decrease in the ratio that approaches or exceeds 5 percent, the decrease could be considered a substantial change warranting a more detailed analysis. In this assessment, the analysis also includes a broader look at the active open space resources nearby the study area to provide a better understanding of the overall open space available to the study area population.

In addition to the quantitative factors cited above, consideration of qualitative factors in assessing the potential for open space impacts is recommended when warranted. These include the capacity and utilization of open space resources, the connectivity of an open space, distance to regional parks or other parks located just outside the study area, and the beneficial effects of new open space provided by a project, as applicable.

C. EXISTING CONDITIONS

STUDY AREA POPULATION

Based on the 2015–2019 ACS, the eight census tracts included in the study area have a total residential population of 45,734 (see **Table 5-1**).

OPEN SPACE INVENTORY

There are a total of 80 publicly accessible open spaces located within the ½-mile residential study area, including publicly accessible open spaces and privately owned spaces open to the public. **Table 5-2** summarizes the open spaces within the study area, and **Figure 5-2** shows their locations. Altogether, the open space resources total 100.68 acres, of which 28.41 acres are considered active recreational open space, and 72.27 acres are considered passive recreational open space. Open spaces within the study area include a variety of parks, playgrounds, plazas and pedways and bikeways that are accessible for use by the public. These resources include parks or recreational



-  WTC Site
-  Project Site
-  Development Site (Site 5)
-  Half-mile Boundary
-  Open Space Study Area
-  Open Space Resource
-  Notable Open Space Resources Near or Contiguous to the Study Area

0 1,000 FEET



areas operated by NYC Parks, BPCA, or other public agencies, as well as plazas and seating areas attached to residential or office buildings, some of which are considered to be privately owned public spaces (POPS), an amenity introduced through provisions in the New York City Zoning Resolution.

**Table 5-1
Existing Residential Study Area Population**

Census Tract	Residential Population
7	8,501
9	1,796
13	4,455
15.02	8,309
21	6,666
317.03	5,783
317.04	10,224
319	0
Total Residents	45,734
Source: 2015–2019 ACS. Accessed through U.S. Census website in May 2021.	

Several large open spaces with active and passive uses exist within the study area. The study area is served by parks managed by NYC Parks, BPCA, the Port Authority, and the 9/11 Memorial. Many of these open spaces have been improved, expanded, or even created as part of recovery projects funded by the Lower Manhattan Development Corporation’s Community Development Block Grant. For instance, the Battery has been improved through several reconstruction plans to create 21.88 acres of invaluable active and passive open space for Lower Manhattan. Most recently, the construction of a playground to be known as the Battery Playscape has been progressing and is expected to be completed in fall 2021. Some of the additional amenities within the Battery include paths, benches, lawn space, memorial spaces, monuments, an esplanade, eateries, playgrounds, and restrooms. The Battery (21.88 acres) and the Battery Park City Esplanade (26.04 acres—including Wagner and Rockefeller Parks) run along the Hudson River and southern tip of Manhattan, providing over 45 acres of active and passive open space to the local area. These open spaces are heavily utilized by residents, visitors, and workers in the area and kept in excellent condition.

Portions of the East River Esplanade are also located within the study area, providing active and passive open space amenities for the public. Approximately half, or 5.46 acres, of the 10.92-acre East River Esplanade is within the study area. This open space is well-traversed and offers a variety of public amenities, such as benches, lawns, sculptures, and a waterfront esplanade, while also connecting to the larger 45.88-acre John V. Lindsay East River Park (aka East River Park).

Other large open spaces in the study area are the Battery Park City Ball Fields and Teardrop Park. The Ball Fields offer a large space for active uses, supplying turf fields for various sports and seating for spectators. The Ball Fields total 1.9 acres of active recreational open space and are heavily utilized. The nearby Teardrop Park and Teardrop Park South have a variety of amenities for active and passive users, including paths, benches, and play equipment for children. The two parks sit across from one another on Murray Street between River Terrace and North End Avenue, with the Teardrop Park South consisting primarily of benches and landscaping. Of the two parks’ total 2.14 acres, approximately 1.78 acres are considered passive recreational open space and 0.36 acres are considered active recreational open space.

Table 5-2

Study Area Open Space Inventory (Existing Open Spaces—2021)

Map ID No. ¹	Name	Location	Owner	Total Acres	Active	Passive	Amenities	Condition/Utilization
1	WTC Memorial Plaza	WTC Site	The Port Authority of New York and New Jersey	5.75 ²	0.00	5.75	Benches, trees, WTC memorial	Excellent/Heavy
2	Millennium Hilton	Fulton St at Church St	Millennium Hilton	0.12	0.00	0.12	Planters, seating, trees	Excellent/Moderate
3	Tower 7 Plaza (Silverstein Family Park)	South of Barclay St between Greenwich St and West Broadway	The City of New York	0.50	0.00	0.50	Plaza, fountain, trees, shrubs, benches	Excellent/Moderate
4	Ball fields	Between Murray and Warren Sts along the west side Rte 9A	BPCA	1.90	1.90	0.00	Ball fields, seating, plantings, trees	Excellent/Moderate
5	I.S./P.S. 89 Playground ³	201 Warren St	DOE	0.25	0.20	0.05	Playground, basketball courts, benches	Good/Low
6	Stuyvesant High School Plaza	West of Rte 9A, North of Chambers St	DOE	0.83	0.00	0.83	Trees, plants, seating (no open space on southern side)	Good/Low
7	3 Medians	North End Ave	BPCA	0.58	0.00	0.58	Landscaping, trees, seating, dog run	Good/Moderate
8	Teardrop Park	Between Warren and Murray Sts, River Terrace, and North End Ave	BPCA	1.80	0.36	1.44	Paths, landscaping, trees, play equipment, lawn	Good/Moderate
9	Teardrop Park South	2 River Terrace	BPCA	0.34	0.00	0.34	Seating, trees, landscaping	Good/Low
10	Triangular Median	North End Ave at Murray St	BPCA	0.18	0.00	0.18	Landscaping, trees, seating	Good/Low
11	Irish Hunger Memorial	North End Ave at Vesey St	BPCA	0.50	0.00	0.50	Sloped hill, stone house ruin, landscaping, seating	Good/Low
12	Battery Park City Esplanade (includes Rockefeller, Pumphouse, and Wagner Parks, and North and South Coves)	Along Hudson River	BPCA	26.04	13.02	13.02	Lawn, trees, benches, sculptures, esplanade, play equipment,	Excellent/Heavy

Table 5-2 (cont'd)
Study Area Open Space Inventory (Existing Open Spaces—2021)

Map ID No. ¹	Name	Location	Owner	Total Acres	Active	Passive	Amenities	Condition/Utilization
13	Route 9A Bikeway/Walkway (Hudson River Greenway) ⁴	Rte 9A between Battery Pl and North Battery Park Esplanade (Stuyvesant HS plaza)	BPCA	3.38	3.38	0.00	Landscaping, pedway/bikeway, seating south of West Thames to Battery Pl	Good/Moderate
14	West Thames Park	West side of Rte 9A north of West Thames St	BPCA	1.30	1.04	0.26	Play equipment, spray showers, benches and tables, basketball court, turf field, community garden	Excellent/Low
15	Rector Park	Rector Place at South End Ave	BPCA, DPR	0.77	0.00	0.77	Trees, plants, seating (no open space on southern side)	Good/Low
16	Little West Dog Run	West of Rte 9A Bikeway between West Thames St and 3rd Pl	BPCA	0.14	0.00	0.14	Dog run	Good/Moderate
17	Elizabeth H. Berger Plaza/ Trinity Plaza	Between Greenwich St and Broadway at Edgar St	TBTA	0.37	0.00	0.37	Benches, trees, planters, lighting, subway entrance	Good/Low
18	123 Washington St (Gwathmey Plaza)	Between Albany and Carlisle Sts	123 Washington LLC C/O The Moinian Group	0.14	0.00	0.14	Seating, tables, trees	Good/Moderate
19	Liberty Plaza (Zuccotti Park)	Between Broadway, Liberty, Trinity, and Cedar Sts	New Liberty Plaza LLP	0.82	0.00	0.82	Trees, plantings, benches, lighting, tables, sculptures	Good/Heavy
20	One Liberty Plaza	Between Broadway, Liberty, Church, and Cortlandt Sts	New Liberty Plaza LLP	0.64	0.00	0.64	Trees, planters, seating	Good/Low
21	Trinity Church Graveyard	Between Church St and Broadway	Trinity Church Corp	1.43	0.00	1.43	Trees, benches, footpaths, grass, tables	Good/Low
22	55 Broadway/1 Exchange Plaza	55 Broadway	Bank of Communications	0.15	0.00	0.15	Plantings, seating	Fair/Low
23	Bowling Green	Broadway and Whitehall St	DPR	1.02	0.00	1.02	Benches, trees, fountain, garden, lighting, lawn, sculpture	Excellent/Heavy
24	The Battery	Southwest tip of Manhattan	DPR	21.88	5.47	16.41	Lawn, benches, sculptures, esplanade, eateries, bathrooms, carousel, playscape (under construction), cruise dockings, memorials	Excellent/Heavy
25	Peter Minuit Plaza	South of State St and west of Whitehall St	DPR	1.30	0.00	1.30	Benches, plantings, information booth	Good/Heavy
26	Staten Island Ferry/ Whitehall Terminal	Whitehall St and South St	Department of General Services	0.60	0.00	0.60	Elevated plaza, Benches, panoramic views	Good/Moderate
27	1 State Street Plaza	West side of Whitehall St north of State St	1 State St LLC	0.22	0.00	0.22	Plaza, planters, landscaping, trees, seating	Good/Low
28	1 Battery Park Plaza	Southwest corner of Bridge and Whitehall Sts	State Whitehall Co	0.27	0.00	0.27	Plaza, planters, flagpoles, seating	Good/Low
29	17 State Street	Pearl St west of State St	RFR SF 17 State Street	0.14	0.00	0.14	Plaza, plantings, statue, seating, trees	Excellent/Low

Table 5-2 (cont'd)

Study Area Open Space Inventory (Existing Open Spaces—2021)

Map ID No. ¹	Name	Location	Owner	Total Acres	Active	Passive	Amenities	Condition/Utilization
30	1 New York Plaza	State St between Broad and Whitehall Sts	1 New York Plaza Co LLC	0.90	0.00	0.90	Plaza, planters, seating	Good/Low
31	4 New York Plaza	115 Broad St	4 New York Plaza Ventures LLC	0.23	0.00	0.23	Open plaza, planters, seating	Good/Low
32	2 New York Plaza	125 Broad St	125 Broad Condominium	0.57	0.00	0.57	Plaza, planters, seating, trees	Good/Low
33	Vietnam Veterans Plaza	South St Between Broad St and Old Slip	DPR	0.73	0.00	0.73	Benches, trees, monument, steps, amphitheater, fountain	Excellent/Low
34	Coenties Slip	Corner of Water St and Coenties Slip	DPR	0.13	0.00	0.13	Benches, seating, trees, plants, sculpture	Good/Low
35	7 Hanover Square	From Water to Pearl Sts between Coenties Alley and Hanover Square	7 Hanover Association	0.17	0.00	0.17	Through block covered arcade with seating and planters	Good/Low
36	British Garden at Hanover Square (The Queen Elizabeth II September 11th Garden)	Hanover Square, Pearl St, and Stone St	DPR	0.12	0.00	0.12	Seating, statue, planters, trees landscaping	Excellent/Low
37	86 Water St/10 Hanover Square	Hanover Square between Water and Pearl Sts	UDR 10 Hanover LLC	0.08	0.00	0.08	Stairs, tables, seating, plantings	Good/Low
38	55 Water Street Elevated Plaza and Arcade	Water Street between Coenties Alley and Old Slip	New Water Street Corp.	2.10	0.00	2.10	Tables, chairs, benches, lawn, trees, landscaping, open plaza,	Excellent/Low
39	Old Slip Plaza	Old Slip between Water and Front Sts	DPR	0.05	0.00	0.05	Trees, lighting, fountain, plantings, benches	Good/Low
40	77 Water Street Plaza	Front to Water Streets between Old Slip and Gouverneur Lane	Water Street Fee LLC	0.32	0.00	0.32	Benches, fountains, trees, sculpture	Good/Low
41	Gouverneur Lane/32 Old Slip	Gouverneur Lane between South and Front Sts	Old Slip Property LLC	0.41	0.00	0.41	Trees, benches, lighting	Good/Low
42	111 Wall Street Plaza	Southeast corner of Front Street and Wall Street	230 Central Co., LLC	0.31	0.00	0.31	Benches, trees, planters, bike racks	Good/Low
43	Mannahatta Park (Wall Street Triangle Park)	Wall St between South and Front Sts	DPR	0.47	0.00	0.47	Trees, fountain, seating	Good/Low
44	75 Wall Street Plaza	Water St to Pearl St south of Wall St	85 Wall Street Limited Partnership and Realty Trust	0.30	0.00	0.30	Seating, planters, trees	Good/Low
45	52 Broadway	Broadway between Exchange Place and Morris St	Jack Resnick & Sons, Inc.	0.11	0.00	0.11	Indoor space with tables and chairs	Fair/Low
46	St. Paul's Chapel, Graveyard	Church St, Broadway, Vesey St and Fulton St	Parish of Trinity Church	1.20	0.00	1.20	Cemetery, benches, paths, trees	Good/Low
47	Bank of New York Plaza	1 Wall St (along Broadway)	One Wall Street Holdings LLC	0.11	0.00	0.11	Seating, planters, trees	Good/Low

Table 5-2 (cont'd)
Study Area Open Space Inventory (Existing Open Spaces—2021)

Map ID No. ¹	Name	Location	Owner	Total Acres	Active	Passive	Amenities	Condition/Utilization
48	85 Broad Street Plaza	Broad St between Pearl and S William St	85 Broad Street LLC	0.52	0.00	0.52	Seating, planters, lighting, trees	Good/Low
49	111 Murray Street Plaza	Murray Street btwn West St and Greenwich St	111 Murray	0.20	0	0.2	Benches, tables, plants, small lawn, fountain	Excellent/Moderate
50	30 Park Place Plaza	Between Park Pl, Barclay St, Church St and Broadway	30 Park Place Condominium	0.28	0	0.28	Seating and tables, lighting, sculpture, plants, trees	Excellent/Moderate
51	One World Trade Plaza	One World Trade Center along West St	The Port Authority of New York and New Jersey	0.29	0	0.29	Open plaza, planters, seating	Good/Low
52	Albany Street Plaza	Albany Street between Washington St and Greenwich St	The Port Authority of New York and New Jersey	0.21	0	0.21	Benches, seating, planters, trees, artwork	Good/Low
53	Liberty Park	Between Cedar Street, West St, Greenwich St, Liberty St	The Port Authority of New York and New Jersey	1.40	0	1.40	Elevated pathway with landscaping, benches, sculptures/monuments, and St. Nicholas National Shrine (Under construction)	Excellent/Moderate
54	New York Plaza	Whitehall Street, Broad Street, and Water Street	DOT	0.37	0	0.37	Softscaped plaza, planters, benches	Good/Low
55	200 Water Street	Water St between Fulton and John Sts	200 Water Street, LLC	0.17	0	0.17	Art, seating, tables, plantings	Good/Moderate
56	Cortlandt Way	Cortlandt Way between Greenwich and Church St (Plaza between 3 WTC and 4 WTC)	The Port Authority of New York and New Jersey	0.37	0	0.37	Open plaza, trees, seating	Excellent, Moderate
57	Pier 16	South St off of Fulton St	Department of Small Business Services	1.57	0	1.57	Seating, Panoramic views	Good/Heavy
58	Pier 15	South St off of Fletcher St	DPR	0.69	0	0.69	Grass, plantings, seating, panoramic views	Good/Heavy
59	East River Esplanade	Along East River between Whitehall St and Fulton St	DPR	5.46	2.73	2.73	Seating, landscaping, tables, dog run, bike lane	Good/Heavy
60	Pier 11	South St off Gouverneur Lane	DOT	0.76	0	0.76	Benches, covered waiting area	Good/Heavy
61	180 Maiden Lane	Southwest corner of Front St and Maiden Lane	Almah LLC	0.52	0	0.52	Benches, trees, indoor open space, lighting	Good/Low
62	Wall Street Plaza/88 Pine Street	Front St to Water St between Wall St and Maiden Lane	Orient Overseas Association	0.23	0	0.23	Benches, trees, sculpture, water feature, lighting	Good/Low
63	60 Wall Street/JP Morgan	Wall St between Pearl and William St	DBAB Wall Street, LLC	0.35	0	0.35	Indoor space with seating, plants, restrooms, pedestrian thoroughway	Good/Moderate
64	Federal Hall Steps	28 Wall St	National Park Service	0.06	0	0.06	Steps, statue, plantings	Excellent/Heavy
65	Chase Manhattan Plaza	Nassau, William, Liberty, and Pine Sts	JP Morgan Chase	1.31	0	1.31	Benches, trees, planters, lighting, sculpture	Excellent/Moderate

Table 5-2 (cont'd)

Study Area Open Space Inventory (Existing Open Spaces—2021)

Map ID No. ¹	Name	Location	Owner	Total Acres	Active	Passive	Amenities	Condition/Utilization
66	10 Liberty Street	Northeast corner of William and Cedar Sts	Liberty Street Realty, LLC	0.11	0	0.11	Plantings, seating, trees, water feature	Good/Moderate
67	Louise Nevelson Plaza	William St between Liberty St and Maiden Lane	Federal Reserve Bank of New York	0.25	0	0.25	Benches, trees, sculptures, lighting	Good/Low
68	140 Broadway Plaza, south side ⁵	140 Broadway	Silverstein 140 Broadway Property LLC	0.46	0	0.46	Planters, trees, seating, sculpture	Good/Moderate
69	Home Insurance Company Plaza	59 Maiden Lane at William St	Olympia & York Maiden Lane Co.	0.19	0	0.19	Seating, landscaping, lighting, trees	Good/Moderate
70	100 William Street	South side of John St east of William St	MFA 100 William LLC	0.12	0	0.12	Covered pedestrian space, seating	Good/Low
71	160 Water Street	Northeast corner of Pearl and Fletcher Sts	160 Water Street Association	0.13	0	0.13	Seating, open plaza	Good/Low
72	Imagination Playground	Between Front, John, and South Sts	DPR	0.39	0.31	0.08	Play equipment, benches	Good/Heavy
73	2 Gold Street	Corner of Gold and Platt Sts	2 Gold LLC	0.19	0	0.19	Seating, trees	Under Construction
74	Cliff Street Plaza	15 Cliff St between John and Fulton Sts	15 Cliff Street Condo	0.04	0	0.04	Seating, plants, trees	Good/Low
75	Oculus Plaza	Between Fulton, Dey, Church and Greenwich St (Plaza surrounding the Oculus Center)	The Port Authority of New York and New Jersey	1.20	0	1.20	Open plaza, trees, seating	Excellent/Moderate
76	Two Federal Reserve Plaza	33 Maiden Lane between Maiden Lane and John St	BBV US Real Estate Fund III, LP	0.10	0	0.10	Covered pedestrian space, seating	Good/Low
77	Wedge of Light Plaza	Along Fulton St and Church Street, below Vessey St	The Port Authority of New York and New Jersey	0.45	0	0.45	Tables, seating, planters, artwork	Excellent/Low
78	Stock Exchange District	Broad Street between Wall Street and Beaver St	DOT	0.25	0	0.25	Pedestrian-only zone with security bollards, benches and tables, open streets on cobble roads	Good/Moderate
79	Bogardus Plaza	Hudson, Chambers and Reade Sts	DOT	0.23	0	0.23	Greenstreet planters, seating, planters	Excellent/Moderate
80	50 West Plaza	Between West St, Joseph P Ward St, and Washington St	Private	0.14	0	0.14	Seating, landscaping	Excellent/Low
Study Area Total				100.68	28.41	72.27		

Notes:

DPR= New York City Department of Parks and Recreation
 DOE= New York City Department of Education
 DOT= New York City Department of Transportation
 TBTA= Triborough Bridge and Tunnel Authority
 BPCA= Battery Park City Authority
 1. See Figure 5-1 for open space resources.
 2. GIS has estimated the acreage to exclude the vents, memorial museum, and reflecting pools from the total plaza acreage.
 3. I.S./P.S. 89 is part of the DPR Schoolyards to Playgrounds program and is open to the public during non-school hours; therefore, it has been included in the quantitative analysis.
 4. Route 9A trail includes the pedestrian plaza south of West Thames St and north of Battery Pl, as well as bikeway/walkway along West Thames Park, continuing until Hudson River Park.
 5. The plaza is partially undergoing construction as of May 2021.
Sources: DPR; AKRF Field Surveys, May 2021; *WTC Memorial and Redevelopment Plan Final Generic Environmental Impact Statement (FGEIS)*, 2004; *East River Waterfront Esplanade and Piers Final Environmental Impact Statement (FEIS)*, 2007; *Seaport District Draft Environmental Impact Statement (DEIS)*, 2021; Select open space acreages were calculated using GIS data and ZoLa measurements.

Another well-frequented open space resource in the study area is the Route 9A Bikeway/Walkway, otherwise known as the Hudson River Greenway, which runs parallel to West Street from the southern tip of Manhattan and connects to the Hudson River Park at the northern end of the ½-mile study area. The Route 9A Bikeway/Walkway is a major active pathway utilized by bikers, joggers, and pedestrians alike and provides roughly 3.38 acres of active open space to the community. It extends beyond the study area from Battery Park up until Inwood Hill Park for a total of 12.9 miles.

NOTABLE OPEN SPACE RESOURCES NEAR OR CONTIGUOUS TO THE STUDY AREA

In addition to the open spaces within the study area, there are several large-scale open space resources situated near the study area or contiguous to it. These resources are not included in the quantitative analysis presented in this chapter, but they are considered qualitatively because they provide important open space amenities for study area residents. These resources are listed in **Table 5-3**, shown on **Figure 5-2**, and discussed below.

Table 5-3
Notable Open Space Resources Near or Contiguous to the Study Area

Map ID	Name
A	Hudson River Park
B	Washington Market Park
C	East River Esplanade <i>(with connection to East River Park)</i>
D	Governor's Island <i>(access by ferry from Battery Maritime Building)</i>
E	Brooklyn Bridge Park <i>(access by ferry from Pier 11)</i>
Notes:	See Figure 5-2 for Map ID locations. A portion of the East River Esplanade is within the study area, as discussed above.

Hudson River Park is an important large-scale open space resource that is situated just outside of the study area’s vicinity and is not included within the open space inventory. Hudson River Park runs four miles along Manhattan’s west side to 59th Street and includes 13 public piers, a marine estuary, waterfront esplanades, and bikeways. It includes several active space amenities, including numerous courts, ball fields, playgrounds, skate parks, and boat houses. Most recently, Hudson River Park’s 550 acres of open space have been expanded by a newly opened 2.7-acre open space on stilts known as Little Island that extends out onto the Hudson River.

Bordering the study area to the north on Chambers Street is Washington Market Park, a 2.12-acre urban park that offers tennis courts and basketball courts for active members of the community. This park also includes play equipment for children, a water spray, community gardens, park benches, and a gazebo.

On the east side of the study area, the East River Esplanade continues beyond the study area with approximately half of its area located outside the study area. The East River Esplanade also connects to the larger East River Park. East River Park begins at Montgomery Street, runs east and north along the East River, and includes a total of 45.88 acres, offering many ball fields, tracks, and court spaces for active uses, as well as fitness equipment, bicycle pathways, and playgrounds.

WTC Site 5

Furthermore, there are several piers along the southern, western, and eastern borders of the study area, providing access points to additional open spaces in the nearby vicinity. Most notably, ferries from the Battery Maritime Building take passengers to and from Governors Island, a 172-acre island fully equipped with active and passive open space amenities. Governors Island has a number of passive spaces, such as open lawns, picnic areas and hammock groves, as well as active amenities, including bike paths throughout the island, playgrounds, water activities, and ball fields. In addition, ferries from Pier 11 provide access to the Brooklyn Bridge Park, an 85-acre park in Brooklyn with field space, beach volleyball, playgrounds, courts, bouldering, and bike paths.

ADEQUACY OF OPEN SPACES

As shown in **Table 5-4**, the residential population of 45,734 has a total open space ratio of 2.2 acres per 1,000 residents, which is higher than the City’s median of 1.5 acres per 1,000 residents, but lower than the optimal goal of 2.5 acres total. The study area currently has 100.68 acres of open space for residents and workers, of which 28.41 acres are considered for active use, and 72.27 acres are utilized for passive recreation.

Table 5-4
Existing Conditions: Adequacy of Open Space Resources

Residential Population	Open Space Acreage			Open Space Ratios			City Open Space Goals		
	Total	Active	Passive	Total	Active	Passive	Total	Active	Passive
45,734	100.68	28.41	72.27	2.20	0.62	1.58	2.5	2	0.5

Note: Ratios in acres per 1,000 people

D. THE FUTURE WITHOUT THE PROPOSED AMENDMENT

As described in Chapter 1, “Project Description,” in the No Action condition the Approved Plan would create a new office building with retail use at its base. The No Action development would consist of roughly 1,300,000 sf of office space and 50,000 sf of retail.

STUDY AREA POPULATION

The No Action condition would not include any residential space. Therefore, there will be no additional residential population within the study area as a result of the No Action condition on the development site. However, there are numerous development projects in the study area containing residential space that are anticipated for completion by the project’s analysis year. These projects are described in greater detail in Chapter 2, “Land Use, Zoning, and Public Policy,” and are expected to introduce approximately 2,130 DUs. Applying the average household size of Manhattan Community Districts 1 and 2 of 1.91 to the anticipated number of DUs, these projects are expected to introduce an estimated 4,068 new residents to the study area. Therefore, with the new residents, the residential population within the study area is anticipated to increase to 49,802 in the No Action condition.

STUDY AREA OPEN SPACES

Under the No Action condition, on the WTC Site one open space resource would be displaced while one new open space plaza would be created. The construction of the Approved Plan on the Development Site would result in the displacement of Albany Street Plaza, eliminating 0.21 acres of passive open space with benches, seating, and planters. The new open space resource to be

created in the study area is located at the PACWTC, just east of One World Trade Center. It is estimated to be 0.41 acres and expected to be complete in 2023. Additionally, the Wedge of Light Plaza on the Two World Trade Center development site is anticipated to undergo improvements as a result of construction of that tower. The plaza currently exists as a 0.45-acre passive open space that serves as a beer garden and is expected to be further developed in the coming years.

While the No Action development would include the generation of a new plaza from the PAC building, it would also lose 0.21 acres of temporary project-created passive open space by displacing Albany Street Plaza at the development site. The new total open space acreage under the No Action condition is 100.88, compared to the existing condition total of 100.68 acres.

ADEQUACY OF OPEN SPACES

In the No Action condition, the residential population in the study area is expected to increase to 49,802 as a result of new completed development projects in the study area. With the anticipated inclusion of 0.41 acres from the PAC development and the loss of 0.21 acres of open space from the Approved Plan, the total amount of open space resources would be 100.88 acres compared to the existing condition total of 100.68 acres.

The changes in open space resources are only a loss in passive open space and remain above the City’s planning goal of 0.5 acres of passive open space per 1,000 residents. The active open space ratio declines slightly from 0.62 to 0.57 acres per 1,000 people as a result of the expected influx of residents by the project’s analysis year. The total open space ratio in the No Action condition (2.03 acres per 1,000 people) will remain above the City’s median guideline of 1.50 acres per 1,000 people (see **Table 5-5**).

Table 5-5

Future Without the Proposed Amendment: Adequacy of Open Space Resources

Residential Population	Open Space Acreage			Open Space Ratios			City Open Space Goals		
	Total	Active	Passive	Total	Active	Passive	Total	Active	Passive
49,802	100.88	28.41	72.47	2.03	0.57	1.46	2.5	2	0.5

Notes: Ratios in acres per 1,000 people

E. THE FUTURE WITH THE PROPOSED AMENDMENT

The assessment of conditions in the future with the Proposed Amendment examines conditions that are expected to occur as a result of the Proposed Project compared to the Approved Plan. The capacity of open space resources to serve future residential populations in the study area is examined using quantitative and qualitative factors. The potential for direct effects on open space is also considered.

As outlined in Chapter 1, “Project Description,” the Proposed Project, similar to the Approved Plan, would result in the removal of the temporary 0.21-acre open space resource on the Development Site. As noted above, this open space resource (Albany Street Plaza) was constructed as a temporary public plaza space for local visitors, workers, and residents in the area as WTC development plans were established. This analysis evaluates the potential impacts of the residential population that would be introduced under the Maximum Residential Program, which would introduce roughly 2,426 residents to the study area.

DIRECT EFFECTS ON OPEN SPACES

In accordance with CEQR, a proposed project may result in a significant direct impact on open space resources if there would be direct displacement or alteration of existing open space within the study area that would have a significant adverse effect on existing users, or an imposition of noise, air pollutant emissions, odor, or shadows on public open space that may alter its usability.

Both the Approved Plan and the Proposed Project would result in the direct loss of Albany Street Plaza, currently located on the Development Site. Given that this would occur with or without the Proposed Amendment, it would not constitute a new significant adverse impact of the Proposed Project on open space. Additionally, the Proposed Project would not result in any direct impacts to open space in the technical areas of shadows, air quality, or noise.

INDIRECT EFFECTS ON OPEN SPACES

STUDY AREA POPULATION

Development of the Maximum Residential Program under the Proposed Amendment would result in the construction of 1,270 new DUs. Upon applying the average household size of Manhattan Community Districts 1 and 2 to the proposed number of dwelling units, the Proposed Project is expected to introduce roughly 2,426 residents to the study area compared to the No Action condition. Therefore, the population in the residential study area would increase to a total of 52,228 residents with the Proposed Project.

STUDY AREA OPEN SPACE RESOURCES

There would be no change to study area open spaces compared to the Approved Plan. The total amount of open space in the study area would be 100.88 acres, including 28.41 acres of active open space, and 72.47 acres of passive open space in both the No Action and With Action conditions.

ADEQUACY OF OPEN SPACES

With the Proposed Project, the introduction of new residents would result in a total open space ratio of 1.93 acres per 1,000 people, or 0.10 less than the No Action condition. The active open space ratio would also decrease to 0.54 acres per 1,000 people (from the 0.57 in the No Action condition), and the passive open space ratio would decrease to 1.39 acres per 1,000 people (from the 1.46 in the No Action condition). **Table 5-6** presents a summary of the open space ratios in the With Action condition.

Table 5-6

Future With the Proposed Amendment: Adequacy of Open Space Resources

Residential Population	Open Space Acreage			Open Space Ratios			City Open Space Goals		
	Total	Active	Passive	Total	Active	Passive	Total	Active	Passive
52,228	100.88	28.41	72.47	1.93	0.54	1.39	2.5	2	0.5

Note: Ratios in acres per 1,000 people

QUANTITATIVE ASSESSMENT

As shown in **Table 5-7**, the With Action condition with the Proposed Amendment would result in a 4.64 percent decrease in total open space ratio as compared to the No Action condition with the

Approved Plan. This decrease would be less than the 5 percent threshold identified in the *CEQR Technical Manual* guidance, and the study area total open space ratio would exceed the City’s median community district ratio of 1.5 acres per 1,000 residents, indicating that the study area would continue to be well-served by open space overall. Therefore, the decrease in the total open space ratio would not constitute a significant adverse impact.

**Table 5-7
Open Space Ratios Summary**

Ratio	City Goal (acres per 1,000 people)	No Action Condition (Approved Plan)	With Action Condition (Proposed Project)	Percent Change
Total	2.5	2.03	1.93	-4.64%
Active	2.0	0.57	0.54	-4.56%
Passive	0.5	1.46	1.39	-4.60%
Note: Ratios in acres per 1,000 people				

The passive open space ratio would decrease by 4.60 percent compared to No Action condition with the Approved Plan, and it would remain above the City’s planning goal of 0.5 acres per 1,000 residents. Therefore, the decrease in the passive open space ratio would not constitute a significant adverse impact.

The active open space ratio would decrease by 4.56 percent compared to No Action condition with the Approved Plan,¹ which is less than the percentage decrease that the *CEQR Technical Manual* indicates could potentially result in significant adverse open space impacts in the study area. This reduction in the open space ratio provides a way of measuring the adequacy of open space capacity and setting a goal for enhanced open space resource accessibility. Given the predicted quantitative effects on the active open space ratio, no significant adverse open space impacts are expected. Nevertheless, a qualitative assessment of active open space resources near or adjacent to the study area is included in the following section to determine whether the decrease in the active open space ratio with the Proposed Project would rise to a level of significance. Overall, taking these quantitative and qualitative analyses into account, the Proposed Amendment would not have a significant adverse impact on the use of or access to active open space by study area residents.

QUALITATIVE ASSESSMENT

Although active open space ratios in the study area would fall below the City’s planning goals in both the Approved Plan and with the Proposed Project, residents in the study area would have access to other open space resources with active recreation features located near the study area or immediately contiguous to it. These open space resources are not included in the quantitative assessment, but they are discussed below in greater detail as part of the qualitative assessment of potential open space impacts.

Washington Market Park is located just outside of the study area on Chambers Street. The park is situated near the entrance to the Hudson River Park and the Battery Park City Ball Fields. It has 2.12 acres of open space and offers a variety of active amenities such as basketball and tennis courts on one side of the park, and a large playground and open lawn with benches on the other side.

¹ With the Reduced Residential Program of 1,193 units, the percent change in the active open space ratio would be 4.21 percent.

Many of the open space resources not considered formally in the quantitative analysis are also connected to parks located within the study area. To the north the Proposed Project would have access to Liberty Park, which connects to the pedestrian bridge over Route 9A to Battery Park City's open spaces and the Route 9A Bikeway/Walkway. Also, Hudson River Park and the East River Esplanade, which both extend well beyond the study area to the north on the east and west sides, provide additional space for both active and passive recreation. Hudson River Park is a 550-acre open space resource that extends along the west side of Manhattan. Hudson River Park includes a wide variety of active and passive features, including an extensive bikeway and walkway, numerous courts and ball fields, skateparks, playgrounds, and access to waterfront activities.

The East River Esplanade starts at the Battery Maritime Building within the study area and continues along the waterfront to Montgomery Street where the East River Park begins. Similar to Hudson River Park, East River Park offers a number of active open space amenities, including bike paths, fitness equipment, playgrounds, track and fields, and courts. Piers 35, 36, and 42 all connect to the East River Esplanade providing waterfront vistas, lounging areas and access to art and cultural exhibitions.²

Furthermore, the study area is uniquely positioned in that it provides ferry access to other parks in New York, such as Governors Island, a 172-acre park with significant outdoor open space including courts, playgrounds, ball fields, and access to kayaking and other water activities. Pier 11 also provides access to the Brooklyn Bridge Park, an 85-acre park in Brooklyn with field space, beach volleyball, playgrounds, courts, bouldering, and bike paths. The study area has a notable amount of open space resources and unique access to waterfront recreation and nearby public parks.³

In addition, the Proposed Project is expected to include recreational space and amenities for building residents, such as a fitness center totaling approximately 36,000 gsf. The open space amenities in the development would serve some of the recreational needs of the new population introduced into the study area and thereby reduce demand on other resources in the study area. The Proposed Project would also have direct access to Liberty Park on the second level; from Liberty Park, residents would have seamless access over West Street to the active open space amenities in Battery Park City. The creation of active recreational amenities for building residents, as well as the substantial access to open space resources just outside the study area, would ameliorate the new population's effects on the study area resources. Overall, taking these factors into account, the Proposed Amendment would not have a significant adverse impact on the use of or access to active open space by study area residents.

Overall, the Proposed Amendment would not result in a significant adverse impact on the use of or access to passive or active open space in the study area. *

² Pier 42 is currently undergoing redevelopment through the partnership of NYCEDC, LMDC, and NYC Parks to create a new park space with extended bike paths, playground space, recreation areas with soccer fields, tennis courts, fitness equipment and picnic areas.

³ The Developer is continuing discussions with NYC Parks and other agencies to identify nearby park areas that may be in need of improvement.

A. INTRODUCTION

This chapter considers the potential of the Proposed Amendment of the General Project Plan (GPP) to cast new shadows on sunlight-sensitive resources, which include publicly accessible parks and other open spaces, sunlight-dependent features of historic resources, and natural resources that depend on sunlight. A shadow study is required if a proposed project would result in new structures with a net increase of 50 feet or more in height, or of any height if the project site is located adjacent to, or across the street from, a sunlight-sensitive resource. As noted in Chapter 1, “Project Description,” the Approved Plan considers a 57-story-tall office building with retail at its base on the Development Site. Figure 1-2 in Chapter 1, “Project Description,” depicts the Approved Plan with Tower 5 at approximately 57 stories and 839 feet tall. As described in Chapter 1, the Proposed Amendment would permit a greater flexibility with regard to uses. While the program and design of Tower 5 have not yet been finalized, the shadows analysis presented below considered a highly conservative worst case massing with a maximum height of 965 feet,¹ a net height increase of approximately 126 feet compared to the Tower 5 of the Approved Plan.

The analysis concluded that thirteen open spaces, including six in the Project Area, would receive incremental shadows in one or more seasons from the top of the proposed residential tower, as well as small areas of reduced shadow (because the residential tower would be more slender compared to the office tower of the Approved Plan). However, in no case would the incremental shadow cause significant adverse impacts to the resources or their users.

B. DEFINITIONS AND METHODOLOGY

DEFINITIONS

Incremental shadow is the additional, or new, shadow that a structure resulting from a proposed project would cast on a sunlight-sensitive resource.

Sunlight-sensitive resources are those that depend on sunlight or for which direct sunlight is necessary to maintain the resource’s usability or architectural integrity. Such resources generally include the following:

- *Public open space* such as parks, beaches, playgrounds, plazas, schoolyards (if open to the public during non-school hours), greenways, and landscaped medians with seating. Planted areas within unused portions of roadbeds that are part of the Greenstreets program are also considered sunlight-sensitive resources.
- *Features of architectural resources that depend on sunlight for their enjoyment by the public.* Only the sunlight-sensitive features need be considered, as opposed to the entire resource. Such sunlight-sensitive features might include: design elements that depend on the contrast between light and dark (e.g., recessed balconies, arcades, deep window reveals); elaborate,

¹ The Proposed Project would have a maximum height of 940 feet.

highly carved ornamentation; stained glass windows; historic landscapes and scenic landmarks; and features for which the effect of direct sunlight is described as playing a significant role in the structure's importance as a historic landmark.

- *Natural resources* where the introduction of shadows could alter the resource's condition or microclimate. Such resources could include surface water bodies, wetlands, or designated resources such as coastal fish and wildlife habitats.

Non-sunlight-sensitive resources include the following:

- *City streets and sidewalks* (except Greenstreets);
- *Private open space* (e.g., front and back yards, stoops, vacant lots, and any private, non-publicly accessible open space); and
- *Project-generated open space* cannot experience a significant adverse shadow impact from the project, because without the project the open space would not exist. However, a discussion of how shadows would affect the new space may be warranted.

A significant adverse shadow impact occurs when the incremental shadow added by a proposed project falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources. Each case must be considered on its own merits based on the extent and duration of new shadow and an analysis of the resource's sensitivity to reduced sunlight, and seasonal conditions.

METHODOLOGY

A preliminary screening assessment must first be conducted to ascertain whether a project's shadow could reach any sunlight-sensitive resources at any time of year. The preliminary screening assessment consists of three tiers of analysis. The first tier determines a simple radius around the proposed building representing the longest shadow that could be cast. If there are sunlight-sensitive resources within this radius, the analysis proceeds to the second tier, which reduces the area that could be affected by project shadow by accounting for the fact that shadows can never be cast between a certain range of angles south of the project site due to the path of the sun through the sky at the latitude of New York City.

If the second tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a third tier of screening analysis further refines the area that could be reached by project shadow by looking at specific representative days in each season and determining the maximum extent of shadow over the course of each representative day.

If the third tier of analysis does not eliminate the possibility of new shadows on sunlight-sensitive resources, a detailed shadow analysis is required to determine the extent and duration of the incremental shadow resulting from the project. The detailed analysis provides the data needed to assess the shadow impacts. The effects of the new shadows on the sunlight-sensitive resources are described, and their degree of significance is considered. The results of the analysis and assessment are documented with graphics, a table of incremental shadow durations, and narrative text.

C. PRELIMINARY SCREENING ASSESSMENT

A base map was developed using Geographic Information Systems (GIS)² showing the location of the Development Site, the Project Site, and the surrounding street layout (see **Figure 6-1**). Mapped databases of parks and other public open spaces, historic resources, and natural resources were added to the map.³ In coordination with the open space, historic and cultural resources, and natural resources assessments presented in other sections of this report, sunlight-sensitive resources were identified.

TIER 1 SCREENING ASSESSMENT

For the Tier 1 assessment, the longest shadow that the proposed development could cast is calculated, and, using this length as the radius, a perimeter is drawn around the project site. Anything outside this perimeter representing the longest possible shadow could never be affected by project generated shadow, while anything inside the perimeter needs additional assessment.

According to the *CEQR Technical Manual*, the longest shadow that a structure can cast at the latitude of New York City occurs on December 21, the winter solstice, at the start of the analysis day (90 minutes after sunrise), and is equal to 4.3 times the height of the structure.

Therefore, at a maximum height of 965 feet above curb level, the reasonable worst-case building under the Proposed Amendment could cast a shadow up to approximately 4,150 feet in length (965 x 4.3). Using this length as the radius, a perimeter was drawn around the project site (see **Figure 6-1**).

The Tier 1 assessment showed that dozens of publicly accessible open spaces were located in the longest shadow study area, as well as a number of historic resources with sun-sensitive architectural features and two natural resources (portions of the Hudson and East Rivers). Therefore, the next tier of assessment was required.

TIER 2 SCREENING ASSESSMENT

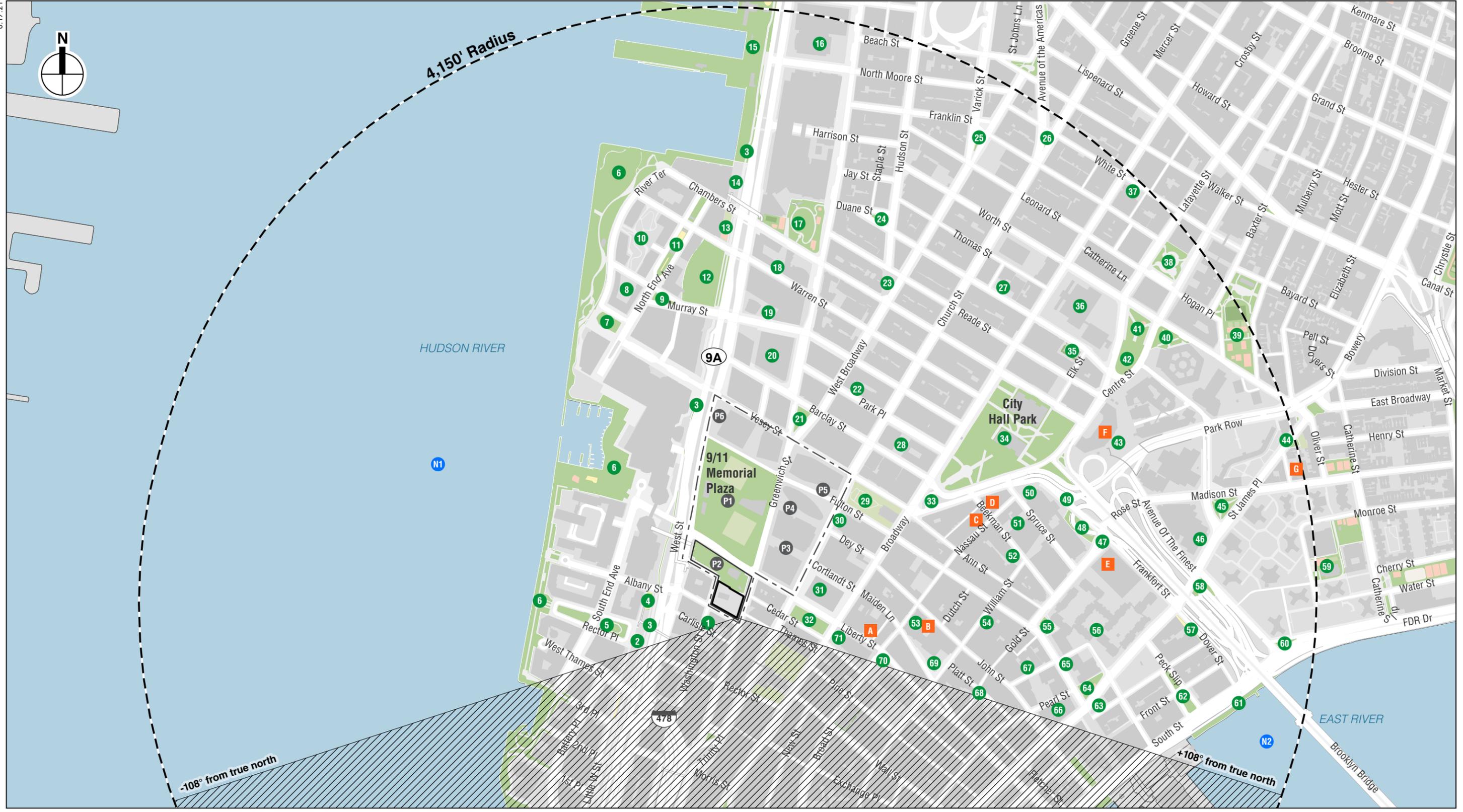
Because of the path that the sun travels across the sky in the northern hemisphere, no shadow can be cast in a triangular area south of any given project site. In New York City this area lies between -108 and +108 degrees from true north. **Figure 6-1** also illustrates this triangular area south of the project site. The complementary area to the north within the longest shadow study area represents the remaining area that could potentially experience new project generated shadow.

The Tier 2 assessment concluded that 71 publicly accessible open spaces are located in the remaining longest-shadow study area. Some of the spaces are public parks and playgrounds, while others are privately owned plazas, courtyards, or other such spaces associated with office or residential buildings that are open to the public. These 71 open spaces required the next tier of assessment.⁴

² Software: Esri ArcGIS Pro 2.7

³ Data: City, State, and Federal agencies including New York City Parks Department; New York City Department of Information Technology and Telecommunications (DoITT), New York City Department of City Planning, New York City Landmarks Preservation Commission, New York City Department of Transportation, New York State Office of Parks, Recreation, and Historic Preservation, and others; supplemented by Nearmap hi-resolution imagery, and AKRF site visits.

⁴ One additional publicly accessible open space, a covered pedestrian arcade at 100 William Street, was not included in the inventory because it was found to have minimal sky exposure. Another interior public



- Development Site (Site 5)
- Tier 1: Longest Shadow Study Area Perimeter
- Project Site
- Tier 2: Area South of Site That Could Never Be Shaded by Proposed Facility
- WTC Site
- Publicly Accessible Open Space

- Historic Structure with Sunlight-Sensitive Features
- Natural Resource
- Project Generated Open Space

0 1,000 FEET

In addition, seven historic buildings with sunlight-dependent architectural features are located in the Tier 2 remaining longest shadow study area and require further assessment to ascertain whether they could be affected by project-generated shadow.

Portions of the Hudson and East Rivers, important natural resources, are also in the remaining longest shadow study area and require the next tier of assessment.

Within the WTC Site itself, several new open spaces have been developed or will be developed as part of the Redevelopment Plan. These spaces are all north of the Development Site and within the remaining longest shadow study area, and will be included in the shadow study.

The 71 open spaces, seven historic buildings, two natural resources, and six project-generated open spaces requiring a Tier 3 assessment are listed in **Table 6-1**, along with the Tier 3 results.

TIER 3 SCREENING ASSESSMENT

The direction and length of shadows vary throughout the course of the day and also differ depending on the season. In order to determine whether project-generated shadow could fall on a sunlight-sensitive resource, three-dimensional computer modeling software⁵ is used in the Tier 3 assessment to calculate and display the proposed project's shadows on individual representative days of the year. A computer model was developed containing three-dimensional representations of the elements in the base map used in the preceding assessments, the topographic information of the study area, and a reasonable worst-case three-dimensional representation of Tower 5 under the Proposed Amendment.

REPRESENTATIVE DAYS FOR ANALYSIS

Shadows on the summer solstice (June 21), winter solstice (December 21) and spring and fall equinoxes (March 21 and September 21, which are approximately the same in terms of shadow patterns) are modeled, to represent the range of shadows over the course of the year. An additional representative day during the growing season is also modeled, generally the day halfway between the summer solstice and the equinoxes, i.e., May 6 or August 6, which have approximately the same shadow patterns.

TIMEFRAME WINDOW OF ANALYSIS

The shadow assessment considers shadows occurring between one and a half hours after sunrise and one and a half hours before sunset. At times earlier or later than this timeframe window of analysis, the sun is down near the horizon and the sun's rays reach the Earth at very tangential angles, diminishing the amount of solar energy and producing shadows that are very long, move fast, and generally blend with shadows from existing structures. Consequently, shadows occurring outside the timeframe window of analysis are not considered significant under CEQR, and their assessment is not required.

TIER 3 SCREENING ASSESSMENT RESULTS

Figures 6-2 to 6-5 illustrate the range of shadows that would occur, in the absence of intervening buildings, from the proposed building on the four representative days for analysis. As they move clockwise and generally west to east over the landscape, the shadows are shown occurring

space, located at 101 Barclay Street, *was* included because its south facing high glass wall admits some sunlight into the space.

⁵ Bentley MicroStation

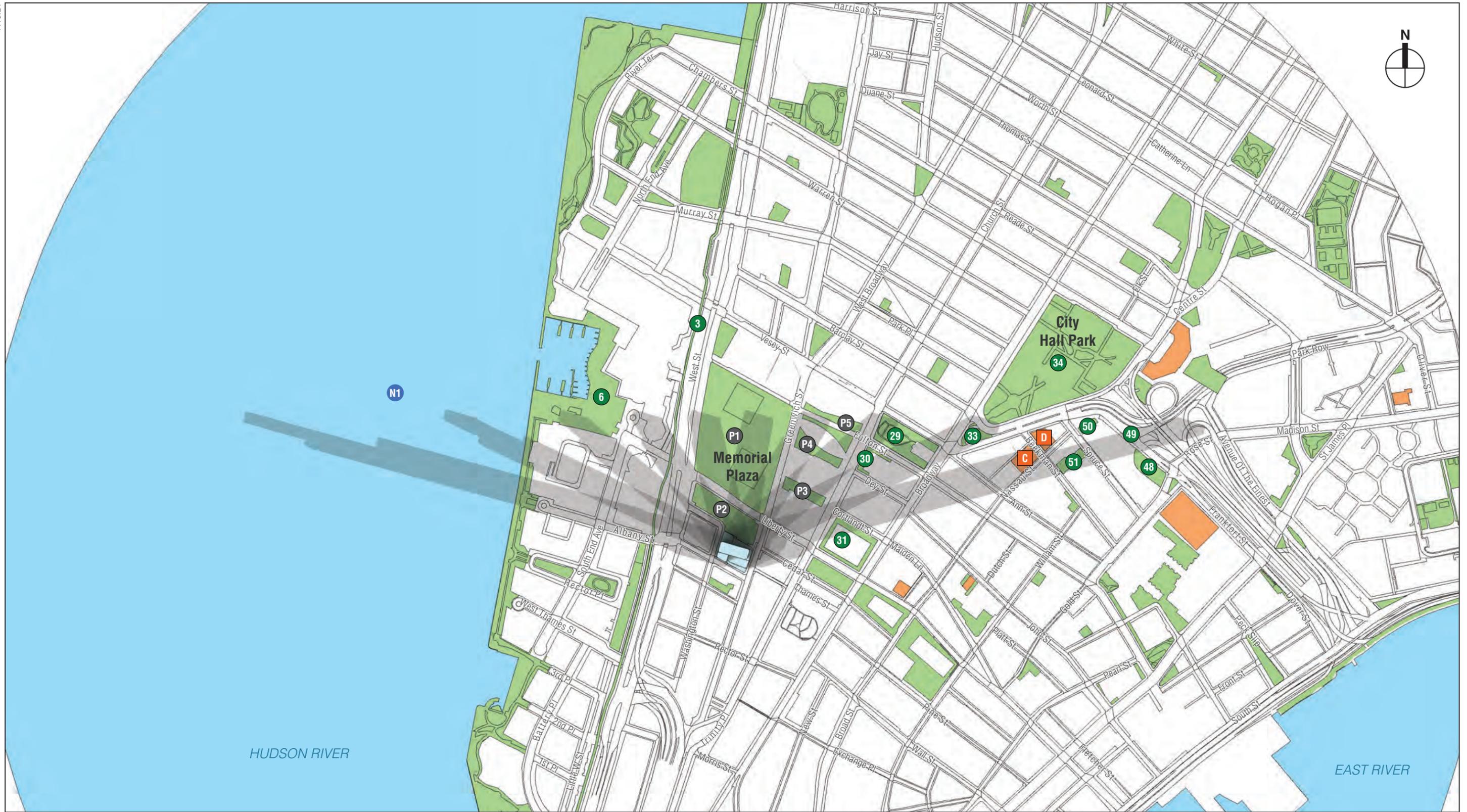


- Proposed Project
- # Publicly Accessible Open Space
- # Historic Resource with Sunlight-Sensitive Features

- N# Natural Resource
 - P# Project Generated Open Space
- See Table 6-1 for resource number key

This figure illustrates the range of shadows that would occur from the Proposed Project on the analysis day representing the winter. The shadows are shown occurring approximately every 60 minutes from the start of the analysis day (90 minutes after sunrise) to the end of the analysis day (90 minutes before sunset). The Tier 3 assessment does not account for future No Action shadows, and the shadows shown in this figure do not represent incremental shadows. The Tier 3 assessment serves to illustrate the daily path or "sweep" of the proposed building's shadows across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow. Daylight Saving Time was not used, per CEQR Technical Manual guidelines.

Tier 3 Assessment:
December 21
Figure 6-2



 Proposed Project

 Publicly Accessible Open Space

 Historic Resource with Sunlight-Sensitive Features

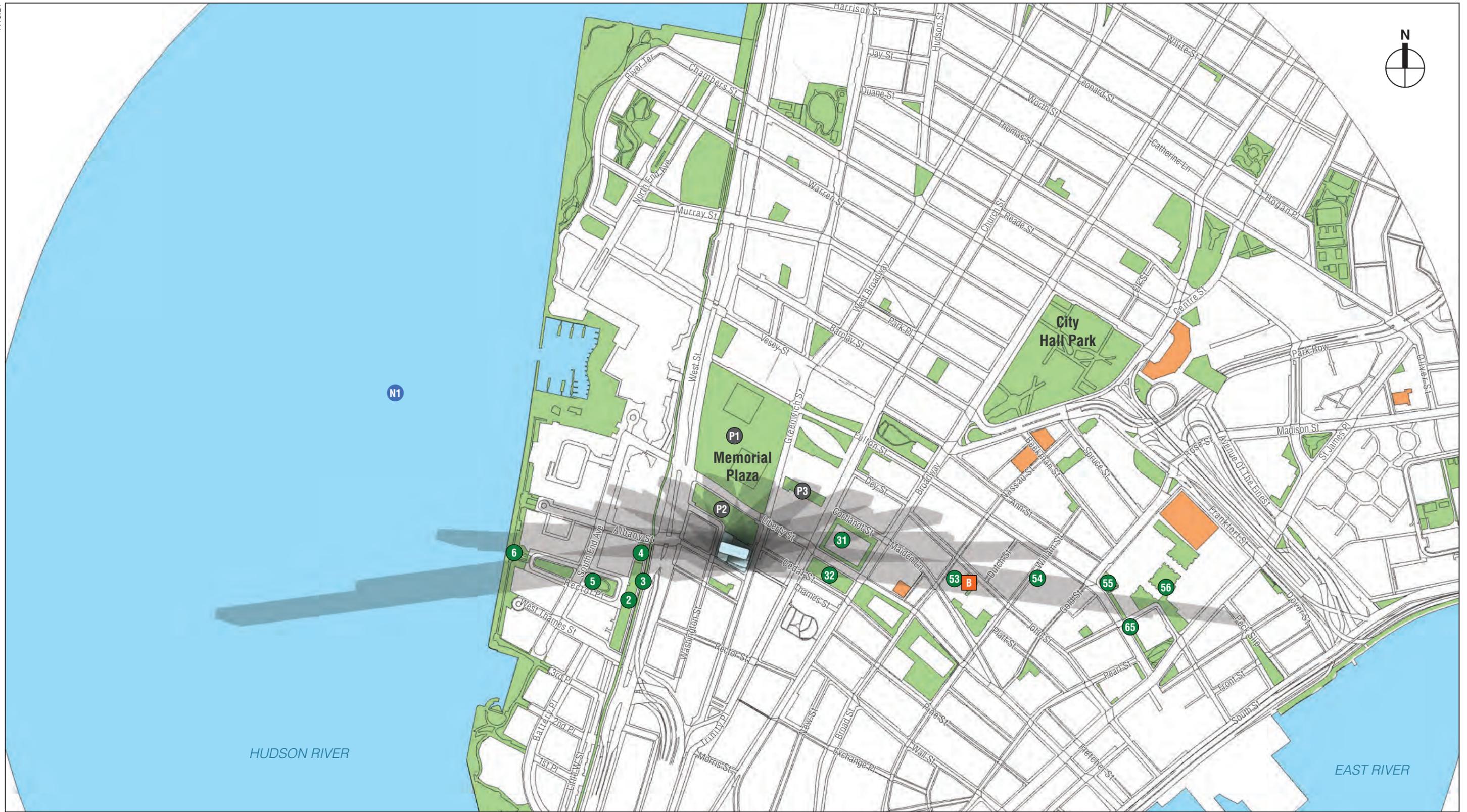
 Natural Resource

 Project Generated Open Space

See Table 6-1 for resource number key

This figure illustrates the range of shadows that would occur from the Proposed Project on the analysis day representing the early spring and the fall. The shadows are shown occurring approximately every 60 minutes from the start of the analysis day (90 minutes after sunrise) to the end of the analysis day (90 minutes before sunset). The Tier 3 assessment does not account for future No Action shadows, and the shadows shown in this figure do not represent incremental shadows. The Tier 3 assessment serves to illustrate the daily path or "sweep" of the proposed building's shadows across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow. Daylight Saving Time was not used, per CEQR Technical Manual guidelines.

Tier 3 Assessment:
March 21 / September 21
Figure 6-3

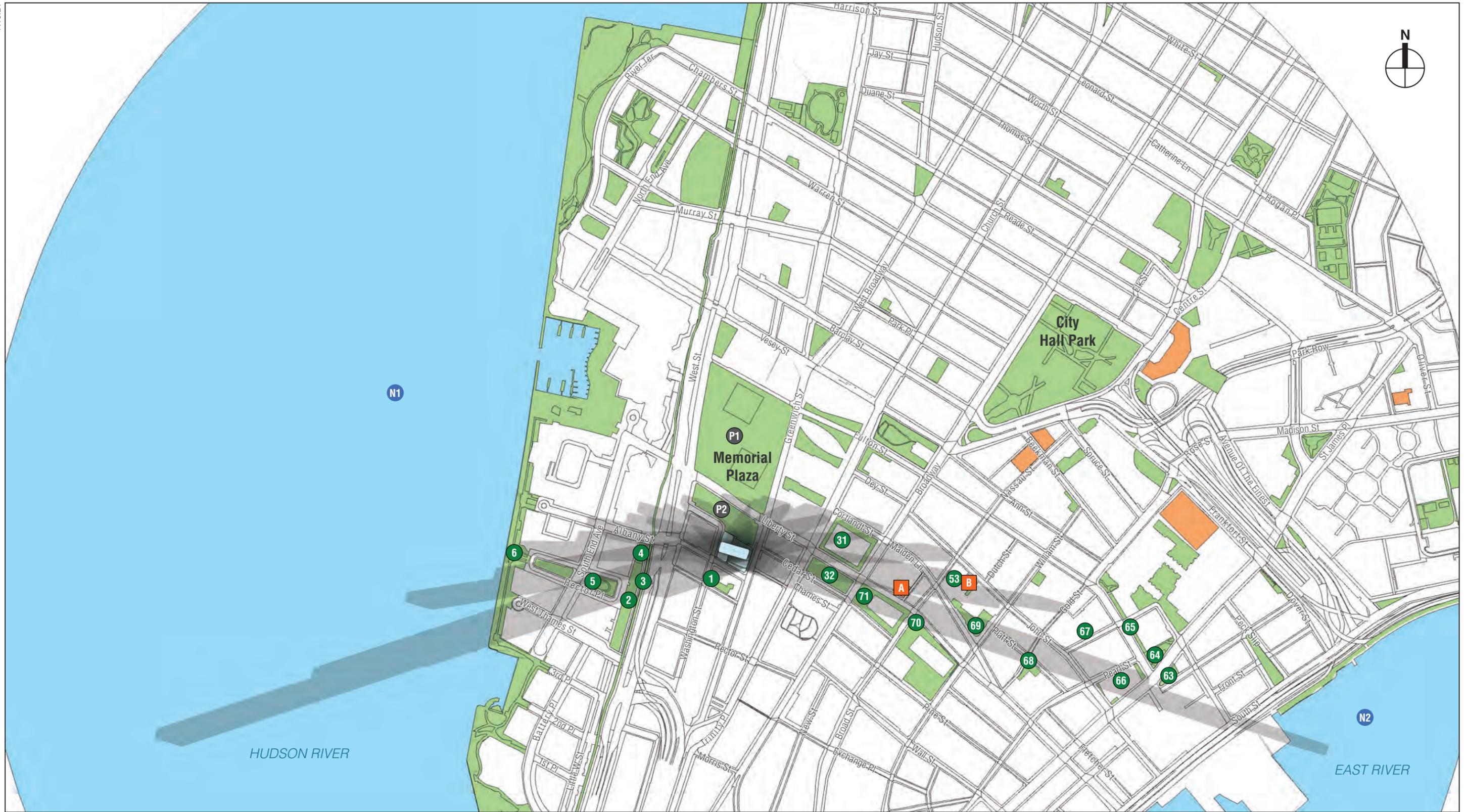


- Proposed Project
- # Publicly Accessible Open Space
- # Historic Resource with Sunlight-Sensitive Features

- N# Natural Resource
 - P# Project Generated Open Space
- See Table 6-1 for resource number key

This figure illustrates the range of shadows that would occur from the Proposed Project on the analysis day representing the spring and summer growing season period. The shadows are shown occurring approximately every 60 minutes from the start of the analysis day (90 minutes after sunrise) to the end of the analysis day (90 minutes before sunset). The Tier 3 assessment does not account for future No Action shadows, and the shadows shown in this figure do not represent incremental shadows. The Tier 3 assessment serves to illustrate the daily path or "sweep" of the proposed building's shadows across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow. Daylight Saving Time was not used, per CEQR Technical Manual guidelines.

Tier 3 Assessment:
May 6 / August 6
Figure 6-4



- Proposed Project
- # Publicly Accessible Open Space
- # Historic Resource with Sunlight-Sensitive Features

- N# Natural Resource
 - P# Project Generated Open Space
- See Table 6-1 for resource number key

This figure illustrates the range of shadows that would occur from the Proposed Project on the analysis day representing summer. The shadows are shown occurring approximately every 60 minutes from the start of the analysis day (90 minutes after sunrise) to the end of the analysis day (90 minutes before sunset). The Tier 3 assessment does not account for future No Action shadows, and the shadows shown in this figure do not represent incremental shadows. The Tier 3 assessment serves to illustrate the daily path or "sweep" of the proposed building's shadows across the landscape, indicating which resources could potentially be affected on that analysis day, absent intervening buildings, by project-generated shadow. Daylight Saving Time was not used, per CEQR Technical Manual guidelines.

Tier 3 Assessment:
June 21
Figure 6-5

approximately every 60 minutes from the start of the analysis day (90 minutes after sunrise) to the end of the analysis day (90 minutes before sunset). **Table 6-1** summarizes which analysis day or days each resource could potentially receive project-generated shadow.

**Table 6-1
Tier 3 Assessment**

Map Reference	Name	Dec. 21	March 21/ Sept. 21	May 6/ August 6	June 21
Publicly Accessible Open Spaces					
1	Gwathmey Plaza POPS	No	No	No	Potential
2	West Thames Park	No	No	Potential	Potential
3	Route 9A Bikeway/Walkway	Potential	Potential	Potential	Potential
4	Liberty Community Gardens	No	No	Potential	Potential
5	Rector Park	No	No	Potential	Potential
6	Battery Park City Esplanade	Potential	Potential	Potential	Potential
7	Irish Hunger Memorial	Potential	No	No	No
8	Teardrop Park South	No	No	No	No
9	Median (Murray St, North End Ave)	No	No	No	No
10	Teardrop Park	No	No	No	No
11	3 Medians (North End Ave)	No	No	No	No
12	Ball fields	No	No	No	No
13	P.S. 89/I.S. 289 Playground	No	No	No	No
14	Stuyvesant H.S. Plaza	No	No	No	No
15	Hudson River Park	No	No	No	No
16	388 Greenwich St POPS	No	No	No	No
17	Washington Market Park	No	No	No	No
18	TriBeCa Dog Run	No	No	No	No
19	111 Murray St POPS	Potential	No	No	No
20	101 Barclay St POPS	Potential	No	No	No
21	7 WTC Plaza	Potential	No	No	No
22	43 Park Place POPS	Potential	No	No	No
23	Bogardus Plaza	Potential	No	No	No
24	Duane Park	No	No	No	No
25	Greenstreet (Finn Square)	No	No	No	No
26	Greenstreet (Sixth Ave, Church St, White St)	No	No	No	No
27	105 Duane St POPS	Potential	No	No	No
28	99 Church St POPS	No	No	No	No
29	St Paul's Chapel Churchyard	No	Potential	No	No
30	Millenium Hilton POPS	No	Potential	No	No
31	One Liberty Plaza POPS	No	Potential	Potential	Potential
32	Zuccotti Park POPS	No	No	Potential	Potential
33	Greenstreet (Millennium Park)	No	Potential	No	No
34	City Hall Park	No	Potential	No	No
35	African Burial Ground Natl Mnmt	No	No	No	No

**Table 6-1 (cont'd)
Tier 3 Assessment**

Map Reference	Name	Dec. 21	March 21/ Sept. 21	May 6/ August 6	June 21
Publicly Accessible Open Spaces (continued)					
36	Jacob K. Javits Federal Bldg Plazas	No	No	No	No
37	376 Broadway POPS	No	No	No	No
38	Collect Pond Park	No	No	No	No
39	Columbus Park	No	No	No	No
40	Foley Square NY Supreme Ct	No	No	No	No
41	Thomas Paine Park	No	No	No	No
42	Foley Square	No	No	No	No
43	Municipal Bldg Plazas	No	No	No	No
44	St James Triangle	No	No	No	No
45	James Madison Plaza	No	No	No	No
46	375 Pearl St POPS	No	No	No	No
47	Greenstreet (Gold St, Frankfurt St)	No	No	No	No
48	Drumgoole Plaza	No	Potential	No	No
49	Greenstreet (Park Row, Frankfurt St)	No	Potential	No	No
50	Pace Plaza	No	Potential	No	No
51	8 Spruce St POPS	No	Potential	No	No
52	33 Beekman St POPS	No	No	No	No
53	33 Maiden Lane POPS	No	No	Potential	Potential
54	130 William St POPS	No	No	Potential	No
55	DeLury Square	No	No	Potential	No
56	Southbridge Towers	No	No	Potential	No
57	Fishbridge Park Garden	No	No	No	No
58	Greenstreets (Pearl St, Brooklyn Bridge)	No	No	No	No
59	Alfred E. Smith Plgd	No	No	No	No
60	Greenstreet (South St, Brooklyn Bridge)	No	No	No	No
61	East River Esplanade	No	No	No	No
62	Peck Slip	No	No	No	No
63	Titanic Park	No	No	No	Potential
64	Pearl St Plgd	No	No	No	Potential
65	St Margaret's House	No	No	Potential	Potential
66	200 Water St POPS	No	No	No	Potential
67	15 Cliff St POPS	No	No	No	Potential
68	2 Gold St POPS	No	No	No	Potential
69	59 Maiden Lane POPS	No	No	No	Potential
70	28 Liberty POPS	No	No	No	Potential
71	140 Broadway POPS	No	No	No	Potential

**Table 6-1 (cont'd):
Tier 3 Assessment**

Map Reference	Name	Dec. 21	March 21/ Sept. 21	May 6/ August 6	June 21
Historic Architectural Resources with Sunlight-Sensitive Features					
A	Chamber of Commerce Building	No	No	No	Potential
B	John St Methodist Church	No	No	Potential	Potential
C	Temple Court Building	No	Potential	No	No
D	Potter Building	No	Potential	No	No
E	100 Gold St	No	No	No	No
F	Municipal Building	No	No	No	No
G	St James Church	No	No	No	No
Natural Resources					
N1	Hudson River	Potential	Potential	Potential	Potential
N2	East River	No	No	No	Potential
Project-Generated Open Space					
P1	Memorial Plaza	Potential	Potential	Potential	Potential
P2	Liberty Park	Potential	Potential	Potential	Potential
P3	Cortlandt Way	Potential	Potential	Potential	No
P4	Oculus Plaza	Potential	Potential	No	No
P5	Two WTC Plaza	Potential	Potential	No	No
P6	One WTC Plaza	Potential	No	No	No
Notes:					
See Figures 6-2 to 6-5 for corresponding resource locations and shadow sweeps. In the columns representing the representative analysis dates, "No" means project-generated shadow could not reach the resource, even without accounting for intervening buildings. "Potential" means project-generated shadow could potentially reach the resource on this date and requires further assessment.					

The Tier 3 assessment concluded that 36 of the 71 publicly accessible open spaces and four of the seven historic resources could potentially receive incremental shadow on one or more of the representative analysis days, and these resources (indicated in **Table 6-1**) required a detailed analysis. The other open spaces and historic resources were too far away and could not receive project-generated shadow on any representative day and do not require further assessment. Portions of both rivers could also potentially receive incremental shadow and required a detailed analysis. In addition, all six of the project-generated open spaces could potentially be reached by incremental shadow on one or more analysis days and were included in the detailed analysis below.

D. DETAILED SHADOW ANALYSIS

A detailed analysis is warranted when the screening analysis does not rule out the possibility that project-generated shadows would reach sunlight-sensitive resources. The detailed analysis establishes a baseline condition, the future without the Proposed Amendment (the "No Action" condition), to illustrate the shadows cast by existing buildings (and other future planned buildings, including the previously approved Development Site office tower). This baseline is then compared to the future condition with the Proposed Amendment (the "With Action" condition) to distinguish the additional (incremental) shadow cast by the proposed Tower 5. The purpose of the detailed analysis is to determine the extent and duration of new incremental shadow that would be cast on a sunlight-sensitive resource as a result of the Proposed Amendment. Because existing (or future

No Action) buildings may already cast shadows on a sunlight-sensitive resource, the proposed Tower 5 may not result in additional, or incremental, shadows on that resource.

Following the analysis framework described in Chapter 1, “Project Description,” detailed analysis was performed for the analysis year of 2028, comparing the Proposed Project to the future No Action condition. In the No Action condition, the Development Site would be occupied by the previously-approved 57-story office tower. The previously-approved tower, with a maximum height of approximately 839 feet, was added to the 3D model as part of the baseline No Action condition. Three-dimensional representations of existing buildings and future planned developments in the study area were added to the baseline 3D model using best-available spatial data and information from publicly available filings with the New York City Department of Buildings and other sources.

Shadows are in constant movement. The computer simulation software utilized produces a minute-by-minute animation showing the movement of shadows over the course of each analysis period. The analysis determines the time when incremental shadow would enter each resource, and the time it would exit. Shadow analyses were performed for each of the representative days and analysis periods indicated in the Tier 3 assessment.

DETERMINATION OF IMPACT SIGNIFICANCE

The determination of significance of shadow impacts on a sunlight-sensitive resource is based on (1) the information resulting from the detailed shadow analysis describing the extent and duration of incremental shadows; and (2) an analysis of the resource’s sensitivity to reduced sunlight. The goal of the assessment is to determine whether the effects of incremental shadows on a sunlight-sensitive resource are significant under CEQR.

A shadow impact occurs when the incremental shadow from a proposed project falls on a sunlight-sensitive resource or feature and reduces its direct sunlight exposure. Determining whether this impact is significant or not depends on the extent and duration of the incremental shadow and the specific context in which the impact occurs.

A significant shadow impact generally occurs when an incremental shadow of 10 minutes or longer falls on a sunlight-sensitive resource and results in one of the following:

- **Vegetation:**
 - A substantial reduction in sunlight available to a sunlight-sensitive feature of the resource to less than the minimum time necessary for its survival (when there was sufficient sunlight in the No Action condition). In the growing season, four to six hours a day of sunlight is a minimum requirement.
 - A reduction in direct sunlight exposure where the sensitive feature of the resource is already subject to substandard sunlight (i.e., less than the minimum time necessary for its survival).
- **Historic and Cultural Resources:**
 - A substantial reduction in sunlight available for the enjoyment or appreciation of the sunlight-sensitive features of a historic or cultural resource.

- **Open Space Utilization:**
 - A substantial reduction in the usability of open space as a result of increased shadows, accounting for anticipated new users and the open space's utilization rates throughout the affected time periods.
- **For Any Sunlight-Sensitive Feature of a Resource:**
 - Complete elimination of all direct sunlight on the sunlight-sensitive feature of the resource, when the complete elimination results in substantial effects on the survival, enjoyment, or, in the case of open space or natural resources, the use of the resource.

SUMMARY OF ANALYSIS RESULTS

Tower 5 with the Proposed Amendment would be similar in scale to the previously approved office tower but would be approximately 126 feet taller. The bulk form of the proposed residential Tower 5 would be more slender than the commercial tower with floor plates of the maximum square footage. The shadow study showed that these differences in height and bulk configuration would generally result in:

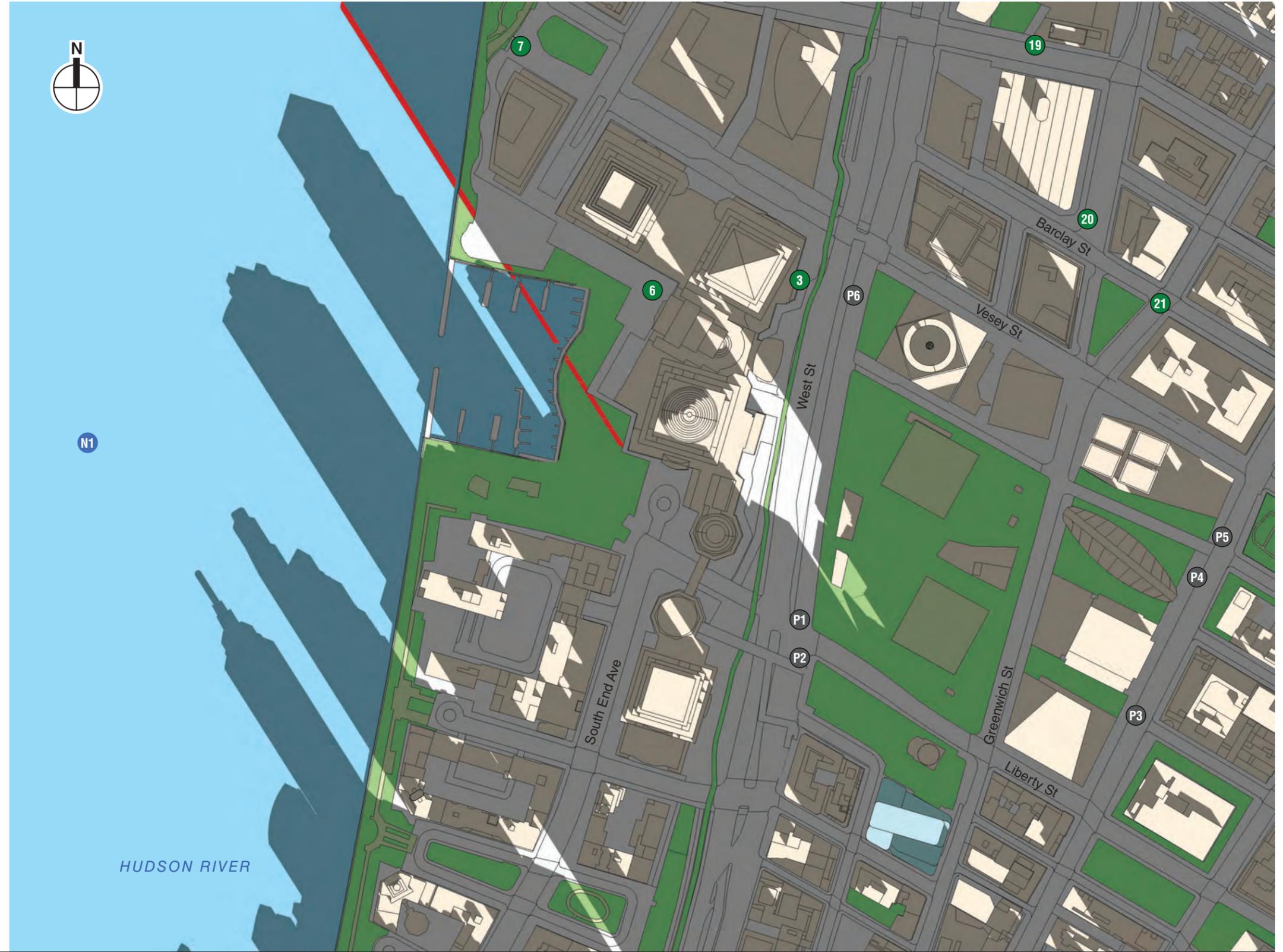
- Incremental shadow from the top 126 feet of the proposed residential tower
- Small areas of reduced shadow compared to the bulkier office tower, mostly occurring when shadows fall west in the morning or east in the afternoon

Of the 40 publicly accessible open spaces that were analyzed, including the open spaces within the Project Area, 13 resources would receive incremental shadows on one or more analysis days. Most of these would also experience areas of reduced shadow at times, compared with the office tower in the Approved Plan. One additional open space, West Thames Park, would receive less shadow with the Proposed Amendment; but never any increased shadow. The other 26 open space resources would not receive any incremental (or reduced) shadow. The Development Site is situated in an area densely developed with tall, often bulky buildings, and the proposed residential tower would only be approximately 126 feet taller than the No Action office tower to which it was compared, and generally similar in bulk. These factors substantially limit the size and the reach of incremental shadow.

Of the four historic buildings with sunlight-sensitive features that were analyzed, none would receive incremental shadow with the Proposed Amendment, and one of the four would experience a brief reduction in shadow compared with the Approved Plan.

Portions of the Hudson River would receive incremental shadows in all seasons, as well as areas of reduced shadow, while the East River would not be affected.

Table 6-2 summarizes the entry and exit times and total duration of incremental shadows on each affected sun-sensitive resource. It also provides durations of reduced shadow, where appropriate, and in those cases the total net duration of incremental (or reduced) shadow is provided. **Figures 6-6 to 6-36** document the results of the analysis by providing graphic representations from the computer animation of times when incremental (and reduced) shadow would fall on a sun-sensitive resource. The figures illustrate the extent of additional, incremental shadow at that moment in time (highlighted in red), and also show existing shadow and remaining areas of sunlight.



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

December 21
9:40 AM

Detailed Analysis
Figure 6-6



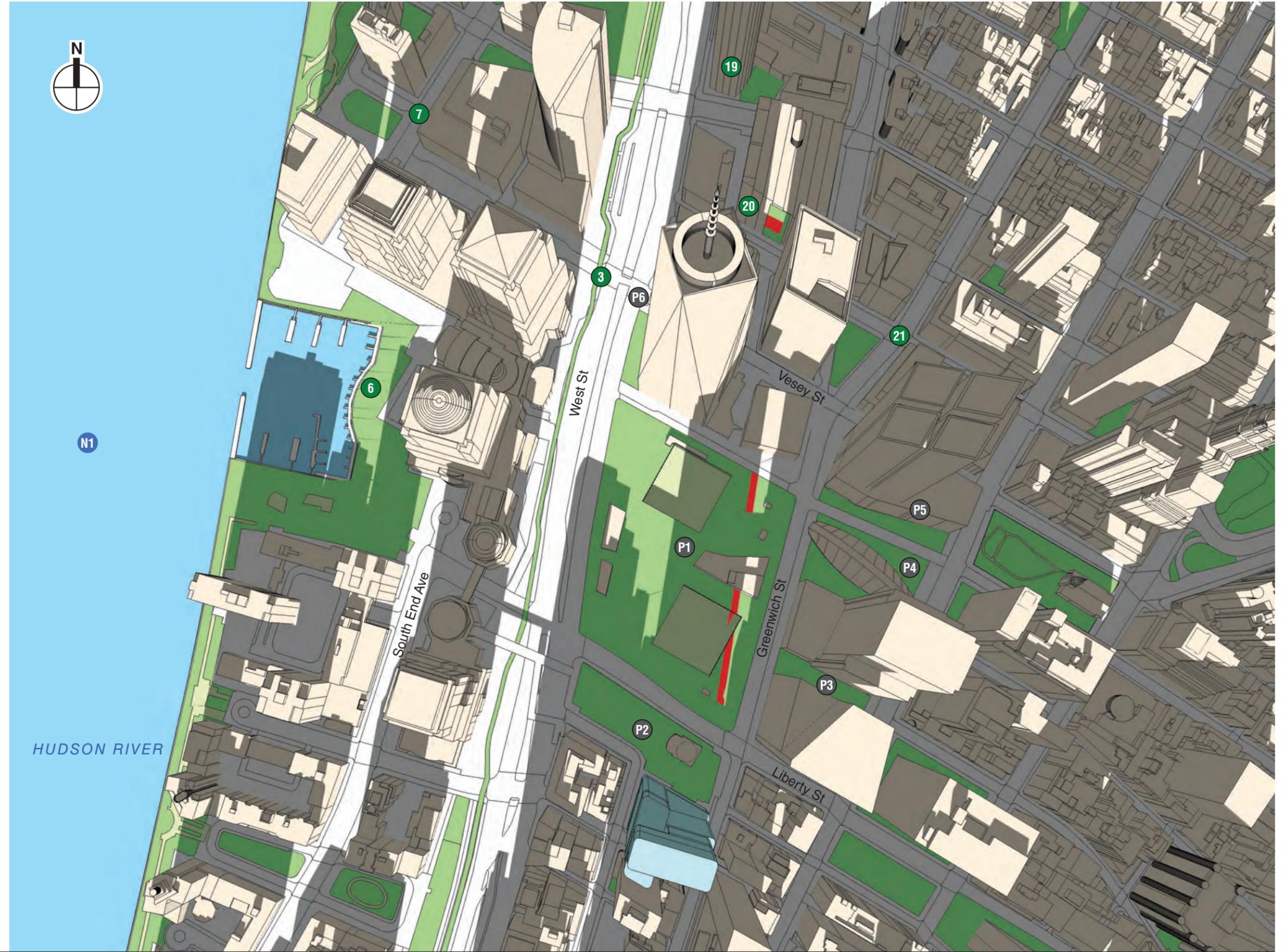
- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

HUDSON RIVER

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

December 21
11:40 AM



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

December 21
12:30 PM



N1

HUDSON RIVER

- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

December 21
1:00 PM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

December 21
1:40 PM

Detailed Analysis
Figure 6-10

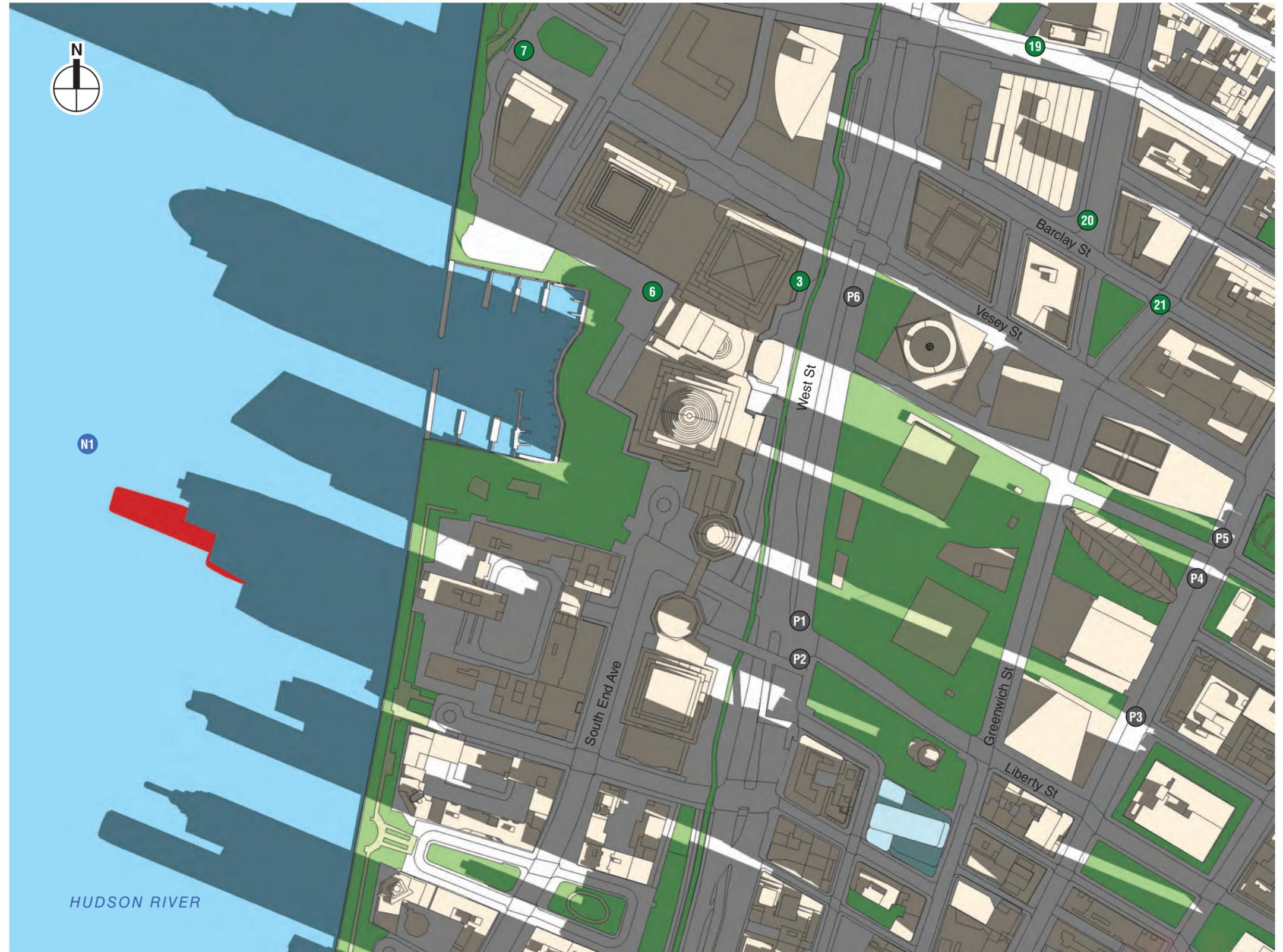


- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

December 21
2:30 PM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

HUDSON RIVER

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

March 21 / September 21
8:15 AM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

HUDSON RIVER

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

March 21 / September 21
10:45 AM



N1

HUDSON RIVER

- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

March 21 / September 21
11:30 AM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- Publicly Accessible Open Space
- Natural Resource
- Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

March 21 / September 21
1:35 PM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- Publicly Accessible Open Space
- Natural Resource
- Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

March 21 / September 21
2:30 PM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

May 6 / August 6
7:15 AM

Detailed Analysis
Figure 6-20



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

May 6 / August 6
8:15 AM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- Publicly Accessible Open Space
- Natural Resource
- Project Generated Open Space

HUDSON RIVER

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

May 6 / August 6
9:45 AM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

May 6 / August 6
10:30 AM

Detailed Analysis
Figure 6-23



N1

HUDSON RIVER

- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

May 6 / August 6
11:30 AM



N1

HUDSON RIVER

- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- Publicly Accessible Open Space
- Natural Resource
- Project Generated Open Space



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

May 6 / August 6
1:15 PM

Detailed Analysis
Figure 6-26



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

HUDSON RIVER

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

May 6 / August 6
3:00 PM

Detailed Analysis
Figure 6-27



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

**“Reduced Shadow” refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

**"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.



N1

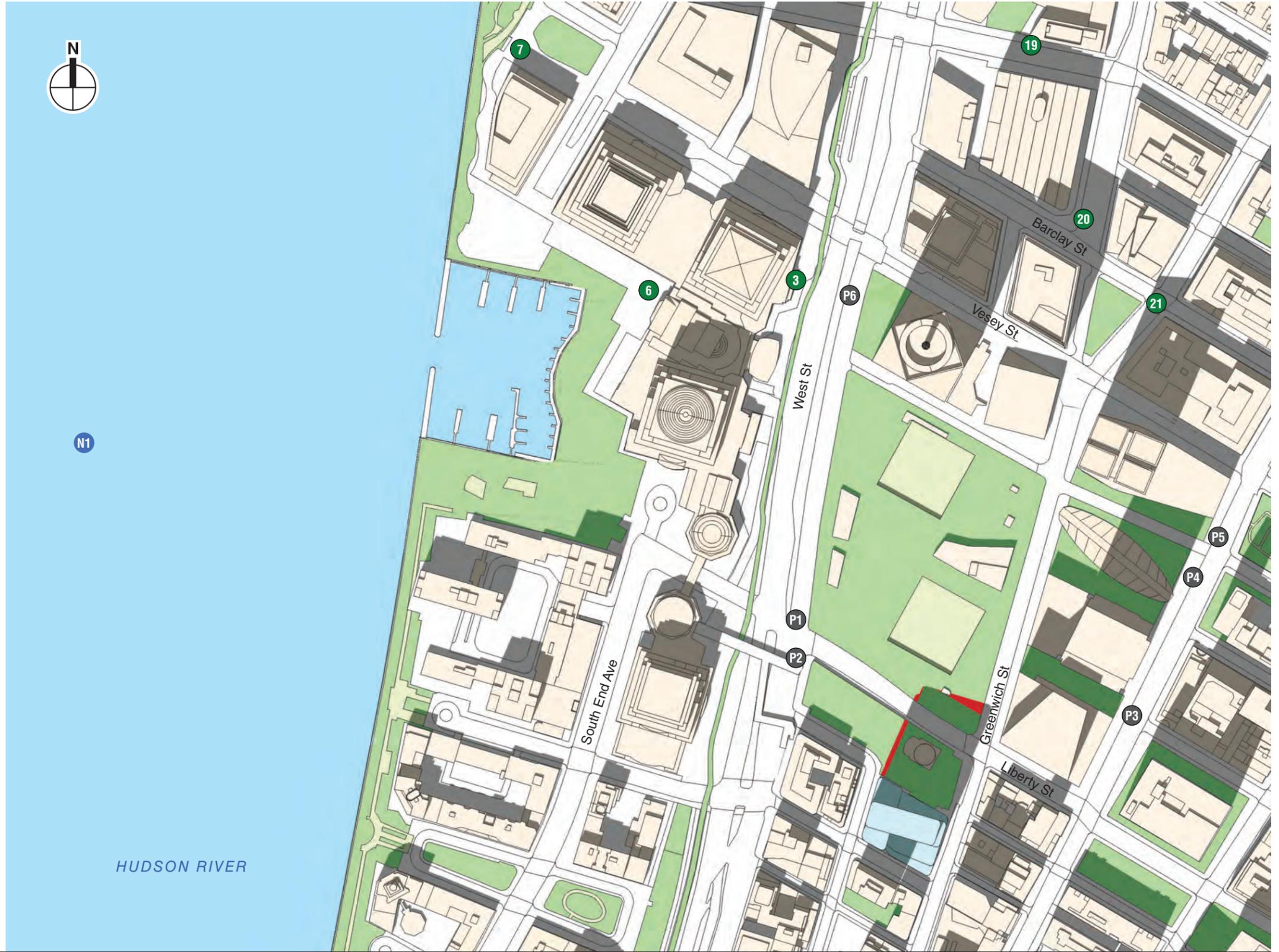
HUDSON RIVER

- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- Publicly Accessible Open Space
- Natural Resource
- Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

June 21
12:30 PM



N1

HUDSON RIVER

- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- Publicly Accessible Open Space
- Natural Resource
- Project Generated Open Space



NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

June 21
1:30 PM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

HUDSON RIVER

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

June 21
2:20 PM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- # Publicly Accessible Open Space
- N# Natural Resource
- P# Project Generated Open Space

HUDSON RIVER

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

June 21
3:15 PM



- Proposed Project
- Incremental Shadow on Sunlight-Sensitive Resource
- Reduced Shadow* on Sunlight-Sensitive Resource
- Publicly Accessible Open Space
- Natural Resource
- Project Generated Open Space

NOTES: Only the areas of shadow highlighted in red represent incremental shadow resulting from the Proposed Project. All other shadow is future No Action shadow, i.e. baseline shadow from existing and future No Action buildings. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

*"Reduced Shadow" refers to shadow that would be cast in the No Action condition, by the as-of-right building, but not in the With Action condition. See Table 6-2 Notes for additional explanation.

June 21
4:15 PM

**Table 6-2
Incremental Shadow Durations**

Map Reference	Name	Dec. 21	March 21 / Sept. 21	May 6 / August 6	June 21
Publicly Accessible Open Spaces					
2	West Thames Park	—	—	(7:10 AM TO 7:20 AM) (TOTAL NET: -10 MIN)	(7:20 AM TO 8:05 AM) (TOTAL NET: -45 MIN)
3	Route 9A Bikeway/Walkway	11:20 AM TO 11:50 AM TOTAL: 30 MIN	8:50 AM TO 9:20 AM; (9:50 AM TO 10:35 AM); 10:35 AM TO 11:15 AM TOTAL NET: 25 MIN	(8:56 AM TO 9:03 AM); 9:30 AM TO 10:00 AM; (10:00 AM TO 10:20 AM); 10:20 AM TO 10:35 AM TOTAL NET: 18 MIN	(7:30 AM TO 8:05 AM); 9:20 AM TO 10:25 AM; (9:45 AM TO 10:10 AM) TOTAL NET: 5 MIN
5	Rector Park	—	—	—	(7:00 AM TO 7:55 AM); 7:48 AM TO 7:55 AM (TOTAL NET: -48 MIN)
6	Battery Park City Esplanade	9:25 AM TO 9:50 AM TOTAL: 25 MIN	(7:45 AM TO 8:00 AM); 9:00 AM TO 9:15 AM; 9:35 AM TO 10:20 AM TOTAL NET: 45 MIN	(6:55 AM TO 7:40 AM); 8:10 AM TO 8:25 AM (TOTAL NET: -30 MIN)	(6:45 AM TO 7:35 AM); 7:30 AM TO 7:55 AM (TOTAL NET: -20 MIN)
20	101 Barclay St POPS	12:20 PM TO 12:50 PM TOTAL: 30 MIN	—	—	—
21	7 WTC Plaza	1:00 PM TO 1:05 PM; 1:35 PM TO 1:50 PM TOTAL: 30 MIN	—	—	—
23	Bogardus Plaza	1:53 PM TO 1:58 PM TOTAL: 5 MIN	—	—	—
31	One Liberty Plaza POPS	—	—	(2:15 PM TO 2:45 PM) (TOTAL NET: -30 MIN)	2:10 PM TO 2:30 PM; (2:15 PM TO 2:28 PM); (3:00 PM TO 4:20 PM); 4:05 PM TO 4:35 PM (TOTAL NET: -43 MIN)
Historic Architectural Resources with Sunlight-Sensitive Features					
A	Chamber of Commerce Building	—	—	—	(4:55 PM TO 5:10 PM) (TOTAL NET: -15 MIN)
Natural Resources					
N1	Hudson River	(8:51 AM TO 9:15 AM); 8:51 AM TO 9:50 AM TOTAL NET: 35 MIN	(7:36 AM TO 8:05 AM); 7:36 AM TO 9:10 AM TOTAL NET: 1 HR 5 MIN	(6:27 AM TO 7:40 AM); 6:27 AM TO 7:55 AM TOTAL NET: 15 MIN	(5:57 AM TO 7:30 AM); 5:57 AM TO 7:50 AM TOTAL NET: 20 MIN
Project-Generated Open Space					
P1	Memorial Plaza	—	10:37 AM TO 10:42 AM; (10:45 AM TO 11:00 AM); 11:05 AM TO 3:05 PM TOTAL: 3 HR 50 MIN	11:05 AM TO 2:20 PM; (11:15 AM TO 11:25 AM); (12:50 PM TO 1:15 PM) TOTAL NET: 2 HR 40 MIN	11:50 AM TO 1:55 PM; (12:00 PM TO 1:20 PM); TOTAL NET: 45 MIN
P2	Liberty Park	—	—	9:45 AM TO 3:40 PM; (10:00 AM TO 11:20 AM) TOTAL NET: 4 HR 35 MIN	10:15 AM TO 4:00 PM; (10:30 AM TO 11:40 AM) TOTAL NET: 4 HR 35 MIN
P3	Cortlandt Way	—	—	12:45 PM TO 1:30 PM; (1:20 PM TO 1:35 PM) TOTAL NET: 30 MIN	—
P4	Oculus Plaza	—	1:05 PM TO 1:40 PM; (1:40 PM TO 1:50 PM); 1:45 PM TO 1:50 PM TOTAL NET: 30 MIN	—	—
P5	Two WTC Plaza	—	1:30 PM TO 2:20 PM; (2:10 PM TO 2:25 PM) TOTAL NET: 35 MIN	—	—
P6	One WTC Plaza	11:50 AM TO 11:55 AM TOTAL: 5 MIN	—	—	—

Notes:

Table indicates entry and exit times and total duration of incremental shadow for each sunlight-sensitive resource. Durations in *(italics with parentheses)* represent times when less shadow would occur on a portion of the resource with the Proposed Amendment compared to the previously approved office tower, due to differences in bulk configuration. In some cases, these times of reduced shadow overlap with times of incremental shadow occurring on a different area in the resource. Total durations reflect the net total of incremental (or reduced) shadow. Daylight saving time is not used—times are Eastern Standard Time, per *CEQR Technical Manual* guidelines. However, as Eastern Daylight Time is in effect for the March/September, May/August, and June analysis periods, add one hour to the given times to determine the actual clock time.

ASSESSMENT OF SHADOW IMPACTS BY RESOURCE

The following section briefly describes each affected resource that would receive more than 10 minutes of incremental shadow;⁶ its sunlight sensitivity; and the extent, duration, and potential effects of incremental shadow. Descriptions of resource condition and utilization rates were taken from Chapter 5, “Open Space.” Map reference numbers are included with the name, for convenience.

Times are given in Eastern Standard Time (EST) in all seasons, but Eastern Daylight Time (EDT) is in effect for all representative analysis days except for December 21, and times are also provided parenthetically in EDT when relevant, for informational purposes.

OPEN SPACE RESOURCES

Route 9A Bikeway/Walkway (Map #3)

This bicycle and walking path extends through the study area between Hudson River Park and Battery Park City on its west side and the West Side Highway/Route 9A on its east side. In terms of use, it is minimally sensitive to shadows due to the transience of its active users moving through it.

On the December 21 analysis day representing winter, incremental shadow from the top of the proposed residential tower passes across a portion of the bikeway around Barclay Street for 30 minutes in the late morning. In the spring, summer, and fall seasons, there would be very small areas of reduced shadow in the mid-mornings resulting from the different bulk configurations of the proposed and previously approved towers, and then a period of about 15 minutes of incremental shadow from the top of the taller proposed tower, occurring between 10:10 AM and 11:15 AM (11:10 AM and 12:15 PM EDT) depending on the season. Net duration of incremental shadow on the bikeway would range from 5 to 25 minutes in these seasons.

Given the limited net duration and size of the incremental shadows in all seasons, and the fact that sunlit areas would remain near the areas affected by incremental shadow, and the transience of the bikeway’s active users through areas of shadow and sun, the incremental shadow would not significantly affect this resource or its users.

Battery Park City Esplanade (Map #6)

The Battery Park City (BPC) Esplanade extends along the Hudson River edge of BPC, providing approximately 26 acres of active and passive open space. These open spaces are heavily utilized by residents, visitors, and workers in the area and kept in excellent condition.

On the winter analysis day, a small area of incremental shadow would fall on a portion of the North Cove area of the Esplanade for 25 minutes, 9:25 AM to 9:50 AM. It would be small enough relative to the North Cove area and existing winter morning shadows that it would likely not be noticed during its short duration and its effect would not be significant in any case.

In the fall and early spring representative dates, there would be very small areas of first reduced, then incremental, shadow, for 15 minutes each, in the early to mid-morning, and then an incremental shadow from the top of the proposed tower would move across the North

⁶ Per *CEQR Technical Manual* guidelines, incremental shadow is not considered significant when its duration is no more than 10 minutes and the resource otherwise continues to receive substantial sunlight. *CEQR Technical Manual*, 2020 edition, page 8-27.

Cove/Pumphouse Park section of the Esplanade between 9:35 AM and 10:20 AM (10:35 AM and 11:20 AM EDT). Large areas of sun would remain on Pumphouse Park and the North Cove during this 45-minute duration, and the new shadow would not significantly affect the Esplanade or its users on this date.

In the late spring and summer months, there would be less shadow on the Esplanade with the Proposed Amendment overall, compared to the Approved Plan. The limited incremental shadow would be gone by 8:25 AM on May 6/August 6 (9:25 AM EDT) and earlier on June 21.

101 Barclay Street POPS (Map #20)

This office building contains a public lobby inside its Barclay Street entrance described as a “glass-topped, office-lined atrium carved out of the building’s center,” and characterized by “its vast internal volume.”⁷ However, it has been closed to public access at times, for unknown reasons. It is included in the analysis here in the event that it is open to the public now or in the future. The south façade, mostly glass, allows light into the atrium and faces the Development Site.

An area of incremental shadow from the top of the proposed residential tower would fall between 1 WTC and 7 WTC onto a portion of the south façade where the atrium is located for 30 minutes, 12:20 PM to 12:50 PM, on the winter analysis day only. The incremental shadow would not eliminate all the sun from the façade. Given the limited extent, duration, and seasonal occurrence of the incremental shadow, the incremental shadow would not significantly impact the public atrium space or its users.

7 WTC Plaza (Map #21)

Also known as Silverstein Family Park, this plaza just north of the Project Area contains a fountain, trees and other plantings, and benches. It is in excellent condition and moderately used.

A narrow incremental shadow from the proposed tower would pass across a portion of the plaza for 30 minutes in the early afternoon of the winter analysis day only. It would not eliminate remaining sun from the plaza except for 5 minutes. Given the small size and relatively brief duration of the incremental shadow, the plaza would not be significantly affected.

One Liberty Plaza POPS (Map #31)

This plaza surrounds the full-block office building bounded by Broadway and Liberty, Church, and Cortlandt Streets, north-adjacent to Zuccotti Park. Its stairs and planters on all four sides of the block provide informal seating opportunities. It is in good condition but lightly used.

No incremental shadow would fall on this plaza in fall, winter, or early spring. In the later spring and late summer represented by May 6 and August 6, less shadow would fall on the plaza with the Proposed Amendment. On the midsummer analysis day, June 21, there would be periods of incremental as well as reduced shadow, both small in size, in the mid- to late afternoon, overall resulting in a net reduction of shadow with the Proposed Amendment.

NATURAL RESOURCES

Hudson River (Map #N1)

The Hudson River is a tidally influenced water body supporting a diverse and productive aquatic community of primary producers (phytoplankton, zooplankton, submerged aquatic vegetation

⁷ <https://apops.mas.org/pops/m010002/>

(SAV) and benthic algae and invertebrates) and fish. Sunlight penetration is an important factor in determining phytoplankton, SAV, and benthic algae productivity and biomass.

Areas of incremental shadow, and to a lesser extent, areas of reduced shadow, would fall on portions of the Hudson River in the early morning in all seasons. The net durations of incremental shadow would be relatively brief, ranging from 15 minutes to about an hour. The areas of the river affected by incremental shadow would receive direct sun for most of the day after this, on all analysis days.

The current flows swiftly in the river, near the Upper New York Bay and the confluence of the Hudson and East Rivers, and would move phytoplankton and other natural elements quickly through the shaded areas. Therefore, project-generated shadows would not be expected to affect primary productivity. Incremental shadows would therefore not be likely to significantly affect aquatic resources (plankton or fish) in these areas of the river. Consequently, project-generated shadows would not cause significant adverse impacts to the Hudson River.

PROJECT-GENERATED OPEN SPACE

The following open spaces have been developed, or will be developed in the future, as part of the WTC Redevelopment Plan.

Memorial Plaza (Map #P1)

This large plaza is located where the original WTC towers, destroyed in the September 11, 2001 attacks, once stood. The plaza contains the memorial pools on the footprints of the original towers, as well as trees and benches. It is in excellent condition and heavily used when it is open.

The plaza would receive incremental shadows in spring, summer, and fall. In winter, shadow from the top 126 feet of the proposed residential building would fall beyond the plaza.

In the spring and fall, and late summer, incremental shadow from the top of the proposed residential tower would move across a portion of the plaza in the middle of the day, ranging in total duration from approximately two and a half to nearly four hours depending on the month. On the midsummer day when shadows are shortest, incremental shadow would only pass across a small portion in the southeast area of the plaza for a total of about two hours. During these periods small areas of reduced shadow would also occur, resulting from the more slender residential tower compared with the bulkier office tower, but these would generally be smaller areas and briefer periods than the incremental shadow from the top of the proposed tower.

The size of the incremental shadow in the spring, summer, and fall would remain small relative to the size of the overall plaza, and plenty of sunlight would remain in the plaza and adjacent open spaces during the affected periods, for users seeking sun.

Liberty Park (Map #P2)

This elevated park, opened in 2016, abuts the Development Site to the north. It contains landscaping, benches, sculptures, and the St. Nicholas National Shrine (under construction), and is moderately used.

Incremental shadows would fall on portions of this park in the late spring and summer months, but would be very small at all times. Very small and brief areas of reduced shadow would also occur, compared with the bulkier office tower. The incremental shadow would never eliminate the remaining sunlight.

WTC Site 5

Cortlandt Way (Map #P3)

This open pedestrian plaza located between the completed 3 WTC and 4 WTC buildings contains trees and seating, and is moderately used. A very small incremental shadow would fall on the west end of the plaza nearest Greenwich Street and Memorial Plaza briefly in the afternoon for up to 30 minutes on the May 6/August 6 representative analysis date.

Oculus Plaza (Map #P4) and 2 WTC Plaza (Map #P5)

These plaza areas were part of the Redevelopment Plan. While the Oculus Plaza is complete, the 2 WTC Plaza awaits completion of 2 WTC itself. They would receive small incremental shadows in the fall and early spring for approximately 30 minutes.

Based on the worst case analysis assuming a building of up to 965 feet tall, thirteen open spaces, including six in the WTC, would receive incremental shadows in one or more seasons from the top of the proposed residential tower, and/or slivers and small patches of incremental shadow as well as small areas of reduced shadow (compared to the office tower of the Approved Plan). The largest shadows are due to the top of the building where it exceeds the height assumed for the previously approved office building. Most of these fall some distance from the building and move quickly. Moreover, in no case would the incremental shadow cause significant adverse impacts to the resources or their users. *

A. INTRODUCTION

This chapter assesses the potential impacts of the Proposed Amendment on community facilities and services, which are defined as public or publicly funded schools, publicly financed early childhood programs, libraries, health care facilities, and fire and police protection services. The analysis focuses on direct effects on community facilities, such as when a facility is physically displaced or altered, and on indirect effects, which could result from increased demand for community facilities and services generated by new users, such as the new population that would result from the future with the Proposed Amendment (the “With Action” condition).

As described in Chapter 1, “Project Description,” this EA considers the potential environmental impacts of the Proposed Amendment to the Approved Plan and General Project Plan (GPP) that would be required to carry out the Proposed Project, which would permit the Developer to construct either the currently approved office and retail tower on the Development Site or a tower building containing residential, retail, and community facility uses. For the purposes of this analysis, the Maximum Residential Program, which would include up to 1,270 dwelling units (DUs) is considered.

B. PRELIMINARY SCREENING

The analysis of community facilities has been conducted in accordance with the latest data and guidance from the New York City Department of City Planning (DCP) and New York City Department of Education (DOE).

The purpose of the preliminary screening is to determine whether a community facilities assessment is warranted. A community facilities assessment is warranted if a project has the potential to result in either direct or indirect effects on community facilities. If a project would physically alter a community facility, whether by displacement of the facility or other physical change, this “direct” effect triggers the need to assess the service delivery of the facility and the potential effect that the physical change may have on that service delivery. New population added to an area as a result of a project would use existing services, which may result in potential “indirect” effects on service delivery. Depending on the size, income characteristics, and age distribution of the new population, there may be effects on public schools, libraries, or childcare centers.

DIRECT EFFECTS

The Proposed Amendment would not displace or otherwise directly affect any public schools, early childhood programs, libraries, health care facilities, or police and fire protection services. Therefore, an analysis of direct effects is not warranted.

INDIRECT EFFECTS

Thresholds for guidance in making a determination of whether a detailed analysis is necessary to determine potential indirect impacts are presented in **Table 7-1**. If a project exceeds the threshold for a specific facility type, a more detailed analysis is warranted.

Table 7-1
Preliminary Screening Analysis Criteria: Manhattan

Community Facility	Threshold For Detailed Analysis
Public schools	New School Construction Authority (SCA) student multipliers that are at the CSD level were released in November 2019. These multipliers were calculated using the latest five-year estimates from the American Community Survey. For CSD 2, where the project is located, the multipliers are .04 for elementary schools, 0.01 for intermediate schools and 0.2 for high schools.
Libraries	Greater than 5 percent increase in ratio of residential units to libraries in borough. In Manhattan, the minimum number of residential units that triggers a detailed analysis is 1,033.
Health care facilities (outpatient)	Introduction of sizeable new neighborhood where none existed before ¹
Publicly Financed Early Childhood Programs	More than 20 eligible children based on number of low- and low/moderate-income units by borough. In Manhattan, the minimum number of affordable units that triggers a detailed analysis is 170.
Fire protection	Introduction of sizeable new neighborhood where none existed before ¹
Police protection	Introduction of sizeable new neighborhood where none existed before ¹
Notes:	1. The <i>CEQR Technical Manual</i> cites the Hunters' Point South project as an example of a project that would introduce a sizeable new neighborhood where none existed before. The Hunters' Point South project would introduce approximately 5,000 new residential units to the Hunters' Point South waterfront in Long Island City, Queens.
Source:	<i>CEQR Technical Manual, 2020.</i>

As discussed in Chapter 1, "Project Description," potential programs for analysis have been developed to assess the range of uses and development envelopes that would be achievable under the Proposed Amendment. In total, in the With Action condition, a total of 1,270 units would be developed. For conservative analysis purposes, it is assumed that 318 units would be considered affordable.

Applying the average household size of 1.91 persons per household (the 2015–2019 ACS average household size for Manhattan Community Districts 1 and 2) to the 1,270 incremental DUs, the Proposed Project would introduce approximately 2,426 new residents to the study area.

Based on the screening criteria in **Table 7-1**, detailed analyses of potential indirect impacts on public schools (elementary and intermediate), public libraries, and publicly financed early childhood programs were conducted.

A detailed analysis of impacts on police and fire services, hospitals, and public health clinics is warranted if a proposed action would affect the physical operation of, or access to and from, a station house or healthcare facility, or where a proposed project would create a sizeable new neighborhood where none existed before. The Proposed Amendment would not directly displace a station house or healthcare facility, and would not adversely affect the physical operation of, or access to and from, a facility. In addition, the Proposed Amendment would not create a sizeable new neighborhood. Therefore, a detailed analysis of potential impacts on police and fire services, hospitals, and public health clinics is not warranted.

C. POTENTIAL INDIRECT EFFECTS ON PUBLIC ELEMENTARY, INTERMEDIATE, AND HIGH SCHOOLS

METHODOLOGY

This analysis assesses the potential effects of the Proposed Amendment on public schools serving the Project Area. The study area for the analysis of elementary and intermediate schools is the school districts' "subdistrict" (also known as a "region" or "school planning zone") in which the project is located; the subdistricts are used for capital planning purposes and do not necessarily reflect individual school zones, therefore students are not limited to attending schools based on their subdistrict. The Project Area is located in Subdistrict 2 of CSD 2 (see **Figure 7-1**).

This schools analysis uses the most recent DOE data on school capacity, enrollment, and utilization rates for elementary and intermediate schools in the subdistrict study area and DOE data for high schools in the borough study area. Specifically, the existing conditions analysis uses data provided in DOE's *Utilization Profiles: Enrollment/Capacity/Utilization*, 2019–2020 edition. Future conditions are then predicted based on Statistical Forecasting's enrollment projections and data obtained from SCA's Capital Planning Division on the number of new DUs and students expected at the subdistrict level. The future utilization rate for school facilities is calculated by adding the estimated enrollment from proposed residential projects in the schools' study area to Statistical Forecasting's projected enrollment, and then comparing that number with projected school capacity. Charter school enrollment is not included in enrollment projections. Statistical Forecasting's enrollment projections for years 2019 through 2028, the most recent data currently available, were provided by DCP. These enrollment projections are based on broad demographic trends and do not explicitly account for discrete new residential projects planned for the study area. The estimated student population from the other new projects expected to be completed within the study area has been obtained from SCA's Capital Planning Division and are added to the projected enrollment to ensure a more conservative prediction of future enrollment and utilization. In addition, new capacity from any new school projects identified in the DOE *2020–2024 Five-Year Capital Plan* are included if construction has begun or if deemed appropriate to include in the analysis by the lead agency and SCA.

The effect of the new students introduced by the Proposed Amendment on the capacity of schools within the study areas is then evaluated. A significant adverse impact may occur if a proposed action would result in both of the following conditions:

1. A utilization rate of the elementary and/or intermediate schools in the subdistrict study area, or high schools in the borough study area, that is equal to or greater than 100 percent in the With Action condition; and
2. An increase of 5 percentage points or more in the collective utilization rate between the No Action and With Action condition.

EXISTING CONDITIONS

ELEMENTARY SCHOOLS

As shown in **Table 7-2**, seven elementary schools serve Subdistrict 2/CSD 2. According to DOE's 2019–2020 school year enrollment figures, elementary schools in the subdistrict have a total enrollment of 3,233 students and are currently operating at 108.1 percent utilization, with a deficit of 243 seats.



- WTC Site
- Project Site
- Study Area (2-mile radius)
- Development Site (Site 5)
- Early Childhood Program

0 4,000 FEET

INTERMEDIATE SCHOOLS

As shown in **Table 7-2**, four intermediate schools serve Subdistrict 2/CSD 2. Total enrollment at these intermediate schools is 1,780 students, or 101.8 percent of capacity, with a deficit of 31 seats.

Table 7-2
Public Schools Serving the Study Area,
Enrollment and Capacity Data, 2019-2020 School Year

Map No.	Name	Address	Enrollment	Capacity	Available Seats	Utilization
Elementary Schools						
Subdistrict 2 of CSD 30						
1	P.S. 003 Charrette School	490 Hudson Street	714	711	-3	100.4%
2	P.S. 041 Greenwich Village	116 West 11th Street	668	669	1	99.9%
3	P.S. 891	201 Warren Street	454	404	-50	112.4%
4	P.S. 150	334 Greenwich Street	190	124	-66	153.2%
5	P.S. 234 Independence School	292 Greenwich Street	510	501	-9	101.8%
6	P.S. 234 Independence School - Annex	200 Chambers Street	128	89	-39	143.8%
7	Battery Park City School (PS)	55 Battery Place	569	492	-77	115.7%
Subdistrict 2 of CSD 2 Total			3,233	2,990	-243	108.1%
Intermediate Schools						
Subdistrict 2 of CSD 30						
8	Battery Park City School (IS)	55 Battery Place	285	246	-39	115.7%
9	I.S. 289	201 Warren Street	276	298	22	92.6%
10	M.S. 297	75 Morton Street	841	881	40	95.5%
11	Lower Manhattan Middle School	26 Broadway	378	324	-54	116.7%
Subdistrict 2 of CSD 2 Total			1,780	1,749	-31	101.8%
Note:	See Figure 7-1.					
Source:	DOE Enrollment/Capacity/Utilization for the 2019–2020 School Year.					

THE FUTURE WITHOUT THE PROPOSED AMENDMENT

The latest available enrollment projections for Subdistrict 2/CSD 2 were used to form the baseline enrollment in the No Action condition, shown in **Table 7-3** in the column titled “Projected Enrollment.” This data projects elementary, intermediate, and high school enrollment through 2028. Since the Proposed Project’s analysis year (2028) is that date, the 2028 projections are used as a baseline. The students projected to be introduced by other No Action projects as well as the No Action condition as analyzed for the Proposed Project are added to this baseline projected enrollment using the SCA No Action student numbers for Subdistrict 2/CSD 2 (derived from SCA’s *Projected New Housing Starts*), as shown in the column titled “Students Introduced by Residential Projects in the No Action Condition” in **Table 7-3**.

As shown in **Table 7-3**, in the No Action condition, the total future study area enrollment is projected to be 3,527 elementary students and 2,349 intermediate students.

Table 7-3

No Action Condition—Utilization in CSD 2/Subdistrict 2

Study Area	Projected Enrollment ¹	Students Introduced by Residential Projects in the No Action Condition	Total Future Enrollment	Capacity ²	Available Seats	Utilization
Elementary Schools						
Subdistrict 2 of CSD 2	3,381	146	3,527	3,902	375	90.4%
Intermediate Schools						
Subdistrict 2 of CSD 2	2,295	54	2,349	1,749	-600	134.3%
Notes:						
¹ 2028 enrollment projections were used, the latest year available. Elementary and intermediate school enrollment in each subdistrict study area was calculated by applying SCA supplied percentages for each subdistrict to the relevant district enrollment projections. For Subdistrict 2/CSD 2, the district's 2028 elementary school projection of 17,077 students was multiplied by 19.80 percent. The subdistrict's intermediate school projection of 8,463 students was multiplied by 27.12 percent.						
² SCA-planned schools currently included and under construction include a PS at Trinity Place (450 seats) and a PS at Hudson Square (462 seats).						
Sources:						
Enrollment Projections 2019-2028 New York City Public Schools by Statistical Forecasting; DOE, Utilization Profiles: Enrollment/Capacity/Utilization 2019-2020 School Year; DOE 2020-2024 Proposed Five-Year Capital Plan; SCA.						

New capacity from new school projects identified in the DOE Five-Year Capital Plan are included if construction has begun or if deemed appropriate to include in the analysis by the lead agency and SCA. According to DOE's *2020–2024 Proposed Five-Year Capital Plan*, two schools are currently under construction. An elementary school at Trinity Place is anticipated to contain 450 seats, while an elementary school at Hudson Square is anticipated to contain 462 seats. The No Action condition capacity is based on an assumption that all of the planned changes to elementary and intermediate schools described above are enacted by 2028.

ELEMENTARY SCHOOLS

As indicated above, two elementary schools with a total of 912 seats are anticipated to be built by the analysis year of 2028. As shown in **Table 7-3**, due to the addition of these two elementary schools in the subdistrict study area, elementary schools would then operate under capacity (90.4 percent utilization) with a surplus of 375 seats in the No Action condition.

INTERMEDIATE SCHOOLS

As shown in **Table 7-3**, intermediate schools in the subdistrict would operate over capacity (134.3 percent utilization) with a deficit of 600 seats in the No Action condition.

THE FUTURE WITH THE PROPOSED AMENDMENT

An incremental increase in DUs of 1,270 the Proposed Project would introduce approximately 48 elementary students and 14 intermediate students to Subdistrict 2/CSD 2. A significant adverse impact may occur if a project would result in both of the following conditions: (1) a utilization rate of the elementary or intermediate schools in the subdistrict study area that is equal to or greater than 100 percent in the With Action condition; and (2) an increase of 5 percentage points or more in the collective utilization rate between the No Action and the With Action conditions. For high schools, a significant adverse impact may occur if a project would result in both of the following conditions: (1) a utilization rate of the high schools in the borough of Manhattan that is equal to or greater than 100 percent in the With Action condition; and (2) an increase of 5 percentage points or more in the collective utilization rate between the No Action and With Action conditions.

ELEMENTARY SCHOOLS

With the Proposed Project, the total elementary school enrollment of Subdistrict 2/CSD 2 would increase to 3,575 students. Therefore, elementary schools would operate at 91.6 percent utilization with a surplus of 327 seats (see **Table 7-4**). As compared to the No Action condition elementary school utilization (90.4 percent), elementary school utilization would increase by 1.23 percentage points with the Proposed Project. As utilization with the Proposed Project would be below 100 percent and would not result in a collective utilization rate increase of more than 5 percentage points over the No Action condition, the Proposed Amendment would not result in a significant adverse impact to elementary schools.

Table 7-4
With Action Condition—Utilization in CSD 2/Subdistrict 2

Study Area	No Action Enrollment	Students Introduced by the Proposed Project	Total With Action Enrollment	Capacity	Available Seats	Utilization	Change in Utilization Compared with No Action
Elementary Schools							
Subdistrict 2 of CSD 2	3,527	48	3,575	3,902	327	91.6%	1.23%
Intermediate Schools							
Subdistrict 2 of CSD 2	2,349	14	2,363	1,749	-614	135.1%	0.80%
Sources:							
Enrollment Projections 2019-2028 New York City Public Schools by Statistical Forecasting; DOE, Utilization Profiles: Enrollment/Capacity/Utilization 2019-2020 School Year; DOE 2020-2024 Proposed Five-Year Capital Plan; SCA.							

INTERMEDIATE SCHOOLS

As shown in **Table 7-4**, in the With Action condition, the total intermediate school enrollment of Subdistrict 2/CSD 2 would increase to 2,363 students (135.1 percent utilization) with a deficit of 614 seats. As compared to the No Action condition intermediate school utilization (134.3 percent), elementary school utilization would increase by less than one percent (0.80 percentage points) under the Proposed Project. Although utilization would remain over 100 percent, the Proposed Project would add a total of 14 new intermediate school students to the four intermediate schools serving the Subdistrict and would not result in a collective utilization rate increase of more than five-percentage-points. Accordingly, the Proposed Amendment would not result in a significant adverse impact to intermediate schools.

D. POTENTIAL INDIRECT EFFECTS ON PUBLIC LIBRARIES

METHODOLOGY

A libraries analysis should focus on branch libraries and not on the major research or specialty libraries that may fall within the study area. Service areas for neighborhood branch libraries are based on the distance that residents would travel to use library services, typically not more than ¾-mile (the library’s catchment area). This libraries analysis compares the population generated by the Proposed Project with the catchment area populations of libraries available within an approximately ¾-mile area around the Project Area (two libraries with respective catchment area for this project).

To determine the existing population of each library’s catchment area, 2014–2018 American Community Survey 5-Year Estimates data were assembled for all census tracts that fall primarily within ¾-mile of each library. The catchment area populations in the No Action condition were

estimated by multiplying the number of new DUs in projects located within the ¼-mile catchment area that are expected to be complete by 2028 by an average household size of 1.91 persons (the average household size for the study area according to 2019 PUMA data). The catchment area populations with the Proposed Project was estimated by adding the anticipated population that would result from the Proposed Project (split evenly between the two libraries).

New population in the No Action condition and With Action condition was added to the existing catchment area populations. If a project would increase the libraries’ catchment area population by 5 percent or more, and this increase would impair the delivery of library services in the study area, a significant impact could occur.

EXISTING CONDITIONS

The study area is served by the NYPL system, which includes 92 locations, and houses approximately 53 million physical items and 900,345 digital materials.

Libraries within the NYPL system provide free and open access to books, periodicals, electronic resources, and non-print materials; as well as reference, career services, Internet access; and educational, cultural, and recreational programming for adults, young adults, and children.

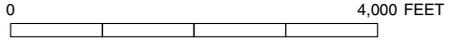
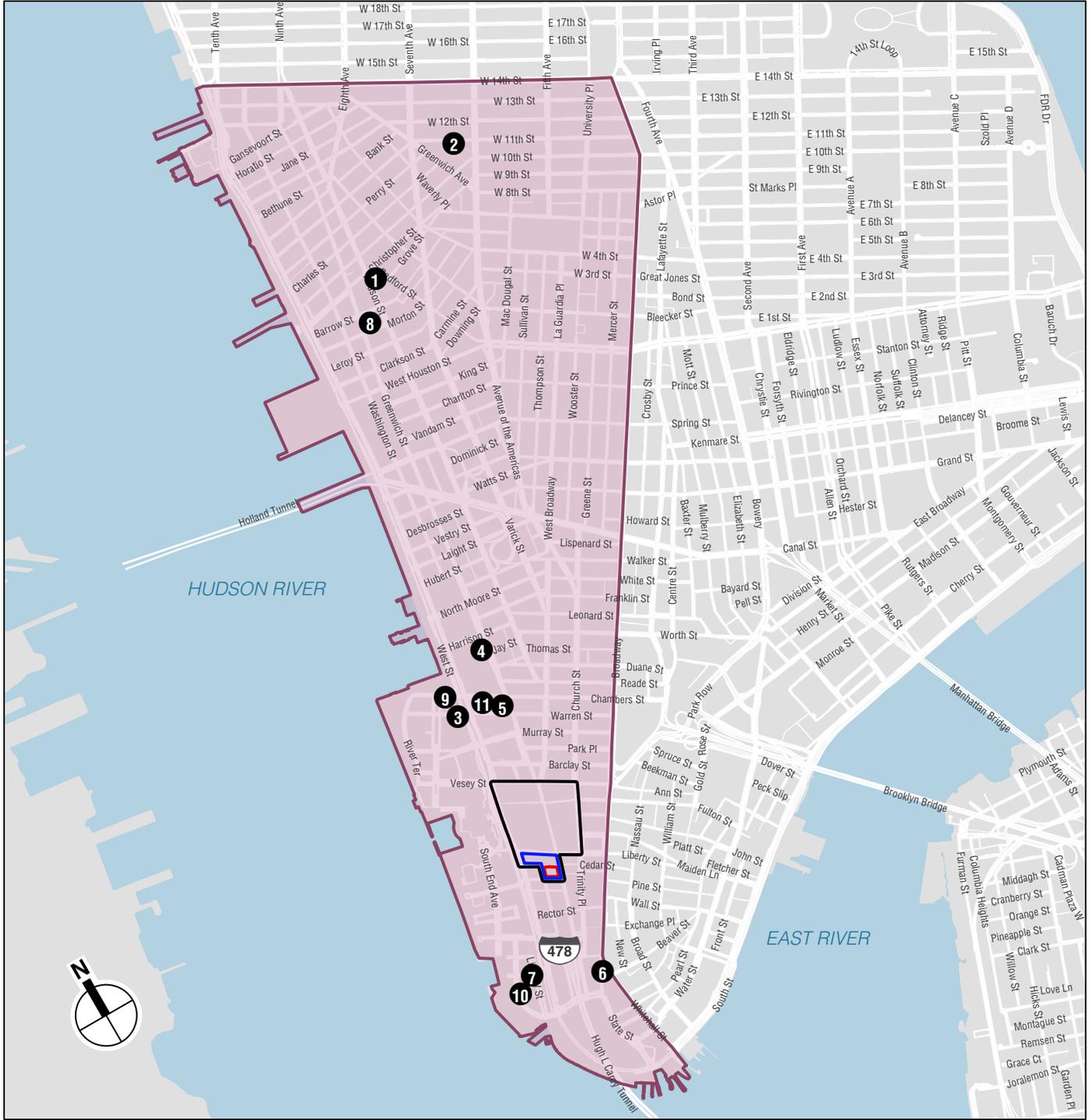
The Project Site falls within the area of two NYPL locations: Battery Park City and New Amsterdam (see **Figure 7-2** and **Table 7-5**). The Battery Park City Branch is located at 175 North End Avenue on the corner of Murray Street and North End Avenue and has served the neighborhood since March 2010. The library has a collection of more than 23,000 items; separate reading areas for children, young adults, and adults; a multipurpose programming space; and 36 computers for public use. In addition, this branch is ADA-accessible and offers a multitude of online classes and events such as financial counseling, painting, early literacy, and career and resilience coaching. The library serves a catchment area population of 77,376 with approximately 45,582 holdings, and therefore has a ratio of 0.59 holdings per resident.

**Table 7-5
Public Libraries Serving the Project Area**

Library Name	Address	Holdings ²	Catchment Area Population ³	Holdings per Resident
Battery Park City	175 North End Avenue	45,582	77,376	0.59
New Amsterdam	9 Murray Street	28,685	113,877	0.25

Notes:
¹ See **Figure 7-2**.
² Holdings include books, CD-ROMs, DVDs, and videotapes.
³ 2014–2018 American Community Survey 5-Year Estimates for census tracts primarily within the library’s ¼-mile catchment area (Battery Park City: Census Tracts 7, 9, 13, 15.01, 15.02, 21, 29, 31, 33, 37, 39, 47, 317.03, 317.04, and 319; For New Amsterdam: Census Tracts 7, 8, 9, 13, 15.01, 15.02, 16, 21, 25, 27, 29, 31, 33, 37, 39, 41, 45, 47, 49, 317.03, 317.04 and 319).
Sources: NYPL; 2014–2018 American Community Survey 5-Year Estimates; DCP Selected Facilities and Program Sites.

The New Amsterdam Branch is located at 9 Murray Street between Church Street and Broadway on the ground floor of an office building and has served the neighborhood since 1989. The library recently completed a systems replacement and interior renovation (October 2020). The New Amsterdam Branch is ADA-accessible and hosts online courses and events, such as virtual book discussions for adults and teens. The library serves a catchment area population of 113,877 with approximately 28,685 holdings, and therefore has a ratio of 0.25 holdings per resident.



- WTC Site
- Project Site
- Development Site (Site 5)
- Community School District (CSD) 2, Subdistrict 2
- 1 Public School

THE FUTURE WITHOUT THE PROPOSED AMENDMENT

In the No Action condition, the Battery Park and New Amsterdam branches will continue to serve the Project Site. No changes to the holdings of these facilities are expected for the purpose of this analysis. The catchment area populations of each library will increase as a result of new development projects completed by 2028. In the No Action condition, approximately 4,600 new residents will be added to the Battery Park City branch catchment area, increasing its catchment area population to 81,976. The holdings-per-resident ratio will decrease to 0.56 in the Battery Park City catchment area. Approximately 4,787 new residents will be added to the New Amsterdam branch catchment area, increasing its catchment area population to 118,664. The holdings-per-resident ratio will decrease to 0.24 in the New Amsterdam branch catchment area (see **Table 7-6**).

Table 7-6
No Action Condition: Catchment Area Population

Library Name	Existing Catchment Area Population	New Residents ¹	New Catchment Area Population	Holdings Total	New Holdings per Resident
Battery Park City	77,376	4,600	81,976	45,582	0.56
New Amsterdam	113,877	4,787	118,664	28,685	0.24

Note:
¹ This number was calculated by multiplying the number of planned No Action developments (4,600 DUs for Battery Park City and 4,787 DUs for New Amsterdam) by the Average Household Size (1.91) for the study area according to 2019 PUMA data.

Sources: NYPL; 2014–2018 American Community Survey 5-year Estimates; DCP Selected Facilities and Program Sites.

THE FUTURE WITH THE PROPOSED AMENDMENT

If a project increases the study area population by 5 percent or more as compared with the No Action condition, this increase may impair the delivery of library services in the study area, and a significant adverse impact could occur.

The Proposed Project would result in a total of 1,270 DUs within the Project Area. Using an average household size of 1.91 persons, the Proposed Project would result in the addition of 2,426 residents.

With this additional population, the Battery Park City branch would serve 84,402 residents, which represents a population increase of 2.96 percent over the No Action condition. The holdings-per-resident ratio for the Battery Park City branch would decrease from 0.56 to 0.54 with the Proposed Project.

The New Amsterdam branch would serve 121,090 residents, which represents a population increase of 2.04 percent over the No Action condition. The holdings-per-resident ratio for the New Amsterdam branch would remain the same (0.24) with the Proposed Project (see **Table 7-7**).

Table 7-7
With Action Condition: Catchment Area Population

Library Name	Catchment Area Population No Action Condition	Population Increase due to the Proposed Project	New Catchment Area Population With Action Condition	Population Increase	New Holdings per Resident
Battery Park City	81,976	2,426	84,402	2.96%	0.54
New Amsterdam	118,664	2,426	121,090	2.04%	0.24

Sources: NYPL; 2014–2018 American Community Survey 5-Year Estimates; DCP Selected Facilities and Program Sites.

As this is less than the five-percent-change threshold, this change would not impair the delivery of library services within the study area. Therefore, there would not be a significant adverse impact on library services in the study area as a result of the Proposed Amendment.

E. POTENTIAL INDIRECT EFFECTS ON PUBLICLY FINANCED EARLY CHILDHOOD PROGRAMS

METHODOLOGY

The New York City Administration for Children’s Services (ACS) provides subsidized childcare in center-based group childcare, family-based childcare, informal childcare, and Head Start programs. Publicly financed early childhood programs are available for eligible children 5 and younger (until the child is eligible to attend Kindergarten for a fall start date). The early childhood program analysis methodology is limited to EarlyLearn. In order to receive subsidized seats, families must meet specific financial and social eligibility criteria as established by DOE. In general, children in families that have incomes at or below 200 percent of the Federal Poverty Level (FPL), depending on family size, are financially eligible, although in some cases eligibility can go up to 275 percent FPL. To receive subsidized childcare services, a family also must have an approved “reason for care,” such as involvement in a child welfare case or participation in a “welfare-to-work” program. Head Start is a federally funded childcare program that provides children with half-day or full-day early childhood education. Program eligibility is limited to families with incomes at 130 percent or less of the FPL.

The City’s affordable housing market is pegged to the Area Median Income (AMI) rather than FPL. Lower-income DUs must be affordable to households at or below 80 percent AMI. Since family incomes at or below 200 percent FPL fall under 80 percent AMI, for the purposes of this analysis, the number of DUs expected to be subsidized and targeted for incomes of 80 percent AMI or below provides a conservative estimate of the number of DUs with children that are eligible for publicly financed early childhood programs.

Most children are served through enrollment in contracted EarlyLearn programs or by vouchers for private and non-profit organizations that operate childcare programs throughout the City. Registered or licensed providers can offer family-based childcare in their homes. Informal childcare can be provided by a relative or neighbor for no more than two children. Children aged 6 weeks through 13 years old can be cared for either in group childcare centers licensed by the New York City Department of Health and Mental Hygiene (DOHMH) (or in homes of registered childcare providers). ACS also issues vouchers to eligible families, which may be used by parents to pay for childcare from any legal childcare provider in the City.

This analysis of childcare centers focuses on services for children under age 5, as eligible children aged 5 through 12 are expected to be in school for most of the day. Publicly financed early childhood programs comprise EarlyLearn NYC (Child Care and Early Head Start), 3-K, and Pre-K for All. While 3-K and Pre-K programs are free for all 3- and 4-year-old children in New York City, there are eligibility requirements for children to enroll in EarlyLearn NYC Child Care and Early Head Start Programs. Space for one child in such childcare centers is termed a “slot.” These slots may be in contracted programs at a childcare center run by a provider, or in private homes licensed to provide childcare services to small numbers of unrelated children. “Group family childcare” serves 6 to 12 children, while “family childcare” serves 3 to 6 children.

Since there are no locational requirements for enrollment in early childhood programs, and some parents or guardians choose a childcare center close to their employment rather than their residence,

the service areas of these facilities can be quite large and not subject to strict delineation to identify a study area. However, this methodology for early childhood program analyses considers the locations of publicly financed early childhood programs within approximately 2 miles of a project site should be shown, reflecting the fact that the programs closest to a project site are more likely to be subject to increased demand from new residents introduced by an action. Therefore, the study area for the analysis of publicly financed early childhood programs is the area within 2 miles of the Project Area as shown in **Figure 7-3**. Current enrollment data for the publicly financed early childhood programs closest to the Project Area were gathered from DOE’s Division of Early Childhood Education.

Early childhood program enrollment in the No Action condition was estimated by multiplying the number of new DUs for low- and low/moderate-income (i.e., affordable, non-senior) residents expected in the 2-mile study area by the multipliers for estimating the number of children under age 6 eligible for publicly funded childcare services. For Manhattan, the multiplier estimates 0.115 eligible children under age 5 per DU for low- and low/moderate-income residents. As noted above, the analysis focuses on services for children under age 5 because eligible children aged 5 to 12 are expected to be in school for most of the day.

The early childhood program-eligible population introduced by the Proposed Project was also estimated using multipliers. The population of eligible children under age 5 was then added to the childcare enrollment calculated in the No Action condition. A significant adverse impact on publicly financed early childhood programs may result if there would be a demand for slots greater than the remaining capacity of the programs (i.e., more than 100 percent utilization), and if the Proposed Project would generate demand constituting an increase of 5 percentage points or more of the collective capacity of the childcare facilities serving the study area.

EXISTING CONDITIONS

There are 16 publicly funded early childhood programs within the study area (see **Figure 7-3**). The group childcare and Head Start facilities have a total capacity of 1,059 slots and have a surplus of 142 available slots (87 percent utilization). **Table 7-8** shows the current capacity and enrollment for these facilities. Family-based early childhood programs and informal care arrangements may provide additional slots in the study area, but these slots are not included in the analysis.

Table 7-8

Publicly Financed Early Childhood Programs Serving the Study Area

Map No.	Contractor Name	Address	Enrollment	Capacity	Available Slots	Utilization Rate
1	Chinese American Planning	125 Walker Street	54	65	11	83%
2	Chinese American Planning	115 Chrystie St	63	65	2	97%
3	Chinese American Planning	151 Broome St	49	60	11	82%
4	Chinese American Planning	1 York St	28	39	11	72%
5	Dewitt Reformed Church HS	280 Rivington St	72	86	14	84%
6	Educational Alliance Inc	197 E Broadway	32	33	1	97%
7	Escuela Hispana Montessori	180 Suffolk St	105	115	10	91%
8	Grand Street Settlement Inc.	60 Essex St	33	34	1	97%
9	Grand Street Settlement Inc.	300 Delancey St	57	70	13	81%
10	Grand Street Settlement Inc.	294 Delancey St	70	74	4	95%
11	Hamilton Madison House	60 Catherine St	53	57	4	93%
12	Hamilton Madison House	77 Market	30	32	2	94%
13	Hamilton Madison House	253 South St	44	52	8	85%
14	Hamilton Madison House	129 Fulton St	31	49	18	63%
15	Henry Street Settlement	301 Henry St	75	96	21	78%
16	University Settl Soc of NY	184 Eldridge St	121	132	11	92%
Total			917	1,059	142	87%
Note:	See Figure 7-3 .					
Source:	DOE, June 2018.					



-  WTC Site
-  Project Site
-  Development Site (Site 5)
-  Public Library

THE FUTURE WITHOUT THE PROPOSED AMENDMENT

Planned or proposed development projects, i.e., No Action projects, in the early childhood program study area (2 miles from the Project Area) that will include affordable DUs) were identified utilizing data provided by the New York City Department of Housing Preservation and Development (HPD). These projects are summarized on **Table 7-9** below and will introduce approximately 170 new affordable housing units. Based on the generation rates, this amount of development will introduce approximately 20 new children under the age of six who will be eligible for publicly funded childcare programs. Based on these assumptions, the number of available slots will decrease.

**Table 7-9
Affordable Housing Projects in the Study Area**

Project Name/Address	Affordable DUs
302 East 2nd Street	45
167 Chrystie Street	15
102 Charlton Street	16
55 Suffolk Street	94
Total	170
Sources: DOB; HPD	

As described above, there is currently a surplus of 142 available slots and utilization is at 87 percent. When the estimated 170 children under age six introduced by planned development projects are added to this total, early childhood programs in the study area will operate with a surplus of 122 slots (88.48 percent utilization) by the 2028 analysis year (see **Table 7-10**).

**Table 7-10
Estimated Child Care Facility Enrollment, Capacity, and Utilization**

	Enrollment	Capacity	Available Slots	Utilization Rate	Change in Utilization
No Action Condition	937	1,059	122	88.48%	N/A
With Action Condition	974	1,059	85	91.97%	3.49%
Sources: ACS, June 2018; DOB; HPD.					

THE FUTURE WITH THE PROPOSED AMENDMENT

As discussed in Chapter 1, “Project Description,” the Proposed Project would include an affordable housing component in which a minimum of 25 percent of the residential units would be permanently affordable. This analysis assumes that 25 percent of the residential units would be set aside for affordable units. Based on childcare multipliers, the development of approximately 318 affordable DUs would result in approximately 37 children under the age of 5 who would be eligible for publicly funded childcare programs.

With the addition of these children, enrollment in early childhood programs in the study area would increase to 974 children, compared to a capacity of 1,059 slots with a surplus of 85 slots in the With Action condition (see **Table 7-10**). This demand would represent 91.97 percent of the existing capacity and an increase in the utilization rate of 3.49 percentage points over the No Action condition.

A significant adverse impact on publicly financed early childhood programs could result when both of the following criteria are met: (1) a demand for slots greater than the remaining capacity

WTC Site 5

of childcare facilities; and (2) an increase in demand of 5 percentage points of the study area capacity. In the With Action condition, early childhood programs in the study area would continue to operate under capacity and the increase of 3.49 percentage points in the utilization rate (a total of 37 children over some 16 programs) would be well below 5 percentage points. Therefore, the Proposed Amendment would not result in a significant adverse impact to publicly financed early childhood programs.

Overall, the Proposed Amendment would not result in the displacement of any community facilities and therefore would not result in any significant adverse direct impacts on community facilities. In addition, the Proposed Amendment would not result in a significant adverse impact to elementary or intermediate schools in CSD 2/Subdistrict 2, library services in the study area, or publicly financed early childhood programs serving the study area. *

A. INTRODUCTION

This chapter describes the socioeconomic changes that could result from the Proposed Amendment and assesses whether the changes could result in significant adverse impacts. The socioeconomic character of an area includes its population, housing, and economic activity. Even when socioeconomic changes would not result in significant impacts, they are disclosed if they would affect land use patterns, low-income populations, the availability of goods and services, or economic investment in a way that changes the socioeconomic character of the area.

Five ways in which a project could alter socioeconomic conditions are considered: (1) direct residential displacement; (2) direct business displacement; (3) indirect residential displacement; (4) indirect business displacement; and (5) adverse effects on specific industries. The Proposed Project would not result in the direct displacement of any residents or businesses and would not introduce uses that could result in indirect business displacement or adverse effects on specific industries. However, the Proposed Project would introduce a residential use not previously assessed, warranting assessment of potential indirect residential displacement.

B. METHODOLOGY

Socioeconomic changes are disclosed if they would affect land use patterns, low-income populations, the availability of goods and services, or would generate economic investment that changes the socioeconomic character of the area. In some cases, these changes may be substantial but not adverse. In other cases, these changes may have a positive effect for some groups but a negative effect for other groups. The objective of the analysis is to disclose whether any changes created by the Proposed Amendment would have a significant impact compared with what would happen in the Approved Plan condition.

Changes to an area's socioeconomic character may occur directly or indirectly as a result of a project. Direct (or primary) displacement is the involuntary displacement of residents or businesses from a site or sites directly affected by a project. Examples of direct displacement include a proposed redevelopment of a currently occupied parcel for a new use or structure, or a proposed easement or right-of-way that would take a portion of a parcel, rendering it unfit for its current use.

Indirect (or secondary) displacement is the involuntary displacement of residents, businesses, or employees that results from a change in socioeconomic conditions created by a project. Examples of indirect displacement include lower-income residents forced out due to rising rents caused by a new concentration of higher-income housing introduced by a project, or a similar turnover of industrial uses being forced out in favor of higher-paying commercial tenants attracted to an area because of a successful office project.

If a project does not affect an area's socioeconomic characteristics directly or indirectly, it may still affect the operation of a major industry or commercial operation in the City. An example

would be the implementation of new regulations that restrict a certain process that is vital to a particular industry. In these cases, the effect of a project on a particular industry is analyzed.

The socioeconomic analysis of the Proposed Project is based on the Maximum Residential Program, which would introduce a larger number of residential dwelling units (DUs) as compared with the Reduced Residential Program, and therefore represents the reasonable worst case for the assessment of potential indirect residential displacement. By the 2028 analysis year, the Maximum Residential Program would introduce up to 1,270 dwelling units (DUs), including a minimum of 318 affordable DUs in that scenario.

The following screening assessment describes threshold circumstances under which the Proposed Project was analyzed for socioeconomic changes warranting further assessment.

DETERMINING WHETHER A SOCIOECONOMIC ASSESSMENT IS APPROPRIATE

This section presents the threshold circumstances that can lead to socioeconomic changes warranting further analysis and compares those circumstances (numbered in bold italics below) to the incremental development that could result from the Proposed Project.

1. Direct Residential Displacement: Would the Proposed Project directly displace population to the extent that the socioeconomic character of the neighborhood would be substantially altered? Displacement of less than 500 residents would not typically be expected to alter the socioeconomic character of a neighborhood.

The Development Site does not currently contain and would not contain any residential DUs under the Approved Plan. Therefore, the Proposed Project would not directly displace a residential population, and no further assessment of this concern is warranted.

2. Direct Business Displacement: Would the Proposed Project directly displace more than 100 employees, or would it displace any business that is unusually important because its products or services are uniquely dependent on its location, are subject of policies or plans aimed at its preservation, or that serves a population uniquely dependent on its services in its present location?

Site 5 does not currently contain any businesses. The temporary plaza area and Port Authority Police Department parking that currently occupy the site would be directly displaced irrespective of the Proposed Project (in the Approved Plan condition the site would be developed as-of-right with a commercial office building, but no specific businesses are identified in the Approved Plan). Because no displacement would be created by the Proposed Project compared with what would happen with the Approved Plan, no further assessment of this concern is warranted.

3. Indirect Residential Displacement due to Increased Rents: Would the Proposed Project result in substantial new development that is markedly different from existing uses, development, and activities within the neighborhood? Residential development of 200 units or less or commercial development of 200,000 square feet (sf) or less would typically not result in significant socioeconomic impacts.

Under the Maximum Residential Program, the Proposed Project would result in the incremental development of up to 1,270 DUs, which exceeds the analysis threshold of 200 units. Therefore, a preliminary assessment of potential indirect residential displacement was conducted (see Section C, "Preliminary Assessment").

4. Indirect Business Displacement due to increased rents or market saturation: Would the Proposed Project result in substantial new development that is markedly different from existing uses, development, and activities within the neighborhood; or would the project add to, or create, a retail concentration that may draw a substantial amount of sales from existing businesses within the study area to the extent that certain categories of business close and vacancies in the area increase, thus resulting in a potential for disinvestment on local retail streets? Projects resulting in less than 200,000 sf of retail on a single development site would not typically result in socioeconomic impacts.

Commercial development of 200,000 sf or less would typically not result in significant indirect business displacement. The Proposed Project's commercial component would be less than the amount introduced at Site 5 in the future without the Proposed Amendment (with the previously approved mixed-use commercial office building). Further, the retail component of both the Maximum Residential and Reduced Residential Scenarios is well below the 200,000-sf threshold. As such, an analysis of potential indirect business displacement is not warranted.

5. Adverse Impacts on Specific Industries: Is the Proposed Project expected to affect conditions within a specific industry? An analysis is warranted if a substantial number of residents or workers depend on the goods or services provided by the affected businesses or if it would result in the loss or substantial diminishment of a particularly important product or service within the industry.

As noted in the responses to screening questions 2 and 4 above, the Proposed Project would not directly displace any businesses, nor would it result in significant adverse impacts due to indirect business displacement. Therefore, the Proposed Amendment would not have the potential to adversely affect specific industries, and no further assessment of this concern is warranted.

ANALYSIS FORMAT

The socioeconomic analysis began with a screening assessment that determines the need for preliminary assessment. Based on the above screening assessment, the Proposed Project warrants further assessment of indirect residential displacement. A preliminary assessment was conducted to learn enough about the potential effects of the Proposed Project to either rule out the possibility of significant adverse impacts or determine that a more detailed analysis is required to fully determine the extent of the impacts. In the case of the Proposed Project, a preliminary assessment was sufficient to determine that the Proposed Project would not result in significant adverse socioeconomic impacts.

STUDY AREA DEFINITION

A study area typically encompasses a project area and adjacent areas within approximately 400 feet, quarter-mile, or half-mile, depending upon the project size and area characteristics. A larger half-mile study area is appropriate for projects that would potentially increase the quarter-mile area population by more than five percent. Under the Maximum Residential Program, the Proposed Project would introduce up to an estimated 2,426 residents, which is equivalent to approximately 17 percent of the quarter-mile area's population (14,628 residents in 2018); therefore, a half-mile study area delineation is warranted.

Because socioeconomic analysis depends on demographic data, the study area boundary has been adjusted to conform to the census tract delineation that most closely approximates the desired radius (in this case, a half-mile radius surrounding the project site). The census tracts that constitute the "socioeconomic study area," or "study area," are shown in **Figure 8-1** and include Census Tracts 7,



- WTC Site
- Project Site
- Development Site (Site 5)
- Half-mile Boundary
- Socioeconomic Study Area
- 13 Census Tract

0 1,000 FEET

9, 15.02, 13, 21, 317.03, 317.04, and 319. The socioeconomic study area is located within Manhattan Community District 1 and is roughly bounded by Reade and Fulton Streets to the north, the East River to the East, the southern tip of Manhattan to the south, and the Hudson River to the west.

DATA SOURCES

Information used in the analysis of indirect residential displacement was gathered from the U.S. Census Bureau's 2006–2010 and 2014–2018 American Community Survey (ACS) 5-Year Estimates. The New York City Department of City Planning (DCP) NYC Population FactFinder online mapping tool was used to provide comparative census data between geographies and to determine the margin of error (MOE) for single variable ACS estimates presented for the study area.¹ Census data were gathered on population, housing, and income. Data on residential market asking rents within the study area were collected from the real estate listings website StreetEasy.com.

C. PRELIMINARY ASSESSMENT

INDIRECT RESIDENTIAL DISPLACEMENT

Indirect residential displacement usually occurs when a project results in a substantial new development that is markedly different from existing uses and activities within a neighborhood. This can contribute to increased property values and increased rents, which can make it difficult for some existing residents to remain in their homes.

Generally, an indirect residential displacement analysis is conducted only in cases in which the potential impact may be experienced by renters living in privately held DUs unprotected by rent control, rent stabilization, or other government regulations restricting rents, and whose incomes or poverty status indicates that they may not withstand substantial rent increases. Residents who are homeowners, or who are renters living in rent-protected DUs, are not considered potentially vulnerable populations.

The assessment begins with a presentation of existing conditions and trends, followed by the preliminary assessment criteria.

EXISTING CONDITIONS

Based on the 2014–2018 ACS 5-Year Estimates data, in 2018 the study area contained 45,173 residents and 20,808 households. Approximately 89 percent of study area DUs are in multifamily buildings with 50 or more units, and approximately 76 percent of units were renter-occupied, which is similar to the proportions for Manhattan (76 percent) and New York City (67 percent).

This analysis uses average and median household incomes to describe the household income characteristics of the study area population. As reported in the 2014–2018 ACS and shown in **Table 8-1**, in 2018 the average annual household income within the study area was \$251,494 (in 2018 dollars) which was nearly \$100,000 higher than the average annual household income of Manhattan (\$152,002) and over \$150,000 higher than the average for New York City (\$97,647).

¹ MOEs describe the precision of an estimate within a 90-percent confidence interval and provide an idea of how much variability (i.e., sampling error) is associated with the estimate. The larger the MOE relative to the size of the estimate, the greater potential for variability within the data. The MOE is partially dependent on the sample size, because larger sample sizes result in a greater amount of information that more closely approximates the population.

Table 8-1
Average Annual Household Income (2006–2010, 2014–2018 ACS)

Area	2006–2010 ACS ¹	2014–2018 ACS ¹	Change or Direction of Change
Socioeconomic Study Area	\$241,145	\$251,494	NA ²
Manhattan	\$141,525	\$152,002	7.4%
New York City	\$89,907	\$97,647	8.6%

Notes:
¹ All dollar figures have been adjusted to 2018 dollars based on the U.S. Department of Labor Consumer Price Index (via Social Explorer and DCP’s FactFinder).
² The margin of error (MOE) of the difference is greater than the difference, so neither the percent change nor the direction of change (i.e., increase/decrease) can be reported with statistical confidence
Sources: U.S. Census Bureau, 2006–2010 and 2014–2018 ACS 5-Year Estimates; DCP’s NYC Population Factfinder; Social Explorer.

As average income can be heavily influenced by outliers (both high and low) within the data, the median household income is also presented. As shown in **Table 8-2**, in 2018 the median annual household income within the socioeconomic study area was \$185,003. This was well in excess of the median household income for Manhattan (\$82,459) and for New York City (\$60,762). The study area’s median income has increased since 2010, as have the median incomes for Manhattan and New York City.

Table 8-2
Median Annual Household Income (2006–2010, 2014–2018 ACS)

Area	2006–2010 ACS ¹	2014–2018 ACS ¹	Change or Direction of Change
Socioeconomic Study Area	\$162,808	\$185,003	Increase ²
Manhattan	\$74,988	\$82,459	10.0%
New York City	\$58,038	\$60,762	4.7%

Notes:
¹ All dollar figures have been adjusted to 2018 dollars based on the U.S. Department of Labor Consumer Price Index (via Social Explorer and DCP’s FactFinder).
² The margin of error (MOE) of the difference is greater than one third of the difference, so the percentage change cannot be estimated with confidence and only the direction of the change can be reported (i.e., Increase/Decrease).
Sources: U.S. Census Bureau, 2006–2010 and 2014–2018 ACS 5-Year Estimates; DCP’s NYC Population Factfinder; Social Explorer.

As shown in **Table 8-3**, within the socioeconomic study area, median gross rent in 2018 was approximately \$3,290 per month, which was over \$1,600 greater than the median gross rent in Manhattan (\$1,641) and nearly \$1,900 greater than the median gross rent in New York City as a whole (\$1,321).

Table 8-3
Average and Median Gross Rent

Area	2006–2010 ACS		2014–2018 ACS		Change or Percent Change	
	Average ¹	Median ¹	Average ¹	Median ¹	Average	Median
Socioeconomic Study Area	\$3,087	\$2,310	\$3,127	\$3,290	NA ²	NA ²
Manhattan	\$1,641	\$1,424	\$1,803	\$1,682	9.9%	18.1%
New York City	\$1,321	\$1,236	\$1,470	\$1,396	11.3%	12.9%

Notes:
¹ All dollar figures have been adjusted to 2018 dollars based on the U.S. Department of Labor Consumer Price Index (via Social Explorer and DCP’s FactFinder).
² The directionality of change and percent change cannot be reported with statistical confidence.
Sources: U.S. Census Bureau, 2006–2010 and 2014–2018 ACS 5-Year Estimates; DCP’s NYC Population Factfinder; Social Explorer.

U.S. Census data paints a general picture about whether housing costs are changing, but the data does not break down specific rent information according to regulation status or unit size. Market

comparables were therefore used to provide a more complete understanding of where the study area market is today. **Table 8-4** summarizes online listings for available and recently rented apartments in the study area from StreetEasy.com. The median monthly asking rents in the study area ranged from \$2,590 for studio units to \$6,950 for three- or more bedroom units. Based on historic asking rent data from StreetEasy.com, median asking rents in the Financial District² have increased by approximately eight percent since 2010.

Table 8-4
Median Monthly Rental Asking Rates within the Socioeconomic Study Area

Unit Type	Number of Listings	Median Monthly Asking Rent
Studio	151	\$2,590
One Bedroom	165	\$3,595
Two Bedroom	64	\$5,638
Three+ Bedroom	19	\$6,950

Source: StreetEasy.com, accessed May 2021.

FUTURE WITHOUT THE PROPOSED AMENDMENT

Development Site

In the Approved Plan condition (i.e., absent the Proposed Project), it is anticipated that the Development Site would be developed with a 1.3-million-gross-square-foot (gsf) office tower.

Study Area

Within the broader socioeconomic study area, 25 projects are anticipated to be completed by the 2028 analysis year. These include residential, mixed residential and commercial, hotel, and cultural and open space projects. In total, an estimated 2,067 DUs are planned for the study area by 2028.³

PRELIMINARY ASSESSMENT CRITERIA

The following assessment of the future with the Proposed Amendment utilizes a three-step preliminary assessment criteria (in bold italics).

Step 1: Determine if the Proposed Project would add new population with higher average incomes compared to the average incomes of the existing populations and any new population expected to reside in the study area without the project.

The Proposed Project would introduce a combination of market rate and permanently affordable residential units. It is therefore necessary to estimate incomes for the residents of both housing types.

² Median asking rent trends available from StreetEasy.com are for the Financial District market area, which is roughly bounded by Vesey Street and the Brooklyn Bridge Promenade to the north, the East River to the east, the Battery and West Street to the south and east. The percent increase cited is adjusted for inflation.

³ New York City Department of Buildings; see Table 2-2 in Chapter 2, “Land Use, Zoning, and Public Policy.”

Incomes of Market-Rate Unit Households

As a new housing product, the Proposed Project’s incremental market-rate DUs would be expected to rent on the higher end of the range of market-rate asking rents in the study area. For purposes of analysis, the upper quartile of StreetEasy.com listings was utilized to estimate market-rate renters’ incomes, and it was assumed that households would pay 30 percent of their income toward rent.⁴ The resulting projected household incomes, shown in **Table 8-5**, range from an estimated \$123,600 for households residing in studio units to \$389,000 for households in three- or more bedroom units.

Table 8-5
Annual Household Income Projections for the Proposed Project’s Market-Rate DUs

Unit Type	Projected Monthly Rent	Percentage of Unit Type in Study Area	Weighted Average Rent Calculation ¹	Projected Annual Household Income ²
Studio	\$3,090	22.6%	\$698	\$123,600
One Bedroom	\$4,580	44.4%	\$2,033	\$183,200
Two Bedroom	\$6,901	26.3%	\$1,815	\$276,040
Three+ bedroom	\$9,725	6.7%	\$652	\$389,000
Weighted Average Total¹			\$5,198	\$207,920

Note:
¹ Total average monthly rent is a weighted total based on the proportional unit mix for rental DUs in the study area.
² Average rent is assumed to be 30 percent of monthly gross income.
Source: AKRF, Inc. based calculations on rental data collected from StreetEasy.com, accessed May 2021.

The overall average income for market-rate households would depend on the unit mix in the proposed residential building, which is not currently known. For purposes of analysis, a weighted average was calculated based on the proportional unit mix found within the study area’s rental housing stock, resulting in an average household income of \$207,920 for households in market rate units, which is below the study area’s average household income in 2018 (\$251,494).

Incomes for Permanently Affordable Unit Households

As discussed in Chapter 1, “Project Description,” the Proposed Project would include an affordable housing component in which a minimum of 25 percent of the residential units would be permanently affordable. This analysis assumes that 25 percent of the DUs (318 DUs under the Maximum Residential Program) would be permanently affordable units that would be available to households earning an average of 50 percent of the Area Median Income (AMI) for New York City. New York City AMIs and affordable monthly rents by AMI are shown in **Tables 8-6 and 8-7**. AMIs are calculated yearly by the U.S. Department of Housing and Urban Development (HUD).

Table 8-6
2021 New York City Area Median Income

Family Size	30% AMI	40% AMI	50% AMI	60% AMI	80% AMI	100% AMI	120% AMI	130% AMI	165% AMI
1	\$25,080	\$33,440	\$41,800	\$50,160	\$66,880	\$83,600	\$100,320	\$108,680	\$137,940
2	\$28,650	\$38,200	\$47,750	\$57,300	\$76,400	\$95,500	\$114,600	\$124,150	\$157,575
3	\$32,220	\$42,960	\$53,700	\$64,440	\$85,920	\$107,400	\$128,880	\$139,620	\$177,210
4	\$35,790	\$47,720	\$59,650	\$71,580	\$95,440	\$119,300	\$143,160	\$155,090	\$196,845
5	\$38,670	\$51,560	\$64,450	\$77,340	\$103,120	\$128,900	\$154,680	\$167,570	\$212,685

Source: HUD

⁴ Based on U.S. Housing and Urban Development (HUD) affordability guidance where rent is estimated to be approximately 30 percent of total income.

Table 8-7

2021 New York City Affordable Monthly Rents by Area Median Income

Unit Size	30% AMI	40% AMI	50% AMI	60% AMI	80% AMI	100% AMI	120% AMI	130% AMI	165% AMI
Studio	\$419	\$598	\$777	\$956	\$1,314	\$1,547	\$2,084	\$2,263	\$2,889
1 BR	\$532	\$756	\$980	\$1,204	\$1,651	\$1,942	\$2,614	\$2,838	\$3,621
2 BR	\$631	\$900	\$1,168	\$1,437	\$1,974	\$2,323	\$3,129	\$3,397	\$4,337
3 BR	\$722	\$1,032	\$1,343	\$1,653	\$2,273	\$2,677	\$3,608	\$3,918	\$5,004

Notes: Assumes tenant pays electricity. Rents are approximate and have been calculated at 30 percent of annual gross income of the target AMI. For low-income bands, rents are based on 30 percent of 27 percent, 37 percent, 47 percent, 57 percent, and 77 percent of AMI.
Source: HUD

Assuming an average household size of 1.91 persons per unit, the incomes of households in the affordable units are expected to average between \$41,800 and \$47,750, which is well below the study area’s average household income in 2018 (\$251,494).

Average Household Income for the Maximum Residential Program Population

Table 8-8 shows the projected average household income for the residents introduced by the Proposed Project increment under the Maximum Residential Program, when considering both the affordable and market-rate units. To derive this estimate, the average income of market-rate units was multiplied by the total number of incremental market rate units, and the average income of affordable units was multiplied by the total number of affordable units. These two numbers were then added together to determine the aggregate income for all the units, and the result was divided by the total number of incremental units to determine an estimated average income for all incremental units of \$167,680.

Table 8-8

Weighted Average Income of Incremental With Action Population

	Income	Units	Aggregate Income (Income x Units)
Market rate	\$207,920	952	\$197,939,840
Affordable ¹	\$47,215	318	\$15,014,370
Total Increment		1,270	\$212,954,210
Average Income of the With Action Population (Aggregate Income ÷ Total Units)			\$167,680

Note:
¹ Affordable income is based on a weighted average of 50 percent AMI for one- and two-person families, assuming an average household size of 1.91 persons per unit.

Based on the above-described analysis, the Proposed Project would be expected to introduce permanently affordable units occupied by households who have an average income that is well below the average for the existing study area population, while the project’s market-rate units would introduce residents who have incomes more comparable to the existing study area population. In the aggregate, the projected average household income of \$167,680 would be well below the average for the existing study area (\$251,494). If the expected average incomes of the new population would not exceed the average incomes of the study area populations, a project does not have the potential to substantially alter the demographics of a study area, and Steps 2 and 3 of the preliminary assessment are not needed.

The Proposed Project would introduce permanently affordable DUs available to households with incomes well below the study area average and would therefore serve to maintain a more diverse mix of incomes within the study area. In addition, the Proposed Project would add permanently affordable housing in an area where market rates rents are not affordable to low- and moderate-income residents. Overall, the Proposed Amendment would not result in significant adverse impacts due to indirect residential displacement, and no further analysis is warranted. *

A. INTRODUCTION

This chapter assesses the potential for the Proposed Amendment to result in significant adverse impacts to the neighborhood character of the area surrounding the Project Site. Neighborhood character is an amalgam of various elements that give a neighborhood its distinct “personality.” These elements may include a neighborhood’s land use, socioeconomic conditions, open space, historic and cultural resources, urban design, visual resources, shadows, transportation, and noise. However, not all of these elements contribute to neighborhood character in every case; a neighborhood usually draws its distinctive character from a few defining elements.

This analysis of neighborhood character identifies the defining features of the neighborhood and evaluates whether the Proposed Project has the potential to affect the defining features of the neighborhood, either through the potential for a significant adverse impact or a combination of moderate effects in relevant technical analysis areas. This analysis relies on the analyses of the components of neighborhood character (i.e., land use, socioeconomic conditions, open space, historic and cultural resources, urban design, visual resources, shadows, transportation, and noise) as analyzed elsewhere in this Environmental Assessment (EA). To determine the effects of a proposed project on neighborhood character, the defining features of neighborhood character are considered together. Neighborhood character impacts are rare, and it would be unusual that—in the absence of a significant adverse impact in any of the relevant technical areas—a combination of moderate effects to the neighborhood would result in an impact to neighborhood character. The assessment presented below concludes that the Proposed Project, as with the previous Approved Plan, would not result in any significant adverse impacts to neighborhood character.

B. METHODOLOGY

An analysis of neighborhood character begins by determining whether a proposed project has the potential to result in significant adverse impacts in any technical area that contributes to an area’s neighborhood character (i.e., land use, socioeconomic conditions, open space, historic and cultural resources, urban design, visual resources, shadows, transportation, and noise) or if a project would result in a combination of moderate effects to several elements that could cumulatively impact neighborhood character. If a project could affect these technical areas, a preliminary assessment is undertaken. The preliminary assessment first identifies the defining features of the neighborhood, and then assesses whether the project has the potential to affect these defining features, either through the potential for significant adverse impacts or a combination of moderate effects. If the preliminary assessment concludes that a proposed project has the potential to affect defining features of a neighborhood, a detailed assessment of neighborhood character is undertaken. Conversely, if the project has no potential to affect the defining features of neighborhood character, a detailed assessment is not warranted.

As described in the relevant chapters of this EA, the Proposed Project would not result in significant adverse impacts to any of the technical areas that contribute to neighborhood character.

However, the Proposed Project would result in moderate effects in these technical areas. Therefore, a preliminary assessment of neighborhood character impacts from the Proposed Project is provided below. The preliminary assessment describes the defining features of the neighborhood and then assesses the potential for the Proposed Project to impact these defining features.

STUDY AREA

The study area for a preliminary assessment of neighborhood character should be consistent with the study areas in the relevant technical areas, and may be modified, as appropriate, either to include any additional areas that may be affected by the project or to exclude areas that would clearly not be affected by the project. Accordingly, this chapter focuses on an approximate 400-foot study area as assessed in the analyses of land use and urban design and visual resources. The study area is generally bounded by Barclay Street to the north, Church Street/Trinity Place to the east, Rector Street to the south, and Route 9A/West Street to the west (see **Figure 9-1**). This analysis also accounts for the Proposed Project's effects beyond the 400-foot adjusted study area for technical areas where the analysis examines a larger area; for example, the ½-mile study areas for open space and socioeconomic conditions.

IMPACT ASSESSMENT

The key elements that define neighborhood character, and their relationships to one another, form the basis of determining impact significance; in general, the more uniform and consistent the existing neighborhood context, the more sensitive it may be to change. A neighborhood that has a more varied context is typically able to tolerate greater change without experiencing a significant adverse impact related to neighborhood character.

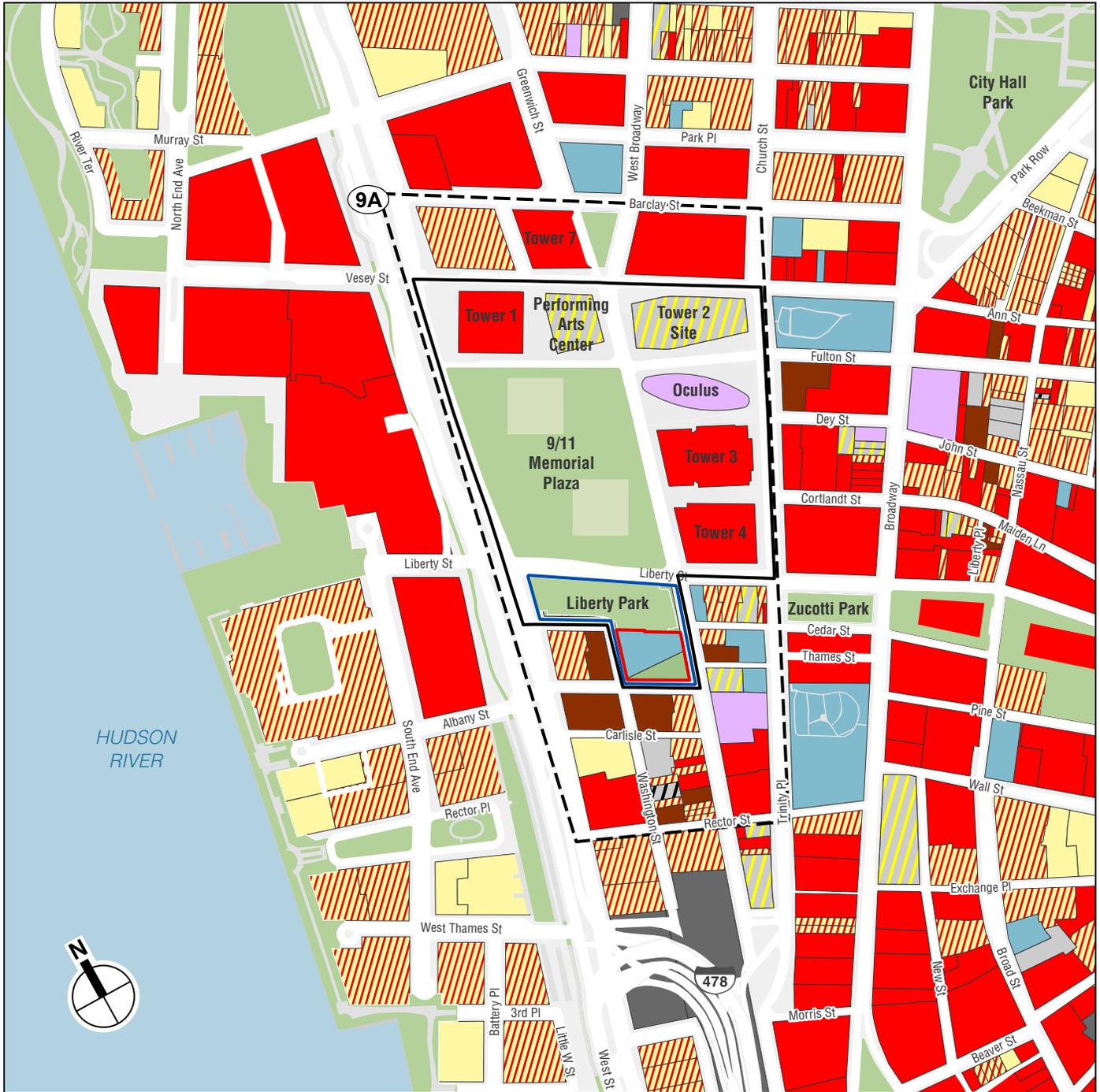
Neighborhood character impacts are rare and it would be under unusual circumstances that, in the absence of an impact in any of the relevant technical areas, a combination of moderate effects to the neighborhood would result in an impact to neighborhood character. Moreover, a significant impact identified in one of the technical areas that contribute to a neighborhood's character is not automatically equivalent to a significant impact on neighborhood character. Rather, it serves as an indication that neighborhood character may be significantly affected.

C. PRELIMINARY ASSESSMENT

DEFINING FEATURES

The Development Site is the block bounded by Albany Street to the south, Greenwich Street to the east, Washington Street to the west, and the former bed of Cedar Street to the north. The larger Project Site was formerly the Southern Site added to the WTC Site in 2003–2004 (see Figure 2-1 in Chapter 2, “Land Use, Zoning, and Public Policy”). The southern portion of the Development Site is a temporary public plaza area and the northern portion is currently occupied by parking for vehicles belonging to the Port Authority Police Department (PAPD).

The study area is located in the Financial District of Lower Manhattan in Community District 1 and comprises the Project Site and the original WTC Site. To the east, south, and west of the Project Site are a variety of old, new, small, and large buildings that are occupied by a mix of uses. To the north of Liberty Street, the Memorial Plaza opened to visitors on September 12, 2011, followed by the opening of the Memorial Museum on May 21, 2014. The Memorial Plaza encompasses an approximately 6.6-acre area with two cascading pools marking the one-acre



- | | | | |
|---|--|---|---|
|  | <i>WTC Site</i> |  | <i>Public Facilities and Institutions</i> |
|  | <i>Project Site</i> |  | <i>Residential</i> |
|  | <i>Development Site (Site 5)</i> |  | <i>Residential with Commercial Below</i> |
|  | <i>Land Use Study Area</i> |  | <i>Transportation and Utility</i> |
|  | <i>Commercial and Office Buildings</i> |  | <i>Vacant Land</i> |
|  | <i>Hotels</i> |  | <i>Vacant Building</i> |
|  | <i>Open Space and Outdoor Recreation</i> |  | <i>Under Construction</i> |
|  | <i>Parking Facilities</i> | | |

0 500 FEET

Neighborhood Character Study Area
Figure 9-1

footprints of the former Twin Towers. Immediately north of Site 5, St. Nicholas Greek Orthodox Church is under construction in Liberty Park overlooking Liberty Street at the corner of Greenwich Street.

Northeast of the Project Site, between Greenwich and Church Streets to the north of Liberty Street are, from south to north, the completed Towers 4 and 3, the Oculus transportation hub and underground shopping complex, and the site of the future Tower 2. West of the Tower 2 site and the north of the Memorial Plaza are the under-construction PACWTC and the completed Tower 1. Towers 1, 3, and 4 contain a mix of office and retail space.

The portion of the study area to the east, south, and west of the Project Site has long been an underutilized area of Lower Manhattan, cut off from Tribeca to the north by the WTC superblock that closed Washington and Greenwich Streets. Today it contains a mix of residential and hotel uses in converted and new buildings with additional ongoing construction. This portion of the study area is part of a larger emerging neighborhood called Greenwich South, an area the Downtown Alliance has identified as having the potential to contain a denser and more diverse mix of uses (commercial, residential, retail, and tourism).

Besides hotels, commercial uses in the study area generally include ground-floor retail and office buildings. The ground-floor retail uses include restaurants and neighborhood services that cater to the office workers and residents in the area. The New York Stock Exchange and the former Chase Manhattan Bank headquarters are located in the portion of the Financial District of the study area and Battery Park City is located to the west. To the north is the neighborhood of TriBeCa and to the south is Greenwich South.

The topography of the study area slopes down to the south and west. The grid is somewhat irregular; West Street/Route 9A, Washington Street, and Greenwich Street travel parallel to each other at a slight northwest–southeast direction, while Church Street/Trinity Place is laid out in a more north–south direction. West Street/Route 9A and Church Street/Trinity Place carry the greatest levels of vehicular traffic, as other streets in the primary study area are small, including the one-way single-lane Thames and Cedar Streets.

The urban design of the northern portion of the study area is characterized by the WTC superblocks, and Memorial Plaza, and modern high-rise commercial office towers. The southern portion of the study area is characterized by a mix of modern towers and older, low- to mid-rise commercial, residential, and institutional buildings ranging from 2 to 27 stories with setbacks. Buildings generally occupy their entire lot and are built to the lot line, creating continuous streetwalls along the north–south streets. Older, low- to mid-rise former office buildings generally have setbacks at the upper floors. Many of these buildings have been converted into residential use with ground-floor retail. These conversions reflect the area’s ongoing trend—shifting from an office/commercial work zone with a small residential population to a more densely populated residential neighborhood with local retail uses.

The study area contains a variety of historic architectural resources, as discussed in Chapter 4, “Historic and Cultural Resources.” Visual resources in the study area include known architectural resources that consist of architecturally significant buildings, such as the early 20th century skyscraper at 90 West Street and the Art Deco-style primary façade of the American Stock Exchange on Trinity Place. The National September 11 Memorial and Museum, the WTC Transit Hub, Liberty Park, and Towers 1, 3, 4, and 7 are visual resources in the study area. Within the study area, Towers 1, 3, 4, and 7 are visible in northern views on Greenwich Street and Washington

Street. However, the buildings are not visible from more than a block or two away, due to the narrow width of the one-way street.

With respect to open space resources, the ½-mile open space study area surrounding the Development Site is generally well-served with open space, with a total open space ratio that exceeds the Citywide Community District median ratio of 1.5 acres per 1,000 residents. Furthermore, this area of Manhattan has access to significant open space resources that extend beyond the study area, including Hudson River Park, Governors Island, John V. Lindsay East River Park, among others, and is unique in New York City for having ready waterfront access to both the Hudson River and the East River.

The character of the area, like many neighborhoods in New York City, is in part defined by a wide range of travel modes, with moderate foot traffic on most of the area's sidewalks and crosswalks, a mix of automobile/taxi/service traffic on the streets, and bus and subway service. Pedestrian activity in the area is associated primarily with workers and the area's growing residential population, consistent with the mix of uses in the area. Overall, transportation is not a defining feature of the study area's neighborhood character.

With respect to noise, roadway noise is the dominant noise source in the area. In terms of the CEQR criteria, the projected noise levels are generally in the "marginally acceptable" and "marginally unacceptable" categories. In terms of United States Department of Housing and Urban Development (HUD) criteria, noise levels at all receptors are categorized as "normally unacceptable." Noise is not a defining feature of the study area's neighborhood character.

ASSESSMENT OF THE POTENTIAL TO AFFECT THE DEFINING FEATURES OF THE NEIGHBORHOOD

In the future with the Proposed Project, the Development Site would be redeveloped with a mixed-use building containing residential (including affordable residential), commercial office, retail, fitness and social center, and community facility uses. The remainder of the Project Site would remain in its current condition, except for the completion of St. Nicholas Greek Orthodox Church at the eastern end of Liberty Park. Both the Maximum Residential Program and the Reduced Residential Program (see Chapter 1, "Project Description") for the Development Site are considered in this analysis. The overall building height would be up to 940 feet tall under either program.

With the Proposed Project, the residential uses on the Development Site would be different from completed and planned uses on the remainder of the WTC Site, and the office area on the overall WTC Site would be reduced in comparison to the Approved Plan. The residential uses would be consistent with residential uses to the east, south, and west of the Project Site, and would also be in keeping with a recent trend of increased residential development in the Lower Manhattan area as it becomes a mixed-use neighborhood.

The Proposed Project would be built on an existing block and would not alter street orientation or street patterns in the primary study area. The building is anticipated to fully occupy the site similar to other buildings in the study area, and its height would be comparable to the height of newer development in the primary study area. Likewise, the proposed building's massing would be consistent with the urban design character of existing buildings and buildings currently under construction in the study area. An elevated pedestrian bridge across the driveway would connect the proposed building and Liberty Park, further enhancing the pedestrian experience.

Similar to the approximately 57-story office tower provided for in the Approved Plan, the Proposed Project would block some pedestrian views of Tower 1 looking north from Albany Street between Washington and Greenwich Streets. However, views of Tower 1 are available from many other locations in the study area. In addition, views of the older historic buildings to the south would remain, as would views of Trinity Church and its burial ground. The Proposed Project would not obstruct views north along Greenwich Street of Tower 7, or views south from West Street/Route 9A of Lower Manhattan, Battery Park City, and Battery Park. The Proposed Project would not create any new impacts as compared to the Approved Plan or adversely impact the pedestrian's view of visual resources or view corridors in the primary study area. Similarly, the Proposed Project would not result in any new adverse contextual or visual effects on historic architectural resources in the study area. The additional height of the building constructed under the Proposed Amendment would not result in a building that is substantially taller than the building under the Approved Plan. The proposed uses would not introduce any new and incompatible visual, audible, or atmospheric elements to any historic architectural resource's setting in the study area. In addition, construction of the Proposed Project would include preparation and implementation of construction protection plans (CPPs) to avoid construction-related effects on the Hazen Building and the American Stock Exchange, two historic resources within 90 feet of the Development Site.

The Proposed Project would not affect socioeconomic conditions in the study area in a manner that would have the potential to affect neighborhood character. In particular, the Proposed Project would not introduce a population that could substantively alter local real estate market conditions in the ½-mile study area surrounding the Development Site. The Proposed Project would introduce an average household income below the average for the study area and would provide permanently affordable housing in a market where rents are no longer affordable to low- and moderate-income households.

The Proposed Project would increase utilization and demand for open space resources in the study area by introducing a new residential population compared to conditions with the Approved Plan. The Proposed Project would not adversely affect the use of or access to active open space by study area residents, as study area residents have access to numerous open space resources in the study area as well as notable open spaces just outside the study area including Hudson River Park, Washington Market Park, East River Park, and Governors Island. As noted above, the ½-mile open space study area is unique in New York City for having ready waterfront access to both the Hudson River and the East River. Both the Approved Plan and the Proposed Project would result in the displacement of the Albany Street Plaza, currently located on WTC Site 5. Because this displacement would occur with or without the Proposed Project, it would not constitute a significant adverse impact on open space. Albany Street Plaza was constructed with the intent of creating a temporary public plaza space for local visitors, workers, and residents in the area as WTC development plans were established.

As discussed in Chapter 6, "Shadows," the Proposed Project would cast incremental shadows on thirteen open spaces. The incremental shadow would not result in significant adverse impacts to the resources or their uses, and would not result in significant adverse impacts to neighborhood character.

As discussed in Chapter 12, "Transportation," the Proposed Project would not generate enough traffic, transit, or pedestrian trips to warrant detailed quantified analysis, and would not result in delays or congestion in the local transportation network. As the Proposed Project would not affect transportation conditions in the study area, it would not result in significant adverse impacts to

WTC Site 5

neighborhood character due to transportation. With respect to operational noise, the Proposed Project would not generate traffic volumes that have the potential to cause a significant noise impact and would be designed to provide building attenuation to satisfy applicable interior noise criteria. Therefore, there would be no significant adverse impact on neighborhood character with respect to operational noise.

The combination of moderate effects from the Proposed Project on the elements that contribute to neighborhood character would not create a significant adverse impact on neighborhood character. The new potential uses—residential and community facility—would support Lower Manhattan’s transition from a predominantly office district to a mixed-use neighborhood. Residential use would be in keeping with the new residential development in the area and the many residential conversions that have occurred in nearby outmoded office buildings. The building with the Proposed Project would be consistent with the height and bulk of existing buildings and buildings currently under construction in the study area.

Therefore, the Proposed Amendment, as with the previously Approved Plan, would be compatible with the defining characteristics of the study area’s neighborhood character, and would not result in significant adverse impact to the overall neighborhood character. *

A. INTRODUCTION

For the purposes of environmental review, a hazardous material is defined as any substance that poses a threat to human health or to the environment. Such substances include but are not limited to heavy metals; volatile organic compounds (VOCs), commonly found in petroleum products and solvents; semi-volatile organic compounds (SVOCs), typically associated with fuel oil and coal ash; and polychlorinated biphenyls (PCBs), usually associated with electrical transformers. Hazardous materials also include substances used (historically) in building materials and fixtures, such as asbestos-containing materials (ACM), lead-based paint (LBP), mercury, and mold.

The presence of hazardous (or contaminated) materials does not necessarily indicate a threat to human health or the environment; an exposure pathway, the presence of a receptor, and an unacceptable dose must also be present to cause a threat. During construction on development sites, hazardous materials could be disturbed through excavation of soil and bedrock, extraction of groundwater, or the demolition of existing structures. The most likely routes of human exposure from hazardous materials are the inhalation of VOCs, the ingestion of particulate-matter-containing SVOCs or metals, or dermal (skin) contact with hazardous materials that can be released during soil-disturbing activities.

As described in Chapter 1, “Project Description,” an Amendment to the General Project Plan (GPP) for the WTC is proposed that would allow the Site 5 to be developed with a new building that could include residential and community facility uses in addition to the previously approved office and retail uses for the Development Site.

B. METHODOLOGY

Information regarding the environmental conditions at the Development Site was gained from a review of previous environmental investigations conducted at or near the Site. The studies included a review of historical land use atlases and a review of regulatory database records to identify the use, generation, storage, treatment, and/or disposal of hazardous materials and chemicals or releases of such materials. Records pertaining to the decontamination and deconstruction of the Deutsche Bank building were also reviewed. Previous environmental investigations included the analytical results of soil and groundwater sampling conducted in the vicinity of the Site. Specifically, the following reports were consulted:

- Lower Manhattan Development Corporation (LMDC), *World Trade Center Memorial and Redevelopment Plan General Environmental Impact Statement (GEIS)*, April 2004;
- LMDC, 130 Liberty Street, New York, New York, Supplemental Investigation Summary Reports, February 2005;
- LMDC, *World Trade Center Memorial and Redevelopment Plan Environmental Assessment for Proposed Refinements*, April 2005;

- U.S. Department of Transportation (USDOT), Federal Transit Administration *Vehicle Security Center and Tour Bus Parking Facility Environmental Assessment and Section 4(f) Evaluation*, November 2006;
- New York City Police Department (NYPD), *World Trade Center Campus Security Plan Final Environmental Impact Statement (FEIS)*, August 2013; and
- LMDC, *130 Liberty Street Deconstruction Plan Documents* - http://www.renewnyc.com/plandesdev/130liberty/deconstruction_plan.asp (various documents)

C. EXISTING CONDITIONS

TOPOGRAPHY AND HYDROGEOLOGY

Previous studies in the vicinity of the Development Site indicate that bedrock is expected at a depth of approximately 60 to 100 feet below grade and that the Development Site is located on man-made land. Fill material of unknown origin—likely including sand, silt, clay, gravel, stone, macadam, river mud, ash, cinders, brick, etc.—is present beneath the lowest slab of the former Deutsche Bank building. As discussed in the next section, crushed concrete and concrete slabs from the below-grade levels of the building remain below the current concrete paving.

Previous studies show shallow groundwater in the area, beginning at approximately 6 to 10 feet below grade. Based on surface topography, groundwater would be expected to flow in a westerly direction toward the Hudson River, but groundwater flow is likely affected by dewatering in the area, bedrock, subsurface openings or obstructions such as basements, underground utilities, parking garages, historical filling and bulkheads, tidal fluctuations, etc. The municipal water supply in Manhattan uses upstate reservoirs, i.e., not groundwater, as a source of potable water.

HISTORICAL USES AND DATABASE REVIEW

Historical Sanborn maps identify the presence of a combination of multi-family residential uses, commercial uses including retail shops, stores, and restaurants, as well as some light industrial uses at and near the Development Site during the late 1800s and early 1900s. Mapping for this era identifies boilers and tanks at individual sites. These sources reveal an increase in commercial usage with a corresponding decrease in residential uses during the 1940s and 1950s, including the presence of gasoline stations. Few changes occurred in the area until the development of the WTC site in the mid- to late-1960s and the construction of the Deutsche Bank building in 1974.

The Deutsche Bank building was damaged by the events of September 11, 2001 and was subsequently decontaminated and deconstructed in accordance with the strict protocols set out in a 2005 Deconstruction Plan approved by EPA; the New York State Department of Labor; the New York and City Department of Environmental Protection (DEP); the New York City Department of Buildings; and the New York City Fire Department, with involvement from numerous other federal, state, and City regulatory agencies. This decontamination and deconstruction involved removal, floor-by-floor, of all hazardous materials (such as asbestos, mold, and lead-based paint), along with removal of PCB and universal waste, before deconstructing each floor for subsequent disposal. This building included two below-grade levels; the below-grade sidewalls and lowest concrete slab of Cellar B were retained and the basement/cellar was filled in with clean crushed concrete from the floors above in accordance with the approved decontamination and deconstruction plan. Following the completion of this work in 2011, the Development Site was paved with concrete and has subsequently only contained temporary structures.

Approximately 27,000 gallons of fuel oil were stored at the WTC Site prior to the September 11, 2001 terrorist attacks. As such, releases into the WTC Site and potentially affecting Site 5 may have occurred, as may have other petroleum spills in the area. However, soil testing conducted in the 2000s beneath streets to the south of the WTC Site (i.e., near Site 5) indicated no evidence of petroleum impacts. Additionally, ongoing dewatering in the area has likely led to reductions in any groundwater contamination.

D. THE FUTURE WITHOUT THE PROPOSED AMENDMENT

In the Future without the Proposed Amendment, with the Approved Plan, the Development Site would be redeveloped with a multi-story building with office and retail uses. The activities associated with construction of the commercial office tower contemplated under the Approved Plan would be the same as for the Proposed Amendment, which are discussed in the next section.

E. THE FUTURE WITH THE PROPOSED AMENDMENT

In the future with the Proposed Amendment, activities associated with the development of a new building would be the same as for a commercial office tower, and would require:

- Removal of the temporary structures (that are of recent vintage and therefore most unlikely to contain hazardous materials such as ACM or LBP).
- Removal of the concrete slab, backfilled-concrete and former 130 Liberty sidewall/cellar slabs (which would be sent off-site for recycling/reuse, assuming they are recognizable and uncontaminated concrete per New York State Department of Environmental Conservation [DEC] requirements). If other materials or evidence of contamination is encountered, these suspect materials would be managed separately, characterized, tested, transported, and disposed of off-site in accordance with applicable regulatory requirements.
- Removal of soil beneath the slab (as needed based upon the design of the new below grade level(s) and foundations). If soil is removed from beneath the slab, any such soil would be pre-characterized by the Developer for disposal via testing in-situ. All excavated soil requiring off-site disposal would be managed in accordance with applicable regulatory requirements. All soil and any other materials intended for off-site disposal would be tested in accordance with the requirements of the intended receiving facility. Transportation of material leaving the site for off-site disposal would be conducted in accordance with federal, state, and local requirements covering licensing of haulers and trucks, placarding, truck routes, manifesting, etc.
- Dewatering is likely to be required for construction. Testing would be performed to ensure compliance with DEP sewer discharge permit/approval requirements and, if necessary, pre-treatment would be conducted prior to discharge to the sewer.
- The new building would extend below the water table and would therefore include waterproofing of the new below-grade sidewalls and lowest level slab. This waterproofing would also serve to reduce the potential for any subsurface vapors (e.g., from past undocumented petroleum spills) that are present or might be present in the future from migrating into the new structure.

Since the proposed excavation and construction activities could expose localized areas of contaminated soil or groundwater not previously identified, the Developer would be responsible for preparing a CHASP prior to any excavation or construction activity and make it a requirement of all the contractors. The CHASP would specify appropriate characterization, testing, and

WTC Site 5

monitoring procedures (both for material requiring disposal and material to be left at the Development Site) and detail appropriate measures to be implemented (including notification of regulatory agencies) if soil or groundwater contamination, or other unforeseen environmental conditions, are encountered. The CHASP would also include a dust control plan that would outline procedures to prevent the generation and dispersal of dust. Dust control measures would include the use of water for sprinkling/wetting to suppress dust in dry weather, covering haul trucks with tarp covers, and appropriate measures at access points to prevent site material from being tracked onto roads in the surrounding area.

Because the activities relating to hazardous materials would be the same under the Approved Plan and with the Proposed Amendment, there is no change in hazardous materials impacts from the Proposed Amendment as compared to the Approved Plan. Further, the implementation of the measures outlined in the previous section would preclude the potential for significant adverse impacts from the Proposed Amendment. *

Chapter 11: Water and Sewer Infrastructure and Solid Waste Services

A. WATER AND SEWER INFRASTRUCTURE

INTRODUCTION

New York City's water and sewer network is fundamental to the operation, health, safety, and quality of life of the City and its surrounding environment, and it must be sized to fit the City's users and surface conditions in order to function adequately. Ensuring these systems have adequate capacity to accommodate land use or density changes and new development is critical to avoiding environmental and health problems such as sewer back-ups, street flooding, or pressure reductions. This chapter evaluates the potential for the proposed project to result in significant adverse impacts on the City's water supply and wastewater and stormwater conveyance, management, and treatment infrastructure.

As outlined in Chapter 1, "Project Description," the 2004 *FGEIS* and ROD (the "Approved Plan") analyzed the approved office use with ground-floor retail for the approximately 57-story building at Tower 5 (the Development Site). The Proposed Amendment would provide greater flexibility in the development of Tower 5 by allowing, in addition to the currently approved office and retail use, residential and community facility use. Absent the Proposed Project, it is anticipated that the Development Site would be developed with a 1.3-million-square-foot (sf) office tower with 50,000 sf of retail use. The differences between the Approved Plan and Proposed Project conditions are assessed in this chapter to determine whether they would result in any significant adverse impacts on water and sewer infrastructure.

As discussed in Chapter 1, "Project Description," the Development Site at World Trade Center (WTC) Tower 5 does not yet have a final program, and instead two potential programs have been created for analysis purposes, one with the maximum residential uses (Maximum Residential Program), and the other with reduced residential use (Reduced Residential Program). The total floor area for either would be 1,627,898 gross square feet (gsf) (or 1,677,898 gsf for an all-electric building). The Maximum Residential Program would include up to 1,270 dwelling units (DUs) and 1,386,898 gsf of residential space (or 1,436,898 gsf for an all-electric building), up to 180,000 gsf of commercial office use, up to 12,000 gsf of retail use, up to 36,000 gsf of fitness and social center uses, and up to 13,000 gsf for community facility uses. The Reduced Residential Program would introduce 1,126,563 gsf of residential use (or 1,176,563 gsf for an all-electric building) with 1,193 dwelling units. The commercial office space would be increased to 374,361 gsf, and the fitness and social center and community facility space would also be increased to about 80,645 gsf and 21,329 gsf, respectively. The retail space would more than double, with a proposed 25,000 gsf.

For the purposes of this analysis, the Reduced Residential Program is considered for the With Action condition. Although the Maximum Residential Program contains more residential space, the Reduced Residential Program results in higher overall water consumption and sanitary sewage generation as a result of the increases in office, fitness and social center, community facility, and retail space; therefore the Reduced Residential Program represents the worst-case scenario for potential adverse impacts on water supply and wastewater conveyance and treatment infrastructure.

METHODOLOGY

A preliminary water analysis is recommended if a project would result in an exceptionally large demand of water (over 1 million gallons per day [gpd]), or if it is located in an area that experiences low water pressure (i.e., an area at the end of the water supply distribution system, such as the Rockaway Peninsula or Coney Island). The Development Site is not in an area that experiences low water pressure; in addition, the Proposed Project is not expected to result in a water demand of more than one million gpd compared with the Approved Plan (the No Action condition).¹ Therefore, an analysis of water supply is not warranted, since it is expected that there would be adequate water service to meet the incremental water demand and that there would be no significant adverse impacts on the City's water supply.

A preliminary analysis of wastewater and stormwater conveyance and treatment is warranted if a project is located in a combined sewer area and would have an incremental increase above the No Action condition of 1,000 residential units or 250,000 sf of commercial, public facility, and institution and/or community facility space in Manhattan. Since the Development Site is located in a combined sewer area and the Proposed Project would exceed the threshold for residential space, an analysis of wastewater and stormwater conveyance and treatment was performed.

To assess the potential impacts of the Proposed Project on water and sewer infrastructure, this chapter:

- Describes the existing sewer infrastructure serving the Development Site;
- Provides a preliminary analysis which estimates water demand and sewage generation on the Development Site under Existing and No Action conditions based on use generation rates provided in the *CEQR Technical Manual*. The preliminary analysis also calculates stormwater runoff and sanitary flows using the DEP Volume Calculation Matrix. The preliminary analysis then forecasts water demand and sewage and stormwater generation by the Proposed Project; and
- Assesses the effects of the With Action water demand and sewage and stormwater generation on the City's water and sewer infrastructure based on the preliminary analyses.

EXISTING CONDITIONS

SEWER SYSTEM AND WASTEWATER TREATMENT

The Development Site is located within a part of Manhattan that is served by a combined sewer system that collects both sanitary sewage and stormwater, as well as direct drainage. In periods of dry weather, the combined sewers located in the adjacent streets convey only sanitary sewage. The Development Site is served by combined sewers within the service area of the Newtown Creek WWTP, the largest of the City's 14 WWTPs.

According to DEP sewer maps, there is a 16-inch-diameter combined sewer which runs along Greenwich Street, on the eastern side of the Development Site. In addition, there is a 42-inch-by-26-inch combined sewer which runs along Albany Street, on the southern side of the Development Site. These sewers were constructed in 2014 and 2003, respectively. The DEP maps also indicate that there are larger (48-inch-by-32-inch) combined sewers on Greenwich Street and Washington Street (on the western side of the Development Site), which date from the 19th and 20th centuries. The sewers on Greenwich Street generally flow to the south and then west, where they connect to Regulator NC-M7, located at West Street near Rector Street. The Albany Street and Washington

¹ As shown in **Table 11-4**, as compared to the No Action condition, the incremental water demand with the Proposed Amendment is approximately 204,947 gpd.

Chapter 11: Water and Sewer Infrastructure and Solid Waste Services

Street sewers generally flow north and west, where they connect to Regulator NC-M6, located at West Street and Albany Street. From the regulators, flow is conveyed to an interceptor running along West Street, which connects to the Newtown Creek WWTP.

At the Newtown Creek WWTP, wastewater is fully treated by physical and biological process before it is discharged into Newtown Creek. The quality of the treated wastewater (effluent) is regulated by a State Pollutant Discharge Elimination System (SPDES) permit issued by the New York State Department of Environmental Conservation (DEC), which establishes limits for effluent parameters (i.e., suspended solids, fecal coliform bacteria, and other pollutants). Since the volume of flow to a WWTP affects the level of treatment a plant can provide, the maximum permitted capacity for the Newtown Creek WWTP is 310 million gallons per day (mgd). The average monthly flow over the last 12-month period for which data is available is 212 mgd,² which is well below the maximum permitted capacity.

Most of New York City’s sewers are combined sewers that collect both sanitary sewage and stormwater. In periods of dry weather, the combined sewers (sized to convey an amount of sanitary sewage that is based on density levels according to zoning regulations) convey only sanitary sewage. During and immediately after wet weather, combined sewers can experience a much larger flow due to stormwater runoff collection. To control flooding at the WWTPs, regulators built into the system serve as relief valves, allowing only approximately two times the amount of design dry weather flow into the interceptors (larger sewers that convey wastewater to the WWTPs). The interceptors then take the allowable flow to the WWTPs, while the excess flow is discharged untreated to the nearest waterbody as CSO. As described above, the Development Site is served by sewers connecting to two regulators, NC-M6 and NC-M7: both regulators convey flows to outfall NCM-071, which is located on the Hudson River esplanade in the Battery Park City area, south of West Thames Street.

SANITARY FLOWS

The Development Site currently contains a temporary public plaza area and an area used for parking for vehicles belonging to the Port Authority Police Department (PAPD). These existing uses do not generate any demand for water or sanitary sewage, therefore there are no sanitary sewage flows from the Development Site under existing conditions.

STORMWATER FLOWS

The Development Site has a lot area of approximately 33,000 sf (0.76 acres); as noted above, there are currently no buildings on the Development Site, which is paved. **Table 11-1** summarizes the surface area of the Development Site, as well as the weighted runoff coefficient (the fraction of precipitation that becomes surface runoff for each surface type).

**Table 11-1
Existing Surface Coverage**

Affected CSO Outfall	Surface Type	Roof	Pavement and Walkways	Other	Grass and Soft Scope	Total
NCM-071	Area (percent)	0%	100%	0%	0%	100%
	Surface Area (sf)	-	33,000	-	-	33,000
	Runoff Coefficient	1.00	0.85	-	0.20	0.85
Notes:		* The Runoff Coefficient is a weighted average. The calculations are based on the DEP Volume Calculation Matrix provided in the <i>CEQR Technical Manual</i> , retrieved July 2021. Totals may not sum due to rounding.				

² Twelve-month period through March 2017.

THE FUTURE WITHOUT THE PROPOSED AMENDMENT

As discussed in Chapter 1, “Project Description,” in the Future without the Proposed Amendment, the approved office tower will be constructed on the Development Site. As contemplated in the *FGEIS*, it will be an approximately 57-story office tower with ground-floor retail uses. In total, the Approved Plan for the Development Site could include approximately 1.314 million gsf of space, consisting of 1.306 million gsf of office use and 50,000 gsf of retail space.

SEWER SYSTEM AND WASTEWATER TREATMENT

Table 11-2 summarizes the water demand and sewage generation on the Development Site in the future without the Proposed Amendment: for purposes of analysis, the amount of sanitary sewage is estimated as all water demand generated on the Development Site except water used by air conditioning, which is typically not discharged to the sewer system. It is estimated that the Approved Plan would result in a total water demand of approximately 373,120 gpd, including approximately 142,600 gpd for domestic uses. As noted above, there are no sanitary sewage flows from the Development Site under existing conditions, therefore the Approved Plan would represent an incremental increase of approximately 142,600 gpd as compared to existing conditions. This additional sanitary discharge to the Newtown Creek WWTP would be well within the capacity available at the plant on average; therefore, the WWTP would continue to operate within its design capacity.

Table 11-2
No Action Condition Water Consumption and Sanitary Sewage Generation

Land Use	Water Consumption and Wastewater Generation Rates ¹	Area/Units	Domestic Water/Wastewater Generation (gpd)	Air Conditioning (gpd)
Retail	Domestic: 0.24 gpd/sf A/C: 0.17 gpd/sf	50,000 sf	12,000	8,500
Office	Domestic: 0.10 gpd/sf A/C: 0.17 gpd/sf	1,306,000 sf	130,600	222,020
Development Site—Total Water Demand				373,120
Development Site—Total Wastewater Generation				142,600
Notes:				
Totals may not sum due to rounding. gpd = gallons per day; DU = dwelling unit				
¹ . Consumption rates from <i>CEQR Technical Manual</i> Table 13-2, “Water Usage and Sewage Generation Rates for Use in Impact Assessment.”				

STORMWATER FLOWS

In the future without the Proposed Amendment, surface coverage would change on the Development Site with the introduction of the previously approved project pursuant to the Approved Plan. As the previously approved project would occupy the full Development Site, the surface area would be fully rooftop space, as opposed to fully paved space in existing conditions. This would result in an increase in the weighted runoff coefficient, as shown in **Table 11-3**.

Table 11-3
No Action Condition Surface Coverage

Affected CSO Outfall	Surface Type	Roof	Pavement and Walkways	Other	Grass and Soft Scape	Total
NCM-071	Area (percent)	100%	0%	0%	0%	100%
	Surface Area (sf)	33,000	0	–	–	33,000
	Runoff Coefficient	1.00	0.85	–	0.20	1.00
Notes:	* The Runoff Coefficient is a weighted average. The calculations are based on the DEP Volume Calculation Matrix provided in the <i>CEQR Technical Manual</i> , retrieved July 2021. Totals may not sum due to rounding.					

As required by DEP regulations and the proposed Unified Stormwater Rule (described below), sanitary and stormwater source control BMPs would be used to reduce sanitary volume and peak stormwater runoff volumes to the combined sewer system. The building with the Approved Plan would incorporate low-flow plumbing fixtures to reduce sanitary flow. In addition, stormwater detention would be required as part of the DEP site connection approval process for new construction that connects to the City’s sewer system. This performance standard, required by DEP, is discussed in more detail below.

In the No Action condition, the building with the Approved Plan would be developed with site flows restricted in accordance with DEP’s regulations. The flow generated from the building with the Approved Plan would be detained and restricted with an outlet control. Through the use of this system, the developed peak flow rate is restricted to the allowable peak flow rate with an additional 10 percent restriction in conformance with DEP standards to reduce the peak flow rate to the City’s combined sewers.

In the No Action condition, independent of the Proposed Amendment, DEP is expected to enact amended on-site stormwater management requirements for new and redevelopment projects in combined sewer areas, updating the current regulations (2012 Stormwater Rule), which reduce peak discharges to the City’s sewer system during rain events by requiring greater on-site storage of stormwater runoff and slower release to the sewer system. Specifically, DEP is proposing amendments to Chapters 31 and 19.1 of Title 15 of the Rules of the City of New York (RCNY) as part of a Unified Stormwater Rule. The Unified Stormwater Rule, to be administered citywide, will update and align Chapter 31 stormwater quantity and flow rate requirements with Chapter 19.1 Construction/Post-Construction permitting program water quality requirements.

Under Chapter 31 amendments, the Unified Stormwater Rule increases the amount of stormwater required to be managed on-site and further restricts the release rates for all new and redevelopment projects that require a DEP House or Site Connection Proposal. Additionally, under Chapter 19.1 amendments, sites that disturb 20,000 square feet or more of soil or increase impervious surfaces by 5,000 square feet or more will also be required to manage the Water Quality Volume (WQv), currently defined as 1.5" over the lot area, using stormwater management practices (SMPs) dictated by DEP SMP hierarchies. DEP has developed hierarchies for both combined and separate sewer areas. The SMP hierarchies prioritize vegetated retention SMPs for both drainage areas with stormwater volume control and stormwater treatment communicated as the underlying goals for combined and separate sewer areas, respectively. For sites that trigger the Chapter 19.1 component of the Unified Stormwater Rule, the hierarchy is mandatory, meaning that developers must start with the most preferred SMP and provide documentation of site constraints that prevent implementation in order to move to the next SMP.

In August 2020, New York City Council passed Intro No. 1851, enabling DEP to move forward with the Chapter 19.1 amendments necessary to package the Unified Stormwater Rule

amendments. Draft rules are anticipated to be in effect in 2022. A new New York City Stormwater Management Guidance Manual will accompany the Unified Stormwater Rule to provide clear guidance on requirements and design options.

The Unified Stormwater Rule is expected to lead to a substantial improvement in the way that individual new and redeveloped properties manage stormwater compared to the 2012 Stormwater Rule. In some cases, stormwater will be entirely prevented from entering the City sewer system through retention and, in most cases, stormwater that does enter the system will be reduced and/or treated and released at a much lower rate, allowing the system to operate more efficiently during peak wet weather events. In combined sewersheds, such as portion of Manhattan that contains the Development Site, the Unified Stormwater Rule is expected to lead to a reduction in CSO volume as more lots redevelop over time. The Unified Stormwater Rule (USR) is not presented as part of this analysis; the analysis is more conservative as the USR would require SMPs that are more stringent.

THE FUTURE WITH THE PROPOSED AMENDMENT

As described in Chapter 1, “Project Description,” the With the Proposed Amendment would result in the construction of the Proposed Project on the Development Site. The Proposed Project under Reduced Residential Program would consist of an approximately 1,625,000-gsf building with 1,126,500 gsf of residential uses (or 1,176,563 gsf for an all-electric building) and 1,193 dwelling units, 25,000 gsf of retail, 374,361 gsf of commercial office space, 21,329 gsf of community facility uses, and an 80,645 gsf fitness and social center.

SEWER SYSTEM AND WASTEWATER TREATMENT

As shown in **Table 11-4**, the Proposed Project would result in a total water demand of 578,067 gpd³ (approximately 0.6 mgd), including 292,824 gpd of daily sanitary sewage. The sanitary sewage generated by the With Action condition would be an incremental increase of 150,224 gpd compared to the No Action condition.

The incremental increase in sewage generation would be approximately 0.07 percent of the average daily flow at the Newtown Creek WWTP and would not result in an exceedance of the WWTP’s permitted capacity of 310 mgd. In addition, in accordance with the New York City Plumbing Code (Local Law 33 of 2007), the Proposed Project would be required by the New York City Plumbing Code to utilize low-flow plumbing fixtures, which would help to further reduce sanitary flows to the WWTP.

Connecting to the City’s sewer system requires certification from DEP as part of the building permit process, which is not a discretionary approval. An applicant would be required to file a SCP for approval from DEP to tie into the sewer system. In this process, before a building permit can be issued, site connection proposals must be certified for sewer availability by DEP. An applicant would be required to demonstrate that the existing sanitary system could handle the site-specific sanitary flows from the proposed development. Because the City’s sewers are sized and designed based on the designated zoning of an area and related population density and surface coverage characteristics, the Proposed Project may result in development that is inconsistent with the design of the existing built sewer system. A site-specific hydraulic analysis of the existing

³ For purposes of analysis, the water demand estimate of the Reduced Residential Program considers the all-electric building, which has the higher residential square footage and would therefore result in higher demand for water for air conditioning.

sewer system may be required to determine whether the existing sewer system is capable of supporting the development and related increases in wastewater flows. Sewer upgrades may be required at the time of the SCP to accommodate the projected flows from the new development. In addition, there may be a need to amend the existing drainage plan based on the hydraulic analysis calculations.

Table 11-4
With Action Condition Water Consumption and Sanitary Sewage Generation

Land Use	Water Consumption and Wastewater Generation Rates¹	Area/Units	Domestic Water/Wastewater Generation (gpd)	Air Conditioning (gpd)
Residential	Domestic: 100 gpd/person ² A/C: 0.17 gpd/sf	1,176,563 sf (1,193 DU)	227,900	200,016
Retail	Domestic: 0.24 gpd/sf A/C: 0.17 gpd/sf	25,000 sf	6,000	4,250
Office	Domestic: 0.10 gpd/sf A/C: 0.17 gpd/sf	374,361 sf	37,436	63,641
Community Facility ³	Domestic: 0.10 gpd/sf A/C: 0.17 gpd/sf	21,329 sf	2,133	3,626
Fitness Center ⁴	Domestic: 0.24 gpd/sf A/C: 0.17 gpd/sf	80,645 sf	19,355	13,710
Development Site—Total Water Demand				578,067
Development Site—Total Wastewater Generation				292,824
No Action to With Action Incremental Water Supply Demand				204,947
No Action to With Action Incremental Sewage Generation				150,224
Notes:				
Totals may not sum due to rounding.				
gpd = gallons per day; DU = dwelling unit;				
¹ Consumption rates from <i>CEQR Technical Manual</i> Table 13-2, "Water Usage and Sewage Generation Rates for Use in Impact Assessment," unless otherwise noted.				
² Assumes 1.91 residents per DU—the 2015-2019 ACS average household size for Manhattan Community Districts 1 and 2.				
³ Community Facility is assumed to consume water and generate domestic wastewater at the <i>CEQR Technical Manual</i> rates for commercial office space.				
⁴ Fitness Center is assumed to consume water and generate domestic wastewater at the <i>CEQR Technical Manual</i> rates for retail space.				

As the Proposed Project is not expected to result in a significant increase in dry weather flows to the combined sewer system, no significant adverse impacts would result.

STORMWATER FLOWS

As with the Approved Plan, the Proposed Project would occupy the full Development Site. Therefore, in the With Action condition, the surface area of the Development Site would remain fully rooftop space, and there would not be a change in surface area as compared to the No Action condition. The weighted runoff coefficient would remain as shown in **Table 11-3**.

Using the sanitary and stormwater flow calculations, the DEP Volume Calculation Matrix was utilized to determine flows for the With Action condition. The calculations from the Volume Calculation Matrix help to determine the change in wastewater volumes to the combined sewer system from existing conditions to With Action condition, and include four rainfall runoff volume scenarios with varying durations. The drainage analysis assumes that all stormwater runoff from the Development Site would flow via the existing combined sewer infrastructure in the area. The summary tables of the Volume Calculation Matrix showing a comparison of the existing and With Action conditions are included in **Table 11-5**.

Table 11-5
DEP Volume Calculation Matrix:
Existing and With Proposed Amendment Volume Comparison

Rainfall Volume (in)	Rainfall Duration (hr)	Runoff Volume to SS (MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	Runoff Volume to SS (MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	Increased Total Volume to CSS (MG)*
NCM-071		Existing				With Action				NCM-071 Increment
		33,000 sf (0.76 acres)				33,000 sf (0.76 acres)				
0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.05
0.40	3.80	0.00	0.01	0.00	0.01	0.00	0.01	0.05	0.05	0.05
1.20	11.30	0.00	0.02	0.00	0.02	0.00	0.02	0.14	0.16	0.14
2.50	19.50	0.00	0.04	0.00	0.04	0.00	0.05	0.24	0.29	0.25
Notes:										
Totals may not sum due to rounding.										
*Assumes no on-site detention or Best Management Practices (BMPs) for purposes of calculations.										
SS = Storm Sewer; CSS = Combined Sewer System; MG = Million Gallons										

In addition, as the Proposed Project would not result in changes to surface coverage compared to the No Action condition, the Volume Calculation Matrix comparing the With Action condition to the No Action condition was prepared to compare the stormwater volumes flowing to the combined sewer system under each condition. The summary tables of the Volume Calculation Matrix showing a comparison of the No Action and With Action conditions are included in **Table 11-6**.

Table 11-6
DEP Volume Calculation Matrix:
No Action and With Proposed Amendment Volume Comparison

Rainfall Volume (in)	Rainfall Duration (hr)	Runoff Volume to SS (MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	Runoff Volume to SS (MG)	Runoff Volume to CSS (MG)*	Sanitary Volume to CSS (MG)	Total Volume to CSS (MG)	Increased Total Volume to CSS (MG)*
NCM-071		No Action				With Action				NCM-071 Increment
		33,000 sf (0.76 acres)				33,000 sf (0.76 acres)				
0.00	3.80	0.00	0.00	0.02	0.02	0.00	0.00	0.05	0.05	0.02
0.40	3.80	0.00	0.01	0.02	0.03	0.00	0.01	0.05	0.05	0.02
1.20	11.30	0.00	0.02	0.07	0.09	0.00	0.02	0.14	0.16	0.07
2.50	19.50	0.00	0.05	0.12	0.17	0.00	0.05	0.24	0.29	0.12
Notes:										
Totals may not sum due to rounding.										
*Assumes no on-site detention or Best Management Practices (BMPs) for purposes of calculations.										
SS = Storm Sewer; CSS = Combined Sewer System; MG = Million Gallons										

As shown in **Tables 11-5 and 11-6**, in all rainfall scenarios the total rainfall and sanitary sewage volume would increase for CSO outfall NCM-071. During storm events with up to 2.5 inches of rainfall, as compared to existing conditions, the increase would be up to 0.25 million gallons; as compared to the No Action condition, the increase would be up to 0.12 million gallons. The increase in volume under the With Action condition is primarily attributable to the increase in sanitary flow resulting from the new development: there is no sanitary sewage generated on the Development Site under existing conditions, and under the No Action condition, sanitary sewage generation would be approximately 150,224 gpd less than the With Action condition. As compared to existing conditions, there would also be a minor increase in stormwater runoff, as the With Action condition would result in an increase in fully impervious rooftop space on the Development Site. However, as shown in **Table 11-6**, the With Action condition would have the

same stormwater runoff as the No Action condition, as the Development Site would be fully rooftop space under both conditions.

The volume matrix calculations presented in **Tables 11-5 and 11-6** above do not reflect the use of any sanitary and stormwater source control BMPs to reduce sanitary volume and stormwater runoff volumes to the combined sewer system. As noted above, the Proposed Project would incorporate low-flow plumbing fixtures to reduce sanitary flow as required by the New York City Plumbing Code. In addition, stormwater detention would be required as part of the DEP SCP application process for new buildings connecting to the City's sewer system. As part of the SCP permit approval processes, developments must be in compliance with the required on-site stormwater volume requirements and stormwater release rate as detailed in the USR. The performance standard is intended to reduce peak discharges to the City's sewer system during rain events by requiring greater onsite storage of stormwater runoff and slower release to the sewer system. The implementation of DEP's stormwater performance standard over time is expected to provide additional capacity to the existing sewer system, thereby improving its performance. The performance standard is a key element of the New York City Green Infrastructure Plan to promote green infrastructure and improve water quality in the City's surrounding waterbodies. Specific BMP measures for the Proposed Project would be determined in the future in consultation with DEP when specific designs are advanced, and may include stormwater detention tanks.

Because the City's sewers are sized and designed based on the designated zoning of an area, and related population density and surface coverage characteristics, the Proposed Project may result in development that is inconsistent with the design of the existing built sewer system. If required by DEP, an Amended Drainage Plan (ADP) will be prepared for the Development Site. In addition, a hydraulic analysis of the existing sewer system may be required as part of the SCP approval process, due to the projected increase in sanitary flow. The hydraulic analysis calculations would inform the ADP process as necessary. Sewer improvements and/or incorporation of BMPs may also be required of the Project Sponsors at the time of the site connection proposal.

The Proposed Project would result in marginally increased flows to the City's combined sewer system that may be discharged as CSOs during rain events. Because of the available capacity of the Newtown Creek WWTP, the projected increased flows to the combined sewer system would not have a significant adverse impact on water quality. In addition, with the incorporation of BMP measures to meet the City site connection requirement, development pursuant to the Proposed Amendment would not result in a significant increase in stormwater runoff or CSO volumes/frequencies. Therefore, the Proposed Project would not result in significant adverse impacts to local water supply or wastewater and stormwater conveyance and treatment infrastructure.

B. SOLID WASTE SERVICES

The Proposed Amendment would result in a new development that would require sanitation services, both from the New York City Department of Sanitation (DSNY) and private commercial waste management services. According to the *CEQR Technical Manual*, if a project does not exceed 50 tons (100,000 pounds) of solid waste per week, it may be assumed that there is sufficient existing capacity to capture the need and properly absorb the incremental increase in solid waste generation. Therefore, most projects generating 50 tons or less of solid waste a week would not result in a significant adverse impact. However, it is recommended in the *CEQR Technical Manual* that the solid waste and service demand generated by a project be disclosed, based on standard waste generation rates. The Proposed Project would result in a new building on the Development

WTC Site 5

Site with approximately 1,627,898 gsf of floor area (or 1,677,898 gsf for an all-electric building).⁴ Two illustrative programs are being considered: one maximizing residential units (the Maximum Residential Program), and one with reduced residential uses but increased commercial space (the Reduced Residential Program).

As shown in **Table 11-7**, the Proposed Project with the Maximum Residential Program would generate approximately 33.33 tons of solid waste per week, while the Reduced Residential Program would generate approximately 39.85 tons per week. The solid waste generated by the residential uses would be handled by DSNY. Solid waste generated by the other building uses, such as retail, office, community facility, and the fitness and social center would be collected by private commercial carters. The new building would also be subject to mandatory recycling requirements. The projected solid waste generation under either proposed program would be less than 50 tons per week and is not anticipated to overburden the City’s existing solid waste handling systems. Therefore, the Proposed Project would not result in a significant adverse impact to solid waste and sanitation services.

**Table 11-7
Solid Waste Generation**

Use	Floor Area (GSF)	Households/ Workers ¹	Solid Waste Generation Rate (lbs/wk)	Solid Waste Generation	
				(lbs/wk)	(tons/wk)
Maximum Residential Program					
Residential	1,386,898 (1,270 DUs)	1,270	41 per household	52,070	26.04
Commercial Office	180,000	720	13 per employee	9,360	4.68
Commercial Retail	12,000	30	79 per employee	2,700	1.35
Fitness and Social Center	36,000	36	75 per employee	169	0.08
Community Facility	13,000	13	13 per employee	2,370	1.19
Maximum Residential Program Total Solid Waste Generation				66,669	33.33
Reduced Residential Program					
Residential	1,126,563 (1,193 DUs)	1,193	41 per household	48,913	24.46
Commercial Office	374,361	1,497	13 per employee	19,461	9.73
Commercial Retail	25,000	63	79 per employee	6,075	3.04
Fitness and Social Center	80,645	81	75 per employee	273	0.14
Community Facility	21,329	21	13 per employee	4,977	2.49
Reduced Residential Program Total Solid Waste Generation				79,699	39.85
Notes:	1. Worker population estimated using standard employment density ratios of 1 employee per 250 gsf office, 1 employee per 400 gsf retail, and 1 employee per 1,000 gsf of fitness center and community facility.				
Sources:	2020 CEQR Technical Manual, Table 14-1; AKRF, Inc.				

*

⁴ The design for an all-electric building would include an additional 50,000 sf of mechanical space within both the Maximum Residential Program and the Reduced Residential Program

A. INTRODUCTION

This chapter examines the potential effects of the Proposed Project on the study area transportation systems. Specifically, it compares the development program with the Proposed Project (the With Action condition) to the Approved Plan (the No Action condition) in the 2004 *WTC Memorial and Redevelopment Plan FGEIS* (“2004 FGEIS”) to identify any new potentially significant adverse transportation impacts. Although there have been previous amendments and refinements to the Approved Plan, as described in Chapter 1, “Project Description,” those actions did not vary the transportation impacts of the Approved Plan, and the analyses below therefore compare the potential transportation impacts of the Proposed Project to those identified in the 2004 FGEIS.

The travel demand projections and screening assessments presented in this attachment were conducted. The travel demand factors in the 2004 FGEIS for the office land use were updated to the most recent U.S. Census Bureau statistics, resulting in a more conservative assumption for autos in the AM and PM peak hours; the travel demand factors for the retail land uses were updated to the 2020 *City Environmental Quality Review (CEQR) Technical Manual* person rates, resulting in a more conservative assumption for daily person trips for all peak hours. In addition, to ensure a conservative transportation assessment, the Saturday peak hour was added since the Proposed Project includes some new land uses that generate trips at a higher rate during the Saturday peak hour than the weekday AM, midday, and PM peak hours that were analyzed in the 2004 FGEIS.

BACKGROUND

The development site is located in Manhattan on the block bounded by Albany Street to the south, the Vehicle Security Center and Liberty Park to the north, Washington Street to the west, and Greenwich Street to the east. As detailed in Chapter 1, “Project Description,” the 2004 FGEIS (the “Approved Plan”) approved office use with ground-floor retail for the approximately 57-story building at Tower 5 (Block 54, Lot 1). The Proposed Amendment would provide greater flexibility in the development of Tower 5 by allowing, in addition to the currently approved office and retail use, residential and community facility use. Absent the Proposed Project, it is anticipated that the Tower 5 site would be developed with a 1.3 million sf office tower with 50,000 sf retail use.

As discussed in Chapter 1, “Project Description,” the Maximum Residential building would have up to 1,270 dwelling units and less of other uses, while the Reduced Residential building would have up to 1,193 dwelling units and more of other uses. The Maximum Residential building would also have up to 180,000 gross square feet (gsf) of commercial office space, up to 36,000 gsf of fitness and social center space, up to 13,000 gsf community facility space and up to 12,000 gsf of retail space. The Reduced Residential building would have up to 374,361 gsf of office space, up to 80,645 gsf of fitness and social center space, up to 21,329 gsf for community facility uses, and up to 25,000 gsf of retail use. If the building under either program is all-electric, the residential area and the overall building would be allowed to be 50,000 gsf larger to accommodate additional mechanical equipment.

Table 12-1 provides a comparison of the development program between the No Action and With Action conditions.

Table 12-1
Future No Action and With Action Development Programs

Use	No Action Program	With Action Maximum Residential Program	With Action Reduced Residential Program	Difference: Maximum Residential Program	Difference: Reduced Residential Program
Residential (dwelling units)	0	1,270	1,193	1,270	1,193
Destination Retail (gsf)	25,000	0	25,000	-25,000	0
Local Retail (gsf)	25,000	12,000	0	-13,000	-25,000
Community Facility (gsf)	0	13,000	21,329	13,000	21,329
Commercial Office (gsf)	1,306,829	180,000	374,361	-1,126,829	-932,468
Health Club (gsf)	0	36,000	80,645	36,000	80,645

B. PRELIMINARY ANALYSIS METHODOLOGY AND SCREENING ASSESSMENT

A two-tier screening procedure for the preparation of a “preliminary analysis” to determine if quantified analyses of transportation conditions are warranted is performed. As discussed below, the preliminary analysis begins with a trip generation analysis (Level 1) to estimate the volume of person and vehicle trips attributable to the Proposed Project. If the Proposed Project is expected to result in fewer than 50 peak hour vehicle trips and fewer than 200 peak hour transit or pedestrian trips, further quantified analyses are not warranted. When these thresholds are exceeded, detailed trip assignments (Level 2) are performed to estimate the incremental trips at specific transportation elements and to identify potential locations for further analyses. If the trip assignments show that the Proposed Project would result in 50 or more peak hour vehicle trips at an intersection, 200 or more peak hour subway trips at a station, 50 or more peak hour bus trips in one direction along a bus route, or 200 or more peak hour pedestrian trips traversing a pedestrian element, then further quantified analyses may be warranted to assess the potential for significant adverse impacts on traffic, transit, pedestrians, parking, and vehicular and pedestrian safety.

LEVEL 1 SCREENING ASSESSMENT

A Level 1 trip generation screening assessment was conducted to estimate the number of person and vehicle trips by mode expected to be generated by the Proposed Project’s Maximum Residential Program and Reduced Residential Program during the weekday AM, midday, PM, and Saturday peak hours. As shown below, it was determined that the Reduced Residential Program would yield greater project generated person and vehicle trips than the Maximum Residential Program. Therefore, the analyses below conservatively assess the Reduced Residential Program.

The difference in trips expected to be generated by the No Action Program compared to the Reduced Residential Program represents the incremental difference between the 2004 FGEIS and the Proposed Project. These peak hour trip increments were then compared to the *CEQR Technical Manual* thresholds to determine if a Level 2 screening and/or quantified operational analyses would be warranted. As described in Chapter 1, “Project Description,” in 2013, NYPD, in collaboration with other New York City agencies, the Port Authority, and other WTC stakeholders, completed its own separate environmental impact statement (NYPD FEIS) under

SEQRA for NYPD's WTC Campus Security Plan. The changes in street use by general traffic due to security restrictions resulting from the WTC Campus Security Plan after completion of the 2004 FGEIS were considered in this Level 1 screening assessment. Overall, there would be little to no change in the arrival and departure patterns for pedestrians, but vehicular traffic would have fewer streets on which to travel since many street segments are currently for authorized vehicles only. However, since No Action vehicle trips would arrive and depart via the same streets as With Action vehicle trips, irrespective of whether the streets continued to be managed as currently in effect or were to revert to the unrestricted street network analyzed in the 2004 FGEIS, the comparison of peak hour trips is appropriate for Level 1 transportation screening, which does not focus on individual street segments or intersections but on the total number of new trips to be generated by a proposed action.

TRANSPORTATION PLANNING ASSUMPTIONS

Trip generation factors for the Proposed Project were developed based on information from the *CEQR Technical Manual*, the 2012 *Seward Park Mixed-Use Development Project FGEIS*, the 2013 *Hudson Square Rezoning FEIS*, and U.S. Census Data, as summarized in **Table 12-2**. The FGEIS and FEIS were used as sources because they are recent, proximate, large mixed-use projects with similar land uses to the Proposed Project, and have been used as sources for travel demand factors in subsequently completed EISs and EAs.

Residential

The daily person trip rate and temporal distribution for the residential component are based on travel demand surveys conducted by the New York City Department of Transportation (DOT). The directional distribution and taxi occupancy factors are from the 2012 *Seward Park Mixed-Use Development Project FGEIS*. Modal Splits and auto occupancy are based on Journey-to-Work (JTW) data from the 2015–2019 U.S. Census Bureau American Community Survey (ACS). The daily delivery trip rate and temporal and directional distributions are from the *CEQR Technical Manual*. Because the JTW data only include auto occupancy rates, the taxi occupancy rate was used from a comparable EIS, per typical City practice.

Local Retail

The weekday daily person trip rate and temporal distribution for the local neighborhood retail component are from the *CEQR Technical Manual*. In line with accepted City practice, a 25-percent linked trip credit was applied to the local retail trip generation estimates. The directional distribution, modal split and vehicle occupancies for local retail are not contained in the *CEQR Technical Manual*, so, per typical City practice, were obtained from a comparable EIS, the 2012 *Seward Park Mixed-Use Development Project FGEIS*. The daily delivery trip rate and temporal and directional distributions are from the *CEQR Technical Manual*.

Destination Retail

The weekday daily person trip rate and temporal distribution for the destination retail component are from the *CEQR Technical Manual*. The directional distribution, modal split and vehicle occupancies, daily delivery trip rate and temporal and directional distributions are from the 2012 *Seward Park Mixed-Use Development Project FGEIS*. As previously stated, this FGEIS was used as a source because it is a recent, large mixed-use project with similar land uses to the Proposed Project, and has been used as sources for travel demand factors in subsequently completed EISs and EAs.

**Table 12-2
Travel Demand Assumptions**

Use	Residential				Local Retail				Destination Retail								
Total Daily Person Trip	(1)				(4)				(4)								
	Weekday		Saturday		Weekday		Saturday		Weekday		Saturday						
	8.180		9.080		205.00		240.00		78.20		92.50						
	Trips / DU				Trips / KSF				Trips / KSF								
Trip Linkage	0%				25%				0%								
Net Daily Person Trip	Weekday Saturday				Weekday Saturday				Weekday Saturday								
	8.180		9.080		153.75		180.00		78.20		92.50						
	Trips / DU				Trips / KSF				Trips / KSF								
Temporal	AM	MD	PM	Saturday	AM	MD	PM	Saturday	AM	MD	PM	Saturday					
	(1)				(4)				(4)								
	9%	6%	8%	8%	3%	19%	10%	10%	3.0%	9.0%	9.0%	11.0%					
Direction	(2)				(2)				(2)								
	In	15%	50%	70%	50%	50%	50%	50%	50%	61%	55%	47%	52%				
	Out	85%	50%	30%	50%	50%	50%	50%	50%	39%	45%	53%	48%				
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					
Modal Split	(3)				(2)				(2)								
	AM	MD	PM	Saturday	AM	MD	PM	Saturday	AM	MD	PM	Saturday					
	Auto	5.0%	5.0%	5.0%	5.0%	2.0%	2.0%	2.0%	2.0%	9.0%	9.0%	9.0%	9.0%				
Taxi	2.0%	2.0%	2.0%	2.0%	3.0%	3.0%	3.0%	3.0%	4.0%	4.0%	4.0%	4.0%					
Subway	58.0%	58.0%	58.0%	58.0%	6.0%	6.0%	6.0%	6.0%	29.0%	20.0%	29.0%	20.0%					
PATH	2.0%	2.0%	2.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					
Bus	0.0%	0.0%	0.0%	0.0%	6.0%	6.0%	6.0%	6.0%	8.0%	8.0%	8.0%	8.0%					
Ferry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%					
Walk	33.0%	33.0%	33.0%	33.0%	83.0%	83.0%	83.0%	83.0%	50.0%	59.0%	50.0%	59.0%					
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					
Vehicle Occupancy	(2)(3)				(2)				(2)								
	Weekday		Saturday		Weekday		Saturday		Weekday		Saturday						
	Auto	1.14			1.65			2.00									
Taxi	1.40			1.40			2.00										
Daily Delivery Trip	(4)				(4)				(2)								
	Weekday		Saturday		Weekday		Saturday		Weekday		Saturday						
	0.06		0.02		0.35		0.04		0.35		0.04						
	Delivery Trips / DU				Delivery Trips / KSF				Delivery Trips / KSF								
Delivery Temporal	AM	MD	PM	Saturday	AM	MD	PM	Saturday	AM	MD	PM	Saturday					
	(4)				(4)				(2)								
	12%	9%	2%	9%	8%	11%	2%	11%	8.0%	11.0%	2.0%	11.0%					
Delivery Direction	(4)				(4)				(2)								
	In	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%					
	Out	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%					
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%					

**Table 12-2 (cont'd)
Travel Demand Assumptions**

Use	Community Facility - General				Office				Health Club			
Total Daily Person Trip	(2) Weekday 48.00 Trips / KSF		Saturday 19.00		(1) Weekday 18.00 Trips / KSF		Saturday 3.90		(4) Weekday 44.70 Trips / KSF		Saturday 26.10	
Trip Linkage	0%				0%				0%			
Net Daily Person Trip	Weekday 48.00 Trips / KSF		Saturday 19.00		Weekday 18.00 Trips / KSF		Saturday 3.90		Weekday 44.70 Trips / KSF		Saturday 26.10	
Temporal	AM	MD	PM	Saturday	AM	MD	PM	Saturday	AM	MD	PM	Saturday
	(2)				(1)				(4)			
	7%	10%	7%	14%	12.0%	11.0%	11.0%	13.0%	4%	9%	5%	9%
Direction	(2)				(2)				(6)			
	In	61%	55%	29%	49%	96%	48%	5%	57%	41%	54%	75%
Out	39%	45%	71%	51%	4%	52%	95%	43%	59%	46%	25%	46%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Modal Split	(2)				(2,6)				(6)			
	AM	MD	PM	Saturday	AM	MD	PM	Saturday	AM	MD	PM	Saturday
Auto	5.0%	5.0%	5.0%	5.0%	11.0%	2.0%	11.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Taxi	1.0%	1.0%	1.0%	1.0%	1.0%	3.0%	1.0%	3.0%	2.0%	2.0%	2.0%	2.0%
Subway	3.0%	3.0%	3.0%	3.0%	54.0%	6.0%	54.0%	6.0%	12.0%	12.0%	12.0%	12.0%
PATH	0.0%	0.0%	0.0%	0.0%	16.0%	0.0%	16.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bus	6.0%	6.0%	6.0%	6.0%	11.0%	6.0%	11.0%	6.0%	4.0%	4.0%	4.0%	4.0%
Ferry	0.0%	0.0%	0.0%	0.0%	2.0%	0.0%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Walk	85.0%	85.0%	85.0%	85.0%	5.0%	83.0%	5.0%	83.0%	80.0%	80.0%	80.0%	80.0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Vehicle Occupancy	(2) Weekday/Saturday				(2,5) Weekday/Saturday				(6) Weekday/Saturday			
	Auto	1.65			1.13				1.00			
Taxi	1.40			1.40				1.00				
Daily Delivery Trip	(2) Weekday 0.29 Delivery Trips / KSF		Saturday 0.04		(4) Weekday 0.32 Delivery Trips / KSF		Saturday 0.01		(6) Weekday 0.19 Delivery Trips / KSF		Saturday 0.01	
	AM	MD	PM	Saturday	AM	MD	PM	Saturday	AM	MD	PM	Saturday
Delivery Temporal	(2)				(4)				(6)			
	10.0%	11.0%	1.0%	0.0%	10.0%	11.0%	2.0%	11.0%	6.0%	11.0%	1.0%	7.6%
Delivery Direction	(2)				(4)				(6)			
	In	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Out	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Sources:												
(1) Based on NYCDOT mode choice surveys												
(2) 2012 Seward Park Mixed-Use Development Project FGEIS												
(3) U.S. Census Bureau, ACS 2015-2019 Five-Year Estimates - Journey-to-Work (JTW) Data for Census Tracts 7, 9, 13, 15.01, 15.02, 21, and 319.												
(4) 2020 CEQR Technical Manual												
(5) U.S. Census Bureau, ACS 2012-2016 Five-Year Estimates - Reverse Journey-to-Work (RJTW) Data for Census Tracts 7, 9, 13, 15.01, 15.02, 21, and 319.												
(6) 2013 Hudson Square Rezoning FEIS												

Community Facility - General

The daily person trip generation rate and temporal distributions for the general community facility component are from the 2012 *Seward Park Mixed-Use Development Project FGEIS*. The directional distributions, modal splits, vehicle occupancies, daily delivery trip rate, and delivery temporal and directional distributions are also from the 2012 *Seward Park Mixed-Use Development Project FGEIS*. This FGEIS was used as a source for the community facility because it is a recent, proximate, large mixed-use project that contained the necessary land use, and has been used as a source for travel demand factors in subsequently completed environmental impact statements and environmental assessments.

WTC Site 5

Office

The daily person trip generation rate and temporal distributions for the office component are based on travel demand surveys conducted by DOT. The directional distribution, weekday midday and Saturday modal splits and taxi occupancy factors are from the 2012 *Seward Park Mixed-Use Development Project FGEIS*. The weekday AM and PM Modal Splits and auto occupancy factors are based on Reverse-Journey-to-Work (RJTW) data from 2012–2016 U.S. Census Bureau ACS. The daily delivery trip rate and temporal and directional distributions are from the *CEQR Technical Manual*.

Health Club

The weekday daily person trip rate and temporal distribution for the health club component are from the *CEQR Technical Manual*. The directional distributions, modal splits, vehicle occupancies, delivery trip rate, and delivery temporal and directional distributions are from the 2013 *Hudson Square Rezoning FEIS*.

TRAVEL DEMAND PROJECTION SUMMARY

As summarized in **Table 12-3**, the No Action condition would generate 2,993, 3,495, 3,149, and 1,371 person trips and 364, 241, 329, and 84 vehicle trips during the weekday AM, midday, PM, and Saturday peak hours, respectively.

Table 12-3

Trip Generation Summary: No Action Condition

Peak Hour	In/Out	Person Trip							Vehicle Trip				
		Auto	Taxi	Subway	PATH	Bus	Ferry	Walk	Total	Auto	Taxi	Delivery	Total
AM	In	302	30	1,476	434	304	54	201	2,801	267	21	21	309
	Out	15	4	71	18	17	2	65	192	13	21	21	55
	Total	317	34	1,547	452	321	56	266	2,993	280	42	42	364
Midday	In	41	52	116	0	105	0	1,391	1,705	31	66	23	120
	Out	41	54	119	0	109	0	1,467	1,790	32	66	23	121
	Total	82	106	235	0	214	0	2,858	3,495	63	132	46	241
PM	In	25	10	106	21	33	3	207	405	18	29	4	51
	Out	282	35	1,366	393	289	49	330	2,744	245	29	4	278
	Total	307	45	1,472	414	322	52	537	3,149	263	58	8	329
Saturday	In	25	23	63	0	48	0	578	737	16	26	1	43
	Out	22	21	55	0	41	0	495	634	14	26	1	41
	Total	47	44	118	0	89	0	1,073	1,371	30	52	2	84

As summarized in **Table 12-4**, the With Action Maximum Residential Program condition would generate 1,492, 1,539, 1,497, and 1,348 person trips and 137, 102, 114, and 84 vehicle trips during the weekday AM, midday, PM, and Saturday peak hours, respectively.

As summarized in **Table 12-5**, the With Action Reduced Residential Program condition would generate 1,959, 1,932, 1,949, and 1,557 person trips and 187, 144, 172, and 106 vehicle trips during the weekday AM, midday, PM, and Saturday peak hours, respectively.

The net incremental trips generated between the No Action and With Action conditions are shown in **Table 12-6**.

**Table 12-4
Trip Generation Summary: With Action Condition – Maximum Residential Program**

Peak Hour	In/Out	Person Trip								Vehicle Trip				
		Auto		Subway	PATH	Bus	Ferry	Walk	Total	Auto		Taxi	Delivery	Total
AM	In	51	9	289	63	46	7	132	597	45	18	8	71	
	Out	45	18	477	18	7	0	330	895	40	18	8	66	
	Total	96	27	766	81	53	7	462	1,492	85	36	16	137	
Midday	In	27	18	212	6	26	0	482	771	22	23	6	51	
	Out	26	18	212	6	27	0	479	768	22	23	6	51	
	Total	53	36	424	12	53	0	961	1,539	44	46	12	102	
PM	In	35	16	360	15	11	0	329	766	30	17	2	49	
	Out	53	11	337	59	46	7	218	731	46	17	2	65	
	Total	88	27	697	74	57	7	547	1,497	76	34	4	114	
Saturday	In	28	15	283	9	12	0	336	683	24	17	1	42	
	Out	28	14	282	9	11	0	321	665	24	17	1	42	
	Total	56	29	565	18	23	0	657	1,348	48	34	2	84	

**Table 12-5
Trip Generation Summary: With Action Condition – Reduced Residential Program**

Peak Hour	In/Out	Person Trip								Vehicle Trip			
		Auto	Taxi	Subway	PATH	Bus	Ferry	Walk	Total	Auto	Taxi	Delivery	Total
AM	In	98	13	513	127	93	16	184	1,044	85	21	10	116
	Out	46	18	468	20	11	1	351	915	40	21	10	71
	Total	144	31	981	147	104	17	535	1,959	125	42	20	187
Midday	In	38	26	233	6	39	0	637	979	30	32	11	73
	Out	35	24	228	6	38	0	622	953	28	32	11	71
	Total	73	50	461	12	77	0	1,259	1,932	58	64	22	144
PM	In	42	17	378	17	17	1	349	821	36	23	2	61
	Out	101	18	550	118	89	14	238	1,128	86	23	2	111
	Total	143	35	928	135	106	15	587	1,949	122	46	4	172
Saturday	In	39	19	296	9	23	0	417	803	30	22	1	53
	Out	38	18	291	9	20	0	378	754	30	22	1	53
	Total	77	37	587	18	43	0	795	1,557	60	44	2	106

**Table 12-6
Trip Generation Summary: Net Incremental Trips – Reduced Residential Program**

Peak Hour	In/Out	Person Trip								Vehicle Trip			
		Auto	Taxi	Subway	PATH	Bus	Ferry	Walk	Total	Auto	Taxi	Delivery	Total
AM	In	-204	-17	-963	-307	-211	-38	-17	-1,757	-182	0	-11	-193
	Out	31	14	397	2	-6	-1	286	723	27	0	-11	16
	Total	-173	-3	-566	-305	-217	-39	269	-1,034	-155	0	-22	-177
Midday	In	-3	-26	117	6	-66	0	-754	-726	-1	-34	-12	-47
	Out	-6	-30	109	6	-71	0	-845	-837	-4	-34	-12	-50
	Total	-9	-56	226	12	-137	0	-1,599	-1,563	-5	-68	-24	-97
PM	In	17	7	272	-4	-16	-2	142	416	18	-6	-2	10
	Out	-181	-17	-816	-275	-200	-35	-92	-1,616	-159	-6	-2	-167
	Total	-164	-10	-544	-279	-216	-37	50	-1,200	-141	-12	-4	-157
Saturday	In	14	-4	233	9	-25	0	-161	66	14	-4	0	10
	Out	16	-3	236	9	-21	0	-117	120	16	-4	0	12
	Total	30	-7	469	18	-46	0	-278	186	30	-8	0	22

LEVEL 1 SCREENING

TRAFFIC

As shown in **Table 12-6**, the net incremental trips generated by the Proposed Project would be -177, -97, -157 and 22 vehicle trips during the weekday AM, midday, PM, and Saturday peak hours, respectively. Since these incremental vehicle trips do not exceed the analysis threshold of 50 peak hour vehicle trips, a detailed traffic analysis is not warranted and the Proposed Project is not expected to result in any new significant adverse traffic impacts.

TRANSIT

For transit operations, New York City Transit (NYCT) typically considers the weekday commuter (AM and PM) peak hours as the only time periods that would be subject to potential studies. As detailed in **Table 12-6**, the net incremental trips generated by the Proposed Project would be -566 and -544 person trips by subway during the weekday AM and PM peak hours, respectively. Since these incremental subway trips do not exceed the analysis threshold of 200 peak hour subway trips at any station during the weekday AM and PM peak hours, a detailed subway facilities analysis is not warranted, and the Proposed Project is not expected to result in any new significant adverse subway impacts.

The net incremental trips generated by the Proposed Project would be -305 and -279 person trips riding Port Authority Trans-Hudson (PATH) during the weekday AM and PM peak hours, respectively. Since these incremental PATH trips do not exceed the analysis threshold of 200 peak hour rail trips at any station during the weekday AM and PM peak hours, a detailed rail facilities analysis is not warranted, and the Proposed Project is not expected to result in any new significant adverse rail impacts.

The net incremental trips generated by the Proposed Project would be -217 and -216 person trips by bus during the weekday AM and PM peak hours, respectively. Since these incremental bus trips do not exceed the analysis threshold of 50 or more peak hour bus riders on a bus route in a single direction during the weekday commuter peak hours, a detailed bus line-haul analysis is not warranted, and the Proposed Project is not expected to result in any new significant adverse bus line-haul impacts.

PEDESTRIANS

As shown in **Table 12-6**, the net incremental person trips generated by the Proposed Project would be -1,034, -1,563, -1,200, and 186 pedestrian trips during the weekday AM, midday, PM, and Saturday peak hours, respectively. Since most of these incremental trips would be pedestrian trips made on City sidewalks, corner reservoirs, and crosswalks, and they do not exceed the analysis threshold of 200 peak hour pedestrian trips, a detailed pedestrian analysis is not warranted, and the Proposed Project is not expected to result in any new significant adverse pedestrian impacts.

Overall, the Proposed Amendment is not expected to result in any new significant adverse traffic, transit, or pedestrian impacts as compared to the Approved Plan. *

A. INTRODUCTION

The Proposed Amendment to the General Project Plan (GPP) for the WTC Memorial and Redevelopment would allow residential and community facility uses in the building on the Development Site in addition to the previously approved office and retail uses.

The Proposed Amendment would allow for the development of a primarily residential building of approximately 1,627,898 square feet (the Proposed Project), which is comparable in floor area to the primarily office building that was part of the Approved Plan.¹ The potential for air quality impacts associated with the Proposed Project is assessed in this chapter.

The maximum projected hourly incremental traffic volumes generated by the Proposed Project would not exceed the carbon monoxide (CO) screening threshold defined in the 2020 *City Environmental Quality Review (CEQR) Technical Manual* (170 peak hour vehicle trips at an intersection in the study area). The incremental traffic volumes would also not exceed the particulate matter (PM) emission screening threshold discussed in Chapter 17, Sections 210 and 311 of the *CEQR Technical Manual*. Therefore, no mobile source analysis was required.

Since the Proposed Project might utilize fossil-fuel-fired heating and water systems if it proves infeasible to use electricity for these purposes, a stationary source analysis was conducted to evaluate the potential impact from these sources on air quality. In addition to emissions from the Proposed Project's stationary sources, the potential for emissions from existing large or major sources to impact the Proposed Project was assessed.

B. 2004 FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT (FGEIS) FINDINGS

An FGEIS, prepared and approved in 2004, evaluated the construction of a WTC Memorial, as well as commercial, retail, museum and cultural facilities, new open space areas, and certain infrastructure improvements. The 2004 *FGEIS* assumed a 57-floor tower including commercial office use and ground-floor retail on the Development Site.

The air quality analyses included in the 2004 *FGEIS* concluded that the Approved Project would not have the potential to result in significant adverse air quality impacts due to mobile sources or stationary sources of emissions.

¹ The Proposed Amendment would permit an all-electric building with a floor area of 1,677,898 square feet; therefore, as a conservative worst-case scenario, the 1,627,898 square foot building was analyzed for Air Quality.

C. METHODOLOGY FOR PREDICTING POLLUTANT CONCENTRATIONS

Stationary source analyses were conducted using the methodology described in the *CEQR Technical Manual* to assess air quality impacts associated with emissions from the Proposed Project. For the purpose of a conservative analysis, the fuel source for the Proposed Project has been analyzed as natural gas². The primary pollutant of concern when burning natural gas is NO₂. An initial screening was prepared using basic project information and applying thresholds defined in the *CEQR Technical Manual*, and further screening was prepared using the U.S. Environmental Protection Agency's (EPA) AERSCREEN model to evaluate potential 1-hour average NO₂ and 24-hour and annual average concentrations of particulate matter less than 2.5 micrometers in diameter (PM_{2.5}), which are not assessed in the initial screening procedure.

Potential 1-hour average NO₂ concentrations were added to representative background concentrations in the area and compared with the National Ambient Air Quality Standards (NAAQS). Potential 24-hour and annual average incremental concentrations of PM_{2.5} were compared with the PM_{2.5} *de minimis* criteria defined in the *CEQR Technical Manual*, which are defined as follows:

- Predicted increase of more than half the difference between the background concentration and the 24-hour standard;
- Annual average PM_{2.5} concentration increments which are predicted to be greater than 0.1 µg/m³ at ground level on a neighborhood scale (i.e., the annual increase in concentration representing the average over an area of approximately 1 square kilometer, centered on the location where the maximum ground-level impact is predicted for stationary sources); or
- Annual average PM_{2.5} concentration increments which are predicted to be greater than 0.3 µg/m³ at a discrete location (elevated or ground level).

HEATING AND HOT WATER SYSTEMS

INITIAL SCREENING ANALYSIS

An initial screening was performed using the methodology described in Chapter 17, Section 322.1 of the *CEQR Technical Manual*. This analysis determines the threshold of development size below which the action would not have a significant adverse impact relative to annual average NO₂ NAAQS for developments using natural gas for heating and hot water systems. The screening is based on the distance from the development to the nearest building of similar or greater height. The screening procedure uses information regarding the type of fuel to be burned, the development type and maximum size, and the exhaust stack height to evaluate whether a significant impact is possible.

² While it is not possible for buildings to be carbon neutral until the power grid is also carbon neutral, it is expected that the Proposed Project will be required to be fully electric except for emergency power (pursuant to New York City Department of Buildings requirements) so that it will be carbon compliant and ready to receive clean power once it is provided (projected to occur in New York State on or before 2040).

The initial screening was performed assuming a potential natural gas-fired heating and hot water system, based on the Proposed Project being a 1,627,898-gross-square-foot (gsf) building, with the nearest receptor of similar or greater height at a distance of greater than 400 feet.

AERSCREEN ANALYSIS

Potential 1-hour average NO₂ and 24-hour and annual average PM_{2.5} impacts from the Proposed Project's heating and hot water system's emissions were evaluated using the latest version of EPA's AERSCREEN model (Version 21112). The AERSCREEN model predicts worst-case 1-hour average concentrations downwind from a point, area, or volume source; longer-period averages are estimated by multiplying the 1-hour results by persistence factors established by EPA or provided in the *CEQR Technical Manual*. AERSCREEN generates application-specific worst-case meteorology using representative minimum and maximum ambient air temperatures, and site-specific surface characteristics such as albedo, Bowen ratio, and surface roughness length.³ The AERSCREEN model was used to calculate worst-case ambient concentrations of NO₂ and PM_{2.5} from the Proposed Project downwind of the exhaust stack.

The model incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithm, which is designed to predict concentrations in the "cavity region" (i.e., the area around a structure which under certain conditions may affect an exhaust plume, causing a portion of the plume to become entrained in a recirculation region). AERSCREEN uses the Building Profile Input Program for PRIME (BPIP-PRM) to provide a detailed analysis of downwash influences on a direction-specific basis. AERSCREEN also incorporates AERMOD's complex terrain algorithms and utilizes the AERMAP terrain processor to account for the actual terrain in the vicinity of the source on a direction-specific basis.

The AERSCREEN model was run both with and without the influence of building downwash, using urban diffusion coefficients that were based on a review of land-use maps of the area. Other model options were selected based on EPA guidance.

Maximum 1-hour average NO₂ concentrations were estimated using an NO₂ to NO_x ratio of 0.8—the recommended default ambient ratio per EPA guidance.⁴

Emission Rates and Stack Parameters

The Proposed Project would potentially utilize natural gas-fired heating and hot water systems.

Annual emission rates for heating and hot water systems were calculated based on fuel consumption estimates, using energy intensity estimates based on type of development and size of the building (1,627,898 gsf) as recommended in the *CEQR Technical Manual*, and applying emission factors for natural gas-fired boilers.⁵ PM_{2.5} emissions include both the filterable and condensable components. The short-term emission rates (24-hour and shorter) were calculated by scaling the annual emissions to account for a 100-day heating season. The exhaust from the heating

³ Albedo is the fraction of the total incident solar radiation reflected by the ground surface. The Bowen ratio is the ratio of the sensible heat flux to the latent (evaporative) heat flux. The surface roughness length is related to the height of obstacles to the wind flow and represents the height at which the mean horizontal wind speed is zero based on a logarithmic profile.

⁴ EPA. *Memorandum: Clarification on the use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO₂ National Ambient Air Quality Standard*. September 30, 2014.

⁵ EPA. *Compilation of Air Pollutant Emission Factors AP-42*. 5th Ed., V. I, Ch. 1.4. September, 1998.

and hot water systems was assumed to be vented through a single stack located three feet above the main roof of the building (approximately 903 feet above grade).

To calculate exhaust velocity, the fuel consumption of the Proposed Project was multiplied by EPA’s fuel factor for natural gas,⁶ providing the exhaust flow rate at standard temperature; the flow rate was then corrected for the exhaust temperature, and exhaust velocity was calculated based on the stack diameter. Assumptions for stack diameter and exhaust temperature for the proposed systems were obtained from a survey of boiler exhaust data provided by New York City Department of Environmental Protection (DEP),⁷ and were used to calculate the exhaust velocity.

The emission rates and exhaust stack parameters used in the modeling analyses are presented in **Table 13-1**.

Table 13-1
Exhaust Stack Parameters and Emission Rates

Stack Parameter	Value
Stack Height (feet)	903
Stack Diameter (feet)	5 ⁽¹⁾
Exhaust Velocity (feet/second)	9.1 ⁽¹⁾
Exhaust Temperature (degrees Fahrenheit)	307.8 ⁽¹⁾
<i>Emission Rate (grams/second)</i>	
NO ₂ (1-hour average)	0.51
PM _{2.5} (24-hour average)	0.038
PM _{2.5} (Annual average)	0.011
Note: 1. Stack parameter assumptions were obtained from a survey of boiler exhaust data provided by DEP.	

Background Concentrations

To estimate the maximum expected pollutant concentration at a given location (receptor), the predicted impacts must be added to a background value that accounts for existing pollutant concentrations from other sources that are not directly accounted for in the model (see **Table 13-2**). For the 1-hour average NO₂ concentration at a given receptor, the modeled concentration from the source was added to corresponding background concentration of 111 µg/m³. This background level represents the three-year average (2017–2019) of the annual 98th percentile of the daily-highest one-hour average NO₂ concentrations (this is the statistical form of the standard) monitored at the nearest New York State Department of Environmental Conservation (DEC) background monitoring station—IS 52, Bronx. Note that the maximum modeled concentration would not necessarily coincide with the maximum background concentrations, and, therefore, this approach results in a conservatively high estimate of the total concentration with the Proposed Project.

⁶ EPA. *Standards of Performance for New Stationary Sources*. 40 CFR Chapter I Subchapter C Part 60. Appendix A-7, Table 19-2. 2013.

⁷ DEP. *Boiler Database*. August 11, 2017.

Table 13-2
Maximum Background Pollutant Concentrations

Pollutant	Average Period	Location	Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)
NO ₂	1-hour	IS 52, Bronx	111	188
PM _{2.5}	24-hour	Division Street, Manhattan	19.7	35

Source: New York State Air Quality Report Ambient Air Monitoring System, NYSDEC, 2017–2019.

PM_{2.5} impacts are assessed on an incremental basis and compared with the PM_{2.5} *de minimis* criteria. The PM_{2.5} 24-hour average background concentration based on the 98th percentile concentration, averaged over the years 2017–2019 was used to establish the *de minimis* value of 7.7 $\mu\text{g}/\text{m}^3$. PM_{2.5} annual average impacts are assessed on an incremental basis and compared to the PM_{2.5} *de minimis* criteria, without considering the annual background. Therefore, the annual PM_{2.5} background is not presented in the table.

Receptor Placement

Receptors (locations at which concentrations are projected) generally include operable windows in residential or other buildings, air intakes, and publicly accessible open space locations, as applicable. Receptors included the commercial WTC Towers 3 and 4 at air intake locations along the facades of these buildings. On WTC Tower 3, the air intakes were estimated at distances of approximately 500, 592, and 700 feet from the Proposed Project. On WTC Tower 4, air intakes were located at distances of approximately 232, 415, and 435 feet from the Proposed Project. Receptors were also included on one lower building, a proposed development at 22 Thames Street, at a distance of 300 feet from the Proposed Project. The worst-case ground level concentration was also evaluated.

ADDITIONAL SOURCES

The *CEQR Technical Manual* requires an analysis of projects that may result in a significant adverse impact due to certain types of new uses located near a “large” or “major” emissions source. Major sources are defined as those located at facilities that have a Title V or Prevention of Significant Deterioration air permit, while large sources are defined as those located at facilities that require a State Facility Permit. To assess the potential effects of these existing sources on the projected and potential development sites, a review of existing permitted facilities was conducted. Sources of information reviewed included the DEC Title V and State Facility Permit websites. The review of major- and large-sources permits⁸ found no such facilities within 1,000 feet of the project site. Therefore, no analysis is required, and no significant adverse impacts would occur on the project site from major or large stationary sources of emissions.

HEATING AND HOT WATER SYSTEMS

INITIAL SCREENING ANALYSIS

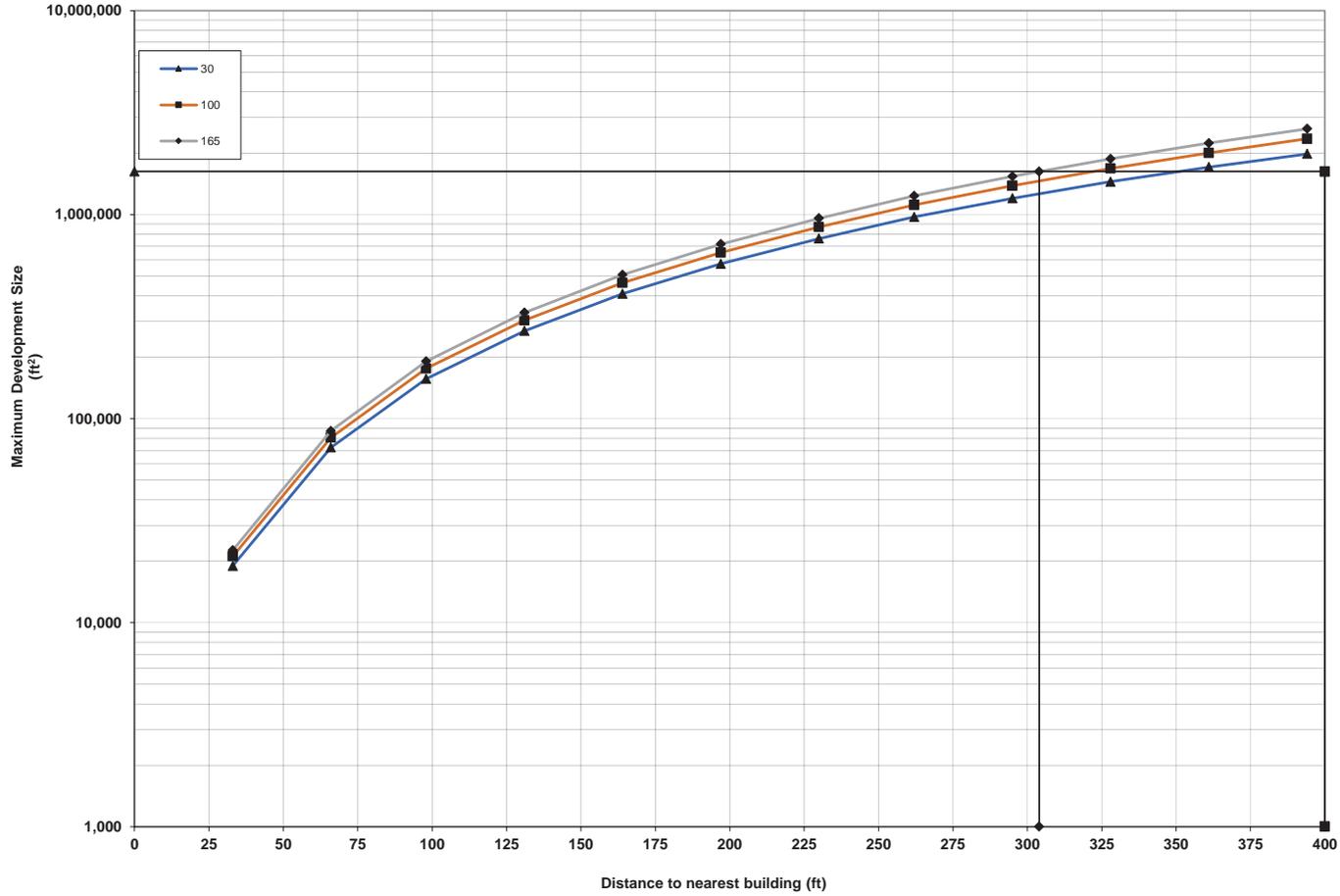
The results of the initial screening analysis are presented in **Figure 13-1**. The distance to the nearest receptor of a similar or greater height was estimated to be greater than 400 feet. Therefore,

⁸ NYSDEC. *Access to DEC Air Permits*. <https://www.dec.ny.gov/chemical/8569.html>. Accessed July 19, 2021.

FIG App 17-7
NO₂ BOILER SCREEN
RESIDENTIAL DEVELOPMENT - NATURAL GAS

HVAC Screening Analysis

Site: World Trade Center Site 5
Date: 8/16/2021
Pass



Stack Height: 903 ft
Distance to Nearest Building of Similar or Greater Height: 400 ft
Proposed Maximum SQFA: 1,627,898 sq. ft
Minimum Allowable Distance to Nearest Building: 304 ft

Notes:

this distance was used, as per the guidance in the *CEQR Technical Manual*. As indicated by the analysis, potential impacts would not occur at distances greater than 304 feet. Therefore, no significant impact is projected. Since annual average NO₂ is the critical pollutant in this analysis, impacts would also not be expected for emissions of non-critical pollutants, including PM₁₀ and CO.

AERSCREEN ANALYSIS

The results of the AERSCREEN analysis for 1-hour average NO₂ and PM_{2.5} are presented in **Table 13-3**. As shown in the table, there are no exceedances of the NO₂ 1-hour NAAQS. In addition, the maximum predicted incremental concentrations of PM_{2.5} are not predicted to exceed the CEQR *de minimis* criteria.

Table 13-3
Maximum Modeled Pollutant Concentrations (µg/m³)

Pollutant	Averaging Period	Maximum Modeled Impact	Background	Total Concentration	Criterion
NO ₂	1-hour	46.3 ⁽¹⁾	111	157	188 ⁽²⁾
PM _{2.5}	24-hour	2.64	N/A	2.64	7.7 ⁽³⁾
	Annual (Discrete)	0.12	N/A	0.12	0.3 ⁽⁴⁾
	Annual (Neighborhood)	0.043 ⁽⁶⁾	N/A	0.043	0.1 ⁽⁵⁾

Notes:
 N/A – Not Applicable
 1. 1-hour average NO₂ concentration is estimated using NO₂ to NO_x ratio of 0.8 as per EPA guidance.
 2. NAAQS.
 3. PM_{2.5} *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.
 4. PM_{2.5} *de minimis* criteria—annual (discrete receptor).
 5. PM_{2.5} *de minimis* criteria—annual (neighborhood receptor).
 6. Represents the maximum ground-level concentration, which was used to demonstrate that the annual neighborhood-scale concentration is less than the *de minimis* criteria.

Based on the two analyses presented, the Proposed Project’s heating and hot water system would not result in any significant adverse air quality impacts.

Overall, the Proposed Amendment would not result in any significant adverse air quality impacts.

*

A. INTRODUCTION

This chapter evaluates the greenhouse gas (GHG) emissions that would be generated by the construction and operation of the proposed mixed-use building on the Development Site and their consistency with the citywide GHG reduction goals (Section B). This chapter also evaluates the resilience of the proposed building to climate conditions throughout the lifetime of the project (Section C). Per the 2020 *City Environmental Quality Review (CEQR) Technical Manual*, evaluation of GHG emissions serves as a proxy for evaluating the Proposed Project's impact on climate change.

As discussed in the *CEQR Technical Manual*, and the most recent update to the to New York State Climate Risk Information (ClimAID),¹ climate change is projected to have wide-ranging effects on the environment, including rising sea levels, increases in temperature, and changes in precipitation levels. Although this is occurring on a global scale, the environmental effects of climate change are also likely to be experienced at the local level. New York City's sustainable development policy, starting with PlaNYC, and continued and enhanced in OneNYC, established sustainability initiatives and goals for greatly reducing GHG emissions and for adapting to climate change. Similarly, the New York State Climate Action Council is currently developing a comprehensive plan to identify policies and regulations to achieve reductions to statewide GHG emissions. New York State and local policies and regulations for the effort are further discussed in the "Policy, Regulations, Standards, and Benchmarks for Reducing GHG Emissions" section.

The citywide GHG reduction goal is currently the most appropriate standard by which to analyze a project under CEQR. CEQR guidance recommends that a GHG consistency assessment be undertaken for any project preparing an environmental impact statement expected to result in 350,000 square feet or more of development and other energy-intense projects. The Proposed Amendment would permit the construction of either the currently approved office and retail tower on the Development Site or an approximately 1,627,898-gross-square-foot (gsf) tower building (or 1,677,898 gsf for an all-electric building)² containing residential, commercial office, retail, and community facility use. Accordingly, a GHG consistency assessment is provided. As there is no final program for the proposed mixed-use building, both the Maximum Residential Program and the Reduced Residential Program are analyzed.

¹ *Climate Change in New York State Updating the 2011 ClimAID Climate Risk Information Supplement to NYSERDA Report 11-18 (Responding to Climate Change in New York State)*. NYSERDA, September 2014.

² The design for an all-electric building would include an additional 50,000 sf of mechanical space within both the Maximum Residential Program and the Reduced Residential Program

B. GREENHOUSE GAS EMISSIONS

POLLUTANTS OF CONCERN

GHGs are those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. The general warming of the Earth's atmosphere caused by this phenomenon is known as the "greenhouse effect." Water vapor, carbon dioxide (CO₂), nitrous oxide (N₂O), methane, and ozone are the primary GHGs in the Earth's atmosphere.

There are also a number of entirely anthropogenic GHGs in the atmosphere, such as halocarbons and other chlorine- and bromine-containing substances, which also damage the stratospheric ozone layer (and contribute to the "ozone hole"). Since these compounds are being replaced and phased out due to the 1987 Montreal Protocol, there is no need to address them in GHG assessments for most projects. Although ozone itself is also a major GHG, it does not need to be assessed as such at the project level since it is a rapidly reacting chemical and efforts are ongoing to reduce ozone concentrations as a criteria pollutant (see Chapter 13, "Air Quality"). Similarly, water vapor is of great importance to global climate change, but is not directly of concern as an emitted pollutant since the negligible quantities emitted from anthropogenic sources are inconsequential.

CO₂ is the primary pollutant of concern from anthropogenic sources. Although not the GHG with the strongest effect per molecule, CO₂ is by far the most abundant and, therefore, the most influential GHG. CO₂ is emitted from any combustion process (both natural and anthropogenic); from some industrial processes such as the manufacture of cement, mineral production, metal production, and the use of petroleum-based products; from volcanic eruptions; and from the decay of organic matter. CO₂ is removed ("sequestered") from the lower atmosphere by natural processes such as photosynthesis and uptake by the oceans. CO₂ is included in any analysis of GHG emissions.

Methane and N₂O also play an important role since the removal processes for these compounds are limited and because they have a relatively high impact on global climate change as compared with an equal quantity of CO₂. Emissions of these compounds, therefore, are included in GHG emissions analyses when the potential for substantial emission of these gases exists.

The *CEQR Technical Manual* lists six GHGs that could potentially be included in the scope of a GHG analysis: CO₂, N₂O, methane, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). This analysis focuses mostly on CO₂, N₂O, and methane. There are no significant direct or indirect sources of HFCs, PFCs, or SF₆ associated with the Proposed Project.

To present a complete inventory of all GHGs, component emissions are added together and presented as carbon dioxide equivalent (CO₂e) emissions—a unit representing the quantity of each GHG weighted by its effectiveness using CO₂ as a reference. This is achieved by multiplying the quantity of each GHG emitted by a factor called global warming potential (GWP). GWPs account for the lifetime and the radiative forcing³ of each chemical over a period of 100 years (e.g., CO₂ has a much shorter atmospheric lifetime than SF₆, and therefore has a much lower GWP). The GWPs for the main GHGs discussed here are presented in **Table 14-1**.

³ *Radiative forcing* is a measure of the influence a gas has in altering the balance of incoming and outgoing energy in the Earth-atmosphere system and is an index of the importance of the gas as a GHG.

Table 14-1
Global Warming Potential (GWP) for Major GHGs

Greenhouse Gas	100-year Horizon GWP
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	21
Nitrous Oxide (N ₂ O)	310
Hydrofluorocarbons (HFCs)	140 to 11,700
Perfluorocarbons (PFCs)	6,500 to 9,200
Sulfur Hexafluoride (SF ₆)	23,900

Note: The GWPs presented above are based on the Intergovernmental Panel on Climate Change's (IPCC) Second Assessment Report (SAR) to maintain consistency in GHG reporting. The IPCC has since published updated GWP values that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO₂. In some instances, if combined emission factors were used from updated modeling tools, some slightly different GWP may have been used for this study. Since the emissions of GHGs other than CO₂ represent a very minor component of the emissions, these differences are negligible.

Source: 2020 CEQR Technical Manual

POLICY, REGULATIONS, STANDARDS, AND BENCHMARKS FOR REDUCING GHG EMISSIONS

GHG EMISSIONS

Because of the growing consensus that human activity resulting in GHG emissions has the potential to profoundly impact the Earth's climate, countries around the world have undertaken efforts to reduce emissions by implementing both global and local measures addressing energy consumption and production, land use, and other sectors. Although the U.S. has not ratified the international agreements that set emissions targets for GHGs, in December 2015, the U.S. signed the international Paris agreement⁴ that pledged deep cuts in emissions, with a stated goal of reducing annual emissions to levels that would be between 26 and 28 percent lower than 2005 levels by 2025.⁵ On January 20, 2021, the President of the United States signed an executive order to bring the United States back into the Paris Agreement.

Regardless of the Paris Agreement, the U.S. Environmental Protection Agency (EPA) is required to regulate GHGs under the Clean Air Act and has begun preparing and implementing regulations. In coordination with the National Highway Traffic Safety Administration (NHTSA), EPA currently regulates GHG emissions from newly manufactured on-road vehicles. In addition, EPA regulates transportation fuels via the Renewable Fuel Standard program, which will phase in a requirement for the inclusion of renewable fuels increasing annually up to 36.0 billion gallons in 2022. In 2015, EPA also finalized rules to address GHG emissions from both new and existing power plants that would, for the first time, set national limits on the amount of carbon pollution that power plants can emit. The Clean Power Plan sets carbon pollution emission guidelines and performance standards for existing, new, and modified and reconstructed electric utility generating units. On February 9, 2016, the Supreme Court stayed implementation of the Clean Power Plan

⁴ Conference of the Parties, 21st Session. *Adoption of The Paris Agreement, decision -/CP.21*. Paris, December 12, 2015.

⁵ United States of America. *Intended Nationally Determined Contributions (INDCs)* as submitted. March 31, 2015.

pending judicial review. In October 2017, EPA proposed to repeal the Clean Power Plan and issued the Affordable Clean Energy rule June 19, 2019, replacing the Clean Power Plan. The Affordable Clean Energy rule establishes revised emissions reduction measures accepted as best technology and focusing on energy efficiency improvements in place of direct emissions reduction measures.

There are also regional and local efforts to reduce GHG emissions. In 2009, Governor Paterson issued Executive Order No. 24, establishing a goal of reducing GHG emissions in New York State by 80 percent, compared with 1990 levels, by 2050, and creating a Climate Action Council tasked with preparing a climate action plan outlining the policies required to attain the GHG reduction goal; an interim draft plan has been published.⁶ The State is now seeking to achieve some of the emission reduction goals via local and regional planning and projects through its Cleaner Greener Communities and Climate Smart Communities programs. The State has also adopted California's GHG vehicle standards (which are at least as strict as the federal standards).

The New York State Energy Plan outlines the State's energy goals and provides strategies and recommendations for meeting those goals. The latest version of the plan was published in June 2015. The new plan outlines a vision for transforming the state's energy sector that would result in increased energy efficiency (both demand and supply), increased carbon-free power production, and cleaner transportation, in addition to achieving other goals not related to GHG emissions. The 2015 plan also establishes new targets: (1) reducing GHG emissions in New York State by 40 percent, compared with 1990 levels, by 2030; (2) providing 50 percent of electricity generation in the state from renewable sources by 2030; and (3) increasing building energy efficiency gains by 600 trillion British thermal units (Btu) by 2030.

New York State has also developed regulations to cap and reduce CO₂ emissions from power plants to meet its commitment to the Regional Greenhouse Gas Initiative (RGGI). Under the RGGI agreement, the governors of nine northeastern and Mid-Atlantic states have committed to regulate the amount of CO₂ that power plants are allowed to emit, gradually reducing annual emissions to half the 2009 levels by 2020, and reducing an additional 30 percent from 2020 to 2030. The RGGI states and Pennsylvania have also announced plans to reduce GHG emissions from transportation, through the use of biofuel, alternative fuel, and efficient vehicles.

In 2019, New York State enacted the Climate Leadership and Community Protection Act (CLCPA) to achieve the GHG reductions goals established in the New York State Energy Plan as well as establishing a new long-term goal to reduce statewide GHG by 100 percent, compared with 1990 levels by 2050. The legislation charges New York State Climate Action Council with establishing statewide GHG emission limits and agency regulations to reduce emissions, increase investments in renewable energy sources, and ensure that significant portions of investments are made in disadvantaged communities. Pursuant to these requirements, the Climate Action Council will prepare and approve a scoping plan outlining recommendations for attaining the GHG emission limits and reduction goals. A final scoping plan is anticipated to be approved by 2022.

Many local governments worldwide, including New York City, are participating in the Cities for Climate Protection™ campaign and have committed to adopting policies and implementing quantifiable measures to reduce local GHG emissions, improve air quality, and enhance urban livability and sustainability. New York City's long-term comprehensive plan for a sustainable and

⁶ New York State Climate Action Council. *New York State Climate Action Plan Interim Report*. November 2010.

resilient New York City, which began as PlaNYC 2030 in 2007, and continues to evolve today as *OneNYC*, includes GHG emissions reduction goals, many specific initiatives that can result in emission reductions, and initiatives aimed at adapting to future climate change impacts. The goal to reduce citywide GHG emissions to 30 percent below 2005 levels by 2030 (“30 by 30”) was codified by Local Law 22 of 2008, known as the New York City Climate Protection Act (the “GHG reduction goal”).⁷ The City has also announced a longer-term goal of reducing emissions to 80 percent below 2005 levels by 2050 (“80 by 50”), which was codified by Local Law 66 of 2014, and has published a study evaluating the potential for achieving that goal. More recently, as part of *OneNYC*, the City has announced a more aggressive goal for reducing emissions from building energy down to 30 percent below 2005 levels by 2025 and achieving net-zero citywide GHG emissions by 2050.

In December 2009, the New York City Council enacted four laws addressing energy efficiency in large new and existing buildings, in accordance with PlaNYC. The laws require owners of existing buildings larger than 50,000 square feet to conduct energy efficiency audits and retro-commissioning every 10 years, to optimize building energy efficiency, and to “benchmark” the building energy and water consumption annually, using an EPA online tool. By 2025, commercial buildings over 50,000 square feet will also require lighting upgrades, including the installation of sensors and controls, more efficient light fixtures, and the installation of submeters, so that tenants can be provided with information on their electricity consumption. The legislation also creates a local NYCECC, which along with the Energy Conservation Construction Code of New York State (as updated in 2016), requires equipment installed during a renovation to meet current efficiency standards.

To achieve the GHG reduction goals, the City is convening Technical Working Groups to analyze the GHG reduction pathways from the building sector, power, transportation, and solid waste sectors to develop action plans for these sectors. The members of the Technical Working Groups will develop and recommend the data analysis, interim metrics and indicators, voluntary actions, and potential mandates to effectively achieve the City’s emissions reduction goal. In 2016, the City published the building sector Technical Working Group report, which included commitments by the City to change to building energy code and take other measures aimed at substantially reducing GHG emissions.

In 2019, the New York City Council enacted a legislative package targeting GHG emissions associated with building energy consumption—the Climate Mobilization Act. For most buildings that exceed 25,000 gsf (excluding electricity/steam generation facilities, rent-regulated accommodations, places of public worship, and City-owned properties), the City has established annual building emission limits beginning in 2024 and would require the owner of a covered building to submit annual reports demonstrating the building is in compliance with the current GHG emission limits. For buildings not covered under the GHG emissions limits, owners may either demonstrate compliance with the current limits or implement specified energy conservation measures where applicable.

For certain projects subject to CEQR (e.g., projects with 350,000 gsf or more of development or other energy intense projects), an analysis of the project’s contributions to GHG emissions is required to determine consistency with the City’s reduction goal, which is currently the most

⁷ Administrative Code of the City of New York, §24-803.

appropriate standard by which to analyze a project under CEQR, and it is therefore applied in this chapter.

A number of benchmarks for energy efficiency and green building design have also been developed. For example, the LEED system is a benchmark for the design, construction, and operation of high-performance green buildings that includes energy efficiency components. EPA's Energy Star is a voluntary labeling program designed to identify and promote the construction of new energy efficient buildings, facilities, and homes and the purchase of energy efficient appliances, heating and cooling systems, office equipment, lighting, home electronics, and building envelopes. The Developer is currently evaluating the specific energy efficiency measures and design elements which would be implemented and seeks to achieve Silver level certification under the LEED rating system.

METHODOLOGY

Climate change is driven by the collective contributions of diverse individual sources of emissions to global atmospheric GHG concentrations. Identifying potential GHG emissions from a proposed action can help decision makers identify practicable opportunities to reduce GHG emissions and ensure consistency with policies aimed at reducing overall emissions. While the increments of criteria pollutants and toxic air emissions are assessed in the context of health-based standards and local impacts, there are no established thresholds for assessing the significance of a project's contribution to climate change. Nonetheless, prudent planning dictates that all sectors address GHG emissions by identifying GHG sources and practicable means to reduce them. Therefore, this chapter presents the total GHG emissions potentially associated with the Proposed Project and identifies measures that would be implemented and measures that are still under consideration to limit emissions. (Note that this differs from most other technical areas in that it does not account for only the increment between the condition with and without the residential development at the Development Site. The reason for that different approach is that to truly account for the incremental emissions only would require speculation regarding where people would live in a No Action condition if residential units are not built at this location, what energy use and efficiency might be like for those alternatives and other related considerations, and similar assumptions regarding commercial and other uses. Furthermore, the previously planned office tower building with retail at its base for Tower 5 was previously assessed under the Approved Plan and GPP. Therefore, the focus is on the total emissions associated with the Proposed Project, and on the effect of measures to reduce those emissions.)

Estimates of potential GHG emissions associated with the Proposed Project are based on the methodology presented in the *CEQR Technical Manual*. Estimates of emissions of GHGs from the development have been quantified, including off-site emissions associated with use of electricity, on-site emissions from heat and hot water systems, and emissions from vehicle use associated with the proposed development. GHG emissions that would result from construction are discussed as well. As per the guidance, analysis of building energy is based on the average current carbon intensity of electricity in 2008, which will likely be lower in the 2028 build year and lower still in future years as the fraction of electricity generated from renewable sources continues to increase. Emissions from transportation conservatively apply the emission factors for the earlier 2028 year, although the potential uses would likely not be fully developed by then and emissions would be lower due to the lower traffic generated. Vehicular emission factors will also continue to decrease in future years as vehicle engine efficiency increases and emissions standards continue to decrease, resulting in lower emissions in future years. Since the methodology does not account for future years and other changes described above, it also does not explicitly address

potential changes in future consumption associated with climate change, such as increased electricity for cooling, or decreased on-site fuel for heating. Overall, this analysis results in conservatively high estimates of potential GHG emissions.

CO₂ is the primary pollutant of concern from anthropogenic emission sources and is accounted for in the analysis of emissions from all development projects. GHG emissions for gases other than CO₂ are included where practicable or in cases where they comprise a substantial portion of overall emissions. The various GHG emissions are added together and presented as metric tons of carbon dioxide equivalent (CO₂e) emissions per year (see “Pollutants of Concern,” above).

BUILDING OPERATIONAL EMISSIONS

Estimates of emissions due to building electricity and fuel use for Proposed Project were prepared using building carbon intensity by use type as detailed in the *CEQR Technical Manual*. Per *CEQR Technical Manual* guidance, the building carbon intensity data represents 2008 citywide averages by use type and not projections for the future build year (2028). Future emissions for the Proposed Project do not consider emission reduction measures that will be implemented and are expected to be lower as efficiency and renewable energy use for grid-supplied electric power continue to increase with the objective of meeting State and City future GHG reduction goals. Therefore, the emissions are conservatively estimated.

Furthermore, the Proposed Project would be required to meet the 2019 local law 97 carbon annual intensity limits (annual metric tons CO₂e per gsf) for buildings. The building carbon intensities by use type as detailed in the *CEQR Technical Manual* generally meet or fall below the immediate carbon intensity limits. However, future limits will be decreased over time in order to achieve the City’s GHG reduction goals, and *CEQR Technical Manual* carbon intensities exceed these limits beginning in 2030. Therefore, quantified emissions from building electricity and fuel use conservatively using building carbon intensity by use type as detailed in the *CEQR Technical Manual* result in conservatively high estimates of potential GHG emissions for the 2028 analysis year, and emissions would decline in future years beyond 2028.

The analysis does not assume any on-site cogeneration (electricity production combining the use of heat and power).

MOBILE SOURCE EMISSIONS

The number of annual weekday and Saturday vehicle trips by mode (cars, taxis, and trucks) that would be generated by the Proposed Project was calculated using the transportation planning assumptions developed for the analysis and presented in Chapter 12, “Transportation.” The assumptions used in the calculation include average daily weekday and Saturday person trips and delivery trips by proposed use, the percentage of vehicle trips by mode, and the average vehicle occupancy. To calculate annual totals, the number of trips on Sundays was assumed to be the same as on Saturday. Travel distances shown in Table 18-6 and 18-7 and associated text of the *CEQR Technical Manual* were used in the calculations of annual vehicle miles traveled by cars, taxis, and trucks. Table 18-8 of the *CEQR Technical Manual* was used to determine the percentage of vehicle miles traveled by road type and the mobile GHG emissions calculator provided with the manual was used to estimate GHG emissions from all trips attributable to the Proposed Project.

Based on the latest fuel lifecycle model from Argonne National Laboratory,⁸ emissions from producing and delivering fuel (“well-to-pump”) are estimated to add an additional 25 percent to the GHG emissions from gasoline and 27 percent from diesel. Although upstream emissions (emissions associated with production, processing, and transportation) of all fuels can be substantial and are important to consider when comparing the emissions associated with the consumption of different fuels, fuel alternatives are not being considered for the proposed development, and as per the *CEQR Technical Manual* guidance, the well-to-pump emissions are not considered in the analysis. The assessment of tailpipe emissions only is in accordance with the *CEQR Technical Manual* guidance on assessing GHG emissions and the methodology used in developing the New York City GHG inventory, which is the basis of the GHG reduction goal.

The projected total annual vehicle miles traveled by roadway type, forming the basis for the GHG emissions calculations from mobile sources, are summarized in **Table 14-2**.

Table 14-2
Vehicle Miles Traveled per Year

Development Program	Roadway Type	Passenger	Taxi	Truck
Reduced Residential Program	Local	382,897	90,871	507,302
	Arterial	835,411	198,264	1,106,841
	Interstate/Expressway	522,132	123,915	691,776
	Total	1,740,439	413,050	2,305,921
Maximum Residential Program	Local	274,989	62,735	347,504
	Arterial	599,975	136,876	758,192
	Interstate/Expressway	374,985	85,547	473,870
	Total	1,249,949	285,158	1,579,566

CONSTRUCTION EMISSIONS

A description of construction activities is provided in Chapter 20, “Construction.” Construction emissions include emissions from on-road trips, on-site non-road engines, and materials extraction, production, and transport.

The number of vehicle trips by mode (worker cars, delivery trucks) that would be generated by the Proposed Project’s construction was calculated using the assumptions developed for the analysis and presented in Chapter 20, “Construction.” The assumptions used in the calculation include average daily workers, the percentage of auto trips, and the average vehicle occupancy to develop annual vehicle miles traveled (VMT) associated with commuting workers. An average round-trip commute distance for construction workers in the New York City Region of 25.28 miles (based on the average trip to work distance for the New York Metropolitan Area area)⁹ was used. Similarly, the numbers of trucks (concrete trucks, dump trucks, and tractor trailers) for each phase of construction activity were used to estimate truck VMT. Distances for truck deliveries were developed based on estimates of the origin and destination of materials for the Proposed Project. Table 18-8 of the *CEQR Technical Manual* was used to determine the percentage of vehicle miles traveled by road type and the most recent version of the EPA MOVES model was used to obtain

⁸ Based on GREET1_2016 model from Argonne National Laboratory.

⁹ NYSDOT. 2009 *NHTS, New York State Add-On*. Key Tables. Table 3: Average Travel Day Person-Trip Length by Mode and Purpose, trip-to work distance for SOV in NYMTC 10-county area. 2011.

an estimate of car and truck GHG emission factors used to produce the associated emissions attributable to the Proposed Project.

The Proposed Project would result in construction worker travel of 411 thousand VMT. Additionally, the Proposed Project would result in construction truck trips totaling 912 thousand VMT. These data were used as the basis for the GHG emissions calculations from mobile sources, applying emission factors as described above for operational mobile source emissions.

On-site emissions were calculated for non-road construction engines based on specific estimates of construction activity and fuel consumption data from the NONROAD emissions module within model EPA's MOVES model. A detailed schedule for the use of non-road construction engines was developed, as described in Chapter 20, "Construction." The detailed data, including the number, type, power rating, and hours of operation for all construction engines was coupled with fuel consumption rate data from EPA's MOVES model to estimate total fuel consumption throughout the duration of the construction activities. Non-road construction engines are estimated to require approximately 513 thousand gallons of diesel equivalent throughout the duration of construction. The quantity of fuel was then multiplied by an emission factor of 10.30 kilograms CO₂e per gallon of diesel fuel.¹⁰

Upstream emissions related to the production of construction materials were estimated based on the expected quantity of iron or steel and cement. Although other materials will be used, cement and metals have the largest embodied energy and direct GHG emissions associated with their production, and substantial quantities would be used for the Proposed Project.

The construction is estimated to require 169,493 metric tons of cement. An emission factor of 0.928 metric tons of CO₂e per metric ton of cement produced was applied to estimate emissions associated with energy consumption and process emissions for cement production.¹¹ The precise origin of cement for this project is unknown at this time.

Construction is estimated to require 15,432 metric tons of steel. An emission factor of 0.6 metric tons of CO₂e per metric ton of steel product produced was applied to estimate emissions associated with production energy consumption,¹² and 0.65 metric tons of CO₂e per metric ton of steel product produced for process emissions associated with iron and steel production were applied.¹³

EMISSIONS FROM SOLID WASTE MANAGEMENT

The Proposed Project would not fundamentally change the City's solid waste management system. Therefore, as per the *CEQR Technical Manual*, the GHG emissions from solid waste generation, transportation, treatment, and disposal are not quantified.

¹⁰ EPA. Emission Factors for Greenhouse Gas Inventories. 26 March 2020.

¹¹ The Portland Cement Association. Life Cycle Inventory of Portland Cement Manufacture. 2006.

¹² Arpad Horvath et al. Pavement Life-cycle Assessment Tool for Environmental and Economic Effects, Consortium on Green Design and Manufacturing. UC Berkeley. 2007.

¹³ Based on 42.3 teragrams of CO₂e emitted and approximately 65,460,000 tons produced; Source: EPA. *Inventory of U.S. Climate Change and Sinks: 1990–2009*. April 15, 2011.

PROJECTED GHG EMISSIONS

BUILDING OPERATIONAL EMISSIONS

The building floor area, emission intensity, and resulting GHG emissions from each of the uses are presented in detail in **Table 14-3**. The analysis presents the total emissions after construction. In general, the increment with more floor area result in greater annual GHG emissions.

**Table 14-3
Annual Building Operational Emissions**

Development Program	Source Use	Building Area (gsf)	GHG Intensity ¹ (kg CO ₂ e / gsf / year)	Annual GHG Emissions (metric tons CO ₂ e)
Reduced Residential Program	Residential ⁽¹⁾ ⁽²⁾	1,126,563 ⁽³⁾	6.59	7,424
	Office	374,361	9.43	3,530
	Health Club	80,645	9.43	760
	Community Facility	21,329	9.43	201
	Retail	25,000	9.43	236
TOTAL:				12,152
Maximum Residential Program	Residential ⁽¹⁾ ⁽²⁾	1,386,898 ⁽⁴⁾	6.59	9,140
	Office	180,000	9.43	1,697
	Health Club	36,000	9.43	339
	Community Facility	13,000	9.43	123
	Retail	12,000	9.43	113
TOTAL:				11,412

Notes: Totals may not sum due to rounding.
 Per 2020 *CEQR Technical Manual* guidance, electricity emissions are representative of existing conditions in 2008 and not the analysis year (2028). Future emissions are expected to be lower.
 Representative emission intensity for existing buildings are higher than new and future construction, and do not include the expected energy efficiency measures.
 * These figures represent gross square footages of the uses indicated to ensure conservative analyses.
⁽¹⁾ Residential building area includes 100,000 gsf of lobby, mechanical and back of house space.
⁽²⁾ An additional 50,000 gsf of mechanical space would be included for an all-electric building design. However, the assessment conservatively assumed the use of natural gas fired HVAC equipment and the analyzed residential building area does not include this additional floor area.
⁽³⁾ 1,176,563 gsf for an all-electric building.
⁽⁴⁾ 1,436,898 gsf for an all-electric building.
Source: ¹ *CEQR Technical Manual*

MOBILE SOURCE EMISSIONS

The mobile-source-related GHG emissions from the Proposed Project are presented in detail in **Table 14-4**.

In addition to the direct emissions included in the analysis, an additional approximately 25 percent would be emitted upstream, associated with fuel extraction, production, and delivery.

CONSTRUCTION EMISSIONS

The estimated GHG emissions from construction of the Proposed Project are presented in **Table 14-5**. Total construction emissions, 184 thousand metric tons CO₂e, would be equivalent to approximately 15.7 years of operational emissions. Emissions for the Proposed Project are approximately proportional to the size of their respective development areas.

**Table 14-4
Annual Mobile Source Emissions
(metric tons CO₂e, 2028)**

Development Program	Use	Passenger Vehicle	Taxi	Truck	Total
Reduced Residential Program	Residential	382	72	1,678	2,132
	Local Retail	39	40	189	268
	Community Facility-Gym	5	3	43	51
	Community Facility-General	8	1	68	76
	Office	469	57	2510	3,036
	Health Club	38	26	324	387
	Total	940	200	4,811	5,951
Maximum Residential Program	Residential	406	77	1,786	2,270
	Local Retail	8	19	91	129
	Community Facility-Gym	3	2	26	31
	Community Facility-General	5	1	41	46
	Office	226	27	1,207	1,460
	Health Club	17	12	145	173
	Total	675	138	3,296	4,109

**Table 14-5
Total Construction GHG Emissions
(metric tons CO₂e)**

Use	2023	2024	2025	2026	2027	Total
Nonroad	1,193	1,733	1,762	651	46	5,386
Transportation Materials ¹	242	662	751	278	32	1,965
Total						176,512
Total						183,863

Notes:
 Totals may not sum due to rounding.
¹ Emissions associated with construction materials are not reported annually, as emissions are associated with the production of materials and may not occur within the same year.

SUMMARY

A summary of GHG emissions by source type is presented in **Table 14-6**. Emissions associated with mobile sources represent approximately one third of the total emissions, and building energy emissions represent approximately two thirds of the total. Note that if new buildings were to be constructed elsewhere to accommodate the same number of units and space for other uses, the emissions from the use of electricity, energy for heating and hot water, and vehicle use could equal or exceed those estimated for the Proposed Project, depending on their location, access to transit, building type, and energy efficiency measures. The Proposed Project is not expected to fundamentally change the City’s solid waste management system, and therefore, emissions associated with solid waste are not presented.

Table 14-6
Summary of Annual GHG Emissions, 2028
(metric tons CO₂e)

Development Program	Use	Building Operations	Mobile	Total
Reduced Residential Program	Residential	7,424	2,132	9,556
	Office	3,530	3,036	6,567
	Health Club	760	387	1,148
	Community Facility	201	127	329
	Retail	236	268	504
	Total	12,152	5,951	18,103
Maximum Residential Program	Residential	9,140	2,270	11,409
	Office	1,697	1,460	3,157
	Health Club	339	173	512
	Community Facility	123	78	200
	Retail	113	129	242
	Total	11,412	4,109	15,521

Note: Totals may not sum due to rounding.

The operational emissions from building energy use include on-site emissions from energy consumption as well as emissions associated with the production and delivery of the electricity to be used on-site. The Applicant is currently evaluating the specific energy efficiency measures and design elements that would be implemented (see the following section) for the proposed building and seeks to achieve a Gold certification under the LEED rating system for the proposed residential tower on the Development Site. To qualify for LEED, the building would be required to exceed the energy requirements of ASHRAE 90.1-2016 so as to reduce energy expenditure by at least two to four percent as compared with a baseline building designed to meet the minimum building code requirements. Furthermore, the *WTC Sustainable Design Guidelines* applicable to commercial tenant build-out would likely result in savings for this portion of the Proposed Project since much of commercial energy use and efficiency is tied to tenant uses, which are speculative to quantify at this time and could not be included in this estimate.

In addition, total GHG emissions associated with the construction, including direct emissions and upstream emissions associated with construction materials (excluding fuel), would be approximately 184 thousand metric tons.

ELEMENTS THAT WOULD REDUCE GHG EMISSIONS

The Proposed Project would include a number of sustainable design features which would, among other benefits, result in lower GHG emissions for the proposed building on the Development Site. As a prerequisite for LEED certification, the Proposed Project would use less energy than it would if built only to meet the building code. In general, dense, mixed-use development with access to transit and existing roadways is consistent with sustainable land use planning and smart growth strategies to reduce the carbon footprint of new development. These features and other measures currently under consideration are discussed in this section, addressing the PlaNYC/*OneNYC* goals as outlined in the *CEQR Technical Manual*. Following the approach defined in the *CEQR Technical Manual*, the Proposed Actions would result in development that is consistent with the City’s emissions reduction goal as implemented to-date.

BUILD EFFICIENT BUILDINGS

The energy systems for the Proposed Project would utilize high-efficiency HVAC systems, with many components designed to reduce energy consumption. The proposed building is also currently considering potential designs to utilize all-electric equipment with the intention to become a carbon-free building in the future with the expectation that the carbon intensity associated with grid electricity would decrease as New York State and New York City target 100 percent renewable electricity by 2040.

In order to reduce the contribution to the urban heat-island effect, high-albedo roofs are being considered for the proposed building on the site. Motion sensors for lighting in the building would be incorporated in all areas controlled by the core and shell components of the design (e.g., back of house, stairwells, amenity spaces) resulting in efficient energy consumption.

The Developer would implement additional lighting controls within the design of the proposed building on the site. Efficient lighting in all areas within the building will be controlled by the core and shell components of the design, and daylight harvesting in areas where practicable, would be installed to reduce electricity consumption. Exterior lighting would be energy efficient and directed. Tenants would be provided with submeters for electricity allowing them to track and optimize their electricity use. Third-party fundamental and enhanced building energy systems commissioning would be undertaken upon completion of construction to ensure energy performance. Consistent with the measures identified within the *WTC Sustainable Design Guidelines* included in the FGEIS, the Applicant would also provide sustainable design guidelines to commercial tenants for build-out of these spaces within the residential tower on the Development Site.

Water conserving fixtures, meeting New York City's stringent building code requirements, would be installed. Water-efficient landscaping would be selected to reduce water consumption, indirectly reducing energy consumption associated with potable water production and delivery. Storage and collection of recyclables would be incorporated in building design. Electricity would be sub-metered. Storage and collection of recyclables would be designed explicitly.

The estimated GHG emissions associated with the building energy use were conservatively estimated for the Proposed Project using the 2008 citywide average emission intensities. The emissions would fall below the immediate carbon intensity limits established in Local Law 97 of 2019, and with the implementation of the above measures, the Proposed Project would be in line with the City's energy efficiency measures, renewable energy, and carbon emission reduction goals, and emissions would likely fall below the future 2030 carbon intensity limits. GHG emissions associated with the electricity consumption at both buildings would continue to decrease in future years as the carbon intensity associated with grid electricity is expected to decrease as New York State and New York City target 100 percent renewable electricity by 2040.

Therefore, the Proposed Project would support the goal identified in the *CEQR Technical Manual* of building efficient buildings.

USE CLEAN POWER

While the use of clean power would not be specifically required, all-electric equipment for the proposed building's heat and hot water systems is considered in the current design, with all heating loads for the building expected to be met by the heat recovery refrigeration plant, air-cooled heat pumps, and domestic water heat pumps. If fossil-fuel equipment is used, the Proposed Project would use natural gas, a lower carbon fuel, for the normal operation of the heat and hot water systems.

Therefore, the Proposed Project would support the goal identified in the *CEQR Technical Manual* of using clean power.

TRANSIT-ORIENTED DEVELOPMENT AND SUSTAINABLE TRANSPORTATION

The Proposed Project is located within walking distance from the Rector Street, Wall Street, WTC Cortlandt, and Cortlandt Street subway stations and is supported by bus routes including the M9 and M55. In addition, the Proposed Project is located near dedicated bike lanes within the Hudson River Greenway, and two Citi Bike stations are located within several blocks.

REDUCE CONSTRUCTION OPERATION EMISSIONS

Construction specifications would include an extensive diesel emissions reduction program, as described in detail in Chapter 20, “Construction,” including diesel particle filters for large construction engines and other measures. These measures would reduce particulate matter emissions; while particulate matter is not included in the list of standard GHGs (“Kyoto gases”), recent studies have shown that black carbon—a constituent of particulate matter—may play an important role in climate change.

USE BUILDING MATERIALS WITH LOW CARBON INTENSITY

Recycled steel may be used for most structural steel since the steel available in the region is mostly recycled. Some cement replacements such as fly ash and/or slag may also be used, and concrete content would be optimized to the extent feasible.

The use of local, rapidly renewable, or certified sustainable wood, and recycled build- materials would be considered. Construction waste would be diverted from landfills to the extent practicable by separating out materials for reuse and recycling.

C. RESILIENCE TO CLIMATE CHANGE

The Waterfront Revitalization Program (WRP)¹⁴ addresses climate change and sea-level rise. The WRP requires consideration of climate change and sea-level rise in planning and design of development within the defined Coastal Zone Boundary. The Proposed Project is within that zone. As set forth in more detail in the *CEQR Technical Manual*, the provisions of the WRP are also applied by the New York City Department of City Planning (DCP) and other city agencies when conducting environmental review. The Proposed Project’s consistency with WRP policies is described in Chapter 2, “Land Use, Zoning, and Public Policy” and Chapter 16, “Coastal Zone Consistency.”

Since the Proposed Project is within projected future 1-percent annual probability (“100-year”) flood areas identified by New York City,¹⁵ the potential effects of global climate change on the Proposed Project have been considered and measures that would be implemented as part of the Proposed Project to improve resilience to climate change have been identified.

¹⁴ City of New York Department of City Planning. *The New York City Waterfront Revitalization Program*. October 30, 2013. Approved by NY State Department of State, February 3, 2016.

¹⁵ NYC. *NYC Flood Hazard Mapper*. Accessed 7/8/2021.

DEVELOPMENT OF POLICY TO IMPROVE CLIMATE CHANGE RESILIENCE

The New York State Sea Level Rise Task Force was created to assess potential impacts on the state's coastlines from rising seas and increased storm surge. The Task Force prepared a report of its findings and recommendations including protective and adaptive measures.¹⁶ The recommendations are to provide more protective standards for coastal development, wetlands protection, shoreline armoring, and post-storm recovery; to implement adaptive measures for habitats; integrate climate change adaptation strategies into state environmental plans; and amend local and state regulations or statutes to respond to climate change. The Task Force also recommended the formal adoption of projections of sea-level rise.

The New York State Climate Action Plan Interim Report identified a number of policy options and actions that could increase the climate change resilience of natural systems, the built environment, and key economic sectors—focusing on agriculture, vulnerable coastal zones, ecosystems, water resources, energy infrastructure, public health, telecommunications and information infrastructure, and transportation.¹⁷ New York State's Community Risk and Resiliency Act (CRRRA)¹⁸ requires that applicants for certain State programs demonstrate that they have taken into account future physical climate risks from storm surges, sea-level rise and flooding, and required the New York State Department of Environmental Conservation (DEC) to establish official State sea-level rise projections. In February 2017, DEC adopted a rule (6 NYCRR Part 490) defining the existing projections for use. These projections provide the basis for State adaptation decisions and are available for use by all decision makers. CRRRA applies to specific State permitting, funding and regulatory decisions, including smart growth assessments; funding for wastewater treatment plants; siting of hazardous waste facilities; design and construction of petroleum and chemical bulk storage facilities; oil and gas drilling; and State acquisition of open space. CRRRA requires DEC to publish implementation guidance by 2017.

In New York City, the Climate Change Adaptation Task Force is tasked with fostering collaboration and cooperation between public and private organizations working to build the resilience of the city's critical infrastructure against rising seas, higher temperatures, and changing precipitation patterns. The Task Force is composed of over 57 New York City and State agencies, public authorities, and companies that operate, regulate, or maintain critical infrastructure in New York City. Led by the Mayor's office of Resilience and Recovery, the Task Force works together to assess risks, prioritize strategies, and examine how standards and regulations may need to be adjusted in response to a changing climate.

To assist the Task Force, the New York City Panel on Climate Change (NPCC) has prepared a set of climate change projections for the New York City region¹⁹ which was subsequently updated,^{20,21} and

¹⁶ New York State Sea Level Rise Task Force. *Report to the Legislature*. December 2010.

¹⁷ NYSERDA. *New York State Climate Action Plan Interim Report*. November, 2010.

¹⁸ *Community Risk and Resiliency Act*. Chapter 355, NY Laws of 2014. April 9, 2013. Signed September 22, 2014.

¹⁹ New York City Panel on Climate Change. *Climate Change Adaptation in New York City: Building a Risk Management Response*. Annals of the New York Academy of Sciences, May 2010.

²⁰ New York City Panel on Climate Change. *Climate Risk Information 2013: Observations, Climate Change Projections, and Maps*. June 2013.

²¹ New York City Panel on Climate Change. *New York City Panel on Climate Change 2015 Report*. Ann. N.Y. Acad. Sci. 1336. 2015.

has suggested approaches to create an effective adaptation program for critical infrastructure. The NPCC includes leading climatologists, sea-level rise specialists, adaptation experts, and engineers, as well as representatives from the insurance and legal sectors. The climate change projections include a summary of baseline and projected climate conditions throughout the 21st century including heat waves and cold events, intense precipitation and droughts, sea-level rise, and coastal storm levels and frequency. NPCC projected that sea levels are likely to increase by up to 30 inches by the 2050s and up to 75 inches by the end of the century (more detailed ranges and timescales are available). In general, the probability of increased sea levels is characterized as “extremely likely,” but there is uncertainty regarding the probability the various levels projected and timescale. Intense hurricanes are characterized as “more likely than not” to increase in intensity and/or frequency, and the likelihood of changes in other large storms (“nor’easters”) are characterized as unknown. Therefore, the projections for future 1-in-100 coastal storm surge levels for New York City include only sea-level rise at this time, and do not account for changes in storm frequency.

The New York City Green Code Task Force also has recommended strategies for addressing climate change resilience in buildings and for improving storm water management.²² Some of the recommendations call for further study, while others could serve as the basis for revisions to building code requirements. Notably, one recommendation was to require new developments within the projected future 100-year floodplain (the area that would potentially be flooded in a severe coastal storm with a probability of 1-in-100 of occurring in any given year) to meet the same standards as buildings in the current 100-year flood hazard zone.

While strategies and guidelines for addressing the effects of climate change are being developed at different levels of government, there are currently no specific requirements for resilience or accepted recommendations for development projects in New York City. However, the revisions to the WRP and accompanying guidance²³ require consideration of climate change and sea-level rise in planning and design of waterfront development. As set forth in more detail in the City’s *CEQR Technical Manual*, the provisions of the WRP are applied by city agencies when conducting environmental review, and are described in Chapter 2, “Land Use, Zoning, and Public Policy.”

Climate change considerations and measures that would be implemented to increase climate resilience are discussed below. Additional climate change considerations may be incorporated into state and/or local laws prior to the development of the Proposed Project, and any development would be constructed to meet the codes in effect at the time of construction.

RESILIENCE OF THE PROPOSED PROJECT TO CLIMATE CHANGE

According to current flood hazard projections,²⁴ the one-percent annual chance coastal storm surge could reach elevations of approximately 11 feet NAVD88 at the Development Site. Therefore, the Base Flood Elevation (“BFE”) established by FEMA is 11 feet and the official Design Flood Elevation (“DFE”) per the New York City building code adds one foot of freeboard to the BFE. The Proposed Project would be constructed with a DFE of 13 feet NAVD88—this adds two feet

²² New York City Green Codes Task Force. *Recommendations to New York City Building Code*. February 2010.

²³ NYC Planning. *The New York City Waterfront Revitalization Program: Climate Change Adaptation Guidance*. March 2017.

²⁴ FEMA. *Preliminary Flood Insurance Rate Map*. Panel 3604970184G. Release Date: 12/05/2013.

of freeboard as required by Local Law 43 of 2021, effective April 18, 2022. While the ground floor of the building would be constructed at DFE, the first floor mezzanine would be constructed at an elevation of 23 feet NAVD88. Points of entry for utilities would be located below the DFE within the cellar. However, no mechanical equipment would be located lower than DFE.

Resilience considerations are accounted for throughout the lifetime of the use being evaluated. Residential buildings have a projected lifetime of 80 years or more, and therefore the furthest available projections (end of century) are considered here. According to the above cited NPCC data, by the 2050s, the one percent annual chance flood levels could reach 30 inches higher (relative to 2000-2004) due to sea-level rise (per NPCC “High” scenario), to approximately 13.5 feet NAVD88 at the Development Site. By the end of the century, the one percent annual chance flood levels could reach 75 inches higher (per NPCC “High” scenario), to approximately 17 feet NAVD88 at the Development Site.

Note that these flood areas and elevations are likely conservatively high and may be revised in the near future. On October 17, 2016, the Federal Emergency Management Agency (FEMA) and New York City Mayor de Blasio announced plans to revise the FEMA flood maps based on a 2015 New York City appeal of FEMA’s flood risk calculations for New York City and the region. While revised flood maps have not yet been produced, the appeal generally identified potential reductions of 1.5 to 2.0 feet in the area of the Proposed Project. Therefore, it is possible that the revised FEMA current flood elevations would be lower, and the resulting future flood elevations, including sea-level rise, may also be lower than those presented here.

In the surrounding areas near the Proposed Project, New York City is currently in the process of planning and approving the Lower Manhattan Coastal Resiliency (LMCR) Project, a flood-proofing and park-building measure that extends from Montgomery Street, one block north of the Project Area, around Lower Manhattan to the north of Battery Park City. The City received funding through the U.S. Department of Housing and Urban Development’s (HUD) National Disaster Resilience Competition (NDRC) to initiate LMCR and is in the early design phase. In addition, construction is currently underway for the City’s East Side Coastal Resiliency (ESCR) project, a similar effort starting at Montgomery Street northward to East 25th Street. Through these projects the City is proposing to install a flood protection system within City parkland and streets. The flood protection system would include a combination of floodwalls, closure structures, and deployable systems with other infrastructure improvements to reduce flooding, and is being designed to accommodate the one-percent chance flood elevation with 30 inches of sea-level rise—equivalent to the NPCC 2050s “High” scenario.²⁵

The new construction for the Proposed Project would be designed to provide resilience to the potential conditions for the ground floor projected through the 2050s, and to the first floor mezzanine through 2100. Examples of ground floor flood damage reduction measures include insulated flood vents providing wet floodproofing at residential exit stairs (and loading dock doors if the dock is conditioned space); loading dock doors with open lattice to provide wet floodproofing if the dock is unconditioned space; flood-resistant storefront glazing and removable flood barriers to provide dry floodproofing at the community facility entrance. The cellar will be dry floodproofed.

If the flood elevation increases in the future, the Proposed Project could be retrofitted with additional flood protection features (e.g., internal flood barriers, temporary stairs, etc.) as necessary in the future in accordance with applicable code and regulations. Specific measures would be determined at a later date. *

²⁵ ESCR: Project Area One—Conceptual Design Update. Press Release, December 1 and 7, 2016.

A. INTRODUCTION

This chapter assesses the potential for the Proposed Project to result in significant adverse noise impacts. The analysis determines whether the Proposed Project would result in increases in noise levels that could have a significant adverse impact on nearby sensitive receptors and also considers the effect of existing noise levels on the proposed developments that could result from the Proposed Project.

The noise analysis for the Proposed Project examined the following: (1) whether there are any locations where there is the potential for the Proposed Project to result in significant noise impacts, and (2) what level of building attenuation would be necessary to provide acceptable interior noise levels at newly introduced noise-sensitive uses under guidelines contained in the 2020 *City Environmental Quality Review (CEQR) Technical Manual* and the U.S. Department of Housing and Urban Development (HUD) *Noise Guidebook*. As discussed in Chapter 12, “Transportation,” the Proposed Project would not result in sufficient additional vehicular traffic to require a detailed traffic analysis. Therefore, the Proposed Project would not have the potential to result in a significant increase in noise levels as a result of mobile sources (i.e., it would not result in a doubling of Noise Passenger Car Equivalents). However, noise exposure at the project site must still be evaluated to determine the necessary level of window/wall attenuation for the noise-sensitive uses (i.e., residences) that would be introduced by the Proposed Project.

The analysis below considers potential noise effects of the Proposed Project when it would be operational. The potential noise effects of construction of the Proposed Project are described in Chapter 20, “Construction.”

B. 2004 FINAL GENERIC ENVIRONMENTAL IMPACT STATEMENT (FGEIS) FINDINGS

A Final Generic Environmental Impact Statement (FGEIS) and a Record of Decision (ROD) were prepared and approved in 2004, the *World Trade Center Memorial and Redevelopment Plan FGEIS*, which evaluated the construction of a World Trade Center (WTC) Memorial, as well as commercial, retail, museum and cultural facilities, new open space areas, and certain infrastructure improvements at the WTC Site, including the adjacent Project Site and the construction of a 57-story tower including ground-floor retail and commercial office use on the Development Site.

The noise analyses included in the 2004 *FGEIS* concluded that the Approved Plan would not have the potential to result in significant increases in noise levels from mobile or stationary noise sources. The 2004 *FGEIS* did not consider noise exposure at the Development Site, because the then-proposed commercial office and retail uses at that site were not considered to be newly introduced noise receptors.

C. METHODOLOGY

ACOUSTICAL FUNDAMENTALS

Sound is a fluctuation in air pressure. Sound pressure levels are measured in units called “decibels” (“dB”). The particular character of the sound that we hear (a whistle compared with a French horn, for example) is determined by the speed, or “frequency,” at which the air pressure fluctuates, or “oscillates.” Frequency defines the oscillation of sound pressure in terms of cycles per second. One cycle per second is known as 1 Hertz (“Hz”). People can hear over a relatively limited range of sound frequencies, generally between 20 Hz and 20,000 Hz, and the human ear does not perceive all frequencies equally well. High frequencies (e.g., a whistle) are more easily discernible and therefore more intrusive than many of the lower frequencies (e.g., the lower notes on the French horn).

“A”-WEIGHTED SOUND LEVEL (DBA)

In order to establish a uniform noise measurement that simulates people’s perception of loudness and annoyance, the decibel measurement is weighted to account for those frequencies most audible to the human ear. This is known as the A-weighted sound level, or “dBA,” and it is the descriptor of noise levels most often used for community noise. As shown in **Table 15-1**, the threshold of human hearing is defined as 0 dBA; very quiet conditions (as in a library, for example) are approximately 40 dBA; levels between 50 dBA and 70 dBA define the range of noise levels generated by normal daily activity; levels above 70 dBA would be considered noisy, and then loud, intrusive, and deafening as the scale approaches 130 dBA.

Table 15-1
Noise Levels of Common Sources

Sound Source	SPL (dBA)
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area	60–70
Typical Suburban Area	50–60
Quiet Suburban Area at Night	40–50
Typical Rural Area at Night	30-40
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0
Source: 2020 <i>CEQR Technical Manual</i>	

In considering these values, it is important to note that the dBA scale is logarithmic, meaning that each increase of 10 dBA describes a doubling of perceived loudness. Thus, the background noise in an office, at 50 dBA, is perceived as twice as loud as a library at 40 dBA. For most people to perceive an increase in noise, the increase must be at least 3 dBA. At 5 dBA, the change will be clearly noticeable.

NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

Because the sound pressure level unit of dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise over extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period as if it had been a steady, unchanging sound. For this condition, a descriptor called the “equivalent sound level,” L_{eq} , can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted as $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors, such as L_1 , L_{10} , L_{50} , L_{90} , and L_x , are used to indicate noise levels that are exceeded 1, 10, 50, 90 and x percent of the time, respectively. L_{eq} is used in the prediction of future noise levels by adding the contributions from new sources of noise (i.e., increases in traffic volumes) to the existing levels.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is not simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} will approximate L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90} or the background level by 10 or more decibels. Thus the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50} .

For purposes of assessing the Proposed Project, the maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in the noise impact evaluation. $L_{eq(1)}$ is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic and construction noise impact evaluation, and is used to provide an indication of highest expected sound levels. The 1-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines for city environmental impact review classification and the metric used to determine the building attenuation required to comply with the acceptable interior noise level criteria. Lastly, The HUD *Noise Guidebook* sets exterior noise standards for housing construction projects based on Day-Night Sound Level (i.e., L_{dn}) values. The L_{dn} refers to a 24-hour average noise level with a 10 dB penalty applied to the noise levels during the hours between 10:00 PM and 7:00 AM, due to increased sensitivity to noise levels during these hours.

NOISE STANDARDS AND CRITERIA

NEW YORK CEQR TECHNICAL MANUAL NOISE STANDARDS

The *CEQR Technical Manual* sets external noise exposure standards; these standards are shown in **Table 15-2**. Noise exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable.

The *CEQR Technical Manual* defines attenuation requirements for buildings based on exterior noise level (see **Table 15-3**). Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower for residential or community facility uses, and are determined based on exterior $L_{10(1)}$ noise levels.

Table 15-2
Noise Exposure Guidelines For Use in City Environmental Impact Review

Receptor Type	Time Period	Acceptable General External Exposure	Airport ³ Exposure	Marginally Acceptable General External Exposure	Airport ³ Exposure	Marginally Unacceptable General External Exposure	Airport ³ Exposure	Clearly Unacceptable General External Exposure	Airport ³ Exposure
Outdoor area requiring serenity and quiet ²		$L_{10} \leq 55$ dBA	----- L _{dn} ≤ 60 dBA -----	NA	NA	NA	NA	NA	NA
Hospital, nursing home		$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 65$ dBA	----- 60 < L _{dn} ≤ 65 dBA -----	$65 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA	----- L _{dn} ≤ 75 dBA -----	
Residence, residential hotel, or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		$65 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA		
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA		
School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, outpatient public health facility		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)			
Commercial or office		Same as Residential Day (7 hAM-10 PM)	Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)	Same as Residential Day (7 AM-10 PM)				
Industrial, public areas only ⁴	Note 4	Note 4		Note 4		Note 4		Note 4	

Notes:
(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more; (ii) *CEQR Technical Manual* noise criteria for train noise are similar to the above aircraft noise standards: the noise category for train noise is found by taking the L_{dn} value for such train noise to be an L_{dn} (L_{dn} contour) value.

Table Notes:

- Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.
- Tracts of land where serenity and quiet are extraordinarily important and serve as important public need, and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheatres, particular parks or portions of parks, or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and nursing homes.
- One may use FAA-approved L_{dn} contours supplied by the Port Authority of New York and New Jersey (PANYNJ), or the noise contours may be computed from the federally approved Aviation Environmental Design Tool (AEDT) Computer Model using light data supplied by the PANYNJ.
- External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are listed by octave band).

Source: New York City Department of Environmental Protection (adopted policy 1983).

Table 15-3
Required Attenuation Values to Achieve Acceptable Interior Noise Levels

Noise Level With Proposed Project	Marginally Unacceptable				Clearly Unacceptable
	$70 < L_{10} \leq 73$	$73 < L_{10} \leq 76$	$76 < L_{10} \leq 78$	$78 < L_{10} \leq 80$	$80 < L_{10}$
Attenuation ^A	(I) 28 dB(A)	(II) 31 dB(A)	(III) 33 dB(A)	(IV) 35 dB(A)	$36 + (L_{10} - 80)^B$ dB(A)

Notes:
^A The above composite window-wall attenuation values are for residential dwellings and community facility development. Commercial office spaces and meeting rooms would be 5 dB(A) less in each category. All of the above categories require a closed window situation and hence an alternate means of ventilation.
^B Required attenuation values increase by 1 dB(A) increments for L₁₀ values greater than 80 dBA.

Source: New York City Department of Environmental Protection.

HUD DEVELOPMENT GUIDELINES

Pursuant to 24 CFR Part 51, Subpart B, the HUD *Noise Guidebook* sets exterior noise standards for housing construction projects based on Day-Night Sound Level (i.e., L_{dn}) values (see **Table 15-4**). The L_{dn} refers to a 24-hour average noise level with a 10 dB penalty applied to the noise levels during the hours between 10:00 PM and 7:00 AM, due to increased sensitivity to noise levels during these hours. If the exterior noise level is $65 L_{dn}$ to $70 L_{dn}$, 25 dBA of noise attenuation must be provided; if the exterior noise level is $70 L_{dn}$ to $75 L_{dn}$, 30 dBA of noise attenuation is required; and if the exterior noise level exceeds $75 L_{dn}$, sufficient attenuation must be provided to bring interior levels down to $45 L_{dn}$ or lower for residential uses.

**Table 15-4
HUD Exterior Noise Standards**

	Acceptable	Normally Unacceptable	Unacceptable
Noise Level With Proposed Project	$L_{dn} \leq 65$	$65 < L_{dn} \leq 75$	$75 < L_{dn}$

Source: HUD *Noise Guidebook* (March 2009)

For this analysis, L_{dn} noise levels were estimated using the following equation:

$$Ldn = 10 \log \left(3 \times 10^{\frac{Leq_{peakhour}-2}{10}} + 12 \times 10^{\frac{Leq_{midday}-2}{10}} + 9 \times 10^{\frac{Leq_{latenight}+8}{10}} \right) - 13.8$$

The method used to determine L_{dn} noise levels utilizes 1-hour measurements collected during the AM, midday (between the morning and afternoon roadway-traffic peak hours), and late-night (between midnight and 5:00 AM) time periods to calculate the existing L_{dn} , which is consistent with federal guidance on estimating L_{dn} from hourly noise data.¹

D. EXISTING NOISE LEVELS

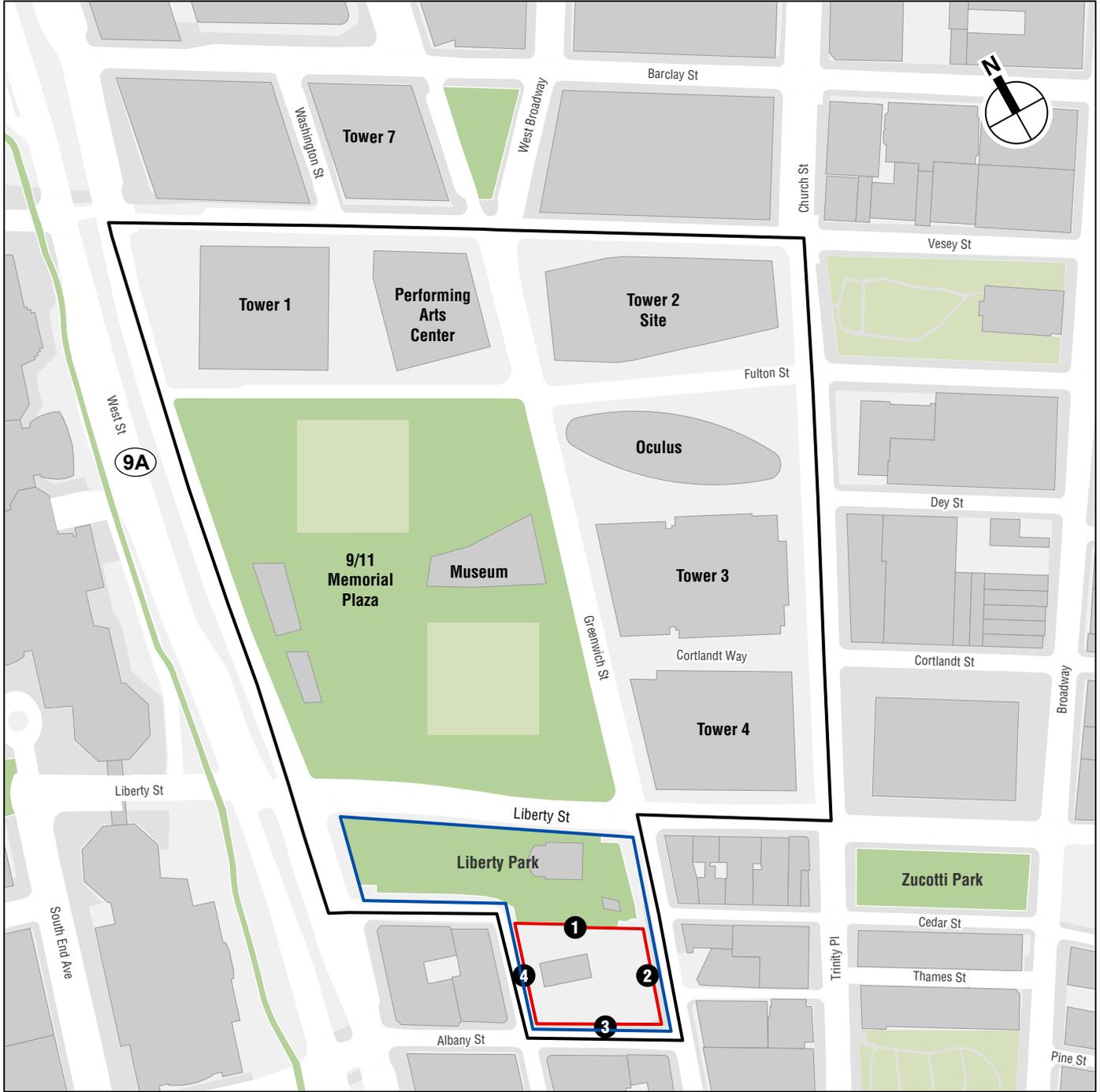
SELECTION OF NOISE RECEPTOR LOCATIONS

A total of four receptor locations adjacent to the Development Site 5 were selected to represent noise conditions at the project site. These locations are detailed below in **Table 15-5** and shown in **Figure 15-1**.

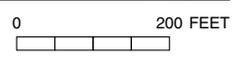
**Table 15-5
Noise Receptor Locations**

Noise Receptor	Location
1	Liberty Park Platform Landing
2	Greenwich Street Between Cedar and Albany Streets
3	Albany Street Between Cedar and Greenwich Streets
4	Cedar Street near intersection with Albany Street

¹ Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, September 2018



- WTC Site
- Project Site
- Development Site (Site 5)
- 1 Noise Measurement Location



Noise Measurement Locations
Figure 15-1

NOISE MONITORING

NOISE SURVEY PROCEDURES

At each receptor location, existing noise levels were determined by field measurement. Noise level measurements were conducted by AKRF, Inc. on June 17, 2021. At all receptor sites, 20-minute duration noise measurements were conducted during typical weekday AM (7:15 AM–9:15 AM), midday (12:00 PM–2:00 PM), PM (4:00 PM–6:00 PM), and late night, LN, (midnight – 5:00 AM) peak periods. The weekday noise measurements were conducted between Tuesday and Thursday on weeks when New York City public schools were in session, as recommended by the *CEQR Technical Manual*.

EQUIPMENT USED DURING NOISE MONITORING

Measurements were performed using Class 1 Sound Level Meter (SLM) instruments according to ANSI Standard S1.4-1983 (R2006). The SLMs have a laboratory calibration date within one year of the date of the measurements. The SLM was calibrated before and after readings with either a Brüel & Kjær Type 4231 or NTi Class 1 Sound Level Calibrator using the appropriate adaptor. The data were digitally recorded by the SLMs and displayed at the end of the measurement period in units of dBA. Measured quantities included the L_{eq} , L_1 , L_{10} , L_{50} , and L_{90} . Windscreens were used during all sound measurements except for calibration. All measurement procedures were based on the guidelines outlined in ANSI Standard S1.13-2005. All noise measurement locations were located approximately five feet above grade, with the exception of receptor 1 which was located on the raised platform at Liberty Park, approximately 25 feet above grade. Traffic on adjacent roadways was counted concurrently with the noise measurements.

NOISE SURVEY RESULTS

The results of the measurements of existing noise levels are summarized in **Table 15-6**. Roadway traffic was the dominant noise source for all receptor locations, with contributions from nearby heating, ventilation, and air conditioning (HVAC) equipment operating near receptor 1. In terms of *CEQR Technical Manual* criteria, noise levels measured at receptor locations 2, 3, and 4 are categorized as “marginally acceptable,” and noise levels at receptor location 1 are categorized as “marginally unacceptable.” In terms of HUD criteria, noise levels at all receptors are categorized as “normally unacceptable.”

**Table 15-6
Existing Noise Levels (in dBA)**

Receptor	Measurement Location	Time	L _{eq}	L ₁	L ₁₀	L ₅₀	L ₉₀	L _{dn}
1	Liberty Park Platform Landing	AM	67.8	76.0	69.4	65.8	65.2	68.7
		MD	68.1	70.9	70.4	66.4	64.6	
		PM	65.3	68.6	66.0	65.0	64.6	
		LN	63.2	67.9	63.9	62.6	62.1	
2	Greenwich Street Between Cedar and Albany Streets	AM	67.4	77.2	68.5	64.4	63.1	70.9
		MD	63.9	69.8	65.7	63.0	61.8	
		PM	66.4	72.3	68.3	65.5	63.6	
		LN	66.7	71.1	68.2	66.1	64.5	
3	Albany Street Between Cedar and Greenwich Streets	AM	65.1	74.6	65.8	62.1	60.5	67.1
		MD	63.5	71.5	65.1	62.2	60.4	
		PM	61.7	66.9	63.7	60.9	59.3	
		LN	62.4	71.0	64.8	60.0	58.1	
4	Cedar Street near intersection with Albany Street	AM	63.0	70.9	65.4	61.4	58.9	66.0
		MD	62.7	67.8	64.0	62.1	60.2	
		PM	62.5	69.9	63.8	61.6	59.7	
		LN	61.4	67.7	63.2	60.5	58.4	

Note: Field measurements were performed by AKRF, Inc. on June 17, 2021.

E. THE FUTURE WITHOUT THE PROPOSED AMENDMENT

Future noise levels due to mobile sources were evaluated in the 2004 *FGEIS* at receptors near the Project Site, specifically 2004 *FGEIS* site 7 located at the intersection of Cedar and Washington Streets, 2004 *FGEIS* site 9 located midblock on Albany Street between Cedar and Greenwich Streets (at current location 3), and 2004 *FGEIS* site 10 located at the intersection of Cedar and Greenwich Streets, near current location 2. At these locations, noise levels with the Approved Plan were determined to be no greater than those without the Approved Plan.

In the future without the Proposed Amendment, no substantial increase in noise from transportation sources (i.e., vehicular traffic) at the analyzed receptor sites is expected. Noise levels in the future with the Approved Plan would be comparable to existing noise levels, or only slightly increased due to natural growth in vehicular traffic. Since the 2004 ROD anticipated no increase in noise levels at the relevant receptors compared to pre-9/11 conditions, existing conditions, which now include the mostly-complete Approved Plan as well as nearby development since 2004, provide a conservative baseline against which to measure any contributions from the Proposed Project.

F. THE FUTURE WITH THE PROPOSED AMENDMENT

The potential for the Proposed Project to affect noise levels was considered at noise receptors in the vicinity of the Development Site, including receptors considered in the 2004 *FGEIS* as well as those that have been newly introduced since 2004. Since the predicted 2004 *FGEIS* With-Action noise levels were predicted to not exceed the 2004 *FGEIS* No-Action noise levels, and the amount of vehicular trips associated with the Proposed Project would be low enough not to require a detailed traffic analysis, the Proposed Project would not have the potential to result in a doubling of noise passenger car equivalents [Noise PCEs], which is necessary to cause a perceptible increase in noise levels. Consequently, no project increments have been added to the measured 2021 existing noise levels. Additionally, since the Proposed Project would not result in a doubling of Noise PCEs, it would not result in any new significant adverse noise impacts associated with mobile sources.

In terms of CEQR noise exposure guidelines, noise levels with the Proposed Project at receptor locations 2, 3, and 4 would remain categorized as “marginally acceptable,” and noise levels at receptor location 1 would remain categorized as “marginally unacceptable.” In terms of HUD criteria, noise levels at all receptors would remain categorized as “normally unacceptable.”

G. NOISE ATTENUATION MEASURES

As described above and shown in **Table 15-3**, the HUD *Noise Guidebook* and the *CEQR Technical Manual* set noise attenuation values for buildings that constitute newly introduced noise-sensitive receptors. These requirements are based on exterior L_{dn} and L₁₀₍₁₎ noise levels in order to determine the attenuation necessary to achieve interior noise levels of 45 dBA or lower for residential and community facility uses.

Table 15-7 shows the minimum window/wall attenuation necessary to meet *CEQR Technical Manual* and HUD requirements for internal noise levels at the Proposed Project.

Table 15-7
CEQR Required Attenuation at Noise Measurement Locations (in dBA)

Facade	Governing Noise Receptor(s)	Highest L ₁₀₍₁₎ Value	L _{dn} Value	Minimum CEQR Required Attenuation ^{1,2}	Minimum HUD Required Attenuation ³
North	1	70.4	68.7	28	24
East	2	68.5	70.9	N/A	26
South	3	65.8	67.1	N/A	22
West	4	65.4	66.0	N/A	21

Notes:

¹ The composite window-wall attenuation values are for residential and community facility uses. Commercial office spaces and meeting rooms require 5 dBA less attenuation. Storage, corridor, stairwells, lobbies, and other spaces with non-noise-sensitive uses would not require any specific level of attenuation.

² "N/A" indicates that the highest calculated L₁₀ is below 70 dBA. The *CEQR Technical Manual* does not specify minimum attenuation guidance for exterior L₁₀ values below this level.

³ HUD attenuation values are only applicable for residential uses.

The window/wall attenuation requirements outlined in **Table 15-7**, as well as the requirement to provide an alternate means of ventilation, would be included in project documents with the Project Sponsors. Alternate means of ventilation includes, but is not limited to, air conditioning. Up to 28 dBA window/wall attenuation would be required to achieve acceptable interior noise levels per the HUD and *CEQR Technical Manual* noise exposure guidelines at these uses. To implement the attenuation requirements, the Developer has committed, as part of its Project Description, to incorporate the required 28 dBA window/wall attenuation in the Proposed Project and to include the same in the proposed lease for the Development Site.

The attenuation of a composite structure is a function of the attenuation provided by each of its component parts and how much of the area is made up of each part. Normally, a building façade is composed of the wall, glazing, and any vents or louvers for HVAC systems in various ratios of area. The Proposed Project would be designed to provide composite window/wall attenuation greater than or equal to the attenuation requirements listed in **Table 15-7**.

By adhering to the requirements described above, the Proposed Project would provide sufficient attenuation to achieve both HUD and *CEQR Technical Manual* interior noise level guidelines for residential or community facility uses.

H. MECHANICAL EQUIPMENT

The Proposed Project's mechanical systems (i.e., HVAC systems) would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code, the New York City Department of Buildings Code) to avoid producing levels that would result in any significant increase in ambient noise levels.

Therefore, the Proposed Amendment would not result in any new significant adverse noise impacts related to building mechanical equipment or, cumulatively with any increase in noise from mobile sources, any new significant adverse noise impacts. *

A. INTRODUCTION

This chapter assesses the consistency of the Proposed Project with New York coastal zone policies and potential impacts of the Proposed Project on coastal resources under the framework of New York City's Waterfront Revitalization Program (WRP) policies in accordance with the guidelines of the 2020 *CEQR Technical Manual*.

B. REGULATORY CONTEXT**FEDERAL**

The Federal Coastal Zone Management Act (CZMA) of 1972 was established to encourage coastal states to manage development within the states' designated coastal areas to balance conflicts between coastal development and protection of resources within the coastal zone. Requirements for federal approval of coastal zone management programs and grant application procedures for development of the state programs are included in 15 CFR Part 923, Coastal Zone Management Program Regulations, National Oceanic and Atmospheric Administration (NOAA). Among other things, these regulations authorize states to issue general concurrences for certain activities (40 CFR § 930.53(b)). CZMA requires that federal activities within a state's coastal zone, including approvals and permits, be consistent with that state's coastal zone management plan. New York has a federally approved coastal zone management program.

NEW YORK

In accordance with the CZMA, New York State adopted its own Coastal Management Program (CMP) in accordance with the New York State Executive Law Article 42: Waterfront Revitalization of Coastal Areas and Inland Waterway Act. The CMP is designed to balance economic development and preservation by promoting waterfront revitalization and water-dependent uses while protecting fish and wildlife, open space and scenic areas, farmland, and public access to the shoreline, and minimizing adverse changes to ecological systems and erosion and flood hazards. The New York State Department of State (NYSDOS) administers the CMP in New York. New York State permits any local government that has any portion of its jurisdiction contiguous to the state's coastal waters to submit a Local Waterfront Revitalization Program (LWRP) to NYSDOS for approval. NYSDOS reviews a federal agency's proposed activity (e.g., permit) and consistency determination, and renders its own decision regarding the consistency of the activity with the CMP. State agencies determine the consistency of their action with the CMP.

NEW YORK CITY

New York City has established an LWRP in accordance with the CZMA and Article 42 of the New York State Executive Law. New York City's LWRP is made up of 10 major policies focusing on the goals of improving public access to the waterfront; reducing damage from flooding and

other water-related disasters; protecting water quality, sensitive habitats like wetlands, and the aquatic ecosystem; reusing abandoned waterfront structures; and promoting development with appropriate land uses. DCP administers New York City's LWRP.

C. WRP POLICY DISCUSSIONS

An assessment of the Proposed Project's conformity with the City's WRP policies is provided below for all policy questions addressed with respect to the Approved Plan (those answered either "Promote" or "Hinder" on the attached Consistency Assessment Form in **Appendix B**).

Policy 1: Support and facilitate commercial and residential redevelopment in areas well-suited to such development.

Policy 1.1: Encourage commercial and residential redevelopment in appropriate Coastal Zone areas.

The Proposed Project comprises a mixed-use building containing residential, commercial office, retail, fitness and social center, and community facility uses. Two illustrative (hypothetical) scenarios are currently being considered. The Maximum Residential building would also have up to 180,000 gross square feet (gsf) of commercial office space, up to 36,000 gsf of fitness and social center space, up to 13,000 gsf of community facility space, and up to 12,000 gsf of retail space. The Reduced Residential building would have up to 374,361 gsf of office space, up to 80,645 gsf of fitness and social center space, up to 21,329 gsf for community facility uses, and up to 25,000 gsf of retail use. If the building under either program is all-electric, the residential area and the overall building would be allowed to be 50,000 gsf larger to accommodate additional mechanical equipment. The residential uses of either scenario would be consistent with residential uses to the east, south, and west of the Development Site and would also be in keeping with a recent trend of residential development in the Lower Manhattan area as it becomes a mixed-use neighborhood. Therefore, the Proposed Project would promote Policy 1.1.

Policy 1.3: Encourage redevelopment in the Coastal Zone where public facilities and infrastructure are adequate or will be developed.

The Proposed Project is located in an already established neighborhood with adequate existing public facilities and infrastructure, including water and sewer, community facility, and transportation services. It would facilitate redevelopment consistent with existing development in the surrounding neighborhood, and at an appropriate density. Therefore, the Proposed Project would promote Policy 1.3.

Policy 1.5: Integrate consideration of climate change and sea level rise into the planning and design of waterfront residential and commercial development, pursuant to WRP Policy 6.2.

As described further below, under Policy 6.2, the Proposed Project would incorporate measures to provide resiliency from climate change and sea level rise. Therefore, the Proposed Project would promote Policy 1.5.

Policy 4: Protect and restore the quality and function of ecological systems within the New York City coastal area.

Policy 4.7: Protect vulnerable plant, fish and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.

As discussed in Chapter 17, “Natural Resources,” the state-listed endangered peregrine falcon (*Falco peregrinus*) and the yellow bumblebee (*Bombus fervidus*), an unlisted species identified as of conservation concern, have the potential to occur within a half-mile of the Project Site. The New York Natural Heritage Program has been consulted with respect to the Proposed Project. The peregrine falcon is globally widespread and common in many areas,¹ and populations in New York State have grown dramatically since the 1980s. Peregrine falcons have become increasingly common in urban areas, demonstrating a tolerance of human disturbance and an ability to exploit resources in human-modified environments.^{2,3} It has been stated that peregrine falcons will tolerate almost any level of human activity taking place below their nest provided that the nest is inaccessible to humans.⁴ Urban peregrine falcons appear to have particularly high tolerance thresholds compared with those in more remote areas.⁵ In several cities within New York State, including New York City, peregrine falcons nest in bridges and high-rise buildings among high levels of noise and human activity associated with the urban environment.^{6,7,8} Therefore, as was concluded in the FGEIS, peregrine falcons are not expected to experience a negative impact due to the Proposed Project. Measures to minimize potential construction impacts to adult falcons and their nesting activity and juvenile falcons that were proposed in the FGEIS would also be employed for the Development Site. These measures may include bird control devices on the tops of cranes or other tall construction equipment to keep young falcons from landing on them and slipping off. Similarly, the Proposed Project would have no effect on the abundance of pigeons or

¹ White, C.M, N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). In *The Birds of North America*, No. 660 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

² Cade, T.J., M. Martell, P. Redig, G. Septon, H. Tordoff. Peregrine Falcons in Urban North America. 1996. In: Ed. Bird, D.M., D.E. Varland, J.J. Negro. *Raptors in Human Landscapes: Adaptation to Built and Cultivated Environments*. Academic Press. San Diego, CA. pp. 3-14.

³ White, C.M, N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). In *The Birds of North America*, No. 660 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

⁴ Ratcliffe, D. A. 1972. The Peregrine Population of Great Britain in 1971, *Bird Study*, 19:3, 117-156.

⁵ White, C.M, N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). In *The Birds of North America*, No. 660 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

⁶ Cade, T.J., M. Martell, P. Redig, G. Septon, H. Tordoff. Peregrine Falcons in Urban North America. 1996. In: Ed. Bird, D.M., D.E. Varland, J.J. Negro. *Raptors in Human Landscapes: Adaptation to Built and Cultivated Environments*. Academic Press. San Diego, CA. pp. 3-14.

⁷ Frank, S. 1994. *City peregrines: a ten year saga of New York City falcons*. Hancock House Publishers, Blaine, Washington, USA

⁸ Loucks, B.A. and C.A. Nadasdeski. 2005. Back From the Brink. *New York State Conservationist* 59:5. April 2005.

other birds in the project area, and therefore would have no potential to impact the prey base of the peregrine falcons associated with these nesting territories.

The primary threat to yellow bumblebees is exotic pathogens in addition to habitat loss, insecticides, and urbanization. Yellow bumblebees are generalist foragers that nest both above and below ground.⁹ The yellow bumblebee would have limited potential to occur within the vicinity of the project site due to the lack of vegetation and flowering plants used for foraging and nesting. Liberty Park may provide some of this habitat, but the open space spans just one acre and is only partly vegetated. While plans have yet to be developed, any landscaping on the Development Site could provide additional habitat for the yellow bumblebee. For these reasons, the Proposed Project would not have the potential to adversely affect the yellow bumblebee and may provide some habitat.

Additionally, migrating birds commonly occur within New York City during the spring and fall for brief periods of rest and refueling before continuing onwards to the north or south. The Proposed Project would comply with New York City building code requirements for the use of “bird friendly materials” for the portion of the exterior wall envelope, and any associated openings, up to 75 feet above grade and as such, would reduce the potential for daytime bird collisions. With the measures discussed above in place, the Proposed Project would promote this policy.

Policy 5: Protect and improve water quality in the New York City coastal area.

Policy 5.1: Manage direct or indirect discharges to waterbodies.

There would be a minor increase in stormwater runoff with the Proposed Project’s residential as compared with the office development in the Approved Project. However, a reduction in stormwater peak flows to the combined sewer system would be achieved with the incorporation of stormwater source control best management practices (BMPs), specifically on-site detention, that would be required as part of the DEP site connection approval process. DEP’s detention performance standard is intended to reduce peak discharges to the City’s sewer system during rain events by requiring greater onsite storage of stormwater runoff and slower release to the sewer system. The implementation of DEP’s stormwater performance standard over time is expected to provide additional capacity to the existing sewer system, thereby improving its performance. The Proposed Project would result in marginally increased flows to the City’s combined sewer system that may be discharged as CSOs during rain events. Because of the available capacity of the Newtown Creek Wastewater Treatment Plant, the projected increased flows to the combined sewer system would not have a significant adverse impact on water quality. In addition, with the incorporation of BMP measures to meet the City site connection requirement, the Proposed Project would not result in a significant increase in stormwater runoff discharged to the combined sewer or CSO volumes/frequencies. With these measures in place, the Proposed Project would promote this policy.

Policy 5.2: Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.

See above response to Policy 5.1. Specific BMP measures would be determined in the future in consultation with DEP when specific designs for the Proposed Project is advanced and may

⁹ New York Natural Heritage Program. 2021. Online Conservation Guide for *Bombus fervidus*. Available from: <https://guides.nynhp.org/yellow-bumble-bee/>. Accessed June 30, 2021.

include on-site detention. With these measures in place, the Proposed Project would promote this policy.

Policy 5.4: Protect the quality and quantity of groundwater, streams, and the sources of water for wetlands.

The permanent placement of the below-grade structures associated with the Proposed Project would not adversely affect the overall direction of groundwater flow. Proper handling of hazardous materials would be ensured, including any contaminated groundwater encountered. Any groundwater recovered during dewatering would be treated in accordance with DEP requirements prior to discharge to the sewer system. With these measures in place, the Proposed Project would promote this policy.

Policy 5.5: Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.

See above response to Policy 5.1. Stormwater detention would be required as part of the DEP site connection approval process for new construction in order to reduce peak discharges to the City's sewer system during rain events and reduce CSO events. Onsite storage of stormwater runoff would allow for a slower release to the sewer system. Therefore, the Proposed Project would promote this policy.

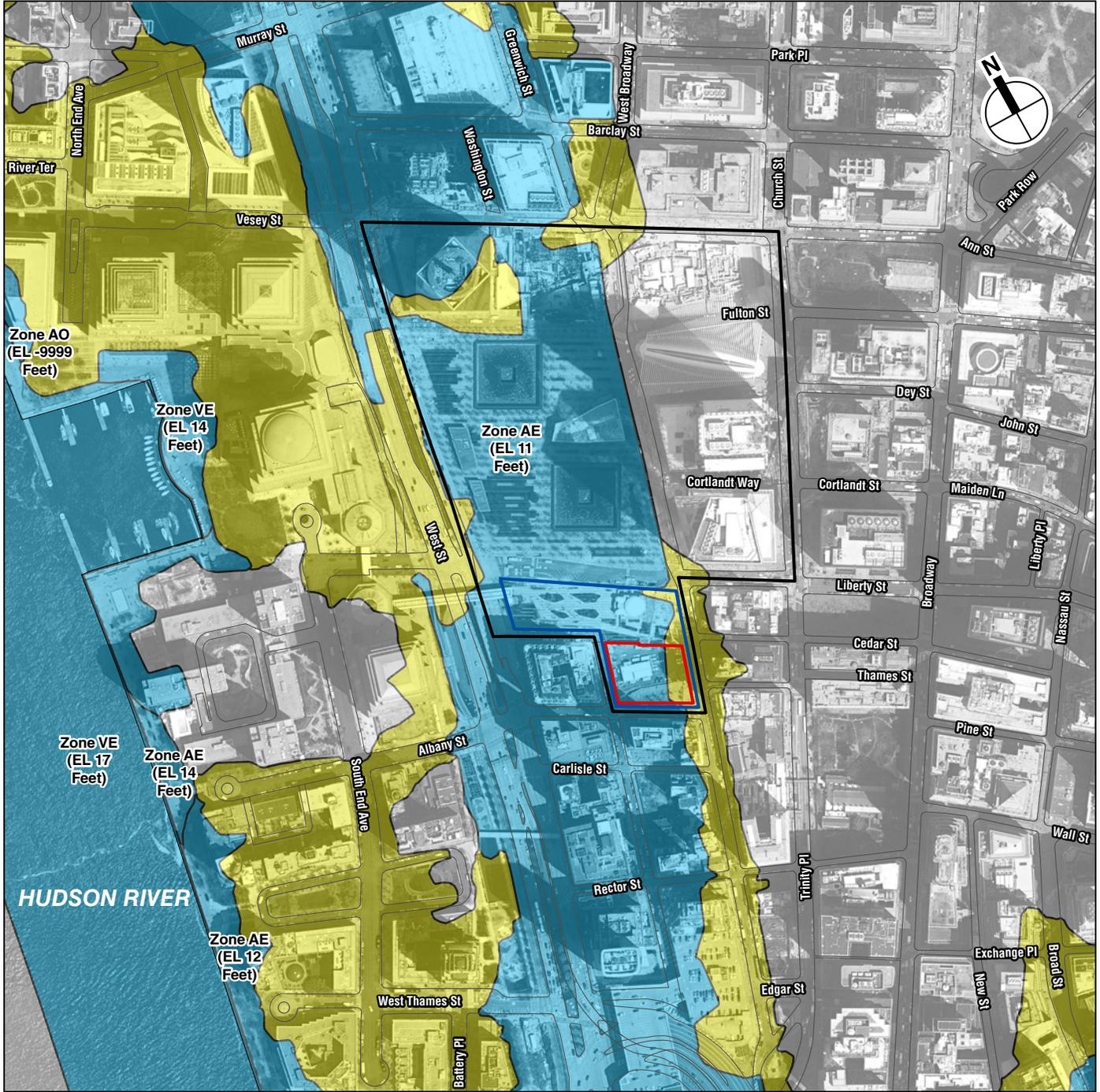
Policy 6: Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.

Policy 6.1: Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.

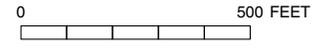
Under Policy 6, the primary goal for projects in coastal areas is to reduce risks posed by current and future coastal hazards, particularly major storms that are likely to increase in magnitude and frequency due to climate change and sea level rise. The Development Site is partially within the 100-year floodplain (area with a 1 percent chance of flooding each year) and partially within the 500-year floodplain (area with a 0.2 percent chance of flooding each year), as shown on **Figure 16-1**. Approximately 75 percent of the approximately 33,000-square-foot (sf) Development Site is within the 100-year floodplain, while about 25 percent of the Development Site is solely within the 500-year floodplain. Federal projects located within a special flood hazard area (SFHA), as defined by the Federal Emergency Management Agency (FEMA), are subject to Executive Order (EO) 11988. Based on the FEMA preliminary Flood Insurance Rate Maps (FIRMs) released on January 30, 2015, which represent the Best Available Flood Hazard Data, the portion of the Development Site within the 100-year floodplain falls within Zone AE, with a base flood elevation (BFE) of +11 feet North American Vertical Datum of 1988 (NAVD88). Like the building under the Approved Plan, the Proposed Project would be constructed in accordance with the Flood Resistant Construction requirements of Appendix G of the New York City Building Code and could incorporate additional measures to minimize losses due to flooding in the future with sea level rise, as discussed in detail under Policy 6.2 below. Therefore, the Proposed Project would promote this policy.

Policy 6.2: Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in New York City Panel on Climate Change 2015 Report,

Data source: FEMA, January 2015 / NYS GIS Program Office; NYC Orthoimagery, six-inch resolution, captured April 2018



- WTC Site
- Project Site
- Development Site (Site 5)
- 1% Annual Chance of Flooding
- 0.2% Annual Chance of Flooding



FEMA Preliminary FIRM 2015
Figure 16-1

Chapter 2: Sea Level Rise and Coastal Storms) into the planning and design of projects in the city's Coastal Zone.

Guidance provided by DCP¹⁰ recommends a detailed methodology to determine a project's consistency with Policy 6.2. A summary of this process is provided below.

1. Identify vulnerabilities and consequences: assess the project's vulnerabilities to future coastal hazards and identify what the potential consequences may be.

1(a). Complete the Flood Elevation Worksheet.

The information in the following subsections is based on the results of the completed worksheet, which is attached.

1(b). Identify any project features that may be located below the elevation of the 1% floodplain over the lifespan of the project under any sea level rise scenario.

The lifespan of buildings is generally at least 80 years, and the lifespan of critical equipment, such as mechanical and electrical equipment, is 50 years. The Proposed Project would involve one of two programs:

The Development Site is currently partly within the one percent annual chance flood zone (Zone AE), based on the 2015 Preliminary FIRM, with a BFE of +11 feet NAVD88.¹¹ On the basis of the New York City Panel on Climate Change (NPCC) projections, the one percent annual chance flood elevation with sea level rise under the High Scenario for Site 5 could increase to +13.50 feet by the 2050s, +15.83 feet by the 2080s, and up to +17.25 feet by 2100. The Proposed Project is expected to have a lifespan of at least 80 years and is evaluated through 2100. The mechanical equipment in the development is expected to have a lifespan of 50 years and is evaluated through the 2080s.

The ground floor of the building would be constructed at a design flood elevation (DFE) of +13 feet NAVD88. This adds two feet of freeboard to BFE as required by Local Law 43 of 2021, effective April 18, 2022. The first floor mezzanine would be located at +23 feet NAVD88. The ground floor and first floor mezzanine would contain mechanical equipment. The cellar of the building would be located below the DFE at an elevation of -2 feet NAVD88 and would contain the points of entry and any associated meters for gas, electrical service, internet, and sanitary and water supply, and the sewer ejector pumps and pits, but no mechanical equipment. Under the High estimate (90th percentile) of Sea Level Rise ("SLR"), as determined by the New York City Panel on Climate Change, the ground floor would be below the one percent annual chance flood level by the 2050s. Under the Middle range (25th to 75th percentile) of SLR, the ground floor would be under the one percent annual chance flood levels by the 2080s. Under the Low estimate (10th percentile) of SLR, the ground floor will remain above the one percent annual chance flood levels through 2100. Under all estimates of SLR, the first floor mezzanine will remain above the one percent annual chance flood level through 2100 and the cellar will remain below the one percent annual chance flood level.

¹⁰ NYC Planning. *The New York City Waterfront Revitalization Program: Climate Change Adaptation Guidance*. March 2017.

¹¹ All elevations provided are in NAVD88.

1(c). Identify any vulnerable, critical, or potentially hazardous features that may be located below the elevation of Mean Higher High Water (MHHW) over the lifespan of the project under any sea level rise scenario.

Based on the range of sea level rise predictions described above, MHHW at the NOAA Station nearest Site 5 (currently +2.61 feet at NOAA Station #8518750 at the Battery) could range up to +5.11 feet by the 2050s, +7.44 feet by the 2080s, and +8.86 feet by 2100. The ground floor and the first floor mezzanine would remain above the MHHW elevation through 2100 under all scenarios of sea level rise. The cellar would remain below the MHHW elevation throughout the life of the project.

1(d). Describe how any additional coastal hazards are likely to affect the project, both currently and in the future, such as waves, high winds, or debris.

The Development Site is located in FEMA Flood Zone AE, outside the Wave action hazards (i.e., Zone VE or Coastal A Zone indicated by the Limit of Moderate Wave Action). Therefore, storm impacts due to waves, high winds, or debris would not be expected to affect development pursuant to the Proposed Project.

2. Identify adaptive strategies: assess how the vulnerabilities and consequences identified in Step 1 are addressed through the project's design and planning.

2(a). For any features identified in Step 1(b), describe how any flood damage reduction elements incorporated into the project, or any natural elevation on the site, provide any additional protection. Describe how would any planned adaptive measures protect the feature in the future from flooding?

The cellar will be dry floodproofed. Examples of ground floor flood damage reduction measures include insulated flood vents providing wet floodproofing at residential exit stairs (and loading dock doors if the dock is conditioned space); loading dock doors with open lattice to provide wet floodproofing the dock is unconditioned space; flood-resistant storefront glazing and removable flood barriers to provide dry floodproofing at the community facility entrance. If the flood elevation increases in the future, the Proposed Project could be retrofitted with additional flood protection features (e.g., internal flood barriers, temporary stairs, etc.). Specific measures would be determined at a later date.

2(b). For any features identified in Step 1(c), describe how any flood damage reduction elements incorporated into the project, or any natural elevation on the site, provide any additional protection. Describe how would any planned adaptive measures protect the feature in the future from flooding?

The cellar will be dry floodproofed.

2(c). Describe any additional measures being taken to protect the project from additional coastal hazards such as waves, high winds, or debris.

As noted in 1(d), the Development Site is not within a wave impact zone in the City's designated flood hazard area. Therefore, no specific measures are required.

2(d). Describe how the project would affect the flood protection of adjacent sites, if relevant.

Because the floodplain within New York City is controlled by astronomic tide and meteorological forces (e.g., nor'easters and hurricanes) and not by fluvial flooding, the

Proposed Project would not have the potential to adversely affect the floodplain or result in increased coastal flooding at adjacent sites or within the study area. The Proposed Project would not significantly alter the existing site elevation and would not encroach into adjacent areas. During and following construction, activities at the Development Site would be in accordance with applicable stormwater regulations.

3. Assess policy consistency: conclude whether the project is consistent with Policy 6.2 of the Waterfront Revitalization Program.

The ground floor of the building would be constructed at a DFE of +13 feet NAVD88 and the first floor mezzanine at an elevation of +23 feet NAVD88, which is 2 feet and 12 feet above BFE, respectively, at this location. Mechanical equipment would be located no lower than DFE. The cellar of the building would be located below DFE at an elevation of -2 feet NAVD88 and would contain the points of entry for utilities but no mechanical equipment.

Under the High estimate (90th percentile) of SLR, as determined by the New York City Panel on Climate Change, the ground floor would be below the one percent annual chance flood level by the 2050s. Under the Middle range (25th to 75th percentile) of SLR, the ground floor would be under the one percent annual chance flood level by the 2080s. Under the Low estimate (10th percentile) of SLR, the ground floor will remain above the one percent annual chance flood level through 2100.

The cellar will be dry floodproofed. Examples of ground floor flood damage reduction measures include insulated flood vents providing wet floodproofing at residential exit stairs (and loading dock doors if the dock is conditioned space); loading dock doors with open lattice to provide wet floodproofing the dock is unconditioned space; flood-resistant storefront glazing and removable flood barriers to provide dry floodproofing at the community facility entrance. If the flood elevation increases in the future, the Proposed Project could be retrofitted with additional flood protection features (e.g., internal flood barriers, temporary stairs, etc.). Specific measures would be determined at a later date. Therefore, the Proposed Amendment would promote Policy 6.2.

Policy 7: Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.

Policy 7.1: Manage solid waste material, hazardous wastes, toxic pollutants, substances hazardous to the environment, and the unenclosed storage of industrial materials to protect public health, control pollution and prevent degradation of coastal ecosystems.

From 1974 until 2011 the Development Site contained the Deutsche Bank building. Severely damaged by the events of September 11, 2001, this building was deconstructed in accordance with unusually strict protocols related to hazardous materials. The below-grade sidewalls of this building (backfilled with clean crushed concrete) remain. Construction of a new building (whether it included residential uses or not) would entail removal of these remnants and potentially some soil beneath, as well as dewatering. A CHASP would detail the requirements for appropriate monitoring and testing to protect site workers, the community, and the environment. All materials removed during construction activities (soil, concrete slab, backfilled-concrete) requiring off-site disposal would be managed in accordance with applicable regulatory requirements. All soil and any other materials intended for off-site disposal would be tested in accordance with the requirements of the intended receiving facility. Transportation of material leaving the site for off-site disposal would be conducted in accordance with federal, state, and local requirements

covering licensing of haulers and trucks, placarding, truck routes, manifesting, etc. Dewatering is likely to be required for construction. Testing would be performed to ensure compliance with DEP sewer discharge permit/approval requirements and, if necessary, pre-treatment would be conducted prior to discharge to the sewer. With the implementation of the measures described above, the Proposed Project would promote this policy.

Policy 7.2: Prevent and remediate discharge of petroleum products.

Approximately 27,000 gallons of fuel oil were stored at the WTC Site prior to the September 11, 2001 terrorist attacks. As such, releases into the WTC Site and potentially affecting the Development Site may have occurred, as may have other petroleum spills in the area. However, soil testing conducted in the 2000s beneath streets to the south of the WTC Site (i.e., near the Development Site) indicated no evidence of petroleum impacts. Additionally, ongoing dewatering in the area has likely led to reductions in any groundwater contamination.

Policy 7.3: Transport solid waste and hazardous materials and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.

Any solid waste and hazardous materials would be disposed of off-site at appropriate facilities in accordance with applicable regulatory requirements. Therefore, the Proposed Project would promote this policy.

Policy 8: Provide public access to, from, and along New York City's coastal waters.

Policy 8.1: Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.

The Development Site does not currently provide physical, recreational, or visual access to the waterfront. The Development Site is separated from the Hudson River waterfront by three city blocks and Route 9A. Views to the waterfront from the Development Site and adjacent sidewalks are obscured by buildings within Battery Park City. The Proposed Project would not alter physical, recreational, or visual access to the waterfront. Therefore, the Proposed Project would promote this policy.

Policy 8.2: Incorporate public access into new public and private development where compatible with proposed land use and coastal location.

Although the Proposed Project would not provide for any direct waterfront access, it would be built on an existing block and would not alter street orientation or street patterns in the surrounding area. Therefore, the Proposed Project would promote this policy.

Policy 8.3: Provide visual access to the waterfront where physically practical.

The Development Site is separated from the Hudson River waterfront by three city blocks and Route 9A, and views to the waterfront from the Development Site and adjacent sidewalks are obscured by buildings within Battery Park City. It is possible that some limited views to the waterfront may be available from some of the higher floors of the proposed building. Therefore, the Proposed Project would promote this policy.

Policy 9: Protect scenic resources that contribute to the visual quality of the New York City coastal area.

Policy 9.1: Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.

The height, size, and use of the building under the Proposed Project would be consistent with the urban design character of existing buildings and buildings currently under construction in the surrounding area. In addition, the residential use proposed for the building would be consistent with uses in the surrounding area and would continue the current trend in this area of shifting to a more residential neighborhood with local retail uses.

Policy 9.2: Protect and enhance scenic values associated with natural resources.

The Development Site is not located within or adjacent to a Special Natural Waterfront Area or Recognized Ecological Complex. Redevelopment of this site would not block significant views of open waters from public vantage points. Therefore, the Proposed Project would promote this policy.

Policy 10: Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City coastal area.

Policy 10.1: Retain and preserve historic resources and enhance resources significant to the coastal culture of New York City.

While there are no historic architectural resources on the Development Site, there are two located within 90 feet of the site—the Hazen Building and the American Stock Exchange. In conformance with the 2004 WTC Memorial and Redevelopment Plan Programmatic Agreement among the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Office (SHPO), and LMDC, and to avoid any potential adverse direct effects to these historic architectural resources, a Construction Protection Plan (CPP) would be implemented to avoid inadvertent construction-related impacts on these resources. The CPP would contain measures to avoid construction-related impacts, including ground-borne vibration and accidental damage from heavy machinery, as appropriate. The CPP would be developed in consultation with SHPO and implemented by a professional engineer prior to excavation and construction activities and would be based on the requirements laid out in the New York City Department of Buildings' (DOB) *Technical Policy and Procedure Notice (TPPN) #10/88* concerning procedures for avoidance of damage to historic structures from adjacent construction.¹² With these measures in place, the Proposed Project would promote this policy.

Policy 10.2: Protect and preserve archaeological resources and artifacts.

The 2004 FGEIS and ROD determined that the Development Site was not considered archaeologically sensitive due to its previous excavation for construction of the

¹² *TPPN #10/88* was issued by DOB on June 6, 1988, to supplement the New York City Building Code regulations with regard to historic structures. *TPPN #10/88* outlines procedures for the avoidance of damage to historic structures that are listed on the State and National Registers of Historic Places or New York City Landmarks resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

Deutsche Bank building. Therefore, no additional study of archaeological resources is warranted for this project

Section 3.2.3 of the ROD identified other portions of the WTC Site and Southern Site that were potentially sensitive for historic period archaeological resources and provided for mitigation consisting of a Phase 1B investigation in those areas, in the form of archaeological monitoring. Since then, on the Development Site, the Deutsche Bank building was decontaminated and deconstructed, while the north part of the Development Site was excavated for construction of the adjacent VSC.

In the event that there are any unanticipated discoveries of previously unidentified archaeological resources on the Development Site during any excavation for Tower 5, they would be subject to the process set forth in the World Trade Center Memorial and Redevelopment Plan Programmatic Agreement, dated April 22, 2004 (Programmatic Agreement).

Therefore, the Proposed Project would not result in significant adverse impacts on archaeological resources and would promote this policy. *

A. INTRODUCTION

A natural resources assessment is conducted when a natural resource is present on or near a project site and when an action involves the disturbance of that resource. The 2020 *CEQR Technical Manual* defines natural resources as water resources, including surface water bodies and groundwater; wetland resources, including freshwater and tidal wetlands; upland resources—including beaches, dunes, and bluffs; thickets, grasslands, meadows, and old fields; woodlands and forests; and gardens and other ornamental landscaping—and built resources, including piers and other waterfront structures.

This chapter describes:

- The regulatory programs that protect floodplains and natural resources (e.g., groundwater, wildlife, threatened, endangered, and special concern species);
- The current condition of the floodplain and natural resources within the natural resources study area (e.g., groundwater, ecological communities, wildlife, and threatened or endangered species and species of special concern);
- The floodplain and natural resources conditions in the future with the Approved Plan (the No Action Condition);
- The potential impacts of the Proposed Project on the floodplain and natural resources (the With Action Condition); and
- The measures that would be developed, as necessary, to mitigate and/or reduce any of the Proposed Project’s potential significant adverse effects on natural resources and floodplains.

B. REGULATORY CONTEXT**FEDERAL**

Floodplain Management EO 11988 requires Federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Title 24, Subtitle A Part 55 of the Code of Federal Regulations (24 CFR § 55) contains the U.S. Department of Housing and Urban Development’s (HUD) regulations implementing the requirements of EO 11988 and the eight-step decision making process for making determinations on compliance with this Executive Order.

The Endangered Species Act of 1973 (16 USC §§ 1531-1544) prohibits the importation, exportation, taking, possession, and other activities involving species covered under the Act. The Act also provides for the protection of critical habitats on which endangered or threatened species depend for survival. This Act requires Federal agencies to consult with the U.S. Fish and Wildlife

Service (USFWS) for any actions that may jeopardize threatened or endangered species or destroy or adversely modify their critical habitats.

The Migratory Bird Treaty Act (50 CFR Parts 10, 20, 21, EO 13186) makes it unlawful to pursue, hunt, take, capture, kill, or sell birds listed therein. Over 800 species are currently protected under the Act.

STATE

New York State has established the **State Pollutant Discharge Elimination System (SPDES) program (ECL Article 3, Title 3; Article 15; Article 17, Titles 3, 5, 7, 8; Article 21; Article 70, Title 1; Article 71, Title 19; Implementing Regulations 6 NYCRR Part 750)** for controlling wastewater and stormwater discharges to groundwaters and surface waters; the SPDES program is an authorized program under the Clean Water Act.

METHODOLOGY

Existing conditions of natural resources within the project site, the Development Site, are characterized using information such as:

- The New York State Department of Environmental Conservation (NYSDEC) Nature Explorer for records of federally and state-listed species;
- 2000–2005 New York State Breeding Bird Atlas results;
- Federal Emergency Management Agency (FEMA) Preliminary Floodplain Insurance Rate Maps (pFIRMs);
- United States Fish and Wildlife Service (USFWS) Information, Planning, and Consultation (IPaC) system for federally threatened and endangered species; and
- NYSDEC Environmental Resource Mapper.

Probable impacts of the Proposed Project are identified by comparing conditions under the Proposed Amendment against projected conditions evaluated in the 2004 FGEIS under the Approved Plan.

C. EXISTING CONDITIONS

The larger Project Site, including the Development Site, are located in a fully developed area of Manhattan with a mix of commercial office, retail, residential, hotel, open space, and transportation and utility uses and limited natural resources. The Development Site currently comprises a parking lot, temporary building structures, and the Albany Street Plaza, a temporary open space. Liberty Park, also part of the Project Site and immediately adjacent to the Development Site to the north, is the closest landscaped space. The Proposed Amendment would allow development of a residential tower that would also provide a direct connection to Liberty Park.

GROUNDWATER

As discussed in Chapter 10, “Hazardous Materials,” groundwater has been encountered at the Development Site beginning at approximately 6 to 10 feet below grade. Groundwater is expected to flow in a westerly direction toward the Hudson River. Existing factors that could affect the flow of groundwater in this location include dewatering in the area, bedrock, subsurface openings or ob-

structions such as basements, underground utilities, parking garages, historical filling and bulkheads, tidal fluctuations, etc. Groundwater in Manhattan is not used as a source of potable water.

FLOODPLAINS

Based on the FEMA preliminary Flood Insurance Rate Maps (FIRMs) released on January 30, 2015, which represent the Best Available Flood Hazard Data, the portion of the Development Site within the 100-year floodplain falls within Zone AE with a base flood elevation (BFE) of +11 feet North American Vertical Datum of 1988 (NAVD88). The Proposed Project involves new construction within the floodplain and thus E. 11988 applies. Less than 25,000 square feet (sf) of the approximately 33,000 sf within the Development Site, or approximately 75 percent, is within the 100-year floodplain, while just under 10,000 sf, or approximately 25 percent of the Development Site, is solely within the 500-year floodplain.

ECOLOGICAL COMMUNITIES AND WILDLIFE

Ecological communities within the Development Site are limited to building exteriors, paved city streets, and parking lots. Vegetation is limited to potted trees and herbaceous species. Wildlife habitat within the vicinity of the Development Site is limited to the aforementioned urban ecological communities (i.e., building exteriors, paved parking lots, paved city streets with street tree pits, and the green space in Colonel Charles Young Playground). As such, wildlife with the potential to occur within the Development Site are primarily limited to mostly urban-adapted disturbance-tolerant species that are ubiquitous throughout the heavily developed areas of New York City, such as house sparrow (*Passer domesticus*), rock pigeon (*Columba livia*), European starling (*Sturnus vulgaris*), and Norway rat (*Rattus norvegicus*).

THREATENED AND ENDANGERED SPECIES

A review of the USFWS Information, Planning, and Conservation (IPaC) System¹ did not indicate any federally listed, candidate, or proposed species, or critical habitat as having the potential to be present in the Development Site. The New York Natural Heritage Program (NYNHP) indicated that the state-listed endangered peregrine falcon (*Falco peregrinus*) and the yellow bumblebee (*Bombus fervidus*) an unlisted species identified as of conservation concern, have the potential to occur within a half-mile of the project site. NYNHP was consulted with respect to the Proposed Project.

The peregrine falcon is globally widespread and common in many areas,² and populations in New York State have grown dramatically since the 1980s. Peregrine falcons have become increasingly common in urban areas, demonstrating a tolerance of human disturbance and an ability to exploit

¹ USFWS Information, Planning, and Conservation (IPAC) IPAC System (Accessed on June 30, 2021. Available at: <http://ecos.fws.gov/ipac/>)

² White, C.M, N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). In *The Birds of North America*, No. 660 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

resources in human-modified environments.^{3,4} It has been stated that peregrine falcons will tolerate almost any level of human activity taking place below their nest provided that the nest is inaccessible to humans.⁵ Urban peregrine falcons appear to have particularly high tolerance thresholds compared with those in more remote areas.⁶ In several cities within New York State, including New York City, peregrine falcons nest in bridges and high-rise buildings among high levels of noise and human activity associated with the urban environment.^{7,8,9}

The yellow bumblebee is critically imperiled at the state level by NYNHP. The primary threat to yellow bumblebees is exotic pathogens in addition to habitat loss, insecticides, and urbanization. Yellow bumblebees are generalist foragers that nest both above and below ground.¹⁰

D. FUTURE WITHOUT THE PROPOSED AMENDMENT

In the future with the Approved Plan, it is assumed that the approximately 57-story, 839-foot-tall office tower with ground-floor retail contemplated for the Development Site in the 2004 FGEIS would be constructed. The potential impacts to groundwater, floodplains, ecological communities and wildlife, and threatened and endangered species would be the same as for the Proposed Project, which are described below. Potential impacts to the yellow bumblebee were not analyzed in the 2004 FGEIS because the species was not listed as critically imperiled at the time. The yellow bumblebee would have limited potential to occur within the vicinity of the Development Site due to the lack of vegetation and flowering plants used for foraging and nesting. Liberty Park may provide some of this habitat, but the park spans just one acre, is only partly vegetated, and is a project-created space. For these reasons, the Approved Plan would not have the potential to adversely affect the yellow bumblebee.

³ Cade, T.J., M. Martell, P. Redig, G. Septon, H. Tordoff. Peregrine Falcons in Urban North America. 1996. In: Ed. Bird, D.M., D.E. Varland, J.J. Negro. Raptors in Human Landscapes: Adaptation to Built and Cultivated Environments. Academic Press. San Diego, CA. pp. 3-14.

⁴ White, C.M, N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). In The Birds of North America, No. 660 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

⁵ Ratcliffe, D. A. 1972. The Peregrine Population of Great Britain in 1971, Bird Study, 19:3, 117-156.

⁶ White, C.M, N.J. Clum, T.J. Cade, and W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). In The Birds of North America, No. 660 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

⁷ Cade, T.J., M. Martell, P. Redig, G. Septon, H. Tordoff. Peregrine Falcons in Urban North America. 1996. In: Ed. Bird, D.M., D.E. Varland, J.J. Negro. Raptors in Human Landscapes: Adaptation to Built and Cultivated Environments. Academic Press. San Diego, CA. pp. 3-14.

⁸ Frank, S. 1994. City peregrines: a ten year saga of New York City falcons. Hancock House Publishers, Blaine, Washington, USA

⁹ Loucks, B.A. and C.A. Nadareski. 2005. Back From the Brink. New York State Conservationist 59:5. April 2005.

¹⁰ New York Natural Heritage Program. 2021. Online Conservation Guide for *Bombus fervidus*. Available from: <https://guides.nynhp.org/yellow-bumble-bee/>. Accessed June 30, 2021.

E. FUTURE WITH THE PROPOSED AMENDMENT

In the future with the Proposed Project, the Development Site would be redeveloped with a mixed-use building containing residential, commercial office, retail, fitness and social center, and community facility uses. Having the same height and exterior features, the Maximum Residential Program and the Reduced Residential Program are not analyzed separately in this section. The overall building height would be up to 940 feet tall under either program.

GROUNDWATER

As stated above, the Development Site is not located within a designated Sole Source Aquifer, nor is New York City groundwater utilized as a potable water source. However, since construction activities may require dewatering, groundwater testing would be performed to ensure that recovered groundwater would be treated, as necessary, in accordance with New York City Department of Environmental Preservation (DEP) requirements prior to discharge to the city sewer. With these measures in place, construction of the Proposed Project would not have the potential to result in any new significant adverse impacts to groundwater as compared with the previously Approved Plan.

Similar to the Approved Plan, the below-grade building foundation for Development Site would have the potential to modify groundwater flow patterns; however, groundwater would be expected to flow around these structures. The permanent placement of the below-grade structures allowed with the Proposed Amendment would not adversely affect the overall direction of groundwater flow. Therefore, permanent operation of the Proposed Project would not have the potential to result in any new adverse impacts to groundwater as compared with the Approved Plan.

FLOODPLAINS

Construction of the Proposed Project would comply with applicable New York City Building Code provisions and FEMA requirements regarding non-residential and residential structures within the floodplain and would incorporate sea level rise resilience measures into the design of building structures in order to minimize losses due to flooding. As discussed in the 2004 FGEIS, New York City is affected by local flooding (e.g., flooding of inland portions of the City from short-term, high-intensity rain events in areas with poor drainage), and coastal flooding (e.g., long- and short-wave surges that affect the City's shorelines along the Atlantic Ocean and tidally influenced rivers and straights such as the Hudson River, Harlem River, and East River). Because these floodplains are affected by coastal flooding rather than local or fluvial flooding, the construction and operation of the Proposed Project would not exacerbate flooding conditions on or near the project site. The Proposed Project, similar to the Approved Action evaluated in the 2004 FGEIS, would occur within a previously developed site with existing foundation structures. Therefore, the Proposed Project would not result in any new significant adverse impacts to flood levels, flood risk, or the flow of floodwater within the project site or the surrounding area. An evaluation of compliance with 24 CFR Part 55 that supports this conclusion is included in **Appendix B**.

ECOLOGICAL COMMUNITIES AND WILDLIFE

All work would be performed in compliance with Local Law 3 of 2010 and New York City Department of Parks and Recreation (NYC Parks) Tree Protection Protocol to minimize potential adverse impacts to trees. Any required replacement and/or restitution of trees removed because of the project would occur in compliance with Local Law 3 and Chapter 5 of Title 56 of the Rules of

the City of New York. Therefore, the Proposed Project would not have the potential to result in any new adverse effects on ecological communities as compared with the Approved Plan.

Any disturbance to wildlife in the vicinity of the Development Site would be similar to that described in the 2004 *FGEIS* and the Approved Plan, including construction noise, and would not reduce habitat availability for the common, urban-adapted species that occur in the area, or have any potential to adversely affect their populations.

During spring and fall, migrating birds commonly occur within New York City for brief periods of rest and refueling before continuing onwards to the north or south. They are most abundant in the City's large natural areas and parks but can also occur in low numbers in small green spaces in fully developed areas like the project site. In such situations where migrating birds are in close proximity to buildings with windows or other glass materials on their exterior, there is the potential for daytime collisions to occur. The vast majority of bird collisions with buildings in New York City occur near ground level and during the daytime, as a result of the glass reflecting images of vegetation or sky that birds cannot distinguish from the real thing.^{11,12,13,14} Therefore, there would be no significant difference in the risk of bird collisions between the 940-foot-tall building under the Proposed Project versus the 840-foot-tall building proposed under the Approved Plan.

There have been changes in the New York City building code since publication of the 2004 *FGEIS* with respect to requiring bird friendly materials in construction and renovation projects. The ROD for the Approved Plan concluded that while bird strikes were expected to be reduced compared to pre-September 11 conditions, the potential to reduce bird strikes through building design and management practices would be investigated. The Proposed Project would also be subject to the new Local Law 15 of 2020, which amended the New York City building code to require "bird friendly materials" for the portion of the exterior wall envelope, and any associated openings, up to 75 feet above the ground surface. Therefore, there would be no significant adverse change in the potential for bird collisions from the 2004 *FGEIS*. Local Law 15 also addresses other bird hazards, such as by requiring bird friendly materials to be used.

Nighttime collisions of migratory birds with illuminated City skyscrapers have been well publicized, but collisions with buildings at night are relatively rare and are largely limited to sporadic episodes of mass mortality that can occur with the right mix of extremely poor weather conditions and particularly disorienting lighting characteristics.¹⁵ While the Proposed Project would allow development of a 940-foot-tall building, which would be higher than the building proposed in the Approved Plan, it would still be shorter than two of the other WTC buildings and

¹¹ Gelb, Y., and N. Delacretaz. 2006. Avian window strike mortality at an urban office building. *Kingbird* 56:190-198.

¹² Gelb, Y., and N. Delacretaz. 2009. Windows and vegetation: primary factors in Manhattan bird collisions. *Northeastern Naturalist* 16:455-470.

¹³ Klem, D. Jr., C. J. Farmer, N. Delacretaz, Y. Gelb and P.G. Saenger. 2009. Architectural and landscape risk factors associated with bird-glass collisions in an urban environment. *Wilson Journal of Ornithology* 121: 126-134.

¹⁴ Loss, S. R., Will, T., Loss, S. S., & Marra, P. P. (2014). Bird-building collisions in the United States: Estimates of annual mortality and species vulnerability. *The Condor*, 116(1), 8-23.

¹⁵ DeCandido, R. and D. Allen. 2006. Nocturnal hunting by Peregrine Falcons at the Empire State Building, New York City. *The Wilson Journal of Ornithology* 118(1): 53-58.

would be lower than the altitudes at which birds migrate through the metropolitan region.^{16,17,18} Therefore, the frequency of nighttime collisions with the proposed Development Site building would be expected to be similar to the frequency expected from the Approved Plan. For all of these reasons, the Proposed Project would not result in significant daytime or nighttime bird collisions as compared with the Proposed Action analyzed in the 2004 FGEIS.

THREATENED AND ENDANGERED SPECIES

As stated above, peregrine falcons have become increasingly common in urban habitats and can tolerate almost any level of human activity taking place below their nest provided that the nest is inaccessible to humans. Therefore, as was concluded in the 2004 FGEIS, peregrine falcons are not expected to experience a negative impact due to the Proposed Project. Construction-period measures to minimize potential construction impacts to adult falcons and their nesting activity and juvenile falcons that were proposed in the 2004 FGEIS would be maintained for development pursuant to the Proposed Project. These measures may include bird control devices on the tops of cranes or other tall construction equipment to keep young falcons from landing on them and slipping off. As stated above, measures would also be taken to reduce bird collisions. Therefore, there is no substantive difference in the potential for the Proposed Project to adversely affect peregrine falcon as compared with the Approved Plan, and construction and operation of a tower on Development Site would not adversely affect peregrine falcons at the individual or population level.

Potential impacts to the yellow bumblebee were not evaluated in the 2004 FGEIS, but the species is now considered to be critically imperiled at the state level by NYNHP. The primary threat to yellow bumblebees is exotic pathogens in addition to habitat loss, insecticides, and urbanization. Yellow bumblebees are generalist foragers that nest both above and below ground.¹⁹ As discussed above in Section D, “The Future With the Approved Plan,” the yellow bumblebee would have limited potential to occur within the vicinity of the Development Site due to the lack of vegetation and flowering plants used for foraging and nesting. Moreover, while plans have yet to be developed, any landscaping on the Development Site could provide additional habitat for the yellow bumblebee. For these reasons, similar to the Approved Plan, the Proposed Project would not have the potential to adversely affect the yellow bumblebee, and has the potential to add some habitat as compared with the Approved Plan.

In summary, the Proposed Project would not result in significant adverse impacts to natural resources as compared with the Approved Plan. *

¹⁶ La Sorte F.A., et al. 2015. Seasonal changes in the altitudinal distribution of nocturnally migrating birds during autumn migration. *Royal Society Open Science* 2(12):150347.

¹⁷ Van Doren B.M., Horton K.G., Dokter A.M., Klinck H., Elbin S.B., Farnsworth A. 2017. High-intensity urban light installation dramatically alters nocturnal bird migration. *Proceedings of the National Academy of Sciences* 114(42):11175-80.

¹⁸ Cabrera-Cruz S.A., Smolinsky J.A., McCarthy K.P., Buler J.J. 2019. Urban areas affect flight altitudes of nocturnally migrating birds. *Journal of Animal Ecology* 88(12):1873-87.

¹⁹ New York Natural Heritage Program. 2021. Online Conservation Guide for *Bombus fervidus*. Available from: <https://guides.nynhp.org/yellow-bumble-bee/>. Accessed June 30, 2021.

A. INTRODUCTION

Executive Order (EO) 12898 requires federal agencies to consider whether actions they might fund or approve may have any disproportionately high and adverse environmental or human health effects on minority or low-income populations. Implementation of the Proposed Amendment requires federal approval from the U.S. Department of Housing and Urban Development (HUD) subject to review under the National Environmental Policy Act (NEPA). Thus, this environmental justice analysis has been prepared to assess the Proposed Project's potential for disproportionately high and adverse effects on minority and low-income populations following the guidance and methodologies outlined in the Council on Environmental Quality's (CEQ) *Environmental Justice Guidance under the National Environmental Policy Act* (December 1997). This environmental justice analysis was also prepared to comply with HUD regulations found at 24 CFR Parts 50 and 58, which mandate compliance with EO 12898 for HUD and/or HUD applicants.

EO 12898 also requires federal agencies to work to ensure greater public participation in the decision-making process. For the Proposed Project, this requirement has been satisfied by the review process for this Environmental Assessment under NEPA¹ and the State Environmental Quality Review Act (SEQRA).

This chapter analyzes the Proposed Project's potential effects on minority and low-income populations, to determine if disproportionately high and adverse impacts on those populations would result. The principal conclusion of the analysis is that the study area does not contain a minority or low-income population. The Proposed Project would not result in significant adverse impacts on minority and low-income populations nor any disproportionately high and adverse effects on minority and low-income populations and would result in no environmental justice concerns.

As described in Chapter 1, "Project Description," the Proposed Project would include an affordable housing component in which a minimum of 25 percent of the residential units would be permanently affordable. The provision of affordable housing would be governed by a Regulatory Agreement issued by the New York State Division of Housing and Community Renewal (HCR).

Additionally, there would also be a Minority and Women Owned Enterprises (MWBE) and Service-Disabled Veterans Owned Business (SDVOB) hiring and contracting requirement for all project costs. Furthermore, the future population in the permanently affordable units would not be

¹ Notice of the availability of this Environmental Assessment for public review will be published in the Environmental Notice Bulletin (ENB) published by the New York State Department of Environmental Conservation and in a local newspaper. Interested and involved agencies, New York City Community Boards, community groups, elected officials, and public interest groups, will also be notified. The document will be made available for review at LMDC's office, and on LMDC's web site.

subject to higher costs from flood insurance since all dwelling units including the affordable housing will be on upper floors of the building; and therefore not subject to National Flood Insurance Program (NFIP) requirements. Therefore, there would be no additional cost burden due to the project's location in a 100-year floodplain.

B. REGULATORY CONTEXT

To satisfy EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), this analysis has been prepared to identify and address any disproportionately high and adverse impacts on minority or low-income populations that could result from the Proposed Project. EO 12898 also requires federal agencies to work to ensure greater public participation in the decision-making process. In addition, this environmental justice analysis was prepared pursuant to HUD regulations found at 24 CFR Parts 50 and 58, which mandate compliance with EO 12898 for HUD and/or HUD grantees.

This environmental justice analysis is consistent with the New York State Department of Environmental Conservation (DEC) environmental review process and its application of SEQRA and is consistent with the intent of CP-29, "Environmental Justice and Permitting," which is DEC's policy on environmental justice.

The environmental justice analysis for the project follows the guidance and methodologies recommended by the CEQ's *Environmental Justice Guidance under the National Environmental Policy Act* (December 1997).

CEQ GUIDANCE

The CEQ, which has oversight of the federal government's compliance with EO 12898 and NEPA, developed its guidance to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed.

The CEQ methodology involves collecting demographic information on the area where the project may cause significant adverse effects; identifying minority and low-income populations in that area using census data; and identifying whether the project's adverse effects are disproportionately high on the minority and low-income populations in comparison with those on other populations. Mitigation measures should be developed and implemented for any disproportionately high and adverse effects. Under NEPA, the potential for disproportionately high and adverse effects on minority and/or low-income populations should then be one of the factors the federal agency considers in making its finding on a project and issuing a Record of Decision.

C. METHODOLOGY

This environmental justice analysis follows the guidance and methodologies recommended in the CEQ documents identified above. It involved six basic steps:

1. Identify the area where the project may cause significant and adverse effects (i.e., the study area);
2. Compile population and economic characteristics for the study area and identify potential environmental justice areas (i.e., minority or low-income communities);
3. Identify the proposed project's potential adverse effects on minority and low-income communities;

4. Evaluate the proposed project’s potential adverse effects on minority and low-income communities relative to its overall effects to determine whether any potential adverse impacts on those communities would be disproportionate;
5. Discuss mitigation measures for any identified disproportionate adverse impacts;
6. Describe the public outreach and participation process for effectively engaging minority and low-income populations in the decision-making process.

DELINEATION OF STUDY AREA

The study area for environmental justice encompasses the area most likely to be affected by the Proposed Project and considers the area where potential impacts resulting from construction and operation of the building constructed under the Proposed Amendment could occur. The study area for environmental justice includes the census block groups that are at least 50 percent within the area of potential effect, which is generally the area within a half-mile of the project site, based on the other impact analyses included in this Environmental Assessment. As shown in **Figure 18-1**, the study area includes 16 census block groups.

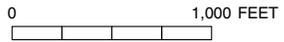
IDENTIFICATION OF POTENTIAL ENVIRONMENTAL JUSTICE AREAS

Data on race and ethnicity and poverty status were gathered from the U.S. Census 2015–2019 American Community Survey (ACS) 5-Year Estimates for the census block groups within the study area, and then aggregated for the study area as a whole. For comparison purposes, data for Manhattan and New York City were also compiled. Based on census data and CEQ guidance (described above), potential environmental justice areas were identified as follows:

- *Minority communities:* CEQ guidance defines minorities to include American Indians or Alaskan Natives, Asian and Pacific Islanders, African Americans or Black persons, and Hispanic persons. This environmental justice analysis also considers minority populations to include persons who identified themselves as being either “some other race” or “two or more races” in the 2015–2019 ACS. Following CEQ guidance, minority communities were identified where the minority population of the affected area exceeds 50 percent.
- *Low-income communities:* The percent of individuals living below the poverty level in each census block group, available in the 2015–2019 ACS estimates, was used to identify low-income populations. Because CEQ guidance does not specify a threshold for identifying low-income communities, all census block groups with a low-income population percentage that is meaningfully greater than in Manhattan—in this case, the primary statistical reference area—were considered low-income communities. In Manhattan, approximately 17.7 percent of the total population is living below the federal poverty threshold, so any block group with a low-income population greater than 17.7 percent was considered a low-income community.

D. ENVIRONMENTAL JUSTICE POPULATIONS IN THE STUDY AREA

The environmental justice study area includes 16 census block groups (see **Figure 18-1**). **Table 18-1** shows population and economic characteristics in terms of race, ethnicity, and poverty status.



- WTC Site
- Project Site
- Development Site (Site 5)
- Environmental Justice Study Area
- 13 Census Tract
- BG 1 Block Groups
- PR Poverty Rate
- MR Minority Rate

WTC SITE 5

Environmental Justice Study Area
Figure 18-1

Table 18-1
Study Area Population, Race/Ethnicity, and Poverty Estimates

Census Tract, Block Group	Total Population	Block Group Minority Rate	White	%	Black	%	Asian	%	Hispanic or Latino	%	Other	%	Block Group Poverty Rate
CT 7, BG 1	8,501	26.9%	6,212	73%	70	1%	1,623	19%	441	5%	155	2%	9.0%
CT 9, BG 1	1,796	36.3%	1,144	64%	78	4%	328	18%	166	9%	80	4%	5.4%
CT 13, BG 1	1,856	39.4%	1,125	61%	99	5%	348	19%	117	6%	167	9%	2.6%
CT 13, BG 2	2,599	36.0%	1,664	64%	76	3%	437	17%	303	12%	119	5%	2.7%
CT 15.01, BG 1	3,237	35.7%	2,082	64%	123	4%	646	20%	192	6%	194	6%	3.8%
CT 15.02, BG 1	3,153	26.0%	2,333	74%	86	3%	399	13%	184	6%	151	5%	7.3%
CT 15.02, BG 2	5,156	29.1%	3,657	71%	67	1%	951	18%	261	5%	220	4%	10.5%
CT 21, BG 1	3,236	27.6%	2,344	72%	122	4%	168	5%	515	16%	87	3%	1.9%
CT 21, BG 2	3,430	28.3%	2,460	72%	257	7%	510	15%	151	4%	52	2%	2.5%
CT 317.03, BG 1	596	39.1%	363	61%	0	0%	0	0%	204	34%	29	5%	0.0%
CT 317.03, BG 2	5,187	30.2%	3,622	70%	57	1%	1,150	22%	179	3%	179	3%	2.6%
CT 317.04, BG 1	2,895	25.1%	2,167	75%	143	5%	275	9%	288	10%	22	1%	3.1%
CT 317.04, BG 2	2,174	45.5%	1,185	55%	70	3%	474	22%	232	11%	213	10%	8.4%
CT 317.04, BG 3	1,637	38.7%	1,003	61%	23	1%	361	22%	250	15%	0	0%	7.9%
CT 317.04, BG 4	3,518	35.2%	2,278	65%	0	0%	766	22%	309	9%	165	5%	1.7%
CT 319, BG 1	0	-	0	-	0	-	0	-	0	-	0	-	0.0%
Study Area	48,971	31.3%	33,639	69%	1,271	3%	8,436	17%	3,792	8%	1,833	4%	5.3%
Manhattan	1,631,993	53.10%	765,627	46.90%	205,340	12.50%	37,839	2.70%	403,577	25.80%	37,839	2.70%	17.70%
New York City	8,419,316	67.90%	2,702,286	32.10%	1,837,549	21.80%	224,857	3.00%	2,447,862	29.10%	224,857	3.00%	17.90%

The 2015–2019 ACS estimated the study area had a population of 48,971, less than 3 percent of the total population of Manhattan.

About two-thirds of the study area’s population (69 percent) identified themselves as White and Non-Hispanic, making it the largest racial or ethnic group. Approximately 31 percent of the residents of this study area are minority—a substantially smaller proportion than in Manhattan (53.1 percent) and the City as a whole (67.9 percent). Because the study area’s total minority percentage does not exceed CEQ’s 50 percent threshold, the study area as a whole is not considered a minority community.

In addition, none of the block groups in the study area have low-income population percentages that are greater than in Manhattan and the City as a whole, ranging from 0 percent to about 11 percent. Overall, the study area has a low-income population of 5.3 percent, and therefore does not exceed the CEQ threshold of 25 percent and is not considered a low-income community.

None of the individual block groups would be considered low-income populations or minority populations. Overall, minority representation in the study area does not exceed the 50 percent minority threshold and the low-income population does not exceed the 25 percent threshold.

Furthermore, as described above, the Proposed Project would increase permanent affordable housing opportunities. Additionally, the future population in the permanently affordable units would not be subject to higher costs from flood insurance such that there would be no additional cost burden due to the project’s location in a 100-year floodplain.

Therefore, the entire study area is considered to not be a potential environmental justice area, and the Proposed Amendment would not have the potential to result in any disproportionate and adverse impacts on minority or low-income populations. *

This chapter assesses the potential for the Proposed Project to affect public health. Public health is the organized effort of society to protect and improve the health and well-being of the population through monitoring; assessment and surveillance; health promotion; prevention of disease, injury, disorder, disability, and premature death; and reducing inequalities in health status. The goal of environmental review with respect to public health is to determine whether adverse impacts on human health may occur as a result of a proposed project and, if so, to identify measures to mitigate such effects. The potential effects of the Proposed Project were considered with regard to effects on the surrounding community.

A public health assessment is warranted for a specific technical area if there is a significant adverse impact found in other environmental assessment analysis areas, such as air quality, water quality, hazardous materials, or noise. As described in the relevant analyses in this Environmental Assessment (EA), the Proposed Project would not result in significant unmitigated adverse impacts in any of the technical areas related to public health. Therefore, no further analysis of public health is required, and no significant adverse impacts to public health are expected to occur as a result of the Proposed Amendment. *

A. INTRODUCTION

This chapter examines the potential for construction impacts associated with the Proposed Project. Specifically, it compares the construction on WTC Site 5 (the Development Site) of the Proposed Project to the Approved Plan in the 2004 *FGEIS* to identify any new potential significant adverse construction impacts. Although there have been previous amendments and refinements to the Approved Plan, as described in Chapter 1, “Project Description,” those actions did not vary the construction impacts of the Approved Plan, and the analyses below therefore compare the potential construction impacts of the Proposed Project to those identified in the 2004 *FGEIS*.

The 2004 *FGEIS* assumed that the below grade work at the Southern Site (the Project Site), which included two adjacent blocks one bounded by Liberty, Washington, Albany, and Greenwich Streets which included the Development Site on its southern end and the other bounded by Liberty, Cedar, and Washington Streets and Route 9A and the bed of Washington Street between the two, would take approximately two and a half years to complete. Construction of the Approved Plan for the Development Site, an office building of approximately 57 stories and 839 feet tall with 1.5 to 1.8 million gross square feet (gsf) of development, was anticipated to take approximately three years to complete. With the Proposed Project, construction (including all below grade work) of the Proposed Project with primarily residential uses and a mix of office, retail, and community facility uses, approximately 77 stories and 940 feet tall with a maximum development of approximately 1.628 million gsf, is anticipated to take approximately four and a half years to complete.

This chapter summarizes the planned construction program. The city, state, and federal regulations and policies that govern construction and the Environmental Performance Commitments (EPCs) for the project are described, followed by the anticipated construction schedule and the types of activities likely to occur during construction are described. In addition, the types of construction equipment are discussed, along with the number of workers and truck deliveries. Finally, the potential impacts from these construction activities for the Proposed Project are then assessed.

B. GOVERNMENTAL COORDINATION AND OVERSIGHT

Construction oversight involves several city, state, and federal agencies. **Table 20-1** lists the primary involved agencies and their areas of responsibility. For projects in New York City, primary construction oversight lies with the New York City Department of Buildings (DOB), which ensures that construction projects meet the requirements of the New York City Building Code and that buildings are structurally, electrically, and mechanically safe. In addition, DOB enforces safety regulations to protect workers and the general public during construction: the areas of oversight include installation and operation of equipment such as cranes, sidewalk sheds, and safety netting and scaffolding. The New York City Department of Environmental Protection (DEP) enforces the New York City Noise Code, reviews and approves any needed Remedial Action Work Plans (RAWPs) and Construction Health and Safety Plans (CHASP), and regulates water disposal into the

sewer system as well as abatement of hazardous materials. The New York City Fire Department (FDNY) has primary oversight of compliance with the New York City Fire Code and the installation of tanks containing flammable materials. The New York City Department of Transportation (DOT)'s Office of Construction Mitigation and Coordination (OCMC) reviews and approves any traffic lane and sidewalk closures. New York City Transit (NYCT) coordinates any construction efforts within 200 feet of a subway line/station and any required bus stop relocations. The New York City Landmarks Preservation Commission (LPC) reviews any archaeological testing or monitoring that may be required. LPC also reviews and approves construction protection plans (CPPs) and any monitoring measures necessary to prevent damage to historic structures.

**Table 20-1
Construction Oversight in New York City**

Agency	Areas of Responsibility
New York City	
Department of Buildings	Primary oversight for Building Code and site safety
Department of Environmental Protection	Noise, RAPs/CHASPs, dewatering, hazardous materials abatement
Fire Department	Compliance with Fire Code, fuel tank installation
Department of Transportation	Lane and sidewalk closures
New York City Transit	Construction near subway line/station, bus stop relocation
Landmarks Preservation Commission	Historic and archaeological resources
New York State	
Department of Environmental Conservation	Hazardous materials and fuel/chemical storage tanks
New York State Department of Transportation	West Street / Route 9A right-of-way
United States	
Environmental Protection Agency	Air emissions, noise, hazardous materials, poisons
Occupational Safety and Health Administration	Worker safety

At the state level, the New York State Department of Environmental Conservation (DEC) regulates disposal of hazardous materials, and construction and operation of bulk petroleum and chemical storage tanks. The New York State Department of Transportation (NYSDOT) has jurisdiction over work within the West Street/Route 9A right-of-way.

At the federal level, the U.S. Environmental Protection Agency (EPA) has wide-ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons, although much of the responsibility is delegated to the state level. The Occupational Safety and Health Administration (OSHA) sets standards for work site safety and construction equipment.

C. ENVIRONMENTAL PERFORMANCE COMMITMENTS

The project sponsors for the Lower Manhattan Recovery Projects (*World Trade Center Memorial and Redevelopment Plan, Fulton Street Transit Center, South Ferry Terminal, Route 9A Project, and Permanent WTC PATH Terminal*) developed a common set of EPCs that they were each to undertake, including design elements, construction techniques, and operating procedures to lower the potential for adverse environmental impacts. Unlike a typical environmental review process, which responds to potential impacts with appropriate mitigation, the EPCs provide specific measures for the avoidance and reduction of potential impacts in advance of the environmental review process (see **Table 20-2**). These EPCs incorporate design features and construction practices to preserve the capacity of the local environment and successfully allow for the development of all of the Lower Manhattan Recovery Project and are applicable for both the Approved Plan and the Proposed Project.

**Table 20-2
Environmental Performance Commitments**

Air Quality
Use ultra-low sulfur diesel (ULSD) fuel for all non-road vehicles that operate with diesel engines.
Develop a plan with Con Edison, as appropriate, to disperse grid power throughout the contraction zone. In contract documents, require all contractors and subcontractors to use electrically powered equipment for air compressors, pumps, mixing, de-sanding and grout plants, welding machines, and any other diesel-powered equipment that can be replaced with an electrically powered version.
Use of post-1995 fuel injection engines, which meet the Tier II engine emissions standards, as defined in Title 40, Part 89.112. Exception will be made only for specific engines that are not yet commercially available as Tier II, and where the task cannot be reasonably accomplished using alternative engines or means which do comply with these demands. In such cases, the contractor would submit a request for an exception for review and approval prior to implementation.
Use of Diesel Particle Filters (DPFs) or other measures with equivalent particulate matter removal efficiency for all non-road diesel engines of 50 horsepower or greater. In cases where DPFs would not be feasible for safety considerations, mechanical reasons, or where the technology would not function properly, the constructor would submit a request for an exception for review and approval prior to implementation, and in these cases, Diesel Oxidation Catalysts (DOCs) may be used. Only in cases where, for technical reasons, neither DPFs or DOCs can be used effectively, and where the operation cannot be performed by another engine or other means, would the use of diesel engines greater than 50 horsepower be allowed without tailpipe reduction measures, subject to the above-described approval process.
Prepare a Diesel Emission Mitigation Plan that shall address the control of emissions from all engines and vehicles including those that are not equipped with emission control devices. The Plan would limit idling times on diesel powered engines to three minutes and would require that contractors locate diesel powered engines away from fresh air intakes.
Require contractors to submit a Dust Control Plan. Among other things, the plan would contain protocols and procedures for the spraying of dust piles, containment of fugitive dust, and appropriate adjustment measures to accommodate changes in meteorological conditions.
Continue to investigate additional means (e.g., fuel emulsions) to reduce NO _x (NO and NO ₂) emissions, but it is not yet known whether these measures would reduce the effectiveness of the above described mitigation. Therefore, specific means to further reduce NO _x have not been identified at this time. If this investigation results in additional means to reduce NO _x without jeopardizing the particulate matter reduction measures, and if other constraints such as technological availability are resolved, then these additional mitigation techniques would be implemented, as appropriate.
Implement verification procedures through construction specifications and contract documents. Verify mitigation and identify opportunities to expand its implementation as part of its ongoing oversight and auditing of the Project's construction. Implement project-specific verification procedures in accordance with decisions of the Lower Manhattan Construction Command Center (LMCCC), including procedures for reporting updates to the public.
Noise and Vibration
Where practicable, schedule individual project construction activities to avoid or minimize adverse impacts.
Coordinate construction activities with projects under construction in adjacent and nearby locations to avoid or minimize adverse impacts.
Consider condition of surrounding buildings, structures, infrastructures, and utilities where appropriate.
Prepare contingency measures in the event that established limits are exceeded.
Access and Circulation
Establish a project-specific pedestrian and vehicular maintenance and protection plan.
Promote public awareness through mechanisms such as: (a) signage; (b) telephone hotline; and (c) website updates.
Ensure sufficient alternate street, building, and station access during construction period.
Regular communication with New York City Department of Transportation and participation in its construction efforts.

Table 20-2 (cont'd)

Environmental Performance Commitments

Cultural and Historic Resources
Establish coordination among projects to avoid or minimize interruption in access to cultural and historic sites.
Initiate public information and involvement outreach with sensitivity to local cultural resources.
Identify public information outlets that will receive and provide current information about access during construction.
Consult with SHPO and LPC regarding potentially impacted, culturally significant sites. Monitor noise and vibration during construction at such sites as appropriate.
Economic Conditions
Coordinate with LMDC, Downtown Alliance, or other entities to minimize residential and retail impacts as required through: (a) relocation assistance, as applicable, to persons and businesses physically displaced by the project; and (b) focus on essential business and amenities to remain in Lower Manhattan.
Add appropriate signage for affected businesses and amenities.

D. CONSTRUCTION PHASING AND SCHEDULE

The 2004 FGEIS assumed that the below grade work at the Project Site (formerly the Southern Site) would take approximately two and a half years to complete and that construction of office tower on the Development Site would take approximately three years to complete. The construction of the residential building (including underground work) is now anticipated to take approximately four and a half years to complete. **Table 20-3** presents the anticipated construction schedule for the Proposed Project.

Construction would proceed in several stages, some of which would overlap - excavation and foundation, superstructure, exteriors, interiors, and sitework. These stages are described in greater detail below.

Table 20-3

Anticipated Site 5 Construction—Proposed Project

Construction Task	Start Month	Finish Month	Approximate Duration (months)¹
Excavation and Foundation	Month 1	Month 11	11
Superstructure	Month 12	Month 34	23
Exteriors	Month 21	Month 40	20
Interiors	Month 13	Month 54	42
Sitework	Month 41	Month 48	8
Overall:	Month 1	Month 54	54
Note: ¹ Construction would proceed in several stages, some of which would overlap.			
Source: Silverstein Properties, April 2021			

E. CONSTRUCTION DESCRIPTION

The following provides a description of the general practices and activities for the construction of the Proposed Project.

GENERAL CONSTRUCTION PRACTICES

HOURS OF WORK

Construction would be carried out in accordance with New York City laws and regulations, which allow construction activities between 7:00 AM and 6:00 PM on weekdays. Construction work would typically begin at 7 AM on weekdays, with most workers arriving between 6:00 AM and 7:00 AM. Normally, work would end at 3:30 PM, but it can be expected that, to complete certain critical tasks such as finishing a concrete pour for a floor deck during superstructure activities, the workday could be extended beyond normal work hours. Any extended workdays would generally last until approximately 6:00 PM.

Weekend or night work may also be required for certain construction activities and to make up for weather delays. Appropriate work permits from DOB would be obtained for any necessary work outside of normal construction hours and no work outside of normal construction hours would be performed until such permits are obtained. The numbers of workers and pieces of equipment in operation for night or weekend work would typically be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend or night work would be less than that of a normal workday.

DELIVERIES AND ACCESS

During construction, access to the construction site would be fully controlled. Work areas would be fenced off, and limited access points for workers and trucks would be provided. Based on the preliminary logistics plan, the tower crane would be placed within the footprint of Tower 5 to maximize pick capacity while still being able to provide access all areas of the slabs for the proposed building. This would reduce impact to pedestrians since the tower crane is located centrally within the site rather than on the sidewalk. Additionally, this allows for the shortest crane ties possible, which creates a much safer condition during crane takedown.

Material deliveries to the construction area would be controlled and scheduled. Based on the preliminary construction logistics plan, the loading docks are anticipated to be located on the north and south sides of Site 5 to minimize traffic on Greenwich Street. Typically, construction delivery trucks would access the Development Site from West Street turning onto Albany Street and exit the Development Site via Washington Street or Greenwich Street (south of Cedar Street only). No construction-related truck traffic is intended north of the Development Site along Greenwich Street. Concrete operations are anticipated to be staged in dedicated lane on Albany Street. Maintenance and Protection of Traffic (MPT) plans would be developed for any required temporary sidewalk and lane narrowing and/or closures to ensure the safety of the construction workers and the public passing through the area. Approval of these plans and implementation of the closures would be coordinated with DOT's OCMC. Measures specified in the MPT plans that are anticipated to be implemented would include parking lane closures, safety signs, safety barriers, and construction fencing.

PUBLIC SAFETY

A variety of measures would be employed to ensure public safety during the construction, including sidewalk bridges to provide overhead protection; safety signs to alert the public about active construction work; safety barriers to ensure the safety of the public passing by construction areas; experienced flag persons to control trucks entering and exiting the construction areas and/or to provide guidance for pedestrians and bicyclists safety; and safety nettings as the superstructure work advances upward to prevent debris from falling to the ground. All DOB safety requirements would be followed to ensure the safety of the community and the construction workers themselves.

RODENT CONTROL

Construction contracts would include provisions for a rodent (i.e., mouse and rat) control program. Before the start of construction, the contractor would survey and bait the appropriate areas and provide for proper site sanitation. During construction, the contractor would carry out a maintenance program, as necessary. Signage would be posted, and coordination would be conducted with appropriate agencies.

DESCRIPTION OF CONSTRUCTION ACTIVITIES

Prior to the commencement of construction, the work area would be prepared for construction, including the installation of public safety measures such as barriers, netting, and signs. The construction areas would be fenced off. Worker and truck access points would be established, and existing street trees would be protected.

Construction of the Proposed Project would then proceed with the excavation and foundation, superstructure, exteriors, interiors, and sitework stages, which are discussed below.

EXCAVATION AND FOUNDATION

The construction would begin with excavation activities for the proposed building's cellar and foundation. The stage of construction would begin with the demolition of the existing old foundations from the previous building on the Development Site. Conventional hoe-rams and hydraulic excavators would be used for the demolition activities. Once the foundations are demolished, excavation work would commence. Excavators would then be used to excavate soil and the soil would be loaded onto dump trucks for transport to a licensed disposal facility or stored for reuse on any portion of the Development Site that needs fill.

This stage would also include the construction of the foundation and below-grade elements of the proposed building. The building foundation system for the proposed residential building is expected to be drilled concrete caissons extending down to bedrock. Piles would be installed with the use of drill rigs and no driven piles are anticipated to be needed. Once the piles are installed, concrete trucks would be used to pour the foundation and the below-grade structures. No blasting is anticipated for the Development Site based on the depth of the bedrock which is underneath the two-level below grade structure of the Proposed Project.

Dewatering

Water from rain and snow collected in the excavation area during construction would be removed using a dewatering pump. Groundwater dewatering would be performed in accordance with DEP sewer use requirements.

SUPERSTRUCTURE

The superstructure work would include the framework for the proposed building, such as beams, slabs, and columns. Construction of the interior structure—or core—of the building would include elevator shafts; vertical risers for mechanical, electrical, and plumbing systems; electrical and mechanical equipment rooms; core stairs; and restroom areas. A tower crane would first be brought onto the Development Site during the superstructure phase and would be used to lift structural components and other large materials. Superstructure activities may also include the use of bar bending machine, concrete vibrators, concrete finishers, and a variety of trucks. In addition, temporary construction elevators (hoists) would be used for the vertical movement of workers and materials during superstructure activities.

EXTERIORS

During this stage of construction, the exterior envelope systems of the proposed building would be installed. The curtain wall units would be delivered to the site for installation with the use of cranes and cherry pickers. This stage of construction would overlap with a portion of the superstructure work.

INTERIORS

Activities during the interiors stage would include the construction of interior partitions, installation of lighting fixtures and interior finishes (e.g., flooring, painting, etc.), and mechanical and electrical work, such as the installation of elevators and lobby finishes. Final cleanup and touchup of the building and final building system (e.g., electrical system, fire alarm, plumbing, etc.) testing and inspections would be part of this stage of construction. Equipment used during interiors and finishing would include a hoist, welders, and a variety of small handheld tools.

Interiors and finishing would typically be the quietest period of construction in terms of its effect on the public, because most of the construction activities would occur inside the building with the façades substantially complete and the proposed building enclosed.

SITWORK

During the sitework stage, soil would be brought to the site for the grassy areas and landscaping. Where necessary, pedestrian areas adjacent to the Development Site would be resurfaced. Site work would include equipment such as rollers, compactors, and pavers.

F. NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES FOR THE PROPOSED PROJECT

Table 20-4 shows the estimated averaged daily numbers of workers and deliveries to the Development Site with the Proposed Project by calendar quarter for all construction activities. For the Proposed Project, the combined peak construction worker vehicle and truck trip generation would occur during the third quarter of Year 3 construction. The average number of workers throughout the construction period would be 350 per day. The peak number of workers would be 618 per day in the third quarter of Year 3 construction. For truck trips, the average number of trucks would be 16 per day, and the peak would occur from the first to the third quarters of Year 3 construction, with 30 trucks per day.

**Table 20-4
Average Number of Daily Workers and Trucks by Quarter
Proposed Project**

Year	Year 1				Year 2				Year 3			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	69	87	88	114	232	328	487	565	567	597	618	510
Trucks	12	16	15	15	23	25	27	29	30	30	30	15
Year	Year 4				Year 5							
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	Peak	Average		
Workers	473	443	414	374	209	119	-	-	618	350		
Trucks	8	7	6	5	2	1	-	-	30	16		

Source: Silverstein Properties, April 2021

G. ENVIRONMENTAL EFFECTS OF THE PROPOSED PROJECT'S CONSTRUCTION ACTIVITIES

Similar to other construction projects in New York City, construction of the Proposed Project would result in some temporary disruptions to the surrounding area. The following compares the construction program for the Proposed Project against the Approved Plan to identify any new potential significant adverse construction impacts on transportation, air quality, noise, and vibration. It also considers potential effects in other technical areas including land use and neighborhood character, socioeconomic conditions, community facilities, open space, historic and cultural resources, hazardous materials, and water and sewer infrastructure. Overall, the somewhat longer construction period would reduce the number of workers coming to the site at any one time and result in reduced potential for any significant adverse impacts from construction activities.

TRANSPORTATION

The construction transportation analysis assesses the potential for construction activities to result in significant adverse impacts to traffic, transit (i.e., subway and bus), pedestrian elements (i.e., sidewalks, corners, and crosswalks), and parking conditions. The analysis is based on the peak worker and truck trips during construction of the Proposed Project which, as described below, are developed based on several factors including worker modal splits (how the workers access the sites per mode of transportation: automobile, transit, or walking), vehicle occupancy and trip distribution, truck passenger car equivalents (PCEs), and arrival/departure patterns. Based on the projections summarized in **Table 20-4**, the greatest construction-related traffic demand with the Proposed Project (the With Action condition) would occur during the third quarter of Year 3, when the combination of worker vehicle trips and truck trips would be the highest. The greatest construction-related pedestrian, transit, and parking demand would occur during that same time period. In comparison, construction activities associated with the Approved Tower 5 Plan (the No Action condition) would peak at approximately the same time as in the With Action Scenario, when the number of worker vehicle trips would be near its peak and the number of truck trips would be at its highest. The assessments presented below compare the peak activities under the With Action and No Action conditions and determine if the forecast increments would have the potential to result in transportation-related impacts during construction. As described in Chapter 12, "Transportation," although there have been previous amendments and refinements to the Approved Plan, as described in Chapter 1, "Project Description," those actions did not vary the construction transportation impacts of the Approved Plan, and the analyses below therefore compare the potential transportation impacts of the Proposed Project to those identified in the 2004 FGEIS.

SUMMARY OF 2004 FGEIS CONSTRUCTION TRANSPORTATION ANALYSIS RESULTS

Analysis of the Refinements to the 2004 FGEIS of the Approved Plan did not quantitatively address changes in construction workers or trucks per day. However, refinements to the construction on the Development Site would not have substantially changed these numbers. Therefore, the Approved Plan would have comparable numbers of construction workers and trucks per day as compared to the 2004 FGEIS. The 2004 FGEIS analyzed the construction of all World Trade Center project components, including the Development Site. Although the 2004 FGEIS did not separately assess the potential for significant adverse construction transportation impacts from the Development Site, it did provide a range of daily worker and truck delivery numbers for the peak quarter of construction on the Development Site in an Appendix. The average of the range of daily workers and truck

delivery numbers was selected for comparison to the With Action condition. Similar to the analysis presented in Chapter 12, “Transportation,” the travel demand factors were updated to the most recent U.S. Census Bureau statistics and 2020 *CEQR Technical Manual* guidance.

TRAFFIC

For traffic, the forecasted trip increments were distributed across different hours of the workday by direction of travel, and truck trips were converted to passenger car equivalents (PCEs). These estimates were then compared to the *CEQR Technical Manual* analysis thresholds to determine if further analyses are warranted to determine the potential for construction traffic impacts.

Daily Workforce and Truck Deliveries

For a reasonable worst-case analysis of potential traffic-related impacts during construction, the daily workforce and truck trip projections in the peak quarter were used to estimate peak hour construction trips. It is expected that construction of the Proposed Project would generate the highest amount of combined daily traffic in the third quarter of Year 3 construction, with an estimated average of 618 workers and 29 truck deliveries per day. In comparison, under the No Action condition, peak construction at the Development Site is expected to yield 593 workers and 115 truck deliveries per day.

Construction Worker Modal Splits and Vehicle Occupancy

Based on the latest available U.S. Census data for workers in the construction and excavation industry (2000 Census, Reverse-Journey-to-Work [RJTW] data for Manhattan tracts 7, 9, 13, 15.01, 15.02, and 21), it is anticipated that 27 percent of construction workers would commute to the Development Site using private autos at an average occupancy of approximately 1.20 persons per vehicle. Approximately 71 percent of the construction workers would commute via public transportation (subway and bus), and 2 percent would walk.

Peak Hour Construction Worker Vehicle and Truck Trips

Similar to other construction projects in New York City, most of the construction activities at the Development Site are expected to take place from 7:00 AM to 3:30 PM. While construction truck trips would occur throughout the day (with more trips during the morning), and most trucks would remain in the area for short durations, most construction workers would commute during the hours before and after the work shift. For analysis purposes, each truck delivery was assumed to result in two truck trips during the same hour (one “in” and one “out”), whereas each worker vehicle was assumed to arrive near the work shift start hour and depart near the work-shift end hour. Further, in accordance with the *CEQR Technical Manual*, it was assumed that each truck has a PCE of two.

The estimated daily vehicle trips were distributed throughout the workday based on projected work shift allocations and likely arrival/departure patterns for construction workers and trucks. For construction workers, the majority (approximately 80 percent) of the arrival and departure trips would take place during the hour before and after each work shift (6:00 to 7:00 AM for arrival and 3:00 to 4:00 PM for departure on a regular day shift). Construction truck deliveries into the construction site typically peak during the hour (6:00 to 7:00 AM) before each shift (25 percent), overlapping with construction worker arrival traffic.

Table 20-5 presents the hourly incremental trip projections. As shown, the maximum construction-related traffic increments would be approximately -14 PCEs between 6:00 AM and 7:00 AM and 54 PCEs between 3:00 PM and 4:00 PM. Based on a reconnaissance of the

surrounding parking resources, there is very limited available on-street parking nearby and there are few off-street parking facilities within ¼-mile from the Development Site. As such, the incremental construction worker vehicle trips (74 during the construction AM and PM peak hours) would be dispersed to a wide area distributed among many area intersections. In addition, truck deliveries, which are projected to yield negative increments, would further diminish any incremental vehicle trips through these intersections, such that the trip increments at any individual intersections are not expected to exceed the *CEQR Technical Manual* analysis threshold of 50 peak hour vehicle trips to warrant any detailed analyses. Accordingly, incremental trips resulting from construction of the Proposed Project would not result in the potential for significant adverse traffic impacts.

TRANSIT

As described above, based on the latest available U.S. Census data for workers in the construction and excavation industry, it is anticipated that 71 percent of construction workers would commute to the Development Site via public transportation. With a total increment of 25 construction workers, the worker transit trips would be well below the *CEQR Technical Manual* analysis threshold of 200 peak hour transit trips. Therefore, no further detailed transit analyses are warranted and incremental trips resulting from construction of the Proposed Project would not have the potential to result in significant adverse transit impacts during construction.

PEDESTRIANS

With a total increment of 25 construction worker pedestrians, the construction worker pedestrian trips would be well below the *CEQR Technical Manual* analysis threshold of 200 peak hour pedestrian trips. Therefore, a detailed pedestrian analysis is not warranted, and incremental trips resulting from construction of the Proposed Project would not result in the potential for significant adverse pedestrian impacts.

PARKING

Typically, when a detailed traffic impact analysis is not warranted, an assessment of the area's parking supply and demand is also not required. Therefore, based on the above traffic assessment, incremental trips resulting from construction of the Proposed Project would not result in a parking shortfall or a significant adverse parking impact.

AIR QUALITY

Construction activities at the Development Site would require the use of both non-road construction equipment and on-road vehicles, which would result in emissions that have the potential to affect air quality. Non-road construction equipment includes equipment operating on-site, such as cranes, loaders, and excavators. On-road vehicles include worker vehicles and construction trucks arriving to and departing from the site as well as operating on-site. In addition, emissions from dust-generating construction activities (i.e., truck loading and unloading operations) also have the potential to affect air quality. The construction air quality analysis presented in this chapter considers whether the construction of the Proposed Project would have the potential to result in new or different construction air quality impacts as compared to the construction of the Approved Plan as analyzed in the 2004 FGEIS. This technical analysis compares the emissions generated by construction activities for the Proposed Project to that of the Approved Plan as analyzed in 2004 FGEIS.

**Table 20-5
Peak Construction Incremental Vehicle Trip Projections**

Hour	Auto Trips			Truck Trips			Total					
	In	Out	Total	In	Out	Total	Vehicle Trips			PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
With Action Construction												
6 AM-7 AM	111	0	111	7	7	14	118	7	125	125	14	139
7 AM-8 AM	28	0	28	3	3	6	31	3	34	34	6	40
8 AM-9 AM	0	0	0	3	3	6	3	3	6	6	6	12
9 AM-10 AM	0	0	0	3	3	6	3	3	6	6	6	12
10 AM-11 AM	0	0	0	3	3	6	3	3	6	6	6	12
11 AM-12 PM	0	0	0	3	3	6	3	3	6	6	6	12
12 PM-1 PM	0	0	0	3	3	6	3	3	6	6	6	12
1 PM-2 PM	0	0	0	1	1	2	1	1	2	2	2	4
2 PM-3 PM	0	7	7	1	1	2	1	8	9	2	9	11
3 PM-4 PM	0	111	111	1	1	2	1	112	113	2	113	115
4 PM-5 PM	0	21	21	0	0	0	0	21	21	0	21	21
Daily Total	139	139	278	28	28	56	167	167	334	195	195	390
No Action Construction												
6 AM-7 AM	37	0	37	29	29	58	66	29	95	95	58	153
7 AM-8 AM	9	0	9	11	11	22	20	11	31	31	22	53
8 AM-9 AM	0	0	0	11	11	22	11	11	22	22	22	44
9 AM-10 AM	0	0	0	12	12	24	12	12	24	24	24	48
10 AM-11 AM	0	0	0	12	12	24	12	12	24	24	24	48
11 AM-12 PM	0	0	0	11	11	22	11	11	22	22	22	44
12 PM-1 PM	0	0	0	11	11	22	11	11	22	22	22	44
1 PM-2 PM	0	0	0	6	6	12	6	6	12	12	12	24
2 PM-3 PM	0	2	2	6	6	12	6	8	14	12	14	26
3 PM-4 PM	0	37	37	6	6	12	6	43	49	12	49	61
4 PM-5 PM	0	7	7	0	0	0	0	7	7	0	7	7
Daily Total	46	46	92	115	115	230	161	161	322	276	276	552
Peak Construction Increments												
6 AM-7 AM	74	0	74	-22	-22	-44	52	-22	30	30	-44	-14
7 AM-8 AM	19	0	19	-8	-8	-16	11	-8	3	3	-16	-13
8 AM-9 AM	0	0	0	-8	-8	-16	-8	-8	-16	-16	-16	-32
9 AM-10 AM	0	0	0	-9	-9	-18	-9	-9	-18	-18	-18	-36
10 AM-11 AM	0	0	0	-9	-9	-18	-9	-9	-18	-18	-18	-36
11 AM-12 PM	0	0	0	-8	-8	-16	-8	-8	-16	-16	-16	-32
12 PM-1 PM	0	0	0	-8	-8	-16	-8	-8	-16	-16	-16	-32
1 PM-2 PM	0	0	0	-5	-5	-10	-5	-5	-10	-10	-10	-20
2 PM-3 PM	0	5	5	-5	-5	-10	-5	0	-5	-10	-5	-15
3 PM-4 PM	0	74	74	-5	-5	-10	-5	69	64	-10	64	54
4 PM-5 PM	0	14	14	0	0	0	0	14	14	0	14	14
Daily Total	93	93	186	-87	-87	-174	6	6	12	-81	-81	-162

Note: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

SUMMARY OF 2004 FGEIS CONSTRUCTION AIR QUALITY ANALYSIS RESULTS

As described in the 2004 FGEIS, no significant adverse impacts on particulate matter (PM) were predicted along the construction access routes for the Approved Plan, and no significant adverse impacts were predicted on overall concentrations of particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM₁₀) in the vicinity of the construction sites. However, absent mitigation, the predicted maximum increases in concentrations of respirable particles with an aerodynamic diameter of less than or equal to 2.5 micrometers (PM_{2.5}) at locations immediately adjacent to the construction activity, due to the Approved Plan alone as well as the cumulative impact of the Approved Plan and the other major reconstruction projects were substantially higher than the

guidance thresholds for both annual and 24-hour average. Under the worst-case conditions, it was also predicted that the cumulative impact of the Approved Plan and the other major reconstruction projects would substantially exceed the 24-hour average PM_{2.5} National Ambient Air Quality Standard (NAAQS) without mitigation. While nitrogen dioxide (NO₂) levels would not exceed the NAAQS, a significant adverse impact on NO₂ concentrations was predicted, absent mitigation, immediately adjacent to the construction site.

LMDC committed to implement measures to reduce significant air quality impacts resulting from construction, which were outlined in the EPCs as presented above in **Table 20-2**. More specifically, the EPCs called for the development and implementation of a Construction Environmental Protection Plan prior to construction, which summarizes the wide array of construction reduction strategies the Developers would explore and implement during construction to minimize construction effects, including reducing potential air emissions, to the lowest practicable level.

CRITERIA POLLUTANTS

As required by the Clean Air Act, primary and secondary NAAQS have been established for six major criteria air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone, respirable PM [both PM_{2.5} and PM₁₀], sulfur dioxide (SO₂), and lead. The NAAQS and associated averaging times are presented in Chapter 13, "Air Quality." In general, much of the heavy equipment used in construction is powered by diesel engines that have the potential to produce relatively high levels of nitrogen oxides (NO_x) and PM emissions. Dust generated by construction activities is also a source of PM emissions, and gasoline engines produce relatively high levels of CO. Since EPA mandates the use of ULSD¹ fuel for all highway and non-road diesel engines, sulfur oxides (SO_x) emitted by construction activities would be negligible. Therefore, the pollutants analyzed for the construction period were NO₂, the component of NO_x that is a regulated pollutant, along with PM₁₀, PM_{2.5}, and CO.

EMISSIONS REDUCTION MEASURES

The 2004 FGEIS analysis predicted potential construction air quality impacts at nearby receptors and described control measures to be included in the construction program to reduce air emissions at these receptors. Among the control measures specified by the 2004 FGEIS was the preparation of a Diesel Emission Mitigation Plan to minimize the use of diesel engines and to require the use of the grid for electricity instead of portable generators where possible; limit unnecessary idling of vehicles and non-road engines; require the use of ultra-low sulfur diesel fuel, best available tailpipe emissions reduction technologies, and engines that meet at least EPA's Tier 2 emission standard; and require placement of stationary engines at a minimum of 50 feet from sensitive locations where feasible and practicable.

Since the publication of the 2004 FGEIS, additional air emission reduction technologies have become available. EPA's Tier 1 through 4 standards for non-road engines regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons (HC) and the Tier 4 emissions standard for newly manufactured non-road diesel engines have a phased-in period of 2008 to 2015. The modeling analysis for the 2004 FGEIS assumed that all non-road

¹ As of 2015, the diesel fuel produced by all large refiners, small refiners, and importers must be ULSD fuel, with sulfur levels in non-road diesel fuel limited to a maximum of 15 parts per million (ppm).

construction equipment with a power rating of 50 hp or greater would meet at least the Tier 2 emissions standard and be equipped with a diesel oxidation catalyst (DOC) where it was conservatively assumed that PM emissions from all such engines equipped with a DOC would be further reduced by 40 percent. However, Tier 4 PM emissions are approximately 90 percent lower than Tier 2 emissions and considerably lower than uncontrolled engines. In addition, the Tier 4 engines meet NO_x emission limits that are much more stringent than the limits applicable to older construction equipment. Over time, irrespective of any project-specific commitments, there has been an increasing percentage of non-road diesel engines on-site conforming to the Tier 4 emissions standards in the New York City construction industry since the Tier 4 standard was introduced, resulting in reduced pollutant emissions during construction activities. Therefore, construction of the Proposed Project is expected to result in substantially lower concentrations than those disclosed in the 2004 FGEIS.

CONSTRUCTION AIR QUALITY ANALYSIS RESULTS

Since the 2004 FGEIS was published, several developments and changes took place in the overall study area as well as immediately adjacent to the Development Site. In the current study area, the area north of the Development Site comprises the Memorial Plaza and Museum (the original WTC site), the Port Authority Police Department's Vehicle Security Center (VSC), and Liberty Park. To the east, south, and west of Site 5 are a variety of old, new, small, and large buildings that are occupied by a mix of uses. The new St. Nicholas Greek Orthodox Church immediately to the north is currently under construction at the eastern end of Liberty Park. The Memorial Plaza and Museum also opened to visitors. The blocks immediately to the east, south, and west of Site 5 include both older and new buildings containing residential and commercial uses, hotels, and a school. The block to the southeast of Site 5 includes an under-construction residential tower at 125 Greenwich Street, east of which is the High School for Leadership and Public Service. Some of the developments that have been completed since the publication of the 2004 FGEIS result in additional receptor locations in proximity to the site not previously analyzed in the 2004 FGEIS. However, none of these additional receptors would be located closer to the construction activities than the closest receptors (e.g., sidewalk locations immediately adjacent to the Development Site) analyzed in the 2004 FGEIS analysis where the maximum concentrations from construction activities were predicted.

The approach and procedures for the construction activities at the Development Site for the Proposed Project would be typical of the methods utilized in other building construction projects throughout New York City, and therefore would not be considered out of the ordinary in terms of intensity. In addition, the Proposed Project would involve the same type of building construction activities (e.g., excavation, foundation, superstructure, and interiors) as those analyzed in the 2004 FGEIS. While construction of the Proposed Project would have a longer duration than that evaluated in the 2004 FGEIS, at individual receptor locations, concentrations of potential concern are almost entirely due to intensive construction equipment emission sources located in close proximity to the receptor locations, and the longer overall duration of construction would not increase, and could in some cases be reduced, the intensity of construction operations near individual receptor locations.

The additional construction time for the Proposed Project would include superstructure and interiors construction of the somewhat taller residential tower compared to the office building assumed in the Approved Plan. However, because the construction activities during this additional time would not be the most emissions-intensive activities and because much of the construction would take place at elevated locations or within the enclosed building with no line of sight to some

or all receptors, the additional duration of superstructure and interiors construction would not necessarily consist of increased duration of exposure to construction emissions.

Furthermore, as discussed above, the Proposed Project is expected to result in substantially lower pollutant concentrations than those disclosed in the 2004 FGEIS since LMDC is committed to implement measures to reduce significant air quality impacts resulting from construction, which were outlined in the EPCs. There would also be an increasing percentage of non-road diesel engines on-site conforming to the Tier 4 emissions standards, resulting in a substantial reduction of pollutant emissions during construction activities.

Based on the analyses provided and implementation of the emissions reduction measures that are beyond those assumed in the 2004 FGEIS, and in consideration of the minimal difference in air quality effects between the Proposed Project and the Approved Plan during peak construction activities, construction of the Proposed Project would not result in any new significant adverse construction air quality impacts.

NOISE

The noise analysis presented in this chapter considers whether the construction of the Proposed Project would result in new or different construction noise impacts as compared to construction of the Approved Plan. As noted previously, the 2004 FGEIS considered the potential for significant adverse construction noise impacts resulting from construction of the 57-story office building on the Development Site, estimated to take approximately three years to complete. The analysis predicted potential construction noise impacts at nearby receptors and described control measures to be included in the construction program to reduce noise at these receptors. The Proposed Project would allow for residential and community facility use in addition to the currently approved office and retail use, and construction of the Proposed Project is now anticipated to take approximately four and a half years to complete. This technical analysis will compare the intensity and duration of construction noise for the Proposed Project to that of the Approved Plan as analyzed in 2004 FGEIS.

SUMMARY OF 2004 FGEIS CONSTRUCTION NOISE ANALYSIS RESULTS

The 2004 FGEIS identified the potential for significant adverse construction noise impacts. Specifically, noise levels attributed to on-site construction activities were projected to exceed CEQR noise impact criteria at all receptor locations evaluated, except for Sites 1, 12, and 18 to 20. This included the receptors near the Development Site, specifically: Site 7, a residential building at Cedar Street and Washington (now a hotel at 140 Washington Street); Site 8, a hotel at 85 West Street; Site 9, a residential building at 4 Albany Street; Site 10, an institutional building at 120 Cedar Street (a 5-story mixed-use building with retail on the first floor and residences above); and Site 11, a residential building at 114 Liberty Street. The 2004 FGEIS also evaluated construction noise using the DEC and Federal Transit Administration (FTA) construction noise impact criteria. However, the current analysis of noise due to construction of the Proposed Project uses CEQR and DEC criteria only, which are more stringent than FTA criteria for construction occurring primarily during daytime hours.

As described above, LMDC is committed to implementing measures to reduce significant noise impacts resulting from construction by means of development and implementation of a Construction Environmental Protection Plan prior to construction. The plan will summarize the construction noise reduction strategies that the Developers would employ.

CONSTRUCTION NOISE IMPACT CRITERIA

Chapter 22 of the *CEQR Technical Manual* breaks construction duration into “short-term” and “long-term” and states that construction noise is not likely to require analysis unless it “affects a sensitive receptor over a long period of time.” Consequently, the construction noise analysis considers the potential for construction of a project to create high noise levels (the “intensity”), whether construction noise would occur for an extended period of time (the “duration”), and the locations where construction has the potential to produce noise (“receptors”) in evaluating potential construction noise effects.

The noise impact criteria described in Chapter 19, Section 410 of the *CEQR Technical Manual* serve as a screening-level threshold for potential construction noise impacts. If construction of the proposed project would not result in any exceedances of these criteria at a given receptor, then that receptor would not have the potential to experience a construction noise impact. The screening level noise impact criteria for mobile and on-site construction activities are as follows:

- If the No Action noise level is less than 60 dBA $L_{eq(1)}$, a 5 dBA $L_{eq(1)}$ or greater increase would require further consideration.
- If the No Action noise level is between 60 dBA $L_{eq(1)}$ and 62 dBA $L_{eq(1)}$, a resultant $L_{eq(1)}$ of 65 dBA or greater would require further consideration.
- If the No Action noise level is equal to or greater than 62 dBA $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR criteria as being between 10PM and 7AM), the threshold requiring further consideration would be a 3 dBA $L_{eq(1)}$ or greater increase.

If construction of a proposed project would result in exceedances of these noise impact criteria at a receptor, then further consideration of the intensity and duration of construction noise is warranted at that receptor. Generally, exceedances of these criteria for 24 or more consecutive months are considered to be significant impacts. Noise level increases that would be considered objectionable (i.e., equal to or greater than 15 dBA) lasting 12 or more consecutive months or more and noise level increases considered very objectionable (i.e., equal to or greater than 20 dBA)² lasting three or more consecutive months would also be considered significant impacts.

NOISE REDUCTION MEASURES

The 2004 FGEIS analysis predicted potential construction noise impacts at nearby receptors and described control measures to be included in the construction program to reduce noise at these receptors. Among the control measures specified by the 2004 FGEIS was the restriction of construction hours to avoid late night hours, the use of noise curtains or noise enclosures, placing two cubic yards of soil in truck body prior to loading excavated material to mitigate rock impact noise, fitting cranes with silencers, and using flagmen or manually adjustable alarms to reduce back-up alarm noise.

Further, construction of the Proposed Project would be required to follow the requirements of the *New York City Noise Control Code* (also known as Chapter 24 of the *Administrative Code of the City of New York*, or Local Law 113). The Code, introduced in 2005 after completion of the 2004 FGEIS, includes construction noise control measures applicable to all construction sites in New

² Definition of “objectionable” and “very objectionable” noise level increases based on Table B from New York State Department of Environmental Conservation (NYSDEC) *Assessing and Mitigating Noise Impacts* policy manual, revised February 2001.

York City. Additionally, construction of the Proposed Project would incorporate some noise control measures that go beyond those required by Code. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the *New York City Noise Control Code*. These measures could include a variety of source and path controls.

In terms of source controls (i.e., reducing noise levels at the source or during the most sensitive time periods), the following measures would be implemented in accordance with the *New York City Noise Code* and the commitments described in the 2004 FGEIS:

- Equipment that meets the sound level standards specified in Subchapter 5 of the *New York City Noise Control Code* would be utilized from the start of construction. **Table 20-6** shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the proposed project.
- As early in the construction period as logistics would allow, diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders, water pumps, bench saws, and table saws (i.e., early electrification) to the extent feasible and practicable. Where electrical equipment cannot be used, diesel or gas-powered generators and pumps would be located within buildings to the extent feasible and practicable.
- Where feasible and practicable, construction sites would be configured to minimize back-up alarm noise. In addition, all trucks would not be allowed to idle more than 3 minutes at the construction site based upon Title 24, Chapter 1, Subchapter 7, Section 24-163 of the New York City Administrative Code.
- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.

In terms of path controls (e.g., placement of equipment, implementation of barriers or enclosures between equipment and sensitive receptors), the following measures for construction would be implemented:

- Where logistics allow, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations;
- Noise barriers at least 8 feet tall with a cantilever toward the work area would be erected around the Development Site to provide shielding;
- The barriers would be constructed from plywood or other materials consistent with the noise barrier requirements set forth in DEP's *Rules for Citywide Construction Noise Mitigation*;
- Concrete trucks would be required to be located inside site-perimeter noise barriers while pouring or being washed out; and
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents) for certain dominant noise equipment to the extent feasible and practical based on the results of the construction noise calculations. The details to construct portable noise barriers, enclosures, tents, etc. are shown in DEP's *Rules for Citywide Construction Noise Mitigation*.³

³ As found at http://www.nyc.gov/html/dep/pdf/noise_constr_rule.pdf

Table 20-6
Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	L_{max} Noise Level at 50 feet
Auger Drill Rig	85
Backhoe	80
Bar Bender	80
Chainsaw	85
Compactor (ground)	80
Compressor	80
Concrete Pump	82
Concrete Saw	90
Concrete Truck	85
Concrete Trowel	67
Concrete Vibrator	76
Cranes	83
Excavator	85
Generator	81
Front End Loader	85
Hoe Ram	90
Hoist	75
Jackhammer	85
Manlift	85
Milling Machine	85
Paver	89
Pumps	76
Roller	74
Welding Machine	73

Sources:
*Rules for Citywide Construction Noise Mitigation, Chapter 28, DEP, 2007.
2004 FGEIS.*

CONSTRUCTION NOISE ANALYSIS RESULTS

As was the case in the 2004 FGEIS construction noise analysis, the below-grade excavation and foundation construction on the Development Site is expected to be the loudest activity at the Development Site and would occur over the course of approximately 11 months. Since this below-grade activity would generate the highest levels of noise from on-site construction activity, and it would be subject to the same noise controls and proceed using the same means and methods as those assumed in the 2004 FGEIS analysis, the intensity of noise due to the construction of the Proposed Project is not expected to differ from that disclosed in the 2004 FGEIS.

The total duration of construction of the Proposed Project would be approximately 18 months longer than the previous construction schedule evaluated, consisting of approximately 12 months of superstructure construction and 6 months of interior fit-out construction. The additional superstructure and interiors construction time would include construction of the somewhat taller tower compared to that assumed in the Approved Plan. However, the additional duration of construction would not necessarily consist of increased duration of exposure to construction noise exceeding the CEQR construction noise impact threshold, because the construction activities during this additional time would not be the most noise-intensive activities and much of the construction would take place at elevated locations or within the enclosed building with no line of sight to some or all receptors.

At receptor Site 7, now a 21-story hotel at 140-144 Washington Street, the maximum noise levels due to construction are not expected to exceed those predicted in the 2004 FGEIS. While construction of the Proposed Project would occur over a longer total duration, the additional construction activity would include superstructure, which would occur at the upper floors, and interior fit-out, which would occur within an enclosed building. Superstructure construction of floors above 839 feet would include construction noise sources far above the receptors at this hotel and at a greater distance than that evaluated in the 2004 FGEIS or at-grade sources well shielded by the site-perimeter noise barriers. Further, the interior fit-out construction is not noise intensive, and the noise levels from construction activity is reduced by the completed building envelope. Consequently, construction during the additional 18 months of construction of the Proposed Project as compared to the Approved Plan, would not include noise sources with a direct line of sight to this receptor and would not result in an extended duration of construction noise that would exceed CEQR noise impact criteria. Since construction of the Proposed Project would not increase the intensity of construction noise at this receptor, nor would it extend the duration during which this receptor would experience exceedances of CEQR noise impact criteria, it would not have the potential to result in noise impacts beyond those identified in the 2004 FGEIS analysis. Additionally, the hotel building at this receptor includes contemporary façade construction and central air conditioning, which would provide approximately 30 dBA of window/wall attenuation, resulting in reduced interior noise levels.

At receptor Site 8, the 37-story hotel at 85 West Street, and Site 9, the 11-story residential building at 4 Albany Street, the maximum noise levels due to construction are not expected to exceed those predicted in the 2004 FGEIS. Similar to Site 7, while construction of the Proposed Project would occur over a longer total duration, the additional construction activity would include superstructure, which would occur at the upper floors, and interior fit-out, which would occur within an enclosed building. Superstructure construction of floors above 839 feet would include construction noise sources far above the receptors at these buildings and at a greater distance than that evaluated in the 2004 FGEIS or at-grade sources well shielded by the site-perimeter noise barriers. Further, the interior fit-out construction is not noise intensive, and the noise levels from construction activity is reduced by the completed building envelope. Consequently, construction during the additional 18 months of construction of the Proposed Project as compared to the Approved Plan, would not include noise sources with a direct line of sight to this receptor and would not result in an extended duration of construction noise that would exceed CEQR noise impact criteria. Since construction of the Proposed Project would not increase the intensity of construction noise at this receptor, nor would it extend the duration during which this receptor would experience exceedances of CEQR noise impact criteria, it would not have the potential to result noise impacts beyond those identified in the 2004 FGEIS analysis. Additionally, these buildings have contemporary façade construction and central air conditioning, which would provide approximately 30 dBA of window/wall attenuation, resulting in reduced interior noise levels.

At receptor Site 10, an older 5-story mixed-use building at 120 Cedar Street with retail on the first floor and residences above, the maximum noise levels due to construction are not expected to exceed those predicted in the 2004 FGEIS. The residences at this building are at a greater distance to the construction activity occurring on the upper floors. While construction of the Proposed Project would occur over a longer total duration, the additional construction activity would include superstructure, which would occur at the upper floors, and interior fit-out, which would occur within an enclosed building. Superstructure construction of floors above 839 feet would include construction noise sources well above the receptors at this building and at a greater distance than

that evaluated in the 2004 FGEIS or at-grade sources well shielded by the site-perimeter noise barriers. Further, the interior fit-out construction is not noise intensive, and the noise levels from construction activity is reduced by the completed building envelope. Consequently, construction during the additional 18 months of construction of the Proposed Project as compared to the Approved Plan, would not include noise sources with a direct line of sight to this receptor and would not result in an extended duration of construction noise that would exceed CEQR noise impact criteria. Additionally, at-grade construction noise sources are located within the site perimeter noise barriers, and the concrete trucks and pumps are to be staged at the south end of the site as shown on the construction site logistics plan – this noise-emitting equipment would be shielded from nearby noise-sensitive receptors, particularly the residences at site 10 which have window air-conditioning units rather than central air conditioning systems like the other nearby receptors. Since construction of the Proposed Project would not increase the intensity of construction noise at this receptor, nor would it extend the duration during which this receptor would experience exceedances of CEQR noise impact criteria, it would not have the potential to result noise impacts beyond those identified in the 2004 FGEIS analysis.

Two additional receptors not included in the 2004 FGEIS have been considered in the analysis of construction noise with the Proposed Project. These receptors did not exist at the time of the 2004 FGEIS, but are currently completed and occupied, or will be at the time of construction of the Proposed Project. These receptors—including Site 10A, a 30-story hotel at 133 Greenwich Street constructed in 2016 and Site 10B, an 88-story residential building still under construction at 125 Greenwich Street (a.k.a. 22 Thames Street)—are located near Site 10 and consequently have comparable existing baseline noise levels to those at Site 10 and would experience comparable levels of construction noise to those at Site 10. Consequently, as described above for Site 10, Sites 10A and 10B would experience noise impacts from construction of the Proposed Project comparable to those predicted at Site 10 in the 2004 FGEIS for the Approved Plan. These buildings have contemporary façade construction and central air conditioning, which would provide approximately 30 dBA of window/wall attenuation, resulting in reduced interior noise levels. Given the high level of window/wall attenuation provided by these buildings, no additional measures would be effective in further reducing the construction noise exposure at these receptors.

Lastly, at receptor Site 11, the 11-story residential building at 114 Liberty Street, the maximum noise levels due to construction are not expected to exceed those predicted in the 2004 FGEIS. While construction of the Proposed Project would occur over a longer total duration, the additional construction activity would include superstructure, which would occur at the upper floors, and interior fit-out, which would occur within an enclosed building. Superstructure construction of floors above 839 feet tall would include construction noise sources far above the receptors at this hotel and at a greater distance than that evaluated in the 2004 FGEIS or at-grade sources well shielded by the site-perimeter noise barriers. Further, the interior fit-out construction is not noise intensive, and the noise levels from construction activity is reduced by the completed building envelope. Consequently, construction during the additional 18 months of construction for the Proposed Project as compared to the Approved Plan, would not include noise sources with a direct line of sight to this receptor and would not result in an extended duration of construction noise that would exceed CEQR noise impact criteria. Since construction of the Proposed Project would not increase the intensity of construction noise at this receptor, nor would it extend the duration during which this receptor would experience exceedances of CEQR noise impact criteria, it would not have the potential to result in significant noise impacts beyond those identified in the 2004 FGEIS analysis.

In conclusion, construction activity at the upper floors of Tower 5 is not expected to exceed the construction noise levels predicted in the 2004 FGEIS, at-grade noise-emitting equipment would be located within the site perimeter noise barriers and/or shielded from nearby noise-sensitive receptors, and most nearby receptors have contemporary façade construction and central air conditioning systems, which provide noise attenuation and reduce the interior noise levels. Therefore, due to the short duration of additional construction noise and lower or comparable maximum noise levels, the proposed construction would not result in additional or exacerbated construction noise impacts beyond those disclosed in the FGEIS, with the exception of the newly introduced receptors 10A and 10B, which represent newly completed buildings where construction noise levels would not be expected to have significant construction noise impacts at which construction noise would be comparable to or lower than that disclosed in the FGEIS for other nearby receptors and whose contemporary façade construction would result in substantially reduced levels of interior noise exposure for occupants.

VIBRATION

The 2004 FGEIS found that no significant vibration impacts were anticipated at the receptor sites evaluated. Peak vibration levels attributed to the construction activities were not expected to exceed 0.12 inches per second (ips) at any sensitive receptors evaluated during the peak construction period. Therefore, as with the Approved Plan, significant vibration impacts during the construction of the Proposed Project are not expected to occur.

The buildings of most concern with regards to the potential for structural or architectural damage due to vibration would be historic buildings (see Chapter 4, “Historic and Cultural Resources,” for a list of historic structures) immediately adjacent to the Development Site. Since these historic buildings and structures would be within 90 feet of the Development Site, DOB *TPPN #10/88* regulations would require limit acceptable levels of vibration and require vibration monitoring at these structures. For non-historic buildings and other structures immediately adjacent to the Development Site, vibration levels would be in the range generally considered acceptable for a non-historic buildings or structures. In terms of potential vibration levels that would be perceptible and annoying, construction would have the potential to produce perceptible vibration levels at receptor locations within a distance of approximately 80 feet depending on soil conditions. However, the operation would only occur for limited periods of time at a particular location and therefore would not result in any significant adverse impacts. Consequently, significant adverse vibration impacts would not result from construction of the Proposed Project.

OTHER TECHNICAL AREAS

LAND USE AND NEIGHBORHOOD CHARACTER

As is typical with construction projects, during periods of peak activity there would be some disruption to the nearby area. There would be construction trucks and construction workers coming to the area, as well as trucks and other vehicles backing up, loading, and unloading. These disruptions would be most pronounced in areas immediately adjacent to the Development Site but would have more limited effects on land uses in the larger study area, as most construction activities would take place within the Development Site or within portions of sidewalks and parking lanes immediately adjacent to the Development Site. Overall, construction activities at the Development Site would be evident to the local community. However, throughout the construction period, measures would be implemented to control air quality, noise, and vibration within the Development Site. Therefore, construction of the Proposed Project would not result in significant

or long-term adverse impacts on local land use patterns or the character of the broader neighborhood.

SOCIOECONOMIC CONDITIONS

Construction would not block or restrict access to any facilities in the area, affect the operations of any nearby businesses, or obstruct major thoroughfares used by customers or businesses. Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the construction activity. Construction would also contribute to increased tax revenues for the city and state, including those from personal income taxes. Therefore, as with the Approved Plan, construction activities with the Proposed Project would not result in any significant adverse impacts on socioeconomic conditions.

COMMUNITY FACILITIES

No community facilities (i.e., public or publicly funded schools, libraries, childcare centers, health care facilities, or fire and police stations) would be directly affected by construction activities. The construction area would be surrounded by construction barriers that would limit the effects of construction on nearby facilities. Measures outlined in the MPT plan to be implemented for the proposed development would ensure that lane closures and sidewalk closures are kept to a minimum and that adequate pedestrian access is maintained. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, childcare facilities, and health care facilities. New York City Police Department (NYPD) and FDNY emergency services and response times would not be materially affected by construction. Therefore, as with the Approved Plan, construction activities with the Proposed Project would not result in any significant adverse impacts on community facilities.

HISTORIC AND CULTURAL RESOURCES

Historic and cultural resources include both archaeological and architectural resources. A detailed assessment of potential impacts on archaeological and architectural resources is described in Chapter 4, "Historic and Cultural Resources."

The area of potential effect (APE) for archaeological resources is the Development Site. As set forth in the 2004 *FGEIS*, Site 5 (the southern portion of the Southern Site) was not considered archaeologically sensitive due to its previous excavation for construction of the Deutsche Bank Building. Since completion of the 2004 *FGEIS*, the Development Site was excavated for construction of the Deutsche Bank building and after September 11 that structure was decontaminated and deconstructed. Section 3.2.3 of the ROD identified the portions of the WTC Site potentially sensitive for historic period archaeological resources and provided for mitigation consisting of a Phase 1B investigation in those areas, in the form of archaeological monitoring during construction. If there are any unanticipated discoveries of previously unidentified historic resources during any excavation on the Development Site, they would be subject to the process set forth in the 2004 WTC Memorial and Redevelopment Plan Programmatic Agreement among the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Office (SHPO), and LMDC, and therefore a significant adverse impact on historic resources is not expected.

Construction-period impacts to nearby historic resources were analyzed in the 2004 *FGEIS* and are subject to the measures set forth in the ROD and Programmatic Agreement, which contemplate

a Construction Protection Plan (CPP) for historic resources located within 90 feet of construction activities, to be developed in consultation with SHPO prior to the commencement of construction. There are two historic architectural resources in the Area of Potential Impact (API) located within 90 feet of the Development Site—the Hazen Building and the American Stock Exchange. Both were identified in the 2004 *FGEIS* and would be subject to the final CPP. Overall, with the preparation and implementation of a CPP to avoid construction-related effects on these two resources, the Proposed Project would not result in any new significant adverse effects to historic resources as compared to the Approved Plan.

HAZARDOUS MATERIALS

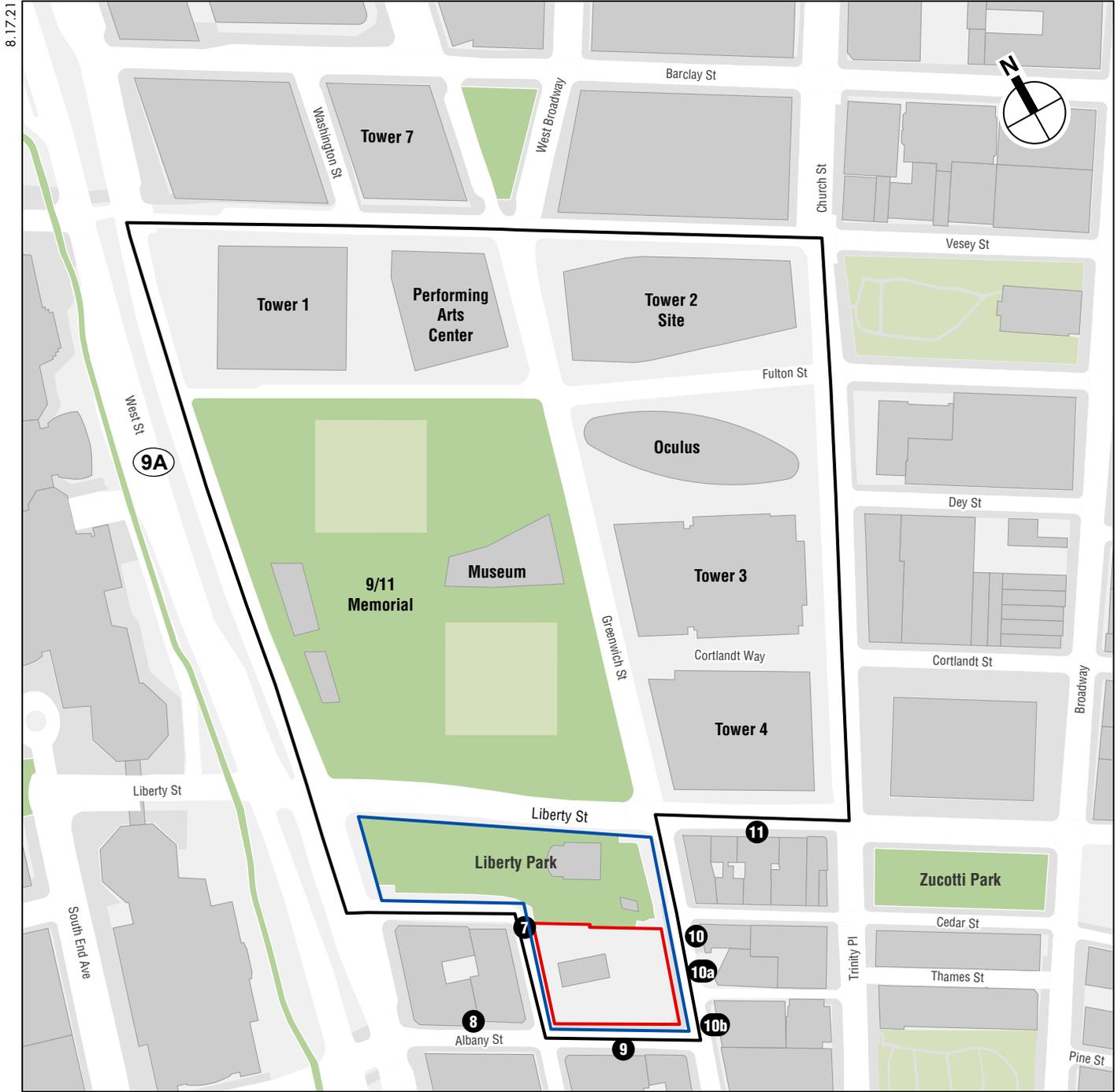
A detailed assessment of the potential risks related to the construction with respect to any hazardous materials is described in Chapter 10, “Hazardous Materials.”

The Development Site contained a portion of the Deutsche Bank building from 1974 until 2011. Severely damaged by the events of September 11, 2001, this building was decontaminated and deconstructed in accordance with unusually strict protocols overseen and approved by EPA related to hazardous materials. The below-grade sidewalls of this building (backfilled with clean crushed concrete) remain. Construction of a new building (whether it included residential uses or not) would entail removal of these remnants and potentially some soil beneath, as well as dewatering. Well-established procedures would be followed by the Developer to accomplish this work and, as necessary, test, transport, and dispose of (or recycle/reuse) this material at appropriate facilities in accordance with City and state requirements. A Construction Health and Safety Plan (CHASP) would set out the requirements for appropriate monitoring and testing to protect site workers, the community, and the environment. As with the Approved Plan, the implementation of these measures would preclude the potential for new significant adverse impacts from the Proposed Project.

WATER AND SEWER INFRASTRUCTURE

Infrastructure activities at the Development Site would include utility connections to existing water, sewer, electric, gas, and telecommunications. These activities would be coordinated with DEP, Con Edison, or the appropriate private utility company to ensure that service to customers in nearby areas is not disrupted. All utility lines would be located either in the street bed or within the below-grade space. Residents and workers in nearby buildings are not expected to experience substantial disruptions to water supply or wastewater removal. Any disruption to service that may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation is expected to be very short-term (i.e., hours). Therefore, as with the Approved Plan, the construction of the Proposed Project would not cause any significant adverse impacts to nearby users of these services.

The Proposed Amendment would not result in any significant adverse construction impacts, as compared to the Approved Plan. *



- WTC Site
- Project Site
- Development Site (Site 5)
- 7 Noise Receptor

Construction Noise Receptor Locations
Figure 20-1

A. BACKGROUND

As required by 40 CFR § 1508.7, the 2004 *FGEIS* considered the cumulative (and indirect) construction impacts for all the elements of the WTC Memorial and Reconstruction Project as well as the other four federally funded recovery projects: the permanent WTC Path Terminal, the Route 9A Reconstruction Project, the Fulton Street Transit Center, and the South Ferry Transit station. While it was acknowledged that market demand and other factors would play a role in the construction and completion dates for all elements at the WTC, it was assumed that construction would take place over approximately 12 years, from 2004 to 2015—with the most intense period of activity between the Third Quarter of Year 2004 and Fourth Quarter of 2008 with a peak period in 2006. This period was expected to include the following activities:

- Demolition of remaining below grade elements from 4, 5, and 6 WTC;
- Construction of Memorial and Memorial Center;
- Construction of the Freedom Tower;
- Construction of up to one million square feet of above and below grade retail and retail bases of Towers 2, 3, and 4;
- Construction of all below-grade elements including bus parking, security check zones, and linkages to the PATH pedestrian connections
- Construction of Fulton and Greenwich Streets, Washington and Cedar Streets;
- Construction of open spaces including Wedge of Light Plaza, PATH Plaza, September 11 Place, and Liberty Park;
- Construction of cultural buildings and a performing arts center; and
- Testing, cleaning and deconstruction of 130 Liberty Street building.

All the above have now been accomplished with the exception of construction of Tower 2 above grade and completion of construction for the Performing Arts Center. However, an additional project not listed above is being constructed on the Project Site: a new St. Nicholas Greek Orthodox and National Shrine is being constructed in Liberty Park atop the VSC immediately north of the Development Site.

The other major projects anticipated to occur in or around the WTC Site during the 2004-2015 period—the Path Terminal, Route 9A Reconstruction Project, FSTC, and the South Ferry subway station (approximately one-half mile to the south) have been completed.

The *FGEIS* assessed the combined impacts of similar construction activities occurring at the same time in the same area. Specific areas analyzed included: access and circulation; air quality; noise and vibration; socio-economic effects; and cultural resources. Taken together temporally and spatially, the construction activities for all these of major projects were expected to affect everyday

activities for residents, workers, and visitors to the WTC Site and Lower Manhattan, particularly during the anticipated peak construction period in 2006.

In anticipation of such extensive construction occurring at the same time and in order to avoid adverse impacts to the extent practicable, the lead construction personnel from the key agencies involved in the rebuilding met regularly as the Lower Manhattan Construction Coordination Group. They recognized the need for and were desirous of an entity to coordinate the construction projects in Lower Manhattan. On November 22, 2004, Mayor Michael R. Bloomberg issued an Executive Order establishing the Lower Manhattan Construction Command Center (LMCCC). It was charged with coordination and oversight of all Lower Manhattan construction projects, both public and private, including street rehabilitation, transportation infrastructure, and commercial development, along with the multiple projects on WTC site. LMCCC set about performing its work with the goals of meeting the ambitious construction timeline while minimizing the impact of such construction on the community. With much of the construction accomplished by December 31, 2013, LMCCC was able to cease its operations.

B. CURRENT CONDITIONS AND CONCLUSION

During the estimated 54-month construction period for the Proposed Project (2023-2028) construction activities are expected to be considerably more limited and the potential for cumulative impacts would be highly unlikely.

The nearest on-going construction project is the Church of St Nicholas immediately north of the Development site atop the VSC. According to the Greek Orthodox Archdiocese of America interior work will continue into 2022, but a *thyranoxia*, an opening of the doors ceremony, is expected to be held on November 2, 2021, to coincide with a visit of Ecumenical Patriarch Bartholomew I of Constantinople. While some construction work may still be on-going after that, the Church is expected to be complete before the Proposed Project goes into construction in 2023.

Construction of Tower 2 may commence during the construction of Tower 5 if major tenants are found. However, the Tower 2 construction would be five blocks north of the Development Site and beyond the VSC and Liberty Park, the WTC Memorial, Towers 4 and 3, and the Oculus. It is noted that each project would be bound by the Environmental Performance Commitments (EPCs) in the 2004 *FGEIS* and in Table 20-2, "Environmental Performance Commitments," in Chapter 20, "Construction." The EPCs incorporate design features and construction practices to preserve the capacity of the local environment and successfully allow for the development of all of the Lower Manhattan Recovery Projects. Further, the Developer has committed to use additional construction control technologies that were not widely available at the time of the 2004 *FGEIS* in order to minimize noise, dust, and air emissions, as described above (see pp. 20-16 and 20-17). Overall, construction of the Proposed Project pursuant to the Proposed Amendment is not expected to result in any cumulative significant adverse construction impacts. *

List of Preparers

LOWER MANHATTAN DEVELOPMENT CORPORATION (LMDC)/EMPIRE STATE DEVELOPMENT (ESD)

Daniel A. Ciniello, President—LMDC
Rachel Shatz, Vice President, Planning & Environmental Review—ESD
Eram Qadri, AICP, LEED AP, Senior Director, Planning & Environmental Review—ESD
Goldie Weixel, Deputy General Counsel/Acting General Counsel—ESD/LMDC
Matthew Acocella, Associate Counsel—ESD/LMDC
Oluwatobi Jaiyesimi, Assistant Vice President, Real Estate & Community Relations—ESD
Terence Cho, Director, Real Estate Development & Planning—ESD

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Lisa M. Lau, AICP, EA Project Manager, Public Health
Owen DiMarzo, Land Use, Zoning, and Public Policy
Jennifer Morris, AICP and Madeleine Helmer, AICP, Urban Design and Visual Resources and Historic and Cultural Resources
Connor Lacefield, Open Space and Neighborhood Character
Jessica Hanlon, Open Space and Solid Waste Services
Kenneth Mack, Shadows
Samuel Nourieli, Community Facilities
John Neill, Socioeconomic Conditions
Marcus Simons, Hazardous Materials
Alexander Lieber, AICP, Water and Sewer Infrastructure
Matthew Carmody, PE, Transportation
Henry Kearney, PE, Air Quality
Kevin Edwards, Greenhouse Gas Emissions and Climate Change
Daniel Abatemarco and Denise Miller, Noise
Sandra Collins and Emma Powell, Coastal Zone and Flood Plain and Natural Resources
Celeste Evans, AICP, Environmental Justice
Kenneth Mui, Construction

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Appendix A:
SHPO Correspondence



**Parks, Recreation,
and Historic Preservation**

KATHY HOCHUL
Governor

ERIK KULLESEID
Commissioner

August 30, 2021

Jennifer Morris
AKRF, Inc.
440 Park Avenue South
7th Floor
New York, NY 10016

Re: ESDC
WTC Southern Site
21PR05197
04SR54340

Dear Jennifer Morris:

Thank you for requesting the comments of the New York State Historic Preservation Office (SHPO). The SHPO has reviewed the materials in accordance with Section 106 of the National Historic Preservation Act of 1966 and the Programmatic Agreement in place for this project.

We have reviewed the proposed Amendment to the Approved General Project Plan (GPP) for the World Trade Center regarding the Southern Site (site 5) and the supporting documentation that was submitted to our office on August, 4th, 2021. Based upon our review, we find the proposed Amendment to be acceptable and we concur with the proposal to develop Construction Protection Plans (CPP) for the Hazen Building at 120 Greenwich Street and the American Stock Exchange at 86 Trinity Place.

If additional information or correspondence is required regarding this project it should be provided via our Cultural Resource Information System (CRIS) at www.nysparks.com/shpo/online-tools/ Once on the CRIS site, you can log in as a guest and choose "submit" at the very top menu. Next choose "submit new information for an existing project". You will need this project number and your e-mail address. If you have any questions, I am best reached via e-mail.

Sincerely,

Olivia Brazee
Historic Site Restoration Coordinator
olivia.brazee@parks.ny.gov

via e-mail only

cc: Eram Qadri, ESDC
Anne Locke, AKRF, Inc.

**Appendix B:
Natural Resources**

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT (please print)

1. Name: Daniel A. Ciniello, President, LMDC

2. Address: 22 Cortlandt Street – 22nd Floor

3. Telephone: Area Code () 212-962-2431

B. PROPOSED ACTIVITY

1. Brief description of activity:

The approved plan for the World Trade Center Memorial and Cultural Program General Project Plan and World Trade Center Memorial and Redevelopment Plan (collectively, the Approved Plan) provides that a tower consisting of commercial office space and retail (Tower 5) would occupy Block 54, Lot 1 within the WTC Site in New York, New York (Development Site). The larger project site (Project Site), on which the Development Site is located, was formerly the Southern Site added to the WTC Site in 2004. The Development Site is a previously developed site with existing foundation structures and has been approved for redevelopment.

The proposed amendment to the Approved Plan (Proposed Amendment) would expand the uses permitted in Tower 5 by also allowing residential use and community facilities and contemplates transfer of the Development Site to ESD for long-term lease to a proposed developer of Tower 5 (the Proposed Project).

The Proposed Project consists of a mixed-use building containing residential, commercial office, retail, fitness and social center, and community facility uses. Two illustrative (hypothetical) scenarios are currently being considered. The Maximum Residential building would consist of 1,270 dwelling units and less of other uses, while the Reduced Residential building would have up to 1,193 dwelling units and more of other uses. The Maximum Residential building would also have up to 180,000 gross square feet (GSF) of commercial office space, up to 36,000 GSF of fitness and social center space, up to 13,000 GSF community facility space and up to 12,000 GSF of retail space. The Reduced Residential building would have up to 374,361 GSF of office space, up to 80,645 GSF of fitness and social center uses as well as space, up to 21,329 GSF for community facility uses, and up to 25,000 GSF of retail.

2. Purpose of activity

To support Lower Manhattan's transition from a predominantly office district to a mixed-use neighborhood.

3. Location of activity

<u>New York</u> County	<u>New York</u> City, Town, or Village	<u>Block 54, Lot 1</u> Street or Site Description
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4. Type of federal permit/license required: **Any actions required by U.S. Department of Housing and Urban Development (HUD) relating to federal funds used in the original acquisition and improvement of the Development Site.**

The Proposed Actions also require compliance with the following environmental review and regulatory requirements:
NEPA, along with applicable environmental reviews pursuant to 24 CFR § 58.5;
National Historic Preservation Act, and WTC Redevelopment Plan Programmatic Agreement, dated April 22, 2004.

5. Federal application number, if known: **LMDC is the grantee of HUD Community Development Block Grants No. B-02-DW-36-001 and B-02-DW-36-002 (the HUD Grant).**

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application number, if known:

Completion of any mapping actions and recordings with respect to the Project Site as contemplated by the Proposed Amendment; approvals, if required, of the Commissioner of the Office of General Services, the Public Authorities Control Board, the Comptroller of the State of New York, and the New York State Attorney General; and approvals of the LMDC, Empire State Development, and the Port Authority boards, as applicable, in connection with the above.

The proposed actions require compliance with the following environmental review and regulatory requirements:

- SEQRA;
- New York State Coastal Management Policies;
- New York State Urban Development Corporation Act;
- New York State Public Authorities Law;
- New York State Finance Law;
- State Historic Preservation Act;
- Any required Approvals of HCR, the New York State Housing Finance Agency or HUD in connection with the affordable housing portion of the proposed residential development; and

Approvals of the LMDC, ESD, and the Port Authority in connection with the above.

C. COASTAL ASSESSMENT Check either “YES” or “NO” for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

1. Will the proposed activity result in any of the following:

YES/NO

- a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)
- b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)
- c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)
- d. Reduction of existing or potential public access to or along coastal waters? (19, 20)
- e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9, 10)
- f. Siting of a facility essential to the exploration, development, and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)
- g. Siting of a facility essential to the generation or transmission of energy? (27)
- h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35)
- i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35)
- j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)
- Note: 2004 FGEIS for the Approved Plan noted that stormwater runoff would be reduced from previous conditions on the project site.**
- k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39)
- l. Adverse effect upon land or water uses within the State’s small harbors? (4)

	X
	X
	X
	X
	X
	X
	X
	X
	X
X	
X	
	X

2. Will the proposed activity affect, or be located in, on, or adjacent to any of the following:

YES/NO

- a. State designated freshwater or tidal wetland? (44)
- b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17)
- c. State designated significant fish and/or wildlife habitat? (7)
- d. State designated significant scenic resource or area? (24)
- e. State designated important agricultural lands? (26)
- f. Beach, dune or Barrier Island? (12)
- g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3)
- h. State, county, or local park? (19, 20)
- i. Historic resource listed on the National or State Register of Historic Places? (23)

	X
X	
	X
	X
	X
	X
	X
	X
	X

3. Will the proposed activity require any of the following:

YES/NO

- a. Waterfront site? (2, 21, 22)
- b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5)
- c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)
- d. State water quality permit or certification? (30, 38, 40)
- e. State air quality permit or certification? (41, 43)

	X
	X
	X
	X
	X

4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document*)

X	
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D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered “NO”, then the applicant or agency shall complete Section E and submit the documentation required by Section F.
2. If any of the questions in Section C are answered “YES”, then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document.* The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy, and (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State’s CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

“The proposed activity complies with New York State’s approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program.”

Applicant/Agent’s Name: Daniel A. Ciniello, President, LMDC

Address: 22 Cortlandt Street – 22nd Floor

Telephone: Area Code (212) 962-2431

Applicant/Agent Signature: _____ Date: _____

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the **New York State Department of State, Office of Planning and Development, Attn: Consistency Review Unit, One Commerce Plaza-Suite 1010, 99 Washington Avenue – Suite 1010, Albany, New York 12231.**
 - a. Copy of original signed form.
 - b. Copy of the completed federal agency application.
 - c. Other available information which would support the certification of consistency.
2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.
3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

* These state and local documents are available for inspection at the offices of many federal agencies, Department of Environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

Additional Information

As determined by the Federal Consistency Assessment Form, the Proposed Actions require detailed assessment for several New York State Coastal Management Program policies, including policies 33, 36, and 39. The consistency assessment is provided below for all questions that were answered “yes” in the CAF.

Policy 11: Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.

Site 5 is not within a New York State coastal erosion hazard area but is partially within the 100-year floodplain (area with a 1 percent chance of flooding each year) and partially solely within the 500-year floodplain (area with a 0.2 percent chance of flooding each year). Less than 25,000 square feet of the approximately 33,000 square feet within Site 5, or about 75 percent, is within the 100-year floodplain, while just under 10,000 square feet, or about 25 percent of Site 5, is solely within the 500-year floodplain. Development of Site 5 under the Proposed Project would occur within a previously developed site with existing foundation structures. Therefore, the Proposed Project would not result in any new significant adverse impacts to flood levels, flood risk, or the flow of floodwater within the project site or the surrounding area. New York City is affected by local flooding (e.g., flooding of inland portions of New York City from short-term, high-intensity rain events in areas with poor drainage), and coastal flooding (e.g., long- and short-wave surges that affect the City’s shorelines along the Atlantic Ocean and tidally influenced rivers and straights such as the Hudson River, Harlem River, and East River). Because these floodplains are affected by coastal flooding rather than local or fluvial flooding, the Proposed Project would not exacerbate flooding conditions on or near the project site.

The Proposed Project would be constructed in accordance with the Flood Resistant Construction requirements of Appendix G of the New York City Building Code. The ground floor of the building would be constructed at a design flood elevation (DFE) of +13 feet NAVD88, which is 2 feet above the base flood elevation (BFE) of +11 feet North American Vertical Datum of 1988 (NAVD88) at this location. Under all estimates of SLR, the first floor mezzanine will remain above BFE through 2100 and the cellar will remain below BFE. Under the High estimate (90th percentile) of Sea Level Rise (“SLR”), as determined by the New York City Panel on Climate Change, the ground floor would be below BFE by the 2050s. Under the Middle range (25th to 75th percentile) of SLR, the ground floor would be under BFE by the 2080s. Under the Low estimate (10th percentile) of SLR, the ground floor will remain above BFE through 2100. Residential units would be located above the first floor mezzanine in the upper floors, and would remain above the BFE throughout the life of the project under any scenario of sea level rise.

The cellar will be dry floodproofed. Examples of ground floor flood damage reduction measures include insulated flood vents providing wet floodproofing at residential exit stairs (and loading dock doors if the dock is conditioned space); loading dock doors with open lattice to provide wet floodproofing the dock is unconditioned space; flood-resistant storefront glazing and removable flood barriers to provide dry floodproofing at the community facility entrance. If the flood elevation increases in the future, the Proposed Project could be retrofitted with additional flood protection features (e.g., internal flood barriers, temporary stairs, etc.). Specific measures would be determined at a later date.

Therefore, the Proposed Project would be consistent with this policy.

Policy 12: Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.

There are no natural protective features on or near the Development Site. Therefore, this policy does not apply.

Policy 17: The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.

The Proposed Project does not involve the construction or reconstruction of an erosion protection structure. Therefore, this policy does not apply.

Policy 33: Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.

There would be a minor increase in stormwater runoff with implementation of the Proposed Project as compared with the No Action condition. However, a reduction in stormwater peak flows to the combined sewer system would be achieved with the incorporation of stormwater source control best management practices (BMPs), specifically on-site detention, that would be required as part of the New York City Department of Environmental Protection (DEP) site connection approval process. DEP's detention performance standard is intended to reduce peak discharges to the City's sewer system during rain events by requiring greater onsite storage of stormwater runoff and slower release to the sewer system. The implementation of DEP's stormwater performance standard over time is expected to provide additional capacity to the existing sewer system, thereby improving its performance. The Proposed Project would also result in marginally increased flows to the City's combined sewer system that may be discharged as combined sewer overflows (CSOs) during rain events. Because of the available capacity of the Newtown Creek Wastewater Treatment Plant, the projected increased flows to the combined sewer system would not have a significant adverse impact on water quality. In addition, with the incorporation of BMP measures to meet the City site connection requirement, development under the Proposed Project would not result in a significant increase in stormwater runoff or CSO volumes/frequencies. With the implementation of these measures, the Proposed Project would be consistent with this policy.

Policy 36: Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.

Approximately 27,000 gallons of fuel oil were stored at the WTC Site prior to the September 11, 2001 terrorist attacks. As such, releases into the WTC Site and potentially affecting the Development Site may have occurred, as may have other petroleum spills in the area. However, soil testing conducted in the 2000s beneath streets to the south of the WTC Site (i.e., near the Development Site) indicated no evidence of petroleum impacts. A Construction Health and Safety Plan (CHASP) would detail the requirements for appropriate monitoring and testing to protect site workers, the community, and the environment. With these measures in place, the Proposed Project would be consistent with this policy.

Policy 39: The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources.

Site 5 previously contained the Deutsche Bank building from 1974 until 2011. Severely damaged by the events of September 11, 2001, this building was deconstructed in accordance with unusually strict protocols related to hazardous materials. The below-grade sidewalls of this building (backfilled with clean crushed concrete) remain. Construction of a new building (whether it included residential uses or not) would entail removal of these remnants and potentially some soil beneath, as well as dewatering. As stated above, a CHASP would detail the requirements for appropriate monitoring and testing to protect site workers, the community, and the environment. All materials removed during construction activities (soil, concrete slab, backfilled-concrete) requiring off-site disposal would be managed in accordance with applicable

regulatory requirements. All soil and any other materials intended for off-site disposal would be tested in accordance with the requirements of the intended receiving facility. Transportation of material leaving the site for off-site disposal would be conducted in accordance with federal, state, and local requirements covering licensing of haulers and trucks, placarding, truck routes, manifesting, etc. Dewatering is likely to be required for construction. Testing would be performed to ensure compliance with New York City Department of Environmental Protection sewer discharge permit/approval requirements and, if necessary, pre-treatment would be conducted prior to discharge to the sewer. With these measures in place, the Proposed Project would be consistent with this policy.

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's Coastal Zone, must be reviewed and assessed for their consistency with the [New York City Waterfront Revitalization Program](#) (WRP) which has been approved as part of the State's Coastal Management Program.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, the New York City Department of City Planning, or other city or state agencies in their review of the applicant's certification of consistency.

A. APPLICANT INFORMATION

Name of Applicant: Lower Manhattan Development Corporation

Name of Applicant Representative: Daniel A. Ciniello, President

Address: 22 Cortlandt Street, 22nd Floor

Telephone: 212-962-2431 Email: _____

Project site owner (if different than above): _____

B. PROPOSED ACTIVITY

If more space is needed, include as an attachment.

I. Brief description of activity

The approved plan for the World Trade Center Memorial and Cultural Program General Project Plan and World Trade Center Memorial and Redevelopment Plan (collectively, the Approved Plan) provides that a tower consisting of commercial office space and retail (Tower 5) would occupy Block 54, Lot 1 within the WTC Site in New York, NY (Development Site). The larger project site (Project Site), on which the Development Site is located, was formerly the Southern Site added to the WTC Site in 2004. The Development Site is a previously developed site with existing foundation structures and has been approved for redevelopment.

The proposed amendment to the Approved Plan (Proposed Amendment) would expand the uses permitted in Tower 5 by also allowing residential use and community facilities and contemplates transfer of the Development Site to ESD for long-term lease to a proposed developer of Tower 5 (the Proposed Project).

The Proposed Project consists of a mixed-use building containing residential, commercial office, retail, fitness and social center, and community facility uses. Two illustrative (hypothetical) scenarios are currently being considered. The Maximum Residential building would consist of 1,270 dwelling units and less of other uses, while the Reduced Residential building would have up to 1,193 dwelling units and more of other uses. The Maximum Residential building would also have up to 180,000 gross square feet (GSF) of commercial office space, up to 36,000 GSF of fitness and social center space, up to 13,000 GSF community facility space and up to 12,000 GSF of retail space. The Reduced Residential building would have up to 374,361 GSF of office space, up to 80,645 GSF of fitness and social center uses as well as space, up to 21,329 GSF for community facility uses, and up to 25,000 GSF of retail.

2. Purpose of activity

To support Lower Manhattan's transition from a predominantly office district to a mixed-use neighborhood.

C. PROJECT LOCATION

Borough: Manhattan Tax Block/Lot(s): Block 54 / Lot 1

Street Address: _____

Name of water body (if located on the waterfront): N/A

D. REQUIRED ACTIONS OR APPROVALS

Check all that apply.

City Actions/Approvals/Funding

City Planning Commission Yes No

<input type="checkbox"/> City Map Amendment	<input type="checkbox"/> Zoning Certification	<input type="checkbox"/> Concession
<input type="checkbox"/> Zoning Map Amendment	<input type="checkbox"/> Zoning Authorizations	<input type="checkbox"/> UDAAP
<input type="checkbox"/> Zoning Text Amendment	<input type="checkbox"/> Acquisition – Real Property	<input type="checkbox"/> Revocable Consent
<input type="checkbox"/> Site Selection – Public Facility	<input type="checkbox"/> Disposition – Real Property	<input type="checkbox"/> Franchise
<input type="checkbox"/> Housing Plan & Project	<input type="checkbox"/> Other, explain: _____	
<input type="checkbox"/> Special Permit		

(if appropriate, specify type: Modification Renewal other) Expiration Date: _____

Board of Standards and Appeals Yes No

<input type="checkbox"/> Variance (use)	
<input type="checkbox"/> Variance (bulk)	
<input type="checkbox"/> Special Permit	

(if appropriate, specify type: Modification Renewal other) Expiration Date: _____

Other City Approvals

<input type="checkbox"/> Legislation	<input type="checkbox"/> Funding for Construction, specify: _____
<input type="checkbox"/> Rulemaking	<input type="checkbox"/> Policy or Plan, specify: _____
<input type="checkbox"/> Construction of Public Facilities	<input type="checkbox"/> Funding of Program, specify: _____
<input type="checkbox"/> 384 (b) (4) Approval	<input type="checkbox"/> Permits, specify: _____
<input type="checkbox"/> Other, explain: _____	

State Actions/Approvals/Funding

<input type="checkbox"/> State permit or license, specify Agency: _____ Permit type and number: _____
<input type="checkbox"/> Funding for Construction, specify: _____
<input type="checkbox"/> Funding of a Program, specify: _____
<input checked="" type="checkbox"/> Other, explain: <u>Amendment of General Project Plan, transfer of Development Site from LMDC to ESD, lease of site to Developer</u>

Federal Actions/Approvals/Funding

<input type="checkbox"/> Federal permit or license, specify Agency: _____ Permit type and number: _____
<input type="checkbox"/> Funding for Construction, specify: _____
<input type="checkbox"/> Funding of a Program, specify: _____
<input checked="" type="checkbox"/> Other, explain: <u>LMDC is grantee of HUD CDBG Grants No. B-02-DW-36-001 and B-02-DW-36-002</u>

Is this being reviewed in conjunction with a [Joint Application for Permits?](#) Yes No

E. LOCATION QUESTIONS

1. Does the project require a waterfront site? Yes No
2. Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land under water or coastal waters? Yes No
3. Is the project located on publicly owned land or receiving public assistance? Yes No
4. Is the project located within a FEMA 1% annual chance floodplain? (6.2) Yes No
5. Is the project located within a FEMA 0.2% annual chance floodplain? (6.2) Yes No
6. Is the project located adjacent to or within a special area designation? See [Maps – Part III](#) of the NYC WRP. If so, check appropriate boxes below and evaluate policies noted in parentheses as part of WRP Policy Assessment (Section F).
 - Significant Maritime and Industrial Area (SMIA) (2.1)
 - Special Natural Waterfront Area (SNWA) (4.1)
 - Priority Maritime Activity Zone (PMAZ) (3.5)
 - Recognized Ecological Complex (REC) (4.4)
 - West Shore Ecologically Sensitive Maritime and Industrial Area (ESMIA) (2.2, 4.2)

F. WRP POLICY ASSESSMENT

Review the project or action for consistency with the WRP policies. For each policy, check Promote, Hinder or Not Applicable (N/A). For more information about consistency review process and determination, see **Part I** of the [NYC Waterfront Revitalization Program](#). When assessing each policy, review the full policy language, including all sub-policies, contained within **Part II** of the WRP. The relevance of each applicable policy may vary depending upon the project type and where it is located (i.e. if it is located within one of the special area designations).

For those policies checked Promote or Hinder, provide a written statement on a separate page that assesses the effects of the proposed activity on the relevant policies or standards. If the project or action promotes a policy, explain how the action would be consistent with the goals of the policy. If it hinders a policy, consideration should be given toward any practical means of altering or modifying the project to eliminate the hindrance. Policies that would be advanced by the project should be balanced against those that would be hindered by the project. If reasonable modifications to eliminate the hindrance are not possible, consideration should be given as to whether the hindrance is of such a degree as to be substantial, and if so, those adverse effects should be mitigated to the extent practicable.

		Promote	Hinder	N/A
I	Support and facilitate commercial and residential redevelopment in areas well-suited to such development.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I.1	Encourage commercial and residential redevelopment in appropriate Coastal Zone areas.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I.2	Encourage non-industrial development with uses and design features that enliven the waterfront and attract the public.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.3	Encourage redevelopment in the Coastal Zone where public facilities and infrastructure are adequate or will be developed.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I.4	In areas adjacent to SMIA's, ensure new residential development maximizes compatibility with existing adjacent maritime and industrial uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I.5	Integrate consideration of climate change and sea level rise into the planning and design of waterfront residential and commercial development, pursuant to WRP Policy 6.2.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		Promote	Hinder	N/A
2	Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.1	Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.2	Encourage a compatible relationship between working waterfront uses, upland development and natural resources within the Ecologically Sensitive Maritime and Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.3	Encourage working waterfront uses at appropriate sites outside the Significant Maritime and Industrial Areas or Ecologically Sensitive Maritime Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.4	Provide infrastructure improvements necessary to support working waterfront uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2.5	Incorporate consideration of climate change and sea level rise into the planning and design of waterfront industrial development and infrastructure, pursuant to WRP Policy 6.2.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.1.	Support and encourage in-water recreational activities in suitable locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.2	Support and encourage recreational, educational and commercial boating in New York City's maritime centers.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.3	Minimize conflicts between recreational boating and commercial ship operations.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.4	Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.5	In Priority Marine Activity Zones, support the ongoing maintenance of maritime infrastructure for water-dependent uses.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Protect and restore the quality and function of ecological systems within the New York City coastal area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.1	Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.2	Protect and restore the ecological quality and component habitats and resources within the Ecologically Sensitive Maritime and Industrial Area.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3	Protect designated Significant Coastal Fish and Wildlife Habitats.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.4	Identify, remediate and restore ecological functions within Recognized Ecological Complexes.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.5	Protect and restore tidal and freshwater wetlands.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.6	In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple habitat characteristics to achieve the greatest ecological benefit at a single location.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.7	Protect vulnerable plant, fish and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Maintain and protect living aquatic resources.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

		Promote	Hinder	N/A
5	Protect and improve water quality in the New York City coastal area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.1	Manage direct or indirect discharges to waterbodies.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5.4	Protect the quality and quantity of groundwater, streams, and the sources of water for wetlands.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.5	Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.1	Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in <i>New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms</i>) into the planning and design of projects in the city's Coastal Zone.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6.4	Protect and preserve non-renewable sources of sand for beach nourishment.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.1	Manage solid waste material, hazardous wastes, toxic pollutants, substances hazardous to the environment, and the unenclosed storage of industrial materials to protect public health, control pollution and prevent degradation of coastal ecosystems.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2	Prevent and remediate discharge of petroleum products.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3	Transport solid waste and hazardous materials and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Provide public access to, from, and along New York City's coastal waters.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.1	Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.2	Incorporate public access into new public and private development where compatible with proposed land use and coastal location.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.3	Provide visual access to the waterfront where physically practical.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4	Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

		Promote	Hinder	N/A
8.5	Preserve the public interest in and use of lands and waters held in public trust by the State and City.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8.6	Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Protect scenic resources that contribute to the visual quality of the New York City coastal area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.1	Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2	Protect and enhance scenic values associated with natural resources.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City coastal area.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.1	Retain and preserve historic resources, and enhance resources significant to the coastal culture of New York City.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2	Protect and preserve archaeological resources and artifacts.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

G. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Daniel A. Ciniello, President

Address: 22 Cortlandt Street, 22nd Floor

Telephone: 212-962-2431 Email: _____

Applicant/Agent's Signature: _____

Date: _____

Submission Requirements

For all actions requiring City Planning Commission approval, materials should be submitted to the Department of City Planning.

For local actions not requiring City Planning Commission review, the applicant or agent shall submit materials to the Lead Agency responsible for environmental review. A copy should also be sent to the Department of City Planning.

For State actions or funding, the Lead Agency responsible for environmental review should transmit its WRP consistency assessment to the Department of City Planning.

For Federal direct actions, funding, or permits applications, including Joint Applicants for Permits, the applicant or agent shall also submit a copy of this completed form along with his/her application to the [NYS Department of State Office of Planning and Development](#) and other relevant state and federal agencies. A copy of the application should be provided to the NYC Department of City Planning.

The Department of City Planning is also available for consultation and advisement regarding WRP consistency procedural matters.

New York City Department of City Planning

Waterfront and Open Space Division
120 Broadway, 31st Floor
New York, New York 10271
212-720-3696
wrp@planning.nyc.gov
www.nyc.gov/wrp

New York State Department of State

Office of Planning and Development
Suite 1010
One Commerce Place, 99 Washington Avenue
Albany, New York 12231-0001
518-474-6000
www.dos.ny.gov/opd/programs/consistency

Applicant Checklist

- Copy of original signed NYC Consistency Assessment Form
- Attachment with consistency assessment statements for all relevant policies
- For Joint Applications for Permits, one (1) copy of the complete application package
- Environmental Review documents
- Drawings (plans, sections, elevations), surveys, photographs, maps, or other information or materials which would support the certification of consistency and are not included in other documents submitted. All drawings should be clearly labeled and at a scale that is legible.
- Policy 6.2 Flood Elevation worksheet, if applicable. For guidance on applicability, refer to the WRP Policy 6.2 Guidance document available at www.nyc.gov/wrp

NYC Waterfront Revitalization Program - Policy 6.2 Flood Elevation Worksheet

COMPLETE INSTRUCTIONS ON HOW TO USE THIS WORKSHEET ARE PROVIDED IN THE "CLIMATE CHANGE ADAPTATION GUIDANCE" DOCUMENT AVAILABLE AT www.nyc.gov/wrp

Enter information about the project and site in highlighted cells in Tabs 1-3. Tab 4, "Summary Charts" contains primary results. Tab 5, "0.2%+SLR" produces charts to be used for critical infrastructure or facilities. Tab 6, "Calculations" contains background computations. Appendix A contains tide elevations for station across the city to be used for the elevation of MHHW if a site survey is not available. Non-highlighted cells have been locked.

Background Information	
Project Name	LMDC Proposed Tower 5 Amendment
Location	World Trade Center Site 5 (Block 54, Lot 1)
Type(s)	<input checked="" type="checkbox"/> Residential, Commercial, Community Facility <input type="checkbox"/> Parkland, Open Space, and Natural Areas <input type="checkbox"/> Tidal Wetland Restoration <input type="checkbox"/> Critical Infrastructure or Facility <input type="checkbox"/> Industrial Uses <input type="checkbox"/> Over-water Structures <input type="checkbox"/> Shoreline Structures <input type="checkbox"/> Transportation <input type="checkbox"/> Wastewater Treatment/Drainage <input type="checkbox"/> Coastal Protection
Description	Construction of a mixed-use building with office, retail, residential, and community facility uses.
Planned Completion Date	2028
Expected Project Lifespan	2100

The New York City Waterfront Revitalization Program Climate Change Adaptation Guidance document was developed by the NYC Department of City Planning. It is a guidance document only and is not intended to serve as a substitute for actual regulations. The City disclaims any liability for errors that may be contained herein and shall not be responsible for any damages, consequential or actual, arising out of or in connection with the use of this information. The City reserves the right to update or correct information in this guidance document at any time and without notice.

For technical assistance on using this worksheet, email wrp@planning.nyc.gov, using the message subject "Policy 6.2 Worksheet."

Last update: Sept. 7, 2018

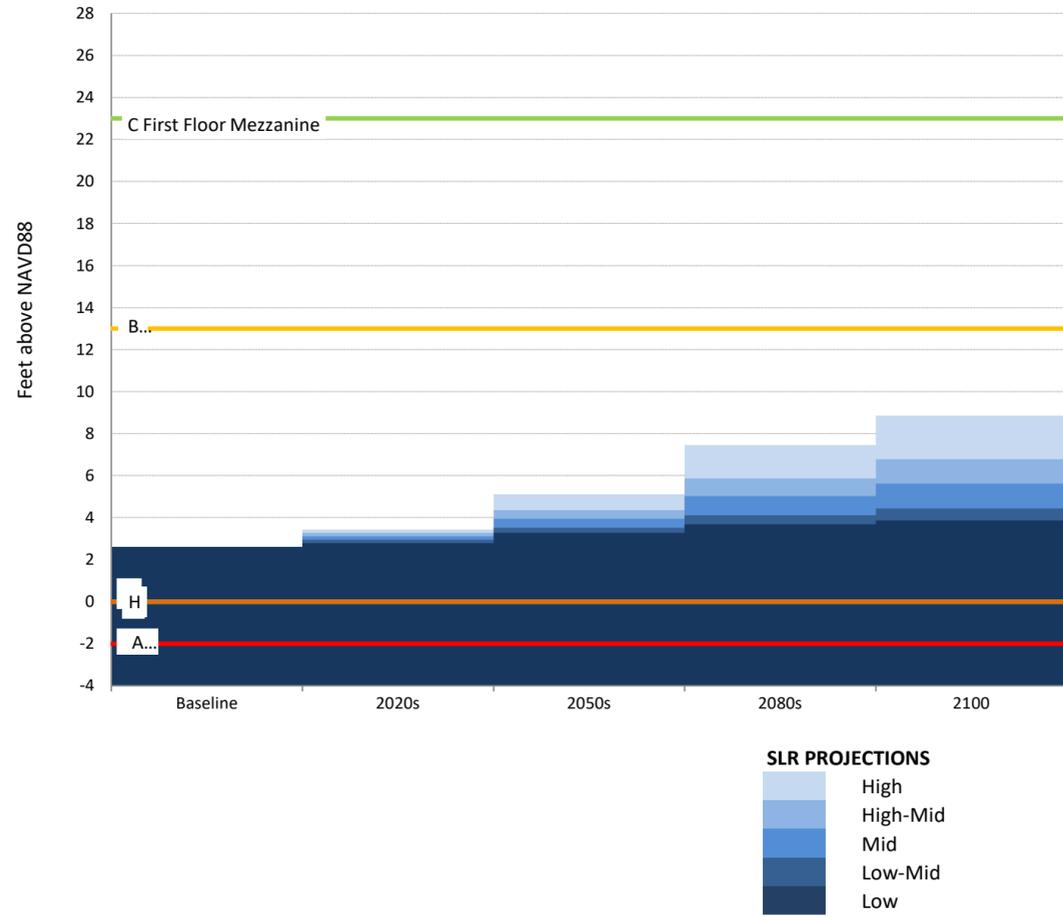
Establish current tidal and flood heights.

	FT (NAVD88)	Feet	Datum	Source
MHHW	2.61	2.61	NAVD88	<i>Appendix A - The Battery</i>
1% flood height	11.00	11.00	NAVD88	
Design flood elevation	13.00	13.00	NAVD88	
<i>As relevant:</i>				
0.2% flood height	-->			

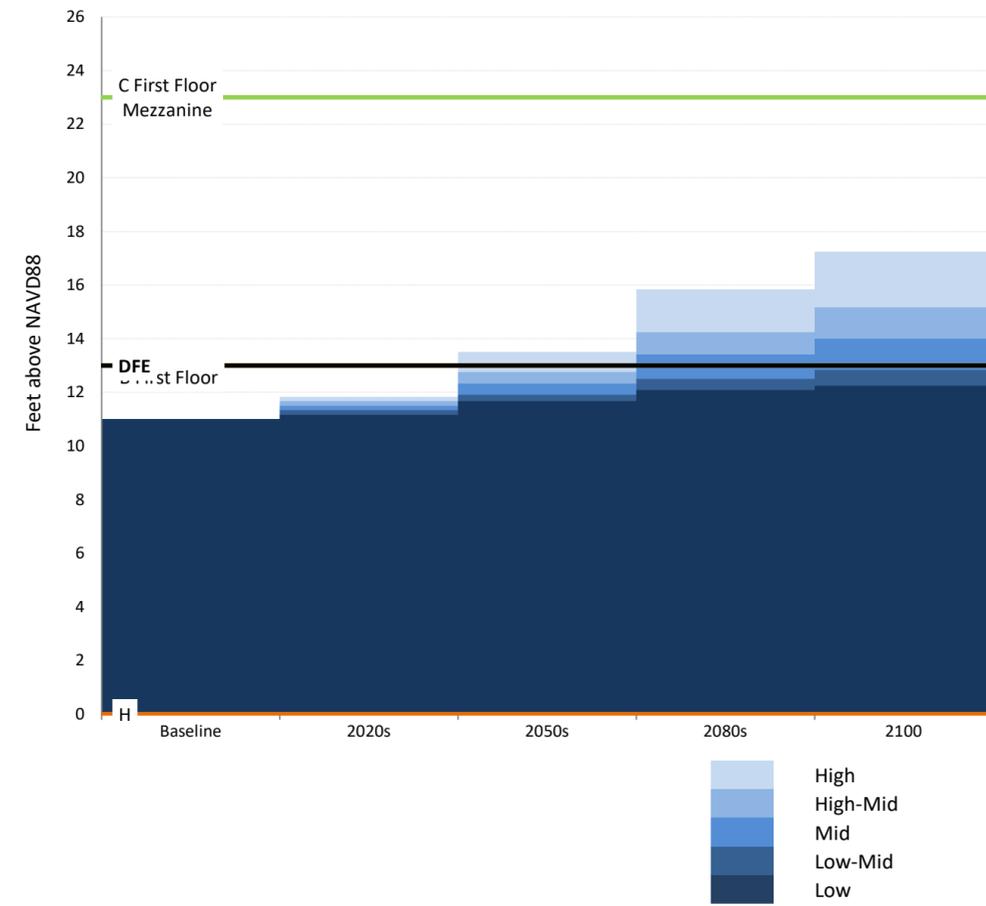
Data will be converted based on the following datums:

Datum	FT (NAVD88)
NAVD88	0.00
NGVD29	-1.10
Manhattan Datum	1.65
Bronx Datum	1.51
Brooklyn Datum (Sewer)	0.61
Brooklyn Datum (Highway)	1.45
Queens Datum	1.63
Richmond Datum	2.09

Mean Higher High Water + Sea Level Rise



1% Flood Elevation + Sea Level Rise



8-Step Process for Executive Order 11988: Floodplain Management

Lower Manhattan Development Corporation
The Port Authority of New York and New Jersey
U.S. Department of Housing and Urban Development

**Proposed Modifications to World Trade Center Memorial and Cultural Program General
Project Plan and World Trade Center Memorial and Redevelopment Plan
New York, New York**

New York County, New York
November 2021

Executive Order 11988 – Floodplain Management

Lower Manhattan Development Corporation

Proposed Modifications to World Trade Center Memorial and Cultural Program General Project Plan and World Trade Center Memorial and Redevelopment Plan

New York, New York

Effective Date: _____

This 8-Step Process for Executive Order 11988: Floodplain Management Compliance Document meets the requirements of 24 CFR Part 55.20 and Executive Order (EO) 11988—Floodplain Management—for a proposed amendment to the World Trade Center Memorial and Cultural Program General Project Plan and World Trade Center Memorial and Redevelopment Plan (Proposed Amendment) with respect to the development of the World Trade Center (WTC) Site 5 located at Block 54, Lot 1 within the WTC campus in New York, New York (Development Site). The larger project site (Project Site), on which the Development Site is located, was formerly the Southern Site added to the WTC Site in 2004. The Lower Manhattan Development Corporation (LMDC), a subsidiary of the New York State Urban Development Corporation doing business as Empire State Development (ESD), a political subdivision and public benefit corporation of the State of New York, and the Port Authority of New York and New Jersey (Port Authority) are the Project Sponsors, acting in cooperation with the U.S. Department of Housing and Urban Development (HUD). LMDC is the grantee of HUD Community Development Block Grants No. B-02-DW-36-001 and B-02-DW-36-002 (the HUD Grant).

The Approved Plan provides that a tower consisting of commercial office space and retail (Tower 5) would occupy the Development Site. The Proposed Amendment would expand the uses permitted in Tower 5 by also allowing residential use and community facilities, and contemplates transfer of the Development Site to ESD for long-term lease to a proposed developer of Tower 5.

The purpose of the Proposed Amendment is to support Lower Manhattan's transition from a predominantly office district to a mixed-use neighborhood. Residential use would be in keeping with the new residential development in the area and the many residential conversions that have occurred in nearby outmoded office buildings and would also reduce the total planned office space on the WTC Site.

This document provides the eight-step decision making process for the Proposed Project and pertains to activities within the Special Flood Hazard Area (SFHA) as defined by the Federal Emergency Management Agency (FEMA), or its successors, pursuant to the National Flood Insurance Program (NFIP), or a successor program, whether advisory, preliminary, or final, and wetland as defined by 24 CFR 55.2(b)(11).

Description of Proposed Actions

In April 2004, LMDC, acting as lead agency under the National Environmental Policy Act (NEPA) and the New York State Environmental Quality Review Act (SEQRA) prepared, in cooperation with HUD and the Port Authority, a Final Generic Environmental Impact Statement (2004 FGEIS) for the World Trade Center (WTC) Memorial and Redevelopment Plan. In June 2004, LMDC adopted its Record of Decision and Lead Agency Findings Statement (ROD) for that Plan and affirmed the General Project Plan (GPP) for LMDC's WTC Memorial and Cultural Program. Implementation of the WTC Memorial and Redevelopment Plan began with a formal groundbreaking for the new 1 World Trade Center (Tower 1) on July 4, 2004. Since

that time, there have been a number of adjustments, refinements, and amendments made to the Redevelopment Plan and the GPP, as described below. The current Redevelopment Plan and GPP with such adjustments, refinements, and amendments are referred to as the Approved Plan and the GPP, respectively.

On June 26, 2019, LMDC and the Port Authority issued a Request for Proposals for the Proposed Project on the Development Site. Respondents were invited to propose either commercial development consistent with the Approved Plan or mixed-use development which might include residential development consequently requiring modification to the GPP (Proposed Project). In February of 2021, the Boards of LMDC and the Port Authority voted to conditionally designate a joint venture comprising Brookfield Properties, Dabar Development, OMNI New York, and Silverstein Properties team (collectively, the “Developer”) as the development team, subject to the completion of environmental and all other reviews and public approvals required by law, amendment to the GPP to permit residential development and the negotiation and execution of the necessary project agreements (the “Proposed Amendment”). The Approved Plan contemplated that Tower 5 to be built on the Development Site would be an office tower of approximately 57 stories with ground-floor retail use. The Proposed Amendment would provide greater flexibility in the development of Tower 5 by allowing residential and community facility uses in addition to commercial and retail uses.

LMDC is conducting an evaluation of the Proposed Amendment to the Approved Plan as required by Executive Order 11988 in accordance with HUD regulations under 24 CFR Part 55 - Procedures for Making Determinations on Floodplain Management and Protection of Wetlands, to determine the potential effects that Project activity in the floodplain and wetlands would have on the human environment.

The final program for the Site 5 tower has not yet been defined; however, two potential programs shown in **Table 1-1** were developed to represent the reasonable worst case for analysis.

**Table 1-1
Potential Programs for Analysis***

	Maximum Residential (1,270 Units)	Reduced Residential (1,193 Units)
Residential	1,386,898 gross square feet (gsf)	1,126,563 gsf
Commercial	180,000 gsf	374,361 gsf
Fitness and Social Center	36,000 gsf	80,645 gsf
Community Facility	13,000 gsf	21,329 gsf
Retail	12,000 gsf	25,000 gsf
Total	1,627,898 gsf**	1,627,898 gsf**
Notes: * These figures represent gross square footages of the uses indicated to ensure conservative analyses. ** An additional 50,000 gsf of residential mechanical space is permitted for an all-electric building under either program. Source: Development Team		

Parking is not contemplated in Tower 5. Construction of Tower 5 under the Proposed Project is expected to commence in 2023 and be complete in 2028.

Executive Order 11988 & 24 CFR Part 55

Pursuant to 24 CFR §55.20, an 8-step process for floodplain management must be completed for proposed actions taking place in a floodplain. 24 CFR §55.20 implements EO 11988 (Floodplain Management). EO 11988 requires federal agencies (or a state agency implementing a federal funding program) to reduce the loss of life and property caused by floods, minimize impacts of floods on human safety, health, and welfare, and preserve the natural and beneficial functions of floodplains.

In addition, federal agencies are required to demonstrate that consideration of all practicable alternatives has resulted in the reduction or elimination of long- and short-term adverse impacts associated with occupancy and modifications of the floodplain. This 8-step process includes assessing all practicable alternatives and incorporating public review.

Projects located within a Special Flood Hazard Area (SFHA) are subject to EO 11988. Information on where SFHAs are located is available on Flood Insurance Rate Maps (FIRMs) published by FEMA. FEMA uses engineering studies to determine the delineation of these areas or zones subject to flooding. The relevant data source for the SFHA is the latest issued FEMA data or guidance, which includes advisory data, such as Advisory Base Flood Elevations (ABFEs) or preliminary and final FIRMs.

24 CFR Part 55.20 Eight-Step Process

Step One: Determine whether the proposed action is located in the 100-year floodplain (500-year floodplain for critical actions) or results in new construction in a wetland.

Site 5 is partially within the 100-year floodplain (area with a 1 percent chance of flooding each year) and partially solely within the 500-year floodplain (area with a 0.2 percent chance of flooding each year), as shown on **Figure 1**. Less than 25,000 square feet of the approximately 33,000 square feet within Site 5, or about 75 percent, is within the 100-year floodplain, while just under 10,000 square feet, or about 25 percent of Site 5, is solely within the 500-year floodplain. Federal projects located within a SFHA as defined by FEMA are subject to EO 11988. Based on the FEMA preliminary FIRMs released on January 30, 2015, which represent the Best Available Flood Hazard Data, the portion of Site 5 within the 100-year floodplain falls within Zone AE with a base flood elevation (BFE) of +11 feet North American Vertical Datum of 1988 (NAVD88). The project involves new construction within the floodplain and thus EO 11988 applies.

Site 5 is not located in or near any wetlands.

Step Two: Notify the public at the earliest possible time of intent to carry out the proposed action in a floodplain and involve the affected and interested public in the decision making process.

Portions of the Project Site are located within the 100-year floodplain while other portions are located within the 500-year floodplain. As a result, LMDC must publish an early notice that allows the public an opportunity to provide input into the decision to provide funding for the Proposed Project. LMDC is the grantee of HUD Community Development Block Grants No. B-02-DW-36-001 and B-02-DW-36-002 (the HUD Grant).

Upon completion of the early public notice and comment period, LMDC assessed, considered, and responded to the comments received individually and collectively for the project file, then proceeded to Step Three.

A “**Notice for Early Public Review of Proposal in the 100 and 500-Year Floodplains**” was published in **the New York Daily News on October 1, 2021**. The ad targeted local residents, including those in the floodplain. The notice was sent to 151 federal, state, and local agencies; elected officials; Indian tribes; community boards; public libraries and potentially interested organizations on **October 1, 2021**. (see **Enclosure 1 (Public Notice)** for the notice).

More than the required **15** calendar days were allowed for public comment. As required by regulation, the notice also included the name, proposed location and description of the activity, total number of floodplain acres involved, a map, a link to the responsible entity contact for information, the web address for LMDC’s posting of information at www.renewnyc.com, the location and hours of the office at which the publicly

available environmental record of the Approved Plan and Proposed Amendment can be viewed, and contact information for mail, phone and email comments.

LMDC received eight public comments on this notice. The floodplain issues noted by the commenters are addressed as follows: stormwater management (EA at p. 16-4 (Coastal Zone) and Appendix B, NYS Department of State Coastal Management Program Federal Consistency Assessment Form, at p. 6 (New York State coastal management program Policy 33); consistency with Lower Manhattan coastal resiliency planning (EA pp. 16-1 through 16-11, including conformity with the 10 major policies in the New York City Local Waterfront Revitalization Program, and in particular in Policy 6, and in Chapter 14, Climate Change); open green areas (EA p. 1-5 and Figure 1-3); lower Manhattan resiliency infrastructure projects (EA p. 14-7); flood resilient construction (EA p. 14-16 to 14-18; p. 16-7) and below at Step Five; and discussion of other flood protection measures on other parts of the WTC campus (see 2004 FGEIS and Record of Decision, discussing, *e.g.*, addition of pervious surfaces and extension and construction of bathtub).

Step Three: Identify and evaluate practicable alternatives to locating the proposed action in a floodplain.

After consideration of the following alternatives, it has been determined the best practicable alternative is the Proposed Project.

Alternatives

No Action Alternative

The Development Site is a previously developed site with existing foundation structures and has been approved for redevelopment. The No Action Alternative would comprise the redevelopment plan as described under the Approved Plan. In the 2004 FGEIS, Tower 5 was assumed to be approximately 57 stories tall with 1.5 to 1.8 million sf of office space, including retail at its base. As adjusted in 2005, Tower 5 was assumed to contain 1.2 to 1.5 million sf of office use, including a retail base. In the 2007 amendment to the GPP and the NYPD FEIS, Tower 5 was assumed to be developed with 1.3 million sf of office use. It was expected to comprise approximately 1.306 million sf of office use and 7,042 sf of retail space, to be approximately 57 stories (approximately 839 feet tall), and to incorporate the Sustainable Design Guidelines developed by LMDC as part of the Approved Plan.

Proposed Project under the Proposed Amendment

As the final program for Tower 5 has not yet been defined, two potential programs were created to represent the reasonable worst case for analysis of the Proposed Project. The Maximum Residential building scenario would have 1,270 residential units, while the Reduced Residential building scenario would have 1,193 residential units. The Maximum Residential building would have 180,000 gross square feet (GSF) of commercial office space, while the Reduced Residential building would have 374,361 GSF of commercial office space. The Maximum Residential building would have 36,000 GSF of fitness and social center uses and 13,000 GSF of community facility uses. The Reduced Residential building would have 80,645 GSF of fitness and social center uses as well as 21,329 GSF for community facility uses. Both would have retail in the base, but the Reduced Residential building would have 25,000 GSF of retail as compared to 12,000 GSF in the Maximum Residential building.

The proposed arrangement of uses for either scenario under the Proposed Project would be as follows: the ground floor (anticipated to be 24 feet high) would contain lobbies for all the different uses and retail space as well as a service area. The second floor is anticipated to be split between office space and a community facility. Floors 3 through 7 would contain offices. It is anticipated that the eighth floor would be a

mechanical level, and that the ninth and tenth floors would provide fitness and social center. The upper floors would contain residential units with four outdoor spaces.

Step Four: Identify the potential direct and indirect impacts associated with the occupancy or modification of the floodplain.

As discussed in the 2004 FGEIS, New York City is affected by local flooding (e.g., flooding of inland portions of New York City from short-term, high-intensity rain events in areas with poor drainage), and coastal flooding (e.g., long- and short-wave surges that affect the City's shorelines along the Atlantic Ocean and tidally influenced rivers and straights such as the Hudson River, Harlem River, and East River). Because these floodplains are affected by coastal flooding rather than local or fluvial flooding, the Proposed Amendment would not exacerbate flooding conditions on or near the Project Site.

Development of Site 5 under the Proposed Project, like the No Action Alternative, would occur within a previously developed site with existing foundation structures. Therefore, the Proposed Project would not result in any new significant adverse impacts to flood levels, flood risk, or the flow of floodwater within the Project Site or the surrounding area.

Step Five: Where practicable, design or modify the proposed action to minimize the potential adverse impacts within the floodplain and to restore and preserve its natural and beneficial values.

The Proposed Project would increase the number of residential units as compared with the No Action Alternative. These residential units would be located in the upper floors, beginning with approximately the tenth floor and would remain above the one percent annual chance flood level throughout the life of the project under any scenario of sea level rise as predicted by the New York City Panel on Climate Change (NPCC). The ground floor would be located at design flood elevation of +13 feet NAVD88. This adds two feet of freeboard as required by Local Law 43 of 2021, effective April 18, 2022. The Proposed Project would be constructed in accordance with the Flood Resistant Construction requirements of Appendix G of the New York City Building Code and could incorporate additional measures to minimize losses due to flooding in the future with sea level rise. The cellar will be dry floodproofed. Examples of ground floor flood damage reduction measures include insulated flood vents providing wet floodproofing at residential exit stairs (and loading dock doors if the dock is conditioned space); loading dock doors with open lattice to provide wet floodproofing the dock is unconditioned space; flood-resistant storefront glazing and removable flood barriers to provide dry floodproofing at the community facility entrance. If the flood elevation increases in the future, the Proposed Project could be retrofitted with additional flood protection features (e.g., internal flood barriers, temporary stairs, etc.). Specific measures would be determined at a later date.

The Development Site is a previously developed site that contained the Deutsche Bank building from 1974 until 2011, which was severely damaged by the events of September 11, 2001. There are no alternatives that do not involve the development of the Development Site. Like the No Action Alternative, the Proposed Project would not aggravate the current hazards to other floodplains or disrupt floodplain values. Unlike the No Action Alternative, however, the Proposed Project would contribute to advancing the policy goals of developing Lower Manhattan as a viable, full-service community with an appropriate balance between commercial and residential development by providing additional residential units. It would advance the goals of Housing New York to build or preserve affordable housing.

Step Six: Reevaluate the proposed action to determine: (1) Whether it is still practicable in light of its exposure to flood hazards in the floodplain, the extent to which it will aggravate the current hazards to other floodplains, and its potential to disrupt floodplain values; and (2) Whether

alternatives preliminarily rejected at Step Three are practicable in light of the information gained in Steps Four and Five.

After considering the Environmental Assessment and public comments received in response to the Early Floodplain Notice, LMDC will reevaluate the Proposed Project, and determine whether the project is still practicable in light of its exposure to flood hazards in the floodplain to determine: (1) Whether it is still practicable in light of its exposure to flood hazards in the floodplain, the extent to which it will aggravate the current hazards to other floodplains, and its potential to disrupt floodplain values; and (2) Whether alternatives preliminarily rejected at Step Three are practicable in light of the information gained in Steps Four and Five.

Step Seven: If the reevaluation results in a determination that there is no practicable alternative to locating the proposal in the floodplain, publish a final notice.

If the reevaluation results in a determination that there is no practicable alternative to locating the proposed building in the floodplain, a final notice will be published.

Such notice would consist of a “Notice for Final Public Review of a Proposed Activity in a 100- and 500-Year Floodplain” and would be published in in **the New York Daily News**, and will provide for at least a 7-day comment period, or the appropriate comment period for combined notices. The notice will be sent to the distribution list that received the early floodplain notice, and any parties that have subsequently expressed interest in receiving such notice.

All comments received by the deadline will be considered.

Step Eight: Implement the Action

Step eight is implementation of the proposed action. If, after considering comments received after the final floodplain notice, LMDC determines that the Proposed Project will have no direct or indirect adverse impacts to the floodplain, LMDC will implement the action, and will ensure that all mitigation measures prescribed in the steps above will be adhered to. This record of the 8-step process will be updated as appropriate.

LMDC will also complete a NEPA review in accordance with 24 CFR Part 58 and a NY State Environmental Quality Review Act (SEQR) review in accordance with 6 NYCRR Part 617.

Enclosure 1



LMDC

Lower Manhattan Development Corporation
22 Cortlandt Street, 22nd Floor New York, NY 10007
Tel: 212.962.2300 Fax 212.962.2431
www.renewnyc.com

**NOTICE FOR EARLY PUBLIC REVIEW
OF PROPOSAL IN THE 100 AND 500-YEAR FLOODPLAINS**

**PROPOSED MODIFICATIONS TO WORLD TRADE CENTER MEMORIAL
AND CULTURAL PROGRAM GENERAL PROJECT PLAN AND
WORLD TRADE CENTER MEMORIAL AND REDEVELOPMENT PLAN**

October 1, 2021

Name of Responsible Entity and Recipient:

Lower Manhattan Development Corporation (LMDC),
a subsidiary of Empire State Development
22 Cortlandt Street – 22nd Floor
New York, NY 10007
Telephone Number: (212) 962-2300
Facsimile Number: (212) 962-2431
Email: publiccomment@renewnyc.com
Contact name: Daniel A. Ciniello, President

This notice is provided pursuant to Section 2(a)(4) of Executive Order 11988 for Floodplain Management and 24 CFR § 55.20(b) regulations of the United States Department of Housing and Urban Development (HUD) concerning financial assistance for activities that are within and/or affect a floodplain, under HUD Grants No. B-02-DW-36-001 and B-02-DW-36-002.

LMDC, a subsidiary of the New York State Urban Development Corporation, doing business as Empire State Development (ESD) (a political subdivision and public benefit corporation of the State of New York), is considering a proposed modification of the World Trade Center (WTC) Memorial and Cultural Program General Project Plan and WTC Memorial and Redevelopment Plan (collectively, the Approved Plan). The Approved Plan provides that a tower consisting of commercial office space and retail (Tower 5) would occupy the development site bounded by Washington Street, Albany Street, Greenwich Street, and Liberty Park (the Development Site). The larger project site (Project Site), on which the Development Site is located, was formerly the Southern Site added to the WTC Site in 2003-2004.

The proposed modification would expand the uses permitted in Tower 5 by also allowing residential use and community facilities, and contemplates transfer of the Development Site to ESD for long-term lease to a proposed developer of Tower 5. The Development Site is approximately 33,000 square feet, with approximately 75% within the 100-year floodplain and the remaining approximately 25% solely within the 500-year floodplain. A map with the location of the Development Site within the 100-year and 500-year floodplain is available at: <http://www.renewnyc.com>.



LMDC

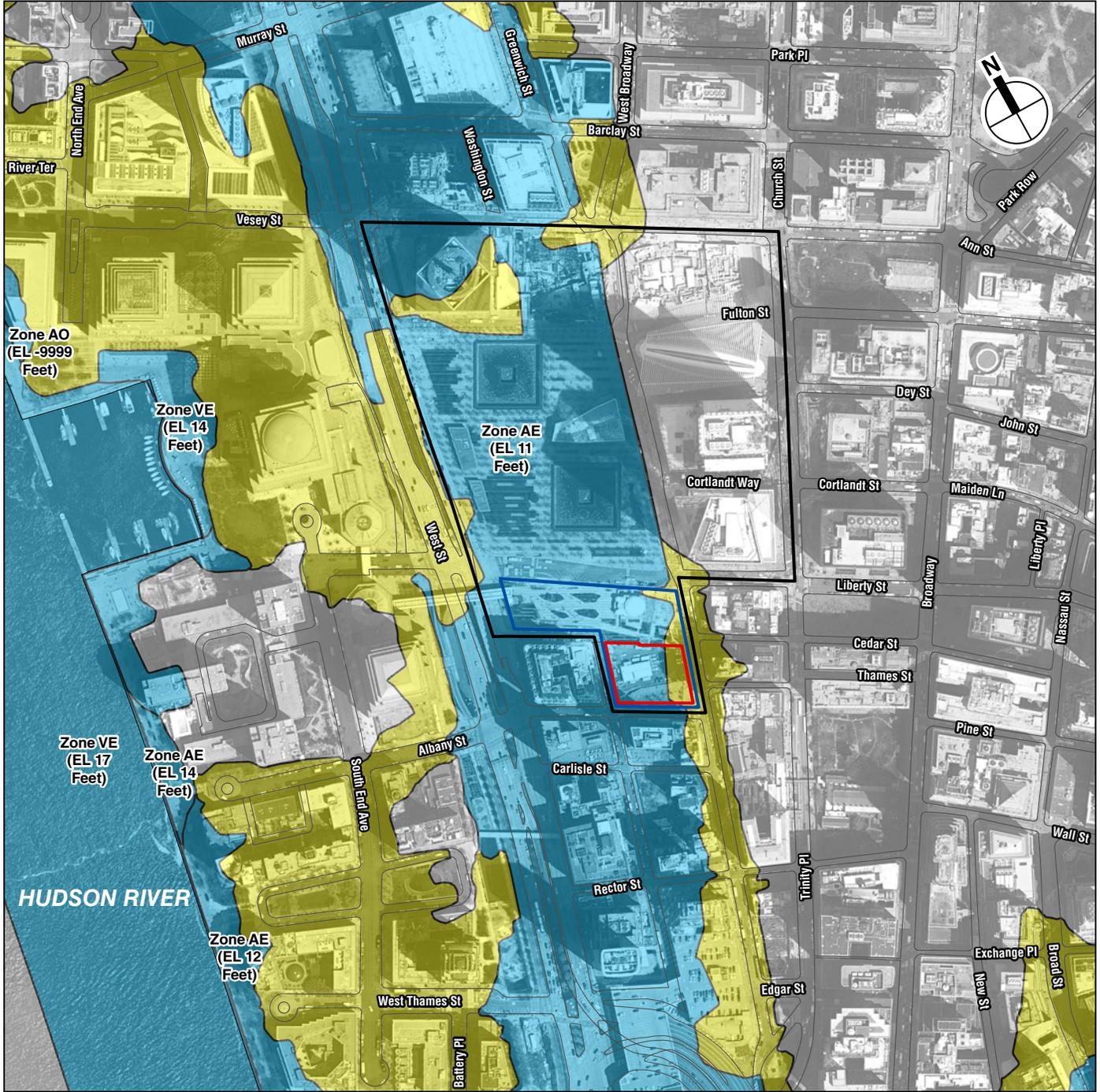
Lower Manhattan Development Corporation
22 Cortlandt Street, 22nd Floor New York, NY 10007
Tel: 212.962.2300 Fax 212.962.2431
www.renewnyc.com

The Development Site is the former location of the damaged Deutsche Bank building, which was decontaminated and deconstructed in 2011. A portion of the site is now a temporary public plaza area. To the north, the Development Site is currently occupied by construction trailers containing the Port Authority Police Department World Trade Center Command Center.

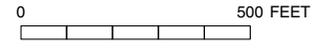
There are three primary purposes for this notice. First, people who may be affected by activities in floodplains and those who have an interest in the protection of the natural environment should be given an opportunity to express their concerns and provide information about these areas. Second, an adequate public notice program can be an important public educational tool. The dissemination of information about floodplains can facilitate and enhance Federal efforts to reduce the risks associated with the occupancy and modification of these special areas. Third, as a matter of fairness, when the Federal government determines it will participate in actions taking place in floodplains, it must inform those who may be put at greater or continued risk.

PUBLIC COMMENTS

Any individual, group, or agency wishing to comment on this notice may submit written comments to LMDC at any of the above addresses. All comments received by 5 PM Eastern Standard Time on October 18, 2021 will be considered by LMDC prior to the completion of an environmental assessment. The publicly available environmental record for the Approved Plan and proposed modification described herein will be available on line at <http://www.renewnyc.com/> and may be reviewed during weekdays 9:30 A.M. to 4 P.M., public holidays excluded, at LMDC's office by contacting LMDC at the above address.



- WTC Site
- Project Site
- Development Site (Site 5)
- 1% Annual Chance of Flooding
- 0.2% Annual Chance of Flooding



FEMA Preliminary Flood Insurance Rate Map 2015

WTC SITE 5

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program

625 Broadway, Fifth Floor, Albany, NY 12233-4757

P: (518) 402-8935 | F: (518) 402-8925

www.dec.ny.gov

October 26, 2021

Emma Powell
AKRF, Inc.
7250 Parkway Drive, Suite 210
Hanover, MD 21076

Re: Lower Manhattan Development Corporation (LMDC) Tower 5 Amendment
County: New York Town/City: Manhattan

Dear Emma Powell:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 2 Office, Division of Environmental Permits, at dep.r2@dec.ny.gov.

Sincerely,



Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program



The following state-listed animals have been documented in the vicinity of the project site.

The following list includes animals that are listed by NYS as Endangered, Threatened, or Special Concern; and/or that are federally listed.

For information about any permit considerations for your project, please contact the Permits staff at the NYSDEC Region 2 Office at dep.r2@dec.ny.gov, (718) 482-4997.

<i>COMMON NAME</i>	<i>SCIENTIFIC NAME</i>	<i>NY STATE LISTING</i>	<i>FEDERAL LISTING</i>
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The following species has been documented nesting within about 1/4 mile of the project site.

Birds

Peregrine Falcon <i>Breeding</i>	<i>Falco peregrinus</i>	Endangered	5292
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The following species have been documented in the Lower Hudson River and so could occur within 1/4 mile of the project site.

Fish

Shortnose Sturgeon	<i>Acipenser brevirostrum</i>	Endangered	Endangered	1091
Atlantic Sturgeon	<i>Acipenser oxyrinchus</i>	No Open Season	Endangered	11464

This report only includes records from the NY Natural Heritage database.

If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about many of the listed animals in New York, including habitat, biology, identification, conservation, and management, are available online in Natural Heritage’s Conservation Guides at www.guides.nynhp.org, and from NYSDEC at www.dec.ny.gov/animals/7494.html.