5

Shadows

The purpose of this chapter is to assess whether new structures may cast shadows on publicly-accessible sunlight-sensitive resources or other resources of concern such as natural resources, and to assess the significance of their impact.

5.1 Introduction

According to the *CEQR Technical Manual*, the longest shadow a structure will cast in New York City is 4.3 times its height. For land actions that could result in structures less than 50 feet high, a shadows assessment is generally not necessary unless the site is adjacent to a park, historic resource or important sunlight-dependent natural feature.

A sunlight-sensitive resource is defined in the *CEQR Technical Manual* as a resource that depends on sunlight or for which direct sunlight is necessary to maintain the resource's usability or architectural integrity. The following are sunlight-sensitive resources:

- **Public open space** (e.g., parks, beaches, playgrounds, plazas, schoolyards, greenways, landscaped medians with seating). Planted areas within unused portions of roadbeds that are part of the Greenstreets program are also considered sunlight-sensitive resources.
- **Features of architectural resources that depend on sunlight for their enjoyment by the public**. Such sunlight-sensitive features might include: design elements that depend on the contrast between light and dark (e.g., recessed balconies, arcades, deep window reveals); elaborate, highly carved ornamentation; stained glass windows; historic

landscapes and scenic landmarks; and features for which the effect of direct sunlight is described as playing a significant role in the structure's importance as a historic landmark. Only the sunlight-sensitive features need be considered, as opposed to the entire resource.

- **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.

In general, shadows on city streets and sidewalks or on other buildings are not considered significant. In addition, shadows occurring within an hour and a half of sunrise or sunset generally are also not considered significant. An adverse shadow impact is considered to occur when the incremental shadow (additional or new shadow that a building or other built structure would cast on a sunlight-sensitive resource during the year) from a proposed project 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.

This chapter assesses the potential for the proposed development to result in significant adverse shadows impacts. [1] As described in **Chapter 1**, "**Project Description**," the proposed development would consist of two buildings on Projected Development Site 1—a 310-foot-tall building called The Suffolk Building and a 165-foot-tall building on Norfolk Street called the Norfolk Building. The shadows analysis conservatively accounts for an additional 30-foot-tall mechanical bulkhead zone on both buildings. The analysis provides a Tier 1 through Tier 3 screening, as well as a detailed analysis, and determined the proposed actions would not result in significant adverse shadows impacts.

5.2 Principal Conclusions

A preliminary assessment (Tier 1, Tier 2, and Tier 3 assessments) was undertaken and indicated the need for a detailed shadows analysis of one resource—The Park, an open space resource on Site 5 of the Essex Crossing development. The Park, which opened in June 2019, is located across Suffolk Street from Projected Development Site 1; it contains both passive and active recreation, as well as vegetation.

While the proposed development would result in shadow increments on The Park during the afternoon periods of the March, May and June analysis days, it would not result in a significant adverse shadows impact. From its inception, the site identified and chosen for the privately-owned and maintained, publicly-accessible Park on Site 5 was conceived of as one that would be largely in shadow during most of the fall, winter, and early spring analysis days. For those open space users who want afternoon sun, there is a nearby park (Seward Park) that would be in sunshine during the afternoon periods, which offers similar amenities to those at The Park. In addition, an assessment of whether there would be sufficient sunlight during the growing season so that the viability of The Park's vegetation would be

[1] As discussed in Chapter 1, "Project Description," independent of the proposed development, the owner of Lot 95 would develop additional commercial space on Projected Development Site 2; this commercial space would be just one- to two stories and would not have the potential to result in shadow increments on nearby open spaces. Therefore, this analysis focuses on potential shadow from the proposed development on Projected Development Site 1.

maintained indicated that there is a small section of The Park that may receive less than four hours of direct sunlight on two of the analysis days. However, consistent with the original conception of the park as a space that would be largely in shadow during most of the fall, winter, and early spring, the planted species in this area of the park are those that tolerate partial shade conditions; therefore, the proposed development is not expected to have a significant adverse shadows impact on vegetation. Overall, the proposed development would not result in significant adverse shadows impacts.

5.3 Methodology

In accordance with the *CEQR Technical Manual*, a preliminary screening assessment is conducted to ascertain whether shadows resulting from a project could reach any sunlight-sensitive resource at any time of year. This preliminary screening assessment consists of three tiers of analysis:

- **Tier 1 Screening:** The first-tier analysis determines a simple radius around the proposed building representing the longest shadow that could be cast. If a base map that identifies public open spaces, landmarks and natural resources reveals sunlight-sensitive resources within the radius, the analysis proceeds to the second tier;
- **Tier 2 Screening:** The second-tier analysis 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. According to the *CEQR Technical Manual*, shadows cannot be cast within New York City within 108° from True North;
- **Tier 3 Screening:** 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. For the Tier 3 screening, three-dimensional modeling software with the capacity to model shadows is used, and the maximum building envelope that could be achieved as a result of the proposed project is modeled and geo-located within the program. Terrain provided by the modeling software is also incorporated into the model to account for how changes in elevation throughout the study area can influence shadows that could be cast by the proposed project. The representative days are December 21 (winter solstice), June 21 (summer solstice), March 21 (vernal equinox), and May 6 (halfway between the solstice and equinox). The *CEQR Technical Manual* determines the timeframe windows of analysis. According to the guidelines, shadows occurring 1.5 hours before sunrise and 1.5 hours after sunset are not considered significant because they are long, fast-moving, and blend in with shadows from existing structures, Therefore, assessment for these shadows is not required. The modeling software is also used to approximate times that shadows cast from the proposed project could enter and exit a resource.

Detailed Assessment

If the Tier 3 screening indicates that, in the absence of intervening buildings, shadows from the proposed project would reach a sunlight sensitive resource on any of the representative analysis days, a detailed shadow analysis would be warranted. Because existing buildings may already cast shadows on a sun-sensitive resource (or a future building could be expected to cast shadows), the proposed project may not result in additional (incremental) shadows upon that resource. The detailed shadow analysis models a baseline condition (future No-Action) that is compared to the future condition resulting from the proposed project (future With-Action) to illustrate the shadows cast by existing or future buildings and distinguish the additional (incremental) shadow cast by the project.

Like in the Tier 3 analysis, the detailed analysis considers the maximum building envelope that could be achieved as a result of the proposed actions. As shown in **Figures 1-4, 1-5, and 1-6** in **Chapter 1**, **Project Description**, the proposed development on Projected Development Site 1 would not occupy the full extent of the maximum building envelope. However, for purposes of a conservative analysis, the maximum building envelope, including the bulkhead zone, is modeled in the detailed analysis.

5.4 Preliminary Assessment

The study method described above is presented in the relevant subsections below.

Tier 1 and Tier 2 Screening

A base map was created identifying all known historic, natural and open space resources within the potential shadow sweep. Sunlight-sensitive features of each resource were identified. Any resources that did not have sunlight-sensitive elements were not considered further in the analysis.

Figure 5-1 shows the result of the Tier 1 and Tier 2 screening assessments. The potential sunlight-sensitive resources identified in the Tier 1 and Tier 2 screening are presented below in **Table 5-1**. No natural resources were identified within the shadow study area.

Table 5-1 Affected Area – Potential Sunlight Sensitive Resources

Map ID	Resource Name	Potential Resource Summary	Sunlight-Sensitive Elements
Open Space Resources			
O1	The Park	Approximately 15,000 sf open space on the north side of Essex Crossing Site 5.	Passive & active recreation, vegetation
O2	Schiff Mall	Series of vegetated medians within Delancey Street	Vegetation
O3	Seward Park (and High School Courts)	A 3.3-acre park with playground, tennis/ handball/ basketball/ volleyball courts, running track, bench seating, municipal pavilion	Passive & active recreation, vegetation
O4	Straus Square	Cobble stone triangular square with a sculpture	None
O5	Ahearn Park	Partially paved triangular park with bench seating and vegetation	Passive recreation

Map ID	Resource Name	Potential Resource Summary	Sunlight-Sensitive Elements
O6	Sol Lain Playground	Playground adjacent to PS 137 consisting of paved multi-purpose area with basketball courts, bench seating, picnic benches, and comfort station	Active recreation, vegetation
O7	Capt. J. Joseph Playground	Playground with vegetation and bench seating	Passive & active recreation, vegetation
O8	Allen Street Malls	Series of vegetated medians within Allen Street, including a bike path and vegetation	Passive & active recreation, vegetation
O9	PS 142 Playground	School playground consisting of basketball courts, track, and rubber baseball field.	Active recreation
O10	Nathan Straus Playground	School playground consisting of basketball court, handball courts, playground equipment, and benches	Passive & active recreation, vegetation
O11	Siempre Verde Garden	Community garden with frontage to Stanton Street and Attorney Street	Passive recreation and vegetation
O12	Community of Poor People in Action	Community garden at southeast corner of Clinton Street and Stanton Street	Passive recreation and vegetation
O13	Children's Magical Garden	Community garden that hosts activities	Passive recreation and vegetation
O14	Luther Gulick Park	1.4-acre park with handball courts, bench seating, and table tennis	Passive & active recreation, vegetation
O15	Little Flower Playground	Playground with comfort station and bench seating	Passive & active recreation, vegetation
O16	Anna Silver School Playground	School playground on north side of Stanton Street between Essex Street and Norfolk Street	Active Recreation
Historic Resources			
H1	Beth Hamedrash Hagodol Synagogue	Badly damaged former synagogue on Projected Development Site 1	None
H2	143 Allen St House	Single-family brownstone residence	None
H3	Kehila Kadosha Janina Synagogue	Synagogue constructed in 1926-27 for a small group of Romaniote Jews who had emigrated from loannina in northwestern Greece	Stained glass
H4	Edward Ridley & Sons Department Store Bldgs	Series of four buildings that used to be home to Lower East Side's largest department store	None
H5	339 Grand St/57 Ludlow St	Federal-style rowhouse built by Jacob Astor c. 1831-1833	None
H6	Willett St Methodist Episcopal Church	Once the home of the Willett Street Methodist Episcopal Church, the building is of the late Federal Period and has stained glass features	Stained glass
H7	Neighborhood Playhouse	Neo-Georgian theater constructed 1913 – 1915 and designed by Ingalls & Hoffman	None
H8	S. Jarmulowsky Bank Building	Completed in 1912 as the architectural showpiece of one of the neighborhood's most prominent bankers	None
H9	Loew's Canal St Theatre	Theater constructed 1926 – 1927	None

Map ID	Resource Name	Potential Resource Summary	Sunlight-Sensitive Elements
H10	Bialystoker Center and Home for the Aged	Designed in a distinctive Art Deco style by architect Harry Hurwit, was one of the largest and most enduring landsmanshaft—or immigrant hometown association—established in the neighborhood	None
H11	New York Public Library, Seward Park Branch	Library that served the immigrant community of the Lower East Side since it opened its doors on November 11, 1909.	None
H12	281 East Broadway House	Modest Federal style two-and-a-half story rowhouse built c. 1829	None
H13	Henry Street Settlement	Three townhouses that formed the Henry Street Settlement	None
H14	Forward Building	A ten-story building constructed in 1912 that housed the Jewish Daily Forward, a Yiddish-language daily circular	Stained glass
H15	Stanton St Shul/ Bnai Jacob Anschei Brzezan	Built in 1913 in American vernacular synagogue design, this is one of the few surviving "tenement synagogues" on the Lower East Side	Stained glass
H16	University Settlement House	Settlement house that served as a home for many immigrants who arrived in the United States in the late-19th and early-20th century	None
	Lower East Side Historic District	S/NR-Listed Historic District noted for architecture, ethnic heritage, social history, commerce & religion	None

Sources: MapPLUTO 17v1.1, NYS Cultural Resources Information System (CRIS), nycparks.org

As shown in **Figure 5-1**, there are a total of 16 open space resources, 16 individual historic resources, and one historic district within the shadow study area. No natural resources were identified within the study area. The Lower East Side Historic District is not noted for its sunlight-sensitive resources, and therefore no further shadows analysis is warranted for this district; however, the district contains several individual historic resources that contain sunlight-sensitive resources, and these were considered in a Tier 3 analysis. A total of six open space resources and eight individual historic resources are completely within an area that cannot be shadowed by the proposed development. The Tier 1 and Tier 2 screenings could not rule out the potential for significant adverse impacts to 11 open space resources and seven individual historic resources, which warranted analysis in a Tier 3 screening, as noted in **Table 5-2**.

Figure 5-1 Tier 1 and Tier 2 Screening Results



Table 5-2 Resources that Warrant Tier 3 Shadow Analysis

Open Space Resources	
O1	The Park
O2	Schiff Mall
O3	Seward Park (& HS Courts)
O8	Allen St Malls
O9	PS142 Playground
O10	Nathan Straus Playground
O11	Siempre Verde Garden
O12	Community of Poor People in Action
O13	Children's Magical Garden
O14	Luther Gulick Park
O16	Anna Silver School Playground
Historic Resources	
H3	Kehila Kadosha Janina Synagogue
H6	Willett St Methodist Episcopal Church
H15	Stanton Street Shul

Tier 3 Screening Results

Figures 5-2 through **5-5** show a representative sample of shadows that could be cast by the proposed development on the December 21, March 21/September 21, May 6/August 6, and June 21 analysis days in the absence of intervening structures.

Figure 5-2 Tier 3 Screening Results – December 21 Analysis Day

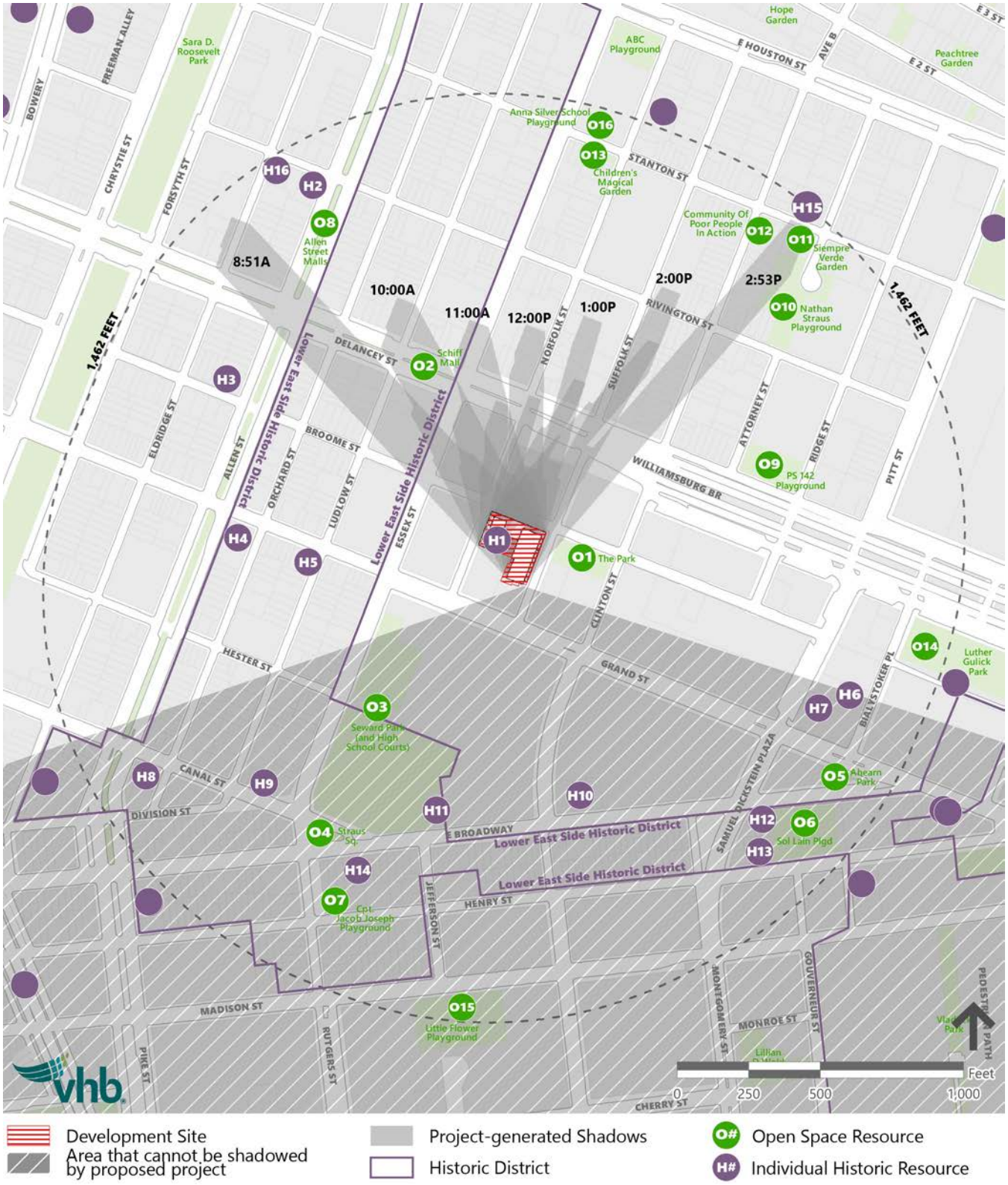


Figure 5-3 Tier 3 Screening Results – March 21/September Analysis Day



Figure 5-4 Tier 3 Screening Results – May 6/August 6 Analysis Day

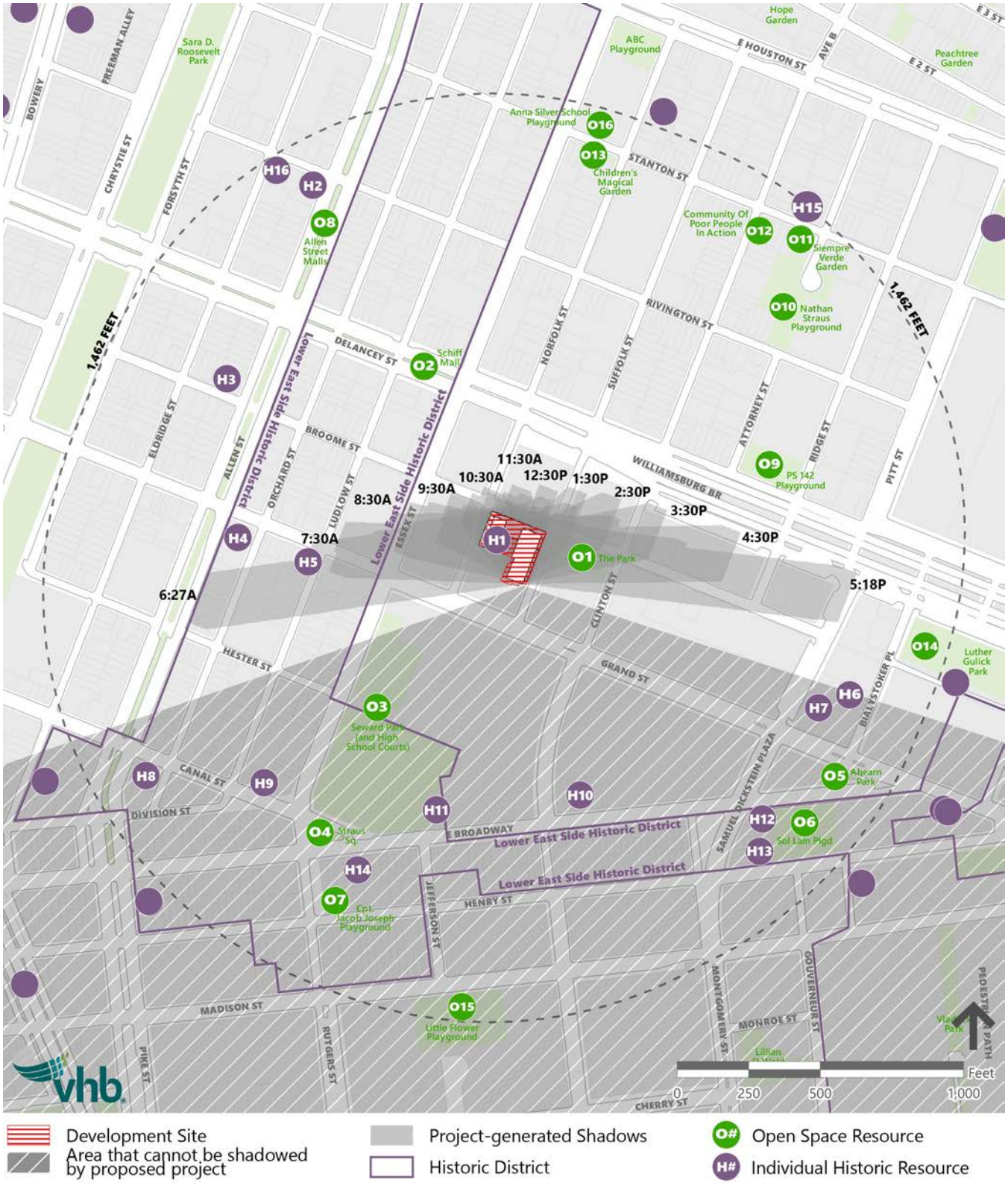
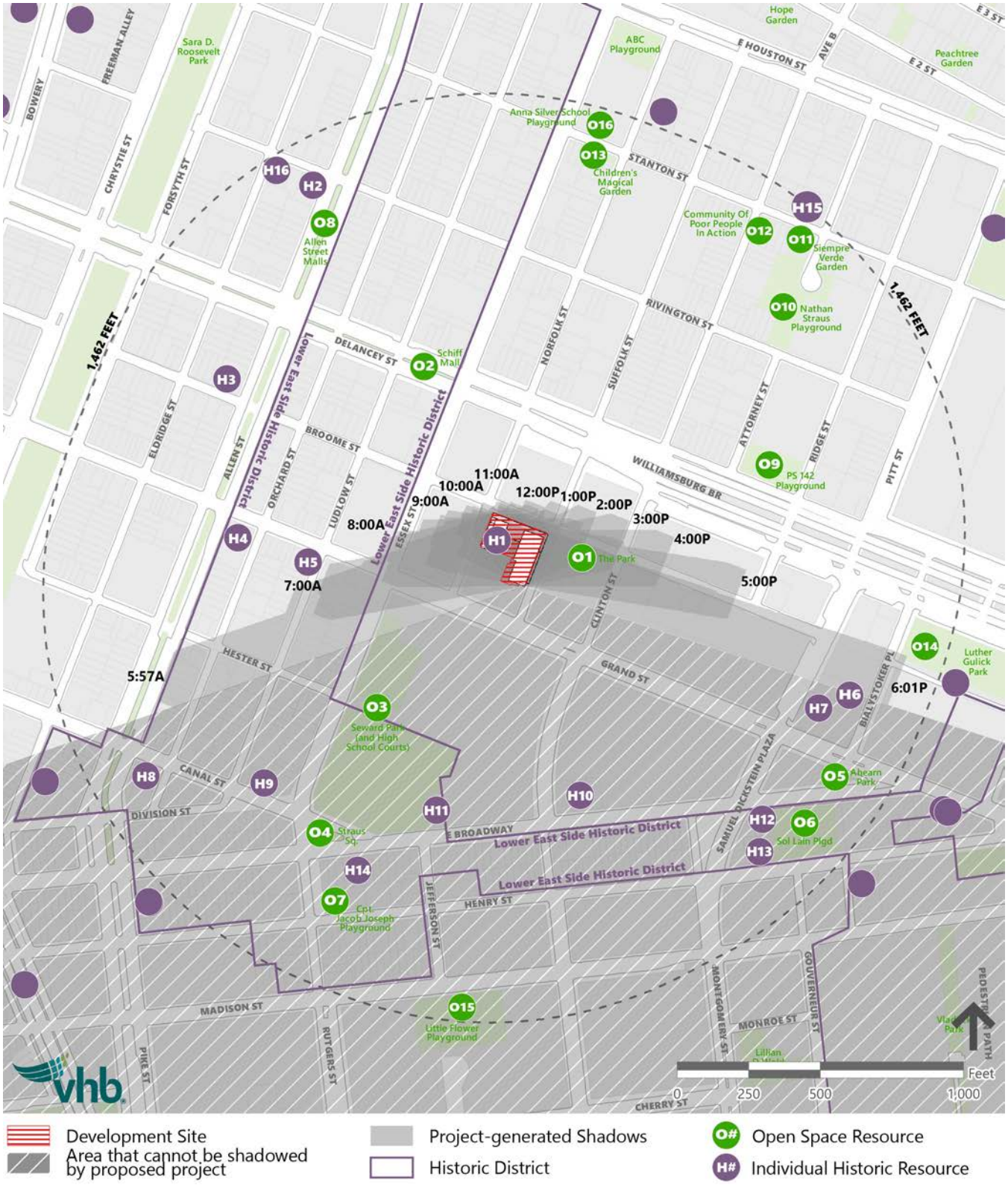


Figure 5-5 Tier 3 Screening Results – June 21 Analysis Day



The Tier 3 screening indicates that in the absence of intervening structures, the following incremental shadow durations to sunlight-sensitive resources shown in **Table 5-3** would occur:

Table 5-3 Tier 3 Screening Results and Shadow Duration

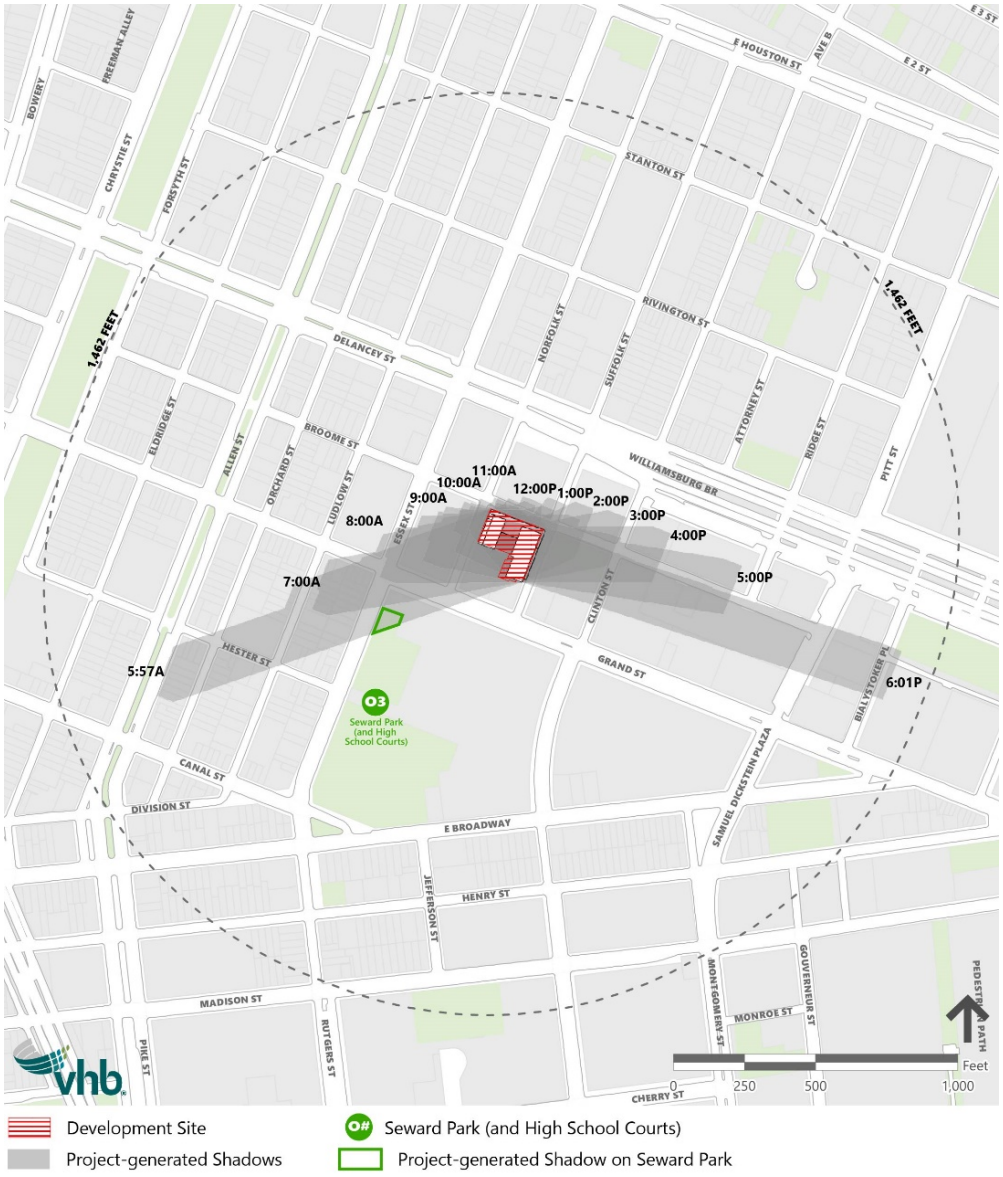
	Analysis Day			
Resource	**Dec 21**	**Mar 21/Sept 21**	**May 6/Aug 6**	**Jun 21**
Analysis Timeframe	**08:51A – 02:53P**	**7:36A – 4:29P**	**6:27A – 5:18P**	**5:57A – 6:01P**
O1 – The Park	2:40P – 2:53P (13m)	1:50P – 4:29P (2h, 39m)	1:07P – 5:18P (4h, 3m)	1:08P – 6:01P (5h, 56m)
O2 – Schiff Mall	8:51A – 2:53P (6h, 2m)	N/A	N/A	N/A
O3 – Seward Park (& High School Courts)	N/A	N/A	N/A	5:57A – 6:48A (51m)
O8 – Allen Street Malls	8:51A – 9:16A (25m)	7:36A – 7:41A (5m)	N/A	N/A
O9 – PS142 Playground	N/A	3:57P – 4:29P (34m)	N/A	N/A
O10 – Nathan Straus Playground	2:47P – 2:53P (6m)	N/A	N/A	N/A
O11 – Siempre Verde Garden	2:49P – 2:53P (4m)	N/A	N/A	N/A
O12 – Community of Poor People in Action	2:43P – 2:45p (2m)	N/A	N/A	N/A
O13 – Children's Magical Garden	N/A	N/A	N/A	N/A
O14 – Luther Gulick Park	N/A	N/A	N/A	N/A
O16 – Anna Silver School Playground	N/A	N/A	N/A	N/A
H3 – Kehila Kadosha Janina Synagogue	N/A	N/A	N/A	N/A
H6 – Willett Street Methodist Episcopal Church	N/A	N/A	N/A	5:54P – 6:01P (7m)
H15 – Stanton Street Shul	N/A	N/A	N/A	N/A

The Tier 3 screening shows that in the absence of intervening buildings, the proposed development has the potential to cast shadows on The Park (O1), Schiff Mall (O2), Seward Park (& High School Courts) (O3), Allen Street Malls (O8), PS 142 Playground (O9), Nathan Straus Playground (O10), Siempre Verde Garden (O11), Community of Poor People in Action (O12) and Willet Street Methodist Episcopal Church (H6); however, because the Tier 3 screening does not account for intervening buildings and several resources would have a very short duration of incremental shadow in the absence of such intervening structures, the

following resources did not warrant additional analysis: O8 – Allen Street Malls; O9 – PS 142 Playground; O10 – Nathan Straus Playground; O11 – Siempre Verde Garden; O12 – Community of Poor People in Action; and H6 – Willett Street Methodist Episcopal Church. Because the Tier 3 screening shows the proposed development has the potential to cast shadow on O2 – Schiff Mall only during the December 21 analysis day when vegetation is dormant, a detailed analysis was not warranted for this resource. O3 – Seward Park (and High School Courts) also did not warrant a detailed analysis as the Tier 3 screening found that in the absence of intervening buildings, shadow could only be cast in the very northern-most portions of the Seward Park High School Courts (see **Figure 5-6**) and would occur very early in the morning (all shadow would occur before 7AM), when usage would be low, and only for a duration of 51 minutes.

The Tier 3 screening showed the proposed development has the potential to cast shadows on The Park during the March 21/September 21, May 6/August 6, and June 21 analysis days, and therefore a detailed analysis was undertaken for this resource.

Figure 5-6 Seward Park and High School Courts (O3) – Tier 3 June Analysis Day



5.5 Detailed Shadow Analysis

The detailed shadow analysis builds on the three-dimensional modeling used in the Tier 3 analysis to reflect the presence of existing structures and any new structures expected to be constructed in the No-Action condition. After accounting for these structures, any new shadows projected to be cast onto the identified resources by the proposed development are considered "incremental shadows." The No-Action developments shown in **Table 5-4** and **Figure 5-7** were incorporated into the detailed shadow analysis (Essex Crossing Sites 8, 9 and 10 would be expected to have a negligible (if any) effect on The Park due to their respective locations north of Delancey Street). In addition, the proposed Grand Street Guild project was considered.

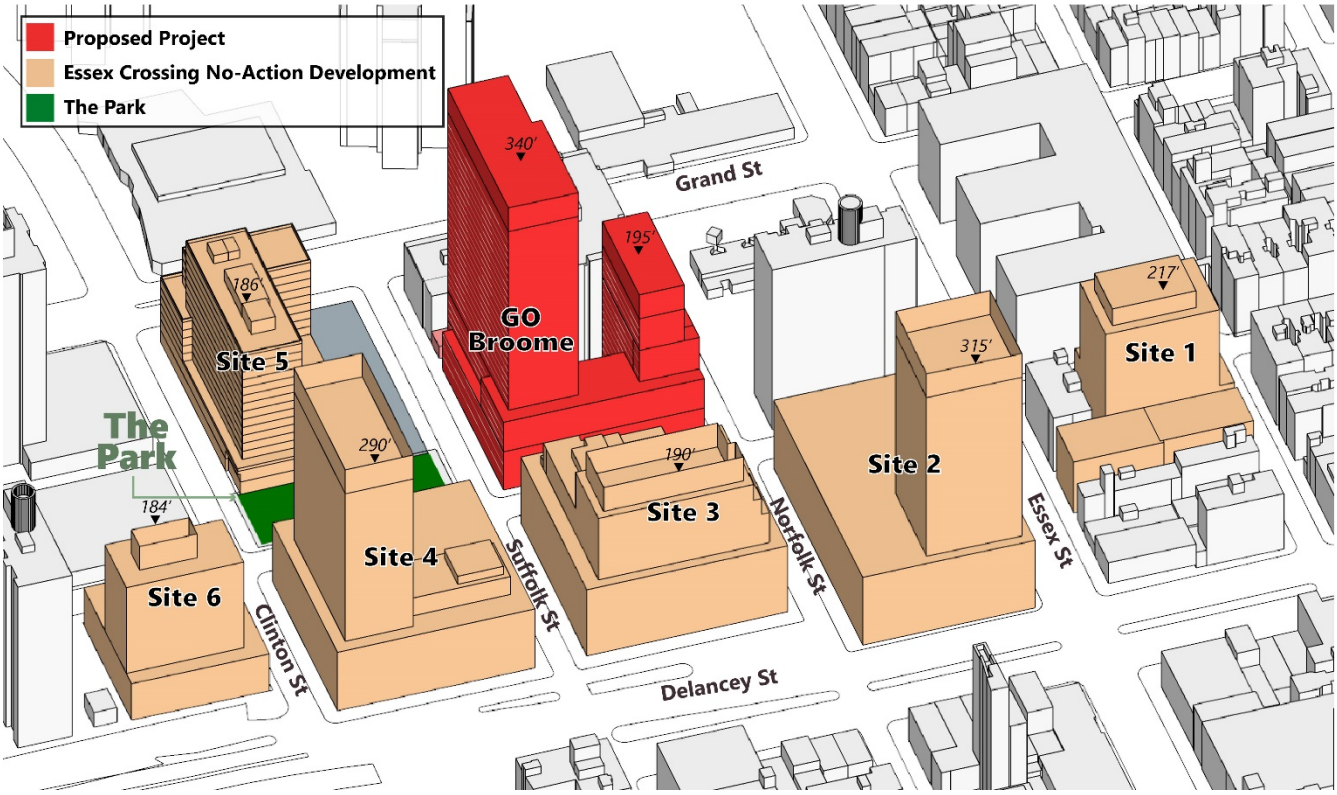
Table 5-4 No-Action Essex Crossing Developments Considered in Detailed Analysis

Essex Crossing Site # (block and lot(s))	Location Relative to Proposed Development	No-Action Development Description	Max. Building Height, ft (inc. bulkhead)
1 Bl: 409, L: 56	West	Residential, museum, and commercial uses with a base height of 63-ft	177.6
2 Bl: 352, L: 7501	Northwest	Residential and commercial uses with a base of 83-ft and a residential tower	315.0
3 Bl: 346, L: 150	North	Residential and commercial uses with several setbacks above a height of 60-ft	190.0
4 Bl: 346 L: 175	Northeast	Residential and commercial uses with a base of 74-feet, a midrise component with a height of 96.5 ft, and a residential tower	290.0
5 Bl: 346, L: 7501 & 39	East	Residential and commercial uses with a base of 29.5-feet on lot 7501[2]	186.0
6 Bl: 347, L: 7501	East	Residential, community facility, and commercial uses with a base height of 64-ft	184.0

Source: NYC Department of Buildings (DOB) Building Information System (BIS), accessed May 4, 2018.

[2] As discussed in the *Seward Park Mixed-Use Development Project Final Environmental Impact Statement* (CEQR No. 11DME012M), a school is proposed on the Suffolk Street frontage of Site 5. Consistent with CEQR methodologies and the analytical framework for the GO Broome Street Development EIS, since the school is not expected to be constructed by the 2023 analysis year, it is not included in the No-Action condition.

Figure 5-7 Essex Crossing Developments Considered in Detailed Analysis



Note: The Norfolk Building would be 165 feet tall with a 30-foot bulkhead for a maximum height of 195 feet. The Suffolk Building would be 310 feet tall with a 30-foot bulkhead for a maximum height of 340 feet.

The Park

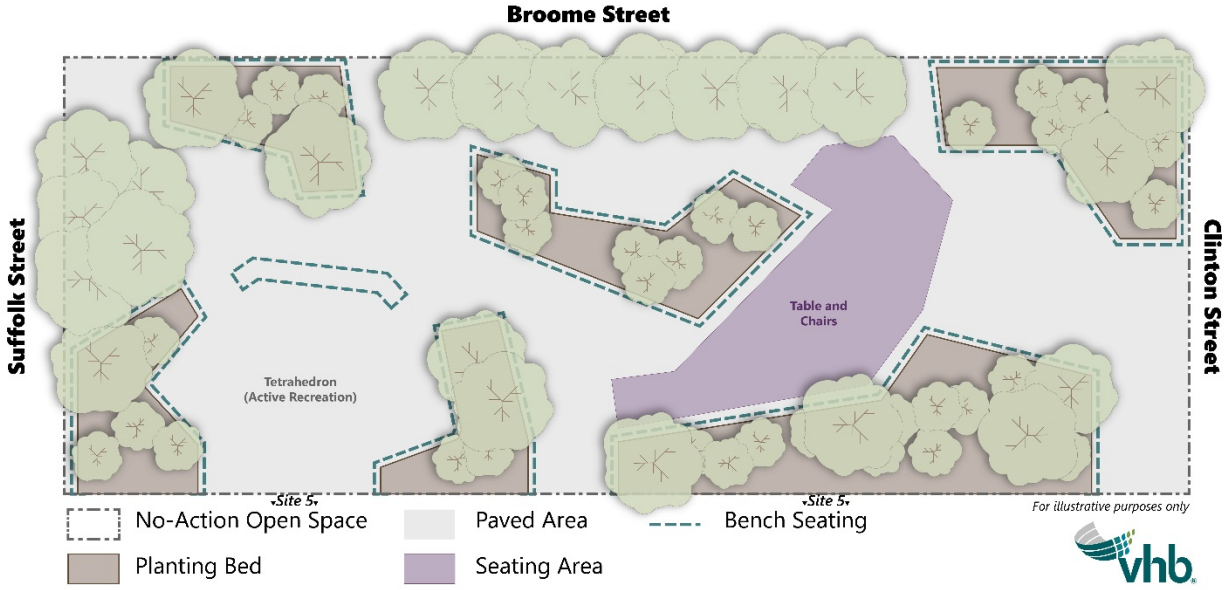
Site 5 of Essex Crossing contains a privately-owned and maintained publicly-accessible open space on the north side of the block: "The Park at Essex Crossing" (The Park); the owner/operator is Delancey Street Associates.

The Park, which opened in June 2019, contains a series of bench seating areas, movable tables and chairs, an active recreational area (playground) called "Tetrahedron," and planting beds with trees. A representative diagram of The Park and its various sunlight-sensitive elements are shown on **Figure 5-8**.

The Essex Crossing development was analyzed in the *Seward Park Mixed-Use Development Project Final Environmental Impact Statement* (CEQR No. 11DME012M)[3] and was approved by the City Council on October 11, 2012. Since planning approvals, the Seward Park Mixed Use Development has been renamed "Essex Crossing."

[3] And subsequent technical memoranda.

Figure 5-8 Locations of Sunlight Sensitive Features in The Park



Created by VHB. Data Source: ULURP Application C 120228ZSM, filed March 12, 2018

Site 5 of the Essex Crossing development is located across Suffolk Street from the proposed development site and consists of the block bounded by Broome Street to the north, Clinton Street to the east, Grand Street to the south, and Suffolk Street to the west. Consistent with the planning process for the Seward Park project,[4] which identified a new open space on the north end of Site 5, the Seward Park FEIS assumed that Site 5 would be developed with an open space on the north side of the block, fronting Broome Street and extending from Suffolk Street to Clinton Street; a mixed-use building containing residential and retail uses on the eastern portion of the block south of the open space; and a school on the western portion of the block south of the open space that would rise to a height of up 85 feet. The open space and the mixed-use building are complete. **Figure 5-9** shows the proposed planting plan, and **Photo 5-1** through **Photo 5-8** show the built conditions at the site.[5] As shown in the photographs, current built conditions are consistent with the proposed planting plan.

As detailed in the Seward Park FEIS shadows analysis, The Park "*on Site 5 would experience project-generated shadow. The open space, which would be located on the Broome Street side of Site 5, would experience substantial project-generated shadow throughout the year*." The

[4] Manhattan Community Board 3 commenced the planning process in 2008 and EDC, HPD, and DCP participated in the process. Out of this planning process came a set of project guidelines that CB3 adopted; CB3 then worked with the City on design principles for the development.
[5] Photographs were taken in June 2019 around 12:45 PM and in July 2019 around 11:30 AM.

analysis also noted that The Park would be "*largely in shadow from the maximum zoning envelope on Site 5 during most of the fall, winter, and early spring analysis days*."[6]

Because of The Park's location on the north side of the Site 5 project block, north of the projected mixed-use and school development, this park has always been conceived of as a shaded space. As noted on West 8 Urban Design and Landscape Architecture's webpage describing The Park, "the design for the Park at Essex Crossing provides a refined, shaded oasis in the heart of Manhattan's Lower East Side."[7]

[6] Fall, winter, and early spring analysis days correspond to March 21/September 21, December 21, and May 6/August 6 analysis days. The Seward Park shadows analysis considered conditions at the park assuming development of both the mixed-use building on Site 5 (now complete) and the school building.

[7] http://www.west8.com/projects/parks/the_park_at_essex_crossing/, accessed July 20, 2018

Figure 5-9 Proposed Planting Plan

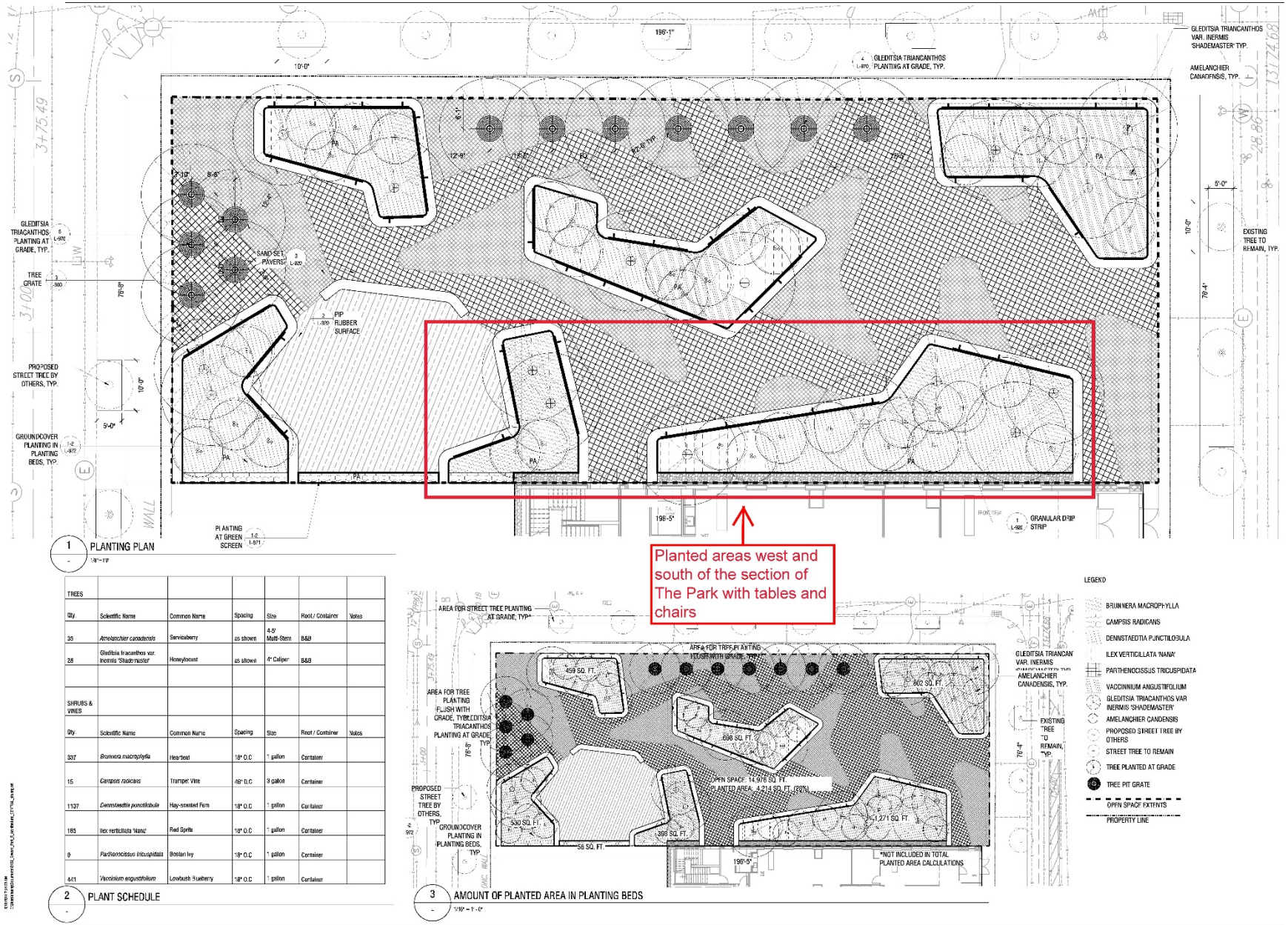
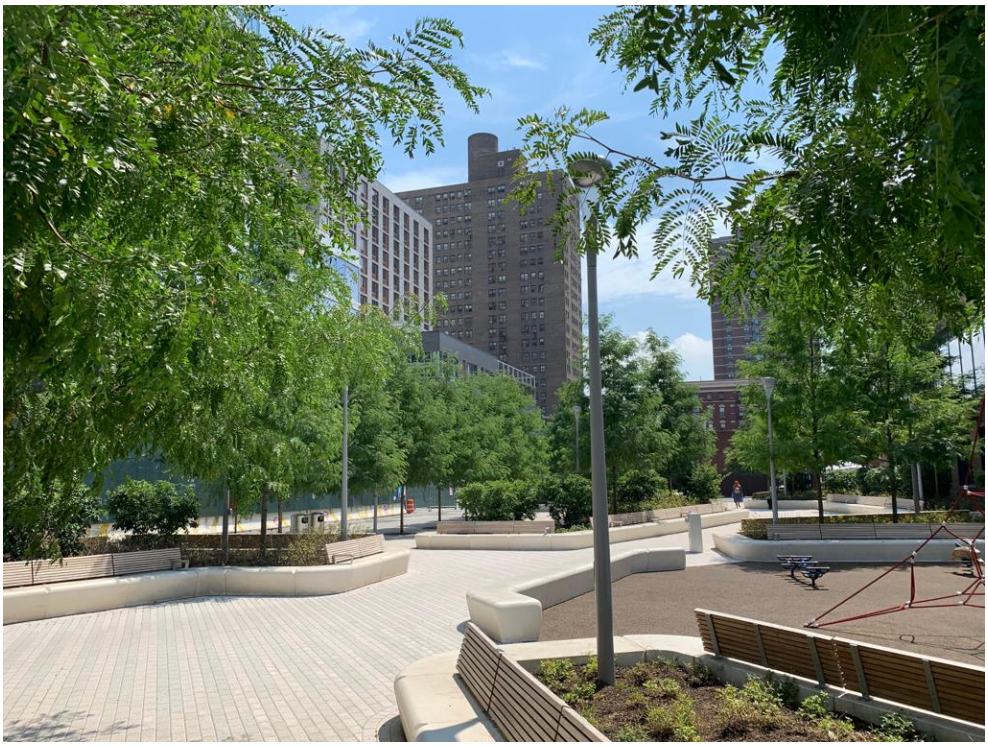


Photo 5-1



View of the Tetrahedron located in the southwest portion of The Park (July 2019)

Photo 5-2



View of The Park facing east from Suffolk Street (July 2019)

Photo 5-3



View of The Park from the west side along Suffolk Street (July 2019)

Photo 5-4



View of the planting area located in the middle of The Park (July 2019)

Photo 5-5



View of The Park from the southwest corner of Broome Street and Clinton Street (June 2019)

Photo 5-6



View of the northeast portion of The Park (June 2019)

Photo 5-7



View of the northern portion of The Park fronting Broome Street, facing west from Clinton Street (June 2019)

Photo 5-8



View of southern portion of The Park facing west from Clinton Street (June 2019)

Analysis Results by Season

As described above, a detailed analysis was warranted for The Park on the March 21/September 21, May 6/August 6, and June 21 analysis days. The detailed analysis for each of these representative analysis days is presented below.

March 21 Analysis Day

Figures 5-10 through **5-15**, at the end of this chapter, provide a representation of the projected incremental shadows for the March 21/September 21 analysis day.

The detailed analysis demonstrates that incremental shadow from the proposed development would begin at 1:50PM and occur until 4:29PM, a duration of approximately 2 hours, 22 minutes. Project-generated incremental shadow on this analysis day would be limited to the north and western portions of The Park, covering approximately half of The Park throughout the analysis period, including the northwestern portions of the active recreational space as well as some areas of bench seating and vegetation.

May 6/August 6 Analysis Day

The detailed analysis for The Park for the May 6/ August 6 analysis day is presented in **Figures 5-16** through **5-24**.

The detailed analysis demonstrated that the proposed development would cast incremental shadow from 1:07PM. The Park is not projected to be wholly in shadow until approximately 3:34PM. Incremental shadow would be limited to the western and northern portions of The Park, which includes the active recreation area, bench seating, and vegetation.

June 21 Analysis Day

The detailed analysis for The Park for the June 21 analysis day is presented in **Figures 5-25** through **5-35**.

Incremental shadow from the proposed development would occur after approximately 1:08PM, and would be cast initially in the western, and then the eastern portion of the park. The park would be wholly in shadow from existing and incremental shadow from approximately 3:02PM to the end of the analysis period.

Summary of Projected Shadow Conditions at The Park

Table 5-5 below provides a summary of the incremental shadow that is projected to be cast by the proposed development.

Table 5-5 Detailed Analysis Summary of Shadow Entry/Exit Times at The Park

Analysis Day	December 21	March 21 / September 21	May 6 / August 6	June 21
Timeframe Window	**8:51A – 2:53P**	**7:36A – 4:29P**	**6:27A – 5:18P**	**5:57A – 6:01P**
Shadow Entry/Exit Times	N/A	1:50PM – 4:29PM	1:07PM – 4:29PM	1:08PM – 6:01PM
Shadow Duration	N/A	2hr, 39m	3hr, 22m	4hr, 53m

Note: Daylight savings time was not used during the analysis

Table 5-6 shows the times various portions of The Park would experience sunlight.

Table 5-6 Detailed Analysis Summary of Sunlight Duration on The Park

Analysis Day	December 21	March 21 / September 21	May 6 / August 6	June 21
Timeframe Window	**8:51A – 2:53P**	**7:36A – 4:29P**	**6:27A – 5:18P**	**5:57A – 6:01P**
Times of Sunlight (Whole and Partial)	N/A	7:36AM – 8:20AM; 8:50AM – 4:29PM	6:53AM – 3:34PM	7:07AM – 3:02PM
Sunlight Duration	N/A	44 minutes; 7 hours, 39 minutes	8 hours, 41 minutes	7 hours, 55 minutes

Determination of Significance

While the project would result in incremental shadow on the Site 5 open space, including some periods where the increment would remove the remaining sunlight, determining whether the impact is significant or not depends on the extent and duration of the incremental shadow and the specific context in which the impact occurs.

The following are considerations that inform whether a project's shadow increments would be considered a significant adverse impact, per the *CEQR Technical Manual*:

- Is there a substantial reduction in the usability of the open space as a result of increased shadows?
- Are there well-lit resources in close proximity to the affected resource?
- Is there a substantial reduction in sunlight available to a sunlight-sensitive feature to less than the minimum time necessary for its survival (when there was sufficient sunlight in the future without the project)?

The Park is a new open space that opened in June 2019, and from its inception was to be located on the north portion of Site 5, resulting in a park that would be largely in shadow. As described above, the Seward Park FEIS found that The Park would be in shadow during most of the fall, winter, and early spring analysis days from the mixed-use and school buildings to be constructed on Site 5. According to the Seward Park FEIS, "In the late spring and summer, portions of the north side of the space would be in sun for much of the morning and mid-

day, and in the afternoon the northwest section would be in sun; however, shadow from the maximum zoning envelope on Site 5 would shade the southern areas of the space for most of the day even on these analysis days."[8] The proposed development's shadow increments would occur during the March and May analysis days, and therefore, there would be no reduction in the usability of the open space during these analysis days as a result of the increased shadows from the proposed development, since this is consistent with The Park's character.

The proposed development would also result in shadow increments on the June analysis day. However, this new increment would not result in a significant adverse impact because The Park would continue to experience morning sun and because there are nearby resources available for open space users seeking to experience afternoon sun. Specifically, based on a review of open space resources in the area near both the proposed development site and The Park, the nearby 3.36-acre William H. Seward Park provides passive recreation areas (in addition to active recreation spaces), including benches, landscaping, and mature trees. Seward Park is approximately 600 feet from The Park and less than 300 feet from Projected Development Site 1 (see **Figure 5-1**).

A qualitative assessment was undertaken to review the shadow conditions at Seward Park at the time when the proposed development would introduce incremental shadow on The Park (i.e., in the afternoon periods of the March, May and June analysis days). The analysis found that direct sunlight is available to most of Seward Park in the afternoon during these analysis days, as buildings to the south and west of this open space are predominately lower in scale with buildings up to 6 stories. Consistent with CEQR guidelines, the proposed development's incremental shadow on The Park during the June analysis day would not be considered significant and adverse because there are existing open space resources within the study area that provide similar amenities as the park but are in sun during times that The Park is in shadow.

In terms of The Park's vegetation, an analysis was conducted to evaluate whether there would be sufficient sunlight during the growing season so that the viability of vegetation would be maintained. The Manual states that for vegetation requiring direct sunlight, generally four to six hours a day of sunlight, particularly in the growing season, is a minimum requirement. However, the Manual also states that the assessment should consider the relative shade tolerance of a resource's vegetation. For The Park, due to shadow from existing structures, including the Site 5 building, No-Action developments surrounding The Park, including the future Grand Street Guild building, and shadow from the proposed development, there is one small section of planted area within The Park that may receive less than four hours of direct sunlight: the planted area located on the southern portion of The Park (as identified by the red bounding box with accompanying text in **Figure 5-9**). During the March analysis day, the planted area just south and west of the portion of The Park consisting of tables and chairs (see **Figure 5-9** for reference) would experience little to no sunlight throughout the analysis day. During the May analysis day, the southern portion of The Park just below the section with tables and chairs would experience approximately 3 hours, 30 minutes of sunlight (8:45AM to 12:15PM). A review of the planting plan for The

[8] Seward Park FEIS, Shadows, pg. 6-15

Park indicates that, consistent with the original conception of the park as a space that would be largely in shadow during most of the fall, winter, and early spring, the species identified in this area are species that tolerate partial shade conditions.[9] Therefore, as the proposed development's shadow increments would not cause a reduction in direct sunlight on the planted areas to less than 4 hours, except for this small area, the proposed development is not expected to have a significant adverse shadows impact on vegetation.

Overall, while the proposed development would result in shadow increments on The Park during the afternoon periods of the March, May and June analysis days, the proposed development would not result in a significant adverse shadows impact. From its inception, the site identified and chosen for the privately-owned and maintained, publicly-accessible Park was conceived of as one that would be largely in shadow during most of the fall, winter, and early spring analysis days. For those open space users who want afternoon sun, there is a nearby park (Seward Park) that would be in sunshine during the afternoon periods, which offers similar amenities to those at The Park. The proposed development would introduce some incremental shadow to an open space that will already experience a notable amount of shadow due primarily to existing development on Site 5 and the future Grand Street Guild project. Therefore, the proposed development would not result in significant adverse shadows impacts.

[9] These species include: *Amelanchier canadensis*, *Gleditsia triacanthos var. inermis* 'Shademaster', *Brunnera macrophylla*, *Campsis radicans*, *Dennstaedtia punctilobula*, *Ilex verticillata* 'Nana', *Parthenocissus tricuspidata,* and *Vaccinium angustifolium*.

March 21/September 21 Analysis Days

Figure 5-10 March 21/September 21 – 1:30P

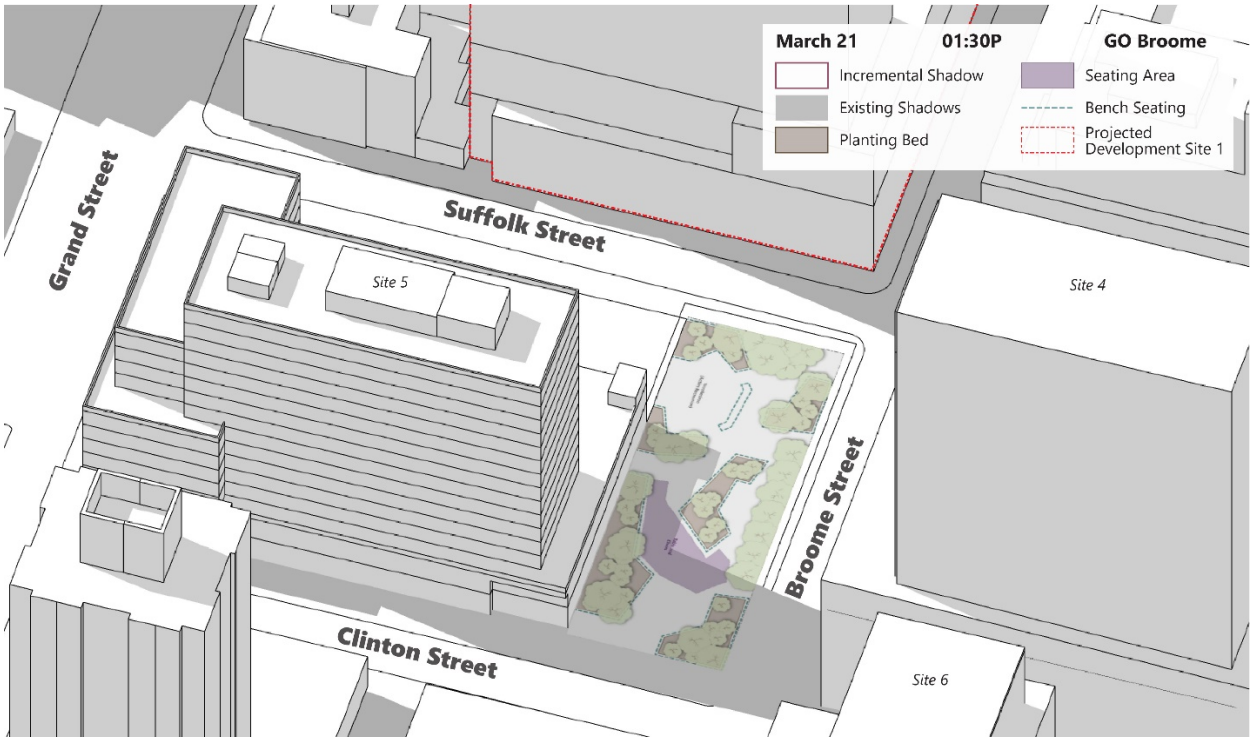


Figure 5-6 March 21/September 21 – 2:00P

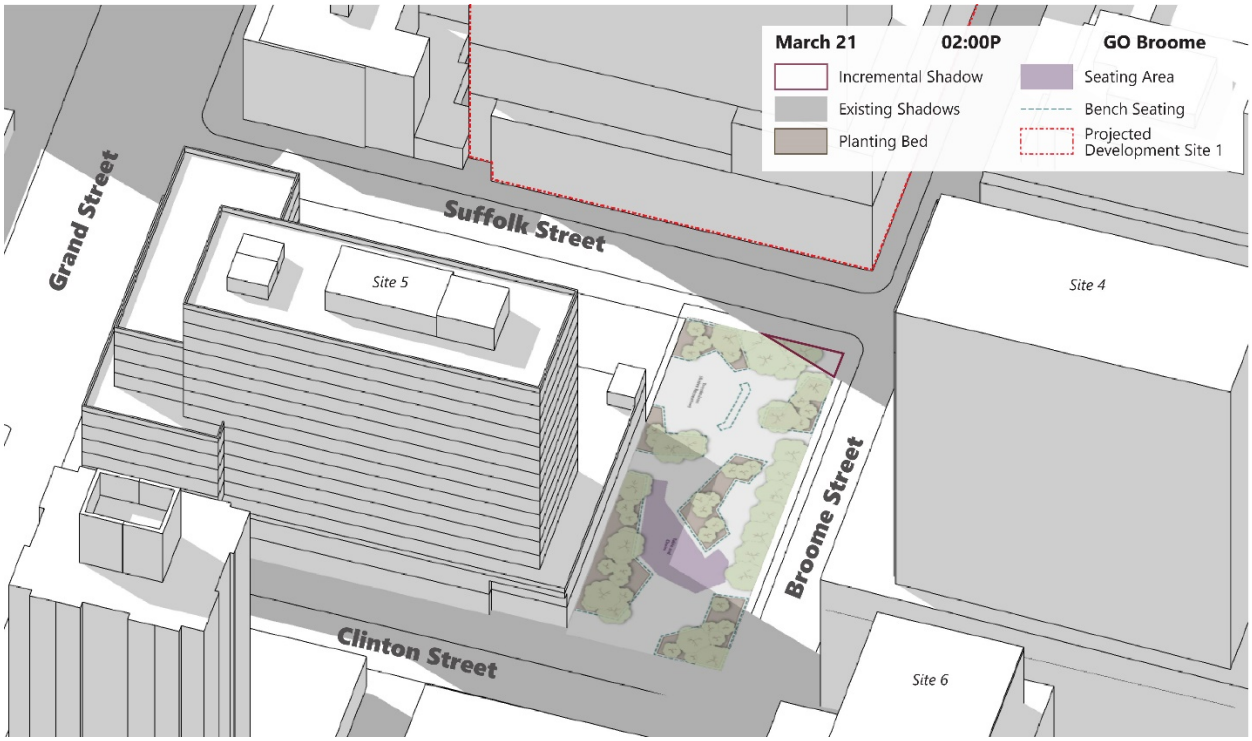


Figure 5-7 March 21/September 21 – 2:30P

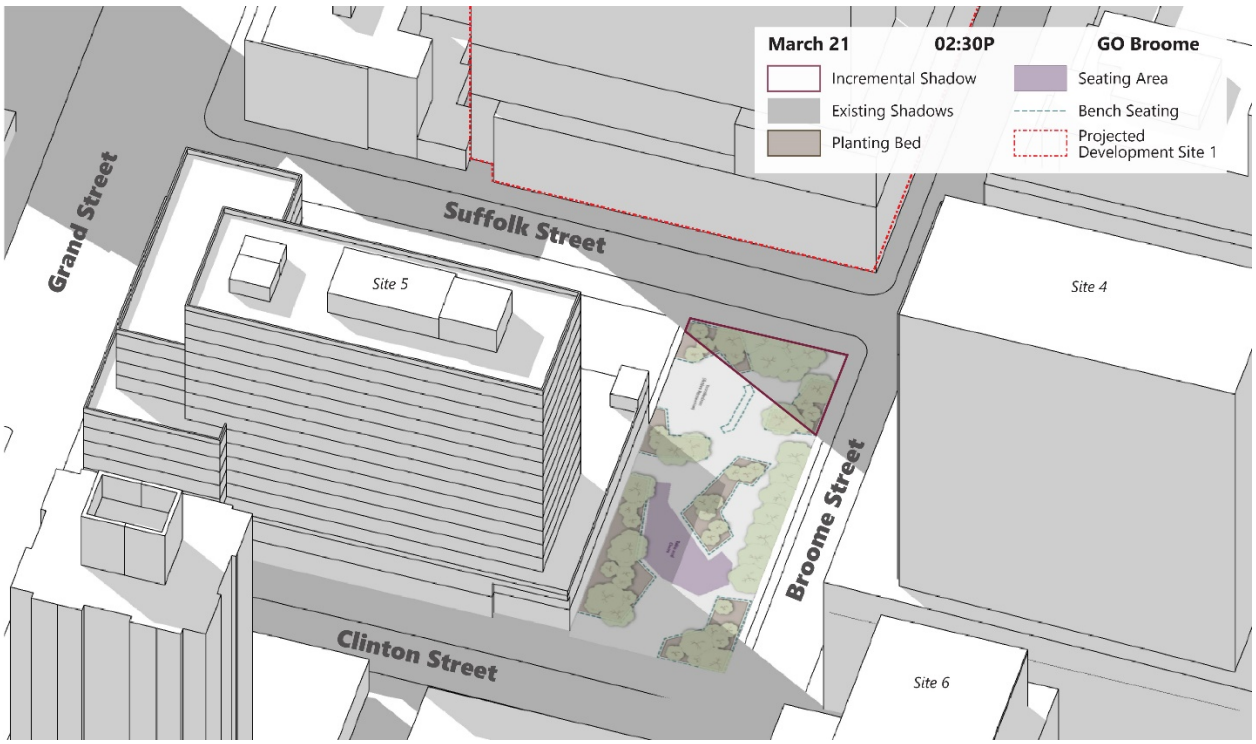


Figure 5-8 March 21/September 21 – 3:00P

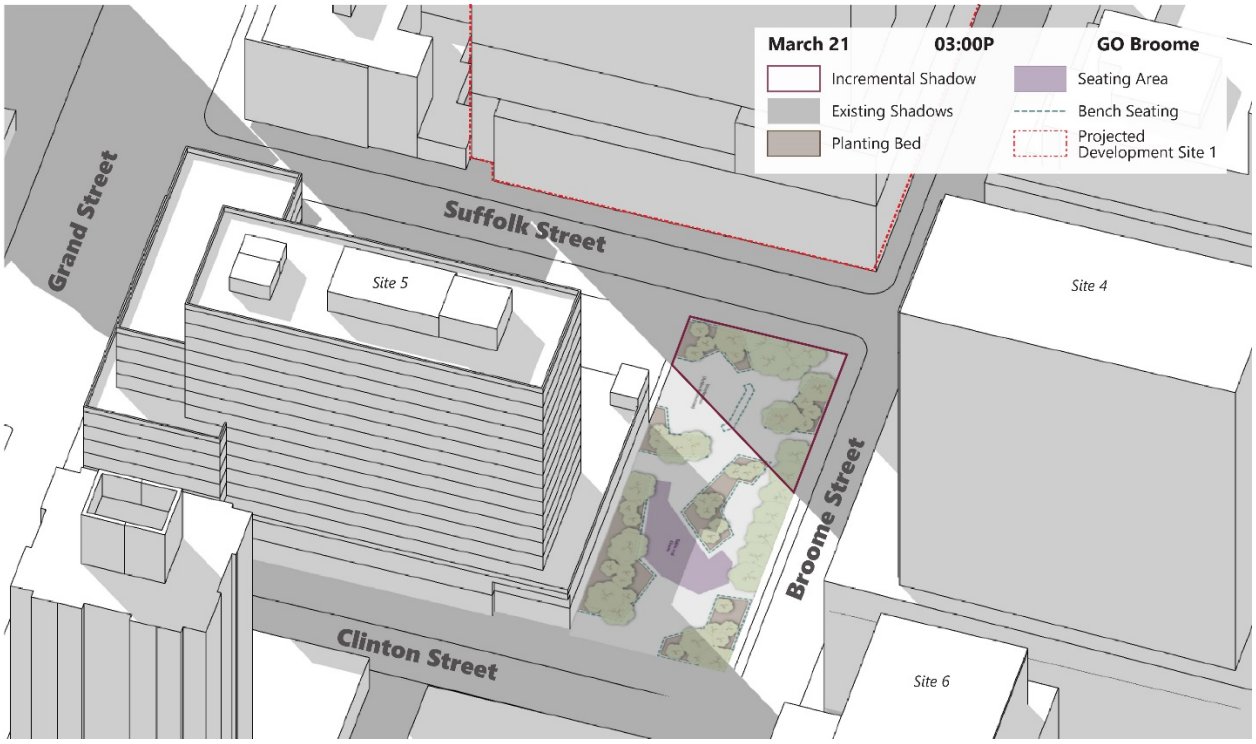
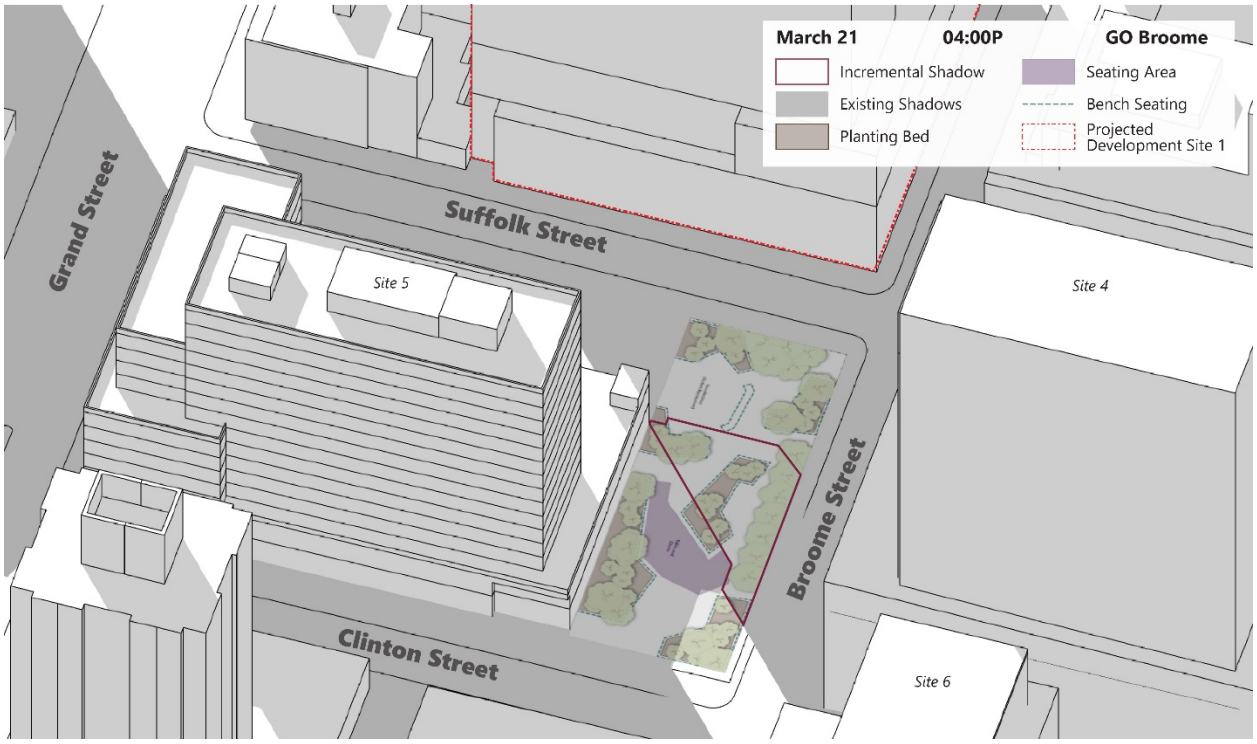


Figure 5-9 March 21/September 21 – 3:30P



Figure 5-15 March 21/September 21 – 4:00P



May 6/August 6 Analysis Days

Figure 5-16 May 6/August 6 – 1:00P

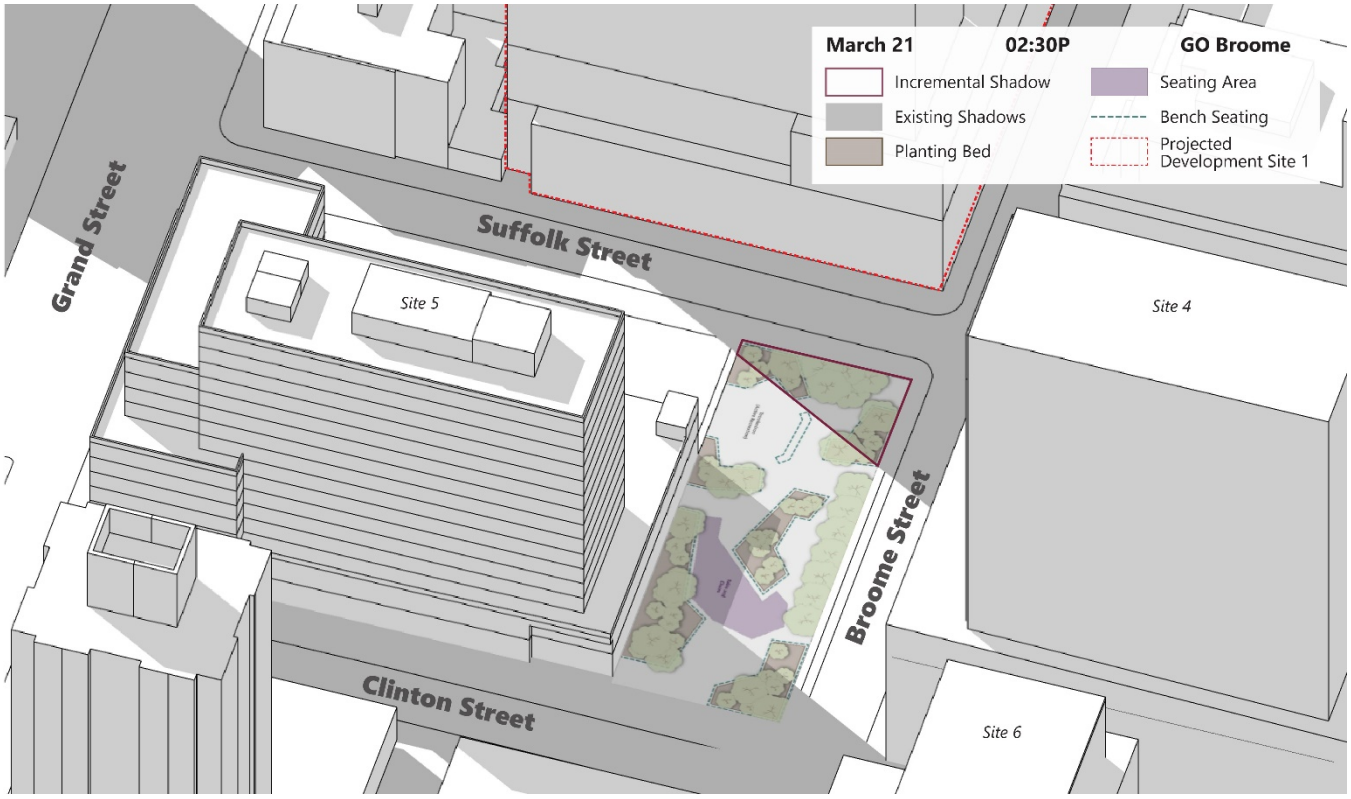


Figure 5-17 May 6/August 6 – 1:30P

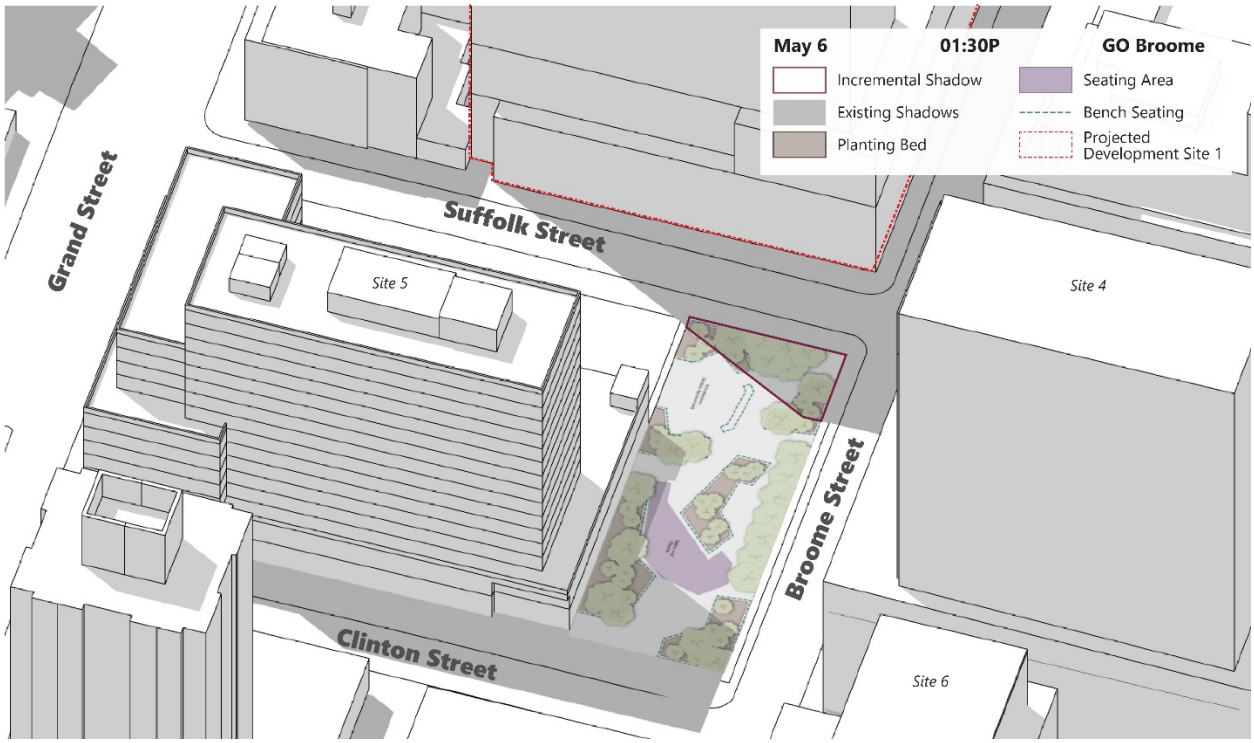


Figure 5-18 May 6/August 6 – 2:00P

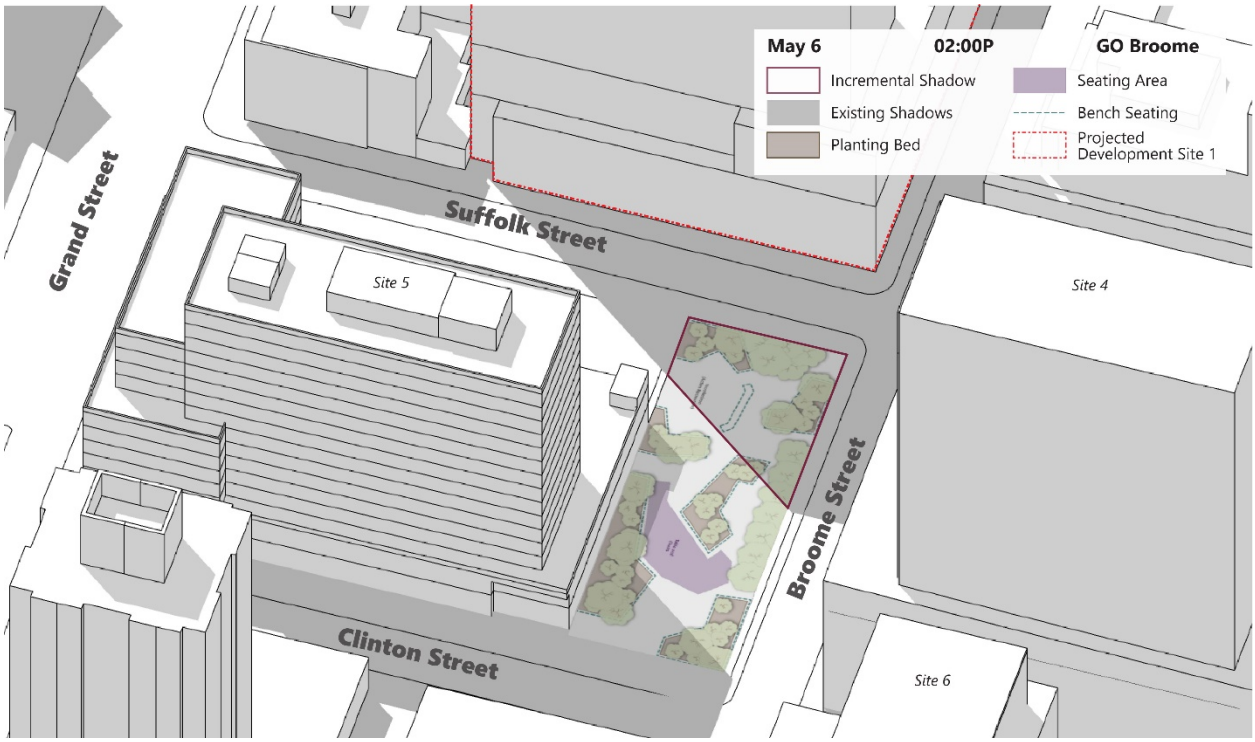


Figure 5-19 May 6/August 6 – 2:30P

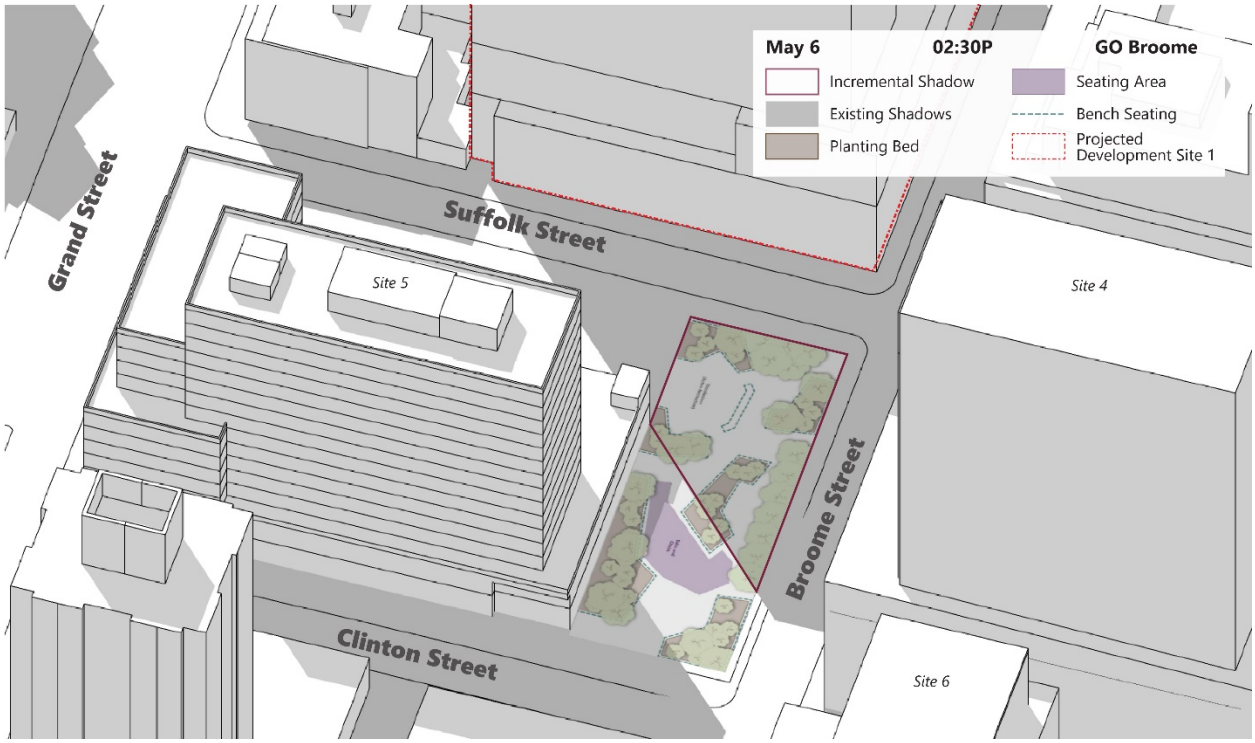


Figure 5-20 May 6/August 6 – 3:00P

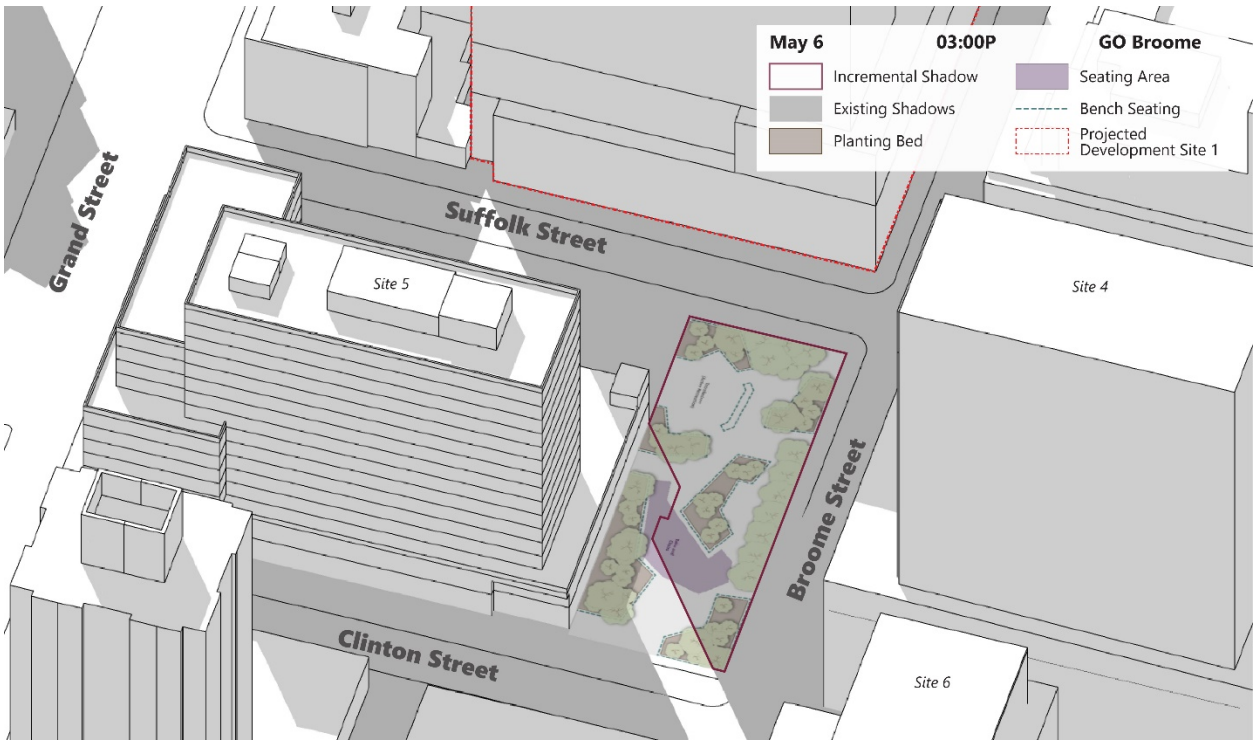


Figure 5-10 May 6/August 6 – 3:30P



Figure 5-11 May 6/August 6 – 4:00P



Figure 5-12 May 6/August 6 – 4:30P



Figure 5-13 May 6/August 6 – 5:00P



June 21 Analysis Day

Figure 5-25 June 21 – 1:00PM



Figure 5-26 June 21 – 1:30P

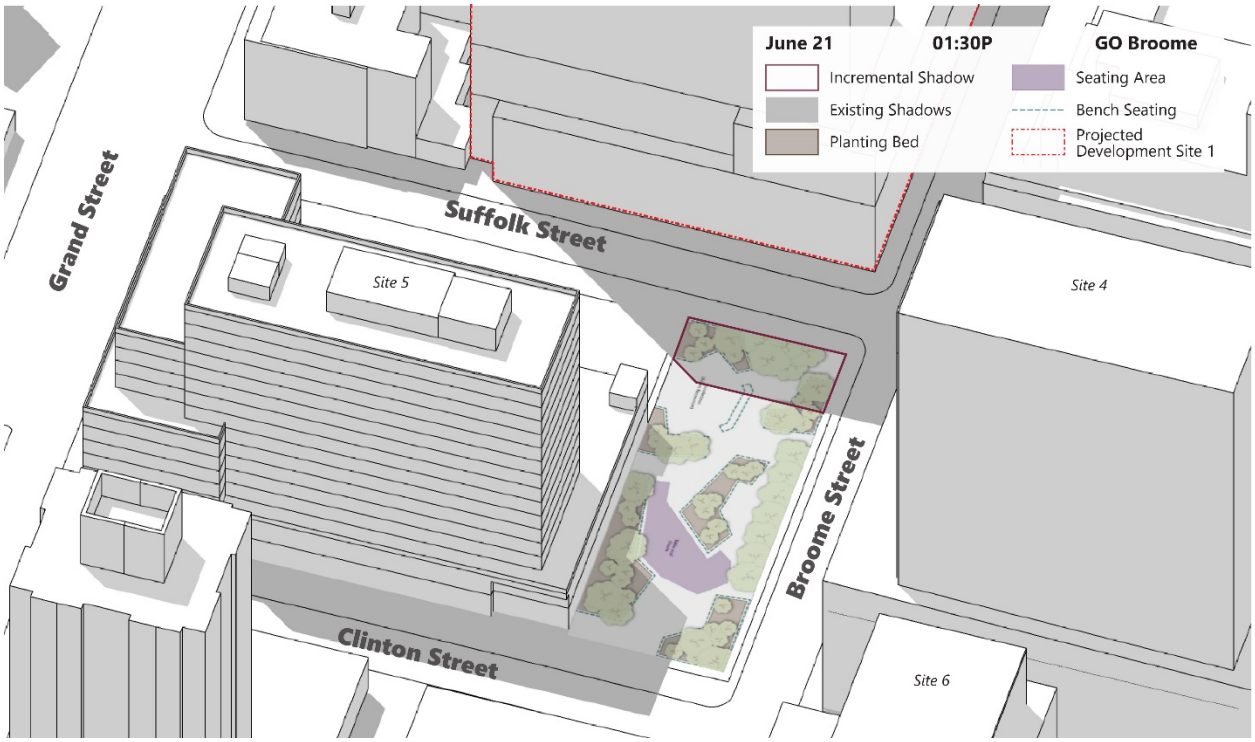


Figure 5-27 June 21 – 2:00P

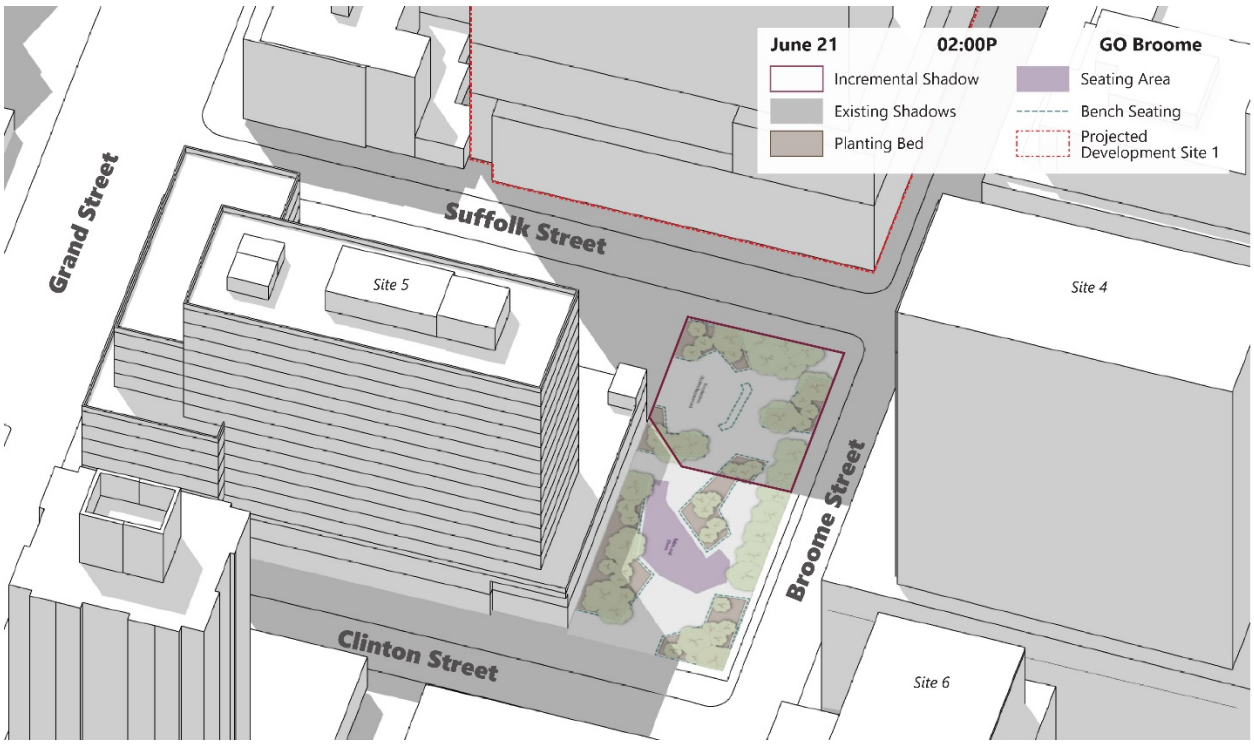


Figure 5-28 June 21 – 2:30P

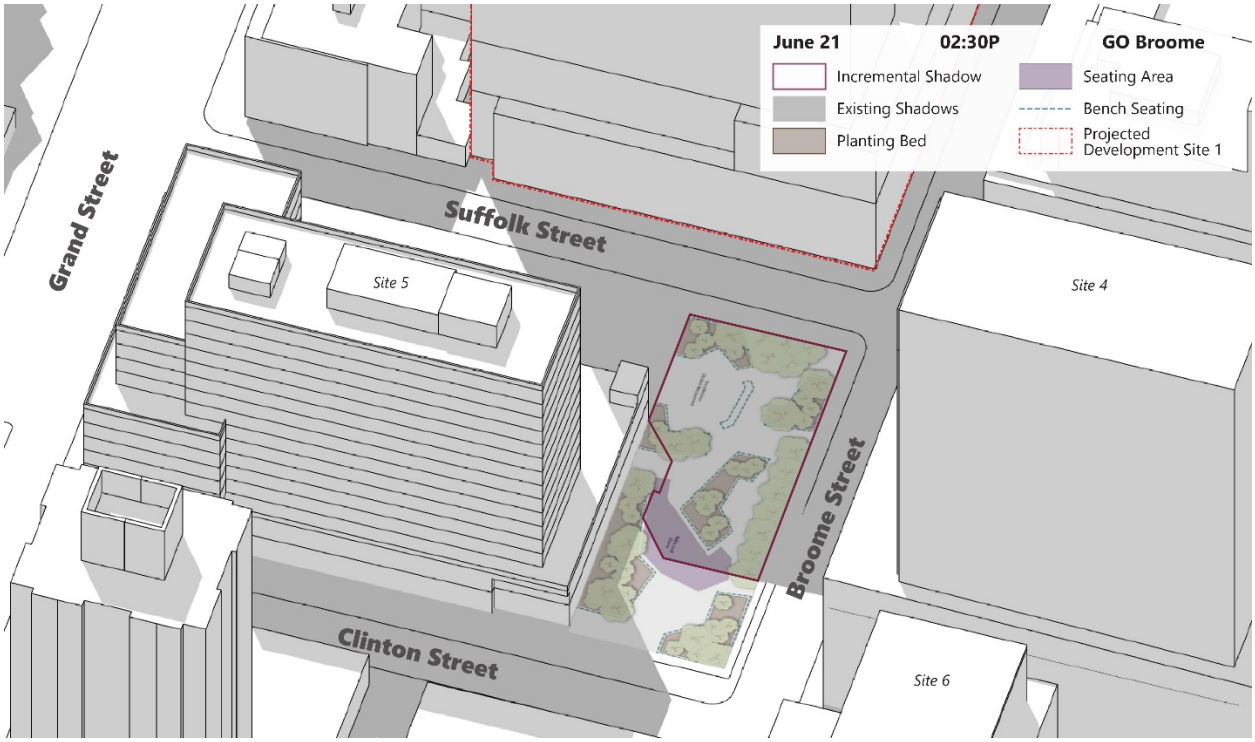


Figure 5-29 June 21 – 3:00P

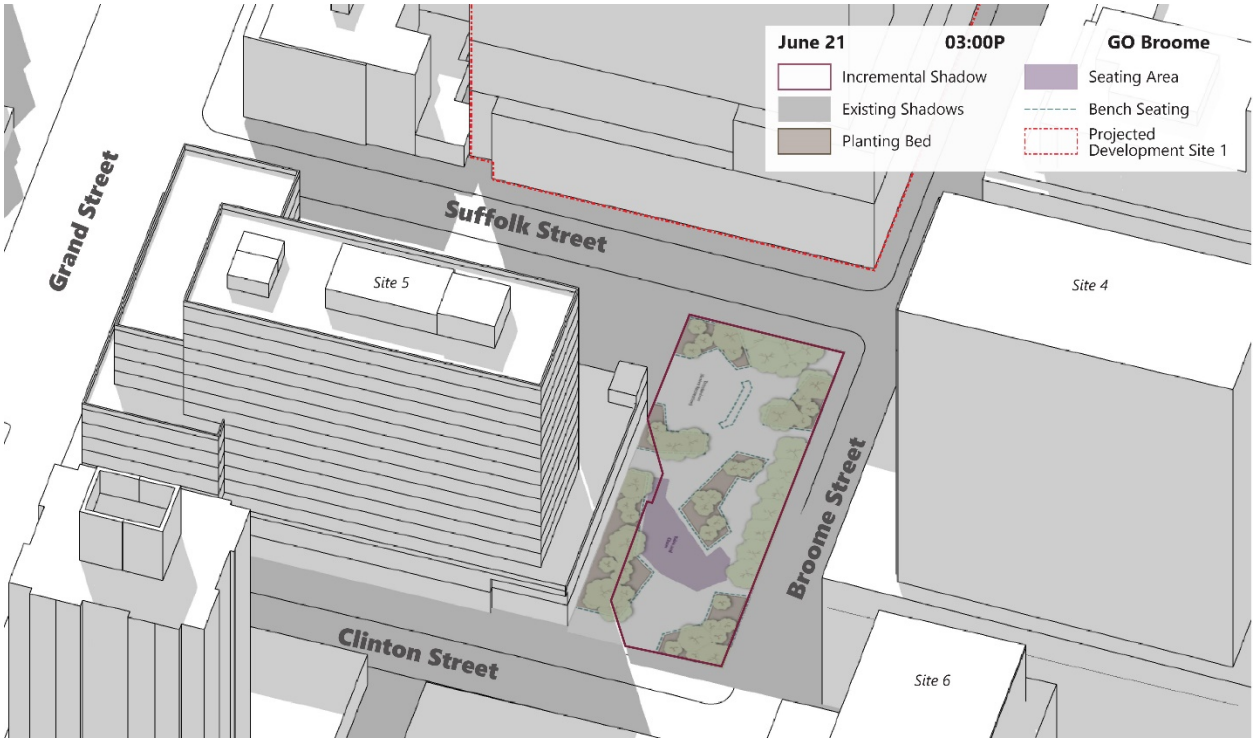


Figure 5-30 June 21 – 3:30P



Figure 5-31 June 21 – 4:00P



Figure 5-32 June 21 – 4:30P

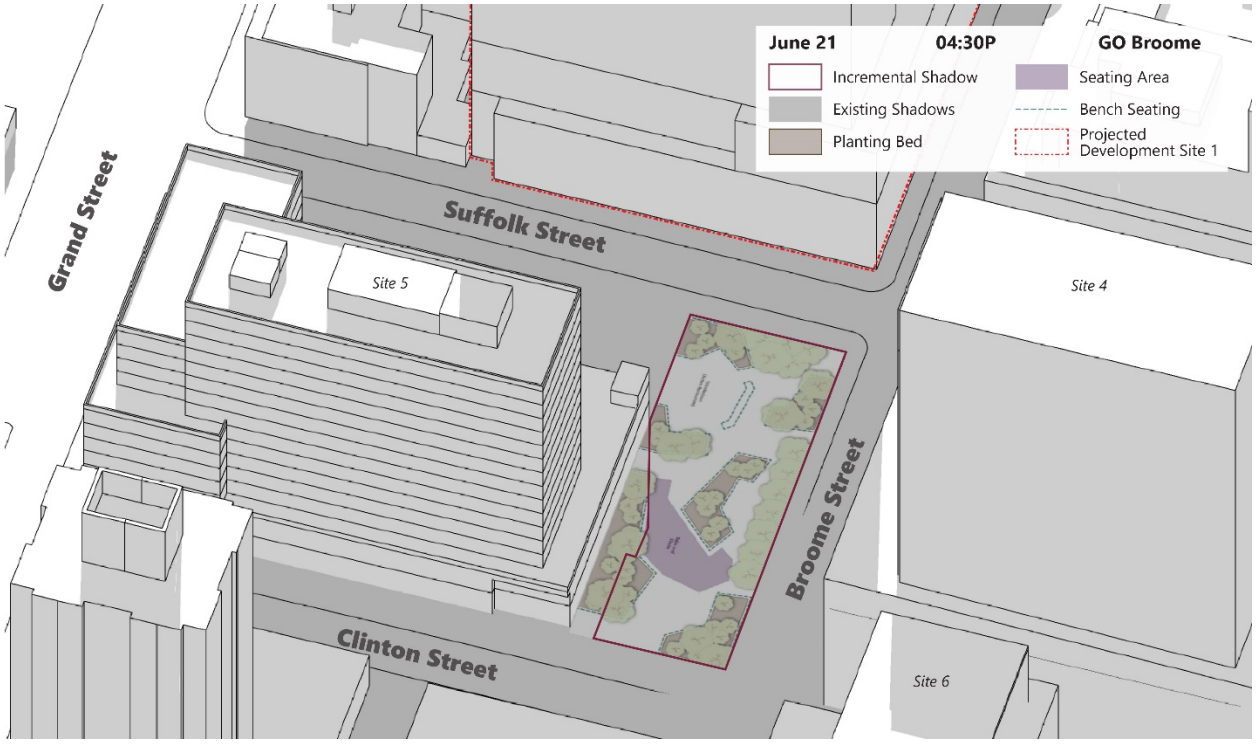


Figure 5-33 June 21 – 5:00P

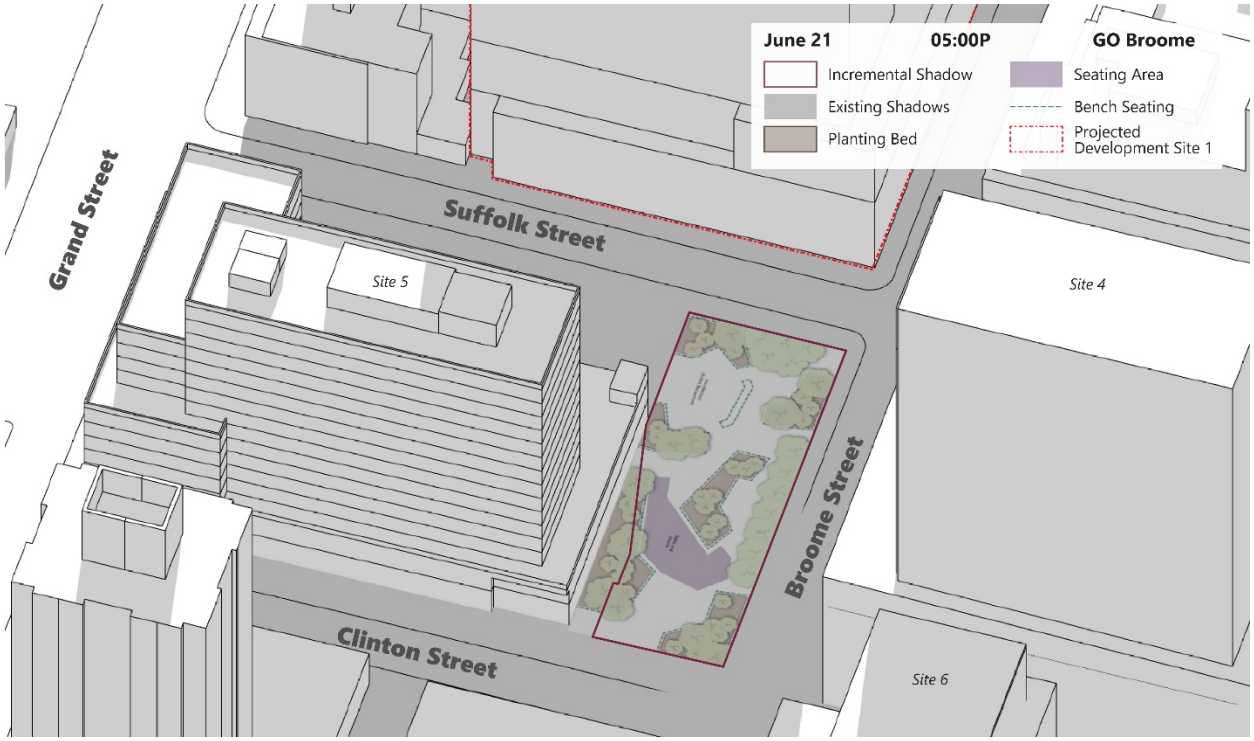


Figure 5-34 June 21 – 5:30P



Figure 5-35 June 21 – 6:00P

