A. INTRODUCTION

According to the *CEQR Technical Manual,* a shadow is defined as the circumstance in which a building or other built structure blocks the sun from the land. An adverse shadow impact is considered to occur when the shadow from a proposed project falls on a publicly accessible open space, historic landscape, or other historic resource if the features that make the resource significant depend on sunlight, or if the shadow falls on an important natural feature and adversely affects its use and/or important landscaping and vegetation. In general, shadows on city streets and sidewalks or on other buildings are not considered significant under CEQR. In addition, shadows occurring within an hour and a half of sunrise or sunset generally are also not considered significant under CEQR.

This chapter assesses the reasonable worst-case development scenario, on a site-specific basis, for potential shadowing effects on existing light-sensitive uses, and discloses the range of shadow impacts, if any, which are likely to result from the action, further identifying:

- Projected and potential development sites adjacent to existing natural resources, historic resources, and/or publicly accessible open spaces.
- Projected and potential development sites located in areas which are not susceptible to shadow impacts.
- If warranted, describe in shadow diagrams and text the potential effect of shadows from buildings resulting from the identified RWCDS (both projected and potential development sites) on publicly accessible open spaces, light-sensitive natural resources, or light-sensitive historic resources.

The area affected by the proposed action covers approximately 184 blocks in the north and southwest portions of Greenpoint and Williamsburg. According to the *CEQR Technical Manual,* the longest shadow a structure will cast, except for periods close to dawn or dusk is 4.3 times its height. Projected and potential developments would range in building heights from 150 to 350 feet along the waterfront and would therefore cast maximum shadows of 645 to 1,505 feet. Projected and potential developments would range in heights from 50 to 80 feet within the upland portion of the action area and would therefore cast maximum shadows of 215 to 344 feet. Preliminary assessment of the projected and potential development sites and the shadows they would cast found that several cast shadows long enough to reach open spaces and architectural resources. Therefore, a shadow screening analysis was undertaken for the projected and potential development sites to determine whether the proposed action has the potential to result in significant shadow impacts thereby requiring a detailed shadow analysis.

B. RESOURCES OF CONCERN

In accordance with CEQR guidelines, the assessment of potential shadow impacts is limited to new shadows long enough to reach publicly accessible open space, historic resources, or important natural

features. As discussed in Chapter 10, "Natural Resources," the Bushwick Inlet, located in the study area, is considered an important natural feature. However, as discussed below under "Assessment", no new incremental shadows from the projected/potential development would extend into the Bushwick Inlet. In coordination with Chapter 5, "Open Space," and Chapter 7, "Historic Resources", publicly accessible open spaces and architectural resources to the north, south, and west of the projected and potential development sites were identified, as shadows created by the proposed action could fall in the direction of these resources. The resources of concern were also assessed for their potential to be sunlight sensitive. Only those resources that are sunlight sensitive and were found to be within the shadow radius (as discussed above) of a projected or potential development site were included in the analysis. Figure 6-1 shows the location of each resource.

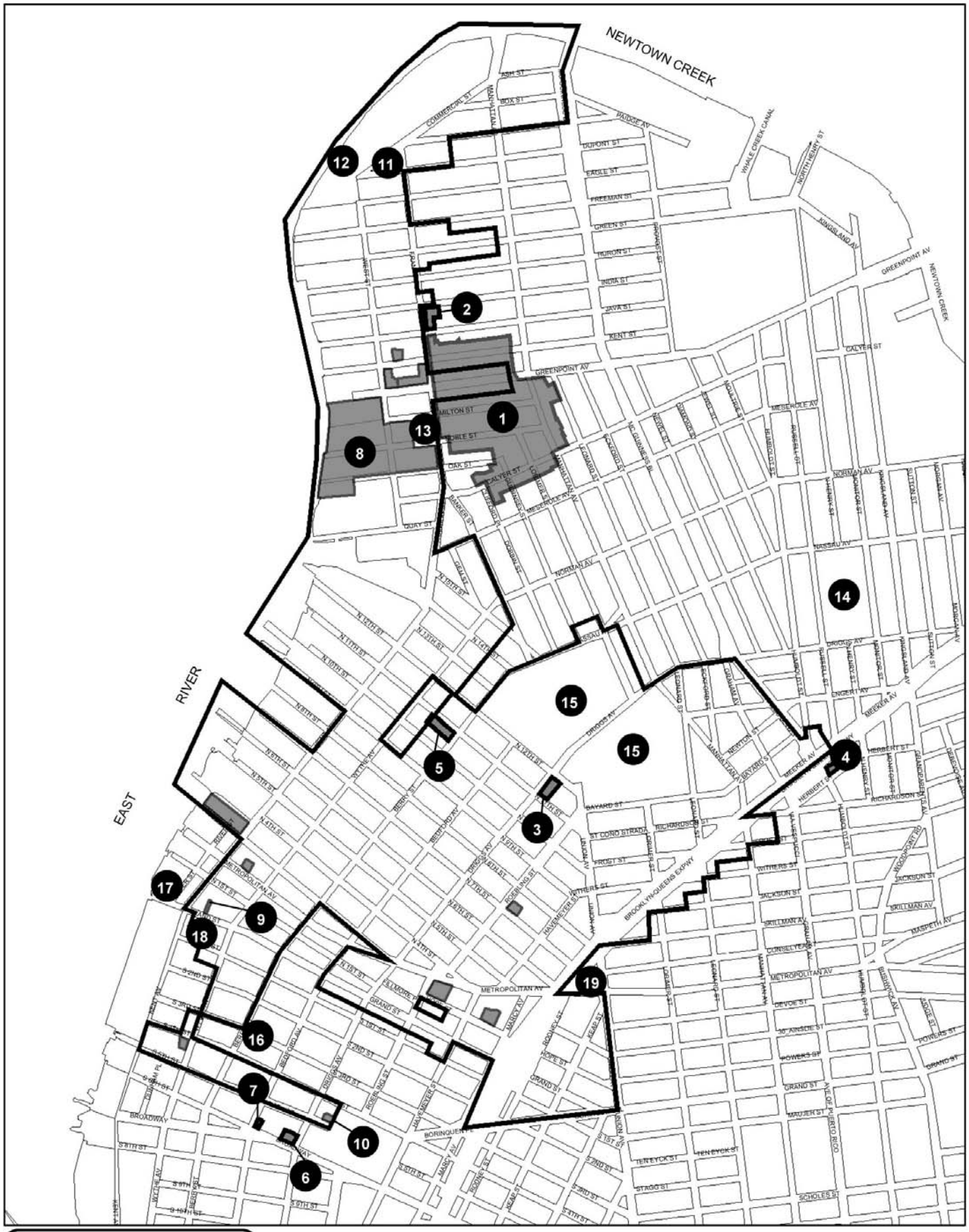
Historic Resources

Designated Historic Resources

1. Greenpoint Historic District
   The Greenpoint Historic District is partially located within the action area. This historic district was designated by LPC in 1982 and listed on the State and National Registers of Historic Places in 1983. Unlike Brooklyn's other 19th century residential historic districts, Greenpoint was not settled primarily by people who commuted to Manhattan. Rather, development in Greenpoint was closely linked to the prosperity of the nearby industrial waterfront. The district contains a wide variety of buildings, reflecting the varied income levels of the local residents. Houses range from early examples of flats to modest frame dwellings to impressive masonry row houses. Construction boomed in the 1860s and early 1870s, and it was during these decades that some of the district's finest houses were erected. Among them, are a large number of Italianate brick row houses with cast-iron window lintels and door hoods that were probably cast in local Greenpoint foundries. The houses at 128-132 Noble Street and 114-124 Kent Street, dating from 1867-68, are particularly notable. Also within the district are some of the most impressive ecclesiastical buildings in eastern Brooklyn, reflecting the importance of religious life to Greenpoint's residents. Among the major churches are the English Gothic-inspired Episcopal Church of the Ascension (1865-66) and the High Victorian Gothic Reformed Church of Greenpoint, now Saint Elias Greek Rite Roman Catholic Church (1869-70, Sunday School 1879), both located on Kent Street. Also of interest are the German Gothic-inspired Saint John's Evangelical Lutheran Church (1891-92) on Milton Street and the early Romanesque Revival First Baptist Church of Greenpoint (1863-65), now Union Baptist Church, located on Noble Street. Most prominent is Saint Anthony of Padua Roman Catholic Church (1875) on Manhattan Avenue.

2. Astral Apartments
   This structure, which was designated as a NYC landmark by LPC in 1983, and is also listed on the State and National Registers of Historic Places (1982), is a significant example of "model tenement" design. Erected by Charles Pratt in 1885-1886 and named for the "astral oil" manufactured by one of his companies in a nearby Greenpoint refinery, the building was planned as quality affordable housing for ninety five families. Each apartment contained adequate windows, a toilet, hot and cold running water, and other amenities not usually provided to working class families in the 19th century. The building was designed in the Queen Anne style, with patterned brickwork, rock-face brownstone arches and lintels, and structural steel storefronts with rivets themselves as decoration.

Figure 6-1
Resources of Concern



3. Russian Orthodox Cathedral of the Transfiguration of Our Lord
This structure, built between 1916 and 1921, was designated as a NYC Landmark by LPC in 1969, and is also listed on the State and National Registers of Historic Places (1980). The Greek cross plan and the impressive scale of the "onion domes" of this small yellow brick church typify design in the Russian Orthodox tradition. The central dome is 85 feet in diameter and the four corner domes are 12 feet across. The cathedral itself stands as a symbol of the importance of Eastern European immigrants in the history of northeastern Brooklyn.

4. 19th Police Precinct Station House & Stable
Built in 1891-92, this romanesque revival police station, with its bold arched entrance porch, prominent tower, and handsome ironwork was designated as a NYC Landmark by LPC in 1993.The building is no longer in use by the Police Department and is currently vacant.

5. Hecla Iron Works Building
The Hecla Iron Works Office Building, which was built in 1896-97, is located at 100-118 North 11th Street, and is identified as potential development Site 118. During the last decades of the 19th century and first decades of the 20th century, Hecla was one of the most important manufacturers of architectural iron and bronze in the United States, and employed more than a thousand workers at its peak. The four-story building includes a cast iron facade that is notable for its late date of production and its unusual black velvety surface. The well-preserved elevations are embellished with simple classical details. Each bay contains three windows and is flanked by double-story pilasters with capitals that suggest metopes. Arranged in vertical grids, the windows are original to the building. Probably manufactured on-site, they are among the oldest metal-frame windows in New York City. The LPC designated this building as an individual New York City Landmark on June 8, 2004.

6. Williamsburgh Savings Bank
This historic resource is located at the northwest corner of Broadway and Driggs Avenue. Constructed in 1870-75, with additions in 1905 and 1925, the exterior of the structure was designated as a NYC Landmark by LPC in 1966, whereas the interior was designated in 1996. The building was listed on the State and National Registers of Historic Places in 1980. With its monumental arched entrance portico and towering dome, this structure is one of the first conscious expressions of the Italian Renaissance style erected in America. The Williamsburgh Savings Bank was founded in 1851 to serve the rapidly growing independent city of Williamsburgh. This building was the bank's third home, and served as its headquarters until its new tower on Hanson Place (in Downtown Brooklyn) was completed in 1929. The vast interior, with its open plan, marble pilasters, and decorative iron grilles, contains one of the rare surviving examples of a post-Civil War ornamental scheme. The structure is currently occupied by an HSBC bank branch.

7. Kings County Savings Bank
The Kings County Savings Bank is located on the same block as the Williamsburgh Savings Bank, and occupies the northeast corner of Broadway and Bedford Avenue. Constructed in 1868, this structure was designated as a NYC Landmark by LPC In 1966 and listed on the State and National Registers of Historic Places in 1980. This former bank, built of light-colored sandstone, is one of New York's most magnificent French Second Empire buildings. The baroque quality of the design is accented by a projecting entrance portico, recessed loggias, a pair of projecting corner pavilions on the side facade, and beautifully executed carving on the ground floor. The building is currently used as a non-profit art center called the Williamsburg Art & Historical Center.

Potential Historic Resources

8. Greenpoint Terminal Market
   The Greenpoint Terminal Market has been the subject of debate concerning historic preservation. The Greenpoint Terminal Market site, which occupies over three blocks of land along the East River between Greenpoint Avenue and Oak Street, is largely vacant. This site includes six industrial buildings ranging in height from one to seven stories, several of which are severely deteriorated.

9. Former Northside Savings Bank
   The former Northside Savings Bank Building is located at 33-35 Grand Street. The former bank building is described in the *AIA Guide to New York City* (fourth edition) as a "super" building, with "rock-face Romanesque, arched, cast-iron corniced, wrought-iron." Although the *AIA Guide* indicates a construction date of 1889, the City's records for the tax lot matching this address (Block 2378 Lot 42) indicate that the building was constructed in 1900, and altered in 1997. LPC has determined that this building is eligible for LPC and S/NR designation.

10. Former Williamsburg Trust Co.
    The former Williamsburg Trust Company Building, located at 177 South 5th Street, is currently occupied by the Holy Trinity Church of Ukranian Autocephalic Orthodox Church in Exile. The *AIA Guide* described the building as an opulent terra-cotta monument, and indicates it was constructed in 1906. LPC has determined that this building is eligible for LPC and S/NR designation.

In addition, the structure on projected/potential development Site 55 (at 61 Greenpoint Avenue, between Franklin and West Streets) was recently determined by LPC to be eligible for LPC and S/NR designation. This structure was part of the Faber pencil manufacturing facility. The building at 184 Kent Avenue may also be eligible for LPC designation.

The details of the features of the above mentioned historic resources, which are not the primary historic characteristics resulting in their designation or potential designation as historic resources, are not dependent on sunlight during the day to the extent that shadows would obscure their significance. Therefore, while the proposed action could potentially cast shadows on the above listed structures, such shadow effects do not require further assessment of these historic resources. However, the *CEQR Technical Manual* cites stained glass windows as an example of sunlight sensitive features. The Russian Orthodox Cathedral of the Transfiguration of Our Lord contains stained glass windows and as such, has the potential to be impacted by shadows cast by new buildings resulting from the proposed action. In addition, the Greenpoint Historic District contains several churches with stained glass windows and also has the potential to be impacted by shadows cast by new buildings resulting from the proposed action. As such, further shadow assessment of these two historic resources is necessary.

Open Space Resources

According to the *CEQR Technical Manual,* some open spaces contain facilities that are not sensitive to sunlight. These are usually paved (such as handball or basketball courts), contain no sitting areas, and no vegetation, no unusual or historic plantings, or contain only unusual or historic plantings that are shade tolerant. Facilities such as children's playgrounds and sprinklers, swimming pools, sitting or sunning areas, ballfields and other play areas that are covered with turf do require direct sunlight for some part of the day or at some times of the year.

Most open space resources within the proposed action area and surrounding areas are small and accommodate paved sitting areas, basketball courts, and/or playgrounds which contain scattered planters and/or trees that are shade tolerant. As shown in Table 5-3 in Chapter 5, "Open Space," most of the open spaces in the area are paved and contain shade tolerant planters and/or trees. As such, the RWCDS development would not be expected to create any significant new incremental shadows which would adversely affect any of these resources. In addition, many of these open space resources fall outside the shadow radius of any projected or potential developments. Eight open space resources were identified as falling within the shadow radius of projected or potential developments and may contain sunlight sensitive features which require detailed technical analysis to identify any incremental shadows created by the RWCDS development. These resources are briefly discussed below.

11. Greenpoint Park
    Greenpoint Park (a.k.a. Right Triangle Park) is located at the northern tip of Greenpoint at the junction of Franklin, Commercial and DuPont Streets. The perimeter of the park is surrounded by shade trees, beneath which are benches. The park also features a playset with safety surfacing, toddler and child swings, and a spray shower at its center.

12. Newtown Barge Park
    This open space resource is a 1.2 acre property along the north side of Commercial Avenue. Newtown Barge Park currently accommodates a paved baseball field and handball courts. Some trees are located at the park's southwestern perimeter.

13. American Playground
    The American Playground is located inland along the west side of Franklin Street between Noble and Milton Streets. It is primarily an active recreation resource that contains basketball and handball courts, a comfort station, play equipment, swings, benches and spray showers. Ample shade trees are scattered throughout the playground and a stately iron fence surrounds the facility.

14. Monsignor McGolrick Park
    Occupying approximately two blocks between Russell and Monitor Streets from Driggs to Nassau Avenues, this park serves mainly the residents of Greenpoint. Monsignor McGolrick Park consists almost exclusively of passive open space. Originally known as Winthrop Park, the facility was developed in 1891, and was later renamed for Monsignor McGolrick in 1941. One of the most striking features of Monsignor McGolrick Park is a handsome shelter pavilion which was erected in 1910 and rehabilitated in 1985. Designed by the architecture firm of Helmle and Huberty, the curved building of brick and limestone features an elegant wood colonnade connecting two comfort station buildings. The building also accommodates a community room and kitchenette. The structure is listed on the National Register of Historic Places, and is a recognized New York City Landmark. In addition, the park contains two monuments, including the World War I memorial designed by Carl Augustus Heber and the Monitor and the Merrimac by sculptor Antonio de Filippo.

15. McCarren Park
    The park, previously known as Greenpoint Park, is 35.7 acres (including inactive swimming pool) and occupies approximately four super-blocks. All four parcels were acquired by the City between 1903 and 1905, and two playgrounds with outdoor gymnastic apparatus were developed soon thereafter, one for boys at the corner of Bedford and North 14th Street, and one for girls at the corner of Manhattan and Driggs Avenues. In the 1910s, state-of-the-art athletic facilities, including a ¼-mile track, a field that was adapted for use as an ice rink in winter, tennis courts, a platform for dancing, play equipment for small children, and fields for baseball, football and soccer were

added to the facility. A large pool, the eighth of eleven built by the Works Progress Administration, opened in 1936. With an original capacity for 6,800 swimmers, the pool served as the summertime social hub for Greenpoint and Williamsburg. The pool was closed in 1984, and remains closed today.

16. Berry Playground
Berry Playground, a 0.33 acre primarily active open space, is located on the south side of South 3rd Street between Bedford Avenue and Berry Street. In 2000, the playground underwent a major reconstruction project. The facility currently features a spray shower, play equipment, swings for tots, animal art and sitting areas beneath shade trees.

17. Grand Ferry Park
Grand Ferry Park, a 1.55 acre passive open space, is located along the waterfront at the western terminus of Grand Street. It contains benches, a flagpole with yardarm, and a north compass rosette, as well as a red brick smokestack rising above a circular pattern of cobblestones which was part of a molasses plant that Pfizer Pharmaceuticals used in the early 20th century. Shore pines, Thornless Honey Locusts, and White Ash trees provide shade and greenery. At the water's edge, a border of boulders, known as rip-rap, protects the shoreline from erosion and provides seating to enjoy a view of the water and the downtown Manhattan skyline.

18. P.S. 84 William Sheridan Playground
William E. Sheridan Playground, a 0.79 acre primarily active recreational facility, is located on Wythe Avenue between South 1st and Grand Streets. Named for William E. Sheridan (1893-1918), a New York police officer who was killed in action during World War I, this playground is one of nine memorial playgrounds. It recently underwent extensive renovations and features nautical-themed play equipment, including climbing facilities, a weathervane with a ship atop a refurbished comfort station, chess and checker tables, swings, benches and ocean-colored ground painting. A flagpole with a yardarm stands in the center of the playground in front of a north arrow rosette.

19. Macri Square
Macri Square is located on the block bounded by Metropolitan, Union and Meeker Avenues just east of the BQE. It is an entirely passive recreational facility which contains approximately 0.57 acres of space and offers shaded sitting areas around the perimeter. There is a fenced grassy area that contains trees and plantings.

In addition to the above referenced existing open space resources, the proposed locations for the proposed new Inlet Park, which is part of the proposed action, and the East River State and WNYC Transmitter parks, which are planned in the No-Action scenario, will be analyzed for shadow impacts that could result from new development along the waterfront. The shadow analysis would help determine the design of the parks in terms of placement of facilities and features that would require an ample amount of sunlight.

A preliminary screening analysis in both the No-Action and With-Action conditions found that shadows cast by the projected/potential development would not reach Berry Playground (#16 in Figure 6-1) or Monsignor McGolrick Park (#14 in Figure 6-1) and therefore, further shadow analysis of these open space resources is not necessary.

C. THE FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

In the future without the proposed action, there would be no height limits in the areas where residential use is currently allowed as-of-right. In the No-Action condition, it is possible that the buildings on projected and potential development sites in those areas could, in some cases, be taller than those which could be built under the proposed action. Recently, permits have been filed for two larger scale residential buildings within the action area located at 55 Eckford Street and 20 Bayard Street that would have heights of approximately 154 feet and 201 feet, respectively.

In addition, as discussed in Chapter 1, "Project Description," under Scenario B, a 1,100-megawatt power plant would be developed on the former Bayside Fuel site under No-Action conditions and would continue to occupy the site in the future with the proposed action. The facility, proposed by the TransGas Energy Company would be an estimated 187,125 sf in size. The tallest proposed structure associated with the power plant would be a 325-foot exhaust tower. As such, the longest possible shadow cast would be 1,400 feet. The proposed structure would not impact any existing sun-sensitive resources, but would cast new incremental shadows on a portion of the proposed Inlet Park site, which lies directly north of the proposed TransGas site[1].

As discussed above, two new open space resources are expected to be developed by 2013 under N-Action conditions. The WNYC Transmitter Site, located at the eastern terminus of Greenpoint Avenue at the East River, is slated for development by 2013 as a waterfront park. East River Park, located along the East River waterfront from North 7th to North 9th Streets, is a proposed approximately 6-acre park

D. THE FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

The shadow analysis considers the times when the projected and potential developments would increase shadows falling on open space or historic resources. As the sun travels across the sky during the day, shadows fall in a curve on the ground opposite the sun. When the sun rises, shadows fall to the west. As the sun travels across the southern part of the sky throughout the day, shadows move clockwise until they stretch east, as the sun sets in the west. Midday shadows are always shorter than those at other times of the day because the sun is highest in the sky then. Further, because of the tilt of the earth's axis, the angle at which the sun's rays strike the earth varies throughout the year, so that during the summer, the sun is higher in the sky and shadows are shorter than during the winter. Winter shadows, although longest, move the most quickly along their paths (because of the earth's tilt) and do not affect the growing season of outdoor trees and plants.

In consideration of the reasonable worst cast development scenario, 50 of the projected and 234 of the potential development sites would result in construction of new buildings. These new buildings are expected to maximize FAR, while complying with the height and setback regulations within the upland portions of the action area. As directed by the *CEQR Technical Manual,* shadow analyses were performed for four days of the year: June 21, May 6, March 21, and December 21. The *CEQR Technical Manual*

[1] *TransGas Energy Facility: Application for a Certificate of Environmental Compatibility and Public Need Pursuant to Article X of the New York State Public Service Law*. Volume 1, p. 4-42. Prepared by TRC Environmental Corporation, 2002.

defines the temporal limits of a shadow analysis period to fall between an hour and a half after sunrise to an hour and a half before sunset.

Table 6-1 provides the starting and ending times of incremental new shadows that would be cast by the projected/potential development on the resources of concern on the analysis days discussed above, and shows the estimated duration of those new incremental shadows. The start times shown in the table represent the time that the shadows first hit any part of the element being considered, and the end time represents the time that the shadows leave that element completely. As shown in Table 6-1, a resource can be affected by more than one site, yielding multiple entries and exits. Figures 6-3 through 6-11 show the new incremental shadows cast on resources of concern by the projected/potential development resulting from the proposed action. As shown in the figures, the portions of new incremental shadows from projected/potential development cast on a resource of concern are represented in red.

Greenpoint Sub-Area

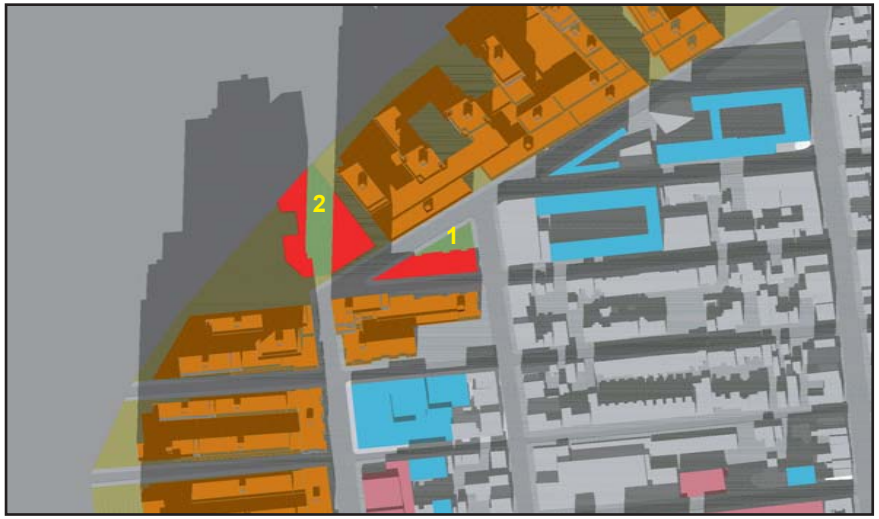
As shown in Table 6-1, within the Greenpoint sub-area, the projected/potential development would cast new incremental shadows on six resources of concern: Greenpoint Park (a.k.a. Right Triangle Park), Newtown Barge Park, American Playground, McCarren Park, and the Greenpoint Historic District. The projected/potential development would also cast new incremental shadows on the proposed WNYC Transmitter Site which is slated for development as a passive waterfront park by 2013. Figure 6-2 shows the locations of the analyzed resources and provides a key to the shadow analysis diagrams. New incremental shadows on these resources would be cast by the projected/potential development on projected development Sites 3, 60, and 56 and on potential development Sites 3.2, 17, 48, 54, 70-77, 82, 83, and 114. The following provides a discussion of each of the analyzed time periods with respect to the Greenpoint sub-area.

December 21

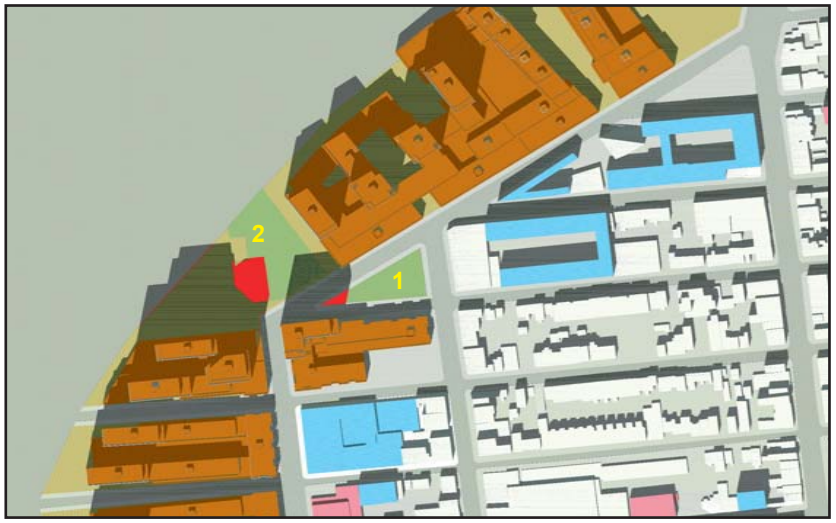
On the shortest day of the year, shadows are longest, but move rapidly. The incremental shadows created by the projected/potential development on this day would be cast on all resources of concern within the Greenpoint sub-area (see Figures 6-3 through 6-5). New incremental shadows cast by new development on projected Site 3 and potential Site 61 would enter Greenpoint Park and Newtown Barge Park at 8:51 AM and exit both resources at 2:53 PM for a duration of 6 hours and 2 minutes. As shown in Figure 6-3, approximately 50 percent of both parks would be cast in shadow at approximately 12:00 PM. Incremental shadows cast by projected/potential development on projected Site 60 and potential Site 61 would also enter American Playground at 8:51 AM and exit at 2:53 PM for a duration of 6 hours and 2 minutes on this day. New incremental shadows from projected Site 56 and potential Sites 48 and 54 would enter the Greenpoint Historic District at 2:33 PM and exit at 2:53 PM for a duration of 20 minutes. The incremental shadows cast would be limited to the northern portion of the historic district and along the east side of Franklin Street (see Figure 6-4). Incremental shadows from projected Site 56 would enter the proposed WNYC Transmitter park at 8:51 AM and exit at 2:18 PM for a duration of 5 hours and 27 minutes, with a majority of the site cast in shadows at approximately 9:30 AM (see Figure 6-4). Incremental shadows from potential development Site 70 would enter McCarren Park at 8:51 AM and exit at 10:10 AM for a duration of 1 hour and 19 minutes. A small area of the northern portion of the park would be cast in shadow on this day (see Figure 6-5).

Figure 6-2

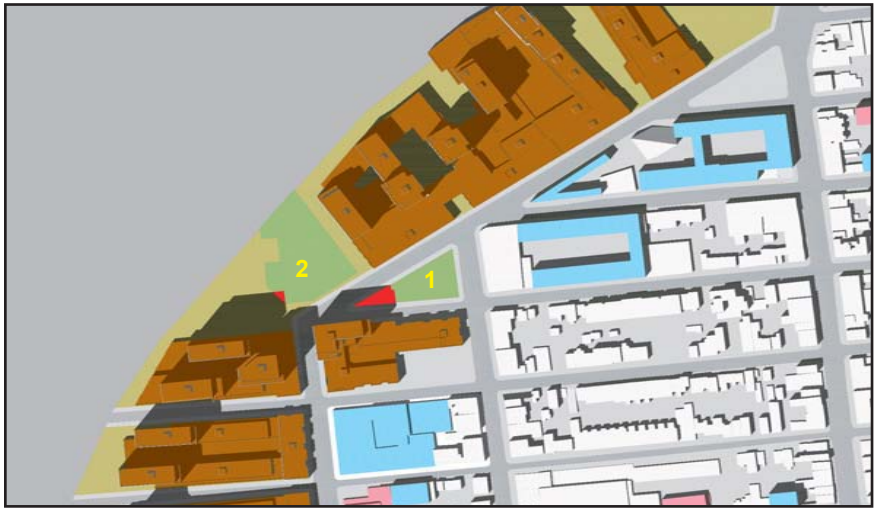
Key to Shadow Analysis Diagrams



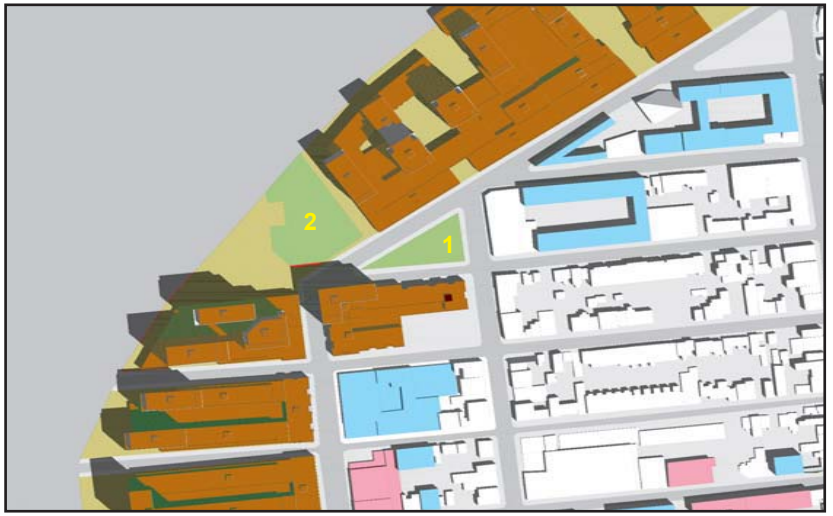
December 21 - 12:00 PM



March 21 - 12:30 PM



May 6 - 2:00 PM



June 21 - 11:47 AM

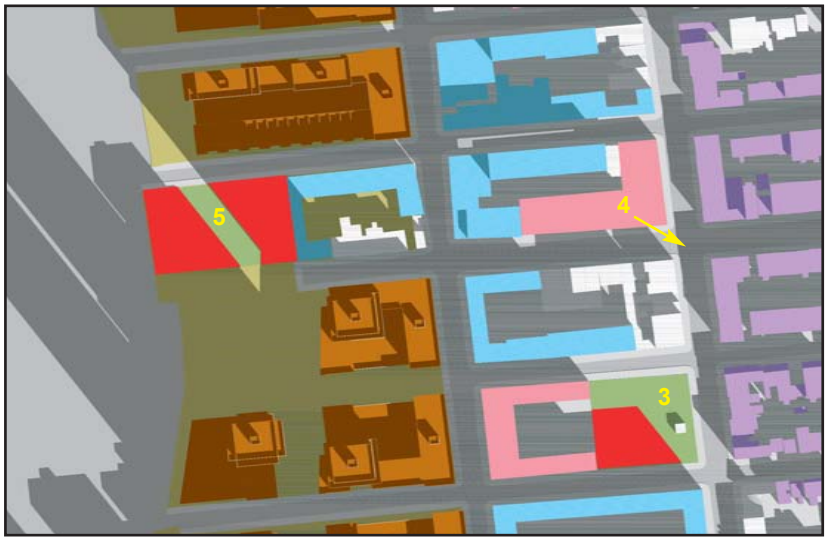
Projected Waterfront Development Sites

Potential Development Sites

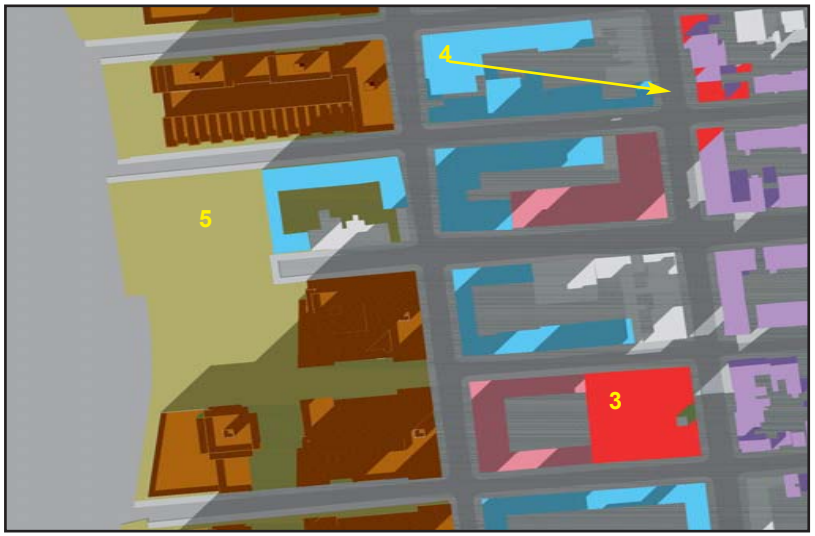
Projected Development Sites

Shadow Increment from Proposed Development

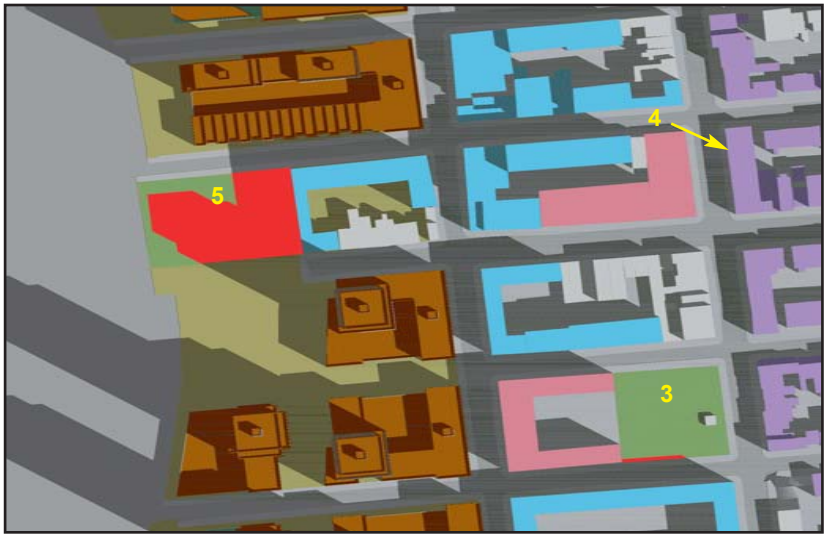
1 - Greenpoint Park
2 - Newtown Barge Park



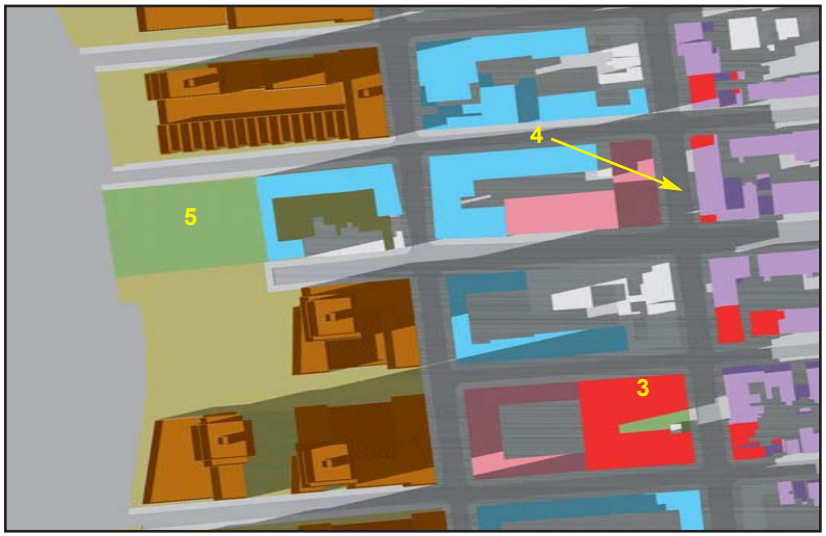
December 21 - 9:30 AM



December 21 - 2:49 PM



March 21 - 9:00 AM



March 21 - 4:29 PM

Projected Waterfront Development Sites

Potential Development Sites

Projected Development Sites

Shadow Increment from Proposed Development

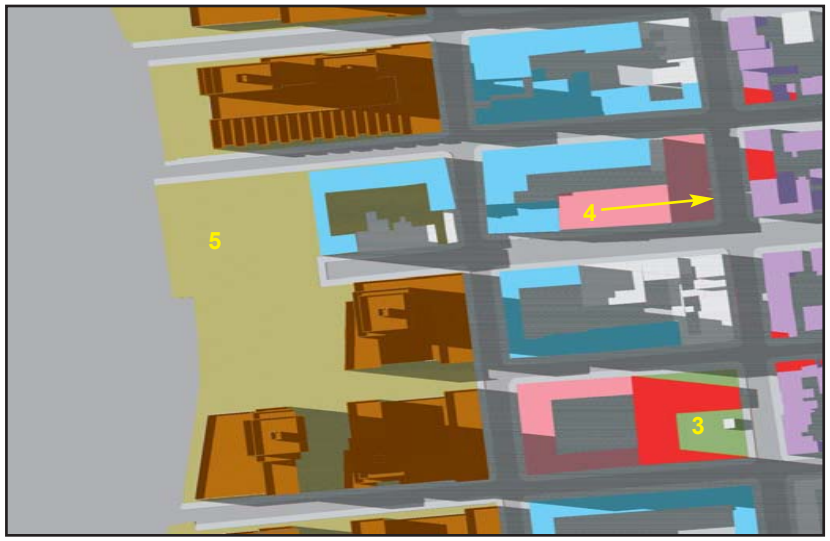
3 - American Playground

4 - Greenpoint Historic District

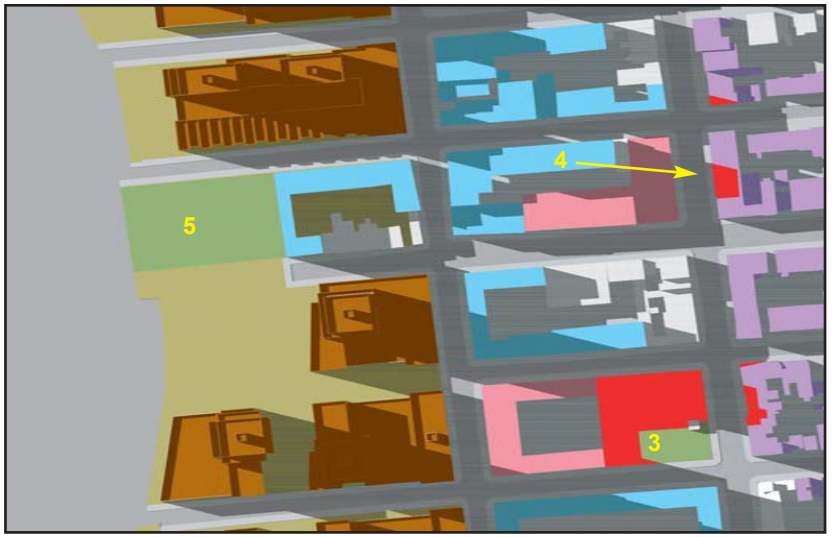
5 - WNYC Transmitter Site

Greenpoint-Williamsburg Rezoning EIS **Figure 6-4**

Shadow Diagram - American Playground, Greenpoint Historic District, WNYC Transmitter Site



May 6 - 5:18 PM



June 21 - 5:48

Projected Waterfront Development Sites

Potential Development Sites

Projected Development Sites

Shadow Increment from Proposed Development

3 - American Playground

4 - Greenpoint Historic District

5 - WNYC Transmitter Site

Greenpoint-Williamsburg Rezoning EIS **Figure 6-4 (cont'd)**

Shadow Diagram - American Playground, Greenpoint Historic District, WNYC Transmitter Site

December 21 - 8:51 AM

March 21 - 7:36 AM

May 6 - 6:27 AM

June 21 - 7:00 AM

Potential Development Sites

Projected Development Sites

Shadow Increment from Proposed Development

6 - McCarren Park

Figure 6-5
Shadow Diagram - McCarren Park

TABLE 6-1
Results of Shadow Analysis

Map #	Resource	Project Shadow Increment 12/21	Project Shadow Increment 3/21	Project Shadow Increment 5/6	Project Shadow Increment 6/21
	Greenpoint Sub-Area				
1.	**Greenpoint Park (a.k.a. Right Triangle Park)**	Enter: 8:51am Exit: 2:53 pm Duration: 6h2m **Total for Analysis Day: 6h2m**	Enter: 7:36 am Exit: 4:29 pm Duration: 8h53m **Total for Analysis Day: 8h53m**	Enter: 6:27 am Exit: 6:30 am Duration: 3m Enter: 11:00 am Exit: 3:08 pm Duration 4h8m **Total for Analysis Day: 4h11m**	Enter: 5:57 am Exit: 6:29 am Duration: 32m Enter: 11:40 am Exit: 1:50 pm Duration: 2h10m Enter: 4:30 pm Exit: 6:01 pm Duration: 1h31m **Total for Analysis Day: 4h13m**
2.	**Newtown Barge Park**	Enter: 8:51 am Exit: 2:53 pm Duration: 6h2m **Total for Analysis Day: 6h2m**	Enter: 7:36 am Exit: 3:50 pm Duration: 8h 26m **Total for Analysis Day: 8h14m**	Enter: 6:27 am Exit: 12:32 pm Duration: 6 h5m Enter: 12:43 pm Exit: 2:19 pm Duration: 1h36m **Total for Analysis Day: 7h41m**	Enter: 5:57 am Exit: 11:58 am Duration: 5h55m **Total for Analysis Day: 6h1m**
3.	**American Playground**	Enter: 8:51 am Exit: 2:53 pm Duration: 6h2m **Total for Analysis Day: 6h2m**	Enter: 7:36 am Exit: 11:47 am Duration: 4h11m Enter: 12:10 pm Exit: 4:29 pm Duration: 4h19m **Total for Analysis Day: 8h30m**	Enter: 11:55 am Exit: 5:18 pm Duration: 5h23m **Total for Analysis Day: 5h23m**	Enter: 12:10 pm Exit: 6:01 pm Duration: 5h51m **Total for Analysis Day: 5h51m**
4.	**Greenpoint Historic District**	Enter: 2:33 pm Exit: 2:53 pm Duration: 20m **Total for Analysis Day: 20m**	Enter: 3:37 pm Exit: 4:29 pm Duration: 52m **Total for Analysis Day: 52m**	Enter: 4:23 pm Exit: 5:18 pm Duration: 55m **Total for Analysis Day: 55m**	Enter: 4:55 pm Exit: 6:01 pm Duration: 1h6m **Total for Analysis Day: 1h6m**
5.	**WNYC Transmitter Site**	Enter: 8:51 am Exit: 2:18 pm Duration: 6h27m **Total for Analysis Day: 5h27m**	Enter: 7:36 am Exit 12:43 pm Duration: 5h7m **Total for Analysis Day: 5h7m**	Enter: 6:27 am Exit: 12:38 pm Duration: 6h11m **Total for Analysis Day: 6h11m**	Enter: 5:57 am Exit: 12:47 pm Duration: 6h50m **Total for Analysis Day: 6h50m**
6.	**McCarren Park**	Enter: 8:51 am Exit: 10:10 am Duration: 1h9m **Total for Analysis Day: 1h19m**	Enter: 7:36 am Exit: 9:15 am Duration: 1h39m **Total for Analysis Day: 1h39m**	Enter: 6:27 am Exit: 8:20 am Duration: 1h53m **Total for Analysis Day: 1h53m**	Enter: 5:57 am Exit: 8:32 am Duration: 2h35m **Total for Analysis Day: 2h35m**
	Williamsburg Sub-Area				
7.	**Proposed Inlet Park**	Enter 8:51 am Exit: 2:53 pm Duration: 6h2m **Total for Analysis Day: 6h2m**	Enter: 9:28 am Exit: 10:30 am Duration: 1h2m **Total for Analysis Day: 1h2m**	None	None
8.	**Grand Ferry Park**	None	None	None	None

TABLE 6-1 (continued)
Results of Shadow Analysis

Map #	Resource	Project Shadow Increment 12/21	Project Shadow Increment 3/21	Project Shadow Increment 5/6	Project Shadow Increment 6/21
9.	**P.S. 84 William Sheridan Playground**	Enter: 12:49 pm Exit: 2:53 pm Duration: 2h4m **Total for Analysis Day: 2h4m**	Enter: 4:08 pm Exit: 4:29 pm Duration: 21m **Total for Analysis Day: 21m**	None	Enter: 5:50 pm Exit: 6:01 pm Duration: 11m **Total for Analysis Day: 11m**
10.	**Transfiguration Church**	Enter: 12:01 pm Exit: 1:48 pm Duration: 1h47m Enter: 2:43 pm Exit: 2:53 pm Duration: 10m **Total for Analysis Day: 1h57m**	None	None	Enter: 5:51 pm Exit: 6:01 pm Duration: 10m **Total for Analysis Day: 10m**
11.	**McCarren Park (1)**	Enter: 9:05 am Exit 2:53 pm Duration: 5h48m **Total for Analysis Day: 5h48m**	Enter: 12:06 pm Exit: 4:29 pm Duration: 4h23m **Total for Analysis Day: 4h23m**	Enter: 1:27 pm Exit: 5:18 pm Duration: 3h51m **Total for Analysis Day: 3h51m**	Enter: 2:20 pm Exit: 6:01 pm Duration: 3h41m **Total for Analysis Day: 3h41m**
12.	**McCarren Park (2)**	Enter: 10:10 am Exit 2:53 pm Duration: 4h43m **Total for Analysis Day: 4h43m**	Enter: 12:55 pm Exit: 4:29 pm Duration: 3h34m **Total for Analysis Day: 3h34m**	Enter: 2:23 pm Exit: 5:18 pm Duration: 3h1m **Total for Analysis Day: 2h55m**	Enter: 3:30 pm Exit: 6:01 pm Duration: 2h31m **Total for Analysis Day: 2h31m**
13.	**McCarren Park (3)**	Enter: 8:51 am Exit: 9:02 am Duration: 11m **Total for Analysis Day: 11m**	None	None	None
14.	**McCarren Park (4)**	Enter: 8:51 am Exit: 2:53 pm Duration: 6h2m **Total for Analysis Day: 6h2m**	Enter: 7:36 am Exit: 3:55 pm Duration: 8h19m **Total for Analysis Day: 8h19m**	None	None
15.	**McCarren Park (5)**	Enter: 8:51 am Exit: 2:53 pm Duration: 6h2m **Total for Analysis Day: 6h2m**	Enter: 7:36 am Exit: 2:50 pm Duration: 7h14m **Total for Analysis Day: 7h14m**	None	None
16.	**Proposed East River State Park**	Enter: 8:51 am Exit: 2:53 pm Duration: 6h2m **Total for Analysis Day: 6h2m**	Enter: 7:36 am Exit: 10:30 am Duration: 2h54m Enter: 11:26 am Exit: 4:29 pm Duration: 5h3m **Total for Analysis Day: 7h57m**	Enter: 6:27 am Exit: 8:53 am Duration: 2h26m Enter: 12:47 pm Exit: 5:18 pm Duration: 4h31 **Total for Analysis Day: 6h57m**	Enter: 5:57 am Exit: 8:10 am Duration: 2h13m Enter: 1:43 pm Exit: 6:01 pm Duration: 4h18m **Total for Analysis Day: 6h31m**
17.	**Macri Square**	Enter: 10:15 am Exit: 2:53 pm Duration: 4h38m **Total for Analysis Day: 4h38m**	**None**	**None**	**None**

March 21

On the spring equinox, as shadows grow shorter, the projected/potential development would still cast an incremental shadow over all resources of concern within the Greenpoint sub-area. The incremental shadows from projected development Site 3 would enter Greenpoint Park at 7:36 AM and exit at 4:29 PM for a duration of 8 hours and 53 minutes. New incremental shadows from projected development Site 3 and potential development Site 3.2 would also enter Newtown Barge Park at 7:36 AM but exit at 3:50 PM for a duration of 8 hours and 14 minutes. New incremental shadows would enter the American Playground twice on this day. Potential development Site 61 would cast shadows that would enter at 7:36 AM then exit at 11:47 AM, for a duration of 4 hours and 11 minutes. Projected development Site 60 would cast incremental shadows that would enter again at 12:10 PM and exit at 4:29 PM for a duration of 4 hours and 19 minutes. The majority of the American Playground would be cast in shadow in the late afternoon, while a small portion of the playground would be in shadow in the morning (see Figure 6-4). The projected/potential development on projected Site 56 and potential Sites 48 and 53 would also cast a shadow on the Greenpoint Historic district in the afternoon that enters at 3:37 PM and exits at 4:29 PM for a duration of 52 minutes and would be mostly limited to the east side of Franklin Street (see Figure 6-4). The projected/potential development would also cast shadows on the proposed WNYC Transmitter park on this day that enter at 7:36 AM and exit at 12:43 PM for a duration of 5 hours and 7 minutes, with the majority of the site cast in shadow in the morning (see Figure 6-4). Potential development Sites 70-77, 81, 83, and 114 would cast shadows on the north and southeastern edges of McCarren Park that would enter at 7:36 AM but exit at 9:15 AM for a duration of 1 hour and 39 minutes (see Figure 6-5).

May 6

On May 6, which is halfway between the summer solstice and equinoxes, the projected/potential development would cast incremental shadows on all resources of concern in the Greenpoint sub-area. In the morning, development on potential Site 17 would cast incremental shadows on Greenpoint Park that enter at 6:27 AM and exit at 6:30 AM for a duration of 3 minutes. In the afternoon, the development on projected Site 3 would cast incremental shadows on Greenpoint Park that enter at 11:00 AM and exit at 3:08 PM for a duration of 4 hours and 8 minutes. A small portion of the park would be cast in shadows at approximately 12:30 PM (see Figure 6-3). The development on projected Site 3 and potential Site 3.2 would also cast incremental shadows that enter the Newtown Barge Park twice on this day. New incremental shadows would enter at 6:27 AM and exit at 12:32 PM for a duration of 6 hours and 5 minutes, then enter again at 12:43 PM and exit at 2:19 PM for a duration of 1 hour and 36 minutes. Small areas of the southwest portion of the park would be cast in shadow on this day (see Figure 6-3). Incremental shadows cast by the development on projected Site 60 would enter the American playground at 11:55 AM and exit at 5:18 PM for a duration of 5 hours and 23 minutes, with a majority of the playground cast in shadow in the late afternoon (see Figure 6-4). The development on projected Site 56 and potential Sites 48 and 54 would cast incremental shadows in the late afternoon on the Greenpoint Historic District which would enter at 4:23 PM and exit at 5:18 PM for a duration of 55 minutes, which would be limited to small areas of the district along Franklin Street (see Figure 6-4). Incremental shadows from the projected/potential development would also enter the proposed WNYC Transmitter park at 6:27 AM then exit at 12:38 PM for a duration of 6 hours and 11 minutes. The development on potential development Sites 70-77, 81, 83, and 114 would cast incremental shadows on the north-east portion of McCarren Park that would enter at 6:27 AM then exit at 8:20 AM for a duration of 1 hour and 53 minutes (see Figure 6-5).

June 21

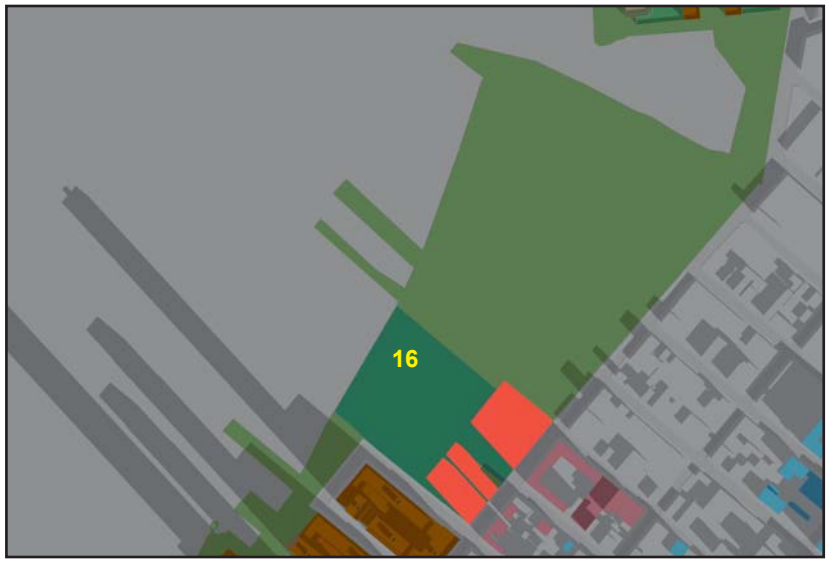
On the longest day of the year, the sun is most directly overhead and shadows are shortest. Incremental shadows created by the projected/potential development would enter Greenpoint Park at three separate times throughout the day. First, the shadows from potential development Site 17 would enter at 5:57 AM and exit at 6:29 AM for a duration of 32 minutes. Incremental shadows from projected development Site 3 would enter again at 11:40 AM then exit at 1:50 PM for a duration of 2 hours and 10 minutes. Incremental shadows from potential Site 3.2 would then enter Greenpoint Park again at 4:30 PM and exit at 6:01 PM for a duration of 1 hour and 31 minutes. Incremental shadows from the development on projected Site 3 and potential Site 3.2 would enter the Newtown Barge Park at 5:57 AM, exiting at 11:58 AM, for a duration of 6 hours and 1 minute. A very small portion of both the Newtown Barge Park and Greenpoint Park would be cast in incremental shadows on this day (see Figure 6-3). Incremental shadows from the projected/potential development would enter the American Playground at 12:10 PM and exit at 6:01 PM for a duration of 5 hours and 51 minutes, with the majority of the playground cast in shadow in the late afternoon (see Figure 6-4). Incremental shadows cast by the projected/potential development on projected Site 56 and potential Sites 48 and 54 would enter the Greenpoint Historic District on this day at 4:55 PM and exit at 6:01 PM for a duration of 1 hour and 6 minutes and again, would be limited to small areas of the district along the east side of Franklin Street (see Figure 6-4). New incremental shadows would also enter the proposed WNYC Transmitter park at 5:57 AM and exit at 12:47 PM for a duration of 6 hours and 50 minutes. Incremental shadows from potential Sites 70-77, 81, and 83 would also enter McCarren Park at 5:57 AM and exit at 8:32 AM for a duration of 2 hours and 35 minutes. The incremental shadows cast would cover small areas of the northeastern portion of the park (see Figure 6-5).

Williamsburg Sub-Area

As also shown in Table 6-1, within the Williamsburg sub-area, the projected/potential development would cast new incremental shadows on three resources of concern: P.S. 84 William Sheridan Playground, the Russian Orthodox Cathedral of the Transfiguration of Our Lord ("Transfiguration Church"), and McCarren Park. The projected/potential development would also cast new incremental shadows on the proposed Inlet Park, as well as the State Park which is slated for development by 2013. New incremental shadows would be cast by the projected/potential development on projected development Sites 98, 100, 102, 105, 108, 110, 111, 125, 160, 160.1, 185, 186, and 199 and on potential development Sites 97, 99, 101,104, 106, 107, 109, 114, 128, 222, and 316. The following provides a discussion of each of the analyzed time periods.

December 21

On the shortest day of the year, shadows are longest, but move rapidly. The incremental shadows created by the projected/potential development on this day would be cast on all resources of concern within the Williamsburg sub-area, with the exception of Grand Ferry Park,(see Figure 6-6 through 6-10). New incremental shadows cast by new development on projected Sites 160, 160.1, and 199 and potential Site 222 would enter the proposed Inlet Park and East River State Park at 8:51 AM and exit at 2:53 PM for a duration of 6 hours and 2 minutes. Shadows would cover the eastern portion of the proposed East River Park in the morning (see Figure 6-6 and 6-7). Throughout the day shadows would move east, with the tower from projected development Site 222 casting a long shadow that would cover the southern edge and western portion of the East River State Park at approximately 12:30 PM (see Figure 6-6). By 2:53 PM, just before the shadow exits both parks, the building on projected development Site 222 would cast a long shadow that would cover the majority of the East River State Park, would extend into Inlet Park, but not reach the Bushwick Inlet itself (see Figure 6-6). Incremental shadows cast by projected/potential



December 21 - 8:51 AM

March 21 - 7:36 AM

May 6 - 5:18 PM

June 21 - 7:00 AM

Projected Waterfront Development Sites

Potential Development Sites

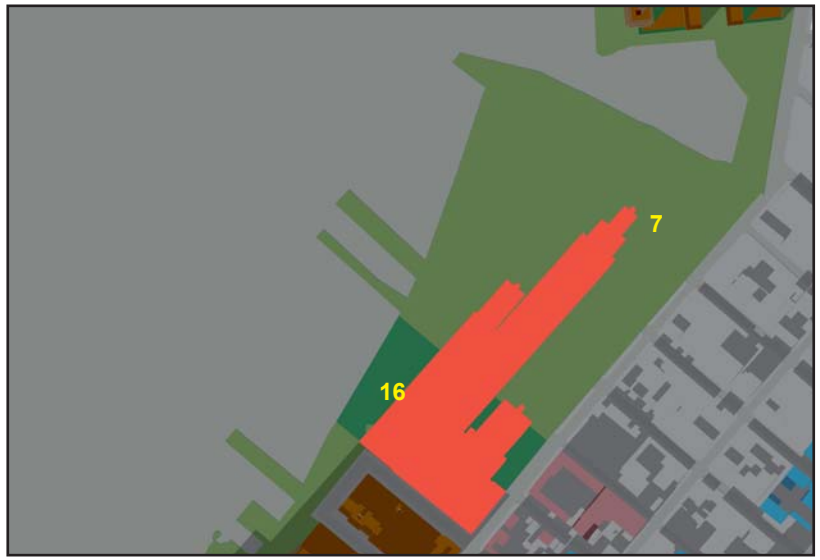
Projected Development Sites

Shadow Increment from Proposed Development

16 - East River State Park

December 21 - 8:51 AM

December 21 - 12:30 PM



December 21 - 2:53 PM

March 21 - 9:45 AM

Projected Waterfront Development Sites

Potential Development Sites

Projected Development Sites

Shadow Increment from Proposed Development

7 - Inlet Park

16 - East River State Park

development on potential Site 316 would also enter P.S. 84 William Sheridan Playground at 12:49 PM and exit at 2:53 PM for a duration of 2 hours 4 minutes on this day. Shadows would cover a small portion in the southeast corner of the playground at approximately 1:00 PM (see Figure 6-8). By 2:53 PM, a long and thin shadow from the projected/potential development would be cast down the center of the playground, just before the shadow exits (see Figure 6-8). New incremental shadows from projected Sites 102 and 125 would be cast on the Transfiguration Church twice on this day. The first shadow would enter at 12:01 PM and exit at 1:48 PM for a duration of 1 hour and 47 minutes. The shadows would then enter again at 2:43 PM and exit at 2:53 PM for a duration of 10 minutes. As shown in Figure 6-9, the proposed buildings on projected Sites 102 and 125 would cast shadows on the southeast corner of the Church. Incremental shadows from projected development Sites 98, 100, 102, 105, 108, 110, and 111 and potential Sites 99, 104, 106, 107, 109, 114, and 128 would cast shadows on all five parcels of McCarren Park on this day, with durations ranging from 11 minutes to 6 hours and 2 minutes. As shown in Figure 6-10, projected/potential development along the southern edge of the park would cast shadows into the southern portions of all parcels of McCarren Park in the morning and in the afternoon. Incremental shadows cast by potential development Site 276 and projected development Site 277 would enter Macri Square at 10:15 AM and exit at 2:53 PM for a duration of 4 hours and 38 minutes.

March 21

On the spring equinox, the projected/potential development would cast an incremental shadow over all resources of concern within the Williamsburg sub-area, with the exception of Grand Ferry Park, the Transfiguration Church, and Macri Square. New incremental shadows cast from projected development Sites 160 and 160.1 would enter the proposed Inlet Park at 9:28 AM and exit at 10:30 AM. As shown in Figure 6-3, a very small portion of the southeast corner of Inlet Park would be cast in shadow on this day. New incremental shadows from development on projected development Sites 185, 160, and 160.1 would enter the proposed East River Park at 7:36 AM and exit at 10:30 AM. As shown in Figure 6-6 and 6-7, shadows would cover the eastern portion of the park at 7:36 AM and a small portion of the eastern edge of the park at 9:45 AM. Shadows from projected development Site 199 would enter the East River Park at 11:26 AM and exit at 4:29 PM for a duration of 5 hours and 3 minutes. Shadows from the development on potential Site 316 would enter P.S. William Sheridan Playground at 4:08 and exit at 4:29 PM for a duration of 21 minutes. As shown in Figure 6-8, a very small corner in the southwest portion of the playground would be cast in shadow on this day. Incremental shadows from projected development Sites 98, 100, 102, 105, 108, 110, and 111 and potential Sites 99, 104, 106, 107, 109, 114, and 128 would cast shadows on four of the five parcels of McCarren Park on this day. New incremental shadows would enter the parcels at different times on this day (see Table 6-1) and would cover the southern edges of the park (see Figure 6-10).

May 6

On May 6, which is halfway between the summer solstice and equinoxes, the projected/potential development would cast incremental shadows on only McCarren Park, and the proposed East River State Park within the Williamsburg sub-area. New incremental shadows from projected development Sites 160, 160.1, 185 would enter the proposed East River State Park at 6:27 AM and exit at 8:53 AM for a duration of 2 hours and 26 minutes. Incremental shadows would enter the park again from projected development Site 199 at 12:47 PM and exit at 5:18 PM for a duration of 4 hours and 31 minutes. The largest area of the park cast in shadow on this day would be at approximately 5:18 PM, right before the shadow exits the park (see Figure 6-7). New incremental shadows from projected Sites 98, 100, and 102 and potential Sites 97, 99, and 101 would enter parcels 1 and 2 of McCarren Park on this day. Shadows cast by the projected/potential development along the southern edge of the park would cast shadows into the southern

December 21 - 1:00 PM

December 21 - 2:53 PM

March 21 - 4:15 PM

June 21 - 6:01 PM

Potential Development Sites

Projected Development Sites

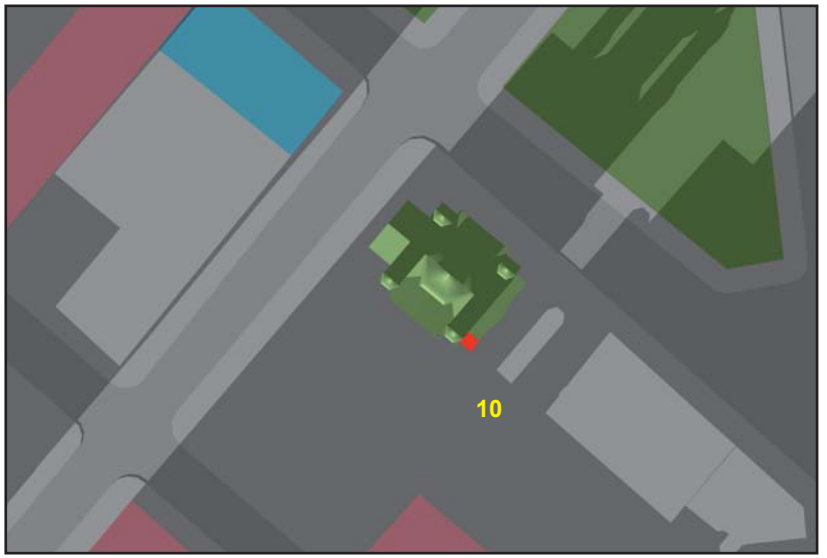
Shadow Increment from Proposed Development

9 - P.S. 84 William Sheridan Playground

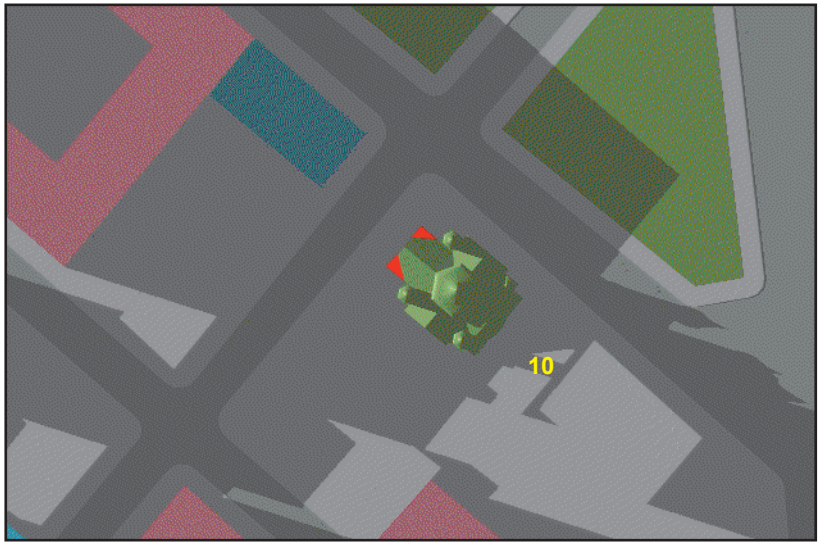
Figure 6-8

Shadow Diagram - P.S. 84 William Sheridan Playground

December 21 - 1:00 PM



December 21 - 2:48 PM



June 21 - 5:56 PM

Potential Development Sites

Projected Development Sites

Shadow Increment from Proposed Development

10- Russian Orthodox Church of the Transfiguration of Our Lord

December 21 - 11:00 AM

December 21 - 1:00 PM

March 21 - 2:20 PM

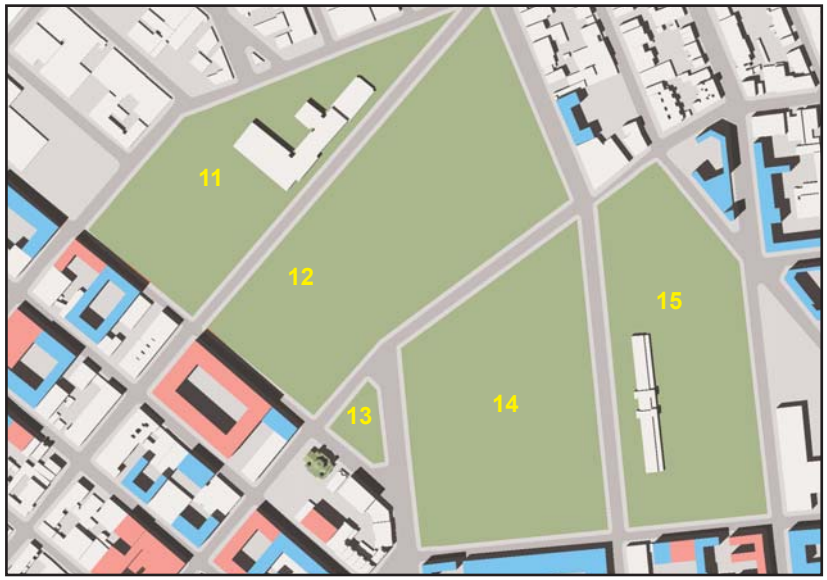
March 21 - 4:00 PM

Potential Development Sites

Projected Development Sites

Shadow Increment from Proposed Development

11 - McCarren Park, Parcel 1
12 - McCarren Park, Parcel 2
13 - McCarren Park, Parcel 3
14 - McCarren Park, Parcel 4
15 - McCarren Park, Parcel 5



May 6 - 2:53 PM

May 6 - 5:18 PM

June 21 - 3:30 AM

June 21 - 5:50 PM

Potential Development Sites

Projected Development Sites

Shadow Increment from Proposed Development

11 - McCarren Park, Parcel 1
12 - McCarren Park, Parcel 2
13 - McCarren Park, Parcel 3
14 - McCarren Park, Parcel 4
15 - McCarren Park, Parcel 5

Figure 6-10 (cont'd)
Shadow Diagram - McCarren Park

portion of the park (see Figure 6-10). Shadows would enter the park in the mid-afternoon, with varying durations (see Table 6-1).

June 21

On the longest day of the year, the sun is most directly overhead and shadows are shortest. The projected/potential development would cast incremental shadows on all resources of concern within the Williamsburg sub-area with the exception of the proposed Inlet Park, Grand Ferry Park, and Macri Square. Incremental shadows from potential Site 313 would enter the P.S. 84 William Sheridan Playground at 5:50 PM and exit at 6:01 PM for a duration of 11 minutes. As shown in Figure 6-8, a small area of the northwest corner of the playground would be cast in shadow. The potential development on projected Site 100 would cast incremental shadows that would enter the Transfiguration Church at 5:51 PM on this day and exit at 6:01 PM for a duration of 10 minutes. As shown in Figure 6-9, shadows would be cast on the north and southwest corners of the church in the evening, right before the shadow exits. New incremental shadows from projected Sites 98, 100, and 102 and potential Sites 97, 99, and 101 would enter parcels 1 and 2 of McCarren Park on this day. Shadows from the projected/potential development would enter the park at different times in the mid- to late-afternoon, and exit by 6:01 PM (see Table 6-1). Incremental shadows cast from projected development Sites 160, 160.1, and 185 would enter the East River State Park at 5:57 AM and exit at 8:10 AM for a duration of 2 hours and 13 minutes. Incremental shadows from projected development on projected Site 199 would enter the park at 1:43 PM and exit at 6:01 PM for a duration of 4 hours and 18 minutes. As shown in Figure 6-7, shadows would cover a small portion of the eastern edge of the proposed park.

Assessment

According to the *CEQR Technical Manual,* a shadow is defined as the circumstance in which a building or other built structure blocks the sun from the land. An adverse shadow impact is considered to occur when the shadow from projected/potential development falls on a publicly accessible open space, historic landscape, or other historic resource if the features that make the resource significant depend on sunlight, or if the shadow falls on an important natural feature and adversely affects its use and/or important landscaping and vegetation. The uses and vegetation in an open space establish its sensitivity to shadows. Uses that rely on sunlight include passive use, such as sitting or sunning, and such activities as gardening, or children's wading pools and sprinklers. Vegetation requiring sunlight includes the tree canopy and flowering plants. Where lawns are actively used, the turf also requires extensive sunlight. For these activities and plants, four to six hours a day of sunlight, particularly in the growing season, is often a minimum requirement. In general, shadows on city streets and sidewalks and on other buildings are not considered significant under CEQR. The following reviews each resource and assesses the shadows due to the proposed action.

Greenpoint Sub-Area

Greenpoint Park and Newtown Barge Park

The projected/potential development would cast new incremental shadows on both Greenpoint Park and Newtown Barge Park. Greenpoint Park is paved and contains several trees, benches, and a playground. According to the *CEQR Technical Manual,* trees, many plants, and many activities can require a minimum of four to six hours of sunlight, particularly between April and October (the growing season). Shadows cast by the projected/potential development on December 21 would be long and cover a majority

of the park for the entire day (see Figure 6-3). The *CEQR Technical Manual* indicates that winter shadows, although longest, move the most quickly along their paths and do not affect the growing season of outdoor trees and plants. As shown in Figure 6-3, new incremental shadows cast by the projected/potential development on March 21 would affect a small portion of the park at approximately 12:30 PM; however, the shadows from the projected/potential development would affect a larger portion of the park later on in the afternoon. As the majority of Greenpoint Park is paved, and December and March are not within the growing season of April through October, new incremental shadows cast by the projected/potential development would not create a significant adverse impact on the park. In addition, shadows cast by the new development on Greenpoint Park would not affect the usability of the passive or active open space resources, as utilization of these resources are generally low during these times of year. As shown in Figure 6-3, at approximately 2:00 PM on May 6, shadows from the projected/potential development would cast the longest shadow; however shadows from the projected/potential development would affect smaller portions of the park in the morning and in the late afternoon. The park would receive 4 hours and 30 minutes of sunlight between incremental shadows and 2 hours and 10 minutes after the last shadow exits on this day. On June 21, although new incremental shadows from the projected/potential development would enter the park at three separate times (see Table 6-1), the shadows cast would be very short and cover a small portion of the park (see Figure 6-3). As Greenpoint Park is mostly paved, and shadows cast during the growing season would cover only small portions of the park, no significant adverse shadow impacts on the park are expected as a result of the proposed action.

Newtown Barge Park contains a baseball diamond and handball courts, as well as a few trees at the southwestern perimeter. Shadows cast on December 21 and March 21 would be long and cover a majority of the park. However, as discussed above, as December and March fall outside of the growing period between April and October, and utilization of open space resources are generally low during these periods, new incremental shadows cast would not create significant adverse impacts on the park during these months. As shown in Figure 6-3, on May 6, the shadows from the projected/potential development would only affect a small portion of the park at approximately 2:00 PM; however the shadows from the projected/potential development would affect a larger portion of the park in the early morning at approximately 6:27 AM. As incremental shadows would cover the majority of the park only in the very early morning, and would affect a small area of the southwest portion of the park until the shadows exit the park at 2:19 PM, the incremental shadows cast by the projected/potential development on this day would not result in a significant loss of sunlight on the park. On June 21, as shown in Figure 6-3, the shadows from the projected/potential development would only affect a small area of the southern portion of the park at approximately 11:47 AM; however, the shadows would affect a larger portion of the park in the early morning at approximately 5:57 AM. The park would receive approximately 6 hours of sunlight on this day after the incremental shadows exit the park at 11:58 AM. As such, no significant adverse shadow impacts on Newtown Barge Park are anticipated as a result of the proposed action.

American Playground

The American Playground features a basketball court, a playground, benches, spray showers, and several trees. New incremental shadows cast on December 21 and March 21 would enter the playground in the morning and last for a substantial duration on these days (see Table 6-1). Shadows cast on December 21 from the projected/potential development would cover a majority of the playground for the duration of the incremental shadow (see Figure 6-4). Shadows cast on March 21 would cover a small area of the playground during the morning at approximately 9:00 AM; however shadows would affect a larger portion of the park later in the afternoon at approximately 4:29 PM (see Figure 6-4). As discussed above, utilization of open space resources during these periods are generally low. As such, new incremental shadows cast during these periods would not create a significant adverse impact on the usability of the playground. In addition, as December and March fall outside of the growing period between April and

October, new incremental shadows cast would not create significant adverse impacts on the trees that are located in the park. On May 6, the shadows from the projected/potential development would affect the majority of the playground at approximately 5:18 PM, right before the shadow exits the playground (see Figure 6-4). The playground would receive approximately 5 hours and 28 minutes of sunlight before the incremental shadows from the projected/potential development enter the playground. Shadows cast by the projected/potential development on June 21 would cover most of the playground in the early evening. On this day, the playground would receive approximately 6 hours and 13 minutes of sunlight before the incremental shadows enter the playground. As discussed above, trees and many activities can require a minimum of four to six hours of sunlight, particularly between April and October. As such, the incremental shadows cast on May 6 and June 21 would not result in a significant loss of sunlight on the playground.

Greenpoint Historic District

As shown in Table 6-1, the projected/potential development would cast incremental shadows on the Greenpoint Historic District. The largest shadow areas would be cast during the winter months, but these shadows would move relatively quickly and last for short durations. The projected/potential development would cast shadows along the western portion of the historic district, along the east side of Franklin Street (see Figure 6-3). According to the *CEQR Technical Manual*, sensitive features on a historic structure include details or characteristics that make the resource significant. Examples of sensitive features include stained glass windows and highly carved ornamentation. As described in Chapter 7, "Historic Resources," the majority of structures within the Greenpoint Historic District are brick row houses with cast-iron window lintels, which are not considered sunlight sensitive. There are several churches that contain stained glass located within the historic district, although shadows from the projected/potential development would not be long enough to reach them. As such, the shadow effects caused by the projected/potential development would not be considered significant adverse impacts as no new shadows would be cast on any structure within the historic district that contains sunlight sensitive features.

WNYC Transmitter Site

In the future without the proposed action, a park that would consist of passive open space is proposed on the WNYC Transmitter site (see Figure 6-2). At this time, the program for the proposed park is unknown. However, a shadow analysis was performed for this site to determine if the projected/potential development would significantly impact the proposed park. On December 21, the new incremental shadows cast by the projected/potential development would cover a majority of the proposed park in the morning, and be completely out of shadows by 2:18 PM (see Figure 6-4). On March 21, shadows cast by the projected/potential development would cover the majority of the proposed park in the morning at approximately 9:00 AM (see Figure 6-4), with the incremental shadows exiting at 12:43 PM. On May 6, incremental shadows would enter the proposed park at 6:27 AM and exit at 12:38 PM. The proposed park would receive approximately 4 hours and 40 minutes of sunlight after the incremental shadow exits the park. On June 21, new incremental shadows from the projected/potential development would enter the proposed park at 5:57 AM and exit at 12:47 PM. As such, the park would receive approximately 5 hours and 18 minutes of sunlight after the incremental shadows exit the park. Although the specific program for the proposed park is not known at this time, it is unlikely that the projected/potential development would have significant adverse impacts on the proposed park as it would receive an ample amount of sunlight after the incremental shadows exit on May 6 and June 21.

McCarren Park

The projected/potential development within the Greenpoint sub-area would also cast new incremental shadows on northeastern portions of McCarren Park. The area of the park that would be cast in shadows from the projected/potential development contains paved walkways, grassy areas, and trees. On December 21, shadows from the projected/potential development would enter the park at 8:51 AM and exit at 10:10 AM. As shown in Figure 6-5, a very small portion of the park would be affected by the incremental shadow. In addition, as mentioned above, winter shadows move quickly along their paths and do not affect the growing season of outdoor trees and plants. On March 21, a small portion of the northeastern edge of the park would be affected by the incremental shadows cast by the projected/potential development (see Figure 6-5). On May 6, the duration of the shadow from projected/potential development would be relatively short and decrease in size considerably by 8:00 AM (see Figure 6-5). On June 21, the duration of the new incremental shadows on the park would be the longest. Like on other analysis days, small portions along the northeastern section of the park would be affected by the incremental shadows (see Figure 6-5). As new incremental shadows cast by the projected/potential development on May 6 and June 21 would affect a small portion of McCarren Park for a relatively short duration in the early morning hours, there would be no noticeable reduction in the usability of this open space resource nor a reduction in the sunlight to sunlight-sensitive uses or features as a result of the proposed action.

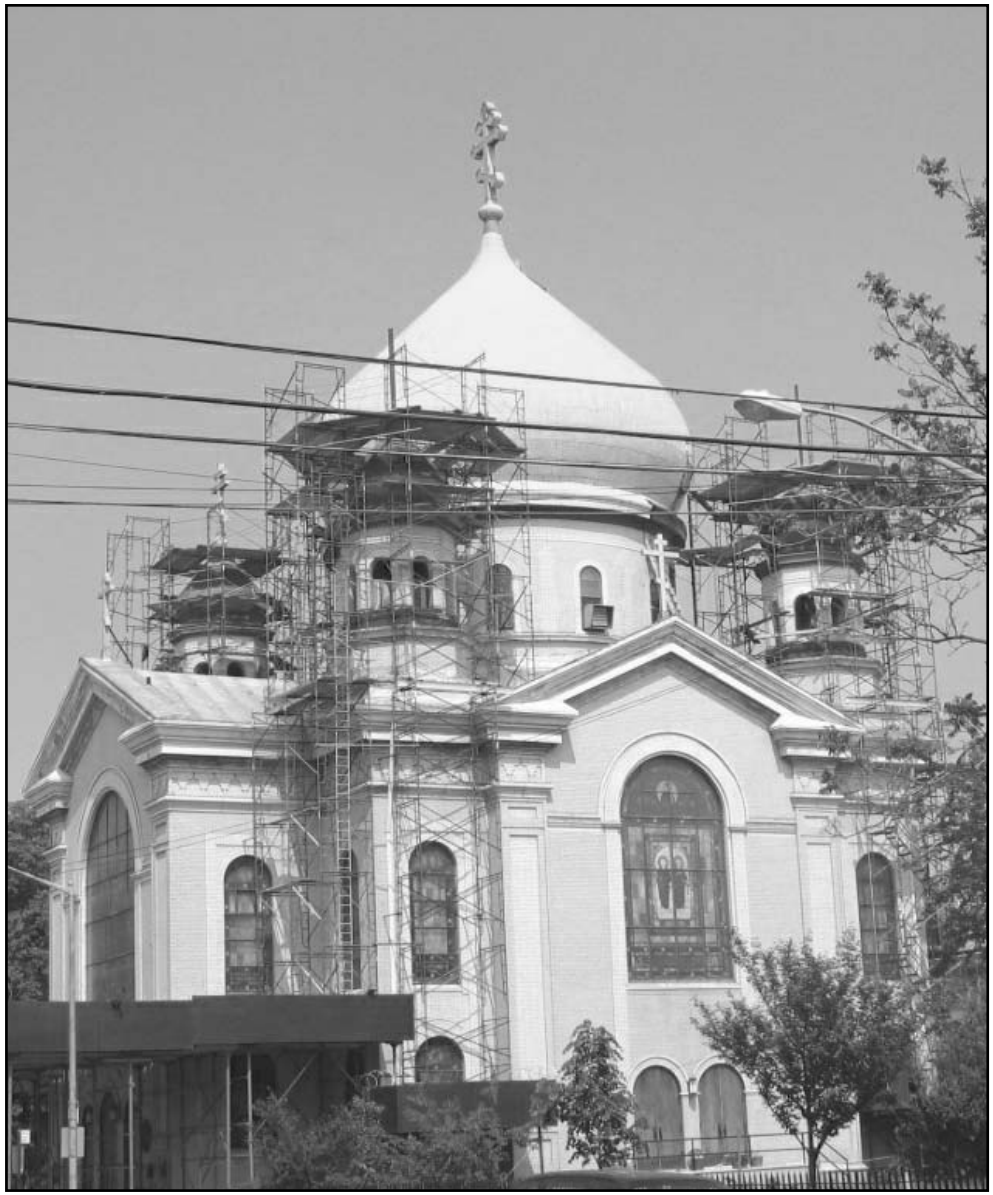
Williamsburg Sub-Area

P.S. 84 William Sheridan Playground

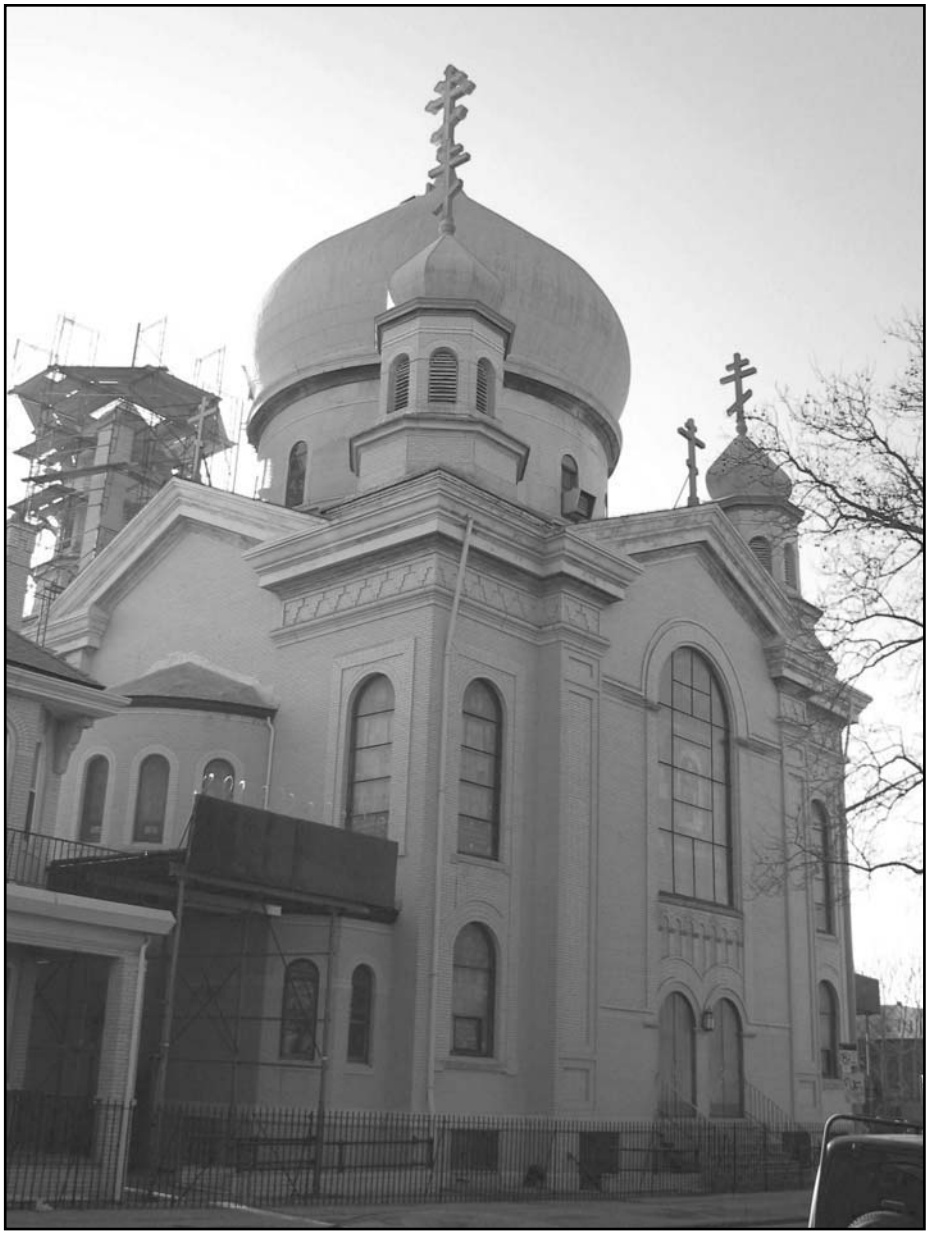
The projected/potential development would cast shadows on the P.S. 84 William Sheridan Playground on December 21, March 21, and June 21. The playground is completely paved and contains play equipment, gaming tables, and a comfort station. As shown in Figure 6-8, on December 21, a very small portion of the southwestern edge of the playground would experience incremental shadows on this day. The projected/potential development would cast incremental shadows on the playground on March 21 and June 21 for a very short amount of time (approximately 21 minutes and 11 minutes, respectively) in the late afternoon, during the end of the analysis period. As shown in Figure 6-8, a small portion of the playground would experience incremental shadows as a result of the proposed action on these days. As the playground is completely paved, incremental shadows cast by the projected/potential development would not significantly impact the playground. In addition, given the brevity of all of the shadow period on all three analysis days and the small area affected by the incremental shadows, the proposed action and subsequent development are not anticipated to significantly impact the programming or amenities of P.S. 84 William Sheridan Playground.

Russian Orthodox Cathedral of the Transfiguration of our Lord

As discussed in Chapter 7, "Historic Resources," the Russian Orthodox Cathedral of the Transfiguration of Our Lord, built between 1916 and 1921, was designated as a NYC Landmark by LPC in 1969, and is also listed on the State and National Registers of Historic Places (1980). The Greek cross plan and the impressive scale of the "onion domes" of this small yellow brick church typify design in the Russian Orthodox tradition. The central dome is 85 feet in diameter and the four corner domes are 12 feet across. The Church features large arched stained glass windows on all four facades of the building (see Figure 6-11). The church has frontages on Driggs Avenue, North 11th Street, and North 12th Street. The south and north facades of the Church, along North 11th Street and North 12th Street, respectively, both contain a large stained glass window. The main entrance to the church is located along Driggs Avenue, which is the west facade of the structure. The west facade also contains a large stained glass window. It should be



View from corner of Driggs Avenue and N. 11th Street, looking north



View from the corner of Driggs Avenue and N. 12th Street looking south-west

noted that non-stained glass windows throughout the church would also be affected by incremental shadows. There are four non-stained glass windows located along the North 11th Street and North 12th Street facades. Non stained-glass windows are also located along the front of the church, along Driggs Avenue. The base of the large, central "onion dome" also contains non-stained glass windows (see Figure 6-11). As these windows are regular-pane glass, they do not represent sunlight sensitive features of the church structure. According to CEQR guidelines, shadows cast on such non-light sensitive features are generally not considered.

The projected/potential development would cast new incremental shadows on the church on two of the analysis days. On December 21, the projected/potential development would cast an incremental shadow on the south east corner of the church. As shown in Table 6-1, on December 21, shadows from the projected development are cast in the mid- and late afternoon and for a relatively short duration (approximately a total of 1 hour and 57 minutes). On June 21, as shown in Figure 6-9, the north and south-east corners of the church would be cast in shadow. As shown in Table 6-1, the shadows would be cast on the church just before the end of the analysis period and be of very short duration (approximately 10 minutes).

As discussed above, the Russian Orthodox Cathedral of the Transfiguration of Our Lord contains large stained glass windows on all four facades of the building. As described in the above analysis, none of the stained glass windows would be cast in shadow by the projected/potential development for extended periods of time, nor would they be affected at all times of the year. In addition, none of the stained glass windows would ever be completely cast in shadows as a result of the projected/potential development. As such, the additional shadows cast by the projected/potential development would not significantly detract from the church's essential functions or its architectural or historic significance, nor would they significantly impact the enjoyment of the stained glass windows by parishioners. Therefore, the proposed action would not result in a significant adverse shadow impact on the church.

McCarren Park

The projected/potential development would cast new incremental shadows on McCarren Park on all four analysis days. Parcels 1 and 2 would experience new incremental shadows from the projected/potential development within the Williamsburg sub-area on all four analysis day, while parcels 3 through 5 would not experience incremental shadows from the projected/potential development during the May and June analysis periods (see Figure 6-10). The portion of parcel one cast in shadow contains paved basketball courts. As such, this portion of parcel one of McCarren Park would not be impacted by new incremental shadows as it does not contain any sunlight sensitive resources. The portion of parcel two cast in shadow contains paved walkways, grassy areas, trees, and two baseball diamonds. The small portion of parcel three cast in shadows contains sitting areas and trees. The portion of parcel four that would experience new incremental shadows contains paved walkways, grassy areas, trees, and a small area of a running track. The portion of parcel five cast in shadow contains grassy areas, trees, and the McCarren Park Pool, which is currently closed. On December 21, shadows cast would extend farthest into the park compared to the other analysis periods. As discussed above, the *CEQR Technical Manual* indicates that winter shadows, although longest, move the most quickly along their paths and do not affect the growing season of outdoor trees and plants. New incremental shadows cast on the March 21 analysis date would cover small portions of the southern edge of the park throughout the day (see Figure 6-10). As discussed above, trees, many plants, and many activities can require a minimum of four to six hours of sunlight, particularly between April and October. As such, there would be no noticeable reduction in the usability of this open space resource nor a reduction in the sunlight sensitive uses or features as a result of the proposed action on this day.

During the May and June analysis periods, when the park would be most utilized, shadows cast by the projected/potential development would cover a small area of the southern portion of parcels one and two in the mid- to late-afternoon (see Figure 6-10). The longest shadows cast on each of these days would be at the end of the analysis period, during the early evening (see Figure 6-10). As described above, all five parcels of McCarren Park would experience short incremental shadows cast by the projected/potential development within the Williamsburg sub-area which would not extend very far into the park and be limited to a small area along the southern edge of the park. In addition, all five parcels would not be cast in shadow through the entire shadow duration on the March, May, and June analysis periods. Moreover, most of the features within the portions of the park that would be cast in shadow do not depend on sunlight for their usability. As such, given the small portion of the park affected by the incremental shadows, the projected/potential development resulting from the proposed action is not anticipated to impact the programming or the amenities of McCarren Park.

East River State Park and Proposed Inlet Park

A shadow analysis was also performed for the planned East River State Park and the proposed Inlet Park. As shown in Table 6-1, the proposed Inlet Park would experience incremental shadows during the December and March analysis periods, while the East River Park would experience incremental shadows on all four analysis periods. No new incremental shadows from the projected/potential development would extend into the Bushwick Inlet or the portion of the proposed Inlet Park located north of the inlet. Although the specific program for the two parks is not known at the time, it is unlikely that the projected/potential development would have significant impact on the proposed parks. Further, as discussed in Chapter 5, "Open Space," the proposed Inlet Park is assumed to consist of 50% active open space to address the needs of the study area. Therefore, the shadow analysis performed could be utilized in the planning and development phase of the proposed parks to develop a layout where features requiring sunlight would be located in areas of the parks where shadows are not cast or cast for a short duration. As such, it is unlikely that the projected/potential development would have significant adverse impacts on the proposed parks.

Macri Square

The projected/potential development would cast new incremental shadows on Macri Square, which contains a grassy area, several trees, plantings, and benches. According to the *CEQR Technical Manual,* trees, many plants, and many activities can require a minimum of four to six hours of sunlight, particularly between April and October (the growing season). Shadows cast by the projected/potential development would only be cast on the park on December 21. As shown in Table 6-1, the duration of the shadow would be relatively short and the park would receive between four to six hours of sunlight on this day. In addition, the *CEQR Technical Manual* indicates that winter shadows, although longest, move the most quickly along their paths and do not affect the growing season of outdoor trees and plants. As such, shadows cast by the projected/potential development would not result in a reduction in the usability of this open space resource nor would they adversely affect its sunlight-sensitive features.