A. INTRODUCTION

According to the 2014 *City Environmental Quality Review* (CEQR) *Technical Manual*, an adverse shadow impact is considered to occur when the incremental shadow from a proposed development falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight exposure, thereby significantly altering the public's use of the resource or threatens the viability of vegetation or other resources. Pursuant to CEQR guidelines, sunlight-sensitive resources of concern are those resources that depend on sunlight, or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity. Sunlight-sensitive resources can include publicly accessible open space, architectural resources, natural resources, and Greenstreets. In general, shadows on City streets, sidewalks, buildings, or project-generated open spaces are not considered significant under CEQR. In addition, shadows occurring within an hour and a half of sunrise or sunset generally are not considered significant under CEQR.

Pursuant to CEQR, a shadows assessment is required if a proposed action would result in structures (or additions to existing structures) of 50 feet in height or greater, or those that would be located adjacent to, or across the street from, a sunlight sensitive resource. As discussed in Chapter 1, "Project Description," the reasonable worst case development scenario (RWCDS) for the proposed action identifies the construction of mixed-use predominantly residential buildings on two adjacent city blocks that would exceed 50 feet in height. As such, a detailed shadows analysis was prepared to determine the potential for the Proposed Action to result in significant adverse impacts on sunlight-sensitive resources.

B. PRINCIPAL CONCLUSIONS

The proposed action would not result in significant adverse impacts related to shadows. A screening analysis determined that the proposed action would result in incremental shadows, i.e., increased shadow coverage as compared to No-Action conditions, on the two publicly-accessible open spaces that would be affected by action-generated shadows. These resources of concern include the Union/Marcy Avenue Greenstreet and De Hostos Playground.

The screening and detailed assessments provided in this attachment found that the proposed action would not result in significant adverse shadows impacts to the open space resources that would be affected by action-generated incremental shadows. Project-generated incremental shadows on De Hostos Playground would be limited to small areas for a 3-hour and 40-minute period on December 21; there would be no incremental shading at other times. In the case of Union/Marcy Avenue Greenstreet, which is a 0.02-acre landscaped area with two benches, action-generated shadows would be cast on it during each of the four analysis dates in the mornings, ranging in duration from 33 minutes on December 21 to 2 hours, 47 minutes on June 21. At other times most portions of this resource would not be in shadow. The action-generated shadows would occur in the early

morning, when use of greenstreet benches is typically low, and the landscaped elements would continue to receive significant sunlight exposure each day. Overall, there would be no noticeable reduction in the usability of any open space resources as a result of the proposed action. Accordingly, no significant adverse shadow impacts are anticipated as a result of the proposed action.

C. METHODOLOGY

According to the *CEQR Technical Manual*, the longest shadow a structure will cast in New York City, except for periods close to dawn or dusk, is 4.3 times its height. For projects or actions resulting in structures less than 50 feet tall, a shadow assessment is generally not necessary, unless the site is adjacent to a park, historic resource, or important natural feature (if the feature that makes the structure significant depends on sunlight).

First, a preliminary screening assessment must be conducted to ascertain whether shadows resulting from a project could reach any sunlight-sensitive resource at any time of year. The *CEQR Technical Manual* defines sunlight-sensitive resources as those resources that depend on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity. The following are considered to be sunlight-sensitive resources:

- *Public open space* (e.g., parks, playgrounds, plazas, schoolyards, greenways, and landscaped medians with seating). Planted areas within unused portions or roadbeds that are part of the Greenstreets program are also considered sunlight-sensitive resources. The use of vegetation in an open space establishes its sensitivity to shadows. This sensitivity is assessed for both (1) warm-weather dependent features, like wading pools and sandboxes, or vegetation that could be affected by loss of sunlight during the growing season (i.e., March through October); and (2) features, such as benches, that could be affected by a loss of winter sunlight. Uses that rely on sunlight include: passive use, such as sitting or sunning; active use, such as playfields or paved courts; and such activities as gardening, or children's wading pools and sprinklers. Where lawns are actively used, the turf requires extensive sunlight. Vegetation requiring direct sunlight includes the tree canopy, flowering plants, and plots in community gardens. Generally, four to six hours a day of sunlight, particularly in the growing season, is a minimum requirement.

- *Features of historic architectural resources that depend on sunlight for their enjoyment by the public*. Only the sunlight-sensitive features are considered, as opposed to the entire architectural resource. Sunlight-sensitive features include the following: design elements that are part of a recognized architectural style that depends on the contrast between light and dark (e.g., deep recesses or voids, such as open galleries, arcades, recessed balconies, deep window reveals, and prominent rustication); elaborate, highly carved ornamentation; stained glass windows; exterior building materials and color that depend on direct sunlight for visual character (e.g., the polychromy [multicolored] features found on Victorian Gothic Revival or Art Deco facades); historic landscapes, such as scenic landmarks, including vegetation recognized as an historic feature of the landscape; and structural

features for which the effect of direct sunlight is described as playing a significant role in the structure's importance as an 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.

The preliminary screening assessment consists of three tiers of analysis. The first tier determines a simple radius around the proposed buildings representing the longest shadow that could be cast. If there are sunlight-sensitive resources within the radius, the analysis proceeds to the second tier, which reduces the area that could be affected by project-generated shadows by accounting for a specific range of angles that can never receive shade in New York City due to the path of the sun in the northern hemisphere. 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 new shadows by looking at specific representative days of the year 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. In accordance with the *CEQR Technical Manual*, shadows on sunlight-sensitive resources of concern were modeled for four representative days of the year. For the New York City area, the months of interest for an open space resource encompass the growing season (i.e., March through October) and one month between November and February representing a cold-weather month (usually December). Representative days for the growing season are generally the March 21st vernal equinox (or the September 21st autumnal equinox, which is approximately the same), the June 21st summer solstice, and a spring or summer day halfway between the summer solstice and equinoxes, such as May 6th or August 6th (which are approximately the same). For the cold-weather months, the December 21st winter solstice is included to demonstrate conditions when open space users rely most heavily on available sunlight warmth. As these months and days are representative of the full range of possible shadows, they are also used for assessing shadows on sunlight-sensitive historic and natural resources. The *CEQR Technical Manual* defines the temporal limits of a shadow analysis period to fall from an hour and a half after sunrise to an hour and a half before sunset.

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 result of the analysis and assessment are documented with graphics, a table of incremental shadow durations, and narrative text. As described in the *CEQR Technical Manual*, an incremental shadow is generally not considered significant when its duration is no longer than ten minutes at any time of year and the resource continues to receive substantial direct sunlight. A significant shadow impact generally occurs when an incremental shadow of ten minutes or longer falls on a sunlight-sensitive resource and results in one of the following:

- *Vegetation:* a substantial reduction in sunlight available to sunlight-sensitive features of the resource to less than the minimum time necessary for its survival (when there would be sufficient sunlight in the future without the project) or 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 an historic or cultural resource.

- *Open space utilization:* a substantial reduction in the usability of open space as a result of increased shadow, including information regarding 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.

In general, a significant adverse shadow impact occurs when the incremental shadow added by a proposed action falls on a sunlight-sensitive resource and substantially reduces or completely eliminates direct sunlight exposure, thereby significantly altering the public's use of the resource or threatening the viability of vegetation or other resources.

Future Without the Proposed Action (No-Action)

As discussed in Chapter 1, "Project Description," the RWCDS assumes that the project site would remain vacant in the future without the proposed action. As discussed in Chapter 2, "Land Use, Zoning, and Public Policy," in the future without the proposed action the area surrounding the project site is expected to experience a moderate amount of new development.

Future With the Proposed Action (With-Action)

In the future with the proposed action, the RWCDS assumes that the project site would be developed with a total of approximately 1.3 million gsf of mixed-use predominantly residential development. Construction would take place on two adjacent city blocks and buildings are expected to reach a maximum height of 157 feet including rooftop mechanical equipment. As shown in Figures 1-13 and 1-14, RWCDS Site Plan and RWCDS Axonometric Diagram, respectively, in Chapter 1, each of the project area buildings would include a streetwall base with taller sections above the base set back from the streetwall, with the maximum roof heights ranging from 75 feet for buildings facing Harrison Avenue to 145 feet for buildings facing Union Avenue. (Heights of rooftop mechanical equipment are not indicated in the site plan as they are exempt from being counted as part of the building height for zoning purposes.) The stepped massing of the RWCDS buildings would reflect the height and setback requirements of the R7A, R7D, and R8A zoning districts that would be mapped on the eastern, central, and western portions, respectively, of the project area. This scenario represents the reasonable worst-case for shadows and will be compared with the No-Action scenario in order to determine the extent and duration of incremental project-generated shadows.

D. PRELIMINARY SCREENING

Tier 1 Screening Assessment

According to the *CEQR Technical Manual*, the longest shadow that a structure will cast in New York City, except for periods close to dawn or dusk, is 4.3 times its height. The height of the proposed building (approximately 157 feet including rooftop mechanical equipment) was used to determine the longest shadow study area—an approximately 675-foot radius (Tier 1 Assessment).

Within this longest shadow study area, there are a number of potentially sunlight-sensitive resources. Therefore, further screening was warranted in order to determine whether any resources could be affected by project generated shadows.

Tier 2 Screening Assessment

Due to the path of the sun 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. The purpose of the Tier 2 screening is to determine whether the sunlight-sensitive resources identified in the Tier 1 screening are located within portions of the longest shadow study area that can receive shade from the projected and potential developments.

Figure 6-1 provides a base map illustrating the results of the Tier 1 and Tier 2 screening assessments (i.e., the portion of the longest shadow study area lying within -108 degrees from the true north and +108 degrees from true north as measured from southernmost portions of the development sites). A total of five sunlight-sensitive resources were identified in consultation with the Department of City Planning (DCP), Department of Parks and Recreation (DPR), and Landmarks Preservation Commission (LPC) as sunlight-sensitive resources that warranted further assessment (see Table 6-1). It should be noted that while two S/NR eligible resources, the former Charles Pfizer & Company buildings at 11 Bartlett Street and at 630 Flushing Avenue, fall within the longest shadow study area, these resources are not sunlight-sensitive as defined by CEQR and no further analysis is warranted.

Table 6-1, Sunlight Sensitive Resources Warranting Further Analysis Based on Tier 1 and 2 Assessment

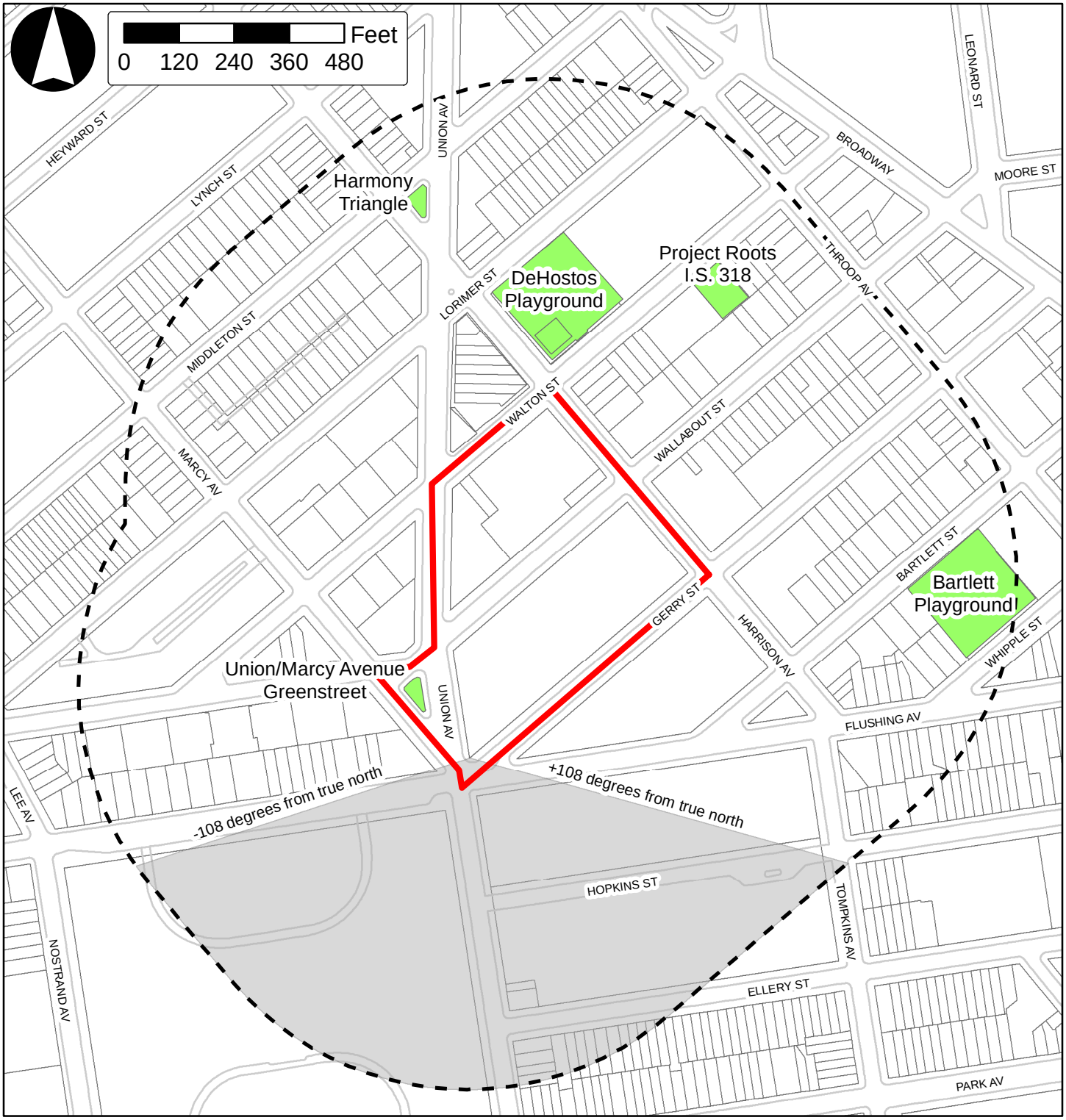
ID.[1]	Open Space Resources
1	Union/Marcy Avenue Greenstreet
2	Harmony Triangle
3	De Hostos Playground
4	Project Roots I.S. 318
5	Bartlett Playground

Notes: [1] Keyed to Figure 6-1.

Tier 3 Screening Assessment

According to the *CEQR Technical Manual*, a Tier 3 screening assessment should be performed to determine if, in the absence of intervening buildings, shadows resulting from a proposed action

Longest Shadow Study Area - Tier 1 and 2 Screening



Legend

- Proposed Rezoning Area
- Tier 1: Longest shadow study area boundary
- Open Space Resources
- Tier 2: Area to south that could never be shaded

can reach a sunlight-sensitive resource, thereby warranting a detailed shadow analysis. The Tier 3 screening assessment is used to determine if shadows resulting from a proposed action can reach a sunlight-sensitive resource at any time between 1.5 hours after sunrise and 1.5 hours before sunset on representative analysis dates.

As project-generated shadows could reach a number of sunlight-sensitive resources, a Tier 3 assessment was performed using three dimensional (3D) computer mapping software. The 3D model was used to calculate and display project-generated shadows on individual representative analysis dates. The model contained 3D representations of the elements in the base map used in the preceding assessments and a 3D model of the projected developments. At this stage of the assessment, surrounding buildings within the study area were not included in the model so that it may be determined whether project-generated shadows would reach any sunlight sensitive resources.

The Tier 3 analysis showed that three sunlight-sensitive open space resources (Harmony Triangle, Project Roots I.S. 318, and Bartlett Playground) would not receive project-generated shadows on any of the four analysis days, and these resources therefore did not require any further analysis. A detailed shadow analysis is required for the two sunlight-sensitive open space resources (Union/Marcy Avenue Greenstreet and De Hostos Playground) that could, in the absence of intervening buildings, receive project-generated shadows. Refer to Figure 6-2.

E. DETAILED ANALYSIS OF SHADOW IMPACTS

Resources Affected by Project-Generated Shadows

Union/Marcy Avenue Greenstreet

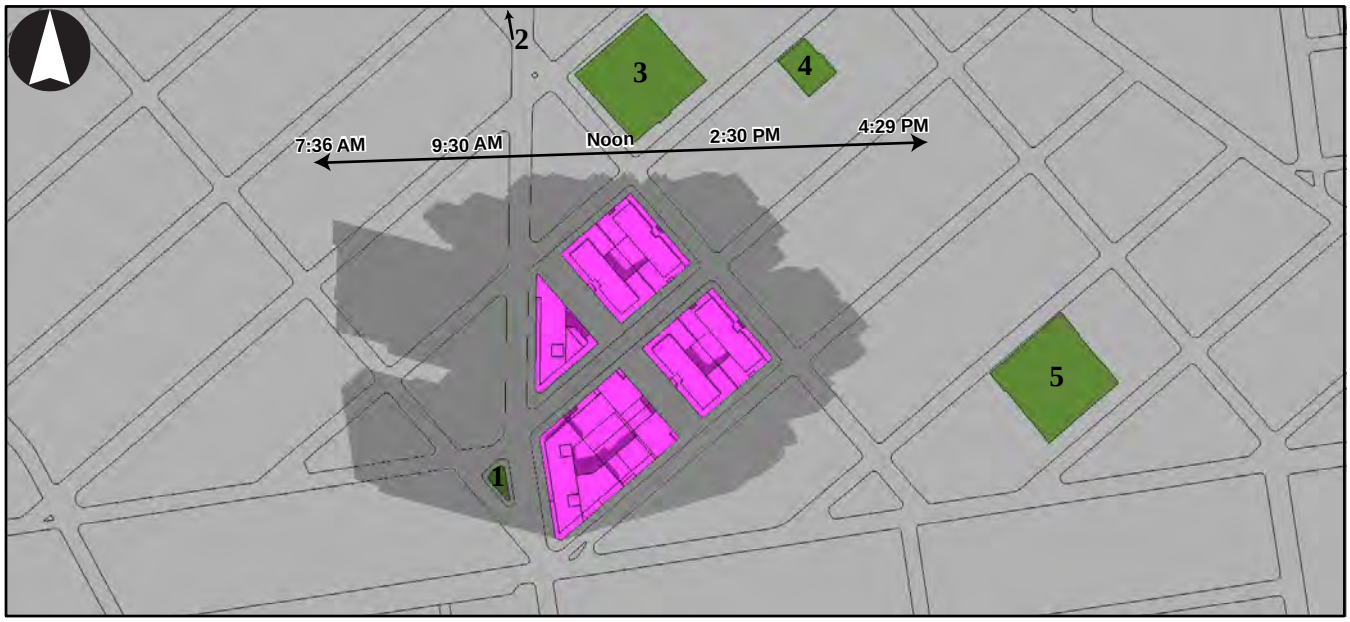
The Union/Marcy Avenue Greenstreet is an approximately 0.02-acre planted median and is a designated greenstreet. The greenstreet is a landscaped area that contains a number of trees and shrubs. Two benches are located along each of the Union Avenue and Marcy Avenue frontages; no other permanent elements, such as tables or benches, are located within the greenstreet.

De Hostos Playground

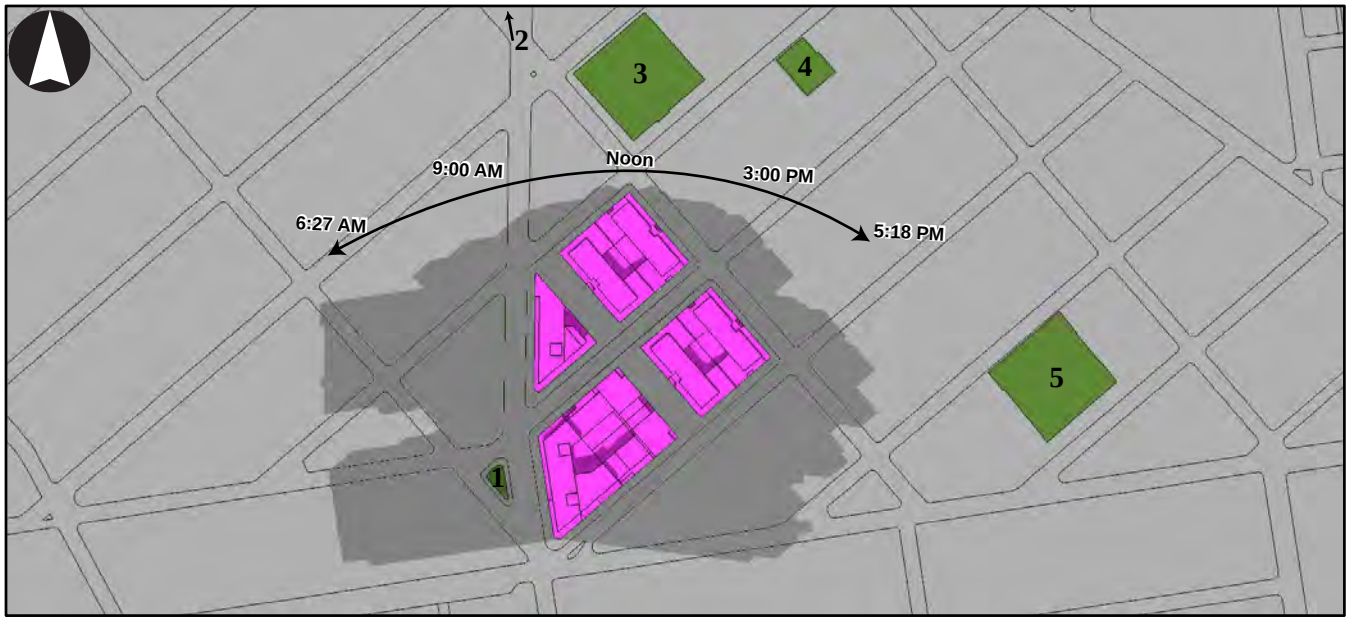
De Hostos Playground is an approximately 1.10-acre open space located along Harrison Avenue between Lorimer and Walton Streets. The open space is comprised of predominantly active uses including a jungle-gym, swings, basketball courts, handball courts, and benches. It is associated with IS 318, Eugenio Maria de Hostos School.

Detailed Shadows Analysis

Per CEQR guidelines, a detailed shadow analysis was performed for the sunlight-sensitive resources identified above. At this stage of the assessment, all surrounding buildings within the study area and all development projects currently under construction or planned to be constructed prior to 2019 within an approximate quarter-mile radius of the project site were included in the 3D model. Per CEQR guidelines, the shadows analysis focused on four representative days of the year:



MARCH 21/SEPTEMBER 21

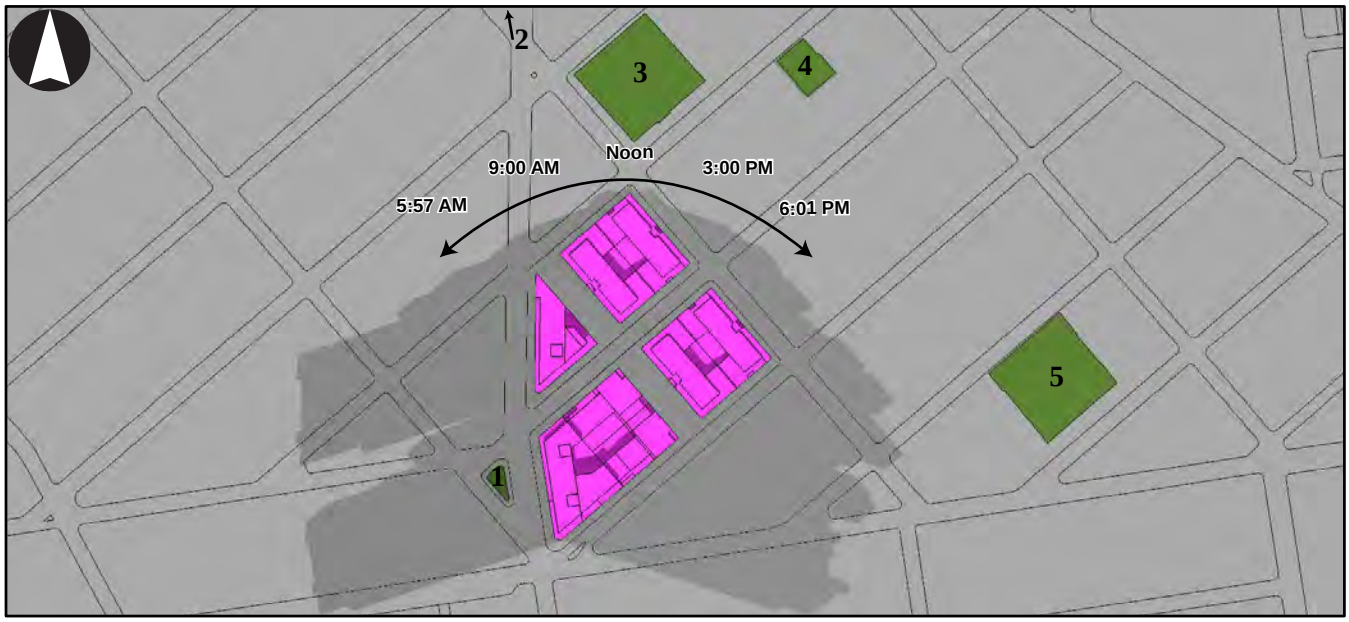


MAY 6/AUGUST 6

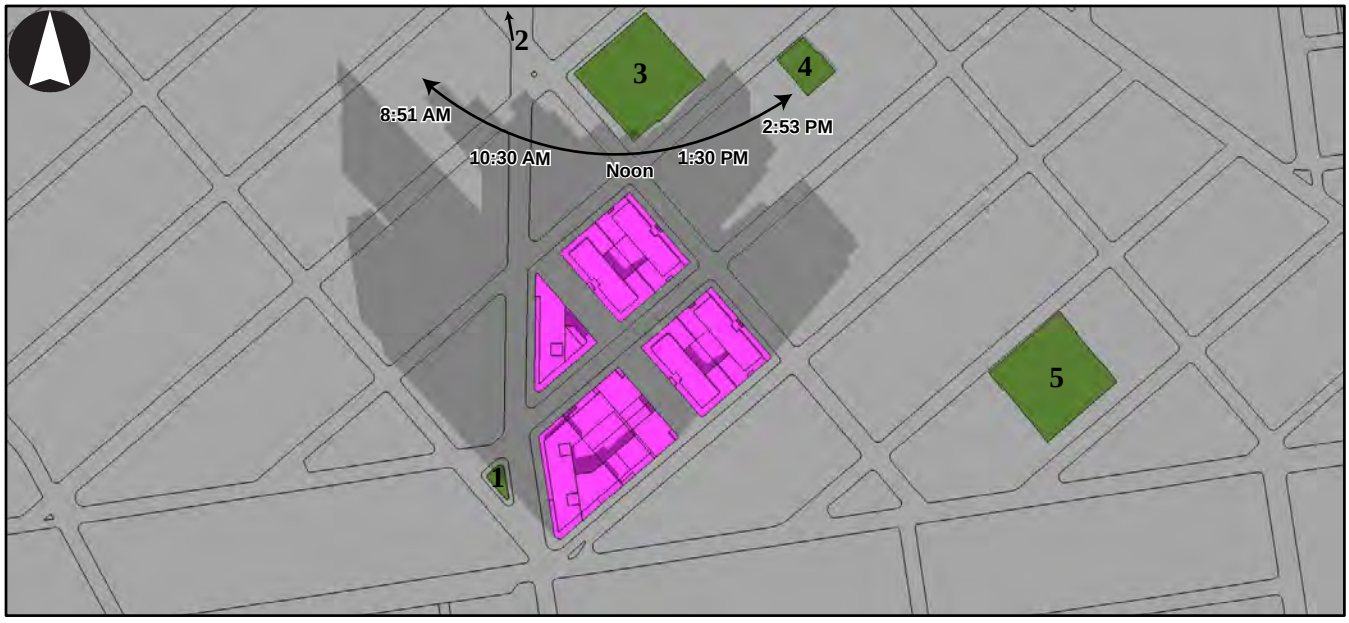
Proposed Development **1** **Open Space** **Incremental Shadow**

Note: Resources keyed to Table 6-1

Figure 6-2 (Cont'd)
Tier 3 Screening



JUNE 21



DECEMBER 21

Proposed Development | **1 Open Space** | **Incremental Shadow**

Note: Resources keyed to Table 6-1

March 21/September 21, the equinoxes; May 6, the midpoint between the spring equinox and the summer solstice (and equivalent to August 6); June 21, the summer solstice and the longest day of the year; and December 21, the winter solstice and shortest day of the year. These four representative days indicate the range of potential shadows over the course of the year. CEQR guidelines define the temporal limits of a shadow analysis period to fall from an hour and a half after sunrise to an hour and a half before sunset. As discussed above, the results of the shadow analysis show the incremental difference in shadows between the No-Action and With-Action scenarios. Table 6-2 summarized the entry and exit times and total duration of incremental shadows on each affected sun-sensitive resource.

Table 6-2, Duration of Shadows on Sunlight Sensitive Resources (Increment Compared to No-Action)

	Analysis Day	March 21/Sept. 21	May 6/August 6	June 21	December 21
		7:36 AM – 4:29 PM	6:27 AM – 5:18 PM	5:57 AM – 6:01 PM	8:51 AM – 2:53 PM
Union/Marcy Avenue Greenstreet	Shadow enter-exit time	7:36 – 10:01 AM	6:27 – 9:33 AM	5:57 – 9:31 AM	8:51 – 9:35 AM
	Incremental shadow duration	2 hours, 25 minutes	3 hours, 6 minutes	3 hours, 34 minutes	44 minutes
De Hostos Playground	Shadow enter-exit time				11:37 – 2:53 PM
	Incremental shadow duration				3 hours, 16 minutes

Note: All times are Eastern Standard Time; Daylight Savings Time was not accounted for per *CEQR Technical Manual* guidelines.
Table indicates the entry and exit times and total duration of incremental shadow for each sunlight-sensitive resource.

As shown in Table 6-2, the proposed action would increase shadow coverage at the Union/Marcy Avenue Greenstreet on all four analysis dates. The proposed action would also increase shadow coverage at De Hostos Playground on the December 21 analysis date. Figures 6-3 through 6-6 show the representative action-generated incremental shadows on the two open space resources of concern. As shadows are in constant motion, Figures 6-3 through 6-6 illustrate the extent of additional incremental shadow at particular moments in time, highlighted in red, and also show existing shadows and remaining areas of sunlight.

It should be noted that, per the *CEQR Technical Manual*, all times reported herein are Eastern Standard Time and do not reflect adjustments for daylight savings time that is in effect from mid-March to early November. As such, the times reported in this attachment for March 21/September 21, May 6/August 6, and June 21 need to have one hour added to reflect the Eastern Daylight Saving Time.

March 21/September 21

On March 21/September 21 the time period for shadows analysis begins at 7:36 AM and continues until 4:29 PM. March is considered the beginning of the growing season in New York City, and September 21, which has the same shadow patterns as March 21, is also within the growing season. On the March 21/September 21 analysis day, incremental shadows from the proposed action would reach the Union/Marcy Avenue Greenstreet. No incremental shadows would be experienced at De Hostos Playground.



8:00 AM



9:45 AM

Project Area

Incremental Shadow

Open Space

1. Union/Marcy Avenue Greenstreet
2. DeHostos Playground

Pfizer Sites Rezoning EIS

Figure 6-3

Incremental Shadows on March 21/September 21



7:00 AM



9:15 AM

Project Area

Incremental Shadow

Open Space

1. Union/Marcy Avenue Greenstreet
2. DeHostos Playground

Pfizer Sites Rezoning EIS

Figure 6-4

Incremental Shadows on May 6/August 6



6:30 AM



9:00 AM

Project Area

Incremental Shadow

Open Space

1. Union/Marcy Avenue Greenstreet
2. DeHostos Playground

Pfizer Sites Rezoning EIS

Figure 6-5

Incremental Shadows on June 21



9:15 AM



12:00 PM



2:30 PM

Project Area **Incremental Shadow** **Open Space**

1. **Union/Marcy Avenue Greenstreet**
2. **DeHostos Playground**

Pfizer Sites Rezoning EIS

Figure 6-6

Incremental Shadows on December 21

The proposed action would cast incremental shadows on the Union/Marcy Avenue Greenstreet beginning at the start of the analysis day (7:36 AM) and continuing until 10:01 AM, for a duration of 2 hours and 25 minutes. For a 1 hour and 54 minute span from 7:36 AM to 9:30 AM, incremental shadows would eliminate all direct sunlight that the open space would receive in the absence of the proposed action and the greenstreet would be completely cast in shade, as shown in Figure 6-3. After 10:01 AM the greenstreet would not experience any incremental shadow coverage as a result of the proposed action. As indicated in Figure 6-3, incremental shadows would enter the open space from the east before moving in a northeasterly direction towards Wallabout Street.

May 6/August 6

On May 6/August 6 the time period for shadows analysis begins at 6:27 AM and continues until 5:18 PM. On the midpoint between the equinoxes and the solstices, incremental shadows from the proposed development would reach the Union/Marcy Avenue Greenstreet. No incremental shadows would be experienced at De Hostos Playground.

The proposed development would cast incremental shadows on the Union/Marcy Avenue Greenstreet beginning at the start of the analysis day (6:27 AM) and continuing until 9:33 AM, for a duration of 3 hours and 6 minutes. For a 2 hour and 26 minute span from 6:27 AM to 8:53 AM, incremental shadows would eliminate all direct sunlight that the greenstreet would receive in the absence of the proposed development and the greenstreet would be completely cast in shade, as shown in Figure 6-4. After 9:33 AM the greenstreet would not experience any incremental shadow coverage as a result of the proposed development.

June 21

On June 21 the time period for shadows analysis begins at 5:57 AM and continues until 6:01 PM. On the summer solstice, which is the day of the year with the longest period of daylight, the sun is most directly overhead and generally shadows are shortest and move across the widest angular range from west to east. On this date the proposed action would cast incremental shadows on the Union/Marcy Avenue Greenstreet. No incremental shadows would be experienced at De Hostos Playground.

The proposed action would cast incremental shadows on the Union/Marcy Avenue Greenstreet beginning at the start of the analysis day (5:57 AM) and continuing until 9:31 AM, for a duration of 3 hours and 34 minutes. For a 2 hour and 49 minute span from 5:57 AM to 8:46 AM, incremental shadows would eliminate all direct sunlight that the greenstreet would receive in the absence of the proposed action and the greenstreet would be completely cast in shade, as shown in Figure 6-5. After 9:31 AM the open space would not experience any incremental shadow coverage as a result of the proposed action.

December 21

On the winter solstice, December 21, the day of the year with the shortest period of daylight, the sun is low in the sky and shadows are at their longest but move rapidly. On this date the proposed

action would cast incremental shadows on both the Union/Marcy Avenue Greenstreet and the De Hostos Playground.

The proposed action would cast incremental shadows on the Union/Marcy Avenue Greenstreet beginning at 8:51 AM and continuing until 9:35 AM, for a duration of 44 minutes. After 9:35 AM the greenstreet would not experience any incremental shadow coverage as a result of the proposed action. As indicated in Figure 6-6, incremental shadows would be limited to the northeastern corner of the greenstreet and the majority of the open space would receive direct sunlight.

De Hostos Playground would be cast in incremental shade beginning at 11:37 AM and continuing until the end of the analysis day at 2:53 PM, for a duration of 3 hours and 16 minutes. After 2:53 PM the open space would not experience any incremental shadow coverage as a result of the proposed action. As indicated in Figure 6-6, incremental shadows would generally be limited to small portions of the playground's southern and eastern edges where trees, bench seating, jungle-gym equipment, and hand ball courts are located. The majority of the open space would continue to receive direct sunlight.

Assessment

Union/Marcy Avenue Greenstreet

As shown in Table 6-2, action-generated incremental shadows would be cast on parts of the greenstreet over the course of several hours on each of the four analysis dates. The extent and duration of shadow coverage would vary, with the greatest coverage on the June 21 analysis day, when the greenstreet would experience approximately 3 hours and 34 minutes of project-generated incremental shadows and would be entirely cast in shadow for approximately 2 hours and 49 minutes from 5:57 AM to 8:46 AM.

On March 21, May 6, and June 21, incremental shadows would affect sizeable areas of the greenstreet that feature trees, shrubs, and bench seating. As shadows are not static and move from west to east throughout the day, these features would only be temporarily affected and would continue to receive some direct sunlight throughout the late morning and afternoon on these three representative analysis days (see Figures 6-3 through 6-5). Additionally, the open space would continue to receive adequate sunlight during the growing season (at least the four to six hour minimum specified in the *CEQR Technical Manual*) and vegetation would not be affected.

On December 21, incremental shadow coverage on this open space resource would be limited (see Figure 6-6). Incremental shadow coverage on December 21, when temperatures would be colder and the use of passive recreational space would not be as high (compared to warmer months), would not affect the utilization or enjoyment of this open space resources. Additionally, bench seating would only be temporarily affected by incremental shadows during the early morning hours, and a number of benches would receive direct sunlight throughout the remainder of the morning, an important period of the day for users of this resource during the winter timeframe. Furthermore, any vegetation would not be affected by incremental shadows, as the December 21 analysis day falls outside the plant growing season defined by the *CEQR Technical Manual*.

Therefore, the incremental shadows that could result from the proposed action are not anticipated to adversely impact the usability of the Union/Marcy Avenue Greenstreet.

De Hostos Playground

The proposed development would cast incremental shadows on De Hostos Playground for 3 hours and 16 minutes from the late morning to early afternoon on one representative analysis day. On December 21, incremental shadow coverage on this open space resource would be limited to the southern and eastern edges of the playground and would result in coverage of approximately 10 percent of the playground's area. Incremental shadow coverage on December 21, when temperatures would be colder and the use of active recreational space would not be as high (compared to warmer months), would not affect the utilization or enjoyment of this open space resource. Additionally, while some bench seating would be affected by incremental shadow coverage, there would be several nearby seating areas within the playground that would continue to receive direct sunlight throughout the day. Furthermore, any vegetation would not be affected by incremental shadows, as the December 21 analysis day falls outside the plant growing season defined by the *CEQR Technical Manual*. Therefore, the incremental shadows that could result from the proposed action are not anticipated to adversely impact the usability of the De Hostos Playground.

Project-Generated Open Space

Pursuant to *CEQR Technical Manual* guidelines, shadows on project-generated open space are not considered significant under CEQR. However, as future project-generated open space is included as part of the qualitative analysis in Chapter 5, "Open Space," a discussion of how shadows could affect the new open space is provided below.

As discussed in Chapter 5, in the future with the proposed action, approximately 0.60-acres (26,000 sf) of publicly accessible open space would be provided in midblock corridors on each of the project area's two blocks. While detailed plans for the open space are not yet known, it is expected that this space would be programmed with passive recreational uses.

On all representative analysis days, project-generated shadow coverage on future open space is expected to be greatest during the early morning hours shortly after the start of the analysis period and the late evening hours shortly before the end of the analysis period. As shadows are not static and move from west to east throughout the day, the amount of coverage would decrease by late morning and future open space areas would generally receive direct sunlight throughout the late morning and early afternoon hours during the growing season. It is anticipated that the majority of future open space areas would not receive adequate direct sunlight throughout the day (at least the four to six hour minimum specified in the *CEQR Technical Manual*), and vegetation could potentially be affected. It is expected that the future open space area would be designed to account for project-generated shadows.